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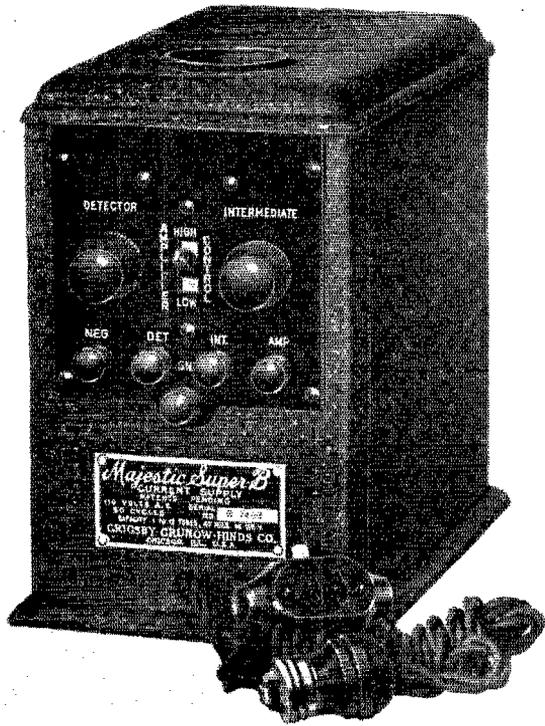
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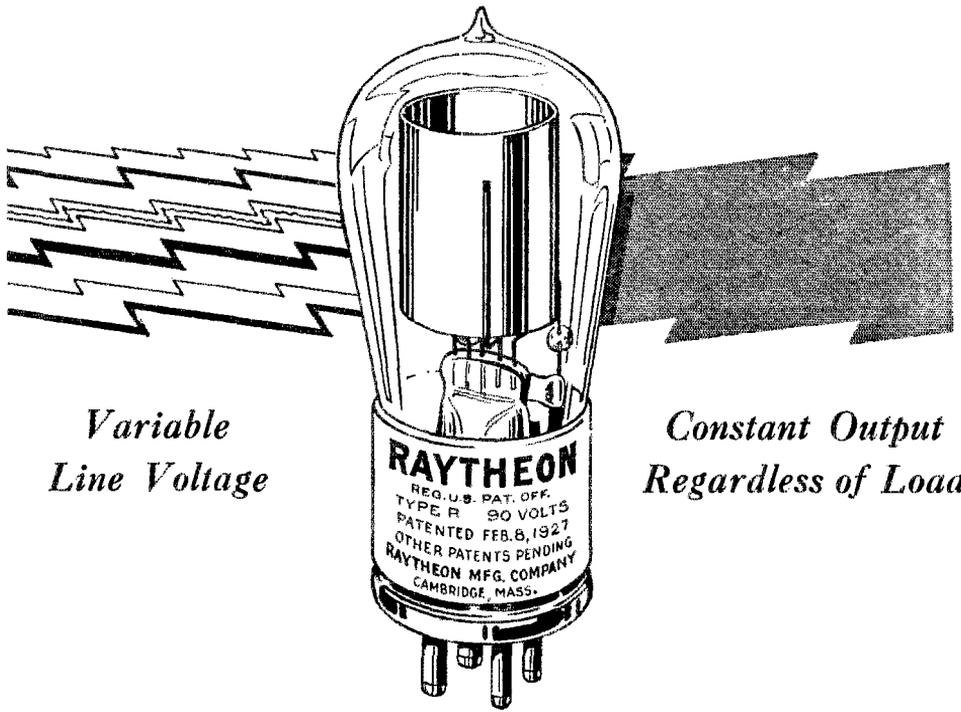
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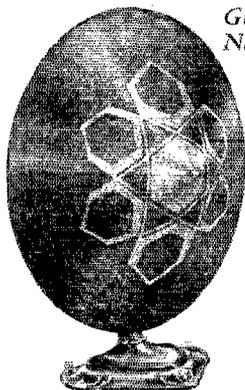
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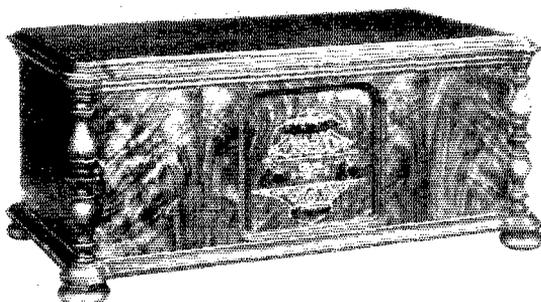
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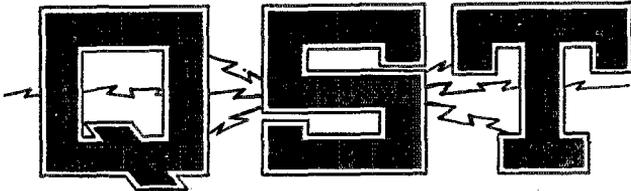
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The Official Organ of the A.R.R.L.

VOLUME XIII

OCTOBER, 1927

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The American Radio Relay League

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

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

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

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

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EDITORIALS

ANOTHER month has rolled around and again it's time to write the monthly story for this page. There ought to be lots to talk about. During the summer a really wonderful progress has been made in the solidification of the amateur world. Short-wave summer contact has been better than ever before. In the world of "organization" an equal amount has been accomplished, for our International Amateur Radio Union has now begun to take form as the world-wide federation of national societies which we have so long envisioned it to be. Fall has come, bringing with it an added zest in operating. Yes, there should be much to talk about, but for us there has been only one thing in radio this past month—this coming international radiotelegraph conference. No operating for us—we've been reading Mr. Berne's *Propositions pour la Conference*. We've lived, slept and eaten nothing but "I.R.C." the past month, so it is all we know to talk about to-day.

It's been lots of fun. We didn't exaggerate when we said last month that there were going to be hundreds of delegates, thousands of hangers-on, and printed matter by the carload. This, people, is going to be some conference. Why, it's going to make a disarmament conference look like a micro-vernier. The most optimistic estimate is that it will last six weeks. The guesses go from there all the way thru the winter. Such radio talk has never been heard of before, and it is sincerely to be hoped that it will hold the world for another fifteen years when the deed is done.

All over the world the national delegations have been preparing for the big parade which commences in Washington on October 4th. Our American delegation in August divided itself into seven committees and with the assistance of numerous technical advisors started a study of the proposals of all the other countries, holding hearings to obtain the views of all the American interests, and in general working to establish an American viewpoint on all the propositions that will arise at the conference. The volume of work done, and yet to be done, is simply prodigious. We thot our A.R.R.L. Headquarters was a busy place but you ought to see the headquarters of the American delegation!

The work so far done at Washington has been strictly an American party, so for the most part a nice harmony on what ought

to be done has prevailed. It has been pleasant to see the American amateur recognized as one of the important components of radio in this country. We have been given a liberal participation in the work. Our Vice President was appointed a technical advisor to the committee on technical matters, our Secretary was appointed to present a study of all the proposals bearing upon amateur matters, and both of them were appointed to the subcommittee on short-wave allocations, that never-failing subject of anxiety in the amateur breast. It is pleasant to be able to report that we have been received with the utmost consideration everywhere. The Army and Navy people in particular have backed us amateurs—we made good friends and powerful ones when we entered upon our programs of cooperation with the services. For a time during the discussions our 20-meter band was in danger, some of the commercial people suggesting that the great commercial value of those waves might make it in the best public interest to move amateurs down to the region around 12 or 14 meters, admittedly border-land waves of questionable usefulness. But we were able to make out a good case for 20, particularly by virtue of its harmonic relation to our other waves, and so it stands to-day. This does not mean that our present allocations are sewed up secure for us, but it does mean that there is every disposition on the part of the American delegation to-day to stand behind us in our request for these waves. It means that if there are no changes in the American attitude, our delegation will go into the conference proposing that the so-called 20-, 40- and 80-meter bands be reserved for point-to-point services that are not open to general public correspondence. It means in effect that the United States is proposing that these be the bands assigned all over the world to amateurs. It sounds good to us. It will be great to have the American delegation as a champion of amateur privileges before the world. It is of course much too early to hazard any guess about the outcome of the conference itself. Anything can happen. We must realize that there will be many governments represented that in the past have been unwilling to think favorably of amateur radio. Some of them want to rule us out of the picture completely; others would give us only the barest opportunity for existence.

We may be very sure that the American delegation will not accept an international proposition that would seriously injure her amateurs, for our government is sold on us. And we believe that our delegation will be able to show the other nations that it is to their benefit to be as liberal themselves. The amateur societies of almost

every nation have made efforts to tell the story of amateur radio to the delegates of their countries, and with both the League and the Union represented at Washington during the conference, it seems to us that we have reason to be optimistic about the outcome.

E. B. W.

9XL Standard Frequency Transmissions

THE Official Wavelength Station Committee of the Experimenters' Section, A.R.R.L., announces the following standard frequency schedules for station 9XL, operated in conjunction with broadcasting station WCCO at Anoka, Minnesota, through the courtesy of the management and the personal cooperation and effort of the operating force. The frequency values at 9XL are based on the standards of the Bureau of Standards and have been checked by Cruft Laboratory at Harvard University and by the Communications Laboratory of the Massachusetts Institute of Technology. While an accuracy of 1/10 of 1% is to be expected no guarantee is made.

Station 1XM may resume shortly. Meanwhile 9XL is covering the country in a very creditable manner.

It is a great pleasure to be able to say that there has been a very fine response to the efforts of the crew at 9XL this summer and that it has been possible to forward many dozens of "appreciations" to Anoka. Since this is the only reward for the tedious S. F. work these acknowledgments should by all means be continued. Please send them to the Ex. Section at Hartford. Mimeographed blanks for making the records will be supplied to all who write the Experimenters' Section for them. In time these records will not only be highly useful

to 9XL's crew but will also gradually grow up into a unique and valuable record of transmission tests, made on the very exceptional basis of a station which operates with exactly the same conditions over a long period of time, and on exactly known wavelengths in all the regularly used amateur bands.

Details on station 9XL may be found on page 8 of the June issue. 9XL now operates with a small percentage of "tone" modulation to distinguish the signals from broadcast harmonics.

In the following, "f" is the frequency in MEGACYCLES and the approximate wavelength in meters follows.

SCHEDULES

(Figures are frequencies in MEGACYCLES per sec.; approx. wavelengths in parentheses.)

Friday Evening Schedules				Sunday Afternoon Schedules		
Central Time		Standard Time		Central Time	Standard Time	
Time (PM)	Schedule A		Schedule B		Time (PM)	Schedule C
	f	λ	f	λ		f
8:30	3.50	(85.7)	6.50	(46.1)	3:00	10.0 (30.0)
8:42	3.60	(83.3)	6.75	(44.4)	3:12	12.0 (25.0)
8:54	3.75	(80.0)	7.00	(42.8)	3:24	14.0 (21.4)
9:06	3.90	(76.9)	7.25	(41.3)	3:36	14.5 (20.7)
9:18	4.00	(75.0)	7.50	(40.0)	3:48	15.0 (20.0)
9:30	5.70	(52.6)	7.75	(38.7)	4:00	15.5 (19.3)
9:42	6.50	(46.1)	8.00	(37.5)	4:12	16.0 (18.7)
9:54	7.00	(42.8)	8.25	(36.3)	4:24	18.0 (16.7)
10:06	7.50	(40.0)	8.50	(35.3)	4:36	20.0 (15.0)
10:18	8.00	(37.5)	8.75	(34.3)		
10:30	8.50	(35.3)	9.00	(33.3)		



October 9,	C
" 14,	A
" 28,	B
November 6,	C
" 11,	A
" 25,	B
December 4,	C
" 9,	A
" 23,	B

DIVISION OF TIME

3 minutes—QST QST QST nu 9XL.
3 minutes—5 sec. dashes broken by station call letters every half minute.

1 minute—announcement of frequency in megacycles per second (8.75 megacycles per sec. is sent as "8 F 75 MC.")

1 minute—announcement of frequency in megacycles cycles per second.

Special Notice—The continuation and possible extension of these transmissions depends entirely upon the response of the A.R.R.L. If you use the transmissions send a note to Experimenters' Section, A.R.R.L., Hartford, Conn.

—R. S. K.

An Arctic Adventure

By Howard F. Mason *

NOW that we are home again, we can look back upon the happenings of the past four months as an experience never to be forgotten. Quite different is getting out and making low powered sets work over long distances in the arctic from sitting at home in a warm room with the old set and lots of power hooked to it.

KFZG and KFZH, you know, were operated at Point Barrow, Alaska, and Fairbanks, 560 miles apart, by the 1927 Detroit-News Wilkins Arctic Expedition from February 28th to June 5th. Fairbanks is a town near

the center of Alaska; Barrow is a village of seven white people, two hundred Eskimos and about eight hundred dogs, just seven miles south of Point Barrow, which is the northernmost tip of the American Continent and of Alaska. From Barrow it is over four hundred miles to the nearest

tree, two hundred miles to the nearest hill, over five hundred miles to the nearest telephone or power leak, and about ten steps to the arctic ice pack. In fact, the little village would be an oasis in a desert—if there were a desert. Mail usually reaches there three times a year after a month's journey by dog team. Once a year the ice opens sufficiently so that boats can reach there with supplies. For three months in the winter the sun never rises—for three months in the summer it never sets. As the old skipper said, "Diz iz da blace you reed about."

And this is the place for which we headed from Fairbanks one day in late March in one of the two Stinson-Detroit air planes of the expedition.

To go back a moment, several weeks and even months had been spent in preparation for this trip. Equipment had to be built, parts secured, a careful list of spares arranged, and everything put in readiness. Now, with Hemrich¹ and KFZH comfortably installed at the Eighteen Mile Roadhouse, near Fairbanks, and with the base station working fine, we turned our attention towards the Barrow end of our communications.

Everything needed for maintaining good communication for from one to six months

*7BU, Seattle Radio Laboratory, and Chief Radioman for Wilkins' 1926 and 1927 Arctic Expeditions. Formerly Department Editor, QST.

1. 7MB, ex-7SC, Radioman on Wilkins' 1927 Expedition.

had to be taken to Barrow in the plane. And this means everything; transmitter, receiver, power supply, antenna system, operator, and spares for fixing anything that could conceivably go wrong with the equipment. This sounds easy, but this was an arctic expedition not a radio expedition; and there were tons, it seemed, of other things that had to be taken and which were more necessary than radio. Noble sacrifices had to be made before the load was cut to that with which the plane would have a chance of getting off the ground. Silver money was even

exchanged for paper money to save weight. At the final reckoning, radio totalled less than three hundred pounds, including the operator.

Bright and early the next morning we were to start.

Five trials were made at getting into the air and we were still on the ground.

Heavy snow on the field held us back and the heavy load held us down. At the sixth attempt we made it. Al Graham, pilot, and myself in the DN-2 circled the field to see how the other plane would get off with its heavy load. It left the snow at the first attempt and after gaining a little altitude, we fell in about half a mile behind as it headed northward.

One hour's flight and we crossed the Yukon, Alaska's largest river. Two hours put us over Wiseman, a cluster of cabins between two mountains, and the last habitation we would pass. Three hours' flying put us in the heart of the Endicotts, ribbed snow-clad peaks as far as one could see in every direction, and with our two little planes just on a level with the highest peaks at 8000 feet. The mountains drop abruptly on the north to the coastal plain or tundra which extends for over three hundred miles to the arctic coast. The fourth hour found us past the mountains trying to follow the plane ahead down through a dense cloud bank to 3,000 feet where it was clear again. Then for three hours or more we saw nothing but a sea of level white below us. Occasionally there was the outline of cut banks on a river, or a snow-swept spot on the tundra, but of landmarks, there are none in this country. Like the "pretty little bird" we "flew, and flew and flew and flew and flew." Al had just finished insisting that we had missed Barrow entirely and were out over



THE DN-2

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



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

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

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

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

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

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

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

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



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

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

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

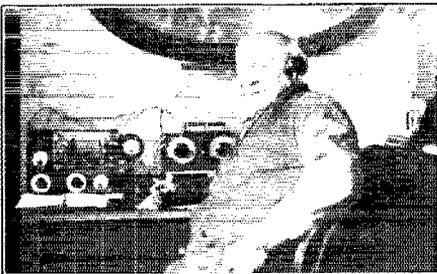
storm and were trying to get the set going. That was good news but not enough of it. The dashes ceased. It was over an hour later we heard them again; pretty good signal, about R4 this time. Then the slow even sending of the automatic contactor on the hand generator started sending the two letter combinations that stood for, "forced landing on sea ice," "out of gas," "plane damaged." This was followed by some jerky hand sending giving a doubtful position about 100 miles from Barrow. The whole message was repeated several times and that was all. I longed for a good ham operator with a receiver out on the ice so we could QSO and get all the dope. But that would not have helped any; not until they start sending gasoline, food, and spare parts for airplanes by radio.

So we at Barrow sat around helpless all of three weeks waiting for more word, and with hope dwindling that the two men out on the ice would be able to get ashore safely. Searching flights were made up and down the coast and as far out to sea as it was safe to venture. The proverbial needle in the haystack is but a drop in the bucket compared to the chances of finding two men and an airplane somewhere on the Arctic Ocean or any other ocean. The arctic ice is continually moved by strong and uncertain currents. Leads several miles wide open up, then close again and the great ice chunks are piled high under enormous pressure. Travelling over this is very slow, difficult and exceedingly dangerous. You might be drifting from your objective faster

we last heard their signals they had abandoned the plane and walked to the coast, reaching there in sixteen days. They came in to Beechey Point, fatigued but in good condition, and with food for several days of



THE AUTHOR SHAKING HANDS WITH HIMSELF UPON ARRIVAL AT BARROW



THE "MAYOR OF BARROW"

Mr. Fred Hopson, listening in to PCGG. Incidentally, he has lived at Barrow 36 years and hasn't been "outside" since 1900.

than you are travelling toward it, and there are no landmarks to go by.

A few days later, one night about one a.m., I had just finished logging a flock of Aussies, when there was a racket outside and the yowling (Eskimo dogs don't bark) of more dogs than usual. In came Takpuk, an Eskimo who had just arrived from the eastward after six days travel, bringing a letter from Wilkins. They were safe! After

travel yet. The next afternoon Graham hopped over to Beechey Point in the DN-1 and brought the two men back to Barrow. We were just as glad to see them as they were to get back.

After resting up a bit, plans were formulated for another trip over the ice, this time in the DN-1, and with hopes for better luck.

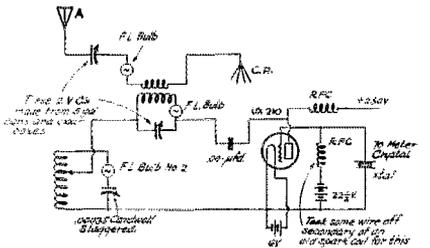
Hemrich and I discussed the radio situation over the air which ended by his sending up by plane what spare parts he had from which I could build a transmitter for use at Barrow. The regular Barrow transmitter had to be installed in the plane, since Hanson's set was "last seen going north."

The powers that be, at Barrow, were quite alarmed to watch me build a transmitter out of the few parts at hand, improvised with condensers made of pieces of five gallon gas cans, etc., and were sure that it was not going to work and that we would be out of communication with the outside world. I told them not to worry; that I had not been monkeying with radio ever since there was any without learning what made the

wheels go 'round, and proceeded to get 'er going and KFZH and I resumed our four schedules a day.

So the regular Barrow transmitter was installed in the DN-1 plane, with a block of 400-volt Burgess batteries for plate and a small storage battery for the filament of the 7.5-watt tube. In this set, the fundamental of the crystal was radiated by the trailing antenna, the current being about .8 ampere.

It was light all night by now, so the long flight was started in the afternoon. As



NOTE: Short F1 Bulb No. 1 & 2 when circuit inoperative. Use smallest F1 bulb you can find.
THE CIRCUIT USED IN THE IMPROVISED TRANSMITTER THAT SOLVED THE DAY-LIGHT PROBLEM

before, signals were sent from the plane every half hour. With the plane three hours out and nearly 900 miles from Fairbanks, Hemrich was reporting KDA (the airplane) as R6, while KDA was a good R8 at Barrow. If they had not decided to turn back after flying through dense clouds and fog I believe we could have followed that signal anywhere. This time the return flight was made without mishap.

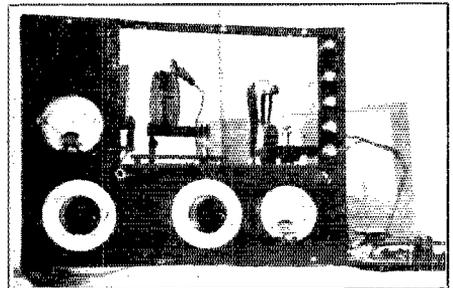
It was getting late in the season. Continued fogs had put a damper on flying. Several warm days had put several inches of water on top of the ice on the lagoon which was our landing field, and cracks began to appear in the ice. The return to Fairbanks had to be made quick or we were all going to have a nice three months wait until the boats could get there and take us home. That would have been fine with a good transmitter handy and lots of power, but the batteries were all pretty flat and I was losing my enthusiasm for the place itself. So it was good news extraordinary when Capt. Wilkins told us to pack up and prepare to leave for Fairbanks in the morning.

We did. The first attempt at getting off ended when water splashed into the carburetor about the time we were leaving the ice. With better luck next time we got into the air and were immediately enshrouded in fog through which we climbed for twenty minutes. When we broke through, it was clear as a bell overhead, and our course was shaped for the mountains. Barrow was behind.

To the mountains the trip was uneventful. We were above the clouds most of the time and saw little. The snow was now all gone from the mountains, for with the sun shining twenty-four hours a day it melts fast. Unknowingly, the plane had been drifting westward and when, three hours later, we came to the Yukon river, there were no places to be seen that checked with the map. We were lost, just plain lost. Well, we couldn't stop and think it over, so the rivers were followed this way and that, and over an hour was spent in looking for some landmark. Finally a town was seen far to the eastward which, on our coming closer, appeared to be Tanana. The question now was: Would there be enough gas to take us to Fairbanks? Careful calculations were made. There might and there might not be.

But we kept going and were just expecting the motor to cough its last when the wonderful city of Fairbanks was seen ahead. That is, wonderful to us, after being at Barrow. But we were not there yet. There were skis on our plane instead of wheels, made necessary by the water and ice at Barrow. The wheels were in the cabin, in fact I had been holding them in my lap for the past eight and a half hours. And I had been told that landing with skis on the bare ground is "not what it's cracked up to be." So we held on tight and again hoped for the best. Due to Graham's skillful piloting there was hardly a jar when we landed, though we did stop within fifty feet. We heaved out the wheels, got untangled, and the gas tanks were looked into. Three gallons were left.

Now for something about the radio work: KFZH at the Eighteen Mile Roadhouse



THE ORIGINAL TRANSMITTER THAT SIGNED KFZH

was a 50-watt tube controlled by a 7.5 watt crystal-controlled oscillator. The set was powered by storage batteries for the filaments and a 750-volt Esco dynamotor running from a 32-volt Delco supply for the amplifier plate. Burgess batteries supplied the oscillator plate current. The complete

transmitter was built into a trunk like cabinet measuring ten by twelve by twenty-four inches inside, for portability. The receiver was a regenerative set with one stage of audio, a duplicate of the one used at Barrow.

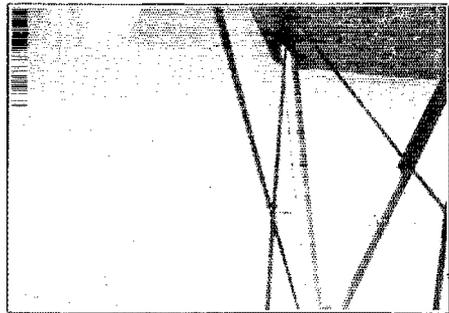
KFZG, the Barrow transmitter, used a UX-112 usually with the filaments supplied by Burgess dry cells. This set, too, was crystal-controlled, and built into a compact unit weighing five and a half pounds and having everything accessible from the front. Plate supply was furnished also by Burgess batteries. The set was keyed in the plate circuit. After the 400-volt block taken to Barrow on the first trip had expired, the ten 45-volt 9½-pound blocks brought to Barrow and used by Waskey on last year's expedition were resurrected and after scraping the frost off of them and thawing them out and fixing corroded connection wires, were found to possess 38 volts apiece! This was luck. Two other 400-volt blocks, used last year and now reading less than 200 volts each were torn apart and the 22½-volt units matched for voltage and paralleled. By breaking all of our batteries into 22½-volt blocks (or rather what was once 22½ volts) and paralleling them so as to have all of our batteries in circuit all of the time the set was used, the current drain on each unit was lessened. The transmitter normally ran at about 250 volts and 60 milliamperes plate, or 15 watts input.

Because of the low power and necessity for reliable communication, it was necessary to pick carefully the right wavelength for the distance over which we had to work and the time of day. Queerly enough, even though the sun is above the horizon all night after May 11th at Barrow, regular night radio conditions seemed to prevail. Upon arriving at Barrow, March 25th, four schedules a day were run with KFZH, both stations being near 46 meters. Later in the season, as the sun rose higher, this wave dropped out in daylight and was sometimes uncopyable at night. A shorter wave was necessary. But how? Our thinnest crystal at Barrow had a fundamental of 46 meters and there was no carborundum in the place to grind it thinner. We had to have daylight communication to handle important messages. The circuit shown in Fig. 1 was tried and used with good success. This radiates the second harmonic of the crystal directly. Energy on the crystal fundamental was not even enough to block a nearby receiver. Two tenths of an ampere were put into a vertical antenna near its fundamental and that solved our daylight problem. But this wave did not always get through at night so sometimes we shifted back to 46 meters.

We started with four schedules a day

but this soon grew to as many as eight sometimes. With weather reports, press, expedition business, private messages, and ham traffic, the average words sent from KFZG averaged about 200 a day. This does not count one 6,000-word press message which was in a class by itself. When we closed the station in June some of those 22½-volt batteries were being used four in parallel and delivering 4 volts. They were sure good to the last drop.

The U. S. Signal Corps office at Fairbanks, in charge of Sgts. Payne and Reeser, cooperated in every way, not only in handling regular messages expeditiously, but in sending us time signals relayed over the cable from Seattle, and press. Hemrich hooked the telegraph line that goes from



FLYING OVER THE SNOWCAPPED ENDICOTTS

Eighteen Mile to Fairbanks right to the radio relay at KFZH and the Fairbanks operator sent to Barrow directly.

A daily paper, based on 2UO's press, was published at Barrow. The people received quite a kick out of receiving the news on the day before it was published in New York, due to difference in time. It is usually six months or more before news reaches the village of Barrow.

No less than a dozen and a half messages were sent from Barrow, via KFZH, to all parts of the U. S. All were delivered and answers to every single one relayed back in good time! Putting those messages through were greatly appreciated by the people at Barrow, fellows, and they wish to thank all who handled them, and especially 7ABK, for the good work.

Hemrich established regular communication with the *Baymaude*, CKA, wintering in the Canadian Arctic in Coronation Gulf; also with Can. 5FS at Herschel Island. We thank these stations for their weather reports which were of great value to the expedition.

At KFZH, Hemrich did excellent work in handling the regular schedules with Barrow, and in keeping in touch with amateur sta-

tions from Japan and New Zealand to Connecticut. It was only through his testing different antennas, trying different wavelengths, and by constantly improving his set, and by good operating, that 90 percent of the traffic was handled on schedule with the low power available at Barrow.

Reception at Barrow was wonderful. Because it is quite far north, by listening the right time of day stations in one continent after another come in regularly each day as the earth revolves once daily! PCGG's 30.2-meter broadcasting was R6 and enjoyed by all; the first broadcasting to be heard at Barrow. WGY's short wave was also good at times. Due to daylight, there was nothing on regular broadcast waves that could be heard.

In conclusion, short wave radio in arctic exploration has been proven. And the amateur is the man for the job. If you get a chance to join an expedition you no doubt will find it a lot different from what you are used to, and different from what you will be expecting. There will be a lot of hard work, many obstacles that must be overcome, and a lot of hard tack and corned willie as well as ice cream and cake. But if your health is good, and you are sure you can stand the cold weather, go to it. You will have the time of your life.

Central Division Director Darr presided at the Banquet and introduced the speakers of the evening, Lieut. Roberts and Dr. Burka from McCook Field. The former told us of his amateur work in the Philippines and the latter explained how aerial photographs are taken and later showed two very fine reels. A.R.R.L. Headquarters was represented by A. A. Hebert, Treasurer and Fieldman, who in a reminiscent mood, told of amateur radio since 1903. Wm. Kidd, 8KG, the founder of the Mahoning Valley Radio Club, was a surprise visitor, having travelled quite a distance to attend. He told about the early beginning of the club before the war. But the most interesting speaker of the evening proved to be 8CNO, Mrs. Thomas, of Delaware, Ohio, a real-to-goodness "Ham-O.W."

The evening closed with the showing of several movie-films and the distribution of the largest assortment of prizes ever seen at any convention. In the wee small hours every one grouped around the convention Committee and personally thanked V. D. Gettys, 8AWX; C. M. Chorpeneing, 8WR; J. H. Borden, 8DMX; and other members for the pleasant time given.

—A. A. H.

The Ohio State Central Division Convention

WITH one of the largest registration lists for the first day, the Sixth Annual Central Division Ohio State Convention opened at Youngstown, August 19th, under the auspices of the Mahoning Valley Amateur Radio Club.

As it had been announced, "Amusement" was to be the key-note of the convention, and soon after the opening, about twenty automobiles left for Idora Park where athletic events took place. The ball game between the two- and three-letter calls, was most exciting and was won by the two-letter fellows. The three-legged, wheelbarrow and shoe-untangling race caused a lot of merriment and got every one well acquainted.

Saturday forenoon was devoted to the traffic meeting, with section manager Storck in charge. After lunch the automobiles were again commandeered and the crowd taken to the club headquarters a few miles out of town and an opportunity given to inspect the club's radio station, 8DPQ, and to listen to a fine description of KDKA by Mr. R. W. Burgess of Westinghouse. The open-air meeting was concluded by Prof. J. R. Martin of the Case School of Applied Science, Cleveland.

Pacific Division Convention

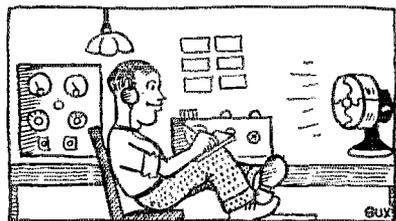
Hotel San Diego, San Diego, Calif.

October 14-15

THIS is our last announcement, fellows. We have planned a great many things for your benefit, but your attendance is the only thing that will make it a success. Don't forget that the annual award of the Wouff Hong trophy donated by the Modesto Radio Club will be made, so please enter the contest. The award will be made on the following four points:

- | | |
|----------------------------------|-----|
| 1—DX in miles per watt max. | 35% |
| 2—Maximum traffic handled | 25% |
| 3—Operating ability | 20% |
| 4—Percentage apparatus home-made | 20% |

Drop a postal to D. C. Good, Convention Manager, 1821 Altura Place, San Diego, California.



SOLID COMFORT

An Oscillating Amplifier for the Crystal Transmitter

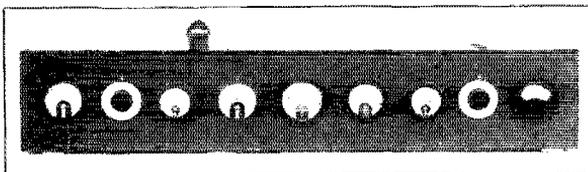
By Ralph Pierce*

ONE of the main reasons that a crystal controlled transmitter might not be as reliable as the self-oscillating circuit is that if anything happens to the crystal tube or its associate equipment, the entire action of the set stops until the necessary repairs or adjustments are made. One way to get around this is to use an oscillating tube instead of a pure r.f. amplifying stage to follow the crystal tube. This is much easier to adjust than is an arrangement where the amplifier must be kept from oscillating while at the same time regeneration must be encouraged to a point closely approaching the oscillating condition.

Regeneration is very desirable and absolutely necessary in cases where a UX-210 crystal oscillator tube is expected to control a power output of 200 or 300 watts without any intermediate amplifiers. At the same time, if the usual amplifier is allowed to oscillate it will do so at a wave that is far enough off the crystal wave to cause all signs of crystal stability to disappear entirely which means that the transmitter goes "off the air" until necessary readjustments are made. This is not the case where the amplifier is designed to oscillate at the same wave as the crystal, for, if the crystal end goes bad, the amplifier still oscillates merrily on, the output wave shifting but a couple of kilocycles at the most. In a well designed outfit, this shift will be quite small and well within the audible range. The signals at the receiving end are, therefore, not completely lost at all but may change in pitch somewhat which can be corrected by a slight amount of retuning. While the stabilization of the crystal may be lost, the set will still be "on the air" and the necessary adjustments and repairs may be made after the particular QSO is over. It is also possible to control much larger powers when the amplifying stage is oscillating than when it is used as a pure r.f. amplifier with regeneration reduced to a point giving satisfactory stability.

A good example of the action taking place is had in the case of received c.w. signals when using an oscillating detector tube. Take a signal that is moderately loud and with a high ratio vernier dial (or a

small tuning condenser so that the tuning control may be used to vary the beat note of the signal), tune to the wavelength of the signal. As the tuning approaches exact resonance, the audible frequency of the beat note will gradually decrease until a point of 200 or 300 cycles is reached. After that, instead of going gradually to zero beat, the audio signal suddenly jumps to zero. When the signal reappears after exact resonance has been passed, it does not do



FRONT VIEW OF TRANSMITTER

so gradually but, again, suddenly appears with a frequency somewhat higher than the one at which it disappeared. From there, it increases in pitch uniformly until it passes out of audibility. What has happened is that the comparatively weak incoming signal has, when the more powerful oscillations of the detector tube approached closely to its frequency, been able to pull these more powerful oscillations into step with itself. It has been able to keep the local oscillations in step exactly so that there is no beat or frequency difference between them at all. It is quite possible to hold this condition over quite a large audible frequency band.

This action is made use of in the case where the amplifier is adjusted so as to oscillate at the wave at which the crystal is resonant (or preferably at a harmonic of the crystal oscillation). It is advisable that the oscillator-amplifier operate at a harmonic of the crystal oscillator as this prevents a large amount of energy from the amplifier, affecting the crystal at its fundamental frequency causing its destruction. As in all self-oscillating arrangements, a large amount of capacity should be used in the circuit determining the frequency of oscillation in order to increase stability.

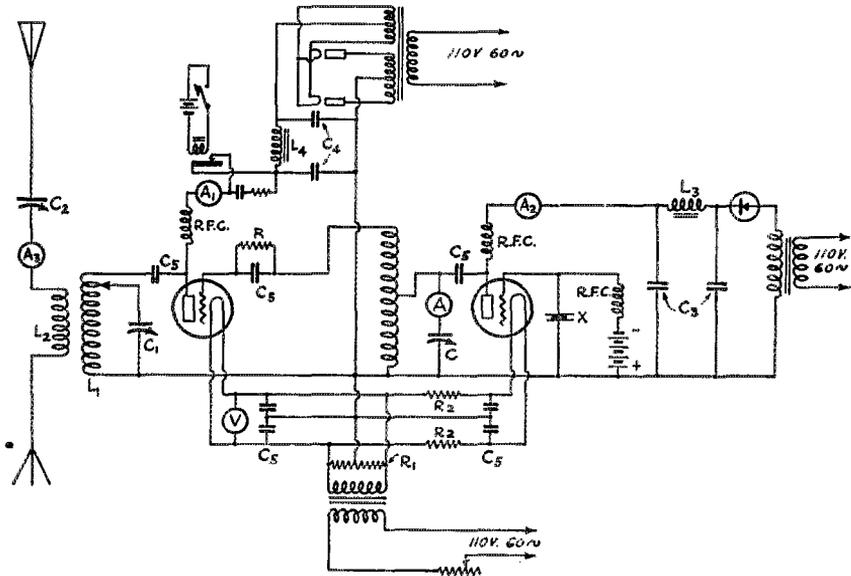
In the set to be described, the crystal oscillator is of the commonly used variety employing a UX-210 supplied with 300 volts of rectified and filtered a.c. The plate current is normally about 40 mils but will

*1AXA, 1B, South Spooner Street, Plymouth, Mass.

vary considerably with the negative bias applied to the grid of the tube. The normal bias will be between 22.5 and 45 volts. The plate inductance has 14 turns of wire and is 4 inches in diameter. It is tuned by a 500- μ fd. condenser which shunts 6 or 7 turns and constitutes the oscillator tank circuit. Two radio frequency chokes are required for the oscillator and consist of 90 turns of 26 d.s.c. wire on a 2" bakelite form. One is

distance units one of which is placed in each of the leads to the 210 filament.

The grid of the amplifier-oscillator connects to the top end of L while the tank circuit condenser is connected across about half the inductance. These extra turns in the grid circuit of a 203-A are adjusted to allow the amplifier to oscillate at the crystal frequency for a multiple of it. If the grid excitation fails, the amplifier will not draw



THE CIRCUIT DIAGRAM OF THE TRANSMITTER

L—12 or 14 turns edgewise wound strip 4" diameter.
 L1—8 or 9 turns edgewise wound strip 4" diameter.
 L2—8 turns edgewise wound strip 4" diameter.
 L3—30-henry "B" eliminator choke.
 L4—10-henry choke.
 C—500 μ fd.
 C1—500 μ fd.
 C2—125 μ fd.
 C3—10 μ d.

C4—3 μ d.
 C5—.002 μ d.
 R—5000 to 15000 ohms.
 R1—200 ohms potentiometer
 R2—1 ohm each.
 A—0-5 amperes. (radio frequency)
 A1—0-150 milliamperes.
 A2—0-100 milliamperes.
 A3—0-1 amperes (radio frequency)

used in series with the bias battery and the other in the power lead to the plate.

The crystal holder consists of two brass plates approximately one inch in diameter and 3/16" thick, each having been ground separately on an optical flat, or a machinist's lapping block. A flexible lead is attached to the top plate and connects to the grid. Make sure that the lead due to its stiffness does not cause the plate to rest unevenly on the crystal. If you do not desire to make your own mounting, one can be obtained very reasonably from the General Radio Company.

The filament of the UX-210 is heated from the same transformer that supplies the filament of the 203-A, the necessary voltage drop being taken care of by two 1-ohm re-

excessive plate current as the tube will oscillate at a frequency close to that of the operating one.

In the amplifier circuit the necessary grid bias is obtained by shunting a 5000-ohm leak across the grid condenser. It is possible to do this because shunt plate feed is being used whereas if series feed were being used, it would apply a positive voltage to the grid. The use of the resistor across this condenser allows the elimination of a radio frequency choke which would be necessary otherwise. The leak may have a value as high as 15,000 ohms according to the type of tube used and the various conditions which may be met with in practice. While I have employed a C battery, there seems to be no material gain by using

one and the resistance is far more simple.

The inductance in the plate of the 203-A consists of 9 turns and is tuned by a condenser of 500 μ fd. which shunts 7 of the turns. A shunt feed of plate supply is also used on this tube and the r. f. c. is of the same dimensions as those used in the crystal tube circuit.

Radio frequency by-pass condensers of .002 μ fd. capacity are connected directly across the filament terminals of the sockets and the center point of both sets are connected to the arm of a 200-ohm potentiometer which is shunted across the filament supply. The filament end of the inductance, negative high voltage, crystal and positive C batteries are all connected to this point which may also be grounded to help stabilize the system if that is necessary. The potentiometer allows the electrical center of the system to be located with ease.

The antenna inductance has 8 turns. An antenna that will give satisfaction on both 40 and 20 meters may be approximately 125 feet long. It may be either bent or straight and need not exceed a height of 30 feet. The antenna at this station happens to be an inverted L 4 wire cage, 60 ft. high, and has a total length of 110 feet. The counterpoise is a single wire 25 feet long and 8 feet high. The antenna series condenser has a maximum capacity of 125 μ fd.

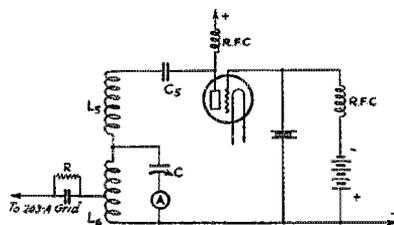
All inductances are spaced with glass beads and are mounted on glass towel rods. However, since constructing the set I have made a change in the mounting of the oscillator inductance and it is now so arranged that by having two sets of plug-in-coils, the set may be operated on either 40 or 20 meters from an 80-meter crystal.

When working on 20 meters, an inductance consisting of 25 turns of No. 26 d. s. c. wire is wound on a 2" form and is close enough to the natural period of the 80-meter crystal to make it oscillate strongly. A tank circuit tuned to 40 meters is connected in series with this inductance. The grid excitation for the amplifier is obtained by coupling to the 40-meter tank circuit and the plate circuit of the amplifier is tuned to 20 meters.

In order to get the set into operation the first problem is to get the crystal oscillator working properly. With the grid clip of the power amplifier detached from the crystal plate circuit inductance and the filaments of both tubes hot, apply the plate voltage to the UX-210 and turn the tank circuit condenser slowly from zero toward maximum capacity. If the crystal has a fundamental somewhere near the 80-meter band and is a good oscillator, a point will be reached where there is a sudden decrease in plate current. Adjust the condenser until you get the maximum value of current possible from the tank circuit of the crystal tube. This current will usually approach

a value of 2 or 3 amperes when the plate potential is 300 volts.

Having adjusted the crystal oscillator, proceed with the amplifier by connecting the grid clip to a point 6 or 7 turns above the plate tap of the tank circuit condenser. Having done this, a readjustment of the tank circuit condenser will be necessary and the current will drop to a value of about 1 ampere. Next, apply the plate voltage to the amplifier and turn the tank circuit condenser in the plate of the amplifier from zero toward maximum capacity. The plate current will be approximately 300 mils, the amplifier being, no doubt, out of resonance. Continue turning the condenser until a sudden decrease in plate current is noted and it will be found that as the capacity is still further



FOR 20-METER OPERATION

- L6—8 turns 4" diameter
- L5—25 turns 24 d.s.c. 2 inches diameter.
- C—500 μ fd.
- R—About 15,000 ohms.

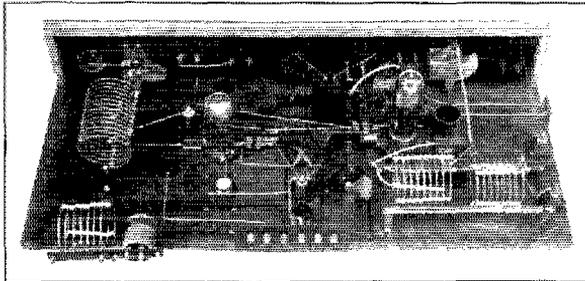
increased, the plate current will rise again indicating that the amplifier is now coming out of resonance. The proper condenser setting is at the lowest value of plate current. While tuning the amplifier, the antenna may be in resonance or entirely removed and in the latter case, some readjustment will be necessary when the antenna is brought into resonance. Some readjustment of capacity and inductance values will be necessary to suit each individual case in order to obtain the maximum output. Plate input to the power amplifier may run as high as 150 watts without excessive heating. The plate voltage of the UX-210 should never exceed 300 and it may be advisable to keep it at a value of about 275. A good voltmeter will come in handy here.

The photo clearly indicates the layout of parts and if this general idea is carried out no trouble should be experienced in tuning the transmitter. The instruments on the panel from left to right are: Antenna ammeter; series condenser; amplifier plate milliammeter; amplifier plate voltmeter; filament voltmeter; crystal oscillator plate voltmeter; crystal oscillator milliammeter; crystal oscillator plate condenser and tank circuit ammeter.

The keying is done in the positive plate lead of the 203-A by means of a relay. The

contacts are shunted by a 1- μ f. condenser and a resistor of 350 ohms. This reduces sparking to a very small amount.

The plate supply for the amplifier is obtained from a 300-watt transformer and a full-wave Kenotron rectifier. The plate supply for the crystal tube comes from a transformer and half wave "S" tube rectifier. The filter for the amplifier consists



REAR VIEW SHOWING COMPLETE LAYOUT OF THE SET

of a 10-henry choke and 6 microfarads of capacity while the other filter uses a 30-henry choke and 10 microfarads of capacity.

The set has been in contact with Australia the long way around on six consecutive week-ends, constituting 13 QSOs which were not scheduled previously arranged. It operates well on either the 40 or 20-meter band and shifting wave is a simple matter with plug-in-inductances and knowledge of the proper condenser dial reading.

their examinations for operator's licenses.

Visits were made to the Bausch & Lomb plant and we were privileged to listen to Mr. H. F. Kurtz of the scientific bureau who, while not a radio man, gave us real information on "Crystals". Another interesting trip was that to the plant of Stromberg-Carlson where several guides took the fellows around and gave every one an opportunity to watch manufacturing operations, which is so seldom allowed, and, to top it off, as every one filed out two young ladies handed each delegate the nicest little souvenir consisting of a miniature desk telephone paper weight.

The up-state New York fellows have started a precedent at the closing Banquet which we sincerely hope may be followed by other conventions that is, invite your mothers, YL's, and OW's. It has a good influence on the "gang" and moreover it shows the gentle sex the "inside" doings of an A.R.R.L. convention. With "Jerry" Hall, SAHK, acting as Toastmaster, the after-dinner speakers consisting of Dr. White, Radio Inspector Brown, A. P. Lawrence, President of the Radio Association of Buffalo, Charles Schrader of the Utica Brass Pounders and A. A. Hebert of A.R.R.L. Headquarters, were duly and properly introduced and appropriate remarks were made by each one. The convention came to a close with the distribution of prizes under the able assistance of Al Balling, 8ALY. The thanks of all those present goes to the S.R.T.A. of Rochester for a well conducted and interesting convention.

—A. A. H.

The Western and Central New York Convention

WITH delegates arriving the night before the convention was scheduled to open, it was a good augury that August 5th and 6th would see a goodly crowd at the Hotel Powers, Rochester, N. Y., for this year's annual convention—and sure enough, the first day saw the largest registration of any New York State Convention. Buffalo led all with 15 men, with Utica a close second.

A great portion of the first day was devoted to all kinds of amusements with a large number of the "gang" participating, but the evening session was the best with real good information presented in a unique way by F. A. Lidbury, 8BAG, and Dr. Elliott White, New England Division Director. Both addresses were followed by discussions.

Radio Inspector Brown from Detroit was present and seemed well satisfied with his trip as a large number of the fellows passed



Traffic Routing of Currents in Condensers

By Alexander Nyman*

IN CONSTRUCTING apparatus for operating with currents of short wavelength, it is necessary to take into account the peculiar nature of these currents and the manner in which they behave when they are confronted with an electrical circuit. This is especially true when dealing with the design of condensers where a number of fairly complicated parts have to be assembled together for the purpose of conducting radio frequency current and at the same time adding capacitive reactance in the circuit.

As a matter of fact, the rules which govern the operation of short-wave current are so strict that unless they are followed closely in the design of the condenser it will be found that the apparatus will either

such a simple manner as would be expected at first sight, for the current may not distribute itself all over the superficial area of the conductor. Assume that the currents

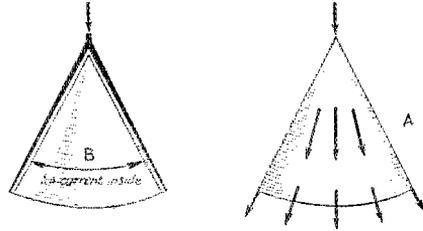


FIG. 2. HIGH-FREQUENCY CURRENT FLOWING DOWN A CONE

The current stays on the outside. Naturally the density decreases toward the larger end of the cone as the area increases.

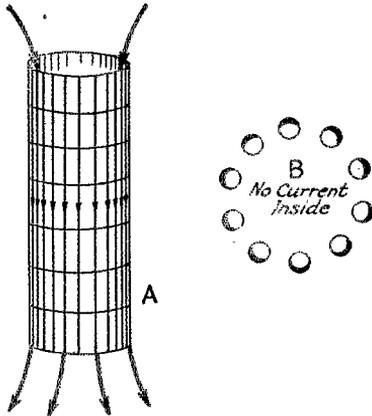


FIG. 1. HIGH-FREQUENCY CURRENT FLOWING LENGTHWISE OF A CYLINDRICAL CAGE

Note that the distribution as shown at B is not even but that the current mainly resides on the outer side of the wires.

over-heat or else spark at most unusual spots and in general the operation of the condenser will not be reliable.

These rules of routing the short-wave currents may be expressed about as follows:

First: They follow the outside of a conductor; they do not penetrate even a slight depth of solid metal if any "outside" path (even of considerable length) offers itself.

Second: They do not follow into re-entrant angles in the surface of a conductor, such as those that frequently occur at joints.

The flow of such currents over the outside of a conductor does not take place in

are passed longitudinally through a metal bird cage or through a cylinder of netting, Figure 1A, such as is placed around small trees. The current would not distribute itself completely around the surface of each individual wire, but would travel along one side only of each wire, the side which is (see Fig. 1B) outermost with respect to the longitudinal axis of the cage or cylinder of netting. Assume again that such a current were being passed longitudinally through a sheet metal cone, Figure 2, say from the edges of the base, to the apex (the cone, of course, having two surfaces, one inside and one outside with respect to the longitudinal axis), the current would not split, half of it traveling along each surface, but all of the current would follow along the outside surface, while none of it would utilize the inside surface.

With respect to solid sheet of metal at right angles to the path of current (Figure 3) the current does not even penetrate a very thin piece of sheet metal if a surface path (that is not of extreme length and complication) offers itself. Furthermore, the width of the surface path is of some importance, for an apparently crooked or curved path may offer scarcely any resistance if the path is quite wide.

The aversion of these currents to flow into re-entrant angles, such as those found in carelessly designed joints, is well illustrated by Litz wire, for the current instead of following any given surface after the wire passes into the body of the plaited mass of wires, simply leaps across the intervening space and takes up its path along the surface of some other wire which happens to be at the surface of the mass.

*Consulting Engineer, Dubilier Condenser Corporation, 4877 Bronx Boulevard, New York, N. Y.

Returning to the case of the joint, assume that the path of a high frequency current is at right angles to the contact joint between two conductors, the joint being so shaped as to make a deep recess (Figure 4) where the two bodies join. Now as the frequency is increased the current more and more, instead of following all the way into

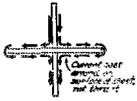


FIG. 3. TWO WIRES WITH FLAT ENDS ARE PRESSED AGAINST A METAL SHEET

High-frequency current does not go thru the sheet but around the edge, altho the path is longer.

the bottom of the recess and coming up at the opposite side, tends to leap from edge to edge, penetrating the intervening atmosphere. In other words, the current has a tendency to follow along a tangent to the general surface rather than to follow in detail into re-entrant angles and depressed irregularities.

HIGH-VOLTAGE CONDENSERS

Figure 5 illustrates a construction of a condenser designed for short wave operation. It consists of two metallic covers T_1 & T_2 which also act as terminals, a condenser clamping ring held inside of one of these covers, and an insulating ring I between them and separating the top from the bottom cover. These covers are concave and convex respectively, in such a manner that a number of these condensers can be stacked together, leaving a free passage in the center for the cooling of the central terminal.

Referring now to Figure 6, which shows a stack of condensers of this type in section,

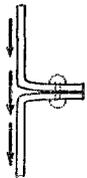


FIG. 4. WHEN MEETING A DEPRESSION IN THE METAL SURFACE, SUCH AS IS FOUND AT A JOINT, THE CURRENT ATTEMPTS TO JUMP ACROSS BY CAPACITY RATHER THAN TO FOLLOW THE SURFACE INTO THE DEPRESSION

the arrow line indicates the manner in which the current travels. It will be seen that the current follows in general the outside of the condenser stack. This "outside" is however sometimes the inner surface of the cover and sometimes the outer surface of the cover.

Following the path of current from the bottom up the first path is along the inside surface A of the base which is really on the outside of the conical surface of that base and therefore obeys the first rule. On reaching point A , where there is a joint between the base and a central block, provisions are made to connect the inside sur-

face of the base directly to the condenser stacks so as to permit the current to conform to the second rule. After passing radially outward through the condenser stacks and reaching point B a similar arrangement is made so that the current is conducted directly to the inside surface of the cover. From here the current follows Rule 1, and travels around the edge of this cover at C , but since the circumference of the cover is long it follows that the path is very wide and it has only low resistance and inductance. The joint D where one condenser unit joins the next one is purposely made very tight, and over a large circumference so that the current acting according to Rule 2 can pass without difficulty. From this point following again Rule 1, the current travels to point A on the next condenser.

The manner of routing the current is therefore such that an easy path is provided for the current to follow the rules.

HIGH-CURRENT CONDENSERS

An entirely different problem of routing of current occurs in another type of con-

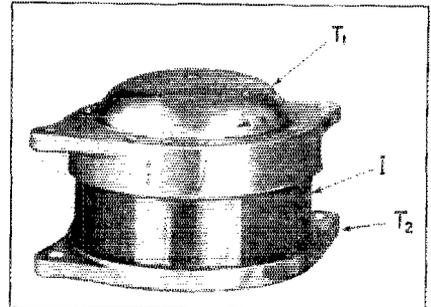


FIG. 5. A HIGH-VOLTAGE HIGH-FREQUENCY CONDENSER UNIT DESIGNED IN ACCORDANCE WITH THE PRINCIPLES EXPLAINED IN THE TEXT

T_1 is a terminal formed by one of the end castings, T_2 being the other. I is the insulating spacing cylinder which at the same time closes the housing. The internal structure is shown in Fig. 6. The units shown here is rated at 25 μfd . to withstand 25 amperes at any wavelength within specified limits. As the frequency is raised the IX drop is less but the current carrying capacity remains the same, therefore a fixed current-rating has been adopted for such units.

denser where a large current is to be handled thru a comparatively large capacity. The question of heating occurs again, although in a different connection. Early models of such condensers simply contained a sufficient amount of mica and tinfoil, with a rigid clamp and good spacing and all other provisions made which were found necessary with currents of lower frequency to secure a cool-operating condenser. In spite of all this the condenser was found

to operate extremely hot, so the cause of the losses had to be analyzed.

Now, it is a well-known fact that when a condenser carries a current, this current establishes an electro-magnetic field sur-

rounding the conductor. Figure 8 shows a side view of a section built on this principle. There are two con-

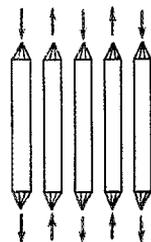


FIG. 7. THE MAGNETIC FIELD AROUND A CONDENSER SECTION CAN BE DECREASED BY PUTTING THE CURRENT THRU THE PARALLEL SECTIONS IN OPPOSITE DIRECTIONS, THUS CANCELING THE FIELDS OF THE SECTIONS AGAINST EACH OTHER

necting leads projecting upwards, which are the incoming sections on alternating sides. The current entering one of the sections, say on the back, goes through this section and comes out on the bottom lead in the front, and vice versa.

Figure 9 is a photograph of the external appearance of such a condenser. It was found that a condenser made in this manner operated absolutely cool, showing that the technical analysis of the problem was correct.

Figure 10 illustrated a radio frequency generating set in which condensers as described above find a ready application.

Figure 12 is the diagram of connections for the same set. This set has been used

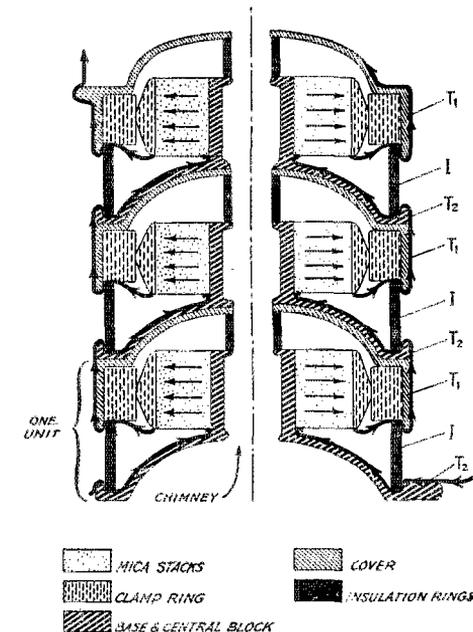


FIG. 6. SKETCH INDICATING INTERNAL STRUCTURE AND CURRENT DISTRIBUTION IN A STACK OF CONDENSERS SUCH AS SHOWN IN FIG. 5

Note that the currents thruout follow the outer surfaces of the bell-shaped base castings and that metal by-pass strips are provided to avoid the necessity of leading current over the joints and the inner surface of the cover castings.

rounding the conductor. An electro-magnetic field at radio frequency is of course always accompanied by an electro-static field at the same frequency and it is also known that an electro-static field of high frequency in dielectric will cause losses known as dielectric hysteresis.

Here is another case where the proper routing of radio frequency currents is necessary to improve the operation of the condenser.

Figure 7 illustrates the construction of a condenser section which is suitable for this service. It will be seen that the currents in each section are in the opposite direction to the adjacent section. Thus, taking the body of the condenser as a whole, the electro-magnetic field is almost cancelled and therefore there is no accompanying electro-static field and no losses, other than those anticipated in the design of the condenser.

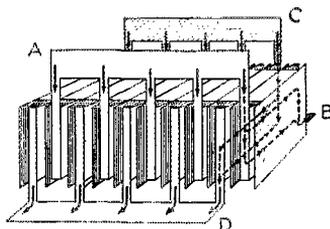


FIG. 8. PRACTICAL FORM OF THE PRINCIPLE SHOWN IN FIG. 7

Current entering at the bus A departs at the bus B while current entering at the bus C departs by the bus D. This construction materially decreases the heating due to high frequency magnetic and electrical fields.

successfully in our laboratory for testing condensers at short waves, and is capable of delivering up to 100 amperes at wavelengths ranging from 100 to 20 meters. Observing the diagram, the oscillating circuit

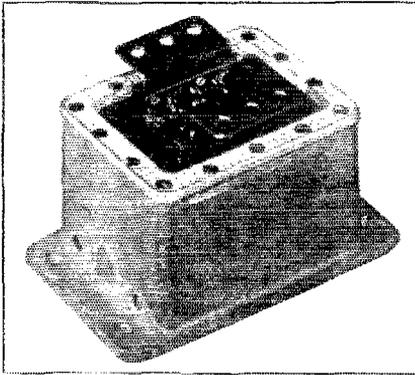


FIG. 9. A HEAVY-CURRENT CONDENSER DESIGNED IN ACCORD WITH THE PRINCIPLES OF FIGS. 7 AND 8

The unit shown is a filament bypass but similar construction is used in a 50-ampere meter shunt whose principle may be understood from the diagram of Fig. 12.

consists of two coils L_1 and L_2 in series with a stopping condenser marked 100 μfd . for

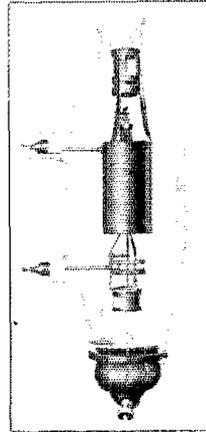


FIG. 11. THE TELEFUNKEN LOW-CAPACITY RS 207 TUBE USED AS AN OSCILLATOR

Note that like the General Electric UX-852, this tube has the grid, filament and plate leads brought out thru separate meshes and is designed for low internal capacity.

Plate 4,000 volts, 625 mls. maximum, 540 normal; filament 16 amperes, 16 volts; plate circuit efficiency 70 % at rated voltages, output 1500 watts at wavelengths down to 20 meters; load resistance should be about 6000 ohms.

which the upper condenser on the rack in the photograph (Fig. 10) is being used.

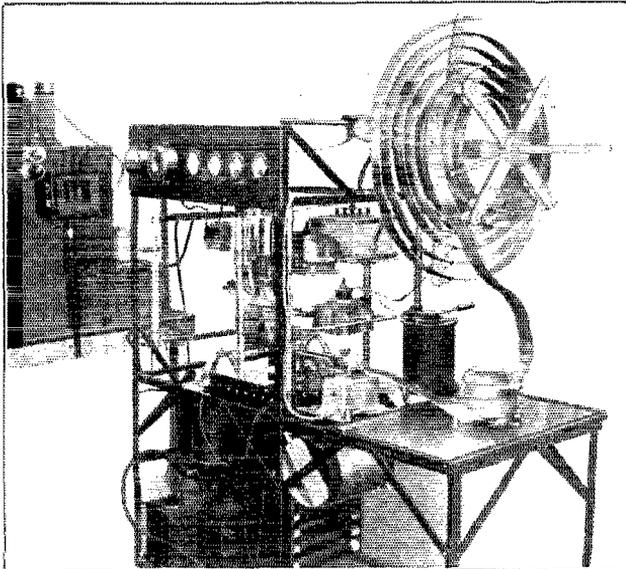


FIG. 10. 1 1/2-KILOWATT 20-TO 100-METER TEST SET USED FOR OVERLOAD TESTS OF HIGH-VOLTAGE AND HIGH-CURRENT CONDENSERS

The set is connected in the manner shown in Fig. 12. The test circuit is at the extreme right and consists of the secondary "pancake" spiral, the test condenser on the glass table top and the current measuring device consisting of the condenser shunt at the left front of the table which is connected thru a shielded lead to the meter at the upper right of the instrument panel. In the rack back of the meter shunt may be seen the fixed and variable grid condensers and above that the high-voltage stopping condenser. The R S 207 Telefunken tube itself is dimly visible at the center of the structure. It may be exchanged for other tubes up to 10-kilowatt sizes. The housing on the bench at the left contains the kenotron system. On its face may be seen the small box containing the water-alarm relays. The filter for the oscillator plate supply is in the main frame, under the tube.

This condenser happens to be an early type of short-wave condenser, before the large terminal structure was properly appreciated, and shows for a terminal a rather thin spider with six independent leads, which is satisfactory, but a good deal too complicated. The circuit diagram also shows a variable condenser V.C. which can be seen in the photograph and which serves for adjustment of the grid circuit to stabilize the operation of the set at extreme values of wavelength or current.

The oscillating circuit is coupled to one or two turns L_2 or the operating circuit which contains a condenser shunt (C_1 , C_2 and T.C.), for the purpose of measuring the current thru the test condenser. Condensers to be tested are set on the glass topped test table as shown in the photograph. The current thru the test condenser is measured by the meter and condenser shunt. The frequency is measured by a wavemeter and if for any reason one wishes to know the peak voltage on the test condenser rather than the r.m.s. voltage (which can be calculated from current, capacity and frequency) there is available a sphere spark-gap calibrated over the entire range of fre-

quencies at which condensers are tested. The secondary or test circuit is operated at resonance, in fact this is generally the circuit which determines the oscillating frequency. The current which circulates in the test circuit is determined mostly by the wavelength and the capacity. If the wavelength is low it is quite easy to secure high currents, with a small amount of secondary inductance. If, however, the wavelength is high the capacity generally has to be quite large as otherwise the voltage across the test condenser multiplied by the current thru it will exceed the K.V.A. capacity of the test set. In general it is possible to secure from 100 to 200 times the Kw. rating of the set. Thus if the test set is rated at 2 kilowatt with the particular tube that happens to be in use it is possible to operate a test circuit carrying 200 to 400 K.V.A. Knowing the current that is to be induced in the test circuit, the maximum voltage that can be obtained may be calculated. This is the upper limit of the set at that particular set of conditions and in general it will be seen that the range adjusts itself rather automatically to the requirements at various wavelengths since the capacities used

power supply to this oscillating set. There is a full wave kenotron rectifier for the

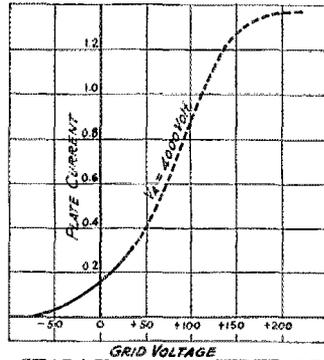


FIG. 13. CHARACTERISTIC CURVE OF SHORT-WAVE 1½ Kw. TUBE

plate supply, with a controlling rheostat in the primary of the transformer, there are two independent filament transformers, the one for the rectifier filament being insulated to the full value of rectifier potential, and

there is a filter consisting of two ½-microfarad condensers and a 5-henry choke coil. In the photograph these condensers and the choke coil will be seen on the bottom of the frame under the other apparatus. The tube itself is illustrated in Figure 11 and its operating characteristics in Figure 13. This is a tube which was developed abroad especially for high frequency work. It will be seen that the plate and grid terminals instead of passing through the base are brought out separately. The diagram also indicates the arrangement for water circulation, as the rectifier tubes, and some of the other oscillating tubes in use, utilize water circulation. Provision is made for supplying three such cooling jackets and giving warning if any one runs dry. For this purpose the water supply from each tube empties into a small can with a small hole in the bottom. When the water flows properly through the cooling coils, this can is filled with water and holds

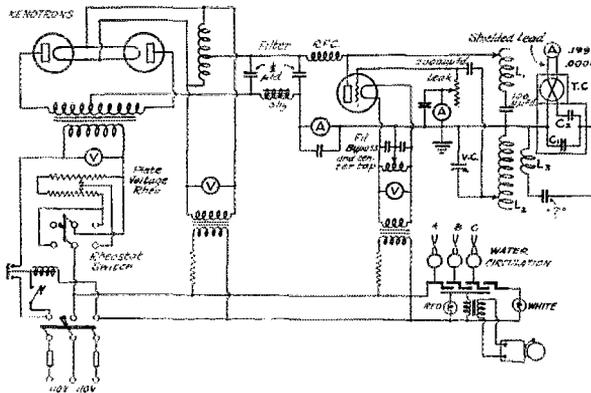


FIG. 12. CONNECTIONS OF THE 1½ KILOWATT TEST SET

The heavy lines show the oscillatory system which is connected in a shunt-feed Hartley circuit to which is coupled the secondary circuit consisting of L3, C1, C2 and "T". The condenser marked "T" is the one under test and may be almost anything. C1 and C2 are the condensers of the meter-shunting system. The two condensers are in parallel and together have a capacity of .2µfd. Of this C2 has but .001 µfd and therefore but 1/200 of the current flows thru C2 and the thermo couple TC in series with it. At full load the condenser C1 (built as shown in Fig. 8) carries 49¾ amperes while C2 and the thermo couple TC carry ¼ ampere. Thus a small meter may be used to read currents to 50 amperes, and the meter may be at a distance, being connected to the thermo-couple by a shielded lead just as in low-frequency and D.C. work. By altering the capacity of C1, any desired range may be secured.

and the shorter wavelengths are smaller and therefore it is still possible to generate somewhat the same test voltages in spite of the lower reactance of the test condenser.

The rest of the diagram illustrates the

down a lever connected to contacts, as illustrated in the diagram. These contacts then connect a white light, showing that the water circulation is in operation. If, however, the water fails to flow in any

one of the cooling coils, immediately the corresponding can is drained of its water, rises, and releases the contacts operating the white light. Instead, another contact is closed, switching on a red light and ringing a bell to indicate trouble.

The diagram furthermore shows a number of instruments which in the photograph are seen to be mounted all on the same switchboard. The instrument which is protected by an insulating box is the rectifier filament voltmeter. The instrument on the extreme right is the radio frequency meter in the testing circuit, connected by a shielded lead to the condenser shunt. The plate ammeter and the grid ammeter are both by-passed by a small condenser, as otherwise the radio frequency is likely to damage them. The double condenser connected to the oscillator filament is the filament by-pass and is of the type described and shown in Figures 8 and 9. Of course the radio frequency current divides evenly between the two halves of this condenser, giving in effect one radio frequency current balancing itself through the body of the condenser.

This set has been in successful operation for over a year, with constant use at all sorts of frequencies and with all sorts of condensers.

Official Wavelength Stations

THE Official Wavelength System furnishes a service cooperative with, but differing from, that of the Standard Frequency Stations 9XL and 1XM, which are also operated in accordance with plans made with the O.W.L.S. Committee. Contact with the O.W.L.S. is through Mr. D. C. Wallace, 6AM, who is also chairman of the committee. Mr. Wallace is continuing the practice of checking up all O.W.L.S. to make sure that they are really indicating their wavelength (or frequency) at the end of each transmission—and are doing so with proper accuracy; which is to say 2%. They do this in the course of regular operation and do not send calibration schedules as do the S.F. stations.

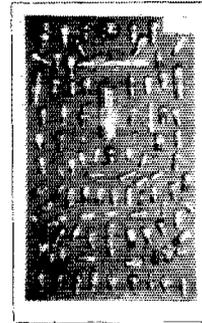
The list is as follows:

1AAC, 1AVW, 1AWW, 1BHW, 1BZQ, 1CCW, 1CK, 1KP, 1ZL, 1ZO, 2CLA, 2DS, 2MU, 2SZ, 2XI, 3APV, 3BE, 3XW, 4LK, 5AGN, 5AKN, 5EW, 5MN, 5OX, 5PH, 5SP, 5XBH, 5ZAV, 6AKW, 6AM, 6BB, 6BCP, 6BGM, 6BMW, 6BQB, 6CAE, 6CMQ, 6CVO, 6LJ, 6SX, 6TI, 6TS, 6XAG, 6XAO, 6ZE, 6ZZH, 6ZV, 7AGI, 7BE, 7BU, 7GQ, 7NX, 7QK, 7XF, 7ZX, 8AA, 8APZ, 8BAU, 8BZT, 8EQ, 8GU, 8GZ, 8XC, 8ZG, 9AXQ, 9BCH, 9BGK, 9BMR, 9CPM, 9CXU, 9DXN, 9EGU, 9ELB, 9FF, 9IG, nc1AE, nc2BE,

nc3CO, nc3NI, nc3FC, nc4BT, nc9AL, eg2OD, eg2SE, Ireland 5NJ, oa2CM and oz2AC. Crystal Controlled O.W.L.S.; NKF, 1AXA, 2BO, 2BRB, 2EF, 2WC, 4BY, 4XE, 6AOI, 6DLL, 8CMM, 3DAJ, 9AUG, 9BVH, 9UZ-NRRL, 9ZA, eg2NM, eg5LF and oa5BG. Standard Frequency Stations: 1XM and 9XL.

Strays

T. J. Sadilek of Des Moines sends in the accompanying photo of his tube collection.



We'll bet he knows what "snaffle" means. If he paid for 'em, he's not like the rest of us.

It is customary to use a saturated solution of borax in our chem. rectifiers. As the water dissolves, the excess borax comes out of the solution and forms crystals. This is not so good. It is better to use a mix which is not saturated and the proper proportions have been given us by 1ANA. He tells us that it will be exactly correct if we use 18 Mule Team Borax!

We are told by 2ABZ, that the BH Rathenon tube makes a fine rectifier for a set using four 171s. As it is possible to get about 2½ watts out of one of these tubes, such an arrangement will make a compact ten-watt set. There are some transformers on the market for "B" sub work that have filament windings for the UX-213 rectifier tube. This winding can be used for the 171 filaments.



HOW TO MAKE MONEY ON A SIDE SHOW AT A HAM CONVENTION

The Naval Reserve in the Army-Navy Maneuvers

By Fred C. Best*

Z 1BIG V NRR A Y GR 48 0003 FOUR ENLISTED MEN ARE NEEDED FOR OPERATORS ON NAVY TUGS DURING MANEUVERS PERIOD TUGS WILL LEAVE APPROXIMATELY TWELVE MAY PERIOD RECOMMEND CAPABLE OPERATORS TO YOUR BEST JUDGMENT COMMA NOTIFYING THEM THAT ALL APPLICATIONS SHOULD BE AT PERSONNEL OFFICE NINE MAY PERIOD 1835

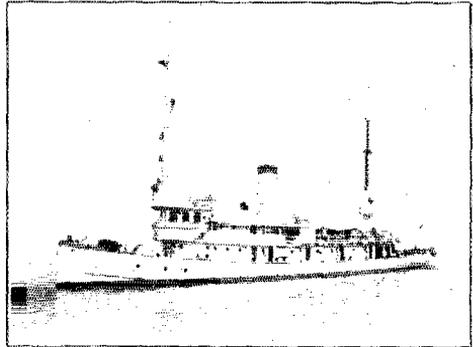
ON THE evening of May third the above message was sent from NRR A, the Master Amateur Control Station of the First Naval District, to 1BIG, 1VR, 1CAB, 1ZD and 1AUA. Acting in accordance with it, 1BIG, 1KL, 1BMS and 1AJK sent in their applications for duty, and were all accepted.

The tugs on which they were to do duty were, however, dispatched to take part in the hunt for the missing fliers, Nungesser and Coli, so the four men were detailed to the *Eagle 19* in Boston Navy Yard until the *Mohave* and *Wandank* returned. The intervening period was taken up with instruction in Naval procedure under the direction of 1BIG.

Early on the morning of May fifteenth the *Mohave* left Boston and steamed through Cape Cod canal and Buzzard's Bay to New Bedford. The *Wandank* had left Boston several hours earlier. The next day, at Ft. Rodman, instructions and copies of the code to be used were received. Both the *Mohave* and the *Wandank*, the former senior in command, were part of the Blue Fleet which was to act with the Army in defending the coast between New Bedford and New London against the attacking Black Fleet. This was the eastern defense area—the territory to be patrolled consisting of the waters and islands adjacent to the Cape Cod Canal, New Bedford and as far west as the Saconnet River. In the afternoon the *Mohave* transferred one radioman to the tugs on the western patrol area and left for sea. At this time a radio silence went into effect. The *Mohave* arrived at New Bedford about 7:30 p.m. and tied up at the State Pier where the Commanding Officer of Ft. Rodman called on the skipper of the *Mohave* and issued final instructions.

The crew had liberty until midnight. The following morning the ship left New Bedford and anchored at the entrance to Quicks Hole Passage between Pasque Island and Naushon Island where a patrol

of four men was landed to watch and signal of any attempt to gain access thru the defense area. This passage, about 700 yards wide, was the only entrance to Buzzard's Bay without coming in between Cuttyhunk Island and Saconnet Point.



THE U.S.S. WANDANK

After landing the patrol the *Mohave* stood over its patrol and anchored near Cuttyhunk Island.

As the radio outfit on the *Mohave* was not in good repair, 1KL and 1BIG, who had been assigned to her, proceeded to go over everything from antenna to power supply. The ½-k.w. outfit was given a thorough overhauling and put in readiness for the coming patrol.

At sundown the *Mohave* and the *Wandank* took up their patrols, running at reduced speed and with darkened lights, but the night passed without incident.

During the following day, various flights of airplanes of the defense passed over and out to sea. At about 2:30 p.m. heavy smoke was sighted in the vicinity of "No Man's Land" and soon a division of the Black Fleet, made up of the U. S. S. *West Virginia*, U. S. S. *Maryland*, and U. S. S. *California* hove in sight. They maneuvered in the vicinity of Gay Head and Vineyard Sound until about five o'clock when they headed west and disappeared in the mist. At about 3:00 p. m. a division of destroyers headed our way and we hove up anchor and stood out to meet them.

Meanwhile, upon sighting the enemy, coded reports were sent thick and fast by the *Mohave* and *Wandank*, via Newport,

*Ensign, U.S.N.R.; 1BIG, Augusta, Me.

NAF, to Ft. Rodman. As the *Mohave* had difficulty in raising NAF, the *Wandank* with 1BMS at the key, did its part well in prompt reliable relays ashore. Whereas the previous day had been one of absolute quiet for the radio gang, now all kinds of contact signals were flying thick and fast and every radioman was busy.

As darkness set in, the sky was overcast. Late in the evening the whole Black Fleet made an approach, all ships being darkened and not sighted until close aboard. Contact reports were at once made and some more snappy work was pulled off by 1KL and 1BMS. Visible signals consisting of rockets, red and green stars, etc., were fired to let the observers ashore know that actual contact had been made with the main force of the enemy. Throughout the remainder of the night we patrolled through the Black Fleet with our running lights turned on. The following morning we picked up our patrol on Quicks Hole and returned to Newport with the problem over.

1AJK, the "ham" transferred to the *Iuka* did not get much of a chance to do his stuff, as his ship was not equipped with a transmitter. However, he did well and nobly in intercept work, which after all is the hardest part of a radio job.

1BMS and 1KL, who handled the bulk of the contact reports, conducted themselves like veterans, and their snappy reliable work was favorably mentioned by ranking communication officials at Boston Navy Yard.

It must be remembered that the hams who took part were working with apparatus with which they were not at all familiar, and which had only a small radius as compared to the usual simple ham outfit. In view of these limitations, their work is all the more commendable.

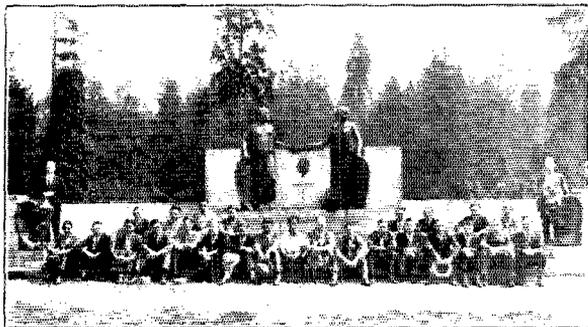
The Vanalta Division Convention

AUGUST 6th and 7th were the dates to be well remembered by all who attended. A.R.R.L. Headquarters was represented by Mr. K. W. Weingarten, the Northwestern Division Director. Seven delegates came from the Radio Club of Tacoma, three from the Victoria Radio Association, one from Alberta and the remainder of the 37 from Vancouver. Our worthy president, Fred Elliott, acted as chairman and handled the gang like a veteran.

The banquet was held at the Orpheum Cafe. After the eats, Bill Rowan, 5GF, tendered a toast to the A.R.R.L. and expressed regret at not having our worthy Fieldman, Mr. Hebert, with us. The reply was very ably put by Mr. Weingarten.

The nc9AJ orchestra tendered several selections during which an exhibition of the Charleston was given by Marv Wilson (janitor 5GO).

The R. I. told the gang how the Govern-



THE GANG AT THE VANALTA DIVISION CONVENTION ASSEMBLED AT THE HARDING MEMORIAL, VANCOUVER.

ment is cooperating with the amateurs. The Halliday Trophy, donated by Mr. E. Halliday for the best operating at the B.C.A.R.A. station 9AJ, was awarded to King Cavalsky, nc5AL, who was as pleased as punch.

The big kick of the evening was the Wet Contest for the U. S. delegates. J. Mardesich, nu7MX, showed the gang how to do it and walked off with the prize. nc5GF and nc5BJ handled the keys for the code contest with QRM. High frequency auto horns were used and the prize was taken by nu7MH with one mistake.

Sunday morning the gang assembled at Stanley Park, where a group photo was taken at the President Harding Memorial.

The Tacoma gang had to be at work Monday morning so thought it best to get an early start. They stepped on the gas and were off, and thus ended the Third Annual Vanalta Division Convention (B. C. Section) under the auspices of the British Columbia Amateur Radio Association (Inc.), Vancouver.

—nc5FJ



UNKNOWN CAPACITY

Experimenters' Section Report

WITH this report the Experimenters' Section makes one of the changes proposed by the members in their response to the recent questionnaire, by presenting a report on the progress made by a section member in his work on one of the problems. Comment on this report is solicited since there is now enough material available and in preparation to make such a report possible each month, either from an individual or on the work of several men.

One important point about these report-articles must be mentioned; unlike *QST's* other articles their purpose is not to present information nearly so much as to excite further study. They are not supposed to close out a problem but to activate it. Thus in presenting Mr. Lidbury's excellent study of r.f. chokes, the intention is not to "kill the subject" but rather to encourage further thought. One may as well say that at this moment there is already at hand a variety of material on the same subject, some of which covers other phases of the subject. Mr. Lidbury's study is presented first because it is perhaps the most comprehensive and because it arrives at some definite conclusions that are immediately useful to the "brass pounding" portion of this organization, whose attention should be called to the results.

Report on Problem T-25—Radio-Frequency Chokes

By F. A. Lidbury*

R.F. chokes are coils which we use, always hopefully and sometimes successfully, to keep r.f. currents where we want them, that is, in the circuits consisting of the tube elements and the r.f. circuits connected to these, while allowing direct currents to flow to or from plate, grid or filament to which the chokes are connected.

An r.f. choke has been defined as "a device having inductance which offers a high impedance to alternating currents." If inductance were *all* it had, there would be *no r.f. choke problem*. All we would have to do would be to figure an inductance having a reactance of a few megohms at the frequency at which we wished to use it. Unfortunately all coils have distributed capacity—which makes the matter considerably less simple; and resistance—which

to a certain extent helps to counteract the mischief which capacity introduces.

Most amateur r.f. chokes are single layer coils. If such a coil, with open ends, be

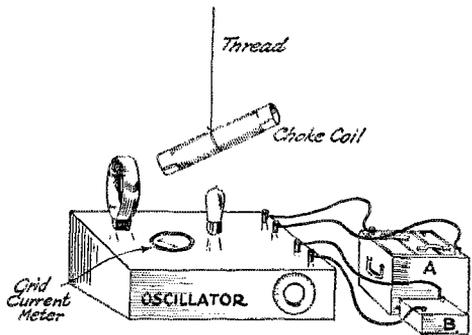


FIG. 1. AN R.F. CHOK HUNG NEAR AN OSCILLATOR WHICH IS PROVIDED WITH A GRID-CURRENT METER CAN EASILY BE INVESTIGATED FOR RESONANCES.

As the tuning dial of the driver is turned the grid meter will indicate the more marked "humps" and "hollows."

suspended near an oscillating circuit as in Fig. 1, it will "resonate" at some particular wavelength, just like a wavemeter. It constitutes, in fact, a tuned circuit. The text books explain that the distributed capacity acts like the shunt condenser of the wavemeter—and then proceeds to state that it acts quite differently, but don't state how or why; so neither will we. What is more important for our purpose is that a coil will

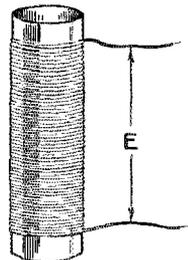


FIG. 2. THE USUAL PROBLEM IS NOT WHAT HAPPENS WHEN R.F. VOLTAGE IS INDUCED IN THE COIL BUT WHAT HAPPENS WHEN IT IS APPLIED ACROSS THE ENDS OF THE COIL, AS SUGGESTED HERE

"resonate" at wavelengths roughly $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$. . . of its first resonant point; which a wavemeter won't do. Further, and this is important, if you now short-circuit

the ends of the coil, it won't resonate at its previous "fundamental," but will continue to resonate at harmonic points which

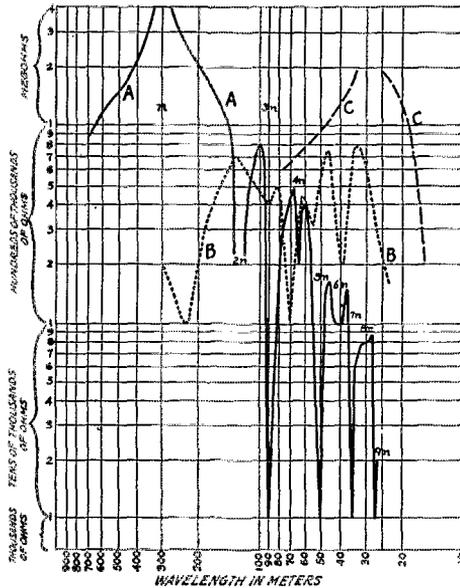


FIG. 3. CURVES SHOWING THE MANNER IN WHICH THE IMPEDANCE OF R.F. CHOKES VARY WITH FREQUENCY

These curves are not a part of the present report but are taken from a preliminary report and are therefore stated to be approximate only.

A—Rather large single-layer choke resonant at 300 meters. Note that the choke is good from about 135 to 750 meters and below 135 is alternately fair and worthless. 2n, 3n etc. are the harmonic frequencies and humps or hollows will be found for each.

B—Curve for a sectional choke of 8 "pies." each of 40 turns of No. 38 D.S.C. wire wound on 1/2" rod with 3/16" between pies.

C—Single layer choke 2" long wound with No. 38 D.S.C. wire on a 1/2" rod. Best at 30M. but very good from 18 3/4 to 85 meters. Note resemblance to long-wave and of curve A.

Of these curves the preliminary report says—"The concentrated chokes (and semi-concentrated ones) work more or less satisfactorily over a very wide range because over most of the low wave part of this range they are functioning hardly at all as a reactance but almost entirely as r.f. resistance." He also indicates that such chokes may do well enough for reception since the tube will oscillate when the choke is working even moderately but in a transmitter the losses would be rather bad hence it is advisable to use a single-layer choke suited to the wavelength—and change it when necessary.—Tech. Ed.

are as a rule very close to the 1/2, 1/3, 1/4 . . . points previously obtained.

For example:

Coil 6 1/4" x 3 1/2" wound with No. 30 wire.

Resonance at	Open	Shorted
	164.5	None
	88.5	94
	61	64
	47.3	47.6
	38	39.5

Multiplying in each case by n we have

164.5	
177	188
183	192
189	190
190	192

15 sections of about 20 turns No. 38 D.S.C. sections 1 1/4" long and separated by 3/16" space

Resonance at	Open	Shorted
	57	
	32.5	35.2
	23.6	25.3
	19.4	19.8

Multiplying by n as before

57	
65	70
71	76
77	79

If a source of r.f. voltage of variable frequency be applied across the choke as in Fig. 2, it is found that at its fundamental resonant point (which will now in general be appreciably higher in wavelength than the "click" point of the choke when its ends weren't connected to anything) it acts very much as a wavemeter would if so connected, that is, as a very high impedance. It is in fact a similar case of parallel resonance. There are very important and vital differences. The wavemeter has an inductance tuned by a lumped capacity, of considerable magnitude, and has a low resistance; the choke has a much higher inductance tuned by distributed capacity, of extremely small magnitude, and has a very appreciable resistance. For these reasons the impedance of the choke never reaches the enormous values shown by the ordinary tuned circuit at parallel resonance; but on the other hand it falls off comparatively slowly as the wavelength is increased or decreased, so slowly in fact that it is still high enough to act as a reasonable choke at wavelengths two or three times the "fundamental" and would act similarly at wavelengths down to perhaps 1/3 or 1/4 of the "fundamental" if it were not for the "holes." These "holes" (see Fig. 3) occur at points roughly 1/2, 1/3, 1/4 . . . of the "fundamental" wavelength, and are nearly the same as the corresponding points found by the "click" method. At these points the impedance drops to very low values indeed and if you happen to strike one of them in your transmitter, the thing probably goes out of oscillation; in your receiver, they give you blank spots where oscillation is either not possible or requires an enormous amount of feed-back.

Let us now take a receiver, capable of tuning from 18M. to 85M. and place a choke (as in Fig. 4) across the terminals of the

tuning condenser, avoiding coupling with the tuning inductance. We will now tune in signals (harmonics of oscillator for preference, if one is handy, if not, various

grid leaks across the condenser terminals till a value of shunting resistance is found which requires approximately the same position of feed-back condenser as before to just set the receiver in oscillation. The resistance value so found is a rough but very useful measure of the value of the choke at that wavelength, and by repeating these observations over a wide range of wavelengths a good picture can be obtained of the range over which the choke is usable. It will be found that in the vicinity of the "fundamental"; that is, the point at which the choke has no tuning effect, these resistance values will be (in the case of a good choke) very high, i.e., one or more megohms. Values falling to several hundred thousand ohms will be obtained as the wavelength is increased above this up to points twice or thrice the wavelength; and similar values obtained as the wavelength is decreased, until we approach the "second harmonic," i.e., about half the "fundamental," at which point the value sinks very rapidly to perhaps ten thousand ohms or less. As we go still further down, we get an irregular curve showing definite minima at the harmonics.

A large number of chokes has been measured in this way, and the results in the case of a number of them checked by

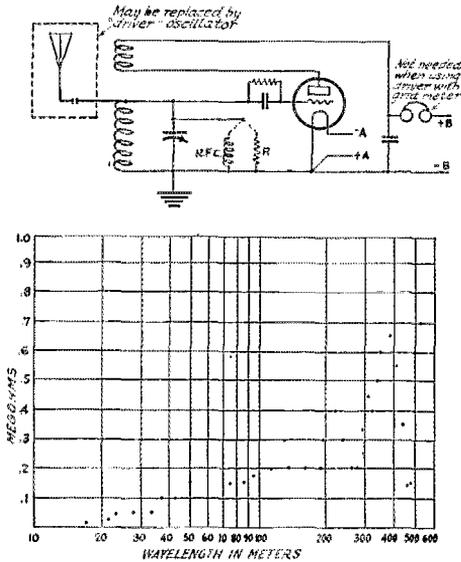


FIG. 4. ARRANGEMENT FOR DETERMINING NATURAL FREQUENCY, EQUIVALENT CAPACITY AND "EQUIVALENT RESISTANCE" OF R.F. CHOKES

The method explained in the text. Usually the receiver will oscillate unless the "equivalent resistance" of the choke falls to 10,000 ohms or less. The points shown were obtained with a commercial concentrated choke designed for the 200- to 600-meter range. The curve has not been drawn since the L/C ratio appeared to affect the exact location of the points and therefore the conditions of operation may place the curve almost anywhere in the "shot-gun diagram."

fixed points like WIK, WIZ, etc.) at various points through the range, with and without the choke shunting the condenser. We shall find that above a certain wavelength the dial setting of the tuning condenser for the same signal is greater with the choke than without it; below, the dial setting is less. In the first case the choke is acting as an inductance; in the second as a capacity. At some particular wavelength the presence or absence of the choke makes no difference in this respect. It will further be noticed that an increased amount of feedback is necessary to make the receiver oscillate with the choke in position. A rough measure of the increased feedback necessary can be obtained by (a) tuning in signal with choke placed, and noting position of feed-back condenser which just sets receiver in oscillation. (b) tuning in same signal without choke, and placing

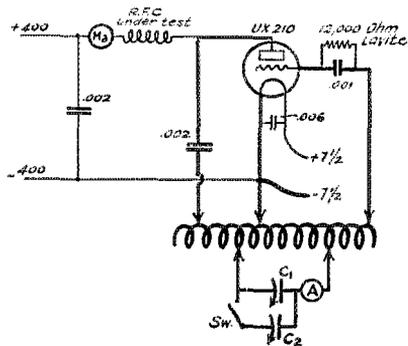


FIG. 5. SHUNT-FEED HARTLEY CIRCUIT USED TO OBTAIN CURVES OF FIG. 6 AND 7

C₁ has a max. capacity of 100 μfd. and is used below 31.5M. after which C₂ with a capacity of 300 μfd. is added. The other constants are given to show that the circuit is normal.

using them as plate chokes in a shunt-feed Hartley oscillator. It would take too long to go into the details, but the following general conclusions may be mentioned:

1. Nothing has been found better than a good single layer choke.
2. Chokes should be (a) wound with the smallest possible diameter of wire—No. 38 D.S.C. is heavy enough for anything

up to and including a 50 watter; (b) of small diameter— $\frac{1}{2}$ " for forty meters, for example; (c) of such length that the "fundamental" found as described above falls in or slightly below the band in which the choke is to be used.

3. A choke made according to the recommendations of the last paragraph and having its "fundamental" about 30M. is usable in the 80, 40 and 20-M. bands; the losses

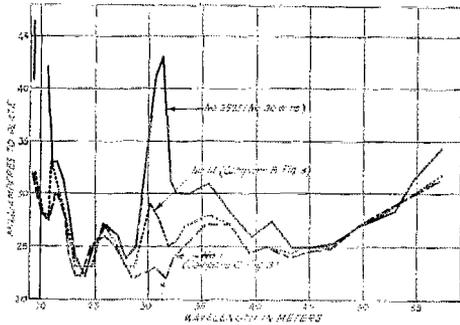


FIG. 6. EFFECT OF GOOD AND BAD CHOKES ON THE INPUT TO THE PLATE CIRCUIT OF A NORMAL SHUNT-FED HARTLEY OSCILLATOR

Similar effects were obtained with other types of circuits. The coils are the same as for Fig. 7. C2 of Fig. 5 is switched in at X on both figures.

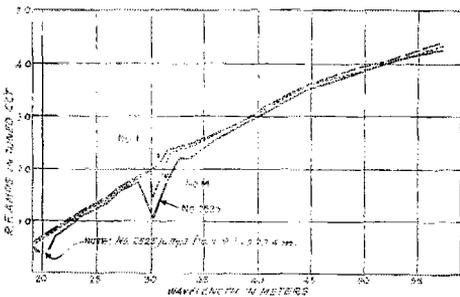


FIG. 7. EFFECT OF GOOD AND BAD CHOKES ON THE R.F. CURRENT IN THE TUNED OUTPUT CIRCUIT

No. 1. Same as for curve C of Fig. 3, single layer No. 38 D.S.C. on $\frac{1}{2}$ " core 2" long with resonance near 30M.

No. 14. Semi-concentrated choke with 14 sections each having about 40 turns of No. 38 D.S.C. wound on $\frac{1}{2}$ " rod with 3-16" between sections. (Same as B of Fig. 3 except for number of sections.) Resonances at 57, 32.5 & 23.6M.

No. 2525. 100 turns No. 30 D.C.E. on 2 $\frac{1}{2}$ " form. Note that this is about the usual amateur choke. Resonance at 54, 23 & 20M. Wave jumps from 19.7 to 20.4 and cannot be made to stay between these points. Note that choke No. 1 gives more output with less input.

in the 80 and 20-M. bands with such a choke, while measurable, are small compared with those due to the imperfect adjustment of the transmitter in other respects.

4. Nearly all the trouble experienced with chokes in practice is due to them being too large, either in size of wire or diameter. This can be readily avoided by determining the W.L. at which the choke has no detuning effect when shunted across the tuning condenser of an oscillating receiver, and taking care that the range over which the choke is to be used is not below .6 of this, nor above from 2 $\frac{1}{2}$ to 3 times this.

5. Various forms of concentrated chokes have been examined; and it is astonishing to what extent some of them will work fairly well over an extremely wide wavelength range. They are not recommended for use in transmitters, however, without careful examination and measurement of the type described above. For receivers, where a moderate amount of plate loss does not matter, they are sometimes useful in extending the wavelength of plug-in systems over more than 2 octaves. Usually they will be found to have "holes" but these are not so pronounced as in the case of single layer chokes. (See the curves of Fig. 3, Tech. Ed.)

Some idea of how No. 38 D.S.C. "makes up" may be found from the following table, showing the "fundamentals" of a number of single layer coils of different diameters and lengths:

Diameter	3" long	2" long	1 $\frac{1}{2}$ " long	1" long	$\frac{1}{2}$ " long
1"	Over 90M.	78M.		55M.	
$\frac{1}{2}$ "		48M.	38M.	25M.	
$\frac{1}{4}$ "				14M.	11.5M. Below 9M.

Any of these coils would be good at wavelengths twice to three times the figures given, and down to nearly half—except possibly the smallest ones; when we get down to 10M. and below the choke problem takes on a new aspect altogether; of which, possibly more later. The most striking thing in these figures is the fact that the wavelength varies somewhat faster than the diameter. The most practical diameters for the amateur bands, using fine wire, are clearly around half an inch.

There are, of course, cases where chokes can be undesirably tuned through capacities connecting them to other portions of the circuit; but these do not exist in the case under consideration (plate shunt-fed) as long as the plate-stopping and other condensers have values so high as to be of quite a different order of magnitude from that of the distributed capacity of the choke, which of course in amateur transmitters they always have, and as long as reasonable care is employed in the placing of the choke to avoid small stray capacities as far as possible.

In conclusion, while a good single layer choke is the best, don't try to use it at wave-

lengths approaching half its resonant wavelength and below, that is to say, in the region of irregular behavior where you may happen to hit a "hole." Even if you don't hit a "hole," a smaller choke will act better and save you power.

tests. This may seem an early reminder but the assembly of apparatus is often slower than one expects—and it takes even longer to make the thing work. The whole story is told on page 24 of the September issue.—R. S. K.

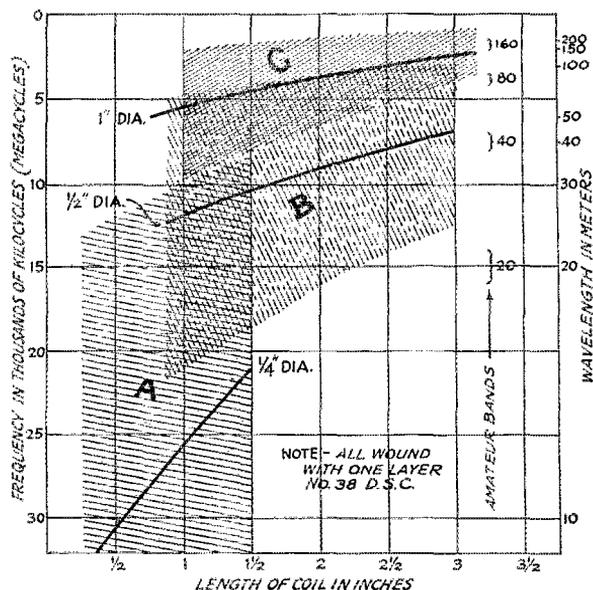


FIG. 8. CHART DRAWN FROM THE AUTHOR'S DATA TO SUGGEST SUITABLE CHOKES FOR THE VARIOUS AMATEUR BANDS

Area "A" is the approximate "useful territory" of chokes 1/4" in diameter and the heavy line thru this area shows the natural frequency of such chokes of various lengths. Similarly; areas "B" and "C" with their heavy lines show the "useful territory" and natural frequency of 1/2" and 1" chokes—all of course being wound with one layer of No. 38 D.S.C. wire. Thus the 160-meter band can be covered by a choke 1" in diameter and 3" long, or perhaps a 1 1/2" diameter with a length around 2 1/2" may be better. The 80-meter band may be covered by a choke 1"x2" or by a choke 1/2"x2" which will also be good in the 40- and 20-meter bands and is perhaps the best "all around choke." The 40-meter band evidently is best handled by some sort of 1/2" choke while the 20-meter band will be taken care of by either a 1/2" choke or a 3/4" choke, or perhaps even better a 5/8" affair, though that is probably a needless refinement. 5-meter chokes can evidently be very small indeed—in fact the capacity between the things connected to them is the main difficulty and a straight length of thin wire may be as good as anything. Where the No. 38 wire will not handle the plate current several chokes may be used in parallel, spaced well apart (at least their length) and connected by No. 38 wires at the ends. The present curves are meaningless for larger sizes of wire.—Tech. Ed.

A RECORD IN DOUBT

At this moment it appears from advice received from the participants that the 5-meter two-way record reported on page 41 of the September issue was incorrectly reported to us. It seems probable that no record was made. The matter is being investigated.—R. S. K.

THE NOVEMBER TESTS

Do not overlook the November 5-meter

Strays

S. G. Thomas of NYC gives these suggestions on clearing up trouble in W.E. tubes having poor grid insulation.

A spark coil that will give about a half-inch spark has one side of its secondary connected to the filament of the tube to be treated. The other end of the secondary is connected to the grid lead and the current turned on and off a few times. This is repeated with the secondary connected between the filament and the plate. If the insulation is poor, a slight spark will be noted at the top of the press just where the leads enter it. The tube should be "flashed" until this sparking stops and if it is continued too long, the tube will become gasey.

It is, of course, better to treat the tubes when they are unbased as there is, then, no danger of the spark jumping between the studs on the base and burning it. The basing cement is made of shellac and whiting, so, it may be burned off or soaked in alcohol and pulled off.

Do not twist the leads of an unbased tube too much (this goes for the UX852) as the weld or seal between the leads and the glass will become loosened and the tube will be useless.

If you are having trouble with a noisy bearing in your variable condensers, 4NF suggests putting a few drops of carbon tetrachloride on them while revolving the rotor plates. It will clean up the contacts nicely.

Some of the Florida gang who were on the Naval Reserve cruise, had a regular ham convention in Wilmington, N. C., when their ship stopped there over the Fourth. The North Carolina boys were responsible for the good time that was had by all.

"Electrician's wife: Watt's the meter? Wire you insulate?"
 "Electrician: I got shocked by a coupler vampers."

The International Test Results

By Lawrence A. Jones, Assistant Communications Manager

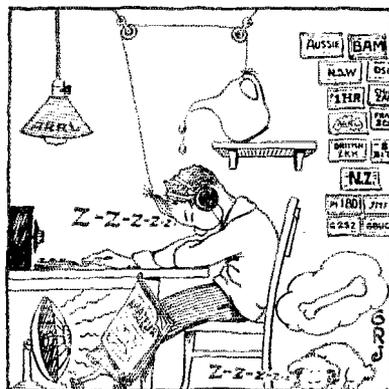
THE question, "May I ask for a report on my standing in the International Tests?", has been popping up in some form or other in a bunch of letters recently, and here's the answer. It's been a long time coming, but waiting for confirmations from all over the world, and then checking all the messages carefully takes more time than a little.

The contest as a whole was a very great success, and many things were learned which will help in the planning of future ones. As an example of this; the rule which prevented any one U. S. or Canadian station from sending more than one message to a foreign country, probably cut down our totals considerably, since the foreign stations for the most part held to the slogan, "A fair exchange is no robbery," and wouldn't part with a reply message unless they could get another for it. And we don't blame them, either. However, the interest shown was very high, and many hams say that they enjoyed the party more than any other one that has ever been held.

Now the first thing to get off our chests is the matter of certificates. An even dozen Official Foreign Contact Station Certificates are being awarded to eleven different U. S. and Canadian stations, and here's the dope: 2AHM gets the honors for Great Britain, having made 16 points with that country. 6BUX spent all his time looking for points with Australia, thereby grabbing off a certificate to the tune of 25 points. 6AM snagged two of 'em, namely New Zealand with 19 points, and China with 1 point. 4IZ gets the credit for the only point that was made with Spain, thus winning a certificate for himself. 1AJM gets the one for Denmark, having squeezed out four points with that country. 2CUQ had four with Morocco, which rates a certificate. 7EK, 'way out west, took the honor with Sweden with his four points. 9AEK got four with South Africa for which he will receive a certificate. 1ON takes the honors for Norway with four points. 1CPB gets one for the Netherlands with four points; and lastly nc5AJ puts in an oar for Canada by being the only station to give a message to New Caledonia which gives him one point and a certificate.

You'll probably wonder why so few certificates were awarded. The answer is easy. At least two stations, and sometimes as many as 35, were tied for high place with all other countries, and it would be impossible to give certificates to all these. They were all equally reliable, hence no certificate could be awarded for the "most

reliable." However, it may be interesting to list some of these duplications: 1CMP and 2APD each had a high score of 7 points with Germany, while 6CKV and 6AM tied for Chile with 13 points. 4IZ and 2CUQ had 7 with Italy. 2TP, 8AHC, 2AHM and 1ADM each had 7 with Belgium. 8ADG, 2AQW and 2CUQ had 7 points with France. 8GZ, 2APD and 1CKP had 7 with Brazil. 2TP, 4JP and 9ADN had 4 with Cuba. 6CKV and 6BQ earned 7 with Argentina. 2APD, 2CUQ and 1ON each had 4 points



NECESSITY WAS THE MOTHER OF INVENTION DURING THE INTERNATIONAL RELAY CONTEST

with Cameroun (fq). 2AHM and 6AM tied with 7 for Uruguay. 2TP, 4IZ, 1AMU, 1AUR and 4JP had 4 with Netherlands. 6CTX, 7EK and 5AHP had 4 with Polynesia (oo). 6CKV and 5AHP made 4 with Japan. 6CKV, 6AM and 6BYH had 4 with Alaska, while 6AM, 6BJX and 6AMM each had 4 points with the Philippine Islands. The remaining countries had so many "nc" and "nu" stations tied for first place that it is impossible to list them, but look at this: 12 stations were tied for Finland; 24 for Canal Zone; 18 for Nicaragua; 7 for Mexico; 8 for Venezuela; 16 for Austria; 28 for Costa Rica; 10 for Portugal; 9 for Hawaii, and 35 for Porto Rico.

Now let's have a look at some of the total scores: 2AHM 90, 8GZ 82, 4IZ 74, 6AM 72, 2CUQ 71, 2APD 70, 8ADG 69, 2TP 66, 1ADM 61, 1AUR 55, 6CKV 54, 2AQW 54, 1AMU 50, 2GX 48, 1CKP 40, 7DF 40, 8AHC 39, 4FU 34, 9ADG 34, 7EK 33, 5WW 32, 8DLL 32, 9ARN 31, 3OQ 31, 5WZ 31, 11C 31, 9AEK 31, 3HS 30, 1AJM 30, 5ACL 30—

that's about all we have room for, but it will give you a pretty good idea of where you stand. You'll notice it covers all stations other than those of Headquarters' Staff that had a total score of 30 or more. In countries outside the United States and Canada, the story is somewhat different. The scores, of course, average a good bit higher, and more certificates could be awarded. Eighteen stations won certi-

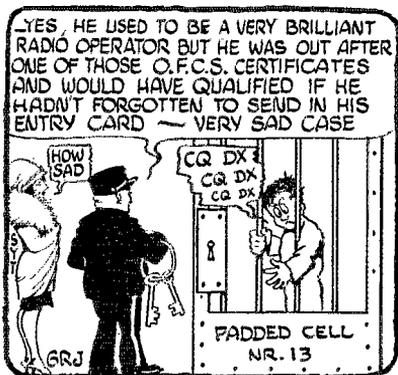
adhered to strictly was perhaps not stressed quite strongly enough, with several slight misunderstandings as a result. For instance, although stations in Ireland were using the intermediate "gi," these stations had to be counted as in the same locality as "eg," since Ireland is listed under "eg." Similarly, Tasmania had to be counted as "oa," and Newfoundland as "nc." This will perhaps account for one or two missing points on some of your scores. One station in Newfoundland worked up a beautiful score for himself, but unfortunately he used "ne," and was exchanging messages with "nc" and "nu" stations. None of these could be counted. This may not seem exactly fair to some of you, but some definite system had to be adopted to avoid difficulties even greater than those encountered, and the list of Intermediates seemed the most logical.

Although actually unable to participate in the contest—at least as far as winning certificates is concerned—several of the HQ gang tried their luck at their own stations. 1BDI, 1BHW, 1SZ and 1MK were all in the swim, and here's how they came out: 1SZ scored 1 point with Poland (et), which would have rated him a certificate had he not been one of the QST staff, and he also



ates, as follows: In Italy (ei), 1CR made a high score of 88 points; in Belgium (eb), 4AU made 118 points; in Costa Rica (nr), 2FG made 133; in Australia (oa), 2SH made 100; in Chile (sc), 3AG made 232; in New Zealand (oz), 2AC made 72; in Austria (ea) GP made 77; in Finland (es), 2CO made 57; in Sweden (em), SMTM made 9; in Germany (ek), 4UAH made 151; in the British Isles (eg), 5BY made 132; in Hawaii (oh), 6BDL made 20; in Porto Rico (np), 4SA made 145; in Canal Zone (nz), EZ5 made 112; in Mexico (nm), 1N made 152; in French Equatorial Africa (fq), PM made 17; in Uruguay (su), 1CD made 32, and in Brazil (sb), 1AK won his certificate with 24 points. In the remaining countries no certificates could be awarded owing either to lack of reports, or to tie scores. More stations have reported as participating in the tests in Australia than in any other country. There were eighteen of them.

If letters are any sign of how the tests were enjoyed, one might safely say that they were the best yet. Such phrases as: "I had a lot of fun"; "A very fine contest"; "The whole test was a wow," and "The tests surely were the berries," are to be found in practically every report. Most of these letters also offer criticism and suggestions, but these narrow down to merely the one point expressed earlier in this article. Many QSOs were effected without an interchange of messages, due to the limitations of the "nc" and "nu" stations. Incidentally, the fact that the new official list of International Intermediates was to be



tied with the high stations for Germany, Italy and Cuba. 1BHW made the same score with Spain as did 4IZ, the certificate winner, and also tied with others for high score with Cameroun (fq). The total scores were: 1BHW 64, 1SZ 57, 1BDI 56, and 1MK 5.

The second week of the contest saw excitement at a fever heat in the QST office. At the beginning of the contest the participants drew up a certificate signed by all, to go to the individual station having the highest number of points. The undisputed honor of being allowed to have the certificate framed went to the lowest scorer. 1BDI won the certificate with 1KP on the "framing" end. If everyone got as

(Continued on Page 48)

More Selectivity With Three Tubes

By Allan T. Hanscom*

THE problem of selectivity in radio receivers has probably had as many kilowatts of brain power expended upon it as any feature connected with the art. Unfortunately, good selectivity can only be obtained by reducing the pick-up ability of the receiver and increasing the tuned amplification after the pick-up. This characteristic has produced the Rolls Royce types of broadcast receivers with their attendant expense, while the Chevrolets have traveled along with their four and five tubes and provided almost as enjoyable programs except in the extremely congested areas. For the purpose of providing the needed selectivity without the complication of many stages, the writer has made some interesting experiments.

Of all the difficulties which beset a designer of radio receiving equipment the most important is the interaction between two

one stage of stabilized r.f. amplification. The best operating condition for this set is when the detector tube is approaching the oscillating point, but it has been noticed that a far greater signal gain results when the first tube is also approaching the oscillating point. However, should the first tube reach this condition before the second tube approaches it, we find that results are very inferior. This will probably explain why, in certain cases, a poorly neutralized Browning Drake set will give louder signals than one which is carefully balanced.

If we could tune the first tube to the frequency of the received signal and then change the frequency so that the second tube would not have any tendency to act on the first tube, it would be theoretically possible to provide a great degree of amplification.

Furthermore, if the second tube could be tuned to a constant frequency, the feedback could be adjusted at the most sensitive point and the tube would always be working with maximum efficiency.

After reading the above, you will be reminded of the fundamentals of the superheterodyne, which accomplishes these results by a succession of stages tuned to a low frequency but with the attendant complication of a number of stages.

By properly selecting a fixed frequency for the second stage, it is possible to provide a tuning system in which the signal can only be received at one point on either of the two tuning controls. If, for example, we choose a detector frequency of 550 meters or 546 k.c., this must be the difference which exists between the frequency of the incoming signals and a frequency which is to be generated within the set. The broadcast spectrum covers the wave bands between 200 meters or 1500 k.c. and 546 meters or 550 k.c. We, therefore, must cover with our oscillator a band of frequencies which will provide a constant difference of 546 k.c. between the oscillator and the incoming signal which ranges from 1500 k.c. to 550 k.c. This condition will be met for the above mentioned frequencies when the oscillator will tune from 2046 k.c. to 1096 k.c., which corresponds in wavelength to the bands between 147 and 274 meters.

The design of an oscillator covering this band is not difficult, and it will be noted that the oscillator does not encroach upon the broadcast band except between 200 and 274 meters. In actual practice, the choice of a detector frequency somewhat higher than this will reduce the overlap still fur-

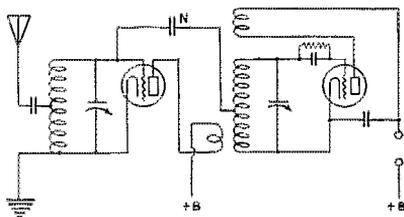


FIGURE 1

or more circuits which are resonant at the same frequency. The modern demands of selectivity make it imperative to use more than a single tuned circuit, and it has been pretty definitely established that a commercial radio amplifier with all interaction and consequent regeneration removed will not provide the necessary selectivity and voltage gain.

Most readers are familiar with the various methods in use to provide stability. These include the bridge methods, such as Rice and Hazeltine, or the introduction of sufficient resistance in the grid circuits of the vacuum tubes.

With the idea of avoiding the interaction between stages and deliberately introducing sufficient feedback in the tubes to provide extreme sensitivity, the writer has developed a circuit containing a novel combination of features which make possible a very high gain per stage.

Figure 1 represents the conventional type of regenerative detector preceded by

*Formerly of Woonsocket, R. I. Mr. Hanscom sent QST this article shortly before his death in August.

ther. It is interesting to note that for any given signal frequency there is only one point on the oscillator scale which will provide the necessary beat frequency for the detector. For example, at 300 meters the frequency of the oscillator is 1546 k.c. and the only other frequency at which the neces-

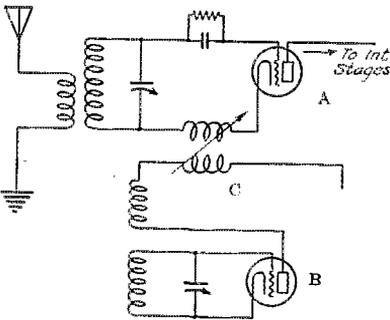


FIGURE 2

sary condition would be met is when the oscillator is tuned to 454 k.c., which corresponds to a wavelength of 662 meters. This point cannot be reached on the oscillator because it is designed to tune only as high as 274 meters.

It is possible to combine the functions of first detector and oscillator in the first tube, but since we are interested in securing regeneration in this tube at signal frequency this method was abandoned, as it involved tuning of the grid of the tube to two different frequencies, allowing it to oscillate on one frequency and bringing it up to the oscillating point on another frequency, all at the same time. It was found that with this arrangement the tuning of one circuit affected the tuning of the other, and it did not provide the independent control so essential for easy tuning.

In order to properly generate a new frequency within the set and transfer to it the modulation which has been impressed on the signal frequency at the broadcasting station, it is necessary that a certain relation should exist between the amplitude of the signal frequency and that of the locally generated oscillator frequency. This is the reason why some experimenters have had difficulty with superheterodyne oscillators. If the oscillator frequency is not coupled sufficiently tight or if it is coupled too tight, the resultant beat frequency will not be properly modulated.

Figure 2 represents the conventional oscillator coupling which is used for superheterodynes in various forms. The tube B is the oscillator and it is coupled to the grid of the tube A through the pick-up coil C. In this case, however, the grid cir-

cuit of the tube A is tuned to the signal frequency and therefore it takes a relatively stronger oscillation to produce enough effect on the grid of the tube to create the proper beat note. In attempting to secure a better coupling without the necessity of a large power waste in the oscillator the writer evolved a method of coupling as indicated in Figure 3. It will be noted that the plate coil of the oscillator is a part of the tuned grid circuit for the first tube, and therefore we have the effect of a series resonant circuit which provides a big voltage change on the grid of the first tube, with a minimum of power in the oscillator.

It will be noted in Figure 3 that the antenna is coupled directly to the grid of the first tube through a small variable condenser of about 80 μmfd . This method of coupling provides an excellent selectivity control and also prevents the formation of an absorption circuit for the oscillator, which would occur at certain frequencies if the antenna were coupled through a coil having a limited number of turns in the so-called "aperiodic" method. If the antenna should be coupled by the conventional "aperiodic" method, the antenna ground capacity together with the few turns in the antenna circuit would have a natural resonant point lying somewhere in the oscillator range, and this is likely to cause the oscillator to cease functioning at a particular frequency.

Due to the series resonant characteristic, the plate coil of the oscillator in Figure 3

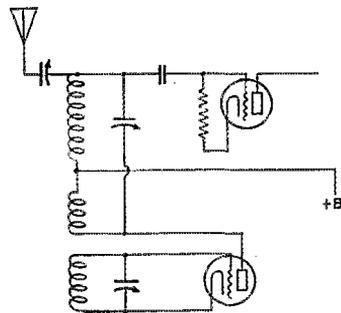


FIGURE 3

need not be inductively coupled to the grid coil of the first tube, although the fact that it is coupled does not seem to produce any harmful effects.

Figure 4 is a wiring diagram of the complete tuner. The coil A consists of 41 turns on a 3-inch tube, while B consists of 7 turns separated from the end of coil A by $\frac{5}{8}$ of an inch. The coil C, twenty turns, which is the tuned grid circuit of the oscil-

lator, is also wound on the same form and separated from B by $\frac{1}{2}$ of an inch. The violence of the oscillation is controlled by the coupling between B and C, and a milliammeter in the plate circuit of the oscillator will give a good indication of this. As the oscillator had no grid condenser or leak the plate current will increase when the tube is oscillating, but the ideal condition exists when there is practically no increase in the plate current and this can be provided by a very loose coupling between B and C. The bias for the first tube is obtained by connecting one end of the coil A to the minus filament and the B battery voltage is prevented from reaching the grid of the tube by means of the 1 μ d. condenser connected between the coils A and B.

The tickler coil D is coupled to the grid end of the coil A and can be made as a conventional moveable tickler, or can be controlled with a shunt resistance. It consists of 8 turns on a 2 $\frac{1}{2}$ " tube, and the oscillation can be controlled by a 200-ohm resistance mounted on the panel.

The fixed condenser shunted between the grid and filament of the oscillator is for the purpose of spreading the dial settings

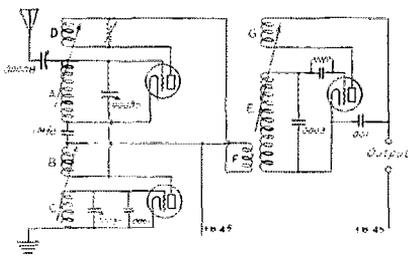


FIGURE 4

and permitting the two dials to read approximately alike for any given signal. The 1- μ d. by-pass condenser, connected between the +B45 and the filament, which is grounded, is placed at this point to take the B batteries out of the tuned grid circuit of the first tube.

The coil E represents the secondary of a tuned R. F. transformer, and this is tuned by means of a fixed condenser having a capacity of .0003 μ d., which corresponds with the beat frequency of about 600 meters. The commercial Brownings Drake regenerative can be used at this point by substituting a fixed condenser for the variable usually supplied. The primary coil F should have about 20 turns wound in a manner that would tend to reduce the capacity coupling between E and F to a minimum. The second tickler coil G is not controlled from the panel of the set but can be adjusted to the point of maximum

sensitivity and allowed to remain. In the diagram of this circuit (Figure 4) we see that there are three tubes, all tuned to a different frequency, and therefore no special precautions are necessary to prevent interaction between the circuits. In an experimental model the writer was able to mount the two sets of coils 4 in. apart with their axes parallel, without detrimental effects.

The normal operation of the set is extremely simple. Both tuning controls will be found to be extremely sharp as there are in reality three tuned circuits, namely, the first tube or signal frequency, the oscillator or generated frequency, and the second tube or beat frequency. Only 45 volts of B are used on the tuner, with the result that the total milliammeter drain for the three tubes will not exceed 7 mils. The first tickler control can be used on weak signals to greatly increase the response, and the variation of this control has little or no effect on the other tuned circuits.

Still another advantage possessed by this arrangement as compared to the usual superheterodyne lies in the fact that the intermediate frequency is sufficiently high to permit a good by-pass action in the plate circuit of the detector so that the quality of output does not suffer as is the case where a low intermediate frequency is used.

The pick-up ability of the set can be demonstrated by disconnecting the antenna completely, and under these conditions it is possible to tune in a 500 watt station at a distance of twenty miles with fair loud speaker volume when using two stages of audio, but by far the greatest advantage of the circuit lies in its extreme selectivity which is in excess of what might normally be expected from a like number of tubes.

Strays

We have been informed by the General Radio Company of Cambridge, Mass. that due to the inadvisability of working crystals having a fundamental in the vicinity of 160 meters for transmission in the 20- and 5-meter amateur bands, they are prepared to supply crystals having a fundamental wavelength of about 80-meters for this work. These are to be known as Type 276-E to differentiate from the 276-A plates which are ground to the 160-meter wave.

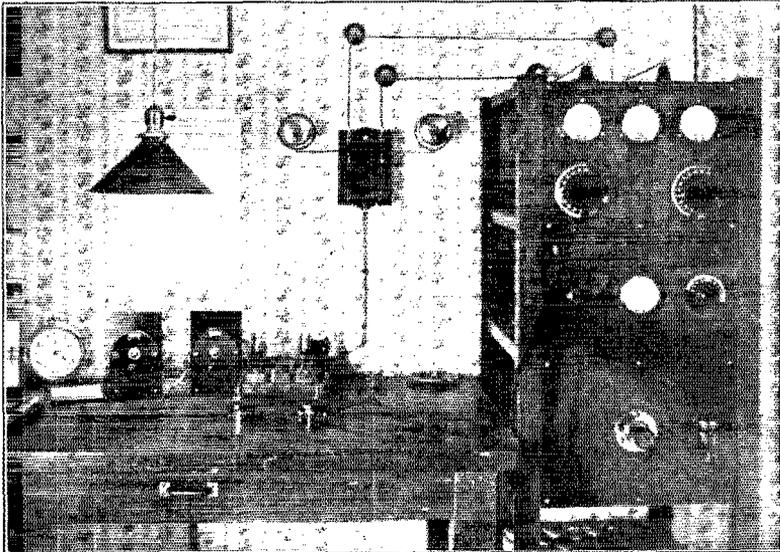
Due to the smaller size of the new plates, there will be more difficulties encountered in their operation than are had with the longer wave crystals and they are not recommended for operation in transmitters for the 40- or 80-meter bands. It is recommended that the 160-meter crystals still be used for these waves.

nu9CM

ANY amateur may be proud of having a crystal-controlled transmitter but it must be more than pride that fills a man who has not only mastered the queer antics of a crystal and its associate circuits but has also mastered the destructive tendencies of our old friendly enemy, the chemical rectifier. How many radio shacks have been threatened with annihilation because of the disfiguring spots that appeared on the best rug? How

The rectifier is a twenty-jar affair using the usual aluminum lead-borax triumvirate but which differs somewhat from the regular run of them in that two aluminum electrodes are used to one lead strip. This allows the use of a smaller lead strip for a given amount of active area and probably gives some improvement in the current distribution through the electrolyte.

The plate transformer is rated at 450 watts and either 1,000 or 1,500 volts may be



CRYSTAL-CONTROLLED nu9CM

many hours have been spent in rigging up wiring so that the old "slop-jars" may be safely placed in the cellar out of everyone's way including yourself when it comes time to add water to them?

Edward N. Fridgen got around this trouble quite effectively by building a wooden frame to contain the entire set from power transformers to the antenna tuning and coupling instruments. The frame is of quarter-sawed oak and stands 59 inches high. It is 18½ inches wide and 24 inches deep which gives plenty of room for all the equipment used. There are four shelves, the upper three of which are spaced to give nine and a half inches of "head-room" for the equipment to be mounted in while the lower shelf, holding the rectifier has somewhat more space above it to allow better ventilation and also to give enough room for checking the height of the electrolyte and the adding of distilled water when that is necessary.

had each side of the center tap. There are ten of the rectifier jars on each side of the transformer. The filter used is the normal arrangement of a 40 henry choke and four microfarads of capacity. A 350 watt transformer giving a secondary voltage of ten is controlled by means of a 500-watt Radiostat in its primary and supplies the filaments.

The transmitter proper consists of a UX-210 crystal oscillator and a 203-A power amplifier. The crystal has its fundamental frequency corresponding to a wavelength of 80.6 meters and the power stage is worked off the second harmonic of the oscillator. This makes it unnecessary to shield or neutralize the circuits and no trouble is had from tendencies toward self-oscillation due to feed-back from the power stage to the crystal circuit.

The circuit diagram of the set is given in Figure 1. Resistors R₁ and R₂ are Clarostats having a range of from 0 to 3

megohms and are used to adjust the bias on the grids of the tubes. The grids of the tubes pick up a certain number of electrons as they pass from the filament to the plate which are forced to return to the filament by way of the resistors as there is no other path of low d.c. resistance. They cannot pass through either the crystal or the coupling condenser. The rate at which they can get back to the filament depends upon the value of it and the higher its resistance, the smaller the number that get back and the higher the negative potential applied to the grid. Therefore, by varying the resistance, the negative bias on the grid can be controlled.

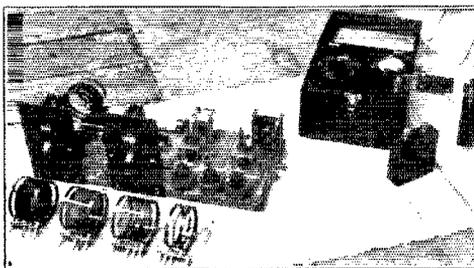


SIDE VIEW OF THE TRANSMITTER

The lower shelf holds the rectifier, and the second one, the transformers, chokes, condensers, rheostats, fuse blocks and switches. The third one holds the crystal tube and the top one the amplifier equipment. A bakelite panel covers all but the lower shelf.

In order to prevent too much of the input grid energy from being by-passed across the resistor between grid and filament of the power tube, a radio frequency choke is inserted between the grid and the resistor. Another choke could be placed in the leak circuit for the crystal tube but may pick up enough energy from the power stage

to cause self-oscillation with a possibility of damaging the crystal. Even though the amount of energy picked-up may not be enough to destroy the crystal,



THE RECEIVER IS SHOWN BEFORE BEING PUT INTO THE SHIELDED CABINET

The neat wavemeter is shown at the right.

it may be sufficient to cause trouble in the operating of a good note.

The resistor R3 is a Bradleyohm, model

E210 with a resistance range of from zero to thirty thousand ohms and rated at a maximum dissipation of twenty watts. It is used to drop the voltage applied to the amplifier stage to a desired value for the crystal tube.

The two resistors, R4, are needed to reduce the ten volts applied to the power tube filament, to 7.5 volts for the crystal tube. Each unit is of one ohm and by using one in each leg of the filament, the center tap arrangement is not unbalanced.

The antenna consists of a single wire, thirty-four feet long and thirty feet high. The counterpoise which is of the same length is located directly beneath the an-

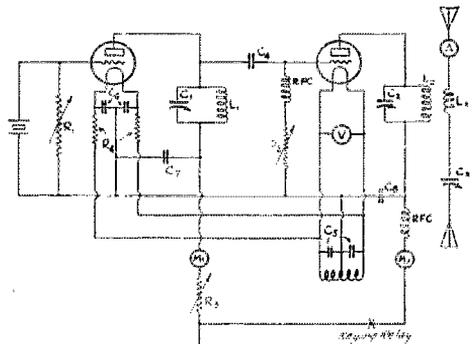


FIGURE 1

L1—15 turns No. 14 d.c.c. on 2.5 inch tube. L2—12 turns flat wound ribbon 4.5 inches diameter. L3—6 turns 1/4 inch copper tubing 2.25 inches diameter. C1—250 μfd., C2, C3—330 μfd., maximum. C4, C7, C8—.002 μfd., 4000-volt fixed condensers, C5, C6—1 μfd. by-pass condensers, RFC—40 turns, No. 36 d.c.c., 1.75 inch diameter, M1—0-100 milliamperes, M2—0-300 milliamperes, A—0-3 amperes, radio frequency, and V—0-15 volts, a.c.

tenna but is only fifteen feet high. The lead-in comes through the wall and is insulated with Pyrex cups. Corona shields of copper are put on each end of the lead-ins. For receiving, the antenna and counterpoise are tied together and change-over made by means of a double-pole, double-throw switch. The antenna current (for those who must know this unenlightening fact) is approximately one ampere with an input of twelve and ninety watts respectively to the crystal and power tubes.

The receiver employs Aero coils and uses the capacitive control of regeneration that is so popular. Two stages of audio amplification are available and jacks provided to allow either a single or both stages to be used. An eighth-inch aluminum panel is used and the cabinet is completely shielded by thin aluminum sheeting. The leads from the "A" and "B" batteries are in lead covered cable and the box holding these

(Continued on Page 42)

International Communication

By Fergus Sunshine McKeever*

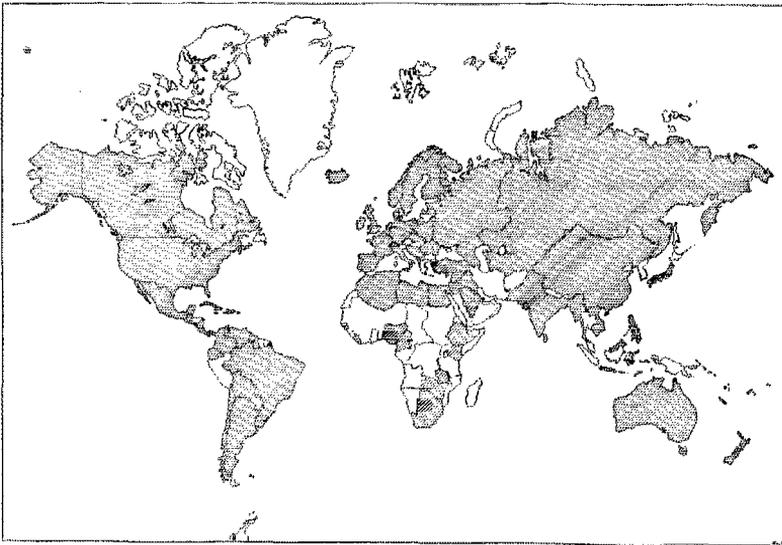
SO-CALLED "international communication" has become such a commonplace and every-day affair that most of us take it as a matter of fact and do not think of its reason for development, its present tendencies and even less of its future possibilities.

By way of review: It was not until the Fall of 1924 that the transmitting amateurs of the world began to communicate over great distances in an established and matter-of-fact way, and not until then that

new ones in new locations, thereby broadening the geography of amateur radio. Nearly all of the countries of the world have now been worked by someone. Nearly all of these countries have active stations at this moment. In not a few cases an individual amateur has communicated with a great many countries.

IS THAT ALL?

To the man who has just learned to operate his transmitter, or to the older operator



THE RADIO FRIENDSHIP MAP OF THE WORLD

Every country or other territorial division shown shaded has at the moment, stations that speak to amateur stations in other countries and make international friendships. There are even single stations on several continents which have spoken to well over half the places marked as active. Can you imagine the satisfaction of having friends in all those places? Can you imagine the kindlier feeling toward other peoples that must follow? May one not look forward to the time when all inhabited countries will be forming such friendships?

any considerable number of amateurs took part. It was not until the 80- and 40-meter bands were put into general use that any practical results were obtained.

During our three years of international radio, the so-called "DX hound" has played a prominent rôle in radio development, although he has not realized this as a rule. It has been the lot of this person to be called undesirable names; nevertheless he served his purpose; to stimulate interest in foreign "QSO" by sitting up many long nights to continue his contacts and to add

who has just become aware of these possibilities, this sort of thing is very attractive for a time. But after the man has worked too many points, what then? Shall he now throw away his set and call amateur transmission completed? No! He must add deeper layed interests than those of merely working DX because it *is* DX. We must therefore stimulate other interests to work *hand in hand* with DX.

I am working DX just as long as it does not become a stiff and formal process,

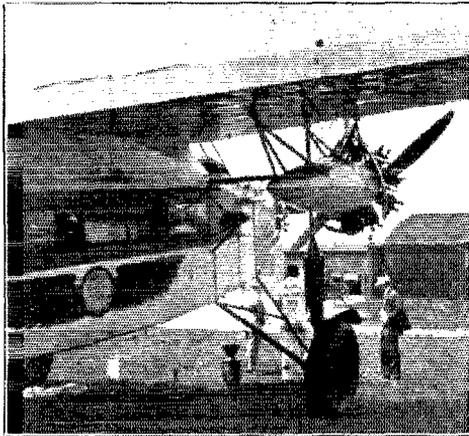
* 9DNG, University Heights, Lawrence, Kans.

"The Voice of the Sky"

A Really Different Loud Speaker

IN THE past few weeks a number of New England towns have been surprised by a tremendous voice from overhead, a voice so loud that it drowned out the very roar of the airplane carrying it. Ordinary traffic noises were swamped by the volume, it could even be heard underneath the elevated railroads whose racket we usually think of as deafening, and the words of the speaker could at times be understood as far as 5 miles from a point directly underneath the plane—though the plane was 3000 feet up and the sound was being directed downward.

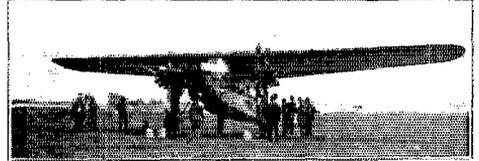
To generate such a voice that drowns out the roar of three airplane motors and makes a whole city stop to listen is naturally the work of a loudspeaker system that is at the least to be classed as unusual. Fundamentally, of course, it operates along the usual lines, beginning with a microphone in a soundproof booth in the fuselage of the big



Fokker F-VII Tri-Motor plane, passing thru a number of stages of vacuum tube amplifiers and then arriving at three high-power loudspeakers built into the skin and pointing downward. The details of the arrangement are quite naturally not for publication since they are the result of much painstaking and expensive experiment in the direction of overcoming the excessively severe operating conditions of which the chiefest are the vibration, noise and finally the relatively immense demand for audio power. There seems to be no secret though, as to the final power. The last stage employs a quartet of Western Electric $\frac{1}{4}$ -kilowatt tubes fed at full voltage by a pair of wind-driven generators delivering 500 watts each. Power for the filaments of this stage is derived from still a third wind-driven gen-

erator. The preceding stages are operated partly from these same generators and partly from batteries.

One may guess immediately that the operation of such an amplifier system is not exactly cheap, especially as there must be added in the cost of operating the Fokker



F-VII tri-motored plane with a crew of five. Several such are operated by an organization called "Voice of the Sky, Inc." The plane which operated for some days with the Hartford airport as a base was engaged in advertising the "Old Gold" cigarette by voice and music and was under the care of George W. McCauley operator of the amplifier equipment and Vice President of "Voice of the Air, Inc.," and further known to this outfit as ex 5YG (spark), 5AJR (C. W.) and WTAW (B. C.). The crew consisted of Lew Gower, pilot, Louis Avaritt, mechanic and of two entertainers, McGrath and Bell—the latter known to some of our readers from his work at the Radio News' station WRNY.

When flying over Hartford at 3000 feet elevation the voice of the plane reached the earth with sufficient intensity so that nobody who was outdoors in the half-mile strip under the plane's line of flight could possibly have overlooked it. The intensity naturally decreased as one went further away but perhaps 50% of the words were still intelligible at 6 miles—though this is unusual. The manner of operating was to traverse the city repeatedly on lines half a mile apart, taking about an hour to cover Hartford, East Hartford and West Hartford which have a total population of perhaps 180,000. Naturally, the time required is proportional to the area to be covered. On the day mentioned there were covered in addition, the towns of Middletown, Berlin, Kensington, New Britain, Plainville, Bristol, Torrington, Winchester, and Manchester, totalling $5\frac{1}{2}$ hours; during most of which time the loudspeaker system was in operation. The audience that came within the range of the 1000-watt voice is hard to estimate but must certainly have come very close to including the total population of all the towns named—and an audience of 300,000 isn't so bad when one is transmitting at audio frequency, even though it is being done with the world's most powerful loud speakers.

Calibrating S/W Receivers and Wavemeters From Broadcasting Stations

By F. S. Huddy*

THOUGH it is Fall now, there are still some nights when even 20 meters is jammed with rattles and crashes and the mind of the really active amateur turns to improving his station. Then too, some of us cannot send during B. C. hours and find that this time hangs heavily on our hands. The enforced quiet can be turned to benefit for there is no better way to improve a station than by adding a good wavemeter and no better time to calibrate it than during B.C. hours.

Not long ago, an article appeared in *QST* telling how receivers might be calibrated from broadcast station harmonics. An article also appeared describing a method of finding the points of highest resistance in an antenna by means of an oscillating receiver. The author combined the two and obtained a very excellent calibration for his home-made wavemeter. The method has the advantage that it calibrates both the receiver and the wavemeter at no additional cost of effort, and may be carried out regardless of whether or not the broadcast stations are going.

So many good wavemeters have been described in *QST* that it is unnecessary to give any constructional details here. It might be said, though, that it is well to have a substantial wavemeter since, the flimsy condensers and coils used in most ham meters make the calibration "subject to change without notice!" The apparatus needed is as follows. First, a regenerative broadcast receiver. The Radiola III or IIIa is very good and was used by the author. Second, a shortwave receiver with a wavelength range as great as that over which it is desired to calibrate the meter. Third, a wavemeter, and fourth some good graph paper. No. 3776c National Simplex Notebook Graph Paper can be had for \$.35 for 18 sheets and is ideal for this work.

The procedure is as follows. Set up the broadcast receiver and adjust it so that it will tune from 200 meters to say 360. Put plenty of B battery on the detector so that it will generate strong harmonics. A high

resistance gridleak will also help in this matter, but the higher the value of the leak the higher the value of B battery must be. Lay off the graph paper with wavelengths as ordinates and dial settings as abscissas. Then listen on the receiver and tune in a station on zero beat, preferably one of the larger ones. WPG makes a good one and is on 273 meters. Opposite 273 on the ordinate line and at a distance from the ordinate line equal to the dial setting for WPG, put a small dot with a small circle around it. Tune a little higher and find another station say WRNY on 309. Plot the point as before. Then go down to say

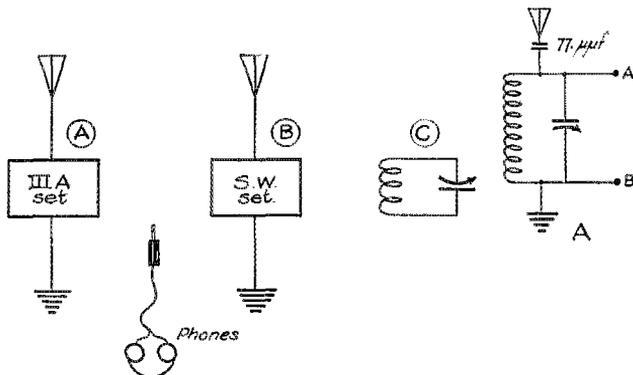


FIG. 1. THE METHOD OF CALIBRATION

Plug the phones into A and by using zero beat on successive broadcast stations make a curve such as shown in Fig. 2. Now put the phone plug into B and set B to (for instance) the 10th harmonic of A, getting the approximate setting of B from the rough wavemeter C by the click method. When B has been set exactly to the zero beat of A, turn the condenser of C slowly and record on the dial of C or on a curve sheet the exact setting for resonance with B. In this way the rough wavemeter C is point by point made into a good wavemeter.

246 meters and find WAAT or WSOM. Plot the point as you did the others. Repeat this operation for as many stations as you can hear. You will be greatly surprised to find that almost every one of the stations will come in on a point on a smooth curve drawn thru the points you have plotted. Now-a-days, the stations are careful about their waves, too, because the new Radio Commission get after them if they aren't! When you finish, you have

1. The particular wavelengths mentioned have been changed, very probably, since this article was written. They are given merely as examples. For up-to-date information see the newspapers or a recent list of B.C. Stations.—Ed.

*III-IZS, Ex. Section, A.I.E.E., 204 Bowen St., Providence, R. I.

A 100-Watt Test Oscillator

By Oliver B. Parker*

B EING of some interest to amateurs the Cardwell laboratory oscillator is being described for those who may wish to make use of some of the features of its construction. The unit has been used very extensively to "burn up" condensers on the comparative efficiencies of the various types, and also in comparing different insulating materials in the same type. This was not the original purpose of the unit which was built for measurements

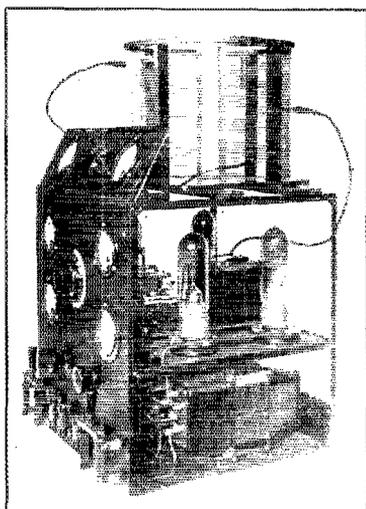
ing range of the set is extended upward to 25,000 meters by loading coils and condenser or downward to 25 meters by reducing the inductance.

The frame of the set is of light angle brass riveted and soldered at all rivets. The panel and shelves are of quarter-inch bakelite. The shells of all the meters are connected to the frame which is grounded when the set is in use. Before this was done it was possible to burn out coils and hair-springs in the meters, although the instruments were short circuited and the hair-springs were not even in the circuit. This is not so surprising when one considers that the current in the helix rises as high as ten amperes when the set is operating normally.

ARRANGEMENT

An interesting feature of the set is its fairly compact arrangement. On the top shelf is the inductance with room to put on clips or to exchange coils if necessary. On the shelf below are the two 50-watt oscillators and the kenotron rectifiers for the plate supply, also the tuning condenser and some of the filter condensers. On the lowest shelf are the power transformer and the filter choke. Full-wave rectification is used.

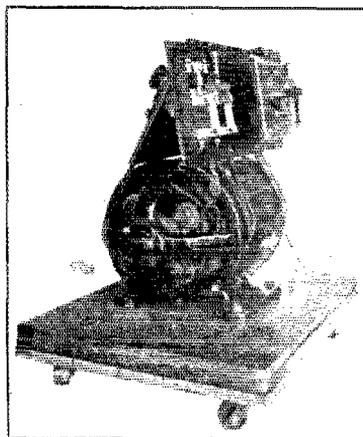
Referring to the panel, the control arrangement is as follows. The upper left meter is the plate milliammeter (0-300), next below is the grid milliammeter (0-50) and at the lower left is the plate voltmeter.



THE R. F. GENERATOR UNIT

and calibration, where a steady wave was essential. The reason for making a "driver" as large as 100 watts was to make its power large compared to that absorbed by the test circuit. This keeps the test circuit from changing the frequency of the driver noticeably. A circuit can be tested 20 feet away. A tuned circuit within several feet of the set will usually arc through the condenser or coil.

The illustrations tell most of the story. The oscillator circuit is the "straight" Hartley. Using the inductance shown the tuning range is from 65 to 3,000 meters, with a Cardwell 43-plate double-spaced condenser having a breakdown voltage of 8,000. This condenser does not stand up at the extremely low wavelengths and a special one has been built which does not arc even at 25 meters. The same difficulty would not occur in a transmitter since the energy is transferred to the antenna instead of being left in the primary as it is here. The tun-



THE PORTABLE M. G. SET

The upper right meter is the r.f. ammeter in the tuned circuit, below that is the filament voltmeter and still below that is the filament ammeter.

(Continued on Page 78)

* Engineer, The Allen D. Cardwell Mfg. Co., Brooklyn, N. Y.



I.A.R.U. NEWS

BELGIUM

BELGIAN stations have been very active during the summer and several have placed themselves on a plane with the best performers. Many have shifted their waves to the 20-meter region with excellent results following almost immediately. The majority use Hertz antennas and oscillators of the Mesny type.

"There have been quite a large number of new members admitted to the Reseau Belge, the official I.A.R.U. Section for this country, and it is hoped that soon there will appear on its membership list the names of all the amateurs in Belgium.

"4CK has been appointed as manager for the Official Relay Station Section of the



A GLANCE AT eb4UU

Reseau Belge and there are at present, five stations in the Section which are 4AC, 4BC, 4BL, 4CK and 4XS. Unfortunately it is only possible to handle messages of an experimental nature as the handling of those of other types is strictly against the law."

—Paul de Neck, eb4UU, President, Reseau Belge.

We are showing a photo of the equipment at 4UU. Two French type E4M tubes having a rated maximum plate dissipation of 60 watts each are arranged in a push-pull oscillating circuit using a tuned plate circuit and obtaining grid excitation through capacity coupling to the grids. The plate power is obtained from 2,000-volt generator rated at a maximum output of 500 watts.

Two 50-henry chokes and two 1- μ fd. condensers make up the filter system.

The antenna is a single-wire Hertz about 34 feet long and about 65 feet high. It is current-fed by a two-wire transmission line.

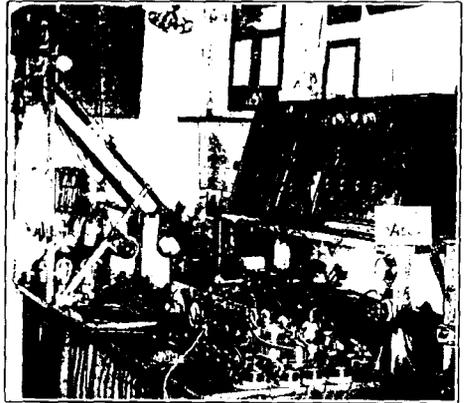
We have been informed that 4BC has been appointed as District Manager for the Province of Antwerp and 4AC has filled his old position as City Manager.

BRAZIL

The following news is from sb1AA via nu1SZ by radio.

"Receiving conditions are rather bad in Rio de Janeiro and 'nu' stations are hardly ever heard on the 20- and 40-meter bands. Until about a month ago, 'nu' and European stations were coming in nicely on these bands but lately, both faded out almost entirely although occasionally one or two would come in with an audibility of about R1 or R2.

"It is interesting to note that such conditions do not exist all over the country and at 1AA which is about 50 miles from Rio, both 'nu' and Europeans come in nice-



THE OUTFIT BEHIND foA50's SIGNAL

ly. Stations located in Rio working on the 20-meter band are heard only occasionally in contrast with conditions of a short time ago when all of them were heard R7 to R9 plus.

(Continued on Page 56)

Correspondence

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



An Accidental Convert

Box 643,
Louann, Arkansas.

Editor, *QST*:

I am a member of that ever increasing order of converted BCLs, most of whom have been led over by *QST*. I have gone through the usual stages of "one tube and up" sets and, located as I am where the only interest in radio of any kind is listening, I have trod a rocky path. To get information on my pet subject, I was forced to buy every radio publication that newsstands offered and purchased a copy of *QST* one time mistaking it for a BCL magazine. After discovering my error I decided that it should be read rather than let the two-bits be a total loss and the further I got between the covers, the more interested I became. My previous idea of amateur radio transmitters was that they were something that rich men's sons and single men with sizable incomes could play with. Imagine my surprise and subsequent gratification when I discovered that a small workable outfit could be put up for the cost of a fair broadcast set and that, with the junk on hand and very few purchases, I had one at my command.

I soon discovered the joker, however, in the ten words per minute. Work on the receiver was under way, though, and after its completion followed many hours of listening and copying the various ham and commercial stations and the old key and buzzer had its workout. I seined the whole countryside for someone in whom enough interest could be fired to hold key and buzzer sessions with me, all without avail. When I reached the stage where some of the commercial stations could be copied solid, Uncle Sam was approached in the matter of a license which was promptly granted.

In the meantime, the balance of the BC set had gone into a tuned plate, tuned grid transmitter using a couple of 201-A's. Then came the matter of power supply. The only available current supply was 110 volts, d.c., generated locally with a large gas engine as the motive power which ran unsteadily and generated a brand of power out of the question. The one silver lining came in the fact that the current came free of charge and was ideal for charging storage batteries and 180 volts of storage plate power it was.

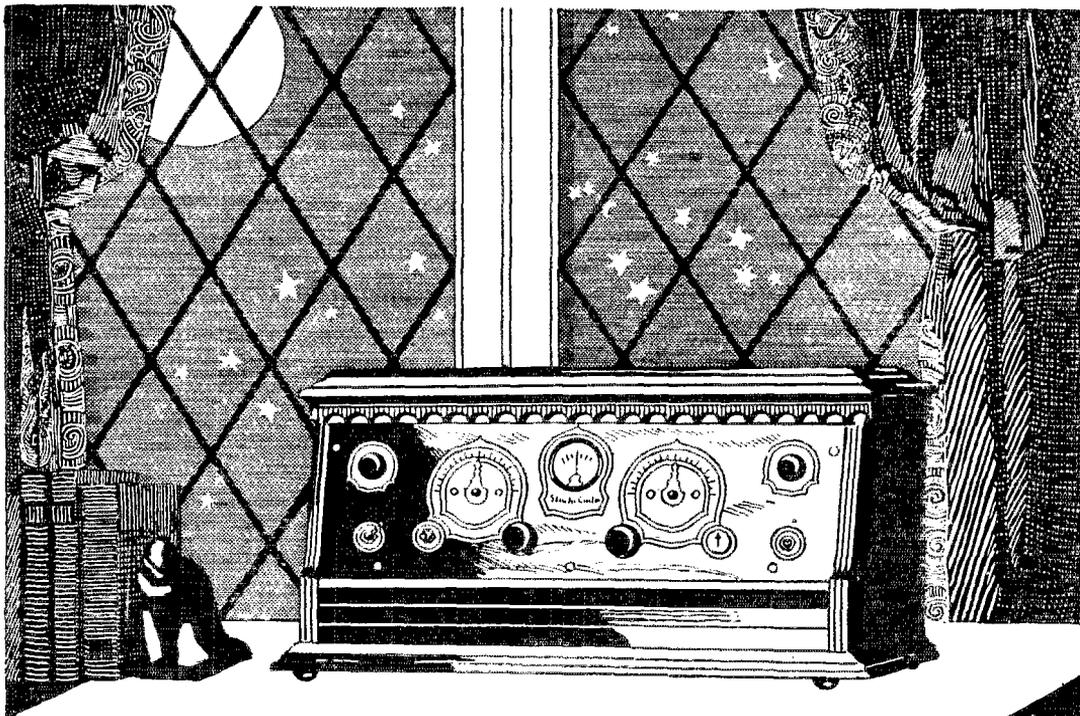
Don't imagine that I went on the air im-

mediately and gathered in a lot of DX. I listened and answered CQs and sent them in great flocks without result. The weather was almost unbearably hot and the neighborhood electric fans on this d.c. supply put out a brand of QRM that could not be beat. Another kind of unbeatable QRM was put up by the more important half of the family who insisted that a lot of swimming time was being lost on account of a bunch of junk which would not work and was not productive of music. This was overcome, however, by a division of time arrangement and she bore up admirably and gave lots of assistance. The non-music productivity was completely overcome when the recent Dempsey-Sharkey bout came off and was nicely received at the speaker without a trace of any kind of interference or static when the neighboring BCLs received a lot of QRM and a few words now and then about the affair from the nearest BC station.

After the receiver had been rebuilt twice and the transmitter had been reborn three times, the thrill of a lifetime came when a "6" answered a CQ and came back with, "R5 dc fb om". This, on twenty meters with a plate current of twenty-two mils and an antenna current of .025 amps as near as it could be read on a .5 amp meter. Since that time, all U. S. districts have been worked on twenty meters with R5s from California to Massachusetts. At noon, Mass. gave me R3. My antenna current will not light a 1.5-volt lamp and the cover had to be removed from a Spark C and the glass grasped right over the live end to get an indication from the stator plates of the plate coil tuning condenser.

Sitting down here working without help, I learn lots of things and hear lots of things. Some things I hear are good and make for the advancement of amateur radio and some things are not so good. The fellows working on the twenty-meter band are one fine bunch of boys and I would like to have some means of thanking those of them who have been so patient with a new ham just starting out and whose sending must be atrocious. I will welcome any suggestions from those boys; in fact, I invite them. The forty-meter boys are in somewhat of a hurry for the most part, and have very little time to spend with the beginner. However, some very pleasant contacts have been made in this band.

This type of letter is, perhaps, a little unusual from a new member but as I have



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No. 523 Stromberg-Carlson
A.C. Receiver. Treasure Chest.

Coils shielded. Equipped with new Audio-Power Unit containing audio-output system and supplying all "A," "B" and "C" voltages direct from house lighting circuit. Operates from antenna. Equipped with Voltmeter. Jack in panel for magnetic phonograph pick-up. Mahogany.

Price, with Audio-Power unit and 8 R. C. A. Tubes—but not including Cone Speaker,

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Similar Cabinet. For use where 60-cycle current is not available.

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The crisp fall days ahead mean a return of finest reception conditions; the radio commission has practically eliminated interference between stations; broadcast transmitters are greatly improved in tone and power—and inadequate Receivers have lost most of their "alibis".

The better radio conditions are—the more outstanding is the performance of the Stromberg-Carlson.

Its trustworthy tone is not a matter of opinion but of laboratory proof. Its freedom from self-made interference is a matter of "total shielding". Its suitability to any room in any home, is a matter of an external cone type speaker which may always be placed wherever it sounds best.

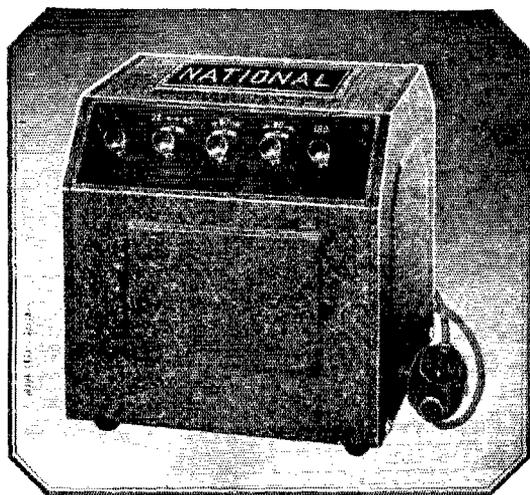
Stromberg-Carlson Telephone Mfg. Co.
Rochester, N. Y.

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Makers of voice transmission and voice reception apparatus for more than 30 years

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

A HEAVY-DUTY BETTER B



AN ENTIRELY NEW AND UNIQUE HEAVY DUTY BETTER-B. Supplies detector voltages from 22 to 45, adjustable; R. F. voltages from 50 to 75, A. F. voltages from 90 to 135, Power tube voltage 180: fixed. Tubes and by-pass condensers are protected against excessive and harmful voltages. An Exclusive Feature.

DESIGNED FOR LASTING SERVICE WITH LIBERAL FACTORS OF SAFETY.

A STRICTLY HEAVY-DUTY POWER UNIT.

Output rating is 70 mills at 180 volts. Uses R.C.A. UX-280 or Cunningham CX-380 Rectron. Licensed under patents of Radio Corporation of America and Associated Companies. For 105-115 volts, 50-60 cycles A.C.

List price, with cord, switch and plug, \$40.00. Rectifier Tube, \$5.00.

Write National Company Inc., W. A. Ready, Pres., Malden, Mass., for new Bulletin Q-123.

NATIONAL — B

TYPE 7180

A "B" That's Built for Service

At Booth 5, Section F. F. New York Radio World's Fair
Booth 94 and 95 Boston Show

previously told you, I have no other hams to chew the rag with down here and it just has to be done.

I wish to mention also that Handy's Handbook has been priceless to me.

—D. L. Edmondson, 5ARA.

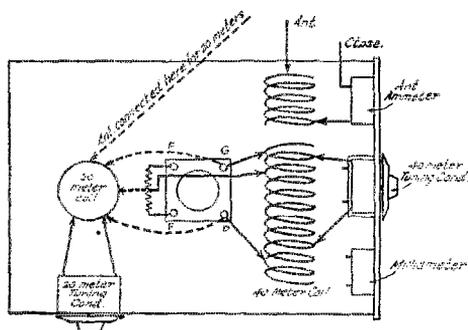
Some Ideas on QSY

1603 South Orange Grove Avenue,
Los Angeles, Calif.

Editor, QST:

I have had a license about six months and have been on the air about the same length of time. I started out on 40 meters and all was fine until two other amateurs, 6COT and 6CPI, located about two hundred feet from my transmitter, started up on the same wave band. This caused very bad QRM at times and led me to try out 20-meter transmission where I found the harmonics of the other two interfering stations were sharp enough to eliminate serious interference. However, on the 20-meter band, I found it impossible to work any station closer than about 800 miles although my signals were reported R5 on the East coast often. I did work a few locals around town but my audibility was never better than R6.

On account of the large distance at 20 meters and the desire to have more reliable



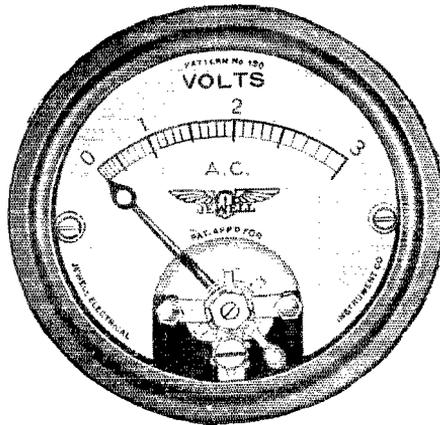
local communication which 40 meters allows, I made up a transmitter which can be shifted from one band to the other and still work efficiently in each band.

The accompanying sketch shows the essential details of the layout. The Hartley circuit is used, laid out breadboard fashion. The two main inductances are at right angles to each other and about eight inches apart. At this distance there is no noticeable reaction between the two coils, although to eliminate further electrical losses, the tank circuits are so tuned that the shorter wave one does not fall on the harmonic of the other. The grid, plate and filament connections may be quickly changed from one coil to the other by using clips.

For the 40-meter band, the conventional antenna-counterpoise system working near



*A
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*Pattern
No. 190
A. C. Voltmeter*

A New Meter For A. C. Filament Control

The advent of vacuum tubes having filaments adaptable for excitation from alternating current creates the necessity for an absolute means of control other than the filament rheostat, for it is frequently found that a particular setting of the filament voltage is necessary to eliminate objectionable hum.

For A. C. filament control the new Jewell A. C. voltmeter, Pattern No. 190 is very desirable. Jewell Pattern No. 190 instruments have a body diameter of 2 inches and in general appearance are similar to the Jewell Pattern No. 135 direct current type. The movement is of the moving vane type with special modifications for the small size case. The instruments are accurate and neat in appearance and are designed for continuous service. Energy consumption is very small.

Pattern No. 190 instruments are available in many ranges, of which the 0-1.5, 0-3, 0-15 and 0-150 volt ranges are most in demand. The 0-1.5 volt range is suitable for tubes having a direct heated Cathode, the 0-3 volt range for tubes having an indirectly heated Cathode and the 0-150 volt range where primary control is used.

Write for a copy of our 15-C catalog supplement, which describes this instrument in detail.

“27 Years Making Good Instruments”

Jewell Electrical Instrument Co.

1650 WALNUT ST., . . CHICAGO



Bradleyunit-A

PERFECT FIXED RESISTOR

Unaffected by temperature, moisture or atmospheric changes. Does not age or change in resistance.



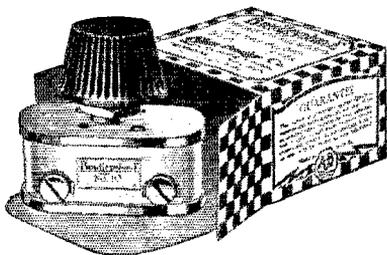
A solid-molded fixed resistor, baked under high pressure, and accurately calibrated. Can be soldered without affecting accuracy of the unit.

Two Remarkable Radio Resistors

Bradleyunit-A is an outstanding success! It is a fixed resistor for radio circuits of all kinds, and has a capacity of two watts. It is rugged and can be soldered easily, without affecting the rating of the unit.

Bradleyohm-E is widely used by manufacturers of B-eliminators for plate voltage control. Its remarkably wide, noiseless range, accomplished with two columns of graphite discs, accounts for its tremendous popularity.

Use Allen-Bradley resistors in your own hook-ups for superlative results. Follow the example of prominent radio manufacturers. They know!



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its fundamental is used. When it is desired to use 20-meters, the grid, plate and filament clips are moved to their marked positions on the 20-meter coil and the antenna is shifted from the coupling coil to the 20-meter coil. It is then used as a single wire, voltage feed antenna working at its fundamental on 20-meters. The position of the antenna tap is determined by experiment and the nearer to the plate it is, the greater the load upon the circuit and the greater the input. The 20-meter signals seem to get out well and "oa" and "oz" stations have been worked using an input of 50 watts to two UX-210s.

The same coil and antenna idea could be used for other of the amateur bands such as the 40- and 80- and the 80- and the 160-meter ones.

Sincerely,
—Bruce H. Dalton, 6DFV.

QRM and Phone

Tilghman,
Maryland.

Editor, *QST*:

The article on "QRM" contained in the August, 1927 issue of *QST* prompts me to write of my experience.

Signals from my station were being heard all over the dials of several broadcast listener's regenerative receivers. The interference was caused mostly when phone transmission was used.

While this might be expected when the amount of selectivity of the regenerative detector is considered, on several occasions the signals were heard on neutrodyne receivers when they were tuned to certain broadcast stations. This puzzled me for a time until upon thinking of what an excellent transmitter a regenerative receiver may be, I decided to make some tests to find out something about this.

I selected three receivers, one regenerative and the other two non-regenerative, and asked the owners to tune in WRC at Washington. I asked the owners of the non-regenerative receivers to ask the man with the regenerative set to shut it off if they heard my signals. When the regenerative set was tuned to WRC, the others could hear my signals but at no other frequency and when it was shut off, they could not hear me on any wave within their range. From this it can be seen that the regenerative set was rebroadcasting my signals.

This QRM problem is now up to the owners of the different type sets and not between the broadcast listeners and myself. Those who are in similar trouble might find it advantageous to look for the regenerative receiver (or transmitter). We might also remember when voicing loudly about America's being so much farther advanced in radio than other countries that many of these other countries prohibit the use of this type of set. The set owners are not to blame; the manufacturers should know better than to continue putting these sets on the market.

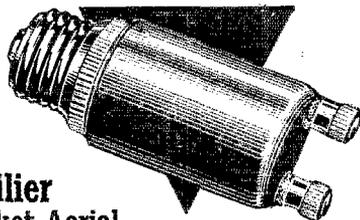
Dubilier

The Pioneer

A history of the Dubilier organization takes us back to the very conception of wireless telegraphy. Then, practically every Dubilier device was a "special order" built for experimenters whose names are now famous. Today, these same electrical and radio engineers turn instinctively to Dubilier for either standard articles of manufacture or laboratory models for their research. This keeping step with the industry has given Dubilier a merited reputation for condensers which are way above the average in ruggedness, safety factor and long life.

DUBILIER CONDENSER CORPORATION

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**Dubilier
Light Socket Aerial**

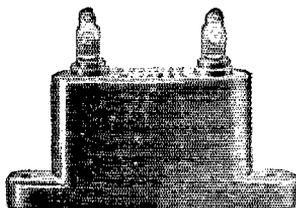
**List Price
\$1.50**

Present-day broadcasting and modern receivers don't require outdoor aerials. A Dubilier Light Socket Aerial and a few feet of cord will give you a highly efficient antenna and do away with lead-in wires, insulators, faulty connections and lightning arresters. The device consumes absolutely no current and needs no attention whatever. Works on any cycle, A. C. or D. C. Sold on a five day money-back basis.



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Dubilier condenser blocks for Raytheon and other leading circuits are rugged in construction, and have the unusually high factor of safety of better than five to one — insuring the longest condenser life obtainable.



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Here's the famous Dubilier *Micadon* in its modern shape and new case of rich Bakelite. Compact, handsome and efficient. Terminals adapted to screwed or soldered connections.

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"B" Eliminator TESTING Problem Solved by



Model R-415

TO GET full value from your "B" Eliminator you must *know* that your "B" Power is delivering the *right* amount of voltage to detector, amplifier and power tube.

Low resistance voltmeters suitable for testing batteries are worthless for testing "B" Eliminators. This specially designed High Resistance Sterling is accurate for both.

Whether this voltmeter is used in your business or for your own set, it is *essential* if you want the facts about any "B" Eliminator.

It is the Universal Voltmeter for the Amateur R-415

Sterling voltmeter meets the special needs of the amateur in a variety of ways—for testing the output of D. C. Generators, and for every other purpose calling for a *high resistance* voltmeter.

Never before has a laboratory instrument been available at a price so reasonable

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R-415 VOLTMETER

A laboratory meter at the remarkably low price of **\$8.50**

Also Model R-417. A New 150v. Sterling A. C. Meter for Testing A. C. line current and all A. C. Circuits\$7.50

THE STERLING MFG. CO.
2531 Prospect Ave. Cleveland, O.

Now, if space permits, a few words about 80-meter phone. Why all this fuss among members of the League when harmony is the strength of all institutions. Why not go about it in a more pleasant manner and profit by each others experiences. While I am a young amateur (so far as operation applies) I have listened to amateur phones for a number of years. I've heard good phones on the 170- to 180-meter band (before it was vacated) and I now hear and work many phones on the upper end of the 80-meter band that are just as good, if not better. I speak of both signal strength and modulation. Surely, I never heard as many distant phones on the former band as on the latter. If a c.w. signal carried better on the higher frequency, why not a phone?

According to my opinion (take it for what it's worth) formulated from information and observation of a number of 80-meter phones, there are several contributing factors which keep them from being a pleasure to listen to. In the first place, it appears that a number of fellows are using too much 170- to 180-meter apparatus for the higher frequency work, such as, antenna systems, r.f. chokes, grid and plate blocking condensers, incorrect values for and poorly constructed inductances, etc. For all of which the correct values may be found in Handy's *Handbook* or *QST*.

Plate and filament supplies *must* be good. I saved a considerable item of expense and a lot of trouble by locating my motor-generator set about twenty-five feet from the set. The leads to the set are twisted wire in a metal cable (bx) the outer metal covering of which is grounded. I have heard the hum of dynamotors or motor-generators (not commutator ripples) due to the vibration caused by their being located too close to the transmitter which had caused the station owners a considerable amount of worry in trying to filter but which disappeared immediately upon the machine's being moved to a distance from the set. It doesn't pay to bring the machine too close.

It is hoped that we amateurs will receive more latitude in our efforts to develop 80-meter phone to a higher degree and secure for the League greater recognition than it has heretofore received.

—J. M. Howeth, 3CV.

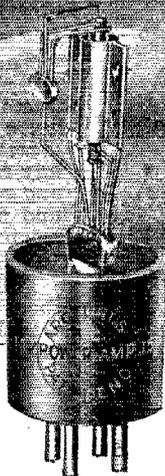
QSZ

Greenville, S. C.

Editor, *QST*:

It is a strange thing how some hams will ask you to please send double after giving you a report of R-7 and steady. You know that they aren't beginners by their well spaced words and all-around smooth sending.

Of course, QRM can interfere but in most of my cases they fail to get the message even after it has been repeated sending double, and I know that all the remaining



Announcing
THE A. C. RADIO TUBE
FOR YOUR PRESENT SET
ARCTURUS A.C.TUBES

DETECTOR—AMPLIFIER—POWER
Four Prongs—Fits Present Sockets—For all D. C. Sets

BETTER RECEPTION
MORE RELIABLE MORE CONVENIENT
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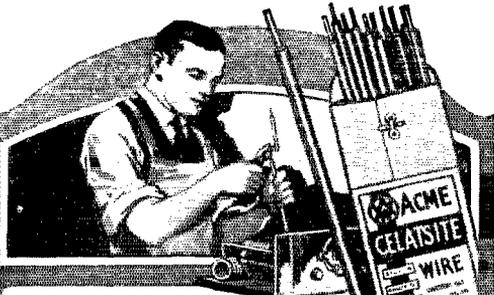
Now you can have unfailing quality reception; the convenience and reliability of A. C. Tubes, with but a few simple changes, in any D. C. Set.

Arcturize Your Present Set

You will find added satisfaction in the perfect reception you get with Arcturus A. C. Tubes.

Write today for complete information mentioning make and model of your present set.

ARCTURUS RADIO COMPANY, Inc.
261 Sherman Avenue, Newark, N. J.



ACME SOLID CELATSITE WIRE

Tinned copper bus bar hook-up wire with non-inflammable Celatsite insulation, in nine beautiful colors. Strips easily, solders readily, won't crack at bends. Sizes 14, 16, 18, 19; 30 inch lengths.

Flexible Celatsite Wire For Sub-Panel Wiring

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

Loop Antenna Wire

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

Stranded Enameled Antenna

Best outdoor antenna you can buy. 7 strands of enameled copper wire. Presents maximum surface for reception, resists corrosion; this greatly improves the signal. Outside diameters equal to sizes 14 and 16. (We also offer solid and stranded bare, and stranded tinned antenna.)

Spaghetti Tubing

Oil, moisture, acid proof; highly dielectric—used by leading engineers. Nine colors, for wire sizes 12 to 18; 30' lengths. (We also make tinned bus bar, round and square, in 2 and 2½ ft. lengths.)

Battery Cable

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

Send for folder

THE ACME WIRE CO., Dept. S
New Haven, Conn.

stations could not be R-7 so as to cause permanent QRM.

The trouble is that nine times out of ten my signals were never R-7, and the ham friend is just tickling my vanity so as to get a good report on his sigs whether it is deserved or not. This plays havoc if I have any messages for him, because I go ahead and send the message at a speed that R-7 and steady would justify and of course it means several repeats if my sigs are just R-5.

Fellows, let's cut out this foolishness and show the world that we are real ops and can shoot the traffic thru.

—C. E. Wells, 4JK

VOQ

Bethlehem, Penna.

Editor, QST:

I desire to call your attention to the courteous treatment which I have received from Mr. Charles J. Heiser, of station SDME, 55 Frances Street, Auburn, New York, in connection with radio messages from and to a member of the Putnam Expedition on board the Schooner *Morrissey*.

It is indeed a wonderful service which these amateur radio operators perform and I want you to know that I am deeply grateful to Mr. Heiser.

—H. G. Lewis.

Silent Keys

It is with deep regret that we record the passing of these amateurs: Mildred S. Lorentson, Providence.

R. I., 1A1D

Rowland C. Martin, Bridgeport, Conn., 11M

Harold W. Davis, Paterson, N. J., 2CQP

Fred Hindson, Toronto, Ontario, Canada, nc3BM

William A. Marsh, Miami, Florida ex4DE

Edward Laurance, San Bernardino, Calif., 6CTF

Harrison M. Haskell, Pleasantville, Pa., 8AQP

Herbert D. Twitchell, Hamilton, Ohio, 8BYV

Russell J. Muman, Scottsdale, Pa., 8BJT.

Rudolph Graf, Rockford, Ill., ex9RP

Edward Gable, Cleveland, Ohio

Allan T. Hanscom, Woonsocket, R. I.

George L. Hedges, Lincoln, Nebraska

William G. McClarren, Altoona, Pa.

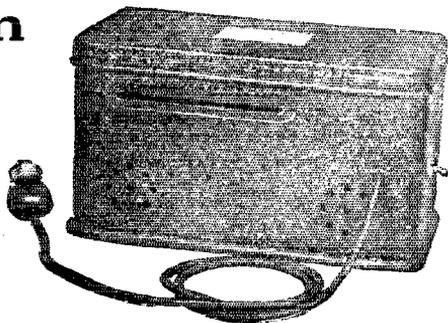
ACME WIRE
MAKES BETTER RADIO

4 Adjustable "B" Voltages in any combination from 0 to 180

Also Adjustable "C" Voltage from 0 to 50

Type 405—Plate Supply. Price \$55

Ux-280 or Cx-380
Rectification Tube
for above \$5



The New **GENERAL RADIO PLATE SUPPLY**

Embodying new and distinctive features
in plate supply design.

1. ADJUSTABLE WIRE WOUND RESISTANCE WITH SLIDING TAPS which control voltages so that any combination of voltages from 0 to 180 may be taken from the four positive "B" terminals. This method of voltage control is superior to the use of several resistances with exterior knob controls. It has the advantage that once the sliding taps are adjusted to the proper operating voltages of the tubes, they are tightened in place by thumb screws and voltages will remain constant, but are immediately available for readjustment whenever the unit is used with a different set.

2. ADJUSTABLE "C" VOLTAGE FOR POWER TUBE.

3. HIGH VOLTAGE TEST CONDENSERS IN FILTER CIRCUIT.

4. USES UX-280 OR CX-380 RECTIFIER TUBE which has maximum output of 100 milliamperes, thereby providing sufficient current for sets of the multi-tube type.

5. AUTOMATIC CUT-OUT SWITCH breaks the 110 volt A. C. circuit when cover is removed for adjusting voltages or connecting wires to taps, thereby making unit absolutely safe even in the hands of persons not familiar with electrical apparatus.

6. DESIGNED TO MEET THE SPECIFICATIONS ADOPTED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS.

7. Absolutely guaranteed against mechanical and electrical defect upon leaving the General Radio factory.

Cost, which has been a secondary consideration to over-all efficiency, has been kept as low as peak performance and production economies permit.

Price from your dealer, or direct from the factory if your dealer cannot supply you

Type 445 Plate Supply Unit\$55.00

Type UX-280 or CX-380 Rectifier Tube for above 5.00

Licensed by the Radio Corporation of America only for Radio Amateur, Experimental and Broadcast Reception.

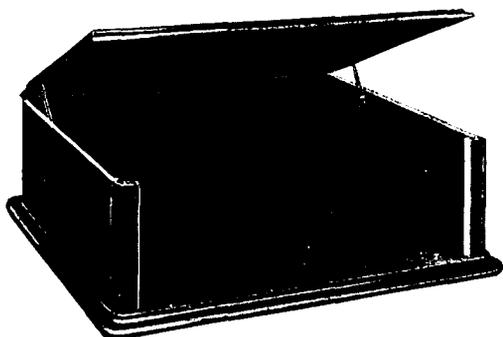
Under terms of R. C. A. license unit may only be sold with tube.

GENERAL RADIO CO., Cambridge, Mass.

(Continued from Page 41)

Vee Dee

All Metal Cabinet



THIS beautiful, metal cabinet is designed to house all the latest hook-ups—A.C. or Battery sets using 7 x 18—7 x 21—8 x 18—8 x 21 panels. Inside dimensions 25" x 14 1/4" x 9 1/8". Hinged top—with stay joint. Rigidly formed for strength and appearance. Felt foot rests—rubber lid stops. A welded job doing away with troubles of swelling, shrinking, cracking, splitting and the uncertain fit of wood cabinets.

Vee Dee metal cabinets combine the original beauty of natural wood grains with the efficiency of all metal construction—and the price is low!



Metal Panel
and Chassis for
Silver-Marshall

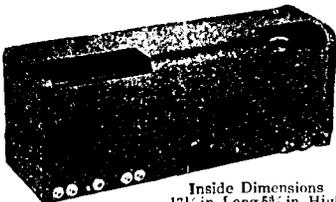


Improved
Laboratory
Model

Complete assembly consisting of panel and chassis, fully drilled, beautiful wood finish with special two-color decoration, all fibre bushings and washers included, also screws, bolts and hardware accessories.

"Unipac" Housing

Especially designed and provided for Silver-Marshall Power Hook-ups—including cabinet and chassis, drilled and with all small hardware.



Inside Dimensions
17 1/2 in. Long 5 3/4 in. High

VEE DEE Metal Panels in all standard sizes—
Metal Panels for Popular Hook-Ups.

JOBBER, DEALERS—WRITE FOR PRICES
Set Builders—If your dealer cannot supply you, write direct

THE VAN DOORN COMPANY
160 North La Salle Street Chicago, Ill.
Factories, Quincy, Ill.

"South African stations are heard sometimes about Noon G.C.T. with signal strengths between R5 and R6. sb1AD claims to have heard af1B among Europeans on the 20-meter band at about 1900 G.C.T. which is still daylight here. He becomes greatly concerned when anyone doubts him.

"Major Raven-Hart who was on his way to Europe, stopped in for a few hours at Rio and met almost the whole gang. A fine hamfest developed that was thoroughly enjoyed by all present.

"One of the heartiest desires of our men has been to get in communication with Australia. Such a contact had never been made until a short time ago when sb2AX and then shortly after sb1IC bridged the gap and worked a third district Aussie."

—sb1AA

CZECHOSLOVAKIA

"The Post-Office Department of Czechoslovakia is just beginning to license amateur transmitting stations. However, the conditions are rather stiff and some of the requirements are as follows:

"The examining committee consists of three members and the examination is not public. Before the test starts, the applicant must pay an amount of three hundred crowns which is equivalent to about ten dollars in American money.

"The practical part of the examination which consists of a code test in both transmitting and reception is taken first. An ability of reading about fifty words in five minutes is required and the transmitting test is quite similar.

"The theoretical portion which is given the applicant after having passed satisfactorily through the practical test, covers high frequency work in general and if a good knowledge is not shown, the license not issued.

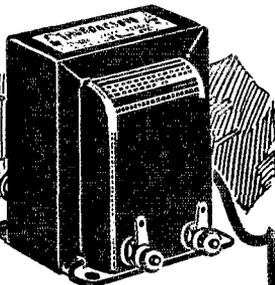
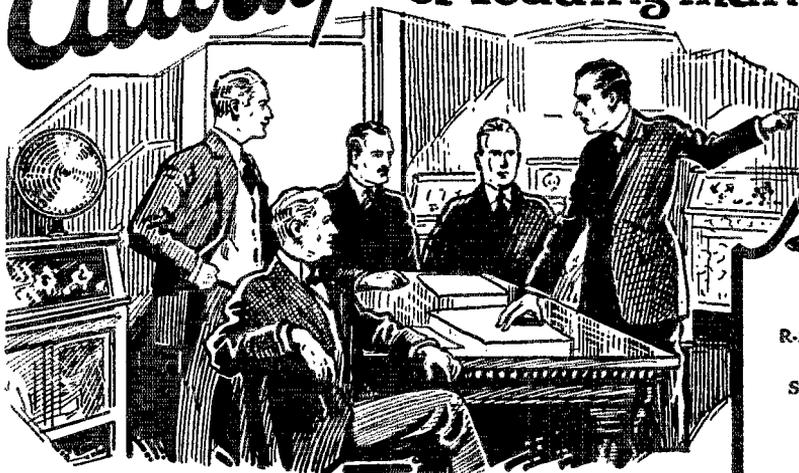
"If a man fails on the test, he forfeits the three hundred crowns paid at the start and another examination may be taken after an interval of six months. He must again pay the same amount and in case of a second failure, can never take another try at it and is, therefore, excluded from ever becoming an active licensed transmitting amateur.

"From this it will be seen that these conditions are not particularly favorable to the average amateur who cannot afford to pay out such a large sum of money for a license and who, therefore, continues to operate his station as an unlicensed one.

"It is hoped that the Post-Office Department will soon see just what the state of conditions are and amend the requirements so that it will be possible for us to obtain licenses. In this way, illegal operation will be reduced whereas the object of the present regulations is not being fulfilled as no amateurs are applying for licenses under its conditions."

—ec1KX, not licensed.

Always the first choice
of leading manufacturers



THORDARSON TRANSFORMERS

FEDERAL, Freed-Eisemann, Howard, Kennedy, Murad, Murdock, Pfanstiehl, Prestolite, Radiodyne, Sparton, Valley, Willard, Zenith. These outstanding trade names are representative of the highest degree of radio workmanship and performance.

No wonder, then, that they should all select Thordarson transformers as best in keeping with the high standards of performance maintained in their receivers and power units.

You, too, can benefit by the careful research of these manufacturers. Whatever your radio problem there is a Thordarson transformer ready for you at your parts dealer.

If you enjoy good musical reproduction, insist on Thordarson transformers.

THORDARSON ELECTRIC MANUFACTURING CO.
Transformer specialists since 1895
WORLD'S OLDEST AND LARGEST EXCLUSIVE TRANSFORMER MAKERS
Chicago, U.S.A.

8565

R-200 AMPLIFYING TRANSFORMERS, \$8.00

STANDARD AMPLIFYING TRANSFORMER

2:1 ratio, \$5.00

3½:1 ratio, \$4.00

6:1 ratio, \$4.50

SPEAKER COUPLING TRANSFORMER

R-76, \$6.00

OUTPUT CHOKE

R-196, \$5.00

POWER PUSH PULL TRANSFORMER AND CHOKE

T-2408 Input Transformer, \$8.00

T-2420 Output Choke, \$8.00

AUTOFORMER IMPEDANCE

R-190, \$5.00

POWER COMPACTS

(for power amplifiers)

R-171, \$15.00 R-210, \$20.00

130 M. A. FULL WAVE RECTIFIER

T-2098 (Transformer) \$20.00

T-2099 (Double Choke) \$14.00

R. C. A. A. C. TUBE

SUPPLY TRANSFORMER

T-2445, \$10.00

McCULLOUGH A. C. TUBE

SUPPLY TRANSFORMER

T-2504, \$7.50

VAN HORNE A. C. TUBE

SUPPLY TRANSFORMER

T-2370, \$5.00

Thordarson Electric Mfg. Co., Dept. F
500 W. Huron Street
Chicago, Ill.
Gentlemen:

Please send me your free booklet on audio amplification and power supply.

Name.....

Street.....

Town.....State.....

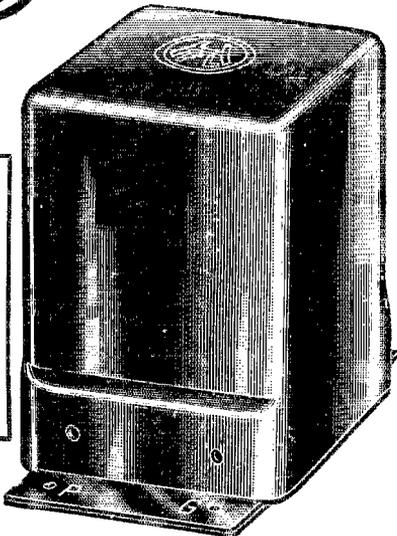
MAIL THIS COUPON



Transformers

An Amazing Achievement in Audio Amplification

The new C-16 and C-25 Transformers will work in any circuit and will improve any Radio Set. Endorsed by America's Leading Engineers. Guaranteed by the Manufacturers



Two additions to last year's Radio Sensation

H.F.L. C-16 is the most efficient Audio Transformer built. It carries signals at highest volume and lowest amplitude without blasting or developing harmonics. Operates with all power tubes as well as standard tubes.

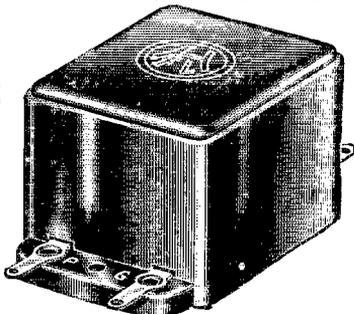
H.F.L. C-25 Output Transformer handles the voltage output of power amplifying tubes, at the same time matches the impedance of the average speaker to the tubes. Protects loud speaker unit without reducing plate voltage.

Mechanical features of these two transformers are: A coil designed and treated to exclude moisture and withstand heavy electrical surges without breaking down—complete magnetic shielding to avoid inter-stage coupling—terminals brought out so as to insure short leads.

MEMBER
RMA

PRICES

H-210 Tran. \$8.00
H-215 Tran. 8.00
C-16 Transf. 8.00
L-425 R. F.
Choke . . . 5.50
L-430 R. F.
Transform. 5.50
C-25 Output
Transform. 8.00



SET BUILDERS! Write Us for the Name of Our Nearest Distributor

HIGH FREQUENCY LABORATORIES
131R—North Wells St., Chicago, Ill.

"All our stations, as far as I am aware, work in the 44- to 46-meter waveband with the exception of 18B who is capable of working on 23 meters. Several of the other stations are making plans to lower their wavelengths to work in this region and there probably will be several more there soon.

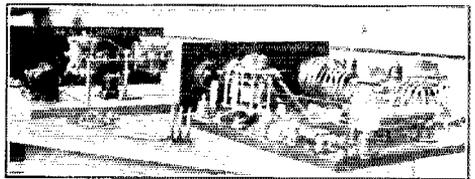
"Unfortunately, we are not permitted by the terms of our licenses to use any but the intermediate "gw" so our stations will not be able to adopt the more uniform official I.A.R.U. intermediate reserved for us."

—H. Hadgens, Hon. Sec., Wireless Society of Ireland.

Mr. W. H. Martin, eg-gi5HV, while on a trip to the U. S. A., paid us a short visit during the latter part of July. Unfortunately, he had but a small amount of time to spend with us which was regretted by all.

NEW ZEALAND

We understand that the amateurs of New Zealand have recently made a decided effort to get permission from their Government to allow the handling of friendly messages as is permissible in the U.S.A. Their efforts met with an absolute refusal from the "powers that be" and they are still in the "land of darkness" as far as these matters are concerned. Won't it be a shock to some of these countries when they finally discover how they have been cheating themselves out of a large number



THE 201-A TRANSMITTER AT nu6HM

This is the one that worked all continents. The receiver is at the left.

of well-trained message-handling operators just because they had an idea that everything connected with communication must be a government monopoly? We hope the idea will get over before it is too late to do either them or us any good!

SOUTH AFRICA

We are mighty pleased to be able to announce that the South African Radio Relay League is now the official South African Section of the I.A.R.U. Congrats OMs! May you grow bigger each day!

At the second S.A.R.R.L. conference, it was decided that it would be necessary for the future expansion and progress of the League that the members be kept in more intimate contact with each other than has been the case heretofore. It was recommended that a news sheet of some sort be published which should contain news items



The Standard Insulating Material

MOST amateurs know Formica panels, tubing and parts. They are familiar with the better finish of Formica, its excellent working qualities and high insulating efficiency for all sorts of high frequency as well as direct current work.

Ask for Formica when you buy insulating panels, tubing and rod. The Standard Formica panels are packed in craft paper envelopes carrying the Formica name and trade mark. Formica has a line of front and sub-panels for broadcast receivers which are already drilled and decorated in gold.

The Formica Insulating Company

4620 Spring Grove Avenue

Cincinnati, Ohio

FORMICA

YAXLEY

APPROVED RADIO PRODUCTS

Automatic Power Control



No more plugging in sockets and turning switches every time you use your set—no more tinkering with them every time you turn off the set. The Yaxley Automatic Power Control takes care of your B eliminator or trickle charger or both. You know that when you turn on your set, the trickle charger is off, the B eliminator is on. When you turn the set off the power control is standing guard for you, automatically, surely and without fail turning off the B eliminator and on with the trickle charger.

No. 444—Series Type, for sets with current draw equivalent to four 199 type tubes up to eleven 201 type tubes. \$5.00

No. 445—Multiple Type 6.00

Radio Convenience Outlets



Install a Yaxley Radio Convenience Outlet for loud speaker and phone connections in every room. Consists of a wall plate and a wall socket jack with screw terminals. Fits any standard switch box. Easily wired. Wiring diagrams in each package.

No. 135 Radio Convenience Outlet—
Each \$1.00

Your Jobber or Dealer has these Yaxley Products in stock—or send your order with his name to

YAXLEY MFG. COMPANY

Dept. S, 9 So. Clinton Street

CHICAGO, ILL.

from all the divisions. Messrs Lowe and Coombs are undertaking the task of getting such a scheme under way.

The first issue of the S.A.R.R.L. FO Experimenters' News is under the date of May 1st, 1927 and contains a great deal of interesting reading matter concerning South African doings. It gives a complete account of the Conference and the most interesting visits that were made to several of the prominent "fo" stations in Division 1.

Unfortunately for the rest of the world's amateurs, the News is only for members or associate members of the League and cannot be subscribed to by others. Subscription to those eligible is three shillings for six months.

The accompanying photo shows a view of foA50, the station of H. W. G. Becker located at 28 Cuyler Crescent, Port Elizabeth, South Africa. The transmitter employs a Phillips Z.5 valve and is located at the left of the picture. Three receivers are at hand; a 5-tube Burndepst set is used for broadcast reception while all of the telegraph work is done with a three tube Reinartz affair. The other set is a seven-tube super-heterodyne which has a wavelength range of from twenty to twenty-thousand meters and which brings in 2XAF, and the short-wave WGY and KDKA signals at loud speaker volume.

The transmitter uses the reversed feedback circuit with an inductively coupled antenna circuit. Plate power is supplied by a split secondary transformer giving 2,500 volts each side of the center tap. Two Phillips Z.5.G rectifier tubes take care of the rectification and a large choke in the positive high voltage lead supplies the necessary filtration.

The antenna is a single-wire inverted L about eighty feet long and forty feet above the ground.

Some 239 American stations were worked during the Springbok Competition and if it hadn't been for a breakdown causing an eight-day period in which no operation took place, it is quite possible that A50 might have won the contest. As it is, second place was obtained, A3B making the greatest number of points.

URUGUAY

The following is being quoted from a letter written by E. H. Fritschel, nu2DC, who is located for the time being in Montevideo.

"As it is now, the only formality in getting a call (it doesn't even amount to a license, I think) is to ask for one, giving the power you intend to use. No code knowledge is required and any wavelength below two hundred meters may be used.

"The new law will require a code speed of twelve words per minute and that the wave be within a specified band. In general, the amateurs are in favor of the proposed law but it is liable to be quite some time before it is passed.



The AmerTran Power Transformer. Type PF-281
\$25.00 Each

New Transformers *For AC Power Supply*

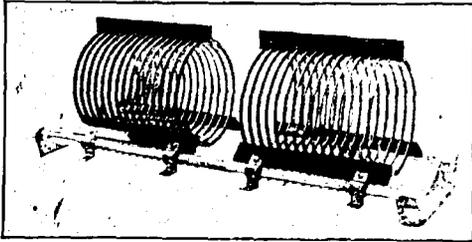
Type PF-281, illustrated above, becomes virtually an A-B-C eliminator when used with AC tubes and the proper filter circuit for DC voltages of from 425 to 650 volts, plate current 110 Ma. This unit is designed for use with the new UX-281 rectifying tube, and has a 750 volt plate winding which enables it to be used with a UX-281 or 216-B rectifying tube. In addition, there are filament heating windings for the new AC tubes. Used with types 709 and 854 AmerChokes in the filter circuit, a receiver may be constructed to operate entirely from the house lighting circuit.

Type H-67 Heater Transformer is a new unit recommended for use with the RCA UX-226 raw AC amplifier tubes and the UY-227 detector tube. It also has a third filament winding capable of handling two UX-171 tubes. In connection with the new AC tubes, type H-67 becomes the power source for the filament and is therefore a real "A" battery eliminator. This transformer sells for \$12.00.

Write for booklet, "Improving the Audio Amplifier," and data on Power Supply Units.

AMERICAN TRANSFORMER CO.
178 EMMET STREET NEWARK, N. J.
"Transformer Builders for Over 26 Years"

SILVERPLATED!



Our inductances are now all SILVER PLATED—a tremendous improvement. Silver has less than 1/4 the resistance of nickle used in other inductances. Think what it means! No increase in cost!

Single Coupled
Coil Unit

Type 154 for 40-80-160 meters	\$5.50	\$12.50
Type 123 for 20-40-80 meters	4.75	11.00
Inductance clips EXTRA, each20

Important Announcement!

Several new items will soon be ready for release, including a transmitting tube of 500 Watts output at a surprisingly low price. Send for advance information and be sure to get our free Ham Catalog.

E. F. JOHNSON COMPANY
WASECA, MINNESOTA

"At the present time, most stations are working around 33 meters with some on the regular 20-meter band. There are, perhaps, a dozen who are active most of the time, most of them being located in Montevideo. The station using the greatest amount of power is su2AK with his 100 watts. He is, perhaps, the best bet for contact with the States.

"A considerable amount of interest is being shown in the new UX-852 transmitting tube and it is most likely that there will be several of these in operation here soon.

" 'su' stations have all been getting weak signal reports from the States during the last several months although the 'nu' stations come in quite well here. I have a short-wave receiver set up in the hotel but as this is in the center of the business district, the air is terribly noisy. I would send in a list of 'calls heard' but it would not be fair to the fellows as I hear but am unable to copy only the loudest due to the local QRM. Let me cast my vote right now for the crystal-controlled sets with their tone readable through almost anything.

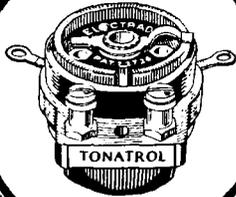
"The gang here in Montevideo has a post office box, Casilla Correo 37, and will forward any cards for Uruguayan stations if sent to that box. They are certainly treating me royally and are sure making my stay in the country a real pleasure. I don't think I've ever met a finer bunch."

WAC

While nu6ZAT was visiting nu6HM, they dug out the little TG&P transmitter using a single 201-A tube and on 20.2 meters worked eg5HS. This set is the same one that Col. Foster had used in Canada during the previous summer. Contact was established for over twenty minutes when 5HS had to quit on account of a sked. This was on June 6th and on the 10th, both ac8HB and fo1SR was worked with the outfit. This completed a very interesting record for the set which has now worked stations in all continents with an input under 10 watts. We imagine this to be a record that very, very few will ever duplicate unless radical conditions change considerably.

There is one station that has very nearly matched this in the shape of oa2SH operated by Alfred Short in Lambton, N.S.W. The following is quoted from a letter of his to nu6HM.

"Whenever I hear your call on the air, I always remember reading about your first QSO with Australia using a 201-A tube as a transmitting tube. I marvelled at the time that such a small tube should be capable of sending a signal such a tremendous distance and I still marvel when I receive a reply from distant station telling me that my signals are 'RG FB' and are the best heard from Australia that morning. It is truly remarkable that such a small tube should cause a bigger commotion in the



What
Volume
?

TONATROL

A True Tone and Volume Control

Exclusively Licensed by The Sylvania Corporation
under U. S. Patent No. 1598638, July 27, 1926.

If you want volume to fit the music you love—volume to meet your mood and fancy—you can have it always at your finger-tips, by equipping your set with "Tonatrol."

Sturdily built of genuine bakelite. Very easy to install. Get "Tonatrol" from your dealer today. "Tonatrol"—Standard Volume Control \$1.50. "Tonatrol"—Type W. S. (with filament switch attached) \$2.00.

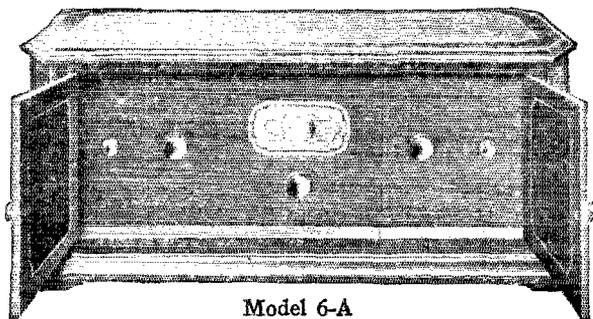
Write for free installation booklet for the correct way to control volume.

Dept. 68A. 175 Varick Street, New York, N. Y.

ELECTRAD



Presenting the New BROWNING-DRAKES



Model 6-A

Browning-Drake has long been known for its natural tone quality and only a few months ago made a record for transcontinental reception, Los Angeles from Boston, on seven consecutive nights. The ability of the new receivers to demonstrate even more remarkable distance performance, to give finer tone, and to cut through the strongest local interference, gives them an unmistakable appeal.

The two new models are the first Browning-Drakes to use more than five tubes. An unusual single control drum dial is used, which is exceptionally powerful in its action and operates without the slightest trace of backlash.

These receivers are the result of nearly five years of exhaustive research and steady progress. Backed by the reputation of the Browning-Drake Corporation, we believe these receivers will occupy a paramount position in radio this year. Ask your dealer to show you the new Browning-Drakes **TODAY!**

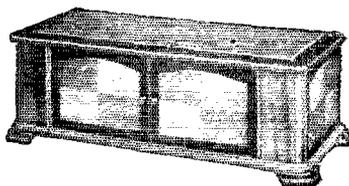
Model 6-A, (illustrated above), uses conventional Browning-Drake circuit with slight modifications. Four audio tubes give natural tone and great volume when desired. Small auxiliary condenser brings signals of distant stations to maximum intensity. Beautiful two tone Duco walnut cabinet is 27 inches long, 15 inches deep and 11 inches high. List without tubes and batteries, \$105.

Some of you fans are dealers. If so, we invite your request for further information on the Browning-Drake line of factory-built receivers and the Official Browning-Drake Kit Set for home construction.

BROWNING-DRAKE CORPORATION
CAMBRIDGE :: MASS.

Model 7-A

Seven tubes, single dial, illuminated drum control. Completely shielded. Four audio tubes give perfect tone and ample volume. Cabinet can be had in either two tone Duco mahogany or walnut. Length, 30 inches; depth, 15 inches, height, 11 inches. Beautiful console is available for this model. List without tubes and batteries, \$145; with console, \$185.



BROWNING DRAKE

CABINETS
PARTS

RECEIVERS
KITS

Have you seen the new Balkite "AB"?

It replaces both "A" and "B" batteries, and supplies radio current from the light socket. It contains no battery in any form. It operates only during reception. Ask your dealer. *Fansteel Products Co., Inc., North Chicago, Ill.*

Balkite Radio Power Units

ether in distant countries than some of its bigger brothers with, at a conservative estimate, forty times the input power!

"Since last writing you, I have been QSO e11NO with an input of about ten watts into the 201-A and was reported R3. A few days earlier, I was reported R3 by 3SR in Rhodesia with about the same input. During the same week, with an input of around six watts, Canadian 5AJ reported me as 'R6 vy FB'. Having previously worked Japan and French Indo-China in Asia, I need only to work South America to have been QSO all continents with the 201-A.

"South America is a very difficult continent for us to work as we hear their stations only occasionally. However, you may be sure I am on the look-out for an opportunity to work one of these stations and once more *rewind* my WAC certificate."

It is interesting to know that although oa2SH first won his WAC membership when using a "fifty watter", he was not satisfied until he had duplicated this using a "fiver". Now he has come mighty close to doing the job over again with a 201-A. This is certainly a fine example of what makes amateur radio what it is today. Our congratu-



THE LOW-POWERED OUTFIT AT oa2SH WHICH USES A 201-A FOR A TRANSMITTING TUBE

It needs only one continent more to its credit to have worked 'em all.

lations to both these stations who don't stop trying as soon as they obtain their certificates but put in front of themselves seemingly insurmountable obstacles and then, *jump over them*. That's the real amateur spirit!

There are at present ninety-nine members in the Club of which thirty-eight are outside the U.S.A. It is also interesting to know that fifty-two of them have been admitted since the first day of April 1927, that is within the last five months (this being written at the last of August). During the year previous to April 1927, there was obtained only forty-seven members. From noting the latest QSOs on the cards that are sent in, it appears that the sudden increase in membership is due to the fact that most of these stations worked their hardest continent on 20-meters and were then able to apply for their certificates. From the looks of things, it appears that there will be many more members admitted in the months to come.

TOBE

Trade Mark R. P. 11
U. S. Pat. Office

CONDENSERS B BLOCKS RESISTORS

SILVER-MARSHALL, Incorporated

SM RADIO EQUIPMENT
946 WEST JACKSON BLVD
Chicago, U.S.A.

June 15, 1927

Mr. Paul Garrison
111 Madison St.
Chicago, Ill.

Dear Mr. Garrison:

We are pleased to receive the card which you have returned to us. We are sorry that we have not been able to supply you with the equipment you have ordered. We are sorry that we have not been able to supply you with the equipment you have ordered. We are sorry that we have not been able to supply you with the equipment you have ordered.

We are particularly glad to be able to supply you with the equipment you have ordered. We are particularly glad to be able to supply you with the equipment you have ordered. We are particularly glad to be able to supply you with the equipment you have ordered.

We are particularly glad to be able to supply you with the equipment you have ordered. We are particularly glad to be able to supply you with the equipment you have ordered. We are particularly glad to be able to supply you with the equipment you have ordered.

Very truly yours,
SILVER-MARSHALL, INC.
Wm. Marshall Garrison

54

Enclosed find \$10.00

Letters like the above speak for themselves. TOBE Condensers, B Blocks and Resistors are *right* for the job when they are installed, and they stay right. The word TOBE means good technical apparatus. Send for price sheet Q-10.

TOBE DEUTSCHMANN CO., Cambridge, Mass.

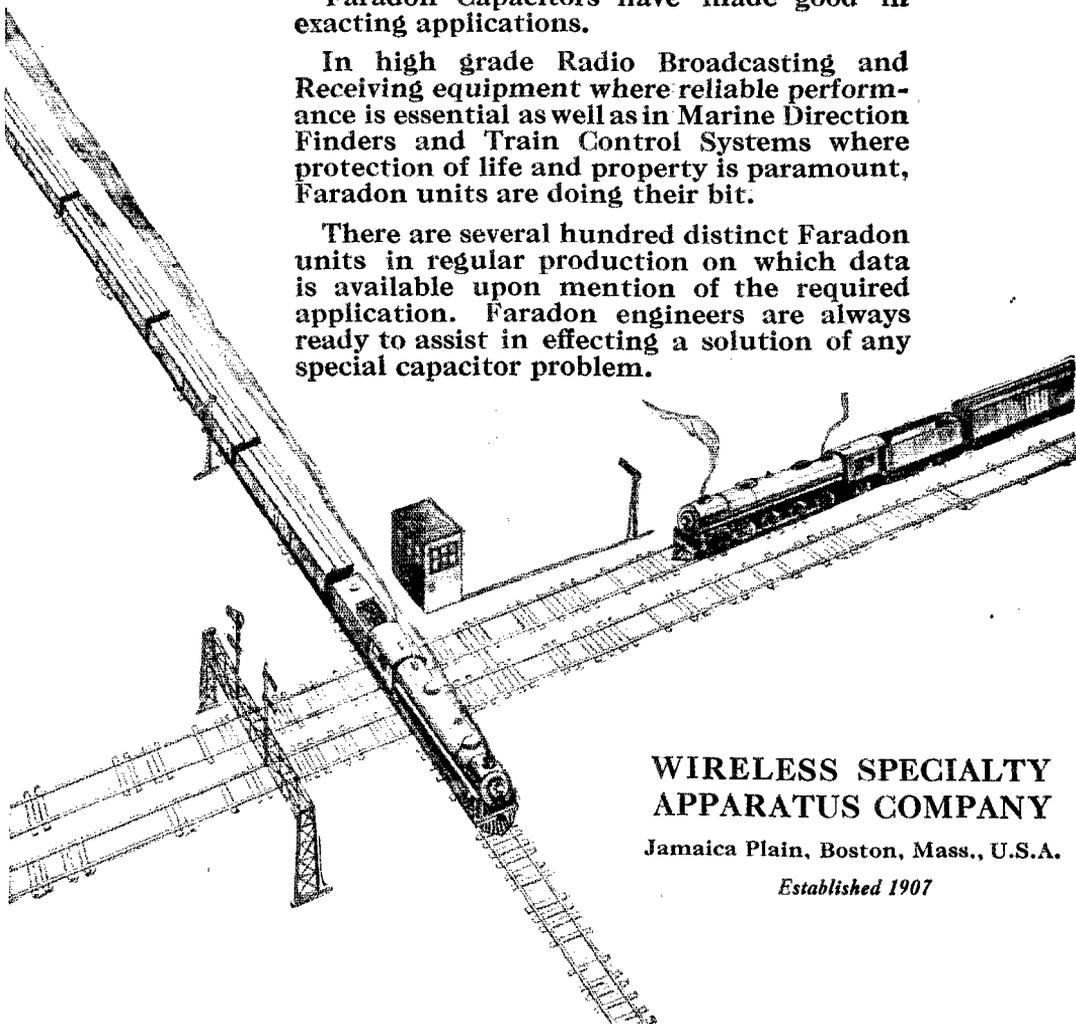
There can be no compromise---

Experts concerned with important applications of electrostatic condensers are content only with capacitors of proven dependability.

Faradon Capacitors have made good in exacting applications.

In high grade Radio Broadcasting and Receiving equipment where reliable performance is essential as well as in Marine Direction Finders and Train Control Systems where protection of life and property is paramount, Faradon units are doing their bit.

There are several hundred distinct Faradon units in regular production on which data is available upon mention of the required application. Faradon engineers are always ready to assist in effecting a solution of any special capacitor problem.



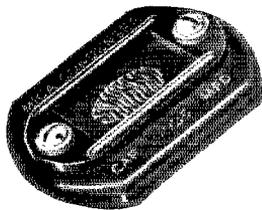
WIRELESS SPECIALTY APPARATUS COMPANY

Jamaica Plain, Boston, Mass., U.S.A.

Established 1907

Faradon

SANGAMO



Mica Sending Condensers

Among the large users who put their faith in Sangamo Mica Sending Condensers is the United States Navy. Permanent accuracy and unvarying performance are inbuilt characteristics of Sangamo Mica Sending Condensers.

CAPACITIES AND PRICES

5,000 Volts D. C. Test	
Up to .002 mfd	\$2.00
3,500 Volts D. C. Test	
Up to .005 mfd.	\$1.75
1,500 Volts D. C. Test	
Up to .01 mfd.	\$1.75

SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

BIG RADIO CATALOG

From the "Big, Friendly
Radio House"

NEW 1928 Book offers finest,
newest well-known sets; parts,
eliminators, accessories at lowest
prices. Dealers, set-builders, agents
—WRITE for this CATALOG!

Western Radio Mfg. Co.

124 West Lake Street Dept. 67
CHICAGO, ILL.

We don't know how many more times we will be able to print the complete list of member stations as the size of it increases and it takes up more and more space each month that it appears. To date we have the following. nu6OI, nu6HM, nu1AAO, nc4GT, np4SA, nu9ZT-9XAX, eb4UZ, nu9DNG, op3AA, nu2APV, op1AU, nu5ACL, nu5JF, eg2IT, eg-gi5NJ, op1CW, fo1SR, nu1CMP, nu1CMX, eb4RS-3AA, nu7IT, nu1CH, sc9TC, nu5TW, nu6CTO, op1BD, nu9BSK, nu4SI-4TN, am-vs1AB (known as ss2SE when issued), eg5XY, sc2LD, ef8CS, nu2CRB, oa2SH, nu7VH-7TM, nu2MK, nu2AHM, nu2CYX, su2AK, su1BD, nu4BL, nu9BHT, nu6ZAT, eg5SZ, nu5QL, nu8ALY, eg5MA, foA5X, nu6ALR, nu1VC, nu6VZ, nu6CCT, nu7EK, eg6TD, sc2AS, nj2PZ, nu6VC, nu9ARA, eg2QB, ek4UAH, nu5AQ, nu1ALR, op1HR, ai2BG, eg5BY, nu6CKV, foA3Z, eg2NH, eg5KU, eg5MA, nu1PY, nu6NX, nu6CDW, oz4AO, oz3AR, nu7DF, nu1AZD, foA3X, eg6UW, ei1GW, nu6KB, oa2RC, eb4BC, sb2AS, saGA2, nu7RL, nu9CCS, foA4L, nu6BUX, su1FB, eg5HS, nu2APD, ei1RM, nu6AZS, nu1ON, eg6YD, eg5YK, nu2GX, and nu6BJL.

NEW QRAS

There seem to be but few new QRAS being turned in and we list them herewith.

ej7AA—Ing. Charles Riesner, Dugaresa, Jugoslavia

ej7OO—Branko Pilar, Zagreb, Tuskauc 1803, Jugoslavia.

en0JA—This appeared as enJA on page 69 of the July issue.

nr2FG—Federico Gonzalez, Box 384, San Jose, Costa Rica.

saFH4—No. 3126, Brown Street, Rosario, Argentina.

sb2AY—Samuel Toledo Filho, Box 182, Sao Paulo, Brazil.

ss2BN—SS Canadian Seigneur, QRD New Zealand. QSL to nc2BN.
(intermediate should be "xnc")

We would like to get some information on GX, BO and HJG.

Seventh Edition Just Off the Press

ROBISON'S MANUAL OF RADIO TELEGRAPHY AND TELEPHONY

Completely Revised and Up-to-Date

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

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

The standard Navy book on radio originally prepared in 1907 by Lieutenant (last year Admiral and C-in-C of U. S. Fleet) S. S. Robison. The 6th edition and the present edition revised by Commander S. C. Hooper, U. S. Navy, late Radio Officer, U. S. Fleet.

Price \$5.50 postpaid (former edition sold for \$8.00)

Address: Secretary-Treasurer, U. S. Naval Institute, Annapolis, Md., U. S. A.

Announcing

ANOTHER

REG. U.S. PAT. OFF.

ELKON

IMPROVEMENT

The ELKON CHOKO COIL

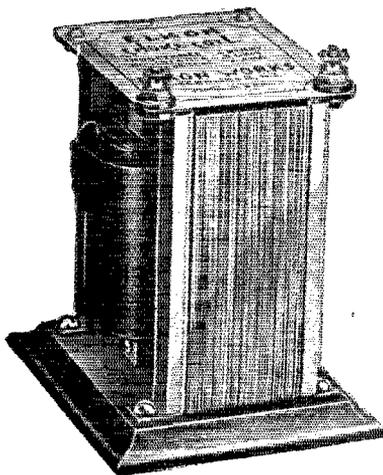
Plenty of reason for calling it an "improvement," not just another choke coil, for it possesses substantial advantages you will be quick to recognize.

For example, it is used, with its charger, **ONLY DURING RECEPTION**, having ample capacity for supplying undiminishing filament "A" power up to full capacity of the charger. Here are both economy and convenience.

Connected up with full wave rectifier it will provide filament "A" power of uniform high quality with any good "A" battery.

It's new, and your dealer may not have it in stock, but he will gladly order it for you, or we will send direct.

ELKON WORKS
Subsidiary of P. R. Mallory & Co., Inc.
Weehawken, N. J. Inc.



The Elkono Choke Coil

\$6.00

made by the manufacturers of

ELKON TRICKLE CHARGER

The original silent bone dry Trickle Charger. 1 amp. capacity. Tapers automatically.

ELKON "A" POWER

Flawless filament "A" Power Instantly. No liquids, tubes or moving parts.

ELKON 3 AMPERE CHARGER

The silent rugged rectifier. Bone Dry. Recommended for use with the Elkono Choke Coil.

Hoyt

Model 300 RADIO SERVICE SET TESTER



Makes All Tests On Any Radio Set

Equipped with precision voltmeter, 1,000 ohms per volt with 3 1/2 inch hand-calibrated, 4-range scale — 0-10 and 0-500 volts, and 25 and 100 M. A. Cased in polished hardwood box with cover and leather carrying handle.

Price, complete with Adapters \$65.00

Send for new Radio Catalog Q-10

BURTON-ROGERS CO.

Sole Selling Agents
Boston, Mass.

How to Select a Resistor

EVERY radio engineer is confronted by two important questions when he selects a resistor—"How accurate is it?" and "How long will it maintain its accuracy under the average load?" Until the resistor answers these two with perfect satisfaction, all other questions are unnecessary.

Here's how Hardwick, Field, Inc., answer them:

1. Harfield Resistors can be supplied to you as accurate as plus or minus 1%, if you wish.
2. Under average load conditions, all Harfield Resistors are guaranteed to maintain the accuracy your order specifies.

Tell us about the resistor you want and let us send you a sample with prices. Write

HARDWICK, FIELD, Inc.
215 Emmet St. - Newark, N. J.



International Communication

(Continued from Page 38)

which seems to be its present unfortunate tendency. In my estimation the time has passed for the "ham" variety of amateur with no idea in his head other than DX. The pure "DX hound" is as a rule a poor operator who causes interference with long CQs and long calls, who sneaks down below the legal band to escape the interference of other amateurs; and thereby unknowingly gets into the commercial QRM.

The proper sort of QSO with foreigners, together with the changing of QSLL is certainly a factor in international relations. It may seem to have a rather small scope but really does give one a new light on other countries. One may have a grudge against a certain type of person in some particular country; after chatting with him by radio and then exchanging cards we find that after all he is much the same as we are and has the same interests at heart.

FRIENDSHIPS INSTEAD OF "QRK-CUL"

Certainly we should combine other interests with mere DX. How can this be done?

To begin with, let us stop calling stations merely for "QRK QSLL CUL". This does not lead to greater friendship, nor in my estimation to greater enthusiasm. Chat with your foreigner. Find out something about him, discover the interests you have in common and above all go out of your way to please him.

I recall last December working fq-PM which is a station operated by a Californian gentleman in the Cameroun, West Africa. It was nearly Xmas and he wanted to send greetings to his family in the U.S.A. Interference was bad and his signals were none too loud so I was tempted to avoid taking the message. I tried, however, and finally succeeded in getting his greetings to California and a reply back to him. My! How much more fun that is than just asking "QRK?" and then saying "CUL"!

On other occasions I have sat for two hours sending the latest news from a paper to a ship or to an out-of-way island.

The appreciation shown for such thing is surprising. This has convinced me that going a little bit out of the way for the other fellow, giving him what he wants, even if it takes a little time and keeping schedules with him faithfully is the easiest way to keep up a real interest.

WHERE QST COMES IN

In the development of international radio one cannot overlook QST. Through it such great factors as c.w., short waves, and crystals have been popularized amongst us amateurs. QST also introduces new circuits, new constructions, types of antennas and frequently sets standards of operation. We cannot give its influence too much credit.

THE STATION ITSELF

Concerning the making of a transmitter that will have a worldwide range I will say

3 New AERO Products You Should Know About!

Here are 3 new items recently added to the famous AERO line of transmitting and receiving inductances. Each is built up to the usual AERO high-quality standard and exactly fills an urgent existing need among radio amateurs.

Read all about this new AERO equipment so that you can make sure of even better performance by building these new chokes and transmitting coils into your new set or substituting them in your present equipment.

AERO Key 9018 Transmitter Kit

This new AERO Interchangeable Transmitter Kit has a range of 90 to 180 meters. The kit includes two mounting bases and two Aero Choke 248 coils.

This new kit is designed for use in the popular AERO Transmitter and is completely interchangeable with the Key 2040 Kit and the Key 4080 Kit, using the same mounting bases and the same choke coils.

Every amateur who has built the AERO Transmitter will appreciate the extra working range offered by this new kit.

Code 9018-K Price \$12.00



The New AERO Choke 60



Modern circuits of high sensitivity demand the use of radio frequency chokes in certain parts of the circuit. The Aero Choke-60 is designed to have a uniform choking action over a wide range of wave lengths, including Broadcast bands and Amateur Short Wave bands as well. Many chokes employed on short waves have an unpleasant characteristic of showing so-called "holes" in the tuning range, which is present also on the broadcast band but in a minor degree. These faults are corrected in the Aero Choke-60.

Price \$1.50

New AERO Choke 248

The Aero Choke 248 is especially designed for operation in Aero Transmitter kits 2040K, 4080K and 9018K, and other circuits. Aero Choke 248 presents a high impedance or choking action over the usual amateur wave lengths. It efficiently covers the entire transmitter band up to 190 meters. It is wound with a conductor sufficiently liberal to handle transmitters up to 100 Watts.



Price \$1.50

A NEW SERVICE

We are now able to furnish complete Foundation Unit for the Aero Short Wave Receiver, the Aero Transmitter, the improved Aero-Dyne 6, the Aero 7, the Aero 4 and the Chicago Daily News 4-Tube Receiver, drilled and engraved on Westinghouse Micarta, at a very reasonable price. These fully finished panels greatly simplify construction of these circuits and are a great convenience for the home set builder. Detailed blue print and wiring diagram for each circuit included with every Foundation Unit. Write for prices and complete information.

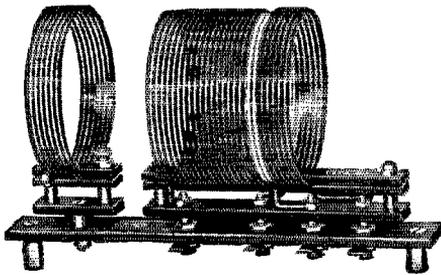
You should be able to get any of the above Aero Coils and parts from your dealer. If he should be out of stock order direct from the factory.

AERO PRODUCTS, Inc.

Department 16

1772 Wilson Ave.

Chicago, Ill.



The NEW CHI-RAD Short Wave Coils

20—40—80 Meter Band

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

Chi-Rad Short Wave Coils Complete for 20, 40 and 80 meter band \$10.00
 Extra coil for broadcast band \$ 4.00
 Dealers and Set-builders—write for further details and discounts.

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

EVERYTHING FOR THE HAM

(Send for Catalogue.)

NICHOLSON ELECTRIC CO.
 1407 FIRST NORTH ST.
 SYRACUSE, N. Y.

but little as there is neither a set rule nor a sure path.

What kind of an antenna should one use? I don't know. Certain antennas are superior under certain conditions. A person in a crowded locality surrounded by trees and large buildings will do well to get the antenna up out of all that mess; either a large antenna worked on a harmonic or a small antenna well up in the air and fed by a one-wire or two-wire r.f. line would be best. On the other hand a person in a clear and fairly high location cannot, in my opinion and experience, find one better than a small fundamental aerial which need not be very high.

As to the circuit to use in the transmitter, everyone has his pet. I don't think it makes much difference which is used if you adjust it for a steady note with fair efficiency and then set your wavelength.

Why set the wavelength? Because the only way to carry on dependable traffic work schedules or even plain hit-or-miss contacts is to set your wavelength. Stations will then soon know just exactly where to listen for you and will be able to find you whenever they desire.

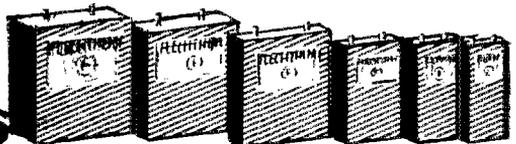
Many station owners complain that they can't get out because they have low power. I don't think this is true to any very great extent. If moderate power is used with a fairly steady note on a wavelength which is set and if common sense is used in operation these stations have nearly the same chance of raising a distant one as has a higher power station. It is merely a case of waiting your turn and then calling the other man. Consider that 250 watts in the antenna can after all make only a little more signal at the distant receiver than is produced by 50 watts. The difference is not large as one can show by either theory or test.

The length of a call and the kind of sending are factors to be reckoned with; the hours of operation are very important. Most of us know that in the 40-meter band signals are usually loudest when it is just getting dark or just getting light at one of the circuit. With a little experimenting, and keeping records on the experiments, it is easy to find the best time for QSO with the different localities in our network of international communication.

FOR TRANSMITTING!

2 Mfd	1000 volts	\$2.75
4 " "	" "	4.75
1 " "	2000 "	2.75
2 " "	" "	4.35
4 " "	" "	6.55

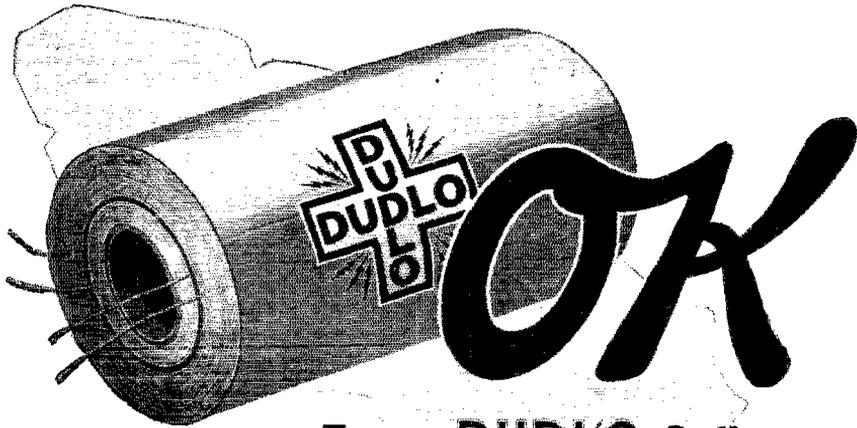
FLECHTHIME CONDENSERS



When your filter condensers "blow," replace with Flechthime and forget them—absolutely guaranteed to stand up. "Flechthime condensers are made for transmitting sets" and will stand up!

Complete transmitters built and installed for broadcasting or telegraph (C. W.) use, from 5 to fifty kilowatts. High grade speech amplifiers. Full line of transmitting apparatus for amateur stations.

AMATEUR RADIO SPECIALTY CO., 77 Cortlandt Street, NEW YORK CITY



**Every DUDLO Coil
must be O. K. in every respect**

—number of turns

—no short circuits

Complete satisfaction is assured to Dudlo customers because each individual coil is thoroughly tested and accurately checked in every way possible.

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Dudlo coils must be up to specifications. There is no passing mark short of perfection.

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Here in the world's coil headquarters has been developed the most complete testing apparatus in the industry. Special methods and equipment have been developed that would be impossible with any but the largest volume.

Unlimited volume, deliveries on schedule and exact adherence to specifications make Dudlo the logical source of supply for magnet wire and windings.

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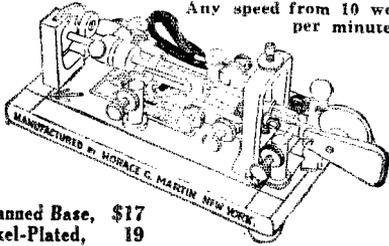
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SAN FRANCISCO, CALIFORNIA

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Vibroplex
Bug
Lightning Bug

With The Improved Martin **VIBROPLEX**

For Continental or Morse Code
Any speed from 10 words
per minute-up



Japped Base, \$17
Nickel-Plated, 19

Easy to learn and easy to operate. Simply press the lever—the Vibroplex does the rest. Adjustable to any speed from 10 words per minute up. Saves the arm, prevents cramp and improves sending 50 to 100%. Over 100,000 users. No station complete without this up-to-date BUG. Can be used in majority of DX circuits without relay.

Special Radio Model

Equipped with Extra Heavy, Specially Constructed Contact Points to break high current without use of relay. Sent anywhere on receipt of price. Money order or registered mail. **\$25** Liberal allowance on old Vibroplex.

Insist on the Genuine Improved Martin Vibroplex. The Vibroplex Nameplate is YOUR protection. Order NOW!

THE VIBROPLEX CO., Inc.
825 BROADWAY NEW YORK
Cable Address: "VIBROPLEX" New York

ELECTION NOTICES

To all A.R.R.L. Members Residing in the Atlantic, Dakota, Delta, Midwest, Pacific (including Territory of Hawaii and Philippine Ids.), and Southeastern (including Porto Rico, the Republic of Cuba and Isle of Pines) Divisions:

1. You are hereby notified that an election for an A.R.R.L. Director, for the term 1928-1929, 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 14, 15, 16, 17 and 18, providing for their nomination and election.

2. The election will take place during the month of November, 1927, 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 living in any Division have the privilege of nominating any member of the League in their Division as a candidate for Director. The following form for nomination is suggested:

(Place and date)

Executive Committee,
A.R.R.L. Headquarters,
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 1928-1929.

(Signatures)

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, 1927. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. Present Directors from these Divisions are as follows: Atlantic, Dr. 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.

5. This is your opportunity to put the man of your choice in office as the repre-

1928 -

Wholesale RADIO Catalogue

FREE

1928
WHOLESALE CATALOG
Sets
Parts
Kits and
Everything in
RADIO

136 Pages of Illustrated Wholesale Bargains
Just off the press—our new wholesale catalog of everything in Radio. The most complete illustrated catalog of quality Radio merchandise ever found in one book. It comprises the entire line of all the popular **Nationally advertised** radio sets, accessories, parts and kits—particularly all the latest features shown in this and previous issues of this magazine. Rock bottom prices on each item.

Electric Sets—6, 7 and 8 tube, also non-electric sets. Astonishing values in "A" Eliminators, "B" Eliminators, loud speakers, chargers, cabinets, consoles, kits and parts. For immediate shipment.

Values That Will Astonish You. The Latest Kits, Power Packs, Parts, Accessories
Also how to make your old sets electrically operated at very low cost. Here's quality radio merchandise at extraordinary low prices. No dealer can afford to be without this book—a veritable clearing house for radio needs. Be sure and get your copy!

We are pioneers in radio and deal in radio exclusively. Only our tremendous purchasing power makes these extraordinary values possible. Write for FREE catalog NOW.

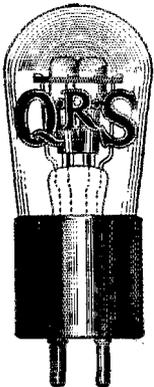
HAMILTON-CARR CORPORATION
711 W. Lake St., Dept. 171 Chicago, Ill.

DUO-POWER B Current Supply



\$29.50. Slightly higher west of the Rockies. Sturdily constructed and dependable in operation. Embodies all the latest improvements in B Power Unit manufacture. Adaptable to any receiver requiring up to 180 volts at 60 mils. Easy to install. Fixed resistances insure selection of proper voltages for any set.

BOUTIN ELECTRIC COMPANY
722 So. 4th St. Minneapolis, Minn.
A.R.R.L. Members and Service men — User agents wanted. Write for very attractive agency proposition.



For Your "B" Battery Eliminator,
Ask Your Dealer for Guaranteed

Q · R · S Gaseous Rectifier Tubes ARE BETTER

60 Milliamperes	400 Milliamperes
\$4.50	With Ionizer — 300 Volts
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\$4.50	with Charts and Diagrams
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THE Q · R · S COMPANY
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FREE—NEW CATALOG

DEALERS & SET BUILDERS . . . Write for our new 1928 Catalog. Its FREE. Shows latest and best nationally advertised radio equipment. Complete Kits as specified in articles in leading radio magazines now ready for shipment. No delays in filling orders. Best Prices.

Miller-Welles Co., 18 W. Kinzie St., Chicago

Learn the Code at Home With the Omnigraph



Morse and Wireless—taught at home in half usual time at trifling cost. Omnigraph Automatic Transmitter will send, on Sounder or Buzzer, unlimited messages, any speed, just as expert operator would. Adopted by U. S. Govt. and used by leading Universities, Colleges, Technical and Telegraph Schools throughout U. S. Send for catalog **OMNIGRAPH MFG. CO., 13M Hudson St., New York**

representative of your Division. Members are urged to take the initiative and file nominating petitions immediately.

For the Board of Directors:

K. B. WARNER, Secretary.
Hartford, Conn., 3 September, 1927.

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 1928-1929, is about to be held, in accordance with the Constitution. Your attention is invited to By-Law 29, 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 26 and 27, specifying the duties and authority of the Canadian General Manager; and By-Laws 23, 24, and 25, providing for his nomination and election.

2. The election will take place during the month of November, 1927, 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 living 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,

A.R.R.L. Headquarters,
Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the Dominion of Canada, Newfoundland or Labrador, hereby

nominate
of
as a candidate for A.R.R.L. Canadian General Manager for 1928-1929.

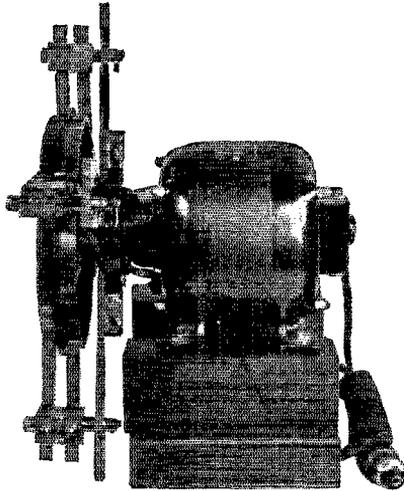
(Signatures)

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, 1927. 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.

THE SUPER SYNC

The Synchronous Rectifier That Can Be Filtered

If you want your ham transmitter to rival commercial performance with the power available, we recommend crystal control with super sync plate supply. This combination gives you the ultimate in modern short wave transmission. By using such a method you obtain an output that only commercial apparatus can duplicate. Crystal control of your transmitter provided with super sync plate supply will materially reduce the



size and capacity of the high voltage filter. This is no small item when high power is used. The wave is of course steady to an unparalleled degree and the tone beyond comparison. Another advantage of this system is that it can be applied to either low or high power transmission. In other words by installing a super you have prepared your station for the future should you desire to increase power.

PAT. PENDING

Price Now \$55 F.O.B. St. Louis, Mo.

MARLO ELECTRIC CO., 5241 Botanical Ave., St. Louis, Mo., U.S.A.

Tested 1500 Volts!

Every Sprague Condenser is factory tested at 1500 volts and capacities are kept constant by a special waterproof asphalt wrapper and a new process of triple impregnation.

Capacities from .00007 to .1 MFD.

The new .1 MFD, no larger than ordinary condensers of smaller capacities, is truly a condenser revelation. Order from your dealer or send one dollar for sample, complete with mounting bushings.

SPRAGUE SPECIALTIES COMPANY
Dept. T Quincy, Massachusetts



16 inch
MUSICONE \$12.75

12 inch
MUSICONE \$9.75

\$55

The BANDBOX

Since Crosley is licensed to manufacture under nearly all important radio patents, this combination with Crosley leadership and experience, naturally produced an amazing radio—the "Bandbox" AC model using the new R.C.A. AC tubes and working directly from electric light socket through the Crosley Power Converter, \$45, Power Converter \$50 extra. If you cannot locate a Crosley dealer write Dept. 18 for his name and literature.

The Crosley Radio Corporation
Powel Crosley, Jr., Pres. Cincinnati, Ohio

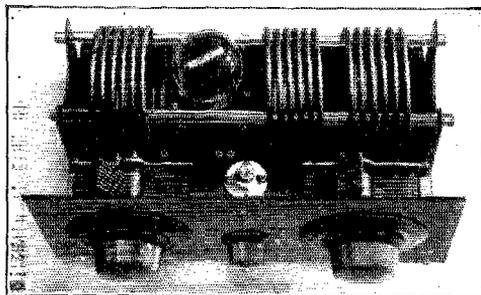
Crosley is licensed to manufacture under patents of the Radio Corporation of America and associate companies, also the Hazeltine Corporation and Latour Corporation only for Radio Amateur, Experimental and Broadcast Reception.

CROSLEY RADIO

Prices slightly higher west of the Rockies.



PARCO S. W. TRANSMITTER



Designed to use the 7½ watt tube and comes delivered to you completely wired and tested with full set of instructions and guaranteed to perk!

PARCO 20 Meter Transmitter	\$20.00
PARCO 40 Meter Transmitter	\$20.00
PARCO 80 Meter Transmitter	\$25.00
PARCO S. W. Receiver with 3 sets of plug-in coils, 13-120 meters	\$20.00
PARCO S. W. Receiver with 1 Plug-in coil either 20, 40 or 80 meter band	\$17.50
PARCO Plug-in receiving coils, set of 3, 20, 40 and 80 meter band	\$5.00
PARCO 5 Meter Receiver	\$25.00

Prepaid, if money order is sent with order

PARMATER PRODUCTS CO.
LANSING SNX MICHIGAN

QST Oscillating Crystals

Prices for grinding POWER crystals for the various Amateur bands as follows:

150-170 Meter band	\$15.00
75-86 Meter band	\$25.00
37.5-42.5 Meter band	\$30.00

We will state the frequency of the crystal accurate to better than a tenth of one per-cent. All crystals guaranteed.

BROADCAST BAND

We will grind for you a crystal accurate to plus or minus 500 cycles of your assigned frequency for \$50.00 unmounted, or \$60.00 mounted. This crystal is our POWER type and is absolutely guaranteed. PROMPT DELIVERIES.

We grind crystals to any frequency between 40 and 10,000 kilocycles. Let us quote prices for your particular requirement.

"The Crystal Specialists"

SCIENTIFIC RADIO SERVICE

P. O. Box 86 Dept. Q Mount Rainier, Maryland

At \$6.00 this famous
Cabinet
has no equal!

THE BLUE RIDGE
7x18x10" Mahogany or Walnut Finish

Send us your order or write for catalog and full information. 12 hour service, factory to you.

Southern Toy Co. Inc.
Manufacturers Hickory N.C.

4. Mr. A. H. K. Russell of Toronto, Ont., is the present Canadian General Manager.

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

For the Board of Directors:

K. B. WARNER, Secretary.
Hartford, Conn., 3 September, 1927.

Strays

Speaking of plug-in-coils, 6BWS tells us that 6BJF goes one better and uses plug-in-tuning condensers.

Talking about tuned plates, did you ever try a good listen while in a restaurant.

nu6BWS.

5NW says he is getting out pretty well on the yf band with his new Chevrolet.

A 160-meter crystal can be made to oscillate with the first tank circuit tuned to either 160, 80, or even 40 meters if the crystal and mounting are clean.

A pressure type of mounting is good if the pressure is not too great and it is clean. However, a mounting employing no extra pressure other than that due to the weight of the top plate will usually give a bit more output.

Be sure the crystal and mounting are clean.

nu6CMQ.

9BAN sends out his QSLs in the form of a blotter. The idea, we suppose, being that after it has been completely used up, it will be necessary to QSO again in order to get another one.

For those who are desirous of making a display of their QSL cards but are prevented from doing so due to the mess tacks make of a wall, the following scheme in use at nc3XM may be of some help.

A large sheet of cardboard is hung up and paper clips fastened to it so that the cards may be held by them. In order to fasten the clips to the cardboard, it is only necessary to cut a small slit with a razor blade or knife and spread the clip so that one half of it is in front of the cardboard and the other half behind it. The cards may then be slipped under the clips, there being two provided for each card. The whole affair may be hung up like a picture or calendar if a piece of wood is tacked to the top of the cardboard.

9HF says that you can control the filament voltage on the transmitting tubes by inserting the primary of a toy transformer in series with the primary of the filament lighting transformer. If a six ohm rheostat is then shunted across the secondary of the toy transformer, the filament voltage may be controlled by varying the load on the toy transformer.

The AMIRAD

MERSHON CONDENSER

A thoroughly tested product. It has been used extensively during the past six years by expert radio amateurs for filtering plate supply in their transmitting equipment, which is a very severe requirement. The Mershon Electric Condenser is even better adapted for smoothing "A" and "B" filter circuits used in conjunction with radio receivers.

Made in copper cans of four different sizes, namely, 1¼ inch, 1½ inch, 2 inch and 3 inch diameters. The three smaller sized cans are of the single anode type. The 3 inch can is produced in double, triple or quadruple anodes having a maximum capacity of 80 mfd. containing two 25 mfd. and two 15 mfd. units. In general the triple anode condenser is sufficient for filtering a "B" eliminator when using an electrolytic or double wave filament type rectifier. With a gaseous tube rectifier the quadruple condenser is recommended.

Of the several uses the most important are as follows:

1. Connection to any "B" eliminator for improving tone quality of reproduction.
2. For preventing "thumping" or "motor-boating" of "B" eliminators.



3. As the basis unit of capacity in building a super "B" eliminator.
4. For constructing an "A" and "B" power unit.
5. For "smoothing" the plate supply current for amateur transmitters.
6. For greatly prolonging the useful life of ordinary dry cell "B" batteries.
7. For protecting receiving sets from punctured parts or insulation breakdowns when using "B" eliminators.
8. Mershon Electric Condensers may be connected in series, to withstand higher voltages at lower capacity, or in parallel, for larger capacity.
9. For eliminating A.C. "hum."
10. Acts as a reservoir to store energy.
11. To take the "ripple" out of a D.C. Motor-generator.

It is self-healing. If the dielectric should be broken down by accidental over-voltage, a re-application of direct current will shortly restore it. Economically this is of great importance, as when other forms of condensers are punctured, they are useless and must be thrown away. Send for descriptive folder, charts, etc.

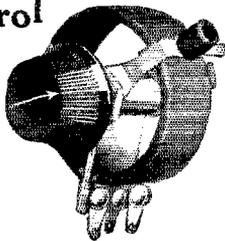
The **AMIRAD** CORPORATION

Medford Hillside, Mass.

Smooth Control

for

POWER CIRCUITS



CENTRALAB 4th Terminal Potentiometer is the new heat-proof, warp-proof Power Potentiometer with an added variable contact arm which is adjustable behind panel. Provides two variable voltage taps on the same resistor. Resistance values of 175 and 250 ohms are suitable for "A-B-C" power circuits. The 2,000 ohm units will give two variable "C" biases in "B" power and power pack circuits. Two of the 5,000 ohm units in series across the output of a "B" power circuit will provide four variable voltage taps and give best possible voltage regulation. All Centralab Fourth Terminal Potentiometers are wound with Nichrome wire on a metal strip insulated with asbestos. They will safely dissipate a continuous current load of 35 watts or more and give constant, smooth and reliable voltage regulation.

These are variable resistors that you simply can't burn out in any ordinary radio circuits.

175, 250 ohms—\$2.00; 2,000, 3,000, 5,000 ohms—\$2.25

At your dealer's or C. O. D. There is a Centralab Resistance for every Radio Purpose. Send for Circuit Literature.

CENTRAL RADIO LABORATORIES
20 Keefe Ave. Milwaukee, Wis.

Centralab

BECOME A RADIO OPERATOR

See the World. Earn a Good Income
Duties Light and Fascinating.

LEARN IN THE SECOND PORT U.S.A.

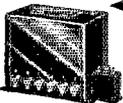
Radio Inspector located here. New Orleans supplies operators for the various Gulf ports. Most logical location in the U. S. A. to come to for training.

Practically 100% of radio operators graduating on the Gulf during the past five years trained by MR. CLEMMONS, Supervisor of Instruction. All graduates secure positions.

Member of the A.R.R.L.—Call "G R"
Day and Night Classes—Enroll anytime—Write for circular.

GULF RADIO SCHOOL

844 Howard Ave. New Orleans, La.



Quality Fixed Electrical Condensers

Fast Hi-Test extra-capacity Condensers for all purposes meet all tests. High insulation resistance. One-piece die-press, steel housing impervious to climatic changes. Laboratory treatment—moisture content removed, assures dependable service. Millions in use since 1919. Fit all units.

Write for free attractive booklet.

JOHN E. FAST & CO., 3982 Barry Ave., Dept. H, Chicago, U.S.A.

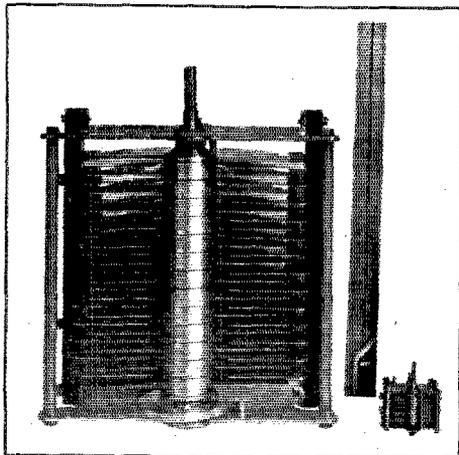
Ensell Radio Laboratory Products are Quality Built for Transmission and Reception. We supply Transmitters for Radiophone or C. W. Receivers of the Three to Eight Tube Designs with Wavelength Range from 15 to 210 Meters. Our Speech Amplifiers are supplied for Direct or Remote Control. We also make and supply, Wavemeters, Inductances, Choke Coils, etc., Distributors for Nationally Known Microphones, Transformers, Plate Rectifiers, Motor Generators, etc., We Build to order using your parts if desired. Prices on Application. Ensell Radio Laboratory, 1208 Grandview Ave., Warren, Ohio Amateur, Broadcast, Marine
"Pioneer Builders of Short Wave Apparatus"

A 100-Watt Test Oscillator

(Continued from Page 43)

Auxiliary Power

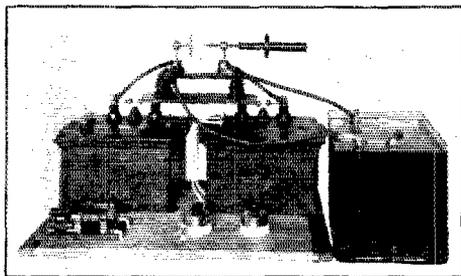
Where alternating current is not available a motor-generator must be used. This



A HIGH-POWER TRANSMITTING CONDENSER COMPARED WITH A MIDGET RECEIVING CONDENSER. THE STEEL SCALE IS ONE FOOT LONG.

may be of amateur interest also as it has been made up in compact form for portability and therefore a photograph of it is shown.

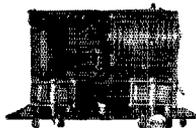
The control switches and starting box are on one of the slanting panels, while the



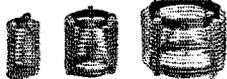
THE 60-CYCLE TEST SET
THIS SET IS USED TO TEST BREAKDOWN VOLTAGES OF CONDENSERS. THE CONNECTIONS CAN BE UNDERSTOOD FROM THE PHOTOGRAPH. THE CONDENSER BEING TESTED IN OIL IS A NEW HIGH-POWER TRANSMITTING TYPE.

other panel carries the field rheostats. This motor-generator set is also used to supply 60-cycle power for the high voltage transformers shown in one of the photographs.

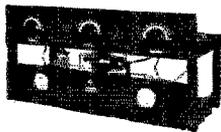
The cost of the test set, including the M. G. set, was about \$2,000. Being fairly portable it has been used for odd jobs of every description which has meant a saving over the usual delays of sending things to a laboratory. Its cost, measured in service, is therefore nominal.



BEGINNER'S
TRANSMITTER



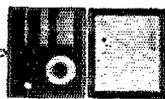
TRANSMITTING
INDUCTANCES-



TUNED PLATE
TUNED GRID



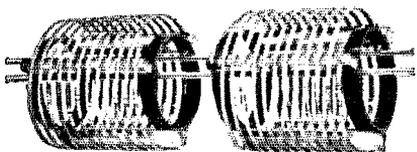
50 WATT SOCKET



WAVEMETERS

SHORT WAVE

REL TRANSMITTING :: RECEIVING REL



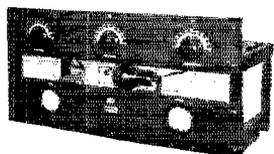
INDUCTANCES

Ultra construction embodies flatwise wound copper nickel plated ribbon mounted on high insulating glass spacers. Three clips furnished with each unit. The last word in Transmitting Inductances. Prices on application.



RECEIVING COILS

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



TRANSMITTING KITS

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

REL



UX-852 TUBE HOLDER

For the new S. W. Xmitting tube. Holds tube absolutely rigid. Connections for grid and plate leads. Provisions for mounting grid and plate condensers. Insures direct leads in the transmitter. Price \$2.50.

REL owns and operates experimental Station NU2XV on 15.1, 30.2, and 60.4 meters

Radio Engineering Laboratories

100 Wilbur Avenue, Long Island City, N. Y.



REL CHOKE COIL



DE FOREST "H"
TUBE HOLDER



50 WATT
COUPLED HARTLEY



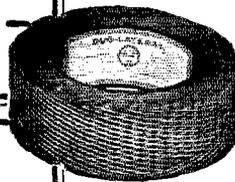
UX-852
TUBE HOLDER



SPECIAL SHORT WAVE
COIL KIT

Ad. Antenna, Inc.
 Manufacturers' Export Managers
 115 Broad Street, New York, N.Y.

Scientifically equipped to economically export dependable receiving and transmitting radio apparatus.



PACENT DUO-LATERAL COILS

PACENT Duo-Lateral Inductance Coils are specially designed for laboratories, engineers, experimenters, as well as for special circuits.

We are "Headquarters" for Duo-Lateral Coils and carry a complete line of all standard turn ratios.

Write for information and prices.

Pacent Electric Corp., 91 Seventh Ave., N.Y. City

SEND AND RECEIVE nine Terminal Cam switches in case British type SES 42 for \$1.25; Marconi hand driven C. W. Mageto generators, 2500 rmp, 1500 volts D. C. 12 millamps for \$8.50; United States Navy long wave receiver type C.F.83 range 1000 to 10,000 meters, maker DeForest, slightly used condition, price \$27.50; Edison Storage Batteries, 10 volts, 8 twin cells in case, type L-4 price \$5.00. Largest stock Government Radio Transmitting and Receiving material in U. S. Send 2c stamp for our new and latest reduced price list.

WEIL'S CURIOSITY SHOP, 20 South 2nd St., Philadelphia, Pa.

10 TOOLS \$2

HIGH GRADE POSTPAID

The Radio Tool Set contains circle cutter, scriber, drills, taps, reamer, countersink and instructions. Buy this bargain now.

WINGRA TOOL CO., Dept. F, Box 626, Madison, Wis.

Financial Statement

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

K. B. WARNER, Secretary.

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

REVENUE

Advertising sales, QST	\$14,090.49	
Advertising sales, Handbook	2,015.00	
Newdealer sales	10,758.67	
Handbook sales	4,402.22	
Newspaper syndicate sales	167.00	
Dues and subscriptions	7,491.60	
Back numbers, etc.	382.73	
Emblems	240.56	
Interest earned, bank deposits ..	301.38	
Cash discounts earned	323.93	
Bad debts recovered	57.38	\$40,235.96

Deduct:

Returns and allowances \$5,714.63		
Less portion charged to reserve for newstand returns \$1,840.10	3,874.53	
Discount 2% for cash	303.08	
Exchange and collection charges ..	9.56	4,187.17

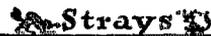
Net Revenue

EXPENSES

Publication expenses, QST	11,545.82	
Publication expenses, Handbook ..	3,853.31	
Salaries	13,614.15	
Newspaper syndicate expenses	125.50	
Forwarding expenses	587.57	
Telegraph, telephone and postage ..	927.36	
Office supplies and general expenses	1,537.90	
Legal expenses—amateur radio defense	712.70	
Rent, light and heat	933.25	
Traveling expenses	1,524.62	
Depreciation of furniture and equipment	225.06	
Bad debts written off	191.91	
Communications Dept. field expenses	57.67	

Total Expenses

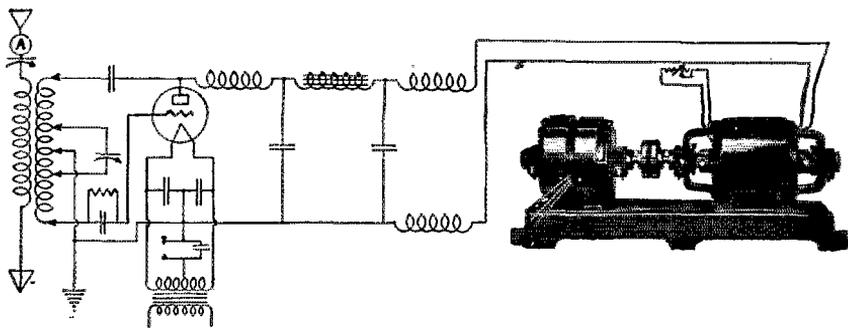
Net Gain from Operations \$ 211.97



In case you have overlooked the Experimenter's Section report, it will pay you to take careful look at the information given on the proper design of radio frequency choke coils that appears therein.

Those of you who have stripped the threads of the lock nut on the Cardwell condenser rotor assembly, can obtain new ones from the factory for a dime each.

How many of you have tried cutting towel bars with a hack saw and plenty of turpentine? Feels like work, doesn't it? Here's a suggestion from 1AQL. File a small nick in the bar and grasping it firmly in both hands, give it a sudden snap. Do it as though you didn't care whether the darn thing likes it or not and nine times out of ten, it will break right at the nick. Then pray that yours isn't the tenth time.



This is Item #26 used as a Plate Power Supply for a 204-A Tube.

Bulletin 237 lists over 300 other Generators, Motor-Generators and Dynamotors for Radio purpose. If you haven't your copy, write for it today!

ELECTRIC SPECIALTY COMPANY

Mark "ESCO" Trade

522 South Street

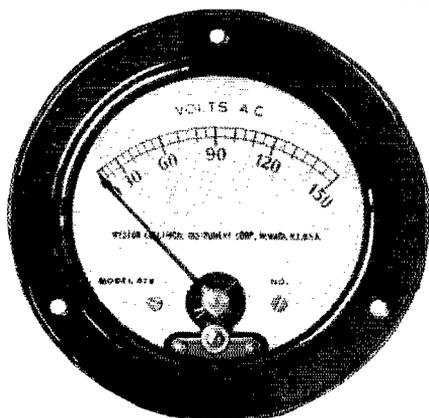
Stamford, Conn., U. S. A.

Manufacturers of Motors, Generators, Motor-Generators
Dynamotors and Rotary Converters, for Radio and Other Purposes

You can now have Weston performance in matched instruments

If you are using three or more instruments on your transmitter for filament voltage, plate current and plate voltage indications, it is always desirable that these panel meters should match in size, appearance and performance.

Weston now has a complete line of radio panel instruments for all transmission and reception uses. Whether you are operating D. C. or A. C., high voltage or low voltage, you can secure a matched set of Weston instruments that will exactly meet your requirements. Moreover, these small panel instruments are moderately priced and there is no reason why you should not have the complete Weston equipment you have always wanted. No other meters can compare with them in electrical design and performance, and their use to the amateur increases in value with the rapid developments towards low wave length reception.



WESTON ELECTRICAL INSTRUMENT CORPORATION

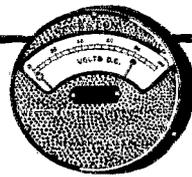
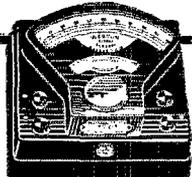
158 Weston Avenue

Newark, N. J.

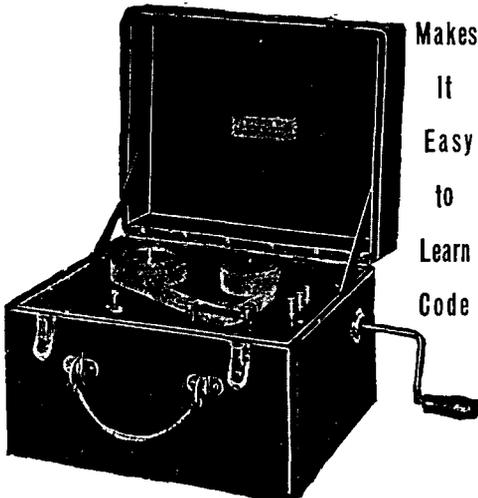
STANDARD THE WORLD OVER

WESTON

Pioneers since 1888



New! Portable TELEPLEX



Makes
It
Easy
to
Learn
Code

Morse or Continental. Eliminates months of tiresome practice. Sends messages, radiograms, etc.—5 to 80 words per minute. Sends five times as many words with one tape as any other instrument, and six are furnished. The only instrument that REPRODUCES actual sending of expert operators. Portable. Handy. Efficient. Satisfied users everywhere. Used by U. S. Navy. Fully guaranteed. Write for FREE Literature. A postcard will do.

Dealers Wanted

TELEPLEX CO.

76 Cortlandt St.,

New York

Precise No. 800-801 PUSH - PULL AUDIO TRANSFORMERS

List \$11.00 Per Pair SPECIAL \$3.75 Per Pair

NEW IN ORIGINAL FACTORY CARTONS

American Sales Co., 21 Warren St., N. Y. C.

A REVOLUTION

In amateur rectifier practice. The new high impedance, high voltage transmitting tubes work beyond the limits of present rectifiers, render them obsolete. We offer a rectifier that will meet your highest expectations and any transmitting load—from a 199 or a 210 to a bank of 204As—the Mercury Arc. Your rectifier problems solved.

RECTIFIER ENGINEERING SERVICE

Radio 8ML, 4837 Rockwood Road, Cleveland, Ohio

WHOLESALE PRICES TO HAMS



My Big 1928 Radio Book contains latest developments in short wave transmitting and receiving apparatus. Remarkable advance developments. Everything for "Hams" at wholesale prices. Valuable information. Get FREE copy.

AMERICAN AUTO & RADIO MFG. CO.
HARRY SCHWARTZBERG, PRES.
Dept. 185 American Radio Bldg., Kansas City, Mo.



FREE

Genuine Bakelite Panels

3-16" Thick, Color Black

38x43" reg. price \$29.00, Special at \$9.85 per panel

30x38" reg. price \$21.00, Special at \$7.25 per panel

American Sales Co., 21 Warren St., N. Y. C.

CALLS HEARD

(Continued from Page 45)

9cv 9cya 9dah 9day 9dcg 9dga 9dit 9dmi 9dng 9dpi 9dpw 9dqe 9dr 9dul 9eag 9eas 9eav 9efo 9egh 9ei 9ek 9eld 9ell 9ep 9hp 9kg 9ln 9lv 9mz 9pd 9vz 9wr 9za naa nao wvz wuby wvz xc6l nc-lak nc-lar nc-lbi nc-lbr nc-1dq nc-2al nc-2bc nc-3fc nc-3jm nc-voq nj-2pz nm-1n nm-9a np-4aag np-4jg np-4oi nq-2cf nr-2fg nr-cto sa-cb8 sb-law sb-lax sb-2as ss-2bn sv-ayre sv-1xc af-hva oa-2dy oa-2ij oa-2jw oa-2no oa-2rc oa-2rx oa-2tm oa-3am oa-3bd oa-3bq oa-3ea oa-3hl oa-3lg oa-3xo oa-5bg oa-5hg oa-7cw oa-7gh oa-7pf oz-2ae oz-3ai oz-3aj oz-3ar oz-4aa oz-4ae oz-4ar.

H. & W. Hazeldene, 31 King St., Canterbury, Kent, England

(Heard during April)

(20 meters)

laba laep lahi laqa lauk lawe lbeb lbd1 lcdp lco lera lia lio lmf lzl 2aer 2akl 2alm 2ann 2apa 2atk 2awx 2ays 2bnc 2bur 2bwr 2cjd 2cla 2ctq 2nm 2ox 2wc 3ade 3akw 3bgg 3di 4dv 4jm 4tv 5ac1 5mi 5uk 6bzm 6ckv Baks 8aul 8bde 8bes 8edf 8cli 8dan 8drj 8kc 9anz 9bq 9cvt 9cn 9cxx 9ef 9emb nc-lac nc-3gg nc-3mp nc-9al sb-lac sb-lad sb-lak sb-law sc-2ar sc-2as sc-3ag fo-a4e fo-a5x af-1b ai-2kt np-4je.

(40 meters)

1aao labt labz ladm laff lafn lagn lahr lajf lajx lair lapv lasa lasy latx laur lavf laxx layj lbbe lbeg lber lbdb lbez lbhm lbr lbr lbe lbf lbqm lbxx lcjc lcmx lda lde lfc lid lik llc llu llx lmv lnl lnz lqi lrf lrr lsz lww lxaw 2abp 2aes 2ags 2ahf 2ahm 2aiz 2akj 2amp 2aqw 2atk 2awq 2awx 2bag 2bbx 2bem 2bir 2bxu 2cep 2cs 2est 2euq 2euz 2md 2pv 2rs 2t1 2t2 2uf 2uk 2vd 2vh 2wj 2wr 3acm 3afw 3bwt 3ce 3dw 3hg 3pf 3mv 3wj 4bl 4db 4fv 4gl 4jp 4lk 4mi 4ok 4oy 4rn 4si 4wo 5jd 5kc 5mx 5oa 5uk 8aef 8ahd 8aj 8bj 8bau 8bfb 8bjb 8box 8ccs 8civ 8cln 8cpl 8dai 8dbe 8dcm 8jq 8vx 8vz 9adk 9ahq 9be 9bhx 9cfr 9ctg 9cwy 9dah 9dj 9ox nc-lad nc-lbr nc-1dm nc-2bg nc-2bh nc-8azs wuby.

F. Pemberton, 115 Cambridge Road, Wimbledon, London, S.W. 20, England

(Heard on 20 meters during May and June)

6agq 5wz 6agr 6azs 6dfe 6tx 6vz 6zat 7ek 9ac1 9bq 9cei 9cf 9cn 9ein nc-lbr nc-2be nc-3bt nc-5au nd-hik np-4je np-4sa nr-lur nr-cto oa-3bq oa-3xa oa-4bd oa-4rb oa-5bw af-1b ai-2kt fo-a4f fo-a5x su-2ak glky x-cr10.

(Heard on 33 and 45 meters during May and June)

5abk 5ame 5di 5kc 5zai 5mi 6am 6bh2 6ctx 7ek 9bqy 9cvy 9dd 9efo 9ell 9vo nc-1bh nc-2br nm-1j nm-m3y np-4bm np-ck4 nq-2cf nr-2fx nr-2gxp sa-cb8 sv-ayre sv-1xc oa-2yi oa-7cw oa-7hl oa-7pf oz-2ae oz-3ar oz-4aa oz-4ac oz-4ae oz-4ar aqe ardi oik x-cbz wvz.

R. A. Rowden, 12 Pennsylvania Road, Exeter, England

(Heard during May and June)

ladm laee laep lajm lakm lanz laoh lapr laqa lasu laur lavj law lawm laxx lazd lbat lben lbeb lbed lbez lbqg lbhw lbhs lbvr lbyv lbyx lchb lcfz lcmf lcpz ldf lfn lgc lgh lie lmr lnq lnx lqc lry lsz lvc lxm lxy lzd 2aap 2abf 2abp 2adl 2afz 2agn 2ags 2agu 2ahb 2aib 2alp 2alw 2amf 2amj 2ang 2ann 2aoj 2aqw 2arb 2ar2 2ase 2asz 2atk 2avb 2avk 2avr 2avw 2azk 2bad 2ber 2bow 2bxu 2ch 2cmq 2cuq 2ewm 2czr 2di 2em 2fa 2fs 2gx 2hw 2ie 2iz 2je 2jn 2nm 2or 2ox 2pv 2qp 2qs 2sg 2uo 3adi 3aed 3ag 3agc 3agr 3ahl 3ajc 3akw 3bco 3bfg 3bqz 3bwz 3bwt 3cvt 3cin 3ckj 3ep 3ec 3ep 3gp 3iu 3nc 3ow 3ph 3rd 3sg 3sh 3su 3sz 3ft 3tu 3wc 3wf 4aah 4aar 4af 4bj 4ce 4cj 4db 4fa 4fu 4fv 4fx 4fy 4gl 4hz 4if 4io 4it 4km 4lk 4ll 4nf 4ok 4oy 4pf 4px 4qb 4qq 4rn 4rr 4tc 4to 4tu 4vh 4we 4xe 5ae 5aqz 5ahm 5ame 5aof 5aqr 5ax 5bf 5by 5di 5df 5dx 5fe 5mx 5qj 5ql 5uk 5wz 5zai 6azs 6bu 6bx1 6bz2 6dfe 6hm 6tz 6vz 6zat 7ek 7xf 8acz 8adk 8aqz 8aj 8alu 8aly 8aro 8arx 8asf 8auq 8avd 8avk 8av 8ay 8bay 8bet 8bep 8bno 8bnz 8bok 8bou 8box 8bq 8br 8brd 8bsu 8bt 8bun 8bxa 8ccq 8ces 8cek 8cl 8cis 8cke 8clp 8enh 8cwb 8cxh 8dem 8dhx 8diq 8djp 8dkx 8dl 8dsy 8ew 8jq 8kc 8kf 8li 8qb 8sf 8vj 8vx 8wt 9aat 9abs 9abz 9ad 9adg 9afx 9ahk 9aic 9anz 9ara 9auu 9axb 9bdt 9beq 9bht 9bmw 9bpb 9bxi 9cei 9ect 9cfn 9cm 9cn 9cnc 9erj 9ctu 9cvn 9db 9dck 9ddz 9des 9dkc 9dng 9dud 9dws 9eag 9eas 9ebp 9ef 9efh 9el 9ell 9hp 9ow 9aj 9wr nc-lad nc-lar nc-lbr nc-2be nc-2cg nc-3bt nc-3ct nc-3fc nc-3jm nc-3nv nc-9al nc-9b2 nm-1j nm-1n nm-9a nr-2fg nr-cto ns-1fmh nj-2pz np-4jg nq-2cf nn-1nic nz-cz5 oa-2ds oa-4bd oa-5bw oa-5sh oa-7cs

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Has a moisture permeated bypass condenser ruined your receiver or amplifier? A defective bypass condenser or coupling condenser in a receiver or amplifier mars reception—causes distortion.

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R.C.A.--U.V. 712 A-F transformer	2.45
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R.C.A.--U.V. 1714 R-F "	1.45
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Erla "	2.45
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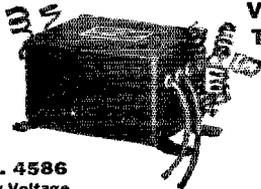
These two famous receivers as well as scores of other well known sets owe no small part of their marvelous performance to the use of Karas Parts. Karas Condensers, Transformers, Filters, Coils and Dials are the perfected products of a factory which has been building precision electrical apparatus for more than a third of a century. Write today for complete catalog of all Karas Parts, and details of the Knickerbocker 4 and the 2-dial Karas Equamatic.

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 —and Dongan Low Voltage Transformer



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 Low Voltage
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UY 227 Tubes.
 \$8 List.

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No. 4586 A C Power Transformer is designed to function also with 1X 171 power amplifier tube; No. 4587 with 1X 210 power amplifier tube.

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em-stauv ei-lse ei-laiw ei-nif ei-lalf ei-lala es-2nm
 es-2co eslco es-2nd eg-5uw eg-2to eh-9xd fm-8jo er-5aa
 ee-earf ee-earf28 en-oga ei-lgw ei-ltu ei-ler ei-lmt
 ei-lno ei-lay ei-lrm ardi eb-n33 eb-4ww eb-4ac eb-4ac
 eb-4ar eb-4xx eb-4ck eb-4au ef-8am ef-8yor ef-8nu
 ef-8jj ef-8aj ef-8nox ef-8jt ef-8tis ef-8eo ef-8ix ef-8ec
 ef-8ft ef-8ax ef-8xx ef-8xuv oye ep-lae ep-3iz fo-8br
 fo-8x fo-a6n fo-a3m fo-a3w fo-a4 fo-a4 ac-lers ac-8ro
 ac-8em ac-8fo ac-2ff ac-8hb ac-xny ac-x2nr aj-lsm
 aj-jkob aj-lsk aj-lfm aj-jkzb aj-jrc ss-2bn ce-8xz.

ei-1ER. Mario Santangeli, S. Eufemia No. 19,
 Milano, Italy
 (June and July)

lahg lanz latv lazd lazn lbat lbge lpo lql 2amh
 2aol 2avw 2a 2bdj 2erb 2ew 2tp 3mz 3ql 3sh 4hx
 4rn 5aof 8adg 8adh 8aj 8bav 8erp 8ess 8cxd 8dia 8uk
 8gj 9uu af-lb ne-1dq ne-3bt oa-lcw oz-2af oz-2ga
 sb-lax sb-lbr sb-2ar sb-2ax se-3ar wnp Oic.

oa-3HL, A. T. Hutchings, Callawadda, Victoria,
 Australia
 (Heard from May 1 to June 30)

laao ladm laka lsmu lfs lagh lvc 2ahm 2apd
 2ejx 2erb 2azr 2fg 3z 4fu 5adz 5aut 5aof 5eb 5jd
 5ok 5ql 6aak 6adn 6ajm 6ala 6akw 6xam 6aby 6azs
 6aeb 6bh 6bia 6bgz 6bh 6buz 6bxd 6bzh 6byh 6bq
 6bol 6cua 6cug 6tx 6olk 6eky 6cxy 6cto 6eww 6cxy
 6ack 6cdq 6dfe 6dht 6ew 6gn 6ju 6ja 6rr 6nl 7abb
 7ajy 7aef 7ld 7gp 7sf 7lj 7to 8ajm 8air 8aq 8axn
 8bau 8ev 8ojm 8dhs 8ddi 8don 8dkx 8fj 8ke 9adg
 9afx 9ara 9djm 9auu 9ebe 9erj 9esh 9ek 9eva 9eir
 9ev 9ekf 9dr 9drd 9dud 9ln 9vo 9ow 9dpp ne-5go
 ne-4di ne-4du ep-laf op-lhr op-lbd.

oa-6KX, Henry T. Simmons, 34-1st Ave.,
 Inglewood, West Australia
 (Heard on 40 meters during May)

1bf 1ar 1boe 1aof 1qh 1bqm 2xai 2tp 2qf 2apd 2sh
 2es 2ub 3eet 3au 3ny 3pf 3agp 3bop 4rn 4fa 4iz
 4fu 8bn 8djp 8bqp 8bn 8da 8x 8sm 8sm 8eac 8eau
 8awt 8dha 8amu 8exx 9daj 9eyb 9bre 9dkk 9dod
 9aop 9dob 9djp.

ec-2UN, Radio Club Czechoslovak, Prague,
 Czechoslovakia

laaf lan 1bur 1cmx lrd 2agn 2aol 2eyx 2jn 7al
 8adg 8am 8ev 9uy 9u ad-ldh fo-2f fi-lw fm-ocrb
 fm-8ap fm-8ip fm-8jo fm-8ma fm-srit fm-8yx nd-hik
 ni-8ps sb-lar sb-law sb-lbr sb-lfa sb-lia sb-2aa
 se-2ah se-2ar agb and gbb gbm glq rky 2xad 2xr.

sa-HGE, H. G. Fare, Nueva York 4575, Villa Devoto,
 Buenos Aires, Argentina.

(Heard between June 15 and June 30)

lazd lxy 2fs 2bi 5aci 5aud 5rg 5aky 6dr 6bix
 6bo 6exi 6bk 6bol 6arp 6ago 6onm 6bro 6ebe 6bwk
 6edl 6bf 6ef 6biu 6cua 6hoo 6eyo 6die 6eur 6hxy
 6bye 6eh 6dhw 6anc 6fp 6xap 6dgr 6dgr 6cua 6a't
 6hrm 6bvw 6aul 6er 6ag 6ccs 6drx 6czf 6pvu 6dfo
 6anc 6pr 6sb 6rn 6aej 6nam 6dfe 6uz 6dic 6adk
 6ou 6aak 6em 6cua 6bf 6bx 7adj 7cu 7abd 7q
 7af 8e 8bww 8evs 8bet 9bef 9ajw 9dod 9dud 9bwj
 9hff 9enn 9dqy 9bcq 9ect.

en-0VN, QSL via I.A.R.U., Noordwijk, Holland.

laab laep lajm lakz lbbo lbux lbyv lccz lcmf
 lcmx ldm lff llf lrf lro lry lww llz 2agn 2ah
 2amo 2aol 2ch 2jn 3hw 3jo 4uy 4xe 8adg 8aly 9mm
 sb-law sb-2aa sb-2ar sa-fcb sa-da5 sa-da8 ne-Zar
 ac-lcr se-Zah se-Zar np-4wq wnp.

nc-3VS, Val Sharp, 280 Sydenham Street,
 Kingston, Ontario, Canada.

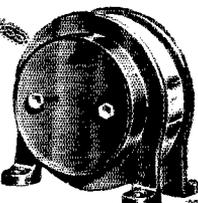
lbat lbdq lpa laa lbux lkx 2lf 2fs 2avr 2avw
 2alm 2dr 2hec 3ag 3mv 3ual 3bme 4af 4ko 4ok 5avz
 6ea 6aon 6bam 7xt 8dem 8chk 9dh mnd-hik nm-1n
 nm-5n nq-2ac nq-2cf nq-2cu nr-2fg nz-4eh eb-4ww
 eb-4zz eb-4ax ef-8jf ef-8gf ef-8ep ef-8g ef-a3b
 en-0ja fq-pm ek-4uab ep-3iz fx-3fw oa-3hl oa-2hm
 oa-2uk oa-3aa fm-8st oa-5hw oa-5bw oa-5hs oz-3aj
 oa-4rb oa-7wf oa-7pf sb-law sb-2ak se-2al se-2ar
 se-2ah se-7fs sg-2ar sj-bsj sq-ket sb-bzl su-loa sgl
 gbm ardi wnp voq rjc nm-xc4l.

1BUX, Touisset, Mass.
 (20 meters)

eb-4aa eb-4au eb-4ax eb-4ck eb-4dj eb-4uu eb-4ww
 eb-4zz ee-2un ef-7ez ef-8el ef-8ct ef-8fd ef-8fz ef-8ft
 ef-8gi ef-8ix ef-8jm ef-8nn ef-8px ef-8udi ef-8yor
 eg-2bm eg-2lz eg-2nh eg-2es eg-5by eg-5dh eg-5gq

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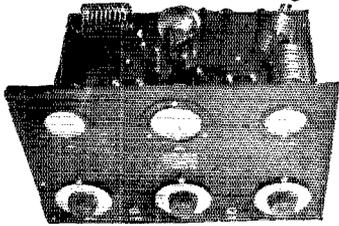
SHORT WAVE EQUIPMENT

Transmitting and Receiving

SEND FOR LIST

KLAUS RADIO & ELECTRIC CO.
 EUREKA, ILLINOIS

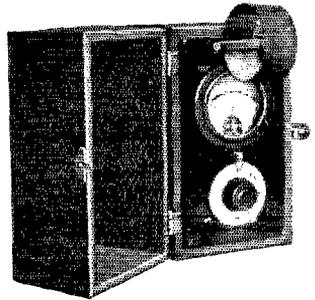
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Transmitter kits as illustrated composed of highest grade parts available, thoroughly metered, Not revamped receivers.

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 Plate Transformers for the 75-watt UX-852 tube in stock.



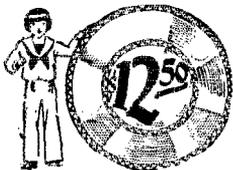
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Gross short wave receiver kits are composed of high grade parts such as Gross plug-in coils, Cardwell variable condensers, vernier dials and other high grade parts necessary to complete the receiver.

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eg-5yk eg-5yx eg-6oo eg-6yv gc-6iz gc-6ko eg-2it
eg-6mu ei-lay ei-cir ei-lgw ek-4uah em-smuk en-0ga
en-0ja en-0vn eo-17c sa-da5 sa-fc6 sb-lac sb-lac
sb-lad sb-law sb-ltr sb-1ib sb-1ld sb-2aa sb-2ab sb-2ar
sa-3ag sa-2ak fm-tun2 ne-8af nj-2pz np-4jq np-4sa.

(40 meters)

oa-2ay oa-2gw oa-2hm oa-2ij oa-2mh oa-2ms
oa-2rh oa-2rt oa-2rw oa-2rx oa-2sh oa-2ss oa-2tm
oa-2uk oa-2yh oa-2yi oa-2yj oa-3bd oa-3cp oa-3fs
oa-3hl oa-3jk oa-3lf oa-3lg oa-3rp oa-3vp oa-4bd
oa-4cg oa-4go oa-4nw oa-4ax oa-5bg oa-5bw oa-5hy
oa-5cm oa-5da oa-5dx oa-5hg oa-5if oa-5ww oa-6mu
oa-6sa oa-6cs oa-7cw oa-7dx oa-7hl oa-7an oz-1ao
oz-1fe oz-2ac oz-2al oz-2ga oz-2hd oz-3aj oz-3al
oz-3ar oz-4ay oh-6acg oh-6amu oh-6buc oh-6dba
ea-gp eb-4aa eb-4ac eb-4ar eb-4au eb-4ck eb-4ll
eb-4kk ed-7cz ee-ar6 ef-8cp ef-8eo ef-8ez ef-8gi ef-8kg
ef-8ko ef-8ku ef-8ng ef-8nn ef-8oe ef-8oo ef-8udi
ef-8vvd eg-5mq eg-5uw ei-cir ei-ldm ei-ler ei-1fg
ei-1gw ei-1uu ek-4da ek-4xa ek-4yo ep-lae ep-3fz
ep-3gb er-5aa es-2nn sa-cb8 sb-1ah sb-1ap sb-1ar
sb-1aw sb-1ax sb-1be sb-1br sb-1cg sb-1ck sb-1id
sb-2ab sb-2af sb-2ag sb-2ak sb-2ar sb-2ax sb-6qa
sb-snni sc-2ar sc-3ag su-lam su-led su-loa su-2ak
nf-bat nj-2pz nm-1aa nm-5c nu-1nic np-4sa nq-8kp
nr-2fg nz-ez5 gly voq vvg fi-pm xg-2gw xnu-7cbz.

H. J. Conti, 15 Habor Terrace Drive, Rye, N. Y.

5acl 5ala 5axn 5df 5ek 5px 5qj 5rg 5ux 5wo
6akt 6atp 6bbn 6gmn 6chl 6cua 6rb 7mf 7mo nc-lap
nc-lar nc-2bb nc-3dt nc-3dz nc-3el nc-3nc nc-4gi
nn-1nic nq-8kp sb-law sb-2ay sc-2as ea-gp eg-6yq
fi-pm wuby wuo kfzq yr.

2AGN, E. L. Sielke, 350 Grand Ave., Englewood, N. J.
(20 meters)

(Heard during June and July)

5api 5lu het hdx 5aa0 5dq 5acl 5fu 5hs 5ax 5aqu
5pt 5aq 5wo 5wz 5akp 5sh 5ek 5aiu 5ava 5akx 6rr 6hzf
6dam 6dec 6azp 6dan 6edw 6bux 6dgg 6byz 6ary
6bxi 6apa 6bgy 6rn 6bam 6cag 6km 6agr 6alg 6bbn
6bjf 6sj 7de 7bm 7da 7rl np-4pq ef-8fd sb-lax
sa-fc6 sb-2aa eg-2lz ef-4ww eb-all ne-8af nj-2pz
ef-8hip ne-4fa ne-1br nf-bat np-4sa ef-8ft eg-5hy
eg-5ls eg-5yx su-2ak eg-5hs eg-2bm eg-6ta eg-6yk
ef-8bf ne-1dm ef-yor eg-5ms ege-8ko ef-8xz eg-2it
em-smuk sc-2ah sb-2ag eg-5ku sb-lad eb-4zz wup
voq wobb.

(40 meters)

sb-lar sb-2af ef-8jf sb-1ib oz-4am oz-4ar oa-7hl
fo-a4x fm-8mb sb-2am sb-lak ei-1gw oa-2yi nj-2pz
ni-4x sb-law nm-1j ny-rxy oa-2rt oa-2uk oa-2rb
no-1kx sa-bal ef-8ux eb-4zz eg-2xy sb-2ig nm-3f
ef-8ix nq-2ro sc-2ah ek-4kka ek-4uah ek-4ud eb-4ac
ef-8oe eb-4ax ep-lae nr-2fg ei-ler ef-8est en-0ga
su-2ak ef-8fmb eg-5mq ei-1uu ef-8ez ef-8cp ei-1no
oa-2ho oa-2as oa-2rx ef-medj x-ahk nf-bat er-5aa
eb-4ck ek-4yo eb-4yz ef-8fr nc-12x nm-9b GX nc-4fv
oa-2hm oz-3aj oa-4go.

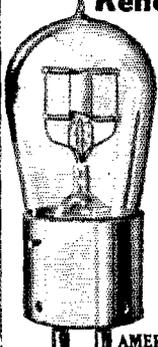
3AG, Bill Hunton, Falls Church, Va.

(Heard during the last four months)

7aab 7aae 7abb 7acf 7adm 7alk 7ay 7dd 7de 7df
7dk 7ek 7fb 7fh 7fg 7gb 7ki 7lx 7tz 7kz 7lz 7m
7ob 7or 7rl 7rx 7uj 7z 7vl 7vu 7vs 7wz 7ww 7xf
7ya 7ye 7zo af-8lha ea-gp ea-1l ea-iz eb-k6 eb-n38
eb-u3 eb-3as eb-4aa eb-4ww eb-4zz ea-ea25 ea-ear55
ef-8bf ef-8cp ef-8eo ef-8fr ef-8ij ef-8max ef-8sm
ef-8vx ef-8zo eg-2it eg-2nh eg-2nl eg-2sw eg-2to eg-2vi
eg-2xy eg-3ad eg-3by eg-3ku eg-3ky eg-3mq eg-3oc
eg-3sz eg-3vx eg-3bd eg-3fa eg-3mu eg-3h eg-3uz
eg-3vp eg-3vq eg-3yv eg-3ib eb-4nd ei-1bw ei-cir
ei-ley ei-ldr ek-4abg ek-4uah en-0fg en-0fp en-0ga
en-0ja en-0pl en-0pm en-0ro en-0uc ep-lae ep-lao
ep-3fz ep-3gb es-2eo fa-4a fb-3xb fm-8ma fm-8at
fo-a3c fo-a3m fo-a3x fo-4a fo-a5x fo-a6n fo-a6r
fo-a7o fq-pm nb-ank ne-4bn ne-4ck ne-4dw ne-4dy
ne-4eh ne-4ek ne-4fo ne-4fz ne-4gi ne-4gt ne-5ac
ne-5ar ne-5bn ne-5go ne-5hp ne-8aw ne-8azs ne-8rg
ne-9ai ne-9aq ne-9ed ne-9eo nd-hik ne-8rg nf-8bat
nj-2pz nl-1p nl-2t nl-4x nm-1n nm-1o nm-1p nm-02
nm-8p nn-1nic np-4ja np-4rx np-4sa np-2ef np-2eo
nq-2jt nq-2lc nq-2mk nq-5az nq-6by nq-7ex nq-8kp
nr-2fg nr-98x nz-ez5 oa-3es oa-3wp oa-5bq oa-5bw
oa-5by oa-5dx oa-5hb oa-5hg oa-5wh oa-5wa oa-6gm
oa-6mu oa-7ep oa-7pf oh-6amu oz-1ac oz-2cg oz-2sh
oz-3al oz-3ap oz-4am sa-bid sa-bgr sa-cd8 sa-cf3
sa-dm7 sa-dw4 sa-em8 sa-fr3 sa-ga2 sa-hd2 sa-hb5
sa-hd7 sa-ka7 sb-1af sb-1ap sb-1bk sb-1br sb-1bu
sb-1ic sb-2ad sb-2aj sb-2ai sb-2ar sb-2as sb-2ax
sb-2ia sb-2ab sb-3aiq sb-6qa sb-7ab sb-snf sb-qlx

Kenotron Rectifying Tubes (Type T.B.I.)

MFD. BY GENERAL ELEC. CO.



These rectifying tubes operate on a filament voltage from 8 to 10 Volts and draw 1 1/2 amps. They will safely stand an A.C. input voltage up to 750 Volts and pass plenty of current and voltage for the plate of the Transmitting Tubes.

They are also very efficient rectifiers for use in "B" Battery Eliminators.

STANDARD BASE
NEW IN ORIGINAL CARTONS

PRICE ONLY \$1.25 Ea.

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

HERCULES AERIAL MAST

\$10 and up. We pay the freight. All steel construction. 20 to 100 ft. high. Roof or earth type complete with guy wires, masthead pulley etc. Writer for full details. S.W. Huff Co. Dept. 8 2048 E 78th St., Cleveland, Ohio



Hey, I am - Have u ordered ur copy of Andy's Handbook?

THE BEST \$1 YOU EVER SPENT!

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

FILTER CONDENSERS

Manufactured by Dubilier Condenser & Radio Corp.



1 3/4 mfd. 1000 volts rated D.C. Working Voltage Extra Special at **\$1.35** each
7 mfd. 600 volts. rated D.C. Working Voltage Extra Special at **\$3.50** each

Manufactured by Stromberg-Carlson Tel. Mfg. Co.

3 1/2 mfd. 600 volts rated D.C. Working Voltage Extra Special at **\$1.75** each

All of these High Quality Filter Condensers, are brand new, and guaranteed as rated. They are excellent for use in your Transmitter, Eliminator or Experimental Work.

AMERICAN SALES CO. **21 Warren Street, N. Y. C.**
 .000125 mfd. 1000 Volt Dubilier Mica Condensers for short wave work. Special **\$1.10** each

Laboratory Product



**CRESCENT
LAVITE
RESISTANCES**
(for Distortionless Amplification)

As Transmitting Grid Leaks, they are made in special sizes and are not afraid of power. Dissipate 10 watts. Four standard sizes \$1.50 ea. Special resistances \$2.50 ea.

Cresradio Corp., 166-32 Jamaica Ave., Jamaica, N. Y.

RADIO SCHOOL

Send for Catalogue

**MASSACHUSETTS RADIO and
TELEGRAPH SCHOOL**

NEW TERM SEPT. 12

18 Boylston St. Boston, Mass.

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

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

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

.....1927

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

.....

.....

Station call, if any

Grade Operator's license, if any

Radio Clubs of which a member

Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of *QST*?.....

Thanks!

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

HAM-ADS

NOTICE

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

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

(2) The signature of the advertisement must be the name of the individual member or his officially assigned call.

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

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

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

(6) The "Ham Ad" rate is 7c per word. Remittance for full amount must accompany copy.

(7) Closing date: the 25th of second month preceding publication date.

THE life blood of your set—plate power. Powerful permanent, infinitely superior to dry cells, lead-acid, Bs, B eliminators. Trouble-free, rugged, abuse proof, that's an Edison Steel-Alkaline Storage, B-battery. Upset electrically welded pure nickel connectors insure absolute quiet. Lithium-Potassium solution (that's no lye). Complete, knock-down kits, parts, chargers. Glass tubes, shock-proof jars, peppy elements, pure nickel, anything you need. No. 12 solid copper enameled permanently perfect aerial wire \$1.00, 100 ft. Silicon steel laminations for that transformer 15c lb. Details, full price list, Frank Murphy, Radio 8ML, 4837 Rockwood Rd., Cleveland, Ohio.

TO licensed hams only—\$12.50 Aero Kit \$8.13. Ferranti \$12 audios \$7.80. \$25 Browning-Drake kits \$16.25. \$85.10 Loftin White kits \$51.06. \$10.00 Enco Cone 36" kits \$7.00. \$32.50 modern compact B eliminators with Raytheon \$19.50. Latest original packages. Discounts on Cardwell type E, Karas., Hammarlund, AmerTran, Aero, Jewell, Thordarson, Benjamin, Samson, Perryman, Ward Leonard 55%. On Sangamo, Lynch, Daven, Marco, Bodine, Yaxley, Paent, Ceco 40%. All prepaid. Our weekly data sheets give more dope than all radio magazines together. 20 weeks trial \$1.00. 52 weeks \$2.50. Over two pounds data, circuits, catalog, prepaid 25c. Fred Luther Kline, Kent, Ohio.

PURE aluminum and lead rectifier elements holes drilled brass screws and nuts, pair 1/16", 1"x4" 13c, 1"x6" 15c, 1 1/2"x6" 17c, 1 1/2"x6" 19c. Sheet aluminum 1/16" \$1.00, lead \$1.00 square foot all prepaid. Silicon transformer steel cut to order .014" 10 lbs. 25c. 5 lb. 30c, less than 5 lb. 35c per lb., .022" thick 5c less per lb. Postage extra. Edgewise wound copper ribbon, 7 sizes, see Jan. QST. 1/2" square copper wire better than copper tubing 50c lb. postage extra. Air pocket insulators blue glazed porcelain 8" leakage path fine for transmitting, 4 for \$1.00 prepaid. Geo. Schulz, Calumet, Michigan.

PARTS and supplies for Edison element storage "B" batteries in stock for immediate shipment. Type "A" elements with welded connector, 5c per pair. Type 3-G, 6c. Type 5-G, 3000 Milli-amp capacity, 9c. Separators free with all elements, 3/4"x6" tubes, 3c. 1x8", 4c. No. 20 pure nickel wire, 1c per ft. No. 18, 1 1/2c. Potash-Lithium for making 5 lbs. Edison solution, 55c. Specials. 100 volt Type 3-G unit, complete, \$3.50. 140 volt, \$11.00. 140 volt Type 5-G, 3000 MA, steel case, complete, \$16.00. All prices are F. O. B. Philadelphia. J. Zied, 904 N. 5th St., Philadelphia, Pa.

1kw plate transformers 2000-2500 each side, \$30.00. 700 watt 550-700v \$10.25. 150 watt filament transformer watt 1000-1500v \$14.25. 700 watt 2000-2500v \$17.25. 250 8-12v, \$8.50. 700 watt 25 cycle 1000-1500v \$18.00. 200 watt 25 cycle filament transformer 8-11v \$11.00. Or can give any size transformer you want. 30 Henry 150 mil choke \$12.00. 9CES F. Greben, 1927 S. Peoria Street, Chicago, Ill.

1100 V. Transformers with 7 V. filament winding \$8.75—U. V. 712 Transformers 90c—Edison BB4 Batteries \$3.50—100 Henry Chokes \$2.75—Get my big new special bargain list—Chas. O. Snyder, Richmond, Indiana.

DODGE Radio Shortkut fixes signals in mind to stick. Users report rapid advance to 25 per. Also state intensive Speed Practice (as follow up) most efficient speed booster known and Morse Shortkut eliminates code mixup. 81W ex SBHM Phillips "Shortkut produced speed 25—15W boosted to 35—more if could type faster. ORS-OBS—Navy Reserve—Army Net". 2BXY Gundrum "Morse method fine. Working both codes now". Reports on request. Radio with Appendix and Better Key Work \$3.50. Speed Practice \$2.50. Morse \$2.50. Money Order. Foreign add fifty cents. No C. O. D. C. K. Dodge, Mamaroneck, N. Y.

HAMS—Why pay big prices for QSL cards? Before ordering get my prices ex samples. Can save you money. As you want 'em. No stock forms. Every card different. SCUX. Fred E. Church, Millington, Michigan.

SAVE your hands! Pure aluminum and lead elements complete, holes drilled, screws, nuts, pair 1/16" 1"x4" 12c, 1 1/2"x6" 17c. Square foot \$1.00. Ammonium phosphate, "beats borax" 50c lb. prepaid. J. J. Jacobson, 535 West 136th St., New York City, 2AHE.

WANT to buy for cash—250 watt; Supersync or mercury arc; transformers; complete equipment. R. D. Chamberlain, 1118 West 7th, Grand Island, Nebraska.

TRADE—Bb tenor, Eb alto, Bb or C Soprano Saxophones; 2 Sonora 6 tube broadcast receivers for transmitting apparatus Bb es Eb saxs. Receivers new, 8BBS.

TWO and four cylinder gasoline engine power units generating 50 volts 750 watts DC also 500 watts 500 cycles AC. Motor generators any capacity to 5KW. Navy portable transmitters complete with power units. Navy Wavemeters \$45.00 Sanzamo Ampere meters designed for battery use \$10.00 GN 240 1,000-10,000 meters \$45. Westinghouse 27.5-350 volts .08 amperes \$18.00 1/2 KW 500 cycle transformers \$12.50 Henry Kienzle 501 East 84th Street New York.

BUCK tubes with six months guarantee. UX201As 75c. UX199s 75c. UX200As \$1.50. UX171s \$1.50. No. 12 enameled aerial wire 90c 100 ft. Choke coils 25c. Amateur Call Books. Frank A. DeLaMater, 311 East Adams, McAlester, Okla.

SELL Grco CR18 never used. Full set coils \$75.00. E. F. Koehler, 4417 Clayton St., St. Louis, Missouri, 9BEU.

A. R. R. L. sweater emblems should be worn by all league members. They are made of the highest grade black and yellow felt, 5"x8" diamond, \$1.00 postpaid. No COD's. Eric Robinson, 185 Jefferson Road, Webster Groves, Mo.

FOR sale—Acme 250 watt plate transformer, 550-1100 volts either side center, \$20.00; UV203A use five months at nine volts filament, normal plate, \$20.00. Both for \$35.00 cash. 9COS, Rochester, Minn.

THE new Jeffries plate transformer, 1000 watts, 4400, 3300, 2200, 1650, 1100 volts, all voltages have center taps. Price \$19.00. Write for descriptive folder. Carl Schwenden, 7427 Alameda Blvd., Los Angeles, Calif.

RADIOMEN—Here's the book you need, if you want to pass commercial 1st class radio examination. "Radio Theory and Operating", by M. T. Loomis, President Loomis Radio College, Washington, D. C. Has all the latest dope on tube transmitters, radio compass, amateur short wave transmitting and practical radio. \$3.25 prepaid in U. S. unless sent C. O. D. Regular price \$3.50. Bargain radio circular free. Amateur station 8ADP. I. C. Patchin, 825 Park Avenue, Kent, Ohio.

WANTED—Back numbers QST, 1923, Apr.; 1922, Apr., Aug.; 1921, Feb., Mar., Apr., Aug., Oct.; 1920, all but Dec.; 1919, all but June & Oct.; 1917, all but June, July; Aug., 1916, all. State condition, price, first letter, Fred Elser, 454 Huntington Ave., Boston, Mass.

8AAH has for sale, tubes, sets, cabinets, parts. Write for prices. W. W. Happy, Traverse City, Mich.

RADIO sets and supplies. Write for "Ham discount sheet". I. W. Robson, Heron Lake, Minn.

FOR sale 300v 25w M.G. \$12. Write for list, Edw. Anderson, 8120 Escanaba Ave., Chicago, Illinois.

BARGAIN 7 1/2 watt transmitter complete. Mounted. Two transformers, two Mershon filter condensers, three meters. Fifty bucks takes it. D. E. Haist, Seaton, Ill.

VIBRATING key with big husky silver contacts—does the work of a high priced bug. Send five bucks today—try it—if not as represented, return in five days and get your money back. SAKX, 795 East 88th St., Cleveland, Ohio.

EDISON "B" battery parts 110 volt knocked down unit \$8.75, 140 volt \$11.00. Large size elements connected 5 cents per pair. All parts carried in stock. Send for booklet, M. Rhine, 146 West 68th St., New York City.

HAWLEY Edison element battery and parts standard for over five years. Look at our patent pending connector—no thin wire to drop off—contains 20 times more metal than regularly used. Heavy shock proof cells, fibre holders, etc. Everything for a rapid-fire "B" supply. Complete assembled 100 volt "B" \$10.00. Knock-down kits at still lower prices. Chargers that will charge in series up to 160 volts \$2.75 to \$4.00. Trickle B Charger for 90 to 150 volt "B" \$3.75. Special transmitter "B" batteries up to 6,000 milli-amp capacity, any voltage. Write for interesting literature, testimonials, etc. B. Hawley Smith, 360 Washington Ave., Danbury, Conn.

FOR sale—Crystal controlled transmitter complete with filament and plate transformer and filter in shielded cabinet. Also 2-203A tubes, sockets, Jewell O-1500 voltmeter, O-250 MA, O-7½-150 volts, 4 S tubes, Jewell tube checker, Weston O-7½-150 volts, 2 pr W. E. fones, 4 pr Baldwin fones new, 40 to 75% off for cash. Want 2000 volt motor generator. E. A. Lawton, Plymouth, Ill.

WANTED—Omnigraph! Edmund Bialik, 3455 Diversey Ave., Chicago, Ill.

PARTS for UX213 eliminator \$12.50. Parts for Raytheon "BH" eliminator \$16.75. Chokes; 50H, 125 MA, \$5.75 30H, 125 MA, \$5.75; 50H, 85 MA, \$2.50; 30H, 85 MA, \$2.50; 60 MA, \$2.25. 110 volt 550 transformer, 3.50. 110 volt 420-6 transformer, \$4.00. Best offer takes General Radio 174-B wavemeter. Four microfarad No. 304 condensers, \$2.10. 3"x4"x2" Silicon steel core, \$1.50. Write for new lists of transformers, meters, chokes and miscellaneous material. M. Leitch, Park Drive, West Orange, N. J.

QSL cards, two color \$1.00, per hundred. Free samples on request. F. L. Young, 9CKA, Corwith, Iowa.

WANT steady DC note? Bargain, mounted 100 watt 500 volt MG with filter f.o.b. Hibbing Minn. at \$15.00 complete or will trade for late model vibroplex. Also have two guaranteed UX210's at \$5.00 each or both for \$9.00 these tubes have the new heavy plates, guaranteed first class, Bill Ryder 9CIY-CSU.

SAVE time, money. Let us drill your glass panels. "QRQ" drilling fluid \$1.00. (We use it.) None better. 9BNR, Sorento, Ill.

CURTIS-Griffith 250-watt power-filament transformers 350-550 each side \$10.50. Thordarson power-filament transformers for 7.5-watters \$6.90. Thordarson power transformers 350-550 each side \$11.00; 1000-1500 each side \$16.00. Edgewood Inductance 6-inch turn 12c; 4-inch 10c; 2.5-inch 7c. Aluminum square foot 85c; Lead square foot 35c. UX-852 75-watters \$32.50. "Ham-list" 4c. James Radio Curtis, 5-A-Q-C, 1109 Eighth Avenue, Forth Worth, Texas.

HEADQUARTERS for hams:—Immediate deliveries on Mueller 150-watt input tubes \$15.00, RCA 6-watters \$3.15. 15-dial Omnigraphs \$25.00. UV204A 250-watters used \$45.00, Western Electric D212 250-watters \$50.00. "Ham-list" 4c. Aerovox 1000-volt tested 1-mfd Condensers \$1.75. Romanyel Curtis, 1109 Eighth Avenue, Forth Worth, Texas.

OMNIGRAPHS, teleplexes, natrometers, vibroplexes, super heterodynes, transmitters, receivers, 50 watters, meters, transformers, chokes, "S" tubes, motor generators, 210s, portable sets, bought sold and exchanged. L. J. Ryan, 9CNS, Hannibal, Mo.

400 V, 100 W. Esco coupled to 220 V. 3ph. A C motor \$25.00. 1000 V. 300 Watt Esco motor 110 V. single phase \$35.00. 2000 V. 1000 Watt Westinghouse double commutator \$275.00. 2500 V. 2 kilowatt Generator double commutator, coupled to three phase 220 V. 1750 Speed motor, 2500 Volt 600 W. double commutator generator coupled to 110-220 V. 60 cycle single phase motor 1750 speed. Also many others. 1mfid Western Electric condensers 50c. New ¼ H. P. 110 Volt 3500 speed Robbins & Myers alternating current motors \$8.50. Prices f.a.b. Chicago, James J. Smat, 1734 Grand Av., Chicago, Ill.

WANTED—1 UP1016 Radio Corporation transformer. State price and condition. Also want Thordarson ¾- or 1-kw. Spark Transformer. C. C. Rodimon, A.R.E.L. Headquarters.

CITIZEN'S super 8 kits as described in 1927 radio call book, \$75.00. Write for list of parts used. Lowell Mast, Box 284, South Bend, Indiana.

RCA UX210s—\$6.90, Senatron UX210s—\$6.00, power transformers—Silver Marshal, for UX210s, 7.5 and 600V. center-tapped—\$6.25. For fifties, 12 and 1100V. center-tapped—\$9.00. RF Chokes—80c, milliameters, O-100,—\$2.00; O-300,—\$3.00. Hoyt, AC Voltmeters, O-15.—\$4.95. REL Inductances—\$3.50. Completely assembled all band receiver—\$18.00; Transmitter—\$26.00. Brandes Phones—\$2.75. All bakelite, UV203A sockets—\$1.00. Rectifier Elements, aluminum, lead, pair: 1"x4"—7c; 1"x6"—10c. Calibrated Wavemeters, 17-160 meters,—\$5.00. QSL's, two colors, \$1.00 per 100. Free samples, Free catalogue. Terms: Cash or 25% deposit. William Green, 207 Cathedral Parkway, N. Y. C.

WANTED—Western Electric 7A amplifier. Also any experimental or laboratory equipment you have in your shack. W. Nangle, 949 Lake St., Oak Park, Illinois.

NEON tubes. The most sensitive wavemeter resonance indicator outside of an expensive thermo-galvanometer. These tubes make it possible for any ham to have a wavemeter which gives extremely sharp readings. We are selling two types of tubes for wavemeter use, type "A" small tube for \$85, and type "B" Ultra sensitive, with sealed in wire electrodes, \$1.25. Information on the tube of the thousand uses, sent with each tube, or on request. Also excellent for detecting stray RF. Operates on all frequencies. Every tube new and guaranteed. Let us know your needs in special neon tubes. G. L. Lang, 2AWH, 20 Hillside Ave., Newark, N. J.

We never knew that 1000 Westinghouse milliameters could be sold so quickly with just one small ham ad, but here they are again. We got another lucky buy, and are passing them on to the hams for only \$1.25 each. O-300 DC flush mount, with nickel finish, and black face. Only requires one 2¼ inch hole for mounting. Complete dope with each one. Here's your chance for a real bargain. C. O. D., M. O., or certified check acceptable. All meters in original boxes. E. P. Hufnagel, 879 So. 18th St., Newark, N. J.

ALL Postpaid and guaranteed brand new. R.E.L. 50 watt sockets, \$2.00. R.E.L. mountings for "H" Tubes, \$2.00. R.E.L. Transmitting Inductances, double unit with glass coupling rods and clips, \$8.90. R.E.L. Radio Frequency chokes, \$1.00. Vitrohm 5000 ohm center tapped gridleaks for 50 watt tubes and less \$2.10. Stopping condensers, 2000 volts, .002 mfd., \$2.25. R.E.L. Short Wave Coil Kits, 10 to 110 meters, \$4.50. Prices effective October 1, 1927. 3BMS, G. F. Hall, 535 West Horrtter St., Philadelphia, Pa.

POSTPAID and guaranteed to licensed hams and set builders only. General Radio 358 wavemeters, extra special, \$18.25. Aero 20-40 or 40-80 transmitting kits \$9.20. Aero shortwave receiving kit \$9.50. Write for special discounts on Thordarson Jewell, Acme, Cardwell, Pyrex etc. M. L. Potter, 9DMI, 4410½ Drexel Blvd., Chicago, Illinois.

JEWELL Meters, new, 25% discount. We stock Acme, Thordarson, National, Cardwell, General Radio, Nathaniel Baldwin, Crescent Lavite, Lynch, Tobe Deutschmann, R. E. L., Allen Bradley, Yaxley, Philco, Signal, Bakelite, Samson, Raytheon, CeCo, Pyrex, R. C. A., Grimes RGS, Browning-Drake, Fleron, Hranston, All-American, Ferranti, Aero Products, Acme Wire Products, Ward Leonard, Westinghouse, Eby, Victoreen, Lincoln, Precise, Hammarlund, and many others. We allow discounts to Hams, custom set builders and dealers only. Tell us what you want. A complete line of Ham and BCL apparatus. Specializing in the best parts only. No junk. Roy C. Stage, Montgomery & Burt Sts., Syracuse, N. Y.

DYNAMOTOR wanted 24/1500 or what high voltage machine have you? 8DOA.

FOR Sale: Short wave receiver. Built from QST's Hand Book. All standard parts such as Aero Coils, Samson, Karas, General Radio, Benjamin etc. Used only two months. No cabinet. One Detector and two audio. First \$25.00 takes it. C. E. Woodling, 1123 Hamilton St., Allentown, Pa.

QST—Beginners, Hams: Quality and workmanship of the best characterize short wave receiver, transmitter, wavemeter, etc., low-powered station equipment priced reasonably by Roger Curran, Dundee, N. Y.

TELEFUNKEN 200 watt (output) tubes \$35.—Filament 14 volts, plate 3000 volts; R. C. A. Magnetic Modulators UT1867, UT1357 \$1.; Experimenters Information Service model C7 8-tube superheterodyne \$25. Everything guaranteed; Inquire, Herman Beyer, 56 Pine Street, New York.

START experimenting on ¾ and 5 meters with a UV202 five watter. Genuine RCA in original boxes. They are good dx getters and are 7b for low power transmitters. The price is the lowest ever, only \$2.25 postpaid. Bernard Mitchell, 3520 Sheridan Rd., Chicago, Ill.

GENERATORS, new 275 volt d. c. will give up to 500 volts at 120 watts, \$8. 6 volt input dynamotors output 400 at 200 watts, \$15. 1/2 kw and 1 kw 500 cycle motor generators 120 volts d. c. drive. Slightly used 500 cycle generators 200 watt \$10. 1/2 kw \$15. 200 watt 900 cycle \$10. 500 cycle large meters volt, watt, frequency and ammeters. 5000 ohm gridleaks 75c. Receivers CN113. 300 to 2500 meters \$12. Western Electric VT ones \$1.25. Postage extra. R. Wood, 46-20 102 St. Corona, N. Y.

FINEST thing you ever saw—our silver plated short wave inductances. See the ad elsewhere this issue. Fall amateur call books, 75c; Our No. 20 standoff insulators sell fast at 20c; DeForest type R 300 watt input transmitting tubes \$35.00; New Acme 500 watt plate transformer, 2000-1500-1000 volts each side of midtap, \$30.00; New high voltage Thordarsons also in preparation; Ready soon, a complete line of transmitting filter condensers including high voltage types necessary for the new tubes. Be sure to get the "Hamalog", the original Ham Catalog. It's free. E. F. Johnson, 9ALD, Waseca, Minnesota.

PANEL mounted fone. Meters, tubes, motor generator. Complete for \$75. Also 3 horse power G. E. motor, 1/2 horse power Howell motor. W. W. Brackenridge, Harrison, Ohio.

SELL—400 volt 100 watt motor generator 60 cycle single phase drive with field rheostat, \$25.00. 400 volt 100 watt generator \$15.00. 500 volt 100 watt aeroplane generator \$20.00. All in first class shape. Kelwin Kearney, SCWK, 5658 South Martindale Ave., Detroit, Michigan.

FILAMENT transformers—forty watt. Mounted and accurately center-tapped; for 21Bs or smaller, \$3.50. 9ACA, 1822 E. 27th Street, Kansas City, Mo.

BARGAIN—750 volt Westinghouse double commutator MG, 110 AC motor, \$30. Clarence Burnett, Atkins, Arkansas.

BJW laboratory rheostats improved. Replacing other types. Inductive. For couple 204s or five. Balanced center-tap with BWJ primary and secondary rheostats. Rheostats \$5.00 postpaid. E. E. Hare, Paintsville, Kentucky, #BWJ.

MO' bargains. Western Electric 234W microphone and stand, \$5.00; WE chest mik 323W, \$2.00; Signal antenna switch, \$1; RCA UM530 2 1/2 ampere hot wire ammeter, \$1.50; RCA UL1655 RF choke, \$1; UL1008 oscillation transformer, used, \$3; Clips for same 25c each; UV 202 slightly used, \$2; RCA UP1016 plate-filament transformer \$12.50; RCA UM 578 500 voltmeter, \$6.50; RCA UM 579 1500 voltmeter; UP1656 filament transformer, 7 1/2 volts, \$5; 2AHO, Wm. M. Derrick, 30 Leslie St., East Orange, N. J.

8LO selling out QRM business—Esco, Cardwell, Weston, RCA, all best equipment. Send for list to 8LO, Box 162, Sta. B, Toledo, Ohio.

HAMS: Discount 25% to 40% on parts, sets, and tubes. Myron Martien, Galion, Ohio.

QST cards—two colors, 150 \$1.20; Government cards, 150 \$2.50. Your advertising on 1/3 of address side, 75c extra. H. M. Selden, Cranesville Penn.

WAVEMETERS, ten fifty prepaid. Amateur bands, William Ford, Eldorado, Okla.

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2FW—Otto J. Nilson, 183 Morningside Road, Yonkers, N. Y.

3AFJ—James L. Rubincam, 544 Harmony St., Coatesville, Pa.

3KP—4828 N. W. 16th St., Washington, D. C.

3PG—J. L. Trindle, Jr., Box 119, Oreland, Pa.

3VA—B. C. Algeo, Jr., Box 119, Oreland, Pa.

4DP—49 West 4th St., Atlanta, Georgia.

4ES—455 N. E. 28th St., Miami, Fla.

5AET—J. W. Hudgins, 104 Oakwood Ave., Huntsville, Ala.

5APO—E. W. Blankenstein, Jr., Union & Madison Streets, Natchez, Miss.

5PT—Bruce A. Storey, General Delivery, Mart, Texas.

6AP—H. H. Crow, 118 Occidental Ave., Burlingame, Calif.

6CJW—H. H. Crow, 118 Occidental Ave., Burlingame, Calif.

6DIG—Joe A. Bowers, Box 37, El Centro, Calif.

6JL—Harry M. Lindgren, General Delivery, Fort Bragg, Calif.

6SM—A. E. Ekdale, 159 S. El Molino Ave., Pasadena, Calif.

6AAH—W. W. Happy, 849 State Street, Traverse City, Mich.

6CFB—E. E. Hertel, Ameagle, Raleigh Co., West Virginia.

6KR—W. D. Wakeman, 22 South St., Walton, N. Y.

6RD—C. H. Vincenti, Packard Motor Speedway, Utica, Mich.

9BZI—Robert W. Thielke, Box 342, Ackley, Iowa

9CFS—Henry W. Thielke, 612 Grant Ave., Waterloo, Iowa.

9CIY-CSU—William Ryder, Jr., 1115 Third Avenue, North, Hibbing, Minn.

9CNB—E. I. Fletcher, 1837 Eddy St., Chicago, Illinois.

oa3WH—A. W. H. Chandler, "Cliffs House", Beach Rd., Beaumaris, Victoria, Australia.

KFLF—Yacht "Ripple", L. Elden Smith, 340 N. Painter Ave., Whittier, Calif.

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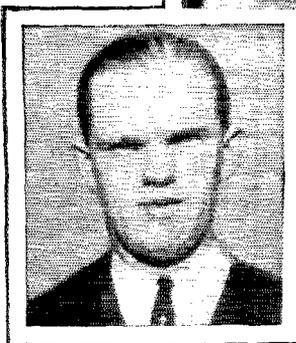
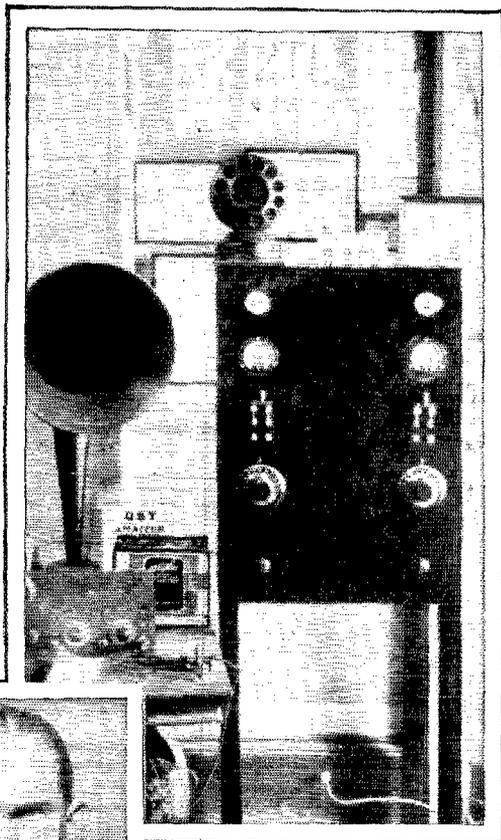
Name.....

Address.....

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“Batteries can't be beat for plate power”



Mr. Jos. W. GIBBONS

Station 2TL
Port Jervis, N. Y.

WHEN you put on the cans and hear the buzzes, rattles and jazz of raw or partly rectified AC; and when in the midst of the racket you suddenly come on a smooth pure DC note, strong, steady, sharp, and easily readable — that's the station you start to copy.

How about yourself, OM? Are you giving the other fellow the sort of sigs you prefer to read? Eveready Layerbilt “B”

Batteries are putting on the air every night the prettiest DC notes you can hear. And as for DX—well, just read this, from Jos. W. Gibbons, 2TL, Port Jervis, N. Y.: “Short waves travel far on low power . . . 7PH of Everett, Washington, heard my signals when using 90 volts of Eveready ‘B’ Battery for plate power.”

2TL adds: “Having followed up radio since the old spark days, I find that Eveready

Batteries have stood the test of time on both transmitter and receiver. The old timers know that ‘B’ batteries can't be beat for plate power for a good report.”

As far as we have been able to discover, the Eveready Layerbilt “B” Battery No. 486 is the longest-lasting, most economical “B” battery ever built, for both transmitters and receivers.

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New York San Francisco

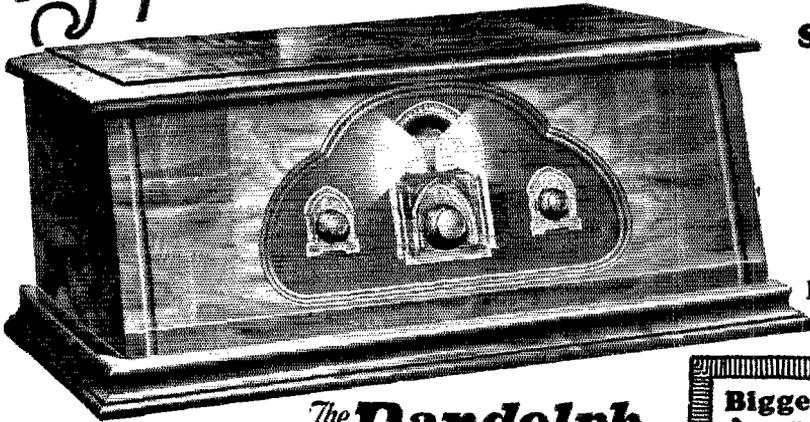
Unit of Union Carbide and Carbon Corporation
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30 Days FREE TRIAL



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7-Tube**

\$ 77

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Powerful 7-tube radio at factory price. Test it without spending a cent. We claim the Randolph Seven will out-perform any radio and we want you to satisfy yourself that it will. To do this, we will send you this powerful radio to try for 30 days. Test it for distance, clearness, ease of operation, tone and every other way you can. Unless it more than satisfies you, return it to us. **Every Randolph set must make good before it is sold.**

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The Randolph Single Seven is sold for use with batteries or connected for operation direct to electric light socket—absolutely batteryless—no chargers or batteries—just plug in socket and tune in. 100% efficient either way. Its construction and performance have been tested and approved by leading radio engineers and authorities and leading radio and scientific publications.

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One drum dial operated by one simple vernier control tunes in all stations with easy selectivity to tremendous volume. No overlapping of stations. Illuminated drum permits operation in the dark. Volume control for finer volume modulation. This is a 7-tube tuned radio frequency receiver with power transformers and power amplification. Space wound solenoid coils. Full and completely shielded. A real receiver of the highest quality. Tremendous distance, wonderful tone quality, simple to operate.

The Randolph cabinets are in themselves beautiful pieces of furniture made of carefully selected solid burr walnut. Bas-relief bronze escutcheon plates are mounted on the dial panel. In design and appearance it is a cabinet worthy of the high-quality radio it contains. Solid walnut beautifully shaped surrounds the soft verdi-green panel.

Nothing has been spared to make the Randolph Seven the leading radio receiver. We are so sure that it will surpass even your best hopes that we know how safe we are in making the 30 day free trial offer.

Read What Owners Say

I have logged more than 50 stations from coast to coast. —Lord Davenport, Littlefield, Texas.
I have logged 52 stations from Cuba to Seattle—the set is a world beater. —J. Tamplin, Detroit, Mich.
Your set is a revelation—has all others tied to the post for distance and selectivity. —Walter Powers, Vergennes, Vermont.
On strength of its performance sold two more sets this week. —T. Scanlon, Orlando, Florida.

Beautiful Ampliphonic Console Set

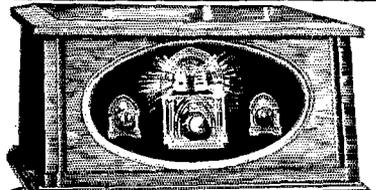
Made of the finest carefully selected solid walnut. Two-tone shaded finish. Has built-in cone loud-speaker that compares with any on the market and accurately reproduces high and low notes. Send for the folder today that shows this beautiful console in full colors and gives complete details. Compare with most table sets in price. For battery or all-electric operation ready to plug in and tune in. Write for complete descriptions.

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\$ 55
Retail Price
Single Control

The Randolph

New, modern, single control, 6-tube radio. Do not compare this set with old style 2-dial 6-tube sets selling for same price. The Randolph 1928 Senior Six has been tested and approved by leading radio engineers. Comes in a beautiful solid walnut cabinet of hand-rubbed finish. Single control. Illuminated Drum with space for logging. Absolutely dependable and very selective. Sent for 30 Days Free Trial. You test it before you buy.

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The Randolph Radio Corporation are pioneers in the manufacture of radios. All of its vast and unlimited resources have been used in making and perfecting of the Randolph Receivers. We know what it will do. Mail us the coupon now.

Use This Coupon Today!

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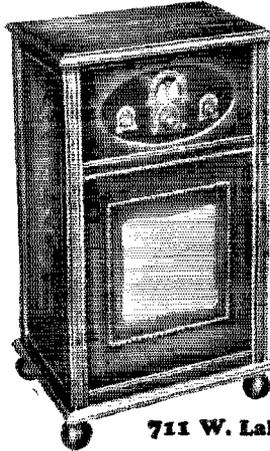
Send me full particulars about the RANDOLPH Six and Seven-Tube Table and Console Sets with details of your 30 Day FREE Trial Offer.

Name.....

Address.....

City.....State.....

Mark here () if interested in Agent's proposition.



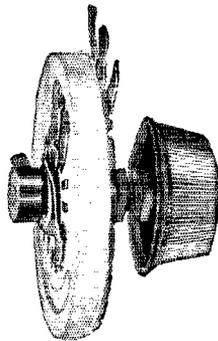
VITROHM RESISTORS *and* RHEOSTATS

Vitrohm Radio Resistors

WARDLEONARD
Resistors and
Rheostats are now avail-
able to the experimenter
and home constructor in
93 types and styles cover-
ing the resistance dem-
ands of every current
supply circuit.

A few of these products
are listed on this page. A
full description is con-
tained in Radio Bulletin
507 which will be sent
you without charge.

"Vitrohm News", a
monthly Bulletin cover-
ing circuits and items of
interest to the radio fan,
was first published in
September. This copy
and subsequent issues
will be sent you upon
request.



THE ADJUSTAT

The Adjustat

The Vitrohm Adjustat is a 15-step potentiometer connected rheostat adapted for use in all current supply circuits. Like all Vitrohm Products, the resistive element, wire, is embedded in and protected by fused-on vitreous enamel.

The Adjustat is priced at \$3.00.

TYPES

507-79	1 ohm	4000 m. a.	507-81	600 ohms	180 m. a.
507-71	2 ohms	3000 m. a.	507-75	1000 ohms	125 m. a.
507-72	6 ohms	1500 m. a.	507-76	2250 ohms	90 m. a.
507-73	20 ohms	1000 m. a.	507-84	7500 ohms	50 m. a.
507-74	30 ohms	800 m. a.	507-77	10,000 ohms	40 m. a.
507-80	50 ohms	650 m. a.	507-78	25,000 ohms	20 m. a.

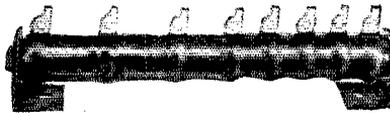
Resistor 507-66

Vitrohm Resistor 507-66 is a transmitting grid leak for circuits up to and including 1000-watts inputs. It is particularly recommended for circuits employing the R. C. A. UX852 Tube.

Total resistance 15,000 ohms, tapped at 5000 and 10,000 ohms. \$6.00.



RESISTOR 507-66



RESISTOR 507-9

Resistor 507-9

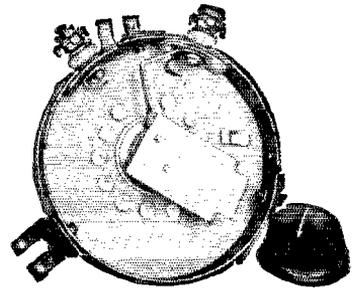
This resistor is for use in B & C Supply Circuits having an output under load of 180 volts. At this voltage, intermediate voltages of 22, 45, 67, 90 and 135 are available. Priced at \$6.75.

Vitrohm HEAVY DUTY Rheostat

The Vitrohm heavy duty Rheostat has 11 steps of adjustable resistance. It is particularly adaptable for use in series with transformer primaries to compensate for line voltage changes. These Rheostats are 4 inches in diameter and are arranged for either base or panel mounting. \$5.50.

TYPES

507-83	12.5 ohms	2200 m. a.
507-59	20 ohms	2000 m. a.
507-63	50 ohms	1000 m. a.



VITROHM
HEAVY DUTY RHEOSTAT

Ward Leonard Electric Company

31-41 South Street

Mount Vernon, N. Y.

resistor specialists for more than 35 years

Inside Information

Inner seal cementing cells into a solid block

Moisture-proof insulating cell partitions.

Moisture-proof inner container

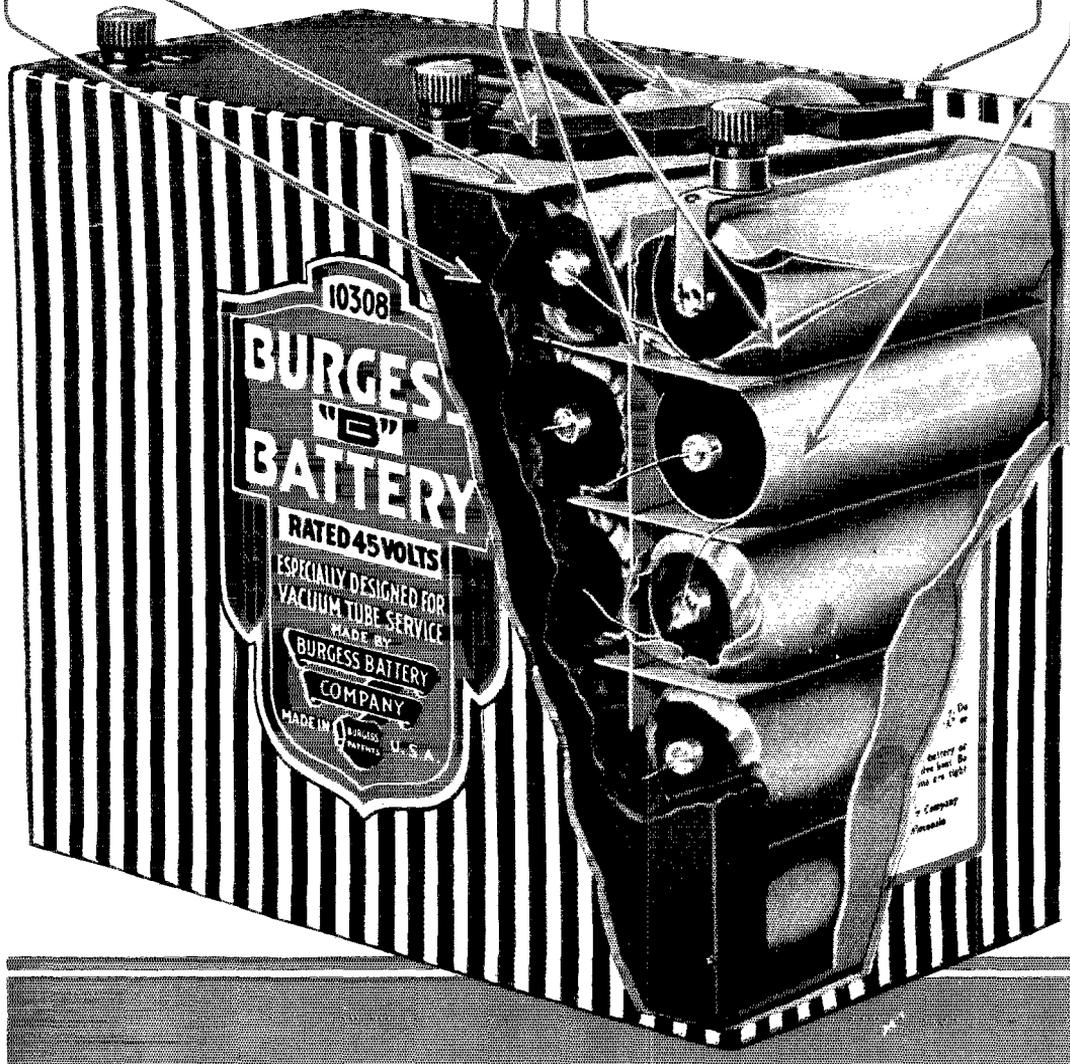
Double top seal

One piece, drawn, seamless zinc can

Moisture-proof cell wrapper

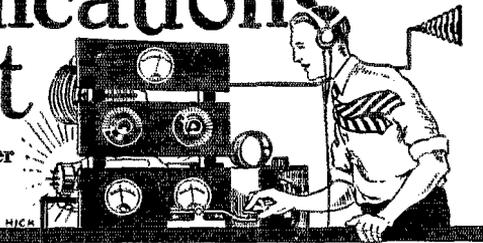
Black and white striped water-proof container

Re-inforcing strip in top seal



The Communications Department

F. E. Handy, Communications Manager
1711 Park St., Hartford, Conn.



Football and Amateur Radio

By David H. Sloan*

MOST universities operate a "gridgraph" to enable students to enjoy the football games played by their teams away from home. This device, is a miniature football field, with the ball represented by a small movable lamp. Other lights are used to indicate the players, plays, score, time, etc. The operation of this gridgraph depends upon information received by telegraph from the distant football field.

The members of the *Rho Epsilon* Radio Fraternity at Washington State College have assumed the responsibility of getting this dope through by means of a portable radio outfit at the football field, and a receiver near the home auditorium. The dope is also broadcast play by play over the college BCL station KWSC.

The first game reported by ham radio was with the University of Washington at Seattle, a distance of about 250 miles. 7RL took some junk to Howard Mason's shack in Seattle, and built a fifty-watt set which was installed in a hot dog stand at the stadium, and was soon QSO 7UL at W. S. C. With 35 watts input 7RL received an R4 signal during the first half of the game, and R7 toward the end. Since it was necessary to send single at 15 per, it was desirable to have a stronger signal for consistent results. Even with the low power we did get the dope through with sufficient detail for rebroadcasting as well as for the gridgraph.

The receiver used at the stadium was that in the portable set used by Mason at Point Barrow, Alaska, with the Wilkins expedition. The W. S. C. gang greatly appreciate the cooperation of the Seattle hams during this experiment. After the game about forty messages were received from W. S. C. congratulating the team upon its victory.

At the U. of Idaho game, a gridgraph was not desired, leaving KWSC only, to use our dope, so we tried phoning it over on 45 meters and rebroadcasting it, but fading became severe in the second quarter, necessitating the use of the key, and reading the dope in the studio. This proved to be the better system.

After these two experiences we decided that a powerful radio telegraph set was the only way to get the dope through with any degree of certainty. Although not pleasant to copy, our present set is a 250 watter using about 500 watts of pure unadulterated ac in the plate circuit, and shoves out a steady signal which is very easy to copy solid.

The school will usually send only one man to report the game, so he should get in touch with hams in the town where the game is to be played, and they can help arrange for power supply, antenna, etc., and can relieve the man at the key. The best ham to send on a trip like this is one who knows quite a little football, and who knows the players of his own team.

This is a rather unusual use of ham radio, and is a big job. After half a day to set up the outfit and complete the testing, the operator must be prepared to send steadily for three hours to cover the game satisfactorily. If he flops, there will be several thousand football fans to be pacified, but sa, oms, it sure is a fine feeling to have the fellows back home come back at you at the end with "Dit Dah Dit," and know that through your efforts a good many hundreds of fellows have almost seen the actual game, when, under normal conditions, the cost of travel would have prevented them from hearing anything but the final results.

* 7RL, 1006 E. 2nd St., Ellensburg, Wash.

Radio on the Red River

By Bradford Hearn*

ON August 26th the River Steamboat *Hustler* was chartered by the Lions' Club of Shreveport for a trip down the Red River to Alexandria, a distance of 200 miles, to demonstrate the navigability of the river between these points. 5WY, Hugh Claycomb, installed his 50-watt short-wave transmitter and receiver on the boat, and 5APA, Jim Henry, went along as assistant operator. They were duly set up in the Captain's cabin, and were ready for business. They strung up an 80-meter antenna-counterpoise radiating system, and used the antenna as a Hertz for 40-meter daylight operation.

The performance in the day time was no good at all. This worried the two operators considerably, and brought us into bad repute with the evening newspaper, the *Journal*, which expected to receive hourly press reports. The trouble was found to be caused by the coal smoke from the stack swinging back over the antenna generating an electrical charge of static (?) electricity. 5WY says that when the smoke came in contact with the antenna, the lead-in would cause the hair on a person's body to stand straight up, and that a spark would jump from the wire to the person's hand. This caused QRM in the receiver that sounded like a motor running. As the smoke came out whenever the boat was running, it was impossible for them to receive our Shreveport signals, and we at Shreveport were unable to hear my signals emitted by xnu5WY.

However, at night, 5WY QSY'd to 80 meters, and my station, 5ANC, was QSO constantly. We handled about 9000 words of press for the morning paper, *Shreveport Times*, in the three nights the boat was on its way, and there were 78 messages originated on board, all of which were received by 5ANC.

It was unfortunate that the 40-meter operation was not successful, as there were two 40-meter stations in Shreveport standing by for QSO: 5KH and 5AGJ. They stood watch from 9:00 a.m. to 7:00 p.m. daily on 40, and handled not a single message. They certainly deserve a lot of credit for the loyal manner in which they kept watch, as it was quite a strain.

Anyway, amateur radio got itself before the public in a mighty big way, and lots of newspaper publicity was received. As a result of the advertisement amateur radio received, 5APA received a good job with a seismograph party surveying in Mississippi. They are using seismographs to map geological structure for oil companies, and are using low-power short-wave radio stations at each seismograph to keep everything synchronized.

* 5ANC, 173 Albany Ave., Shreveport, La.

Radio in a Mining Camp

FROM a little place known as Leadpoint, Wash., comes a tale of good work on the part of one Wesley Bell, 7AEP. He is working at the Gladstone Mine, in connection with radio ore finding apparatus.

It seems that the camp employed a white cook who apparently delighted in seasoning the grub with flies. Since the average man is not prone to consider a fly as a delicacy, this soon proved the cook's undoing, and he was replaced by a Chinese cook. Now there exists among certain mining camps of the west,—especially in the Coeur d'Alene section,—an unwritten law that no Chinese are to be permitted.

This is the law of the worker, and is usually carried out. Consequently the placing of this Chinese cook angered the men, and they proceeded to quit their jobs and leave the camp without food or water.

That night 7AEP was on the job, and sent for transportation and relief through 7ABX. The message went through without a hitch, and was delivered to the Superintendent at a distant point, and he immediately dispatched supplies to the mine.

All went well until the following Sunday night. The men who had quit banded themselves together and appeared at the mine in a body, demanding that the cook be produced immediately. In an ugly mood, they mobbed and bound the unfortunate cook and tossed him in a freight car for points unknown. 7AEP immediately shot the story to TJC, who telegraphed it to Spokane, and the following morning the newspapers carried a front page story of the affair.

—Key Clicks.

The 6BJX Baguio Award

9 DTK, Mr. Fred Catel, among others accepted the friendly challenge of 6BJX, which appeared in July QST, and, as a result, he (or his wife) will become the proud possessor of a genuine Baguio linen set, made by Philippine Island natives. The traffic figures that Catel produced were more than excellent, and we wish that there was room enough to give them all. It is certainly an outstanding bit of work, and 6BJX says, "I'm surely glad to know about 9DTK's work. My object in making the challenge was to bring to light at least one of the 'dark horses' (of course 9DTK is well-known, but not as well as he should be) that has been plugging away all this time without getting a great deal of credit for it."

Time Savers

By George P. Taylor*

I AM, by no means, an OT, and don't claim to be up to perfection at all in ordinary operating, but some hams are pretty slow. For instance, I was working a Texan and, having a message going his way said, "QTC", whereupon he answers politely, "QRU cul". I came back with, "QTC QRV?", which brought forth the retort, "I sed QRU om cul", and signed off. After this I'll say, "I have a message here will you relay same?"

And why do they guess at your wavelength when they haven't the slightest idea what it is? One OM told me I was on 39 meters when I happened to know that I was on 42.6 meters. If they can't guess closer than that, they shouldn't guess at all.

Then we hear the familiar comeback "R R OK OM TNX", and find out that they understood not a word you had said. And too, "Ur sigs r6 wid vac—". Just two words absolutely unnecessary, when "Ur vac r6" suffices.

When an "nu" station CQ's DX I never answer him but frequently have to wade through forty consecutive CQ's before hearing, right at the end, "— DX DX 'nu' —". More time wasted! Also, how does the OB DX himself know whom this ham wants? And these lengthy CQ callers—why not boycott them by making it a point never to answer one when not broken by the call after the fifth consecutive CQ? I believe something like that would work like magic.

And say, when a fellow gives you a report of "R8 steady", and you come back at him about 10 per sending double, you're either due for a bawling out or else the other OM is too polite.

Two other of those unnecessary words are "QRA hr is". I am partially guilty of that, but I almost have to, as the first three letters of my city can be confused to sound like "hr", so if I omit "hr", they invariably ask for a QTA.

If some of the fellows (using vac) would only turn the detector tube off when sending and listen to their keying, they could improve their fists 100% easily. With just the audio tube on, your note drops to about r5, and is easy on both the phones and the ears.

The "Hamiettes", or new hams, might be excused for some of their mistakes, but if everyone would read and digest the "R and R" of the Communications Department, things would run more smoothly and have more snap,—whether DX, traffic, or rag-chewing.

* 9BAN, 728 Second St., Henderson, Ky.

NOTICE

During the past month a new Section Manager in the Michigan Section of the Central Division has taken office. He is Dallas Wise, 302EP, 2187 Falcon Ave., Detroit, Mich. Please give your officials your cooperation in all they are attempting for your Section of A. R. R. L.

This month we are sorry to be obliged to record the resignation of the S. C. M. of the Eastern Massachusetts Section of the New England Division. S. C. M. Briggs' resignation is effective immediately, and E. L. Batten, 1UE, 155 Billings Rd., Norfolk Downs, Mass., will carry on the work until the election of a new S. C. M. To OM Briggs go all good wishes from the gang.

Due to this resignation and to vacancies in our line-up previously existing, nominating petitions for Section Communications Managers are hereby solicited from the following Sections:

Section	Petitions to be valid must be filed on or before
East. Mass.	Noon, November 5
Hawaii	Noon, November 5
Del.-Md.-D. of C.	Noon, November 5
Eastern New York	Noon, November 5
Montana	Noon, November 5
Washington	Noon, November 5
Alaska	Noon, November 5

The closing dates for receipt of nominating petitions in the Sections listed is given above either as previously announced or extended when necessary due to the failure of members in filing petitions in certain Sections. Petitions must be filed at A.R.R.L. Headquarters on or before the time announced to be valid. The proper form for nomination was shown on page 45 of April 1926 QST. The candidate and five signers of a nominating petition for Section Communications Manager must be members of the A.R.R.L. in good standing and the signatures on the petition must be authentic or the petition will be thrown out as invalid. Members are urged to take initiative immediately, filing petitions for the officials of each Section now operating under temporary officials, so that the work of organization can go forward everywhere without further delay.

—F. E. HANDY, Communications Manager.

OFFICIAL BROADCASTING STATIONS

Changes and Additions
(Local Standard Time)
5ADA (88) Sun.; 9MN 10:30 pm Mon. Wed. Fri.

TRAFFIC BRIEFS

9CYQ (SCM Angus of Indiana) and 9CUD with five others mounted a five-watt set, both dynamotor and battery operated, on a 45-foot stern wheel house-boat, and set out from Cincinnati, going down the Ohio River to the mouth of the Kentucky, and up the Kentucky 150 miles. The set operated on 82 meters under the temporary call of 9JP. Perfect contact was maintained by schedule with 9CLO at Indianapolis, as well as with 9DPJ and 9BKJ, with the exception of two nights. The failure one time was due to the antenna being carried away by a heavy sea. Considerable traffic was handled for the members of the expedition, including keeping the SCM in contact with his business at Indianapolis.

FOAM says on a card to HQ, "I have a grouch. Please tell the gang to 'sign off'. After hearing several lately complaining to each other about no DX, or failure of their sigs to reach out, etc., etc., I patiently await their call signs, only to get, 'Hw? K'. Guess some of the gang would like a sight of my log." A word to the wise — I!

5HU left for Washington Sept. 6, and, of course, the usual portable went with him. A portable loop transceiver with spark coil plate supply will be on 40 meters signing either 6AAF or 7SL, depending on the location, until the latter part of October. Watch for him, fellows. A schedule will be kept with 6APP.

Station 5BH is owned by Mr. H. L. Sherwood, of Albuquerque, N. M., who is confined to his bed by a battle with tuberculosis. He is an old pre-war op, and served 14 months in our Navy during the last war. Give him a call when you hear him!

Contact With Expeditions

TWENTY meters is rapidly becoming the fashionable band for expedition work, with WNP, WOBD, VOQ, and others continuing to push a large percentage of their traffic through on that band.

WNP

Hr msg fm Bowdoin Harbor, Labrador WNP nr 484 Sept. 1 (via 8AKW) to A.R.R.L., Hartford, Conn. "Greetings om. Traffic totals for August at WNP are as follows: Forty meter band, sent 21, rec'd 23; Twenty meter band sent 202, rec'd 113, Total 359. Had several dead periods of two to three days in which no signals heard at all on twenty, forty, or eighty meter bands. Nights of bright aurora seem best for twenty meter work from experience to date. Have tried forty meters very little as signals generally poor on this band at all times. Schooner *Radio*, WOBD, starts home in day or so and *Bowdoin* all set for winter in Bowdoin Harbor, Labrador, twenty miles west of Nain. Using Armstrong transmitter on twenty meters dc supply with reports of near crystal steadiness on twenty. 9AFA of Calumet City, Ill., doing great work and is mainstay for Chicago traffic and contact with Field Museum. 1KL deserves great credit also for work on eastern traffic. 1FL did much high speed work until their star operator "DH" went to sea on yacht. Schedules working smoothly with 1CCZ, 1FL, 1KL, 1SZ, 5JQ and 9AFA. Nearly impossible QSO west coast regularly. Schooners *Radio* and *Bowdoin* had smooth contact between Labrador and Baffinland on *Bowdoin's* recent trip north until we hit dead spot. Work of amateur stations in keeping us in good contact with U. S. A. greatly appreciated by Commander MacMillan and entire party. Regards. Himoe, WNP."

Following are the stations worked by WNP during August (obtained in message from Himoe which came via 1CLM):

Forty Meter Band:

1adw 1agg 1ckp 1zk 2bbc 2jc 2uo 4to 5aio 8akv 8bkg 8brf 8brp 8jq 8pl 9avp 9bwn ne-2al nx-1xl fm-8mb ebv8 kgbw wobd vde.

Twenty Meter Band:

1ach 1aff 1ayg 1ayl 1bbm 1bvl 1ecz 1ckk 1cuc 1fl 1ii 1kl 1nf 1ry 1sz 1ue 1vc 1vw 2ahm 2amf 2awx 2bcg 2ekl 2dl 2jx 2va 2wc 3akw 3bqz 3ni 4fa 4km 4tu 5act 5afb 5agq 5im 5ql 6bbi 6col 6pvp 6vxx 8adg 8afc 8akk 8al 8aks 8alu 8aly 8ayo 8azo 8ben 8ccq 8cev 8clp 8cmb 8cpx 8dds 8ded 8dxx 8kl 8dme 8jq 8kf 8vy 9adg 9adn 9aex 9ara 9av 9af 9btw 9bqy 9amv 9dgu 9dwe 9dwn 9egz 9nm ne-1ar ne-1br ne-3bt ne-3fc ne-4dp ne-4fv eb-4ww ek-4ap gi-2it wobd.

As usual, cards from all over have been pouring in for WNP all month, there being a card from most of the above stations, and from many more who report hearing the *Bowdoin*, among them being cards from: eg-2ayn, eg-2to, np-4sa, ss-2bn, and g-dx, a British receiving station.

WOBD

Hr msg fm Nain, Labrador, WOBD nr 263 Aug. 16 (via 1SZ) to A. R. R. L. Hartford, Conn.

"We have been at our station site three weeks, and may be here two weeks more. Forty meter conditions seem to be ok as far as reception is concerned, and can hear many first district stations re: on forty at noon. We also get the NAA time tick at noon on 37, but we cannot get strong sigs south. QSO with WNP is handled at noon on 36 meters. Input here is to two type UV211 fifty watt radiotrons. The antenna and counterpoise are each only 12 feet long with an average height of 4 feet above deck. 73. Gold, WOBD."

There are cards for WOBD from 1ecz, 1ry, 8div, 9cmv, eb-4ck, ef-8hp, eg-6uw, and Mr. W. P. Jones of Newport, England.

VOQ

8DME has been keeping daily schedules with the *Morrisey*, and has handled a huge pile of good traffic in telling us about the month's work with VOQ. 8DME says that trouble began on the 18th and no signals were heard until the 24th, Manley reporting that probably the Northern Lights put the quiet hours on him, as he lost all sigs during this time. When 8DME asked if Manley had had any trouble with the ship, he said no, and that if they had had any and been able to QSO, it wouldn't have done much good anyway, as no help could reach them, since they were in territory heretofore unreached by white men. Another time when they were QSO, Manley asked to QRT, as walrus were sighted and he wanted to go

hunting. It developed that he caught two by harpooning, after two misses. A nice relay was accomplished which ran something like this: 2UO-8DME-WNP-8DME-VOQ-2UO.

In his letter 8DME says about the expedition: "They had fog most of the time, with a few nice clear days while in their farthest north position finally reaching Fury and Hecla straits, at the northeast corner of the continent. The fog froze in layers on the deck and rigging, and about one quarter of an inch of ice formed on the water during the short nights. Once they filled the tank with fresh water from the pools on the ice pans. The hunting was good, seals keeping them in fresh meat, tasting fine, although hard on their jaws. They now are on their way back south, and will probably arrive back in New York about the middle of October."

5BQ, 9CFN, 9DRD, and ne-4BT were QSO VOQ along with a good many others. 4PF, 1CCZ, 1BEY, 4RR, 7FE, 9CCHE, 9HM and 9DUV report hearing signals from the *Morrisey*.

KFLF

A card from operator Smith of the yacht *Ripple* dated Aug. 5, says, "Have been having a great time in Hawaii. Sailing in a day or so for Papiiti, Fijis, and Samoa so will get to see what radio is like in that part of the world." 9EEK reports working KFLF on Aug. 23, and taking a message from him which tells us that the yacht had reached Suva Harbour in the Fiji Islands and had had perfect communication every night since they left California. 9HM reports hearing signals from this yacht.

VDE

A letter from Starr, the operator of the C. G. S. *Stanley* dated August 9, tells us, "Our main receiver got hit by lightning just about the time we left Halifax, and we have an absolutely rotten short wave aerial, so have been having a little difficulty in getting through. Land-locked harbors, have also been causing some trouble. We have been simply swamped with traffic of all kinds, most of which has been going via amateur stations, notably nc-1AR and ne-4FV. We have tried the short wave transmitter on several waves, but are back again on 37 meters as it seems to be very satisfactory."

1VE reports working VDE, and ne-9AQ and ne-9AI have been working the expedition very consistently, handling quite a bit of traffic.

KGBB, the *Ungava*, was heard calling CQ on twenty meters by 9CEI.

SS-2BN informs us by radio gram that all QSL cards should be addressed care of ne-2BN. 4GP reports working ss-2BN.

Some Thoughts for the Traffic Handler

By A. W. McAulry*

AT a meeting of the "PRR gang" held during the Atlantic Division Convention in Pittsburg last June, some points on general operating were discussed. Although proposed primarily for use in PRR work, these points should be useful to Official Relay Stations.

Since the time limit for message delivery is so short in PRR work, the fellows engaged in this work are much interested in any method of procedure that might lessen the chances of failure to deliver. However, there seems to be no "short cut" by which the trick is done. It was agreed that certain rules and practices are valuable aids, but that, after all, common sense methods and teamwork are the factors which will invariably produce the best results. Let us take a peck and see just what the "PRR gang" considers necessary in their work.

First—Be on the job. It is surprising how easily a schedule may fail if one or the other operator is only a few minutes off schedule. Clocks and watches must be checked frequently by a reliable standard, and the start made promptly on schedule time at both ends. Many ORS operators deliberately break a great number of their schedules. In the case of PRR, the operator who does this is unceremoniously dismissed from the gang.

Second—Keep a fixed wavelength. Another thing that will easily knock a schedule flying, is this business of continually tinkering with the transmitter ad-

* 8CEO, 309 Third St., Oakmont, Penna.

justments, thereby changing not only the wave, but oftentimes the note. Our fellow-operators naturally look for us where they last heard us, and they are listening for the kind of note we last had. If the adjustments have to be changed, a careful recording of all the settings as well as the wavemeter reading should be kept so that we can get back exactly where we were working on the last schedule. This applies to the receiver as well. A changed detector tube will often shift the wave 5 or 6 degrees on the dial, and of course, this changes all of our dogged settings.

Third—Choice of wave. When choosing our regular wave for traffic work, it is well to explore the band well for several days before making our choice, so that we do not choose a wave which is being used regularly by one or more good stations in the region. Of course, it is not always possible to locate a spot entirely free from QRM, but we can generally locate so as to miss the few "landmark" stations.

Fourth—Kind of note. Whether the note is *ac, dc, or rae*, does not matter nearly so much as whether or not it is steady in character. Often fairly strong signals are absolutely unreadable on account of a sputtering and gurgling note. The ideal signal for copying is one having every part of the characters of exactly the same pitch.

The above four considerations have been put forth in the hopes that they will benefit some operators who have been having difficulty in working schedules. A few little notes on general operating may not be amiss at this time.

When traffic has been cleared do not do a lot of promiscuous calling, but rather do a lot of listening. We may be able to help someone with a QSQ or by relaying for stations having difficulty with a direct QSO. Learn to copy weak signals, and have patience with the slow operator. New men are often very conscientious, and will take great pains to help out, once they get the drift of what is wanted.

The slogan of the PRR is the well-known, "Accuracy Counts."

With the Route Managers

By Lawrence A. Jones*

BY the time you have this in front of you, the month of October will be about ready to come into the picture, bringing with it increased activity everywhere. The rebuilding which has been going on all summer will be completed, and fellows will be settling down to another season's operating. Let's make it a real one—one we can all be proud to have go down on the records.

A few of the new RM report blanks were filled out this month, but we hardly have enough of them to work out any generally useful dope. Some of the schedules look suspiciously as though they were merely guessed at. Don't do that, fellows. It would be much better not to list any at all than to guess at a bunch of 'em. In another month or so we're going to find some way to put all the information here in the magazine where everyone can make use of it, and you can readily understand that nothing but the most reliable and certain of schedules should be included. Also, if you happen to have an idea that certain schedules may be cancelled within a short time from when you are making out your report, it would be better not to list those.

"Rus" Sakkers, 8DED, agrees with what we have been telling you in the following manner, "Not much doing in the line of skeds this month. I have found that 40 meters is a great deal too unreliable for sked work. Twenty meters is a bit better than forty, but best of all is 80. It is very reliable, and that is what we want."

We are mighty sorry to learn from Johnnie Webb, 4NE, that he will have to resign his RM position owing to a change in doctors. Webb has been among our most active fellows, and has done a lot toward stirring up the Florida gang. Our best wishes for a speedy recovery, OM, and let's hear from you.

ICTI, the Asst. RM of Conn., tells us that after a siege of 40-meter work, he has come up to eighty meters, where he says all RMs should be! He keeps a schedule with the Chief RM (LBHM) and with the SCM, and recommends that other RMs do the same thing in order to keep in closer touch with the doings of the section. He offers another suggestion, "A non-ORS is very likely to be a better

operator and QSR point than an ORS. Then it is up to the RM to get this station interested in being an ORS." Fred practices what he preaches, too!

LAAL says that he has received a lot of requests for schedules already, and that by the looks of things it ought to be a very good season.

9DLD, RM of Wisconsin, says in part, "I certainly believe in 'Sunrise Parties' for QSO and QSR, as recommended by RMs 4NE and 9CZC. — 9BWZ and 9EMD hold high honors for giving the RM the most data on their traffic activities this month. It is hoped that a larger percentage of the stations who are operating will report, and that a larger percentage of the license-holders will get on the air in our section. — I recommend very much that all RMs make special effort to get skeds with RMs in adjoining sections." Kemmeter is another one who practices what he preaches, and therefore *knows* that it is all good dope.

10C-BFT is resigning his position as RM of New Hampshire to take up the role of a "college boy". We are sorry to lose him, too, and wish him success in school. IIP, the Asst. RM will probably carry on.

1UE, RM of East Mass., says, "We need a station or stations in the vicinity of Brockton, New Bedford and Fall River for traffic work, as it is now practically impossible to QSR those points. Would also like to suggest that each ORS send, toward the end of each reporting month, either by card or radiogram a list of their active schedules to their RM."

2TF, the Brooklyn RM, says, "By this winter I think that most of the hams will be tired of working DX, and will settle down to handling traffic and improving their operating ability."

8EU, 8ZI, and those already mentioned sent in very nice lists of schedules and it is to be hoped that a much greater number of you will do likewise this coming month.

The hook is just about clear. There are a number of good suggestions included in the above—not only for RMs, but for every station interested in real honest-to-goodness operating. Working DX is fine, and we all like it to a greater or a less extent, but why not wake up to the fact that there is nothing like short schedule traffic handling together with break-in operation to improve your fist, your copying speed and accuracy, and your tempers. It's a mighty fine feeling to work four or five stations every hour, and to have something to say to each one of 'em. Give it a fair trial, and we'll guarantee that you'll like it!

20-Meter Reports

1 BYV (Framingham, Mass.), "Gosh, 20 meters sounds like a graveyard after 11:00 p.m. Can't we have some Aussies and Zedders on this band? Whenever they are on, we hear them. Tell the gang to get ready for this winter. 20 was great last winter—much louder and less QSS."

043WM (Vict., Aust.), "There are now several Australian stations on 20 meters, including 3LS, 8WM, 3KB, 3HR, 6SA, 2TM, 2NO, 4RB, 3ES, 2SH, 4CG, 2RC, 4BD, 7DX and 7CW. A fair amount of work has been done with the 'nu' hams."

8CLP (Toledo, O.), "I can only say that 20 is surely great in every way. It hasn't been quite as good as usual this last month due to so many fellows deserting it in favor of the 40-meter stockyards."

eg5YK (Cambridge, Eng.), "5YX is our star twenty-meter station, and he only uses around 10 watts actual input. He works the U. S. A. whenever he wants to, and has been heard in the 5th and 6th districts. 5YK, my own station uses around 35-40 watts, and QSO's most anywhere. 20 meters is the berries for everything. There is miles less static, less QRM from other stations, and everybody seems very willing to help with tests or chew the rag."

8AXA (Syracuse, N. Y.), "On 20 meters, more noticeable than on forty, there are days that are wonderful—days that are a real reward for staying on twenty and trying to work a lot of weak stations. The DX rolls in with fine volume and the foreigners are easy to work. This is what makes the column on twenty-meter reports, for the stations report only the results of the best days and not for the many ordinary and even poor days. But these good days are the exception, and the amateur who ventures down to twenty meters for the first time learns that this band is just an ordinary good band, with its good and bad nights, and a band identical to 40 meters except that its contacts are usually 3 to 5 hours earlier."

* Assistant to the Communications Manager.

9BZI (Ackley, Ia.), "For me, twenty meters proves to be the best wave for DX of any now used. Have been down there since the first of June. eb-4WW is by far the most consistent station on twenty here, with WNP second. Eg-5BY wants to have the gang listen for him on about 22.2 meters."

Np-4KD (Emsenada, P. R.), "20 meters continues to be by FB. Best DX on 40 was 'eg' just once, while best DX on twenty is 'eb' almost at will in daylight. Personally, I have found a much better bunch of operators, better QSB's, and more steady QRH's on the twenty-meter band than I ever hope to find on the 40 or 80 bands."

9AEX (St. Louis, Mo.), "I surely cannot understand why one day 20 meters should be so very good and the next day so very bad. Yesterday I worked a whole snaf of stations, and conditions were glorious—today the band is dead. Then I look at the twenty-meter reports in QST and see all the praise it is getting. Where do those fellows live that they find such wonderful conditions?"

9CRD (Danville, Ky.), "This morning at 1:00 a.m. CST, I was QSO oa4BD on the twenty-meter band."

2AMD (Catskill, N. Y.), "I have been working on all waves, but mostly on twenty, and with FB success. Several 'eg', 'ef', 'eb', 'sb', stations, and loads of 'u' and 'nc' have been worked."

6BQ (LaJolla, Calif.), "Been trying for a month to scare up some traffic on twenty but had poor success so far. Freak weather has made twenty erratic lately, although QSO with 'oa' and 'oz' seems reliable as forty before sunset there."

2BAC (White Plains, N. Y.), "Twenty meters sure is FB. In three days I worked 'eg', 'eb', 'ci', WNP and others with a UX-210."

9BSK (Hammond, Ind.), tells us that he worked X2K on twenty-meter schedule, and that X2K gives the following dope: "The following U. S. stations deserve commendable mention for signal strength and consistency of reception during the entire voyage from Madagascar to McDonald Island: 9BSK, 7EK, 6ZAT, 1CMX, 1RD, 2BRB, 4RY, 9DIJ, and 9DVS."

6CDK (Woodland, Calif.), "I am using one 50-watt tube on twenty, and find that it is a very good wave for DX except at time when 20-meter reception seems to be entirely dead here, although FB at Sacramento, 25 miles away." 6CDK sends us the following list of stations heard on twenty by oa2RX between 3 and 4 p.m. Aug. 7th: 8ALY, 8CCS, SAHC, 8AJ, 1ASU, 6AGR, 6KG, 3BQZ, oh-6BDL, and eb-4WW.

3ZI reports QSO with ed7CZ on 20 meters, using one UX-210.

TRAFFIC BRIEFS

An expedition headed by Mr. E. C. La Rue, formerly of the National Geologic Survey, will attempt to navigate the Colorado River from Southern Utah straight through Grand Canyon. This bids fair to be a mighty interesting expedition, as only a small handful of men in the world's history have accomplished this, and it is a decidedly dangerous trip. Besides a 700-meter radio outfit, several cameramen, and a couple of Army officers, there will be a short-wave transmitter on which reports will be sent daily to amateurs. The call and exact wavelength of this transmitter is as yet unknown to us, so hams are urged to send a report to HQ if they hook up with this party.

6CHK claims the honor of playing the first checker game with Australia. One morning at 4:30 a.m. he hooked up with oa5WH and a game lasting until 5:55 a.m. was played, at which 6CHK says he was badly beaten. FB!

6RJX recently arranged that a certain young lady in his city should be present at his station at the same time that her fiance located in the Philippines would be at op1BD. As soon as all four had agreed on the best time, the two stations got QSO, and the couple were thereby able to "talk" back and forth for an hour and a half. 6BJX says: "Had good QSO—r8 on both ends,—and got big kick-out of it." There seems to be no limit to the number of interesting uses to which amateur radio can be put. What next?

BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
3CBT	211	194	106	511
9CV	221	199	8	428
op1HR	139	91	194	424
9AEK	201	217	—	418
7BB	18	307	68	393
6BJX	96	198	35	329
1FL	29	27	213	269
1AKS	20	32	208	260
1IP	35	20	202	257
6AMM	39	104	108	251
3CFG	71	6	160	240
6ALZ	35	9	186	230
1BFT	93	35	90	218
8AVK	43	20	154	217
1UE	46	21	145	212
8CGZ	2	2	200	204
1BIG	28	75	100	203
9BWZ	94	100	8	202
5AIE	78	86	25	189
8CMO	26	19	142	187
6BHI	25	100	50	175
8EU	39	34	92	165
3CEO	5	20	132	157
5DL	10	60	80	150
9PU	25	8	116	149
8DME	27	38	77	142
1ACH	16	97	22	135
9CMV	60	20	52	132
6BZC	2	9	118	129
op1DR	60	6	60	126
9AWX	59	24	39	122
9DLI	12	17	82	111
6DKX	83	11	14	109
9APY	46	36	26	108
1APL	10	11	87	108
9CNH	93	—	14	107
oh6BUC	83	20	4	107
3BNW	13	12	81	106
1MK	19	21	64	104
9CLO	20	76	8	104
1MR	35	74	4	103
9DXG	17	41	44	102
5JY	16	4	82	102
3ADE	24	7	70	101
4NE	22	22	56	100
8DOQ	29	9	62	100

3CBT goes to the head of the class this month, with 9CV right on his heels, and say, —just take a look at the numbers in the "Del." column. 9AEK, 6BJX, 6AMM, 9BWZ, and 6BHI, all boast of 100 or more delivered during the thirty days. Once more we can safely say that it is *schuades*—good old reliable schedules—that are doing the work. It doesn't make any difference whether they are with Alaska, China, P. I. and expeditions, or the fellow in the next town, just as long as they are regular and reliable. Now let's see a whopping big BPL list in next month's QST. It's up to you!

TRAFFIC BRIEFS

E. H. Fritschel, nu2DC ex nu9UQ, is now located at Montevideo, Uruguay, engaged in some short-wave installation work for the General Electric Co. He may be reached by radio through su2AK, about the only Montevideo station using as much as 100 watts power. Each Monday night su2AK keeps a schedule for a couple of hours with nu2AHM at Schenectady. Weekly reports to the different G. E. departments are handled by amateur radio, and a perfect informal contact thus maintained. All the QSO's are on the 20 meter band!

2BO of Brooklyn, N. Y., recently originated a message for Los Angeles, giving it to 6BSL in San Francisco. It was relayed to Los Angeles, and an answer returned to Brooklyn in just twenty-one minutes from the filing time. FB QSR!

2AGU says, "While showing Hancock of NEZB one of my new QSL cards, a fellow walked up to us and asked who 2AGU was. The fellow turned out to be 6APK of the west coast! A few days later, while walking with 2ABP, he noticed an ARRL emblem on a Ford car. Upon locating the owner, we learned that he was KKL5 of Germany. What next?"

Modern Relay Stations

Porter H. Quinby*

THE present day relay station as owned and operated by the highly developed type of amateur we now find in the membership of our dear old A.R.R.L. is representative of the composite growth of the radio art and its affiliated fields of endeavor. It is the melting pot where the gold of real advancement is tested and separated from the dross of unproven theory. In a modern relay station, of the type we wish to describe, we find evidence of all the attributes and qualities that make for success in any venture.

We find simplicity. No superfluous machinery or equipment. None of the "doodads" designed to complicate the working parts and confuse the layman visitor. There are none of those hair-brained mechanisms so easy to get out of adjustment, and so difficult to recondition. Then we find accuracy. This is apparent not only in the way the apparatus is built, but in the way it is maintained and operated. Next we see efficiency and system, coupled together with thrift and progress. The apparatus is rugged and sturdy. It is adjusted to maximum efficiency, expressed not in antenna current but as a ratio of watts output to watts input. Its operation is simple and systematic, requiring a minimum of maintenance. Its construction shows continuous improvement and development with a minimum of expenditure that is in keeping with the amateur's slender purse.

These things sound idealistic and a little overdone. If they are kept in mind when we overhaul our station they should result in an improvement well worth the effort required. Let us now describe a receiver that will meet at least a few of these requirements. It is not supposed to be the best receiver, nor the best circuit, but it is good enough to fulfill our requirements and has been given a grueling test in actual service, handling heavy traffic schedules in a highly satisfactory manner.

The circuit is the ordinary tuned grid, fixed tickler arrangement with a throttle condenser to control oscillation. Here is innovation number one. We felt the usual system of using a few turns wound on a three-inch diameter form was wrong. The form factor of these coils is poor. The magnetic field is too large. What we need is coils of smaller diameter in proportion to their length. This is especially true on our lower wave bands. Then our present plug-in system is too cumbersome and expensive. To avoid these difficulties, we now use a device that gives us a smaller coil and an admirable plug-in system at very little cost. We take an old burnt out tube with a bakelite base and remove the glass and wires by the application of heat. We then wind our grid and tickler coils on this base and run the four leads down to the four prongs on the base and solder securely. For plug-in purposes we simply wire a UX-type socket into the tuner in place of the usual plug-in mounting. The antenna coil consists of one or two turns wound around the bottom of the socket, and requires no further attention. To those who would protest the losses introduced by the bakelite tube base and socket, we might say that with these coils the average signal strength went up two points on the R scale over the regular type of coil. In addition to this, the magnetic field was sufficiently reduced to permit break-in operation with a transmitter that blocked the same receiver using larger coils. We therefore suggest that the form factor of a coil is at least as important as its dielectric losses. Let us now turn our attention to capacity. The usual tuning condenser on the 80-meter band takes us from about 60 to 100 meters. Our 80-meter band covers but one fourth the dial. This is bad since it gives poor separation between stations, increases QRM and makes our dial only twenty-five per cent useful. Also, these condensers have large plates and heavy end plates that pick up considerable energy from our own transmitter, and hamper break-in. So, in choosing condensers for this receiver we decided, after much shopping, upon a very small five-plate, midget type of condenser often used for neutralizing broadcast receivers, and selling for about twenty-five cents. These condensers have no heavy end plates, and use a minimum of metal in their construction. The main consideration is to choose one with good bearings so it will maintain calibration. They are admirably suited to our use since they comfortably cover one amateur wave

band with very little margin at either end, give a good separation of stations and make our dial about 95% useful. An additional advantage is that we do not hear off-wave stations and thus discourage their operation. By choosing proper values for our tickler coil we can use the same size condenser to control regeneration. In this set, the tickler has so little effect on the wavelength, that the tuning dial may be calibrated directly in meters with white ink, and will maintain its calibration with a high degree of accuracy. In place of the conventional r.f. choke, we use an ordinary grid leak mounting. This will take any value of resistance wanted, and, if a choke is desired, can be made by removing the works from a tubular grid leak, winding the space full of fine insulated wire, jumble fashion, and soldering the ends to the metal terminals. It can then be plugged in as desired. This about covers the unusual features of the receiver. Coils for work with foreign countries may be built for the 80- to 46-meter band. One stage of amplification is used, and to simplify wiring, jacks are omitted and 45 volts of B are used on both tubes, giving ample signal strength for phones. Bell wire is used for wiring, the leads made very short, and the whole receiver is surprisingly small and compact. A vernier dial may be used for tuning, but an ordinary knob is sufficient for regeneration control. One stunt may be of interest. When QRN or a power leak gets bothersome, it is usually possible to read the signals thru it, by removing the ground wire and grid leak. This reduces the signal strength some, but the noise is reduced much more. It is not possible, however, to use break-in with this arrangement, as the detector is unstable has a "free grid" and will block. But it will make a signal readable when other means fail.

We believe it is both unnecessary and undesirable to go into as much detail with the transmitter as we have the receiver. Just a few suggestions may be useful. Simplicity is of first importance. The Hartley circuit is as simple as any we have, and uses a minimum of apparatus. A one tube circuit is the easiest to handle, and a UX-210 with only a few hundred volts on the plate is all a good traffic station requires. The set should be mechanically rigid and free from vibration. The parts should be mounted so an accidental jar will not dislodge them or change their adjustment. The set should be calibrated and adjustments marked for several wavelengths within the band in use, so rapid QSY is possible to definite wavelengths, with a minimum of readjustment. This saves time and temper when further QSO is impossible on your regular wave due to QRM. However, a QSY is very trying when the operator must make a complete readjustment of the transmitter, and does not know just where he is going to land or how soon he will get there. Otherwise good stations are often weak on this point when there is really no excuse for it. *One regular wave is essential* as it shortly becomes a part of our identity on the air. The operator with a couple of additional ones up his sleeve and ready for immediate use has a big advantage over the "hit and miss artist." *Remote control* is not difficult to install and has its advantages in making break-in work against odds. And *break-in*, we believe, is almost necessary in the modern relay station. Remote control also has the advantage of removing a.c. from the operating table. This cuts down induction hum and line noises in the receiver. Good methods for this are shown in past issues of *QST*. We will not enter into a discussion of antenna systems here, as the subject is too broad to cover in this paper. Suffice it to say that most any system will work if built and adjusted with ordinary care.

One very essential part of the station is a good wavemeter. "All Gaul is divided into three parts", but a wavemeter needs four. The first three are a coil, condenser and indicating device. The fourth is calibration. A coil and condenser are usually on hand. A 10c flash light bulb will serve as an indicator, and good calibration is easily obtained from the O.W.L.S. and standard frequency stations operating regularly. There really is no excuse for not having a good wavemeter. Volumes could be said on the operation and conduct of a station while on the air. These points are discussed at length in our A.R.R.L. Handbook together with a full measure of constructional dope. There are a few things a good operator always does on the air that distinguishes him from the rest. We all want to be good ops, so we will do these things as a matter of course. We will always be brief and omit the unnecessary and meaningless signals that make the other fellow

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lose his patience. We will always be courteous and co-operative no matter how badly we think the other fellow needs a bawling out. We will not send faster than our normal receiving speed, nor go back at the other fellow any faster than he came to us. He is probably indicating, by his own speed, the speed he wants us to use with him. We will make our letters smooth and uniform, giving no one a chance to say our spacing is bad. We will not QSZ until requested. We will ask for QRS in preference to QSZ. It often does the trick, and haven't you noticed that only good ops will ask for QRS? Of course, a good relay station must handle traffic. But how does he get all this traffic? Let us turn to the BPL in the last three or four issues of QST. There we see many stations handling hundreds of messages each month, regularly. Pick out one you know and ask him how he does it. He will always say *schedules*. That does the trick. If you want traffic, ask your Route Manager to fix you up with some good schedules. He probably has inquiries from other stations and other Route Managers for some good schedules and can fix you up pronto. Then you are all set. Keep schedules and the traffic will pile up before you realize it. Moreover, handling traffic on schedules will make you a real op.

Now just one more suggestion. Something to think over at your leisure. If, after CQ'ing, we invariably started at the bottom of the band and tuned upward, the fellow answering us would know about how long he would need to call before we either heard him or had passed him by. If he were in the lower end he would have to start quickly, but could soon stop and listen, knowing we either heard him or missed him. If in the upper end, he could wait a few seconds before starting, knowing it would take us some time to tune up to his wave. This might appear advantageous to those on the lower end, but this is not necessarily true. For, as more stations look up advantageous positions on the lower end, the QRM would be worse there, and many would be passed by on account of it, so the fellows on the upper end would reap the benefit, after all. The thing would probably adjust itself very nicely, and the overall QRM in the band would be somewhat less.

A few fundamental points made use of in re-vamping our stations will yield big returns and simplify our efforts.

TRAFFIC BRIEFS

4CK uses "QWX" to mean our old friend, "Hws ur wx om?" He says that every one seems to understand what he means by QWX and that it saves lots of time in operating.

A year ago 6BJX delivered a birth announcement message from the Philippine Islands to a party in Brooklyn, N. Y. Now he has the pleasant task of sending a birthday greeting message to the young Mr. He says his schedule with P. I. is still going strong, and he hopes to be able to handle another message like this next year. Good work!

Mickey Doran, operator of KDDS, enroute San Pedro from Yokohama, tells us that the seagoing ops sometimes have a heck of a job getting long wave press on account of QRN. At such times the short wave schedules of nu2UO and NAA-NSS are their only hope. Every now and then some amateur gets himself planted squarely on top of one of these stations and proceeds to gum up the works, thus destroying the last and only hope for getting press. There isn't any need for this, fellows, so let's watch our step. nu2UO sends its press on 40.5 meters at 1 AM. EST, and NAA-NSS does its stuff at 2 AM EST, on 37.4 meters (which is forbidden fruit to us, but some of us eat it anyway). So now you know where and when these stations send their press, and it will be much appreciated if you will leave the air clear for them at the proper time. Doran also says that the 6th, 7th, and 9th district hams cause the most QRM.

1AJK, together with 1BIG, 1KL, and 1BMS, was out as Radioman 1st class in the May war manoeuvres with the USNR. He worked out of Newport, as a member of the Blue fleet, on a U. S. tug.

When WGY of Schenectady recently broadcast a program for the benefit of Australia, news came to the studio just three minutes after the program began, that the program was being picked up in Australia with unusual strength. How come? An amateur near Schenectady (unfortunately the report we have does not give his call) copied a bulletin from an Australian ham giving the information, and immediately phoned it to WGY. FB work!

Here's an idea, gang. 8DCM and 8VZ-AYP live just a block apart, and both work on the same band. Most of you know from experience what this would result in. But these two stations put their heads together, and figured a way out of the difficulty of QRMing each other. Both listen for a CQ at the same time, both call the same station, and both sign off at the same time. Then if either one of them raises the station, he works him for a while, and then has him QRX for the other one. In this way both have worked a Hawaiian and 6 or 7 sixes, not to mention a three way break-in with 6AD. This is surely an FB idea for any of you fellows who have difficulty working through each other.

Mr. Karl Zint, operator of KNT, Zane Gray's yacht *Fisherman*, notifies us that he will have to change his operating hours to Tuesday and Friday nights, U. S. Time. Look for KNT each Tuesday and Friday on 36 meters.

1ALW has been living in a veritable "ham's Paradise" for the last few months. Having worked many South Americans on the air, he decided there was nothing left to do but to go down and see them. Result: A hurried renewal of his commercial ticket followed by an excellent berth on a South America bound steamer. ALW says no one could be more hospitable than the hams down there, and he has spent many a delightful week with them. It is certainly a wonderful experience, art. We wouldn't mind it ourselves.

8BQ says that a message file rack consisting of five spaces, each wide and deep enough for a standard message blank, and about three inches high, tells him at once if he has traffic for a fellow. The five compartments are labeled North, South, East, West, and Cleared. Try it gang, and maybe we'll have less of the well known digging through files accompanied by eseries of dit-dah-dit-dit-dit's on the key.

We're hearing a lot these days about saving time and energy in operating. A whole flock of you have suggestions to make, but some are missing something that will not only save time, but make QSOs nine times as snappy and enjoyable. Yes, you've guessed it, it's Break-In. Bk-in will make more QSO's possible in your available operating time. When talking to your friend on the treet corner you don't mention his name and your own five times before saying something to him, do you? Then why insist on doing it on the air. Dig up the dope on it, and fix up a nice little bk-in system for yourself. Your money back if not satisfied after two weeks' trial.

The Los Angeles Chamber of Commerce has had twenty thousand handsome QSL-cards printed up, free on request to any amateur in Los Angeles county California (apply to 6BKJ). These cards are photographic prints, and each one has six different views of interesting places about Los Angeles. By working a number of L. A. stations Eastern and foreign amateurs may be able to collect the whole series of cards. This is a great idea, and we hope more progressive cities will follow suit.

Some of you realize the value of schedules, but are unable to keep any due to irregular operating hours. SCM Angus, 9CYQ, was in this boat, but gives us his method of getting around the difficulty while still retaining all the advantages of schedule work. All the stations with whom he works regularly, as well as his own, *always* stay on the same wavelength. The stations in the group know that each will be on between certain hours if possible to be on at all. So when any station CQ's or SK's, he proceeds to listen for a moment on the stations with whom he has the agreement. 'S good dope, gang. Try it, OM.

Sometimes message delivery can be made through a third party not able to acknowledge the radiogram overheard but who is in direct contact with the person addressed in the message and thus able to hand him a confirmation copy much sooner than it would be possible to secure a delivery otherwise. It is not good radio etiquette to deliver such messages without explaining the circumstances under which they were copied, as a direct delivery undercredits the operator who acknowledge the message but who through no fault of his own could not deliver so promptly. With a suitable note of explanation, such deliveries can often improve A.R.R.L. service and win public commendation, however. An operator's oath of secrecy prevents him from giving out information of any sort to any person *except* the addressee of a message. It is in no manner unethical to deliver an unofficial copy of a radiogram, if you do it to improve the speed of handling a message or to insure certain and prompt delivery. To make the meaning clear let us cite an excellent example of the advantages of such a delivery that actually took place during the last month.

San Francisco and Los Angeles are about 450 miles apart. On the evening of August 13, 6ZD at San Francisco copied two messages addressed to people in San Francisco and one whose destination was Los Angeles being sent by 6BUC at Honolulu and copied by 6BVG at Los Angeles. Knowing that the only possibility of quick delivery of the messages was by long distance telephone from Los

Angeles (a very expensive sort of delivery, too, it must be remembered) or by radio relay up the coast (a procedure that might take valuable time), 6ZD preserved the unofficial copies of the three messages. The next morning it was found possible to deliver one message in person, taking a reply to send to Honolulu which reached its destination many days in advance of the reply to a message not so promptly delivered. This delivery was to the gentleman addressed at Los Angeles, who spent the night on the train between Los Angeles and San Francisco in order to get the first boat back to Honolulu. If it had not been for a lucky chain of circumstances this message would never have gotten through and there would never have been a reply. The other messages were both delivered unofficially by telephone to the addressee in San Francisco who naturally were impressed with the good service. FB, 6ZD!

This incident can also be used as one more example to illustrate the value of working on schedule with stations whose position in the wave band is accurately known and not changed. Working stations direct and on schedule is the surest as well as the quickest way to handle traffic. Although it is believed that a direct San Francisco-Honolulu traffic circuit is now in operation for just such emergencies as this, it appears that here is a golden opportunity for some work by the newly appointed Route Managers in establishing some inter-state and point-to-point routes to take better care of messages for local and semi-local delivery.

DIVISIONAL REPORTS

ATLANTIC DIVISION

WESTERN NEW YORK—SCM, C. S. Taylor, 8PJ—Reports are very scant owing to summer vacations, etc. 8ADG worked WNP, VOQ and e4YW. 8AHC worked VOQ, WNP, New Zealand and Europe on 20. 8ANX has discovered all the power leaks around his station and remedied the same. 8ARG won the power transformer at Rochester Convention and will have it in operation soon. 8AYU has had several visiting hams at his station during the summer. 8BCM worked the west coast and kept schedules with 3NP. 8BIW has schedules with 1AGH and 8AYU. 8BLE worked e2PM, Hawaii and New Zealand on a UX210 with indoor antenna. 8BMJ worked every U. S. Dist. and a few foreigners. 8BUJ worked the west coast but no schedules or traffic. 8BYE handled one message. 8CNT and 8CPC handled traffic. 8CVJ handled VOQ messages. 8CYK handled quite a bit of traffic. 8DHX has schedules with 8EW and 2CEP. 8DME handled Hudson Bay Canadian Govt. reports from CKA. 8KS reports sigs from WNP. 8PJ has two new ops, 8AAW and 1YB. 8TH has also been busy with traffic and convincing BCLs that the A.R.R.L. means business when it comes to relaying messages. 8BLI will have an assistant op soon—whom he taught the code.

Traffic: 8DME 142, 8DHX 55, 8CVJ 54, 8CYK 67, 8BLP 17, 8CNT 17, 8ADG 14, 8AIL 14, 8BCM 12, 8BMJ 10, 8AYU 9, 8ANX 9, 8KS 7, 8TH 6, 8AHC 5, 8CPC 5, 8RYE 1, 8PJ 28, 8BLI 30.

EASTERN PENNSYLVANIA—SCM, H. M. Walleze, 8BQ—The usual gang reported this month but many of the reports were late. I see no excuse for this, fellows. RM, 8EU set a darned good example by completely rebuilding his xmitter without missing a sked. 20 meters is being rapidly deserted by traffic men. Quite a few new ORS have been appointed and a lot more duds QSK'd. Things look fine for a big winter. Let's go!

8EU still complains of the lack of cooperation from the boys on skeds. 3AYI is pepping up the Phila. gang a lot. 8CGZ wrecked that pet bug! 3HH is active on 80 and has installed a new 30 meter rig. And 8WH came to life again. 8ZM broke his 80 meter xtal. 3AFJ, 3MQ, 3AFA and 3LC are new ORS. 3ADE swears he is going to keep in the BPL all winter. So, Phila. is kept red hot by 8HD. A new antenna and new stick had 8HD busy this month. A 210 went west for 3NF. 3CDS at last decided to get up on 80. 3AWT was not on as much as usual. 8BIR is tearing out well from the new location. Gates and Heiser make a good team there. 8CMO has an awful wallop now. 8AVK keeps his old pace and 8BQ is a faithful worker. 8BFL promises better totals. Let's have 'em, OM. 20 meters fell through for 8BMS. 8ADQ is about sick of trying to work on 40. Hi. 3QV says things are active in Phila. 8WJ is going to QRO soon. 8BQ is on again when the mail basket is clear. Poor routing of traffic has 8CW's goat.

Traffic: 3CBT 511, 8AVK 217, 8CGZ 204, 8CMO 187, 8EU 165, 8ADE 101, 3LC 60, 3AYI 36, 8CW 35, 8BIR 32, 8KQ 26, 3AFJ 24, 3AWT 24, 8BMS 23, 8WH

21, 3AFA 20, 3NP 19, 8HD 18, 3CDS 18, 3QY 8, 8NF 6, 3MQ 5, 8BFL 4, 8ZM 4.

WESTERN PENNSYLVANIA—SCM, G. L. Crossley, 8XE—Message reports are very low this month. Can't blame you any gang, because we all like to go on vacation. This, however, is no excuse for not at least sending in that report card. There are several cancellations this month due to failure to report for the successive three months. Our new RM, 8GI is on the job as he sent in quite a nice report this month and will likely be enclosed in the RM reports. 8AWR, 8BM, 8DFY and 8BJW are off for repairs. 8BRR and 8BJW will be on soon. 8CRR reports QRM from the YL. 8BBL reports bad weather for DX. 8BHN is the only active station in Erie this last month, the rest of the gang being on vacation. 8BGB and 8BDJ were over to the Ohio State Convention from Erie. 8GI was also over and reports a very good convention. 8GI has been working all of his schedules and has been working WNP. 8XE also handled a few messages for WNP to Chicago. 8CEO has some fine schedules. 8DOQ is using a 202 on 20 meters. 8CES is using a 1/2 wave Hertz on 5 meters. 8DNO is having trouble with the BCLs. 8DIP is doing some traffic. 8APC is moving. 8GK worked 22 stations in the last month and says that traffic is very low. 8AJU is having trouble with the power supply. 8DKS also reports little action on the air. 8AXM has a new transformer working on 40 meters. 8AKI reports that 33 out of 33 messages sent to places in U. S. and foreign have been delivered. 8ARC visited HQ and 1MK and reports the QRM at 1MK is no joke and is all that it's cracked up to be. Look in the route manager's report for the reports of 8GL. Very soon the ORS will receive a letter from your SCM and RM. 8AYH handled no messages but built a new transmitter and receiver.

Traffic: 8CEO 157, 8DOQ 100, 8AKI 53, 8GI 63, 8AMU 56, 8CFR 40, 8XE 36, 8BGW 16, 8DKS 15, 8AJU 12, 8DIP 12, 8CRK 11, 8DNO 10, 8BRM 6, 8ARC 6, 8BBL 6, 8CES 4.

SOUTHERN NEW JERSEY—SCM, H. W. Denham, 8EH—Awfully sorry, gang, that I fell down on the reports last month. Was tied up many miles away from home until it was too late to get the dope to Headquarters. A number of the ORS did not report this month. Are you all on vacations? Take a minute, fellows, and drop me a card at reporting time so the SCM files will show who is active and who is not. 3CFG ground out 200 messages in five days, sixty in one night. That boy must be another of the sleepless wonders. 3ZI advises that two new stations have opened up in Trenton, 8BSD and 8VE. The SCM would like to have their traffic reports each month. 3UT, our old dependable at the shore, tells us the sad news that his station will close down for the school term as he is going to R.P.I. this year. 3VM, a new man in this Section, reports that he will be on the air in early Sept. on 20 and 40.

Traffic: 3CFG 240, 8KJ 1, 3ZI 19, 3VM 2.
MARYLAND-DELAWARE-DIST. OF COLUMBIA

SCM, A. B. Goodall, 3AB—S CAB takes the lead this month with 60 msgs. handled. 3BWT is going to get married, but says positively that 3BWT will stay on the air even though he may have to give up his RM appointment. Congratulations from the gang, Ep. 3CGC has been too busy for radio work, 3CFX, 3AJF and 3CE have been away on vacations.
Traffic: 3CFX 2, 3CAB 60, 3BWT 21.

CENTRAL DIVISION

INDIANA—SCM, D. J. Angus, 9CYG—9CMQ blew his 50-watter and now is considering putting in an 852. 9AGR is on with 100 watts on 80 meters. 9BKR is the most active Muncie station, having worked nearly 100 hams in a week. 9EJU is rebuilding his short wave set. 9CYQ is experimenting with crystal control. 9EKW is going good again on 80. 9RS is putting in crystal. 9CMJ is back on 40 meters from 20. 9DXH is going to change from 40 to 80 meters. 9AIN worked regularly and handled some important police traffic. He is the RM for Indiana No. 5 and is doing fine work building up his district. Has 22 stations. 9ABW has a new 80 meter transmitter and wants schedules. 9AEB will be on consistently now and wants traffic. 9RKJ has a new xtal set going on 80 and sure is FB. 9AYO going again on 40 and wants schedules. 9BCM is on for the winter grind now. 9CNC has his new set going on 39 now but reports a little trouble with his antenna. 9AFA is working WNP regularly. 9CP expects to leave on a round the world cruise soon. 9DPJ on both 80 and 40 at his new home and getting out as usual. 9CLO handles plenty of traffic on 80 and grinding crystals on the side. 9CMV still has operators on duty all the time and operating on 20, 40 and 80 meters. 9AGW is a new station at Clinton and wants skeds. 9BSC is back from operating on the Lakes and is getting going again on 80. 9EEY is getting out fine on 40 now. 9CSP has his application in for ORS. 9EAA wants skeds—a new station in Clinton. 9GX, the Nat'l Guard Station at Camp Knox, kept an irregular sked with 9CLO and 9CYG handling requests for funds and love letters for the homesick Indianapolis boys.

Traffic: 9AGW 1, 9CMV 132, 9CLO 104, 9DPJ 74, 9AFA 87, 9CP 1, 9CNC 17, 9BCM 19, 9AYO 19, 9CRV 50, 9CJQ 25, 9DSC 18, 9BKJ 22, 9AEB 2, 9CMQ 14, 9EGE 9, 9EJU 2, 9AIN 15, 9DXH 3, 9CMJ 8, 9EKW 7, 9JP 15, 9CYQ 56.

KENTUCKY—SCM, D. A. Downard, 9ARU—(Report written by 9OX) The SCM is in the Rockies somewheres and judging from meager reports received from stations, seems some of the gang must have gone with him. The social side of radio seems to be more popular in this kind of weather than brass-pounding and quite a few ham parties are being given. 9ATV has been out of town most of the month. Wonder where 9EI is? 9BWJ is back on the air after a period of inactivity. 9KZ's work is seriously interrupted by vacation and other business and he cannot be on steady until Oct. 9BAZ is on about as much as anybody and has about a half dozen sets going. 9BAN is having a great deal of trouble with fluctuating voltage from power house but handles traffic just the same. 9HP is troubled with an excess of Kentucky dew in his primary inductance. After sending messages to Chiefs of Police in all principal cities of the U. S. A., 9WR has located the brother of a local man who has been missing for 40 years. The mast of 9OX-9WR was wrecked by a mowing machine and they were unable to get it all up again. 9DK and 9ELL, both just married, will not be on the air for about four weeks. Hi! 8AVX and 8AVD visited Louisville Aug. 27th.

Traffic: 9ATV 2, 9BAZ 14, 9BAN 23, 9WR 21, 9OX 5.

MICHIGAN—SCM, Dallas Wise, 3CEP—8BOK and 8ATG are going to New Orleans to school this fall but will be on regularly until then. 9EAY is on most every day and says the DX is getting better. 8DED handled some important messages with 5BH and also worked WNP three times. 8AMS is trying to get a new rope on his 60 ft. pole so as to try out a Hertz. 9CM is on every day and has the set perking on 40.3 meters crystal controlled and has a daily sked with 9EAY. 8ZF has a new 75 watter working. A 74 watter is used at 8KN. 8BRS is a new ORS at Pontiac. 8DIV has a crystal controlled outfit going on 41.5 and steps out good. 8ZZ attended the Ohio Central Div. Convention at Youngstown. 3CEP is still fussing with his crystal but uses the old Hartley most of the time. 8AUB reported direct to Hq. this month. See page 3, O.M.

Traffic: 8BOK 56, 9EAY 20, 8DED 63, 8AMS 2, 9CM 7, 8ZF 5, 8BRS 11, 3CEP 17, 8AUB 3.

OHIO—SCM, H. C. Storek, 8BYN—In the first

place, the SCM wants to apologize for any discrepancies and omissions from this report because it was made up at Camp Knox, Ky., while the SCM was there with the Ohio Nat'l Guard. Reports were forwarded from home and those who came late with their reports were left out, which is as it should be, anyway. However, things will be better with the next report. SBAU cannot be counted this month as he did not report so 8BNW takes high honors. Most of the Columbus gang and many of the Ohio ORS are at Camp with the SCM so hence the slim report. 8CQU comes second in message handling. 8BPL will be lost to us until next June. Sorry, O.M. SAKO is keeping a lot of schedules. 8CMB reports traffic and DX on the up and up. 8ALU says receiving conditions on 40 are particularly rotten in his neck of the woods. 8ALU is the new RM and the SCM wants all the Ohio ORS to lend their hearty cooperation as he is going to make things hum this coming season. 8AU has been too busy to take care of the RM work. 8CFL says QRN kept his total low. 8BEV is on 20 exclusively. 8CPQ is now using Hertz and getting around fine. 8AOE says he has his transmitter working FB now and on for good. 8BFA is busy helping others get perking. 8OQ says he will be on every day now. 8ARW is worrying around with his filter. 8DIA has nothing to say for himself. 8DSY blew his 210 but is on again with another. 8BSC is using MO rig with two 201A's and says FB. 8BNA is experimenting with antennas. 8CTD reported but has no news. 8BKM has YLitis. Hi! 8PL is experimenting with a tuned RF receiver for short waves. 8DII was on only 8 days. 8DJG handled a 100-word message. 8ADH is on more regularly. 8CCO is still lazy from his vacation but promises better. 8GL is having trouble with his receiver howling. The SCM was glad to meet so many of his ORS at the Ohio Convention and is sure a good time was had by all.

SPECIAL EXTRA! A UX852 tube is going to be offered as a prize for the best traffic man in Ohio. Nothing definite worked out yet but the prize is sure. See next report and meanwhile, step out after this prize fire bottle, gang. Best of luck!

Traffic: 8BNW 106, 8CQU 48, 8BPL 46, 8AKO 35, 8CMB 18, 8ALU 16, 8BYN 16, 8CFL 15, 8BEV 14, 8CPQ 14, 8AOE 14, 8BFA 13, 8OQ 9, 8ARW 8, 8DIA 5, 8DSY 5, 8BSC 5, 8BNA 5, 8CTD 3, 8BKM 3, 8PL 2, 8DII 2, 8DJG 2, 8ADH 2, 8CCO 2, 8GL 2.

ILLINOIS—SCM, W. E. Schweitzer, 9AAW—The gang want to be complimented for the way they have been reporting. Illinois has been at the top or near the top every month in both the number of stations reporting and traffic totals. What we are striving for now is to have the biggest percentage of all the stations reporting. Send in your report if you handle one msg. or a thousand. 9AAE is operating W5BC and is operating 9AAE on 42.34 and handling real traffic. 9ADG is working WNP regularly on 20 meters. 9AAW is on the air again after Bill Conklin pulled the bugs out of the Hertz antenna. 9AFG reports 20 meters FB. 9AHJ reports ND. 9ALK will be on the air regularly now QRV for traffic. 9ALW is operating on 40. 9AMO is operating on both the 40 and 80 meter bands. 9ANQ is keeping schedules with 3CFX. 9UY is touring the east. 9AFY, the RM, wants the gang to report their schedules to him. He reports 9LY and 9DDE are looking for some. 9AQA is a new ham in the game. 9ASE is on regularly. 9AVP bought a new 852 and promises to have some traffic soon. 9AWX is located about 40 miles from Chicago but is having great difficulty getting into town. 9AXZ has schedules with 7AAT, 6DJW, 6DN, 9RRR, 30A. The station is using a Hertz. 9BBA was on the air only a few days and expects to be off the air until Xmas. 9BFY reports no job so some traffic. 9BZ reports condenser keying best yet and no BCL QRM. 9BHM has been QRV. He reports 9BQA on with a 852. 9BHM will be the chief op at 9NV, Armour Tech., this year. 9BP has schedules with 9EGX, 9BQH, 9EAI and 9BMZ. 9BR is on the air with a MO-PA outfit. 9BUX enrolled in the U. of Fla. 9RVP is operating on 38 and 76 meters. 9CIA worked an SA, EF and WNP. 9CN also worked WNP. 9CNB will soon have a power amplifier transmitter operating. 9CNH is temporarily located at Camp Grant and is operated by Master Sgt. Godman and Sgt. Zimmerman. The transmitter was in operation almost 24 hours per day handling army messages. 9CNY is a new ham in the game and promises to report regularly. 9CZV expects to be on again in the next 30 days. 9CZX is operating. 9DDE is keeping schedules with 9AWX, 3ADE, 8AMU, 8SX and 9BAW. 9DKK promises a report for next month. 9DOX is still QRX. 9DSU moved in from

Colo. 9DXG is doing some excellent traffic work and keeping several schedules. 9DYD has his new sky stick up which he says is a peach. 9DZT sent in a report from Quincy giving the dope on the gang down there. Several of the boys went down with him to New London, Mo., and called on 9CJH, 9ELM and 9AZE are new stations in Quincy. (Let's have your reports, OMS). 9EAL worked BO off the coast of New Foundland. 9EDS is going to take a crack at the 20 meter band. 9EGX is handling traffic again after a short vacation. 9EHK is back on 80. 9EJO's liver took a well earned vacation so he put in a DeForest 20 watter. 9ENE says he is getting excellent results on 80. 9FU is high traffic man for the second month despite the trip west. 9QD has installed a higher mast. We are glad to get a report from 9QI in Springfield which has always been a hard place to QSR. 9RK is going at it strong now with a 204A. 9UX works as a life guard during the summer. (Here's a chance for 8UX to draw a snappy cartoon). We take pleasure in welcoming 9WJ on the air. Get busy, fellows, grease up your elbows, push on the key a little harder, step on the juice, let every other card in the other fellow's shack be from Illinois, make our state look bigger than Texas on the map from the number of pins showing traffic routes and reliable stations, let's all push together, LET'S ADVERTISE, let our watchword be WATCH ILLINOIS!!!! The CRTA is planning another annual banquet better than ever before. Watch for the date and be THERE!

Traffic: 9PU 149, 9AWX 122, 9APY 108, 9CNI 107, 9DXG 102, 9AXZ 86, 9AMO 81, 9DDE 51, 9BPX 51, 9EAL 50, 9CIA 45, 9BVP 37, 9WJ 35, 9AAE 25, 9EDS 21, 9CNY 20, 9AQA 19, 9ASE 18, 9CNB 12, 9QD 12, 9AEG 12, 9UX 11, 9BIZ 10, 9ALK 10, 9ANQ 8, 9EJO 9, 9EHK 7, 9NE 7, 9BFY 5, 9EGX 4, 9BR 4, 9QD 5, 9CZK 3, 9DSU 3, 9AAW 2, 9BHM 4, 9BBA 1.

WISCONSIN—SCM, C. N. Grapo, 9VD—9BWZ comes through with 202 msgs. this month proving that super-power is not always the reason for large msg totals. 9DLD promised us last month that he would be in the BPL column this month and sure enough, he is. 9EMD has schedules with 9EAW, 9DLD and 9EHD Mon., Wed. & Fri. 9EK keeps schedules three days a week with 9DLD, sc3AG and n-1NIC. 9EHD is a new station at Lawrence College, using an H tube and promises to be a good station this fall. 9SA blew his fifty, sold his Esco MG and is now using UX210 with 450 v. on the plate. 9AZN says he is rebuilding and will have remote control. 9CDT is unable to keep schedules at present. 9EEF says not much doing in his town this summer. 9BIE also off the air but will be with us again soon. 9BPW is now at new location and expects to do better work.

Traffic: 9BWZ 202, 9DLD 111, 9EMD 52, 9EK-XH 24, 9EHD 13, 9SA 13, 9AZN 5, 9CDT 4, 9EEF 3, 9BPW 2.

DAKOTA DIVISION

SOUTHERN MINNESOTA—SCM, D. F. Cottam, 9BYA—There are other things that are holding the high hand so naturally traffic is left in the lurch. This report is being made up from the least number of ORS in almost a year. It is true that a great many are on vacations or working hard so they can bust the ether with that 50 or 75 watter this fall, rebuilding, etc. but that is no excuse for not sending in the Form 1 card just the same. 9DGE is home again after an 8500 mile trip thru the west. He is sporting a 500 watter now. 9IG has come to life again. He has been finishing school and took a trip to Chicago. 9DBW has moved to another part of town and is pleased with the radio results. 9DEC says conditions are poor for traffic and was forced to drop his skeds. 9AIX was his guest for a few days. 9DMA worked nu-2KO in daylight on 7.5 watts. 9DHP is on 20 meters and has been QSO oh6BDL and WNP. 9EFK has been QSO OA, OZ, NR, and FS. 9BHZ has been rebuilding for a DeForest 300 watter. 9AIR is on 20, 40 and 80 and holds one sked. 9COS had a blow-up and now has ordered mercury arc equipment, new transformer, etc. He will be on by the time this appears in QST. 9DEG is very QRW and is seldom on. 9BYA has been too QRW for much work at the set. He has a Meissner circuit working nicely now, thanks to 9EFK.

Traffic: 9DGE 71, 9IG 28, 9DBW 27, 9DRC 15, 9DMA 9, 9DHP 5, 9RYA 5, 9EFK 4, 9BHZ 2.

NORTHERN MINNESOTA—SCM, C. L. Barker, 9EGU—9CIY is on the air consistently but forgot to include the traffic for this month. 9KV is now holding the night trick at the RCA station in Duluth,

WRL. 9BTW moved to Minneapolis, leaving the northern Section. 9CKI works WNP regularly with traffic. 9EGN is entering the U. of Minn. this fall, taking EE. 9DUV has suffered from terrible QRN this summer but says FB now and is going after real traffic. 9BVH is making new hams besides working regularly. 9CWA is building a 180 meter phone set. 9CTW was on vacation this month so nothing to speak of. 9EHO is using voltage feed Hertz now with excellent results. He works WNP on 20 meters. 9ABV is getting out again after a rather slack summer season. 9EGF says he can't get out at all now. 9EGU is doing some construction work, replacing some apparatus sold during the summer months and is about ready to go on the air again.

Traffic: 9KV 62, 9BTW 27, 9CKI 13, 9EGN 12, 9DUV 8, 9BVH 7, 9CWA 7, 9CTW 5.

SOUTH DAKOTA—SCM, F. J. Beck, 9DB—9ALN sold his set to a new ham and is going to college next month. 9DB moved to the middle of town and is experimenting with key-thump filters. 9NM reports working WNP and other DX as farm work lightens. 9BOW had trouble with a wet transmitter. 9DIY has rebuilt the xmitter again. 9BKB is having a fine time in Winnepeg. 9BBF made the Convention at Denver while enroute for Frisco. 9DWN has been doing good work at Huron. 9AZR can't get out. 9CJS is building another powerhouse. Hi. Now that cooler weather is here, let's all line up a few skeds and improve our operation.

Traffic: 9ALN 26, 9DB 23, 9NM 17, 9BOW 6.

NORTH DAKOTA—SCM, G. R. Moir, 9EFN—9BJV is using a cage antenna again and can QSY three different bands in one minute. 9DM is getting out well with a 7½ watter. 9DKQ is doing good work on 40. 9EFN expects to have a new TG-TP rig going shortly. 9BVF is helping a new station get started. 9DYA has been too QRW with harvest to do much with radio.

Traffic: 9DM 20, 9DKQ 2, 9BVF 24, 9BJV 27.

DELTA DIVISION

ARKANSAS—SCM, W. L. Clippard, 5AIP—We fell down a bit this month, fellows, but let's hope all the rebuilding is completed for the winter. Hi. Will all the amateurs in this Section with whom we have not come into contact please drop the RM (5SD) and myself a card so we may help cooperate with the rest of "Our Gang" in placing Arkansas on the map? What say, OMS? It is up to you to help out. 5AND is a new addition and a very promising amateur. 5SI is still doing FB. 5ABI was kidded about his big receiver coils so he put 'em in a tube socket. 5LV is moving to La.—sure hate to see you go, OB. We wonder what has become of 5CJ, 5JB and several others. YLs! We hope 5AKF has not had any more bad luck. 5SS increased power. 5RU joined the Navy. 5ER is planning to go to sea. The MG at 5AIP went west when the power was increased. Sit tight, fellows, because we want to go over strong next month and don't forget those cards!

Traffic: 5ABI 22, 5SI 21, 5AVA 6, 5CK 5, 5LV 3.

LOUISIANA—SCM, C. A. Freitas, 5UK—5KH has just returned from a trip to Canada and has consolidated with 5APA. To date, he says he has been QSO five continents. 5NS has been off the air for about three weeks. He will be back soon with a UX852. 5AOZ is all set and ready for heavy traffic handling. He rebuilt his transmitter and it is working FB. 5UK has not been working very much due to bad weather conditions. 5JW is back with us again using a 7½ watter for the time being. Activities as a whole in this Section have been reduced to practically nil during the summer. However, from personal conversation with some of the gang, indications are that we can look for quite an interesting winter season. 5ANC craves DX. Was heard in London July 31st—his first DX. 5AGJ took the Naval Reserve trip to the SS Mawry. 5KH has just returned from an extensive vacation trip throughout U. S., visiting ham stations. He also visited Canadian stations.

Traffic: 5UK 1, 5KH 6, 5IE 9, 5NS 14, 5ANC 10.

MISSISSIPPI—SCM, J. W. Gullett, 5AKP—It seems that most of the gang will attend school at A. & M. College of Miss. this fall and winter as 5AQU, 5AGV, 5QQ, 5AIQ and 5TC are going and will pound brass at 5YD. 5AGS is going to sea as a commercial operator. 5PJ is leaving for Houston, Tex. where he will make his home. We hate to lose the boy as he is a real good brass pounder. 5AQU and 5AGS have just come back from the boy scout camp where they spent most of the summer. 5QZ is tak-

ing a 7½ watt transmitter with him to California. 5ANP is moving to a new location and will work on 20, 40 and 80 meters. 5WO will attend school at Auburn this winter. 5TC and 5AUC have just returned from a trip to the gulf coast. 5AIQ reports that his UX210 blew up on him. 5API says QRM from Cotton and BCL radio business is bad. 5AUB has just returned from a trip through Texas, Missouri and Oklahoma and says he met a crowd of hams while on the trip. 5GQ reports working OZ on 38 meters. 5AKP has been doing considerable experimenting on 20 meters, but is going back to 40 where he can handle lots of traffic. 5AJJ has moved to Bay St. Louis, Miss. from Dallas Tex. Welcome, OM.

Traffic: 5AKP 24, 5FQ 12, 5TC 9, 5ANP 7, 5AIQ 6, 5API 5, 5GQ 3, 5WO 25.

HUDSON DIVISION

NEW YORK CITY & LONG ISLAND—SCM, F. H. Mardon, 2CWR—The SCM has nothing to say other than that he is thoroughly disheartened by the showing of his Section this month.

Manhattan: 2EV has been on vacation. He will soon move to a better location in Manhattan. 2KR has regular schedules with 6CUA, 9BL and 9BEG. They phone all his messages and give him immediate answers. That's the real spirit! 2BNL says nothing new. 2BCB is in Buffalo with a vaudeville act but he trots the SW receiver along.

Bronx: 2BBX keeps up his DX on low power. 2CYX says the TP-TG circuit is working FB. 2AET has been ill but is OK now. 2TY and 2AET are conducting QSS tests between L. I. and Bronx.

Brooklyn: 2PF says most of the gang are rebuilding. He is busy with the N. Y. Radio Show. 2BO is having trouble with a power leak on the L. I. R. R. 22,000 volt line a half block away. 2CRR recently worked Russian 1XL. 2BAZ is getting his transmitter together by degrees. 2ADZ is building a new transmitter but continues to work the old one.

Long Island: 2ALS is enjoying a vacation. 2AGU wants to know what call book puts him in Richmond Hill instead of Elmhurst. We are mighty sorry to hear from 2AGU that 2ADK, Joseph Phelan, was drowned at Bayville, L. I. He has been in ham radio since the spark days and our sincere sympathy goes to his family. 2AIZ says traffic is picking up. 2AWQ picks most of his traffic on 20 and gets it off on 40. 2AVB says 20 is FB when the fellows are on! 2AUE is not on much. 2AYS is trying out 20 meters with indoor antenna and counterpoise. 2AWX had to cancel his sked with WNP because of QSS. He may have to close up for a while as he is going to college.

Richmond: 2AFV's mast came down so he will be off for a while. 2ABO got his commercial ticket. 2CPG, Staten Island Radio Club, has a new shack and will soon be on the 40 meter band. 2ABN is busy with the Lizzie. 2AYH reports 2AKR is op. on the S. S. Verba Linda. KDNS. 2CEP reports that it is impossible to get traffic into N. Y. or Brooklyn and that he has to mail all his traffic to those points. The SCM has been after the gang since he took office to try to get that interborough route going but I guess its the same cry—DX is all that interests most of the hams. I have about given up the idea and will leave it to a better man than I am to get it going.

Traffic: Manhattan: 2EV 16, 2KR 71, 2BNL 4, 2BCB 13. Bronx: 2BBX 33, 2CYX 37, 2AET 10. Brooklyn: 2CRR 84, 2BO 40, 2PF 3, 2ADZ 11. Long Island: 2AWX 29, 2AYS 4, 2AUE 2, 2AVB 1, 2AWQ 42, 2AIZ 53, 2AGU 19. Richmond: 2AFV 53, 2CEP 44, 2AYH 7, 2ABO 18.

NORTHERN NEW JERSEY—SCM, A. G. Wester, 2WR—Now that the summer months have passed with vacations, hot weather, QRM, etc. in the background, let's start the season off with a bang and find each ORS making a monthly report whether or not the station is in operation. Traffic is being pushed thru on 20 on which band plenty of stations are. 2AT is just putting things together after a summer lay off. 2CW has been QSO with South American stations. 2FG is another clicking with that continent. Old 2BHG is back in Verona and on the air with a 171. 2EY is on 40 and finds it hard giving local stations traffic. 2JC, Bloomfield Radio Club station, is working due to the hard efforts of 2CRC and 8DEM. Traffic has been on the increase at 2KA. 2ALM has been QSO with N.Z. and Australia on 40. 2ARC is leaving for college so wants his ORS cancelled. 2CTQ is still on 20 although he never reports any traffic. 2BIR is back from Green Pond and expects to do some real DX this winter. 2IS is back from

vacation and using 2 171's. 2AVK has an 852 which is living up to instructions. 2QI has at last received permission from his landlord to erect an outdoor antenna. 2BAL was at Belmar on his vacation so handled no traffic. 2JX says with the new Hertz everybody called came back. 2AOP has been visiting the 8th district hams. 2GX has been helping install NRRC at the Navy Yard in Brooklyn. 2CJX is troubled with QRM. 2AAT is a newcomer with a 201A on 80 meter band and will be in line for an ORS. 2AGN is having a fine QSO on 20 meters with Africa and Europe. 2CJD had an interesting trip thru Maine and Nova Scotia visiting all amateurs enroute.

Traffic: 2AT 12, 2CW 11, 2EY 4, 2JC 9, 2KA 18, 2ALM 15, 2AVK 2, 2JX 47, 2AOP 11, 2GX 22, 2CJD 3, 2AGN 14, 2AAT 3, 2CJX 22.

EASTERN NEW YORK—2CNS is the only one reporting from this Section and he reported direct to Hq. What's the matter, gang?

Traffic: 2CNS 4.

MIDWEST DIVISION

IOWA—SCM, A. W. Kruse, 9BKV—Well, fellows, vacation time is about over and its now time for us to get busy and pull Iowa out of the rut. We can do this by cooperating with the RM and arranging reliable schedules. The RM is anxious to get the state lined up as soon as possible so please give him your hearty cooperation and he will appreciate it very much. The 40 meter stations lead the Section in traffic this month, handling about 75% of the traffic. The rest being equally divided between the 80 and 20 meter bands. Its time for you 80 meter boys to get busy and do your stuff. What say gang, let's make Iowa a 100% traffic state this winter. 9BAT is pushing traffic galore on 40 meters and has applied for ORS. 9BWN came thru with a fine report and is hollering for schedules. Get QSO 9CZC, OM. 9CVU is doing excellent work for a newcomer and reports a schedule with 9DTR at 9 am. 9EHN is QRW helping 9XCOJ get on the air with his new call 9PB. Everything has been rebuilt at 9DOA and he will get his crystal perking soon. 9CZC is plugging away on 77 meters but says business is rather light. 9DPL has lots of QRM from the YL and work.

Traffic: 9BAT 93, 9RWN 81, 9EHN 17, 9DOA 9, 9CZC 5, 9CVU 26, 9DPL 1.

KANSAS—SCM, F. S. McKeever, 9DNG—Three cheers for 9AEK and 9CVI! Over 800 messages were handled between these two stations while the former was at Nat'l Guard Camp. This is very FB and makes our traffic total the highest it has been for a long time. 9CET reports the big 250 gone west so is QRT. He won't be off long though. 9CWW, a new ORS, is certainly starting out right. He is pushing a pile of QTC and working DX to boot. 9JU and 9BUY are very busy getting the Kansas Convention ready. Plans are under way and they promise us a real ham convention. 9DNG was in California for a spell so wasn't on much. He visited 6AM while in Long Beach. 9DRD and 9CFN are having no trouble working VQO and other DX but let's have more traffic, boys. 9DFK has returned from a trip all around the U. S. on which he saw many hams and stations. He is back now and ready to hit the line hard. Neither 9CKV nor 9BYG have been on much lately. The latter lost his aerial three times and is building a 100 ft. steel stick. 9CNT and 9CVL are both off the air. Come on, fellows, get into it. 9CFW has a new 50 ft. stick and wants skeds. So does 9HL. 9AVM is on again at last. He is building xmitter with changeable coils. 9BII was away most of the month so traffic was nil.

Traffic: 9CV 423, 9AEK 418, 9HL 2, 9LN 15, 9DNG 16, 9BUY 6, 9CFW 5, 9CFN 31, 9CKV 13, 9DRD 5, 9JU 18, 9CWW 53.

NEBRASKA—SCM, C. B. Diehl, 9BYG—9AL is re-fixing for the winter's work. 9CJT says the same old yard. 9CNN is wishing for winter again. 9QY is starting to act again. 9EEW is back in the collar again. 9DFR is tinkering again. 9BYG works some. 9EHW is busy with BCL work. 9DI is beginning again. 9ROQ is polishing up again for the coming season. 9DUH craves action. 9BBS is railroading. 9BQR says OM Static has him by the neck. 9EBL says "nil here".

Traffic: 9CJT 2, 9QY 2, 9EEW 4, 9BYG 2, 9DI 30, 9DUH 18, 9CJI 16.

MISSOURI—SCM, I. B. Laizure, 9RR—Reports from the ORS this month are pretty slim indicating that most of the old timers are away on vacations or have closed up until cooler weather. 9BFQ takes the lead in traffic this month. 9DQN has been hold-

ing the fort in Kansas City and had about five schedules lined up but they have not been very successful due to inability of the distant stations to break through. 9CRM, the old time spark hound of West Plains, is threatening to come back on the air. 9LI had the misfortune not to receive the QRS questions mailed him, delaying his appointment. 9ZK is busy with the new shack and sets, getting ready for a big winter. 9ZD has been out of town so much the past two months that he has done little DX. 9DQN is a prospective addition to the QRS ranks. 9DAE, the RM, has just returned home from a motor tour thru the eastern states. 9DOE is operating on WNX, a Great Lakes freighter during the summer. 9ARA is working considerable DX and lists 11 foreign QCO's during the month. 9DKG is on for the winter season already with 5 watts but will change to 50 soon. 9BQS built a new transmitter and receiver for the coming season. 9CKS is home for a month between terms of school. 9WV is still active but mostly rag-chewing as he cannot keep schedules for traffic. 9ACX, 9ADH and 9ACA are three stations missing in K.C. this season due to moving or job QRM. 9RR is still QRW with rebuilding and also is pretty well tied up by job QRM. A number of hams in K.C. were victimized by a confidence artist the past month, due notice of which has been circulated where it would do the most good. It is feared this will not protect the BCL from further fleecing.

Traffic: 9BEQ 32, 9LI 6, 9DKG 5, 9ARA 6, 9DQN 12, 9RR 3.

NEW ENGLAND DIVISION

MAINE—SCM, Fred Best, 1B1G—1BFZ continues the good work and reports that the QUEEN City Radio Club is planning a trip through Maine about Sept. 17 or 18 when all hams will be visited. 1AIT reports traffic on the increase. 1KL is still about the best contact in the country with WNP and WQBD. He is using the 20 meter band almost exclusively and all his total was handled with one or the other of the ships of the MacMillan Expedition. 1ATV reports some fine DX, getting a bunch of swell reports from Australia and New Zealand. 1COM handled his usual fine total and reports using a horizontal Herizian outfit that is getting out well. 1AUR is very busy with his duties as RM. He visited 1KL, 1ATV, 1COM, 1BEE during the past month and says there is lots of enthusiasm for traffic work the coming season. 1BTQ turned in his usual consistent total, and in addition, reports the arrival of twin second operators, which puts Maine in a class by herself in this line. Congrats, Maurice! 1AQL reports that it is exceedingly hard to clear Maine traffic. 1ACV is now using DC on the plate and is getting out with a fine kick. 1B1G has been experimenting a bit. He is now using a full wave outfit, xtal controlled which is stepping out very FB. 1BC handled a fine total also but did not report. This is the summer station of 4XE of Orlando, Florida.

Traffic: 1B1G 203, 1BFZ 56, 1AIT 52, 1KL 52, 1ATV 37, 1COM 23, 1AUR 14, 1BTQ 3, 1AQL 2, 1ACV 1.

NEW HAMPSHIRE—SCM, V. W. Hodge, 1ATJ—Traffic increased considerably this month and five times as much traffic was handled as during the same period last year. FB, 1IP sent in a fine total and says that good skeds are responsible. 1BFT, 1OC pounded out a bunch. He sent in his resignation as RM as he plans to attend College. We are sorry to lose you, OM, and I wish to extend the thanks of this section for the fine way in which you served us as RM. We all wish you luck at N. H. U. 1AEF blew his 30 watter but is on with a 201A. 1JN and 1AOQ have been very QRW but will be on more soon. Most of the N. H. stations that are on 80 can be found in the lower edge of the band. This may help some of the stations with NH traffic. Please send dope on skeds, etc., to Assist. RM 1IP.

Traffic: 1IP 267, 1BFT 218, 1AEF 87, 1AOQ 11, 1JN 10, 1ATJ 5.

RHODE ISLAND—SCM, D. B. Fancher, 1BVR—It is with deep sorrow that we write of the death of Mildred Lorenston (1A1D). We can hardly believe that she is gone and that we will never hear her familiar call again. She passed away at 10 p.m. Aug. 13th, which sure was an unlucky day for the R. I. gang, 1A1D was one of the best QRS in the country and her call was heard in nearly every country in the world. We understand that the Prov. boys are getting up a petition to send the Radio Inspector requesting that the call be withheld and not reissued. We sincerely hope that the R. I. will

be good to us. Providence—1AMU is back again. He didn't tarry long on ship-board. Reports too many "bugs." Hi. 1MO is rapidly coming up now that he has got things going good. 1AWE says there is no traffic on 20. Better come up to 40, OM, or else originate some on 20. 1EI is still on top. Westerly: 1AAP is getting things whipped into shape for the winter. Says he is going after some records this season. 1BVB came back up from 20 to 40 where there is some traffic. It's too doggone lonesome on 20 for an old timer. Hi. Newport: 1BQD says that traffic is going to pieces. Was on daily all the month and couldn't get any. How about originating some, OTT.

Traffic: 1BVR 31, 1EI 12, 1AMU 11, 1MO 10, 1BQD 2.

CONNECTICUT—SCM, H. E. Nichols, 1BM—The air report for our Section this month may appear small in totals as compared with our recent figures but to those who have spent any great amount of time with the cans on, it is nothing to be worried about as we like to turn in larger ones. The activity for the month has far exceeded the SCM's experience and the fellows who have stood by are certainly to be commended for their loyalty and support. 1ANV, an old timer from the 8th Dist. has recently moved to our state and with a fiver has been doing a rushing business on the 40 meter band. 1BHM has been enjoying a vacation from all labor but says he will be back with a bang and hopes to get a lot of stations lined up for the fall season. 1BMG reports getting a new 852 bottle and is going to send in some more of his usual high totals. We have missed them lately, OM. 1ADW writes that he was out for DX this month and according to all the different calls listed, he must have reached the height of his ambition. 1OS, our YL operator, reports that everything is well with her and that she was QSO Florida recently. 1CTI, 1BWM and 1BCG all at Norwalk have been keeping the air in good action the past month. 1BJK reports working Brazil on 20 meters and that accounts for our not hearing him on 80. 1MK has joined the BPL this time and we are glad to have the station on our records, Jones reports handling several messages to and from Hawaii via 9CEI. 1ZL is getting out in the usual fashion and is hoping to have an H tube going soon. 1IV has been working overtime at his job at WICC due to their removal from the present location to their new home in Easton.

Traffic: 1MK 104, 1CTI 47, 1BJK 26, 1BM 21, 1AOK 20, 1ZL 14, 1ADW 12, 1BLF 11, 1BGC 8, 1TD 5, 1OS 5, 1BQH 3, 1AFB 9, 1BCG 12, 1ASD 12, 1AMC 19, 1ANV 58.

EASTERN MASSACHUSETTS — SCM, R. S. Briggs, 1BVI—Your SCM has resigned so that he can go to sea for a while. All reports should be sent to the RM, 1UE, who will act as temporary SCM. It has been very pleasant to be in contact with you fellows and I surely appreciate your cooperation. 1UE, the RM, would like to hear from any of the fellows concerning traffic schedules. Please get in touch with him as often as possible so that he may have complete information of your schedules. Any criticism regarding the way traffic is handled over the various routes would be very much appreciated. As a suggestion why not send reports to 1UE via radio and incidentally, originate a few messages by doing so. 1AKS, 1UE, 1ACH and 1MR make the BPL this month. 1AKS who is in Chatham is trying for an QRS. 1NK is on with a temporary set while he rebuilds his shack. 1BMS came to life again and is on 80 and 40. 1BDV worked xemSJB, a Swedish ship on 86.5 meters. 1RY handled some traffic with WQBD and also fooled with tone. 1KY had a tough time with QRZ signals at her summer place. 1UE and 1RL are joining the Naval Reserve. 1BZ is QRW pounding strings on a guitar. 1GA moved but expects to be on again soon. 1ASI went on a vacation. 1MR got his first class commercial ticket and joins the mob looking for a ship. 1JL is at sea now, and likes it. 1CUK is a new ham in West Quincy. 1BYV was obliged to play croquet, etc., because radio wx on 20 meters has been so poor. 1ABA worked considerable DX with a UX210. 1LM expects to start schedules soon. 1ALP rebuilt his transmitter and will be QRW for action. 1GP will be on the air again with a new outfit by Oct. 1. 1ACA had trouble with his xmitter but is going strong again on 77 meters. 1OG moved again to Winthrop where he has a fine location. 1APK was a consistent station on 33.5 meters. 1NV reports plenty of traffic on 30 meters and DX normal on 20. 1ACH is quite

active and has a number of schedules. Another ham gone wrong since ION is engaged to a YL. IAYX hopes to visit the SCM. FB. He was very busy this summer at Nantucket and did not get much time to push a key. IBLB sent a letter from Italy where he has been touring. He visited a number of Italian hams, all of whom were fine fellows. IBYV has a YL now. He visited 22 stations in the 9th Dist during a recent trip. A lot of ORS did not report this month. In practically every case, cancellation of appointments is due to failure to report so watch out, everyone!

Traffic: 1AKS 260, 1UE 212, 1ACH 135, 1MR 108, 1RY 64, 1BMS 39, 1APK 36, 1NV 31, 1LM 21, 1BYV 13, 1ASI 12, 1ACA 9, 1BDV 7, 1YC 5, 1BVL 4, 1ABA 3, 1OG 3, 1NK 2, 1ON 2, 1FL 269.

WESTERN MASSACHUSETTS—SCM, A. H. Carr, 1DB—1AAL has his crystal set going on 77.2 meters. 1AJM handled traffic with WNP and eb4WW with whom he has been QSO 17 times in succession. 1AMZ says he has visited quite a few of the other hams and we wish that more would find time to do the same. 1AOF has been visited by quite a few of the gang on week-ends. 1APL, Asst. RM, has made the BPL again. He was visited by 1ACH and says they had a fine rag chew. 1ASU worked WNP, using a Hertz antenna. 1AWW has been a little quiet on account of fishing, etc., but will be going strong soon. 1EO will be on consistently from now on. 1DB has just returned from a short visit to Newport and will be on shortly with his regular schedules on 40 and 80 meters. 1AZD has handled his traffic on a gutterpipe antenna and says it is sure FB. Reports came in very slow this time owing to the holidays and strangely enough, good weather.

Traffic: 1AAL 6, 1AJM 58, 1AMZ 27, 1AOF 10, 1APL 108, 1ASU 2, 1AWW 13, 1DB 10, 1EO 7, 1AZD 19.

NORTHWESTERN DIVISION

OREGON—SCM, R. H. Wright, 7PP—Although 7AEK has been reconstructing his set, he still manages to lead the state for the third consecutive month. 7ABH, a new ORS, has QSO'd four continents in one week. Fishing has occupied most of 7EO's time but he has been on some on 20. 7LT is at present at the coast but is moving traffic through portable 7APL. 7MO is piling up the traffic total besides doing a little antenna experimenting on the side. 7WB has spent the summer salmon fishing but is now back on the air. 7AIX's tube breathed its last but he is getting out on low power. 7MV has a MG but is having trouble getting DC out of it even with an enormous filter system. 7AEC is on regularly and says his new zip is FB. 7NP is heard occasionally. 7OI was working out with 201A's in fine shape until they expired recently.

Traffic: 7AEK 54, 7MO 50, 7ABH 23, 7AEC 20, 7AIX 9, 7APL 4.

WASHINGTON—SCM, Otto Johnson, 7FD—7DQ up in Teku Harbor, Alaska, sends his report through via TTX and takes the traffic honors this month. Alaskan hams should find this a good way to get reports through to QST. 7TX and 7BB are doing good relay work with Alaska. 7LQ is on a vacation trip to California. 7AGO, 7AGN, 7AFV and 7AFY in Spokane and 7AFZ, 7AFO, 7AHD, 7MX, 7VJ and 7VU in Tacoma are some new hams. 7ACA says a new ham will be on in Sunnyside soon. 7AG took a trip to L. A. 7AIY has moved again. Still looking for a power-less location? Hi! The Tacoma Club is building a new club house and station soon. The Spokane bunch have one built for the convention. The acting SCM is planning a fall housecleaning, weeding out the dead ORS and appointing new and live ones. A RM is being lined up for Eastern Washington. ORS are requested to snap out of it and kick through with reports on the 26th of each month. Reports must reach the SCM before the end of the month in order to make QST.

Traffic: 7DQ 54, 7TX 18, 7EH 14, 7AFU 11, 7ACB 9, 7ACA 8, 7FD 8, 7ACS 6, 7VL 3.

MONTANA—SCM, O. W. Viers, 7AAT—Must I remind each of the ORS each month by letters to be sure and report on the 26th? It is queer why some of the fellows let it slip and never drop a line to say that they are inactive and to be excused from reporting during that period. When the Form 1 cards are furnished and even stamped, it seems like it is a

small matter of time and energy to take a pen or pencil and jot down whether you are active or not—it will save a lot of ORS tickets from being cancelled if this is done! This is the last notification to be given and if every report isn't in the 26th of Sept. from those who haven't reported for the last two months, their appointments will be cancelled and it won't be easy to get them again!

TEL has revamped his large receiving cage into a Zeppelin and is ready for the traffic rush this winter. 7DD uses 4th harmonic on 20 meters and works some real DX. 7AHG is a new Red Lodge station but will not be going for a few months. 7AAT worked Alaska three times using a 50 with 450 volts on the plate. 7AFM's home burned down and destroyed all his radio apparatus.

Traffic: 7AAT 33, 7DD 22.

PACIFIC DIVISION

LOS ANGELES—SCM, D. C. Wallace, 6AM—Five stations made the BPL this month, with 6BJX in the lead again after losing it last month to 6BUX. Other stations making the BPL are 6BHI, 6ALZ, 6BZC and 6DKX. 6DKX submitted his first report this month and has made a good start. 6BJX says that on account of typhoon in P. I., QRN was fierce but he got his traffic through. 6BHI finds that he can handle much more traffic. 6ALZ worked OA seven times and is keeping some fine schedules. 6BZC, one of our new stations, makes the BPL, has some good schedules, tried 20 but N. D. 6DKX is ex-1BOX and has been on the air out here about 30 days. 6BZR has been rebuilding and started the month right by going down to 20 with much success. 6QL just passed his commercial first. 6CMQ blinked the lights in most of Altadena, so now he is on a separate 3 kw. 6CQP has changed his QRA. 6RFP finds the UX882 a very consistent DX getter. 6ZBJ has been on his vacation and expects to be back in the BPL again from now on as his MG will be here soon. 6BXD is busy with the Los Angeles Radio Show work but nevertheless sends in a good total. 6AGR would like a sked with a good 9th district ORS. 6BTS has a new transmitter. 6AM has been out of the city most of the month. 6CMT says his total is larger than his bank balance this month. 6AWQ still keeps sked with 6FP at San Diego. 6CLK has eliminated BCL QRM so can come on the air now. 6CAG's fifty watter went west. 6CDY says "rotten DX plus FB YX equals bum msx total". 6AHS just put in a new fifty, perks fine. 6BGC's partner is on his vacation and he is handling both shifts at KFSG. 6BUM put in a motor generator. 6IH would like a sked with a Peoria, Ill. station. 6AKW is putting in a new radio tower. 6RF intends to take transmitter up to Stanford in October. 6CZT's total takes a fall from last month. 6DEG is building portable transmitter on his car and will keep skeds that way. 6CQM reports a terrible lot of QRM from Violet Ray and power leaks. 6PY is getting ready to move. 6GHT is coming on with a whole new set soon. 6BUX will be moving North next month. 6BRO intends to go to the ARRL Convention at San Diego. 6BAV and 6BHR report as usual. RM, H. G. Pearce, 6DDO left to go to sea this month. We shall sure miss him. 6BJX was elected RM and is doing some fine work already as he is in charge of the ARRL booth at the Los Angeles Radio Show with 6AVJ. 6AM, SCM, will be at the Los Angeles Radio Show and the A.R.R.L. Convention in San Diego.

Traffic: 6BJX 329, 6BHI 175, 6ALZ 230, 6BZC 129, 6DKX 109, 6BZR 56, 6QL 52, 6CMQ 51, 6CQP 50, 6RFP 49, 6ZBJ 47, 6BXD 44, 6AGR 34, 6BTS 31, 6AM 26, 6CMT 23, 6AWQ 20, 6CLK 20, 6CAG 19, 6CDY 18, 6AHS 18, 6BGC 18, 6BUM 12, 6IH 4, 6AKW 6, 6RF 3, 6CZT 3, 6DEG 3, 6CQM 3, 6PY 2, 6GHT 1, 6BUX 1, 6BRO 1.

EAST BAY—SCM, P. W. Dann, 6ZX—Asst. SCM, J. H. MacLafferty, 6RJ—It looks like the gang in this Section are spending their vacations at home this year. Many of you fellows were on the job to participate in the assistance given the Dole-Hawaiian flyers by amateur radio stations and your good work is going down in amateur history. Once more, it was the amateur who demonstrated the possibilities of short wave transmission and receiving. Sixes from the "Dallas Spirit" KGGA were copied RT-8 on 83.1 meters and all details of her disaster were copied and QSR'd by amateurs and relief was on the way only a few seconds after her SOS. A letter from the Idalia states that she is QRD Panama and her op 6OC wants more skeds with the Easy Bay. Listen

for KFVM on 37 meters, fellows. 6BER, 6CZR and 6RJ are getting excursion and accommodation rates for the big excursion to the A.I.R.R.L. Convention at San Diego. Let's make a big showing down there and help Southern Calif. put it over big.

RM GAPA has requests from other RMs for schedules. All East Bay stations who can handle more schedules are requested to advise GAPA at once. 6ALX wins the bologna this month, having received a FB letter of appreciation from the Nat'l. Guard Camp at Del Monte for handling 66 messages for them this month. 6CZR handled 55 usages and kept three skeds with Hawaii during Trans-Pacific flights. GAPA was up at the Oakland airport amateur station during the Dole-Hawaiian flight and did his stuff. 6BZU sent a good report from Concord this month and says he is going to try a zep. 6ALV was reported OK by KFVM and says a Hartley is the berries. 6RJ hopes to receive a report from every ORS in our Section next month. 6BHM reported his traffic total over the air this month. 6EY works the Easy Coast and handles traffic thru QRN and says DX is improving. 6BER reports QRW this month making enough for carfare to the San Diego Convention. 6AMI is QRW traffic anywhere using a 7 1/2 watt. W. Easley has been doing some good work on 20 meters at 6COL. 6UTC hasn't been heard due to rebuilding a real ham station at El Cerrito. 6CLZ is QRW at college now but doesn't forget to send in his ORS report. Eddie Smith is moving his station but says 6AFT will be on the air again soon. The filament failed to illuminate 6CCT's new 250 watt. 6AYC donated the use of his transmitter at the Oakland Airport this month and stood several all night watches during the Dole-Hawaiian flight.

Traffic: 6ALX 68, 6CZR 54, 6HJ 55, 6APA 39, 6BZU 30, 6ALV 22, 6BHM 19, 6EY 9, 6BER 6, 6AMI 6, 6COL 11.

SANTA CLARA VALLEY—SCM, F. J. Quement. 6NX—6AMM got back from his vacation and hit 251, most of them from Philippines and lots of government msgs. 6BVY, the other Philippine contact station was off the air again this month but hopes to get going again next month. 6BMW was appointed OWLS this month and to make his RM work more efficient he installed a pair of water cooled kenetrons which are the berries. 6CLP put up a new aerial and using 9DNG type circuit in xmitter. 6CJD is graduating from Tech. and will be on the air more consistently in the future. 6BYH moved and picked lots of QRM which he says is so loud as to drown out WIZ. HI. 6MP will be at 6BB for the winter. 6RNH will be back on the air in two weeks as is anxious for skeds. 6NX is still working on his new xmitter.

Traffic: 6AMM 251, 6BMW 16, 6CLP 9, 6CJD 1.

SAN FRANCISCO—SCM, J. W. Patterson, 6VR—6PW has only been in his new QRA 13 days and leads the Section this month. FB. 6HIA has a new 852 and is installing a new transformer to QRO. 6CCR is now working with 6EX so he doesn't have to worry about tubes now. HI. 6ASI was in town for the radio show—the YLs all flocked around him causing a small riot. 6BVC was operated at the radio show by the S. F. R. C. members and attracted a great deal of attention. 6GW just acquired a new Buick which he claims is an oscillating fool. HI. 6CXI is handling his share of traffic and is out after more. 6PN has a new Buick Sport Roadster which he says is hard to keep on the road on account of its balloon tires. HI. 6WS is still burning the ether with his bug. 6HJ is now in Vallejo and is using a portable set. 6CIS is still at sea and sends 73 to the gang in a recent letter to the SCM. 6VR had a disastrous month, a 50 watt and several other articles went west.

Traffic: 6PW 78, 6HJ 50, 6RVC 48, 6CXI 28, 6BIA 32, 6CCR 37, 6VR 17, 6ASI 10, 6WS 7, 6GW 6, 6PN 2.

SAN DIEGO—SCM, G. A. Sears, 6BQ—6AJM leads in traffic in spite of heavy work on conventions. 6RAM is using a fiver now since his fifty departed. 6FP cancelled his skeds on account of vacations. 6RXN and 6HU are on vacation. 6BQ is on 20 mostly. 6QY now has a regular sked with Philippines. FB. 6LA is getting things ready for a hamfest in Santa Ana. 6BFE is on again. 6GX has moved to 618 Rushville St., LaJolla. Wants to hear from stations interested in phone work.

Traffic: 6AJM 42, 6BAM 34, 6ANO 21, 6FP 20, 6RXN 11, 6BQ 9, 6QY 8.

NEVADA—SCM, C. B. Newcombe, 6UO—Only one station reported this month. What is the matter with the rest of you? Let's see some action next month.

7BTJ will be on in about 2 months as he is waiting for more equipment.

Traffic: 6BTJ.

ARIZONA—SCM, D. B. Lamb, 6ANO—6BJF is on 20 mostly so no traffic now to brag about. 6AZM is working for a company during his vacation. Expects to be on the air regularly now. 6CBJ is just about dropped out of ham ranks—sold outfit but hopes to be on the air again in the future. 6BWS's 50 watt. went soft—YLs bother. 6CDU has returned from a business trip to the West Coast. 6ANO is still going strong getting lined up for winter traffic. 6CUW is going on a ham tour to the Pacific coast for two weeks. 6YB will be on again now that school will open soon. 6AAM is back on the air after an absence of two years. 6DIB returned from his vacation in Northern Arizona. 6DIE is a new ham on the air working FB. 6BBH is QRW business. 6BJI is still off due to new location. 6CUW reports 3 new hams coming on the air in Bisbee soon. 6BGA is QRW baseball so can't find time for radio. Ex6ACG is back from the east.

Traffic: 6ANO 35, 6BWS 38, 6AZM 2, 6BJF 34, 6CDU 41.

HAWAII—SCM, J. A. Lucas, 6HBDL—6BUC is back in the BPL. 6CXY says his new 250 is burning the air. 6BVV is preparing to move somewhere in the third NU district, meanwhile is working from 6SE. 6DCU gave a pile of press to 7KX up in Alaska; helped a fellow with application for a job; had 6Z-3AI drop in and work his second op back in N. Z. 6DJU is going to try 20. 6CLJ is trying it. 6DCU tried 20 but can't make it perk. 6CLJ listened to KGGG, the Dallas Spirit, till they went into the last spin then QST'd the dope and notified the officials. Rigged up a 34 meter transmitter, signing Y16 aboard a sampan going to search the small islands and reefs in the northwest part of this group. 6BDL is now eligible for the WAG club. Made first OH-EB contact, and on 20. QSO'd FO a few days later on 40. Both QSO's were apparently, the long way around.

Traffic: 6BUC 107, 6BDL 62, 6DCU 55, 6CXY 54, 6DJU 21.

PHILIPPINES—Acting SCM, J. E. Jimenez, 6PIAT This report received by radio via 6PIAT and n6BJX—SCM 6PIAU has left for Cornell University and 6PIAT is temporarily acting as SCM. 6PIHR leads traffic, keeping a sked with 6BJX and Shanghai SCM. SZW and locals daily. 6PIDR gets second place. 6PIDL and 6PIAT will keep up sked with 6BVY. 1GZ is a newcomer who reports working Malay and China. QRN is bad these days and reception generally poor.

Traffic: 6PIHR 424, 6PIDR 126, 6PIDL 84, 6PIAT 20, 6PIGZ 3.

ROANOKE DIVISION

NORTH CAROLINA—SCM, R. S. Morris, 4JR—Five ORS out of ten reported this month. Smatter, fellows? The position of RM is still open, anyone want it? 4AB will be leaving for school Sept. 15. 4EC has QRM from his dental practice at present. 4TS will be off the air for two months. 4JR found that the absence of a certain tree under his counterpoise helped his signals considerably. 4OH is off the air due to orders from higher up. 4SJ is taking a trip to Nebraska. 4BT says YLs R9, DX R1 1/2 so no traffic. 4OC worked a German steamer 1000 miles away. 4ARW is off due to his honeymoon. 4QK also took unto himself a permanent YL. 4CS is waiting for Santa Claus to bring him a pair of pole climbers so he can get his antenna up. 4WY can't decide which makes the most noise, his MG or the phonograph. 4ACD saw 9MR and 9AAW while on a trip to Chicago. 4RI is moving his set from the basement to the first floor.

Traffic: 4OC 19, 4AB 13, 4OH 8, 4EC 7, 4JR 3.

VIRGINIA—SCM, J. F. Wohlford, 3CA—3KU had to QSK all skeds on account of heavy QRN, working 20 meters mostly. 3CEB has been experimenting. 3UX tried out 20 meters for a while. 3NM rebuilt the transmitter into plate-tuned grid. 3BMN has come to life again. Reports ex-3MO and 3NO at Richmond busting into the game again. 3AG seems to rattle off a few every month. Worked n4OI, ua-2SH, ek-4AAP, making four continents for a three month old station. Says some of the neighbors fell in the cellar looking at his Hertz. 3BGS has been QRW with his chickens, farm and the new baby, hence no traffic. 3KG has YLitis. 3CKL spent several weeks at Army camp. Replaced his pyp secondary condenser with a good make and improved the set about 500%. 3BZ reports working on 20 meters, working underground antenna but nothing

startling as yet. 3BDZ is on a trip around Great Lakes—expects to come back loaded down with xtal control dope. 4QA is visiting around the district, all broke out with xtal control.

Traffic: 3UX 40, 3KU 21, 3AG 15, 3CEB 12, 3NM 1.
WEST VIRGINIA—SCM, C. S. Hoffman, 8BSU—Not much activity on account of vacations, marriages, etc. 8DCM leads the month in traffic. Has schedules with nq-2RO, also worked sb-2AX. 8CDV worked several Europeans, Brazil and Jamaica. 8BNF worked several Mexicans. 8BBM is back from school and camp. 8CNZ is very active. 8BSU is making a trip to Detroit.
Traffic: 8DCM 40, 8BJB 6, 8BNF 4, 8BBM 3.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, C. R. Stedman, 9CAA—Things took quite a slump this month, probably due to vacations and everyone working to make the convention a success. Practically all reports in this Section were made in person to the SCM during the convention. 9CEV is still rebuilding. 9EJW is a new station to turn in a report. 9DWZ has a schedule that has managed to stick for a week, the longest so far and he hopes it won't fall thru. 6CNK is at the other end. 9CAA cancelled his schedule with 9PU in favor of 9BLU who in turn works 9PU, making daylight traffic handling much easier. 9CDE says he has great difficulty in finding stations to forward his stuff. 9CAW is still doing business on 20 and 40 and works days now. 9CAT didn't do so much this month but he is moving his station to the county fair and promises a lot of traffic from there. 9EEA has been too busy to do much. 9DGJ has been on regularly but no traffic to speak of. 9DVI is out of the state for a few weeks but says he will be back. 9QL is still QRW KOA and so no traffic.

Traffic: 9CAA 45, 9DWZ 21, 9EJW 16, 9CDE 10, 9CAW 10, 9CAT 10, 9EEA 2, 9DGJ 2.

UTAH-WYOMING—SCM, D. C. McRae, 6RM—Things are coming along fine this month although not a great amount of traffic was handled by the stations. Cooler weather is coming on and with it, a greater interest in radio. Handy, CM, was thru here and the gang was very glad to have the pleasure of meeting him. 7GR has made application for an ORS which will be granted shortly. 6AIK has just returned from his vacation in Yellowstone Nat'l Park and up thru Idaho where he visited a number of hams. 6RTH is with us again this month and says he is strong for choke amplifiers but doesn't think so much of "peaked" schemes. 6CLQ still continues to handle the big part of the traffic going thru this Section, keeping skeds etc. 6RM was on a little but most of the time was spent experimenting on 21 meters. Married life does not seem to affect 6BTX as far as pounding brass goes. He is on nearly every night and is getting fine results in his new location.
Traffic: 6CLQ 36, 6BTX 15, 6BUH 12, 6RM 2.

SOUTHEASTERN DIVISION

FLORIDA—SCM, Cecil Foulkes, 4LK—The Fla. gang is showing up FB now and with the cool weather coming along, we will make things hum down here. The doctor says 4NE must give up the RM work. 4VS visited the Jax gang on his way to Mich. 4CK was QSO France on very low power. FB, 4HX will be an ORS very soon. 4OB was QSO Brazil. Hq will be dusting off a WAC certificate soon. 4RK shoots traffic to Roumania. 4BN is a new ORS in Tampa. 4AAO is QRW with the local power company. 4MS is looking for Hurricanes with his emergency set. 4TK has been QRW. YL? 4UL made a trip to Germany. 4DU pulls teeth when not QRW radio. 4IE worked sea-1FG and will be a WAC soon. 4LK shipped an xmitter to Brunswick for the Redfern flight. 4HY is overhauling his shack. 4BL will be back again with plenty of pep. Very glad to see you new fellows reporting. Hope you keep it up. FB!

Traffic: 4NE 100, 4CK 69, 4VS 61, 4HX 55, 4OB 30, 4RK 28, 4BN 25, 4AAO 25, 4MS 16, 4TK 15, 4UL 14, 4DU 13, 4IE 12, 4LK 4.

GEORGIA-SOUTH CAROLINA-CUBA-PORTO RICO-ISLE OF PINES—SCM, H. L. Reid, 4KU—South Carolina: 4AAM-4PQ reports his transmitter will not perk. He has tried three aeriels and four transmitting circuits but ND. 4KZ has been QRW work hence the small report. Porto Rico: 4ACF, Virgin Islands, has been issued a license, 4PQ reports four new amateurs in Mayaguez. 4PQ is on

20, and has worked EF, EK, EB, EG, NC and NU. 4ABT is installing a 5'er on 40. 4ACH is another new one in Mayaguez who will be on with 7½ watts soon. 4JG is experimenting and is observing in Montoso for better conditions. 4LZ is rebuilding the "noise box" for better results. 4SA has been heard by several so guess he is still going strong on 20. 4KD is still going on 20 and 40.
Traffic: 4PQ 12, 4KD 2.

ALABAMA—SCM, A. D. Trum, 5AJP—Montgomery hams cut loose this month and besides the YLs didn't lack attention. Hi. 5ATP went on a 20 mile trip to say goodnight to his YL and got so enthused that he built a transceiver to keep in touch with the gang in town while on the way out. 5JY rebuilt his trustworthy into a 2-210 set and when you run up on his wave, the phones come off. 5ANJ worked his set daily until the little 210 went up in smoke. 5ADA's chemical just wouldn't stand up under the load and he has to use AC until he can save enough nickels for that MG. 5AJP has been ND for the month. 5NL with Bayne and Marks as ops has been trying to set a pace for the gang and believe they deserve praise for the good work that has been done. ex5AFS has been grumbling about returning to the air with a larger set. Montgomery expresses sincere regret in losing 5ATP-5ANJ to college this fall and hope it won't be long before they are back again. Both are taking sets with them. 5DF has moved to Florida and will be heard as a "4". He made some mighty good records while in Alabam' and we hope to hear more of him on the air. 5ABS has been on quite a bit this month on 30 meters. Walter Merkle came home this summer and started with 2 210's but he pushed them too hard and they said goodnight. L. J. Lee, Jr. was pushing sigs out most everywhere this month. He is at Auburn. 5AV must have something up his sleeve. He bought a fifty socket lately. 5VX can't be outdone so he's ordered an 852. 5JP will meet the Auburn gang over 5YB this fall. 5DL was promoted to Master Sergeant of the Radio Section of the 31st Signal Company. 5DL was operated by 5AUC while DL was in encampment and 5AIE was operated by 5DL and several ops. 5AWL is a newcomer and we are looking forward to a report from him soon. When 5AX is not saying "Papa spank", he's at the key and you can hear that thundering DC most all over the place.

Traffic: 5ADA 10, 5ATP 58, 5ANE 12, 5ABS 4, 5AIE 189, 5DL 150, 5AWL 10, 5AC 18, 5NL 21, 5LU 17, 5JP 34, 5JY 102, 5AV 12, 5VX 7, 5AX 47.

WEST GULF DIVISION

SOUTHERN TEXAS—SCM, E. A. Sahn, 6YK—The summer slump seems to affect activity in this Section still. But cooler weather is due soon and doubtless there will be great renewed activity. The SCM had his set just about ready to go and a little cloud blew out of the southeast and took the entire antenna and counterpoise system down. But it will be lots of fun to put it back so what is the difference. 5PK is on a ship on the Father of Waters. He may be back in Texas in a month but not yet ready to SK as a ham. 5AHP says it is difficult to get schedules but he has some traffic to his credit. 5HE reports increasing activity in that city. 5WP has moved to Amarillo. We are sorry to lose him. 5RR is in New Orleans attending radio school. He hopes to be on a ship soon. Joe Wright of Miranda reports that he has been heard in London. 5ARQ is back on the air and QRV for traffic. He is helping organize a new traffic route for the South. Corpus Christi is again represented by 5MS. He reports a YL station, 5ACO, in Arkansas Pass. We would like her in our ORS list.

Traffic: 5MS 22, 5ALA 1, 5HE 7, 5AHP 7.

NORTHERN TEXAS—SCM, W. B. Forrest, 5AJT—Activity is somewhat better now but still reports are coming in few and far between. 5AHU will be off this winter due to college work. 5AQ has been fishing with 5ACL, 5JD, 5RG and 5AKN. He caught the 5 lb. bass while RG and AKN were sitting on the bank reading QST. 5AQ also reports having wasted three good months on the Dallas County Grand Jury freeing bootleggers who made good stuff. 5HY just returned from a visit to 9RR of Kansas City where he spent his vacation. 5SH was QSO WNP. 5OD is a new station for our Section as well as 5OE and 5APJ. Welcome, OMs.

Traffic: 5RG 42, 5NW 1, 5OE-5APJ 6, 5OD 19, 5SH 9, 5HY 10, 5AQ 2, 5OK 3, 5SP 14, 5AKN 4, 5AVS 4, 5AHU 15.

OKLAHOMA—SCM, E. M. Ehret, 5APG—Reports hit the bottom this month. Gotta do better than that, fellows. 5ANT is doing his turn consistently and has the making of a real traffic man. 5VH is on the air about every day now but doesn't seem to be able to get out of the 5th and 9th districts. 5FJ is operating aboard SS Taylor on the Great Lakes but expects to be back with the gang soon. 5SW nailed an Aussie at last. Hurrah. 5QL just announces the arrival of 10 lb. junior op and is getting some code practice. Rumor has it that 5AAV is getting home-sick out in Denver. The OM says get busy and let's have a full report next month. Whachasay?
Traffic: 5VH 19, 5ANT 21, 5APG 6.

CANADA MARITIME DIVISION

PRINCE EDWARD ISLAND—SCM, F. W. Hyndman, 1BZ—1AP reports that nu2CJD has been visiting him and that he thinks P. E. I. a fine place. 1CO had a visit from nc3BR and nu2CJD, also. He uses a Zeppelin antenna on both bands: (20 and 40).

Traffic: 1CO 3, 1AP 34.

NEW BRUNSWICK—SCM, T. B. Lacey, 1EI—Radio has been pretty much at a standstill this month owing to adverse weather conditions which have prevailed practically all month. Apparently the gang are saving their tubes for a long cold winter when they will be compelled to stay indoors and forget their cars. VDE has been heard here about R2 or 3. How about a NB hamfest at Fredericton? Please write the SCM if interested. 1AX, 1AM, 1AK, 1EI and 1CB have been heard on the air but no traffic.

NOVA SCOTIA—SCM, W. C. Borrett, 1DD—Activity in N. S. is mostly in and around the Cape Breton district where several new stations are on the air. 1ED is now crystal controlled on 41.7 meters. 1BT is spending most of his time on 20 meters and likes it better than 40. 1BR and 1BI are also on 20. 1CL, 1DA, 1DM, 1BK and 1BT report that they all visited WNP when he was in Sydney on his way North. 3BR of Ontario has been touring N. S. and has called on all the ham stations possible. 1DD has handled several messages for WOBD, several of the crew being Nova Scotians. 1AR has been doing splendid service with VDE, handling traffic for him every night except Thurs. during the whole trip. VDE has Starr, 1AE, on board. 1CC and 1DQ of Dartmouth are other N. S. stations on the air.

Will all Nova Scotian stations please report on the 20th day of each month to 1DD? Cape Breton stations can report to 1BT on the 19th if they desire and he will forward reports to 1DD. There has been no Nova Scotia Section report in QST for two months because the gang have not sent in reports of their activities. Please make an effort to give the news to 1DD. Try and get on the air Thurs. evenings at 10:00 Atlantic Standard Time when 1DD and 1AR are always standing by for VDE. We could then work one another and if anyone of us can work VDE, it will go to the credit of the Section. 1AR is on at this time every night. Will all Maritime stations please send any suggestions regarding time and place to hold a Maritime Convention to the SCM?

ONTARIO DIVISION

ONTARIO—SCM, W. Y. Sloan, 9BJ—3BT has worked various European stations and WNP on 20 meters. His work has not all been on 20 but he will be found there most of the time.

Central Dist: 3EL took a portable set on a sailing yacht down to a Regatta at Kingston and worked quite a few of the fellows. 3BL is trying to find out what the new TP-TG set will do plus a Zeppelin antenna. 3DY and 3CJ have been operating the latter's station at his summer home at Bobcaygeon. 3DY is home now and working a successful schedule with 3CJ. 3RD has been away most of the month but managed to work up a little traffic. 3BK has been pounding brass at every opportunity. 9AL had to send his generator armature away for repairs owing to a breakdown but he continued his schedules. 9BJ is still taking life easy at his summer home far away from radio. 3FC visited N. Y. C. while on his vacation and then came home expecting to break a few more records but so far has been out of luck. 9AI is working VDE on schedule with 9AQ co-operating. 3CC is oscillating backward and forward between Hanover and Toronto. 3CR has not been heard from lately. 3DC had kenetron failures and is turning to chemical rectifier in disgust. 3DV has been keeping schedules and trying out his set in vari-

ous positions in his home. 3CT is back on the air again. 3HR sold all his junk but couldn't keep away from radio so he is getting another set ready again for work on 20.

Eastern Dist: We hear that only a few of the fellows are awake in this Section. Let's hear from you, gang!

Southern Dist: 3UW is changing his QRA again. 3FU is on the air but we have no particulars. 3WV is going strong on 80 in spite of QRN etc. 3BG is working on 80 and worrying because he can't seem to get her perking on 40. 3ACO is now out of the picture. 3CS is blazing away on 20 and is doing splendidly on low power.

Northern Dist: 3GG has not been heard this month but suppose he is still pounding brass. 3HP is doing excellent work on 20 meters.

Traffic: 3HP 45, 9AL 1, 3FC 24, 3BK 24, 3DB 19, 3BL 1, 3BT 4, 3CJ 30, 3DY 27, 3CB 3, 3IA 1, 3CS 5.

VANALTA DIVISION

BRITISH COLUMBIA—SCM, E. S. Brooks, 5BJ—A very enjoyable ARRL Convention was held at Vancouver Aug. 6th and 7th. The Halliday Cup for the best operating at the BCARA station ne9AJ was won by ne-5AL. Prizes were won by 7MX and 7MH (nu stations). ne5GO has been travelling for the "Governor" and the 3rd operator keeps the key from getting stiff. ne5CF is removing some of the haywire from his transmitter and shortening up all leads. ne5AJ is relief operator at the Forest Service station DN during the regular operator's holiday.

ne5AD keeps busy testing aeriels. ne5HB tries 20 during slack hours at the garage. ne5CT reports getting out a bit better despite the QRN. ne5CO says not much DX this month. ne5CC is too busy to be on much. YLs? ne5AR is at Military Camp and will be off for about two months. ne5CO-CC are going to try 30 soon. ne5CJ expects his new rectifier to perk out a DC note. ne5EK is QRW the YL. ne5HK is a close second to 5EK. Please, all of you, report next month.

Traffic: 5CO 10, 5CT 2.

ALBERTA—SCM, A. H. Asmussen, 4GT—Things are beginning to look better here. 4CC is now home and turns in the best msg. total. 4CL is the DX station of this district this summer due to considerable experimenting with aeriels and when he returns from his holidays, we expect to hear more from him. 4IO is QRW painting his house and reports a number of new stations on in Calgary and trust they will apply for an ORS certificate soon. 4AH expects to be going again soon. 4DG has a lot of YL QRM. 4HM has returned from the East and now has a couple of quart bottles for the 40 band. 4FF has a real ham station and is doing nice work. 4AX has a new Lizzie and is going to tour North for a trip. 4GT is nearly all ready.

Traffic: 4CC 17, 4HM 4, 4FF 3, 4CL 2.

PRAIRIE DIVISION

SASKATCHEWAN—SCM, W. J. Pickering, 4FC—4CM is back on the air again after three months with a rebuilt set, using a UX210. 4CP is down on 20 now and reports results FB. 4AV is back on the air with a new transmitter using storage B's. 4HS writes about the lack of Sask. amateurs on the air and that all his traffic for the Province has to be mailed. 4HS blew 2 five watters and a 210 but will be on soon with a UX852 and 200 volts RAC. 4GA has a low powered set going now since his sweetie went away. 4AO has found a location in Regina and is on with a 5 watter. 4GB has a German tube and is having a hard time to make it perk. How about those Wednesday night prayer meetings on our Canadian band? Let's start them again—SCM.

Traffic: 4CM 2, 4CP 3.

MANITOBA—SCM, F. E. Rutland, 4DE—Only one report from this Section. What's the matter, gang? Haven't you any Form 1's or what? 4BT worked ss2BN on his 7½ watter and is now a DX fan.

Traffic: 4BT 26.

QUEBEC DIVISION

QUEBEC—SCM, Alex Reid, 2BE—Things are rather quiet, vacations are in order. We received a visit from nu2CJD. He seems to like Canada. 2BE is visiting Hartford and other points. 2AC is a new station on the air. 2RB is still experimenting with Zeppelin antennas. 2AL has a junior OW. Congratulations. Well, gang, the fall is coming, the old hamfests will be welcome and how about a little more cooperation this year?

Traffic: 2RB 25, 2BE 9.