

# QST

DEVOTED ENTIRELY TO

# AMATEUR RADIO

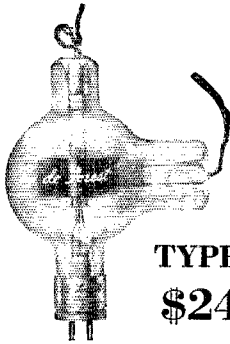
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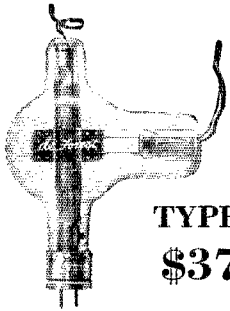
**AUGUST, 1930**

**25<sup>c</sup>**





**TYPE 552**  
**\$24.25**



**TYPE 560**  
**\$37.50**

**These are net prices on  
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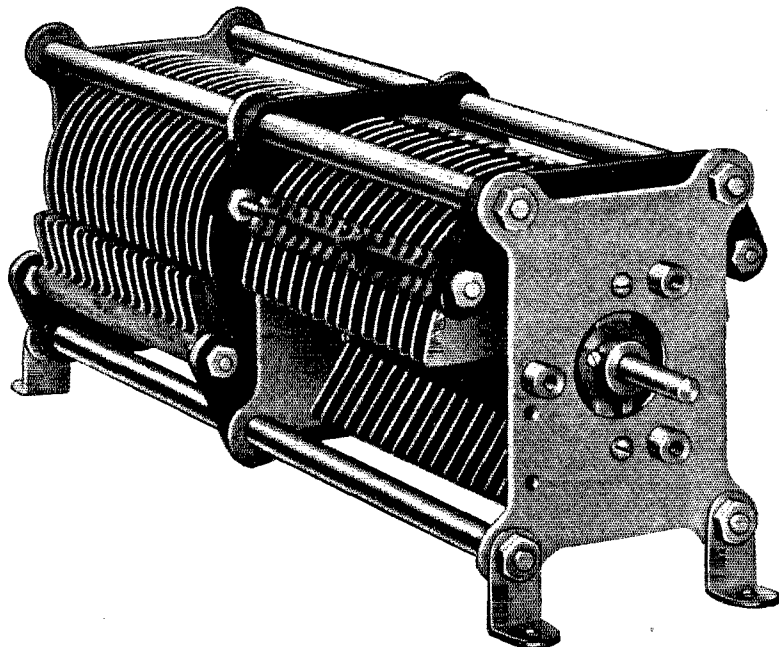
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Maximum Capacitance, 500  $\mu\text{f}$



## SPECIFICATIONS

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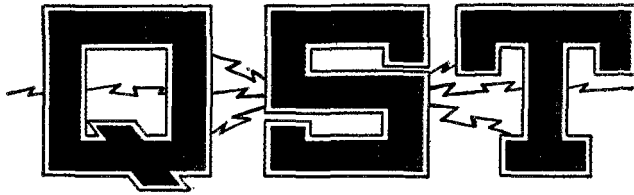
Type Number	Capacitance		Overall Dimensions	Weight	Price
	Max.	Min.			
334-Z	500 $\mu\text{f}$	35 $\mu\text{f}$	3 $\frac{3}{4}$ x 3 $\frac{3}{4}$ x 11 in.	3 $\frac{1}{4}$ lb.	\$10.00
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*334-T	100 $\mu\text{f}$	15 $\mu\text{f}$	3 $\frac{3}{4}$ x 3 $\frac{3}{4}$ x 4 in.	1 $\frac{1}{8}$ lb.	2.75
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# The Official Organ of the A.R.R.L.

VOLUME XIV

AUGUST, 1930

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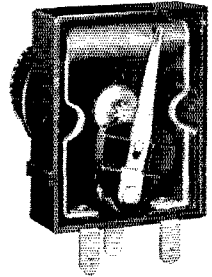
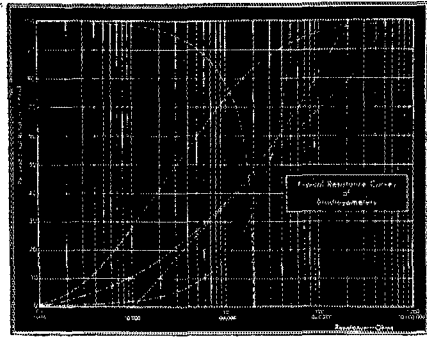
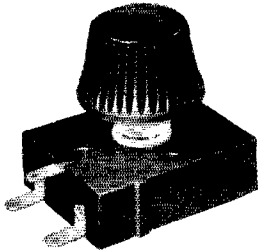
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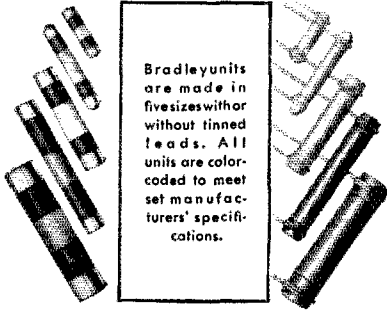
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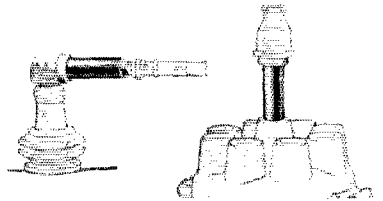
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The American Radio Relay League, Inc., is a non-commercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio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

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

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

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

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# EDITORIALS

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WHENEVER our morning mail discloses an envelope with the writing all snarled up because of the frenzy of the writer, we know what it's about before we open it. It's some member writing in to *QST* to give us the devil for publishing some article which he thinks "too technical." Whenever we publish even the simplest algebra we retire to our bomb-proof dugouts for a week after the issue is out. And we know by long experience that if an article isn't A-B-C in style, with complete specifications for building something or other, there are far too many amateurs who won't try to understand it, irrespective of its merits, but who, more or less vocally, are displeased with its very appearance in our pages.

We think that *QST* is an intensely practical magazine; it is famed for the direct help it brings to practicing amateurs. But amateurs should know something about radio, should be able to think some for themselves, should not have always to follow constructional specifications blindly. Partly for these reasons, partly because there are some subjects not yet reduced to successful practice, *QST* also has articles which deal with the theoretical side of things radio, and it is these stories which are so often scorned by the practical amateur. Fortunately, not all amateurs scorn them, and it happens that right now we're able to point to practical benefits from the "too technical" articles that ought to satisfy all hands. For instance, in our July issue there was an article on a better, more efficient and compact chemical rectifier which places the "chem" right up in the front row as a unit in ham plate supplies. It was directly based on Kryter's theoretical article on rectifiers in April of last year. There are important developments on the fire right now in the dynatron frequency meter, soon to appear in *QST*. They are based on an out-and-out "too-technical" article, "The Dynatron," which we published last February. The filter portion of Grammer's rectifier and filter yarn in June is based on Zottu's "too-technical" article which ran in April.

These practical follow-up constructional articles would never have been born without the fertilizing influence of the "too-technical" articles. They may be castor oil to some of us, but they're good for the system. We shouldn't think we're being "gypped" because we don't understand them all. Other amateurs of greater experience will take up these articles and sooner or later bring practical how-many-turns stuff to *QST*'s pages which means an otherwise unattainable advance in amateur technique.

There is increasing indication of a change in the way amateurs go about their developments — the *QST* staff believes that we are in a period of transition in amateur practice, transition from blind experimenting and empiricism to real research. We don't mean research of the pure-physics variety as much as intensely practical research. Surfeited with merely knowing how to assemble apparatus which works well, we amateurs as a group seem now to be starting back over the route to find out what makes our circuits tick. In the process we are finding out a lot of things and again definitely improving our apparatus and technique. The push-pull transmitter described in our June issue was an excellent example of this; the dynatron exploration now under way is another; so are the recent developments in 28-mc. and directive transmission work, requiring as they do a knowledge of pure physics for their intelligent attack. The moral in all this is that the amateur who has thrown his old high-school physics book in the junk-box had better fish it out and read up on electron theory, light, reflection and refraction, and so on — all of which are pertinent to amateur radio of today.

Not that *QST* means thus to announce that it is going in for more and more theory. Far from it, it is simply that fundamental appreciation of what's happening in radio circuits will help every department of a practical amateur's work. *QST's* articles will always be "of, by and for," because that's our very purpose in life.

We notice, by the bye, that a couple of other magazines are claiming a little too loudly that they have "short waves" by the tail and are the only reliable purveyors of information thereon.

Well, well! Ain't that somethin'!

K. B. W.

## Central Division Convention

Dayton, Ohio, August 30th-31st

(Ohio Section)

**W**HOOPEE! Open sesame! The Central Division Convention is to be held in Dayton, Ohio, Saturday, and Sunday, August 30th and 31st, at the New Biltmore Hotel, under the auspices of the Dayton Amateur Radio Association. While there will be some good technical talks it is the intention of the Committee to give every one 90% good times. It being the desire of the Committee to start things early Saturday it is planned to have something for these who reach Dayton Friday evening. The best of it all fellows is the price — it is only \$3.50. The headliners for this convention are: D. J. Angus, the new Director; K. B. Warner, Secretary and General Manager; K. B. Warner, Secretary and General Manager; and C. C. Rodimon, Managing Editor, *QST*.

A cordial invitation is extended to all amateurs in the Division as well as those in other sections — show up and you will see what we will do for you. Send word to Mr. L. E. Furrow, General Chairman Convention Committee, Post Office Box 76, Dayton, Ohio.

night is being arranged for at the "Oasis" in connection with the Dessert Hotel.

We are hoping to have Mr. A. L. Budlong, Assistant Secretary, A.R.R.L., as Headquarter's representative; if not, Fieldman Hebert will be here. We are doing our best to secure Howard F. Mason, of Seattle, who has been with the Byrd Expedition, as our guest of honor. There are many other things in the wind, but we cannot make the announcement at this writing. Rest assured, however, that a cordial reception awaits all delegates. Just drop a line to J. L. Moon, Secretary, W. 3823 Heroy Ave., Spokane, Wash.

## Pacific Division Convention

Honolulu, T. H., August 8th-10th

(Hawaii Section)

**G**REETINGS! The Hawaiian Section of the Pacific Division, through its Section Communications Manager, extends to all amateurs a cordial invitation to attend its first convention to be held in Honolulu on the 8th to the 10th of August. Radio your reservation to L. A. Walworth, SCM, 2737 Ferdinand Ave., Honolulu, T. H.

## Northwestern Division Convention

August 29th-30th at Spokane, Wash.

**O**NWARD to Spokane, Wash., fellow amateurs, to attend the annual A.R.R.L. divisional convention to be held Friday and Saturday, August 29th and 30th, at the Hotel Dessert, which is being sponsored by the Radio Operator's Club. Those of you who attended the last convention here three years ago will remember the very fine affair given, and the committee this year feel that the visiting members will be treated to a program far in excess of anything yet attempted. There will be plenty of entertainment and a banquet supreme for the last

## Strays

Mr. W. D. Terrell, Chief of the Radio Division of the Department of Commerce, has announced the creation by the Secretary of Commerce of the post of Traveling Radio Supervisor and the assignment thereto of Mr. Arthur Batcheller, for many years the Supervisor of Radio at New York.

Mr. Batcheller's new duties are those of an executive liaison officer, coordinating the activities of the twenty field establishments maintained by the Radio Division — the nine district offices, ten sub-offices, and the Grand Island (Nebr.) monitoring station. His successor in the Second District has not been chosen at this writing.

## The Story of PMZ

By Harry Wells, W3ZD\*

**P**ROBABLY the first thing you fellows would ask if we were all able to get together would be, "How did you happen to get the lucky break"—so let's start off with a football game.

If I hadn't decided to return to Washington from Pittsburgh, where I had been working with the Westinghouse Company, in the fall of 1928 for the homecoming game of the University of Maryland with the University of Virginia, the following events would never have happened; to me anyway.

The day following the game I noticed a news dispatch concerning the All-American Lyric Malaysian Expedition which would go in the near future to Borneo with a small party of scientists for the purpose of making a study of the primitive natives, to obtain geographical data, and also to make observations on tropical and equatorial radio conditions.

Through the medium of the clipping I got in touch with Mr. Theodore Seelmann of Chicago, the leader of the project. It developed that he was looking for someone with certain operating and practical experience as well as technical training, and I was lucky enough to get the appointment.

So, early in 1929 I proceeded with the selection of the various equipment required by our party. In connection with this I wish to offer particular thanks to Dr. J. H. Dellinger of the United States Bureau of Standards and Mr. Lawrence Hyland of the U. S. Naval Research Laboratories, whose timely suggestions were of considerable assistance.

It was considered advisable to have three complete and separate transmitting and receiving units; the first a fairly long-range and semi-portable outfit; the second an emergency transmitter to be used in case of any serious breakdown; and the third the portable job to be used by the advance parties for contact with the base.

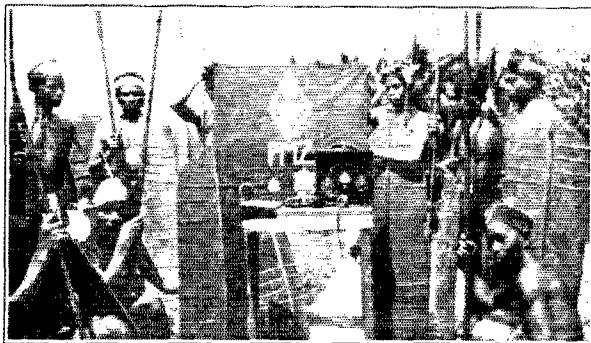
The main transmitter unit was a fifty-watt t.p.t.g. Marine Corps type outfit supplied "in toto" by the firm of Heintz and Kaufman, short-wave radio specialists of San Francisco. Plate and filament currents were supplied from a small duplex 240-cycle generator driven by a single-cylinder two-cycle gasoline engine.<sup>1</sup>

This complete equipment, comprising transmitter, gas-engine generator, receiver, telescopic mast and odd parts, weighed less than 200 pounds packed in sturdy canvas containers and could be erected by several men in a very short time.

The emergency transmitter was a bread-board high-C Hartley incorporating a UX-210, the plate supply of which was obtained from a 12-to-350-volt dynamotor. This was built and tested at W3ZD.

Our portable job was a Burgess aircraft type unit comprising two 201-A tubes in a m.o.p.a. circuit with the power supplied entirely from batteries.

Wherever possible, every piece of equipment



PRIMITIVE DYAKS GATHERED AROUND A PORTABLE INSTALLATION ON THE MORUNG RIVER

*The natives believed that the radio was white man's magic which persuaded friendly autohs to carry the messages. The banner which two of the Dyaks hold was the official flag of the expedition. It was left at the PMZ Shrine at the headwaters of the Morung River.*

was especially sealed or impregnated as an added protection against the disastrous effects of the tropical moisture.

Preparations were completed by the latter part of March and our party of four Americans including Mr. Theodore Seelmann, with Mr. and Mrs. John H. Provinse of the University of Chicago, embarked on April 3 from Seattle. Mrs. Provinse was to accompany her husband as far as Java.

By keeping the strictest personal supervision over the shipping and handling of our equipment we were able to get everything to Borneo without any serious mishaps. Our nearest calamity occurred when a Dutch mate stowed the box containing the storage battery acid upside down in the hold. Luckily, when the mistake was discovered several days later the corks were still holding.

\* 219 East Poplar St., San Mateo, Calif.

<sup>1</sup> This set is identical with that used by W6OJ in his African adventure and was described in July QST.—EDITOR.

The voyage outward was made by way of Japan, China, Philippine Islands, the Celebes and Java. After just two months we were to get our first glimpse of Borneo. However, that long awaited moment didn't present a very enticing view. The heat seemed to come rolling out to meet our small coastwise steamer. The shoreline was indefinite and appeared as a rather depressing maze of swamp and jungle.

On our arrival at Bandjermasin, the capitol of Dutch Borneo and a town of 40,000 population,

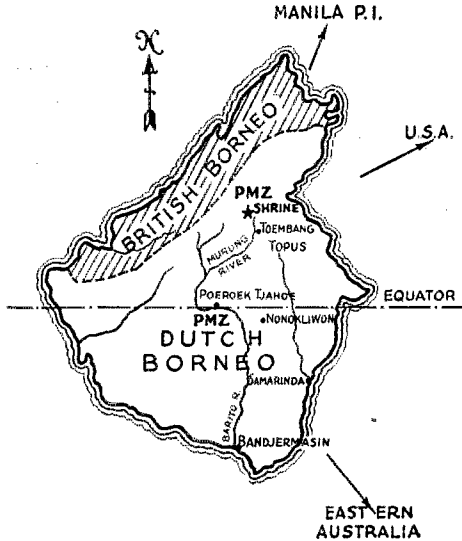


FIG. 1.— WHERE IT ALL HAPENED

"PMZ Shrine" marks the journey's end; here was left the official PMZ flag emblazoned with the A.R.R.L. emblem. The arrows indicate approximate great-circle directions to the U. S. A., Manila and Eastern Australia. Captain DeQuant was massaced only an hour's march from PMZ's base at Poeroek Tjahoe.

of which only a few hundred are whites, we proceeded with the final preparations for our trip into the interior. There we were also initiated into our first crocodile hunt.

On the boat from Soerabaya to Bandjermasin we had become acquainted with a skin buyer who thrilled us with strange tales of Borneo's huge snakes and wild life and promised to take us with him to places nearby where one could see hundreds of crocodiles in an evening. So one afternoon we packed a large boat with guns, lamps, provisions, and started out. We paddled until dark through the myriads of interconnecting rivers and canals in the vicinity of Bandjermasin, then selected a deserted stretch of river lined only by unbroken jungle as our hunting grounds.

An auto spotlight was connected to a storage battery in the bow. One man took his position there and, as the boat gently drifted through the stillness of the tropical night, cast the light

upon the river banks. Another man, with the sights of his rifle whitened, was stationed immediately behind the light quietly awaiting the tell-tale bright red reflection of the crocodile's eyes. When one was spotted we would maneuver the boat within range and he would then take a dead bead on the eyes only, for that is the most vulnerable spot. In the course of the evening we saw dozens of crocodiles both large and small, but most of the old boys were a little too smart for our amateurish methods and we were only successful in bagging several of the smaller ones ranging from 4 to 7 feet in length.

#### INTO THE INTERIOR

The trip up the Barito River proved most interesting. At times the progress of the little Dutch river boat, *Negara*, would be almost completely blocked by vast quantities of water hyacinths which would form a solid mass from bank to bank. The strange jungle odors, the bright-hued tropical birds flying overhead, the herds of chattering monkeys playing along the banks, the occasional wild boar or deer seen cautiously quenching its thirst, the crocodiles or snakes gliding through the muddy, sluggish water, all seemed to be crying, "This is the road to adventure and the real things of life."

One week after leaving Bandjermasin our boat pulled into Poeroek Tjahoe, the last Dutch military outpost on the Barito, some 250 miles from the coast and directly on the Equator. Here the entire white population, consisting of the post commander, Captain J. C. DeQuant, two young lieutenants and a doctor, turned out to welcome our party to the place which was to be our headquarters for the coming months.

At 3:30 in the afternoon we started unloading equipment. Naturally I was anxious to get PMZ on the air as soon as possible to establish contacts, start getting schedules arranged and also to determine with what sort of conditions we would have to contend. We all dropped everything else and commenced unpacking the radio equipment. By dusk the telescopic mast was erected and the assembly of the rest of the transmitting equipment was well under way.

The unusual burst of activity in that ordinarily quiet and slow-moving community attracted considerable attention among the natives; word rapidly spread that some strange and new white man's wonder was about to be demonstrated. Soon the entire population of the kampong was quietly and expectantly squatting around my network of wires and instruments.

Finally all was ready. The gas engine started on the second spin. The transmitter was roughly tuned to the 7-mc. band. I put on the "cans" and picked up a fair signal through a terrible mess of QRN.

"CQ CQ CQ de W6BYY W6BYY . . . AR."  
Ted gave the gas engine a twist and off she



roared. I answered with a long appealing call — the first time on the air for PMZ. (We would soon know what that little outfit would do.) By all that's holy in ham language, W6BYY came right back at us! Those thousands of miles which separated our little group in the heart of wildest Borneo had vanished into the ether. Gentlemen, that *was* a thrill.

To the brown-skinned natives the gas engine was the greatest curiosity and the news quickly scattered that we were doing wonderful things in Poerock Tjahoe and had a contraption which would make a noise like thunder and revolve like lightning. Whole families travelled for days through the depths of the jungle merely to watch our activities. The radio, of course, was far beyond their comprehension, so they preferred to believe that by means of this apparatus we were able to induce friendly "antohs" or spirits to carry forth our messages.

Our first QSO's were not very satisfactory from an operating point of view because the humid atmosphere affected the carburetion. In spite of all possible adjustments, every time I would shut down the engine to listen in, it would invariably become so badly choked or flooded that when I'd want to come back at the other station it would be necessary first to pull the spark plug and wipe that off before the engine would start. During the intermission the QSO would be lost.

It did not require much foresight to see that if PMZ were ever to be a success on the air this



TED SEELMANN ENTERTAINS A GUEST WITH "LYRIC" MUSIC

*Mr. Seelmann is, of course, the gentleman at the left.*

condition would have to be corrected. Accordingly as the erection of our base camp progressed, I developed a method of shielding the ignition so that reception could be obtained without any noticeable electrical QRM while the engine continued running at slow speed with the clutch disengaged.

Reliable schedules were soon established with the Philippine Islands and California. The majority of our traffic, such as the daily report to the Chicago offices, was handled through the P. I. stations of Sergeant Paul Holbrook, KA1AF, and Commander S. M. Mathes, KA1CY. Mr. L. R. Potter, W6AKW, and Colonel Clair Foster, W6HM, took most of the messages to be sent direct from PMZ to the U. S. A.

As had been expected, the moisture and static were our chief persecutors. It is interesting that the equipment which has been especially sealed and impregnated held up O. K., but that a



THE SHACK OF PMZ AT NONOKLIWON

*It was from here that the contact with W6AKW was made. The gentlemen leaning against the floor are John H. Pravnise, of the University of Chicago, and the author (right).*

transformer which was exposed for a test developed an open circuit within two weeks.

There were invariably thunderstorms in the vicinity, so several types of so-called "quiet" antennas were tried in attempts to reduce the noise level, but the ancient Beverage type, long and low, was the one which gave by far the best results. This antenna was about 300 feet long, never over eight feet above the earth, and grounded at the far end through a resistance of 200 ohms. The free end was pointed in the general direction of the U. S. A. and gave a decided directional effect.

The transmitter antenna used at the PMZ base was a single wire about 200 feet long and 30 feet high, fed by a quarter-wave "ladder," for 7320-ke. operation. This arrangement put one and a half full waves on the radiator.

After gradually becoming accustomed to the heat and direct rays of the sun, we started plans for our first real exploration trip. The Dutch Government had very courteously offered military assistance whenever possible, so it was agreed to make an attempt to reach the headwaters of the treacherous Murung River — territory never before seen by a white man — while at the same time making a search for the most primitive of natives, the nomadic Punan Dyaks.

Some tests on the portable transmitter showed

that the Philippine Islands could be worked with an adaption of the W3ZD emergency set using one 201-A with 300 volts of batteries at an input of seven and a half watts. It was decided, therefore, that instead of using the portable jobs



A DYAK MEDICINE MAN

*He waves the chickens and whatnot over his patient's head to drive away evil spirits.*

merely for contact from the field party to the base, we would attempt direct QSO with the P. I. This course was advisable since in the short time available it was impossible to train any other member of the party sufficiently in its operation.

The transmitter, complete with batteries and tray containing wires, tubes and spare parts, was packed in a water-tight metal box. The H. & K. inspector's kit receiver was protected by its stout wooden casing and a heavy canvas bag. The two units comprising our complete transmitting and receiving apparatus weighed some 60 pounds, just making a good load for one coolie.

By the middle of July all was in readiness for the start. Captain J. C. DeQuant, post commander and *controleur* of a portion of Central Borneo larger than all of Holland, was in charge of the party. Seelmann and myself completed the white personnel. Five convicts, who were serving time at Poroek Tjahoe for murder, were assigned to assist in the paddling and do

the cooking. Our Chinese boy, Lim, was not interested in seeing any wilder people. Other natives were secured to help paddle our boats from one kampong to the next. Everything perishable was packed in those five-gallon gasoline tins which are so indispensable in the tropics.

For the first days our two heavily laden boats plowed through rather sluggish muddy water, but on the third day the banks became higher, the water faster and by that evening we were on the edge of the Kiham Hatas, Borneo's longest single rapid — 600 yards of water fury.

The ensuing month was one continual story of man's battle with the elements. There were days of hard paddling — days of roasting in the intense heat; sudden showers would soak us through; then the slightest breeze would chill us to the bone; swarms of insects gave one little rest. Rapids, waterfalls, narrows and whirlpools had to be encountered, where the slightest error in judgment might spell destruction for all.

We were too busy and tired to heed any rumours of unfriendly natives.

At one village we were successful in capturing a Malay trader who had murdered a Dyak only the day before. That night the murderer was chained by the neck to a post in the center of a shack. Our camp beds occupied the other space. The Malay was afraid to sleep on the floor because he thought the Dyaks might spear him from underneath. Personally, I could only think, "Gosh, what if they miss *him*?" That canvas spread on my bed felt awfully thin. . . . I have passed more restful nights. But evidently the Dyaks were satisfied that we kept the prisoner, for nothing untoward occurred.

Three days later we arrived at Toembang Topus, the last village on the Murung and practically at the headwaters. The next day it was necessary for Captain DeQuant to make an overland journey to another isolated kampong.

Little PMZ portable had been stepping out in good shape. We made set-ups every few days, or whenever conditions were favorable. KAICY was on the air every evening at six-thirty looking for my little warble, but the sked proved a little early, and several times it was impossible to raise the Philippines until later in the evening. However, results were quite good since QSO's were made from every installation. The transmitting antenna generally consisted of about 100 feet of wire, anchored onto a handy palm tree, current fed with a quarter-wave "counterpoise." A separate aerial was used for the receiver so that a break-in system was possible.

After signing off we'd tune in some short-wave broadcast and let the group of curious natives listen to the white man's magic. The stolid Dyaks would show little surprise on hearing the moaning of a saxophone or the melodies of an orchestra for the first time — mostly amusement and curiosity. To show them that the music was

being picked from the air I would disconnect the antenna and then put it back, bringing in the signals again. But when I tried to explain that it only required a fraction of a second for the impulses to travel thousands of miles, they gave up and preferred to think that we were powerful beings who controlled kindly spirits to carry out our desires. Toy phonographs also went over big, but some one would invariably try to climb inside the horn to see where that noise was coming from.

I was often bothered by a crowd of natives gathering around the set-up and getting tangled in the wiring or knocking something out of adjustment, so on one occasion I let one of the more troublesome boys feel the terminals of a Burgess PL 108-volt battery. He jumped back yelling "panas" (hot), and after that they were afraid to come within ten feet of the outlay.

The QSO with KA1CY on August 6th was fairly decent and we were able to clear considerable traffic, so we left the outfit under guard and early the next morning Seelmann and I started our dash to the headwaters, while De Quant was away. No white man had heretofore penetrated this territory. With the four of us (counting two Dyaks) paddling steadily our light boat made good time. The water soon became so shallow that it was necessary to wade. Logs and overhanging creepers impeded our progress, but by afternoon we had reached the actual uncharted headwaters. Here a small clearing was cut in the virgin jungle and a shrine erected to the Goddess of Fate who had safely guided us so far. A signed statement was sealed inside a gourd: our homemade PMZ flag bearing the A.R.R.L. emblem was raised, and an old battery and a radio tube were left on the raised platform. Several salutes were fired into the air. The Dyaks seemed deeply impressed by our solemn ritual.

The return to Toembang Topus was managed by nightfall and we had the following message ready: "Reached destination. Starting back tomorrow. Batteries getting low so expect next QSO from base station."

But as it happened the batteries were a little too low — we had already obtained double the expected usage. To make matters worse, Manila was in the throes of a typhoon and the message never got off. The next day we were obliged to start back, having given the dead batteries to the natives as souvenirs.

After a week had elapsed with no word from PMZ, the Manila papers came forth with the stories that we were lost, strayed, and even eaten; and when these reports were reproduced in the American press considerable anxiety was caused. Luckily we reached our base just two days later and notified all that we were safely returned, although slightly the worse for wear.

PMZ took to the jungle on numerous occasions, but to go into detail here might be boring. At one

time our party arrived in a kampong to find the men armed to the teeth with knives, spears, and blow guns. The women and children were cowering in their huts, afraid to venture out of doors. Their report was that an enemy tribe of 200 warriors was hiding in the jungle preparing to



THE "FIRST ASSISTANT OPERATOR" TAKES A TRICK AT THE KEY

*The barbaric accoutrement makes an incongruous accompaniment for the white man's modern radio apparatus.*

attack and massacre them all. One man had been shot at with a poison dart. However, nothing more happened while we were there, nor did we ever hear any more of these headhunters.

What I believe to be a record for portable transmitters was established on the night of September 14th when Potter of W6AKW copied PMZ's signals from a temporary set-up at Nonokliwon, two days away from the base camp. At the time of Potter's reception I was working VS3AB near Singapore and using a 201-A tube with 300 volts on the plate.

On another occasion with the same W3ZD transmitter PMZ was in direct two-way contact from the base camp with Colonel Clair Foster, W6HM, of Carmel, California.

On the 14-mc. band conditions were quite good for working Australia and New Zealand. The ZL's were raised several times when the portable was using an input of only two and a half watts. The air line distance approaches 4000 miles.

Last year on Queen Wilhelmina's birthday the Resident Governor of Borneo and the Commander in Chief of the Dutch Forces there made a special trip to Poeroek Tjahoe from Bandjermasin as guests of Captain DeQuant. They were all very interested in the progress of our expedition and were out to our camp one evening for "chow" after which they listened to some short-wave broadcasting. They were quite surprised to learn that such small transmitting equipment



THE COMPLETE OUTFIT UNLOADED ON  
THE BEACH

could furnish direct contact with America. When it came time for the sked with "CF" of W6HM I told him that we were entertaining the "royalty," so Colonel Foster very thoughtfully sent them a message of greeting from the radio amateurs of America which was greatly prized. The evening was quite a success.

Some time later when Captain DeQuant was so brutally murdered only one hour from the base, amateur radio again came to the fore and performed invaluable service for our party and the Dutch Colonial Government. The quickest possible time in which word of the tragedy could have been sent to the coast by boat and an answer received would have been two weeks. In the event of a serious uprising the whole place could have been wiped out in the meantime. But on Christmas eve at six o'clock PMZ gave the first message for the Dutch authorities in Bandjermasin to KA1AF of Fort Mills, who immediately relayed it to KA1CY of Manila. Mathes rushed it to a cable office, so that the message reached its destination on the very night of the disaster.

Replies were cabled to KA1AF, who shot them on through to us.

Considerable official government traffic was handled, saving several months' time and suspense for all concerned, and possibly averting what might have developed into a serious uprising. The work was appreciated immensely and the Colonial Government has very sincerely thanked all the parties concerned.

A short time after conditions had returned to normal, our expedition activities were completed and PMZ said good-by to its numerous friends of the air. It was with a rather sad feeling that I shut down the little gas engine for the last

time knowing that she would never again disturb the ether of Central Dutch Borneo.

In the June issue of *QST* a letter from Ted Seelmann was published expressing our intense appreciation of the hearty coöperation given our party by the members of the American Radio Relay League and I shall not attempt to add more.

Amateur radio, like many other finer things of life, is not always duly appreciated in one's daily routine. Not until you can stand off at the far ends of the earth and view the coördinated workings of every little cog is one likely to realize fully what a wonderful and staunch machine it is, carrying us all forward into the realms of science and adventure.

## Midwest Division Convention

Topeka, Kansas, Sept. 6-7  
(Kansas Section)

**A**LL aboard for Topeka, Kansas, where the Kaw Valley Radio Club is sponsoring the annual convention of this Division. Something new is being tried this year — the Convention will be held on Saturday and Sunday, September 6th and 7th. The Chamber of Commerce is the headquarters for the convention. Registration will take place Saturday morning and the big official banquet is scheduled for early afternoon Sunday. A.R.R.L. Headquarters have promised a representative, but as this announcement is being written it is still undecided as to whom it shall be; it may be A. L. Budlong, Assistant Secretary or A. A. Hebert, Fieldman.

We will have some good technical talks, plenty of good stunts, visits to interesting places and a general all around good time is planned for the delegates. We will do our best, but after all the success of the convention will depend on your attendance. Come!

Please don't forget to write to Frank K. Tiffany, Secretary, Kaw Valley Radio Club, 919 King St., Topeka, Kans.

## Strays

The signal strength with the popular 4-tube receiver (described in November, 1928, *QST*, and in the *Handbook*) can be greatly increased, according to W9FPD, by substituting a tuned circuit for the antenna coupling resistor. W9FPD uses a 2 3/4" diameter coil of 5 turns of No. 18 wire, tuned by a 250- $\mu$ f d. condenser, this combination covering both the 7000- and 14,000-kc. bands. Tuning is not critical, since the antenna is directly coupled. The size of the antenna will influence somewhat the amount of inductance and capacity required.

# Dummy Antennas

By Guy C. Omer, Jr.\*

ONE of the greatest problems now confronting the amateur is that of interference. The Technical Development program has made possible stable transmitters; taking up but little space in our crowded spectrum, but a necessary feature in obtaining operating stability is the careful adjustment of the transmitter under load, with constant monitoring. The load employed in about 99 cases out of 100, however, happens to be the most logical one, the regular antenna system. The interference caused thereby is of serious proportions. Moreover, the widely prevalent practice of warming up the transmitter under load and of experimenting with different arrangements, also with transmitter loaded, contribute their full share to the present day QRM. Although the method in general is highly commendable, the load employed should be a *non-radiating* one — in other words, a dummy antenna.

Besides effecting a great saving in the wear and tear on the vocabulary of the fraternity, the dummy has other uses. As long as your transmitter doesn't radiate, you are bound by no regulations. So if you wish to see how your transmitter will behave at such and such a frequency without the amateur fold or if you wish to test out that 'phone with a phonograph record — reach for your dummy!

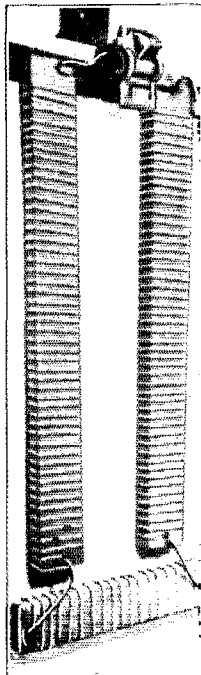
## HOW A DUMMY ANTENNA WORKS

All right, now let's see what makes the wheels go around. As far as the transmitter is concerned, the antenna system is nothing but a closed circuit containing reactance and resistance. When the antenna system is in resonance with the tank, the reactance is close to zero and the resistance is mainly "radiation." Now, if we replace the antenna system with a closed circuit containing very nearly the same values of reactance and resistance, the transmitter will continue to oscillate merrily on, all unsuspecting. No fellows, the idea is not new — it's as old as radio.

## PRACTICAL TYPES

W9EBF-W9FSC is a 15-watt station operating on a frequency of 3700 kc. using the 150-foot high KMMJ antenna at its fifth harmonic. At its fifth harmonic, this antenna has a resistance of approximately 275 ohms. The dummy used here is about the simplest possible, since the resistance also doubles as the inductance. This combination inductance-resistance is wound with about 60 feet of steel wire, which was used because it was

handy. It is mechanically strong, has fairly high resistivity and fair permeability. The latter factor helps along the skin effect, thereby adding to the radio frequency resistance. One dime procured twice as much wire as was needed.



THE DUMMY ANTENNA MOUNTED ON THE WALL OF THE SHACK

Iron wire wound on strips of wood furnishes the necessary inductance and resistance.

The steel wire is wound on three soft-wood forms of a cross section measuring about 5/8" by 2". Two of these forms are 20" long and have windings of 50 turns apiece and the third form is 9" in length and has a 20-turn winding. The amount of resistance cut into circuit is readily variable by a clip. The correct resistance was found by trial and error and these values will not fit your dummy.

An old 250- $\mu$ fd. variable condenser was dug out of the junk box and, with the resistance, was fastened to the wall behind the transmitter. The schematic of the dummy, what there is of it, is given in Fig. 1.

When putting the dummy into service, it is first adjusted to duplicate the characteristics of

\* W9EBF-W9FSC, KMMJ, Clay Center, Neb.

the regular antenna system. Tune up your transmitter on normal frequency under normal conditions. Note the values of plate and antenna currents and record them. Now, leave all other adjustments alone and substitute the dummy for

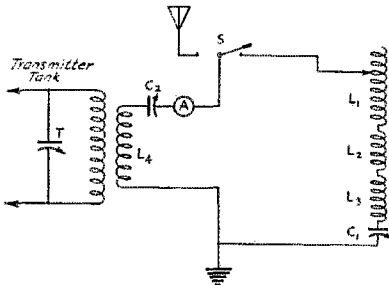


FIG. 1.—DUMMY ANTENNA CIRCUIT

$L_1$ —Dummy-antenna inductance-resistance, 50 turns.  
 $L_2$ —Dummy-antenna inductance-resistance, 20 turns.  
 $L_3$ —Dummy-antenna inductance-resistance, 50 turns.  
 $C_1$ —Dummy-antenna tuning condenser, 250  $\mu$ fd.  
 $S$ —Change-over switch.  
 $L_4$ —Antenna coupling inductance.  
 $C_2$ —Antenna series condenser.

the regular antenna system. Tune the dummy to resonance with the tank and cut enough resistance into circuit so that the same plate current flows as previously and the same current flows through the dummy as flowed into the antenna. When making this adjustment, better take steps to protect your antenna current meter because heavy currents may flow in the dummy before you get the right amount of resistance cut into the circuit. Retune the dummy, of course, after each change of resistance since it also acts as an inductance.

Now the dummy duplicates the regular antenna system for the frequency and any warming up or tuning you wish to do may be done with perfect silence for the ham in the next block. I tune up my transmitter to my dummy, but check the resonance of the antenna with the tank while sending the first "ka" because the dummy has considerable d.c. resistance and it therefore has a broader resonance peak than the antenna. The dummy duplicates the regular antenna only for frequencies close to the one tuned up to. At other frequencies (for an exact duplication) retune the dummy.

The resistance should be readily variable since the resistance of an antenna system varies with frequency changes. The fundamental of the dummy does not have to resonate with the tank and harmonics can be used just as easily. Therefore, the values of inductance and capacity are rather unimportant. If the fundamental of the dummy is in the 1715- to 2000-kc. band (or lower) it can be used in all amateur bands, making a very flexible system.

For the amateur who wants a better dummy,

the inductance, capacity, and resistance should be separate. The resistance wire should be wound non-inductively. A non-inductive winding may be made by doubling the wire and winding it on a form, taking care that the turns do not short. The field of one half of the wire cancels the field of the other half with this type of winding. The tuning up of this type of dummy is similar to the method given previously but is much simplified, since the dummy is brought into resonance with the tank and left alone while the resistance is varied until the correct value is arrived at. It would be best to check for resonance after this, however, because the resistance may have a slight effect on the tuned circuit.

In stations using a feeder line to couple the antenna to the tank, the dummy would be coupled best, directly to the tank. In some commercial installations, a feeder line is used to couple the dummy to the tank to more closely duplicate actual operating conditions, but this is a useless expenditure for the average amateur.

The resistance may be wound with any wire—nichrome, iron, German silver, or anything on hand that will work. The resistance may be any size or shape—it only must be able to dissipate the power. It may be home-made or obtained ready made. Western Electric uses the Ohm-Spun resistors for dummies. In one of the R.C.A. dummies, a water cooled resistor is used and to determine the output of the transmitter, the rate of flow and the rise in temperature of the cooling water are measured!

#### MONITORING

Monitoring is simple and straightforward. The regular monitor is used in the usual way except that it should pick up the signal from the

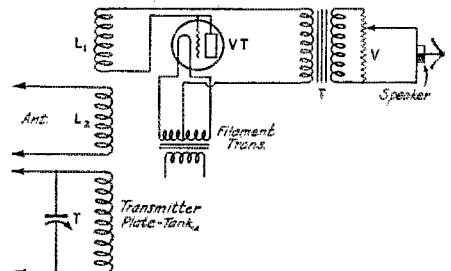


FIG. 2.—CIRCUIT OF THE OUTPUT MONITOR

$L_1$ —Monitor pick-up coil.  
 $L_2$ —Antenna coupling inductance.  
 $VT$ —Monitor rectifier tube.  
 $T$ —Output transformer.  
 $V$ —Volume control.

dummy and not from the tank. For average power, bringing the monitor into proximity with the dummy probably will prove sufficient. For lower power a closer coupling may be obtained by a single wire, one end in the neighborhood of the

(Continued on page 35)

# The Third International Relay Competition

By E. L. Battey, Assistant Communications Manager

**W**HOOOPS!! Now it comes out! The various committees which have been working on the Third International Relay Competition have at last completed their work and turned in their reports. And the reports surely are eye-openers!

The task of checking over the logs fell to the lot of the Award Committee. Those certificates were too good to distribute carelessly, so the committee labored carefully, spending many days going over the reports to see if all rules had been complied with, and *that was some piece of work!* It was a ticklish undertaking, too. When a fellow has put in a lot of time and worked hard, it is mighty disheartening to him to find, when the scores are presented, that he has not as large a total as he submitted. Some of the participants will not recognize their scores. Some are greater than submitted; some are smaller, due to infraction and misapprehension of the rules, but a contest is not a contest unless rules are enforced, and we ask every one to hear with the verdicts of the Committee. We won't bore you with a review of the rules here. Just dig out your December (1929) issue of *QST* wherein all requirements are stipulated, and note the many points that had to be considered in "checking and double checking."

We know that every one wants to know who

None other than W1ASF, the "old reliable" of international tests. He has a total of 2925. Not a bit bad for a one-man station! "Windy," W8GZ, gave the gang a fast race to the tune of 2435! W6AAZ ran up to 2180. The sixth and seventh high are W4FT and W2FP with 1600 and 1495 respectively! Seven is a lucky number so we will stop there and list below the twenty-five highest scoring stations in the United States and Canada.

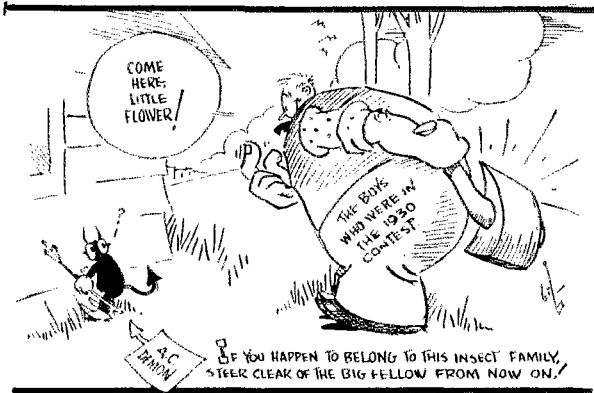
## THE TWENTY-FIVE HIGH STATIONS

W6BAX, 3210; W4FT, 1600; W9DEF, 1420; W8DJV, 1140; W1AZE, 1065; W2CXL, 2945; W2FP, 1495; W7BE, 1368; W8AXA, 1112; W1SZ, 1060; W1ASF, 2925; W9UM, 1476; W7MO, 1308; W3DH, 1104; W6BSN, 976; W8GZ, 2435; W9ECZ, 1440; W6BZD, 1260; W6EPZ, 1092; W8CCW, 915; W6AAZ, 2180; W1CMX, 1430; W9YC, 1236; W9DGZ, 1068; VE2CA, 856.

There are some mighty impressive scores in that list! It is particularly interesting to note that the high stations are well distributed throughout the country. This leads us to believe that the system of weighted credits, which was tested out in this contest, is somewhere near what we are looking for. But after all this was not a contest

between stations throughout the entire country. It was, rather, a competition between the stations in each A.R.R.L. section of the United States and Canada, and between the stations in each foreign country and outlying district where the intermediates "W" and "VE" are not used. A station on the east coast was not trying to out-do one on the west coast but was trying to defeat all other stations in its particular A.R.R.L. section. Certificates will go to the leading foreign-contact station in each section and to the highest scoring station in each foreign locality. A complete list of final scores is given at the close of this article.

Now, what about the foreign participants' scores? CM8UF not only leads the stations outside of the United States and Canada, but also has a score higher than any United States or Canadian station! The score is 3564!! Zowie! CM8UF exchanged messages with 98 stations in the nine United States districts and with 4 stations in three Canadian government inspection districts. HC1FG would have beaten CM8UF's record had VE9AL counted as another district, but Canadian



won and who has the largest score, so we won't keep you guessing any longer. Here goes — it's probably a case of "he who lost the most sleep ran up the highest score." W6BAX heads the list with a total of 3210 points made by work with five continents. What a score! W2CXL comes next with 2945, having worked 83 stations in five continents. Incidentally, no station succeeded in working the six continents. And who is third?

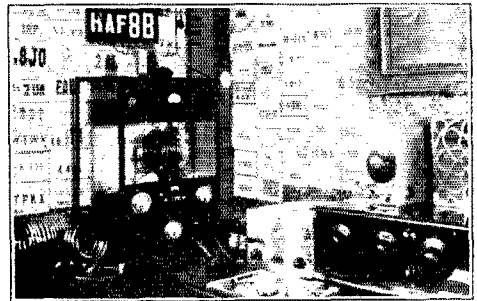
"9" stations count for the district in which they are located. In VE9AL's case this is the second Canadian district. As it is, however, HC1FG's score is a humdinger—3510—a score any station owner should feel proud of. HC1FG contacted more districts than any other station—9 United States and 4 Canadian. A well-known Porto Rican comes third—K4KD with 3300 points! A total of 3278 gives X9A fourth place. ZL2AC has 2981, and here is G5BY with 2552!! We wonder what would happen if G5BY wasn't found with the leaders? There are twenty-nine countries represented in the list of scores following the United States-Canada totals.



MR. VASCO ABREU SEATED AT HIS STATION  
PYIAW

Before we go on, let's see what we can find in some of the letters received from participants. The first and foremost cry is, "I had a whale of a time in the tests. When are the next ones?" or words to that effect. Let us consider the United States and Canadian comments by districts. First district: W1ASF found 14 mc. to be the best frequency. European and South American signals came through very poorly. Australian and New Zealand contacts were plentiful. W1AFD says, "Only the very high powered stations came through." W1RY found many foreigners who didn't understand about the tests. Second district: W2CXL reported the off-frequency "W" stations more prevalent than in the tests two years ago. More about that later! Third district: From the number of "W" stations answering his "CQ test message" calls, W3ALY was led to believe that many United States hams have recently come in from foreign countries. Hi. W3ATJ heard many stations which ordinarily use d.c. using raw a.c. during the tests. He started to list the stations heard out-of-band, but had to give up as it left him no time to operate. Fourth district: Oceania appears to be the easiest continent worked in this district. Fifth district: W5WW had his troubles with a power leak, R5-6 in strength, which was on constantly from February 22nd to

28th. Sixth district: W6BAX contacted all continents except Africa on the first day of the tests. European signals were very weak. W6CUH reports 7000 kc. was FB and 14,000 kc. very poor. W6CTP had a good time with one Type 12A. W6BYH blew a couple of fifties during the excitement. Seventh district: W7DP lost several good foreign QSOs due to broad a.c. signals of United States stations. He says that weather conditions were not the best; 14 mc. was absolutely N.G. after 7:30 p.m. W7ACD, the only Idaho station submitting a score, used a single Type 10. W7AHX found a scarcity of foreigners on 7 mc. Eighth district: W8BYN says, "Bad weather and QRM." W8DED did not hear as many foreigners as in the previous tests. Ninth district: W9AUH bewails the number of stations using raw a.c. on 14,000 kc. W9AJA has some interesting comments, which we quote: "On the two week-ends that the station was on the air for European and African contacts, perhaps the outstanding feature was the absence of signals from those localities, and the terrific QRM from the east coast. . . . A significant proof of the fact that foreign stations rarely answer American CQs is shown in the list of QSOs from this station during the tests, as every station that was worked from here was raised by first listening and finding the foreign station. . . . More intelligent use of the receiver and less use of the transmitter will result in more foreign cards on the station wall." Canadian second district: VE2CA and VE2AC report conditions very poor during the contest. Europeans were almost entirely absent. Only five South Americans and no Asian and African stations were heard. Australian stations were numerous but weak. QRN was very bad. They also mention the raw a.c. notes on 14,000 kc. VE2AC says, "I appreciated the general patience



HAF8B

and good humor of my foreign QSO parties in answering my numerous calls for repetitions and fill-ins. These fellows were real sports." Canadian fifth district: Northern lights bothered VE5AW. The first six days of the tests he did not hear a signal.

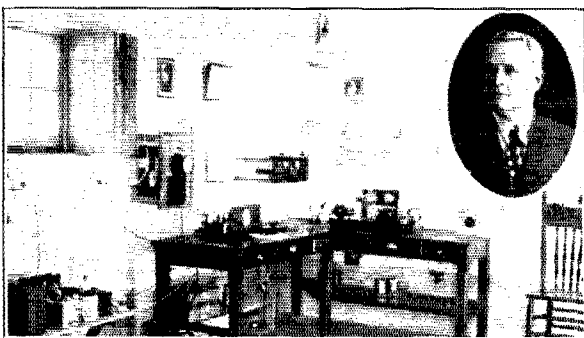
Now let us look over the comments from for-



eign participants. Activity was highest in Australia and New Zealand. From ZL2AC: "We all had a very enjoyable time and met many an old friend during the course of these tests." ZL1FC did some fine work with 50 watts input to four type 'O1As in push-pull. VK4DO says QRM was the worst factor to contend with during the tests, and that during the first week "W" stations were not at all strong. VK3JK says, "The lesson of these tests is that a pure d.c., steady note will let a lot more of us work together in the band at the same time." Several participants complained that many "W" stations did not have test messages. According to VK2NS, the best United States signals came from W2CXL, with W8GZ second best. The 14-mc. band was found rather unsatisfactory by the VK and ZL stations. Conditions in Great Britain were very poor all during the contest. G5BY says this was especially true on 7 mc. G6LK was unable to contact any "W" stations on 14 mc. because of adverse conditions. G2GM states that only the high-powered stations came through with any consistency. CT2AA found it extremely difficult to get reply messages off. ON4BC found DX conditions good. HAF8B was troubled by very strong, broadly tuned western Europe stations, and by QRN. HAF3C tells us that United States signals came through very well but stations in Hungary had a hard time reaching America. OZ7Y says that February is a bad month for Denmark-United States contact, and that consequently he was unable to exchange many messages. South American participants didn't give us any dope on conditions there, but we should judge from scores that they were quite favorable. Conditions in China, except for QRM, were very good. VS6AH says, "The 'W' stations came in at good strength, the reports given by this station averaging R7, QSA5. Crystal control stations, even when R3 or less, 'scored all along the line' for ease of message exchange."

We should like to go on now and list the scores, but there is something else we must consider first, something which will probably leave a bitter taste in the mouth of some participants. We are speaking of the report of the Irregularities Committee. After all that has been said in *QST* during the past year, after all the advice and warnings that have been given, there is very little excuse, if any, for off-frequency operation. And yet, 42 participants in the tests were logged out-of-bounds! Sufficient evidence was presented to the Committee to disqualify *fourteen* of this number!! While each case of off-frequency operation was considered separately and on its own merits, a single observer's word never constituted sufficient evidence to warrant disqualification. The one

exception to this rule was in the case of observations made by a member of the headquarters staff. Inasmuch as the unquestionable accuracy of his reports was known, a single off-frequency report made by him meant "disqualification." W5ANA, W6CNX, W8DED, W9AZY, W9BEU and VE5AW would have each received the certificate for their section had they been more careful in staying within the amateur channels. The other stations disqualified for off-frequency operation, although having scores too low to receive certificates, are: W2AYJ, W2UK, W2AEY, W5AQY, W6EAK, W6DPJ, W7EK and K4AAN. There are several other irregularities to consider in addition to the off-frequency cases. One amateur was disqualified on two counts—not only was he working outside the bands, but

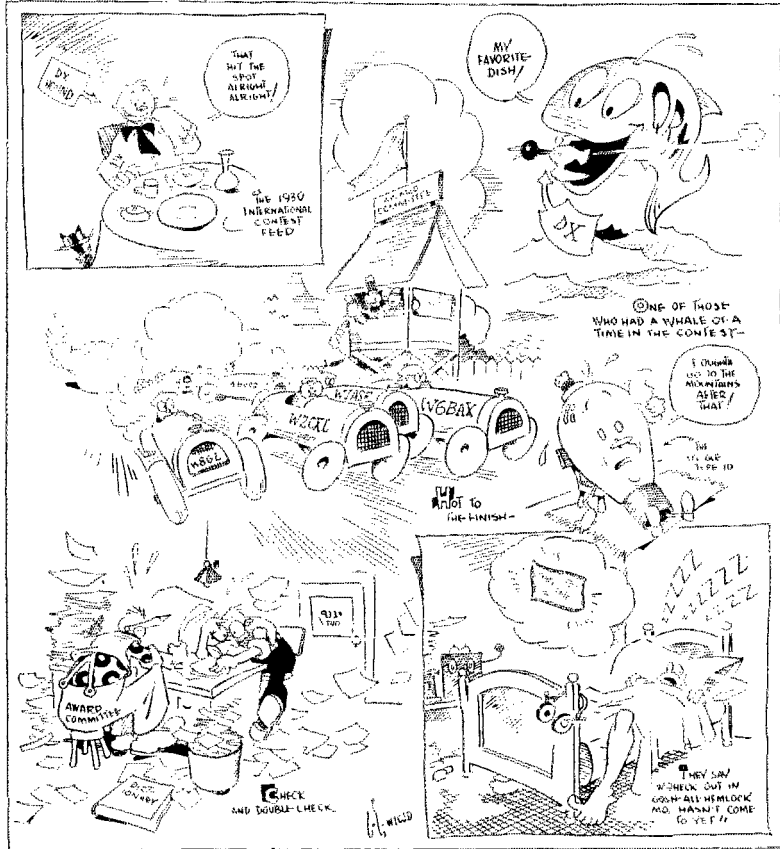


X9A, ONE OF THE PIONEER MEXICAN STATIONS

he also was using another man's call while waiting renewal of his license! Definite closing dates were set in the rules for the receipt of reports. Six reports, from W2CUQ, W3AAZ, W6BUX, W9BQE, KAICE and VK3RJ, were received late and in accordance with the rules were returned to the senders, automatically cancelling their entries. W6AKW, W9DKK and W9DQN cannot be given scores as they did not present all the information required in the rules. W6AME can be given no credit as his messages were handled after 7 p.m. E.S.T. on February 28th. A number of stations, while not actually taking part in the contest, submitted logs so that participants would get credit. We are listing their scores with the rest, marking them with an asterisk to set them apart from those that are actually entered. W6CSJ and W7AAR would be in this group had they not been caught off-frequency.

Several members of the HQs staff entered the tests. W1SZ would take the certificate for Connecticut, if HQs men were eligible for prizes.

Just a few facts and then on to the score sheet: Of 160 United States and Canadian stations whose scores are given below, 57 worked on 14 mc., 32 hammered away on 7 mc., and the remaining 71 divided their time on those two



frequencies. 7 mc. was the popular band in Australia and New Zealand. Throughout the other countries it seems to be more or less of a toss-up between 7 and 14 mc., with, perhaps, a slight leaning toward 14 mc. Of the "W" and "VE" stations, 17 succeeded in contacting five continents; 44 worked four continents; 42 worked three; 36 worked two; and 21 worked one continent only. The leading stations so far as number of contacts is concerned are W2CXL in the United States and Canada, and CMSUF in the foreign group. W2CXL exchanged messages with 83 stations and CMSUF with 102.

SCORES

THE THIRD INTERNATIONAL RELAY COMPETITION

Asterisks denote stations reporting but not entered in contest.

<i>E. Massachusetts</i>			
W1ASF.....	2925	W1WV.....	256
W1CMX.....	1430	W1ABG.....	243
W1AZE.....	1065	W1VS.....	200
W1BKR.....	832	W1KH.....	160
W1CPB.....	360	W1IA.....	90
W1RY.....	333	W1MP.....	48
		W1TL.....	18

W1AJD.....	12	W2AVO.....	96
W1ACH.....	9	W2CJX.....	70
<i>Connecticut</i>			
W1SZ.....	1060	W2FL.....	66
W1BHM.....	117	W2BPPY.....	30
W1DF.....	42	W2AAW.....	6
<i>Rhode Island</i>			
W1BIL.....	351	W2BUY*.....	6
<i>W. Massachusetts</i>			
W1ZA.....	236	W2AEB.....	3
W1ZB.....	6	<i>N. Y. C.-I. I.</i>	
<i>New Hampshire</i>			
W1AFD.....	78	W2KJ.....	416
W1BFT.....	58	W2HJ.....	368
W1COW*.....	42	W2ALW.....	180
<i>Maine</i>			
W1BAD.....	72	W2AJP.....	135
<i>No. New Jersey</i>			
W2CXL.....	2945	W2AQQ.....	72
W2FP.....	1495	W2BO.....	54
W2AI.....	552	W2BDA.....	56
W2AOG.....	264	W2BCB.....	9
W2ADP.....	216	<i>E. New York</i>	
W2JC.....	96	W2RD.....	405
<i>So. New Jersey</i>			
		W2BYS.....	252
		W2BAI.....	81
		W2CC*.....	8
		W2AKD*.....	8
		W2BYP*.....	6
		W3DH.....	1104
		W3ACX.....	292
		W3UT.....	260

W3ATJ.....	126	W6CXW*.....	6	So. Minnesota		PY2IG.....	322
W3PF.....	66	W6ETJ*.....	6	W9YC.....	1236	PY2AZ.....	64
W3ADH.....	30			W9DMA.....	351		
		<i>East Bay</i>				<i>Newfoundland</i>	
<i>Virginia</i>		W6DWI.....	223	<i>Kentucky</i>		VO8MC.....	1424
W3HY.....	351			W9ELL.....	201	VO8AW.....	135
W3CKL.....	324	<i>Oregon</i>		W9AUH.....	58		
		W7BE.....	1368	W9CIS.....	36	<i>Australia</i>	
<i>Md.-Del.-D. C.</i>		W7MO.....	1308			VK7CH.....	1320
W3AJD.....	120	W7AC.....	690	<i>Missouri</i>		VK5WR.....	1305
W3AJH.....	18	W7AEX.....	360	W9BMU.....	171	VK3HL.....	1254
W3NR.....	18	W7PV.....	60			VK2NS.....	1080
		W7DP.....	12	<i>Iowa</i>		VK3JK.....	1060
<i>E. Pennsylvania</i>				W9AZZ.....	81	VK3ES.....	1060
W3MC.....	117	<i>Washington</i>				VK2HU.....	690
W3AIY.....	31	W7NR.....	351	<i>No. Minnesota</i>		VK5IT.....	657
W3MZ.....	42	W7ACY.....	99	W9CTW.....	36	VK5GR.....	630
W3AHR.....	18	W7NM.....	18			VK3HK.....	600
				<i>No. Dakota</i>		VK5HG.....	504
<i>No. Carolina</i>		<i>Idaho</i>		W9DGS.....	9	VK3BQ.....	480
W4FT.....	1600	W7ACD.....	138			VK4DO.....	392
W4OC.....	500			<i>Wisconsin</i>		VK3BW.....	264
W4LY.....	405	<i>Ohio</i>		W9ASL.....	9	VK6SA.....	240
W4WE.....	400	W8GZ.....	2435			VK7WI.....	138
W4TS.....	60	W8DJV.....	1140	<i>Maritime</i>		VK2RX.....	92
		W8BKP.....	805	VE1BR*.....	20	VK3LS.....	39
<i>Alabama</i>		W8CFW.....	595			VK3PR.....	33
W4AAQ.....	216	W8BYN.....	508	<i>Quebec</i>		VK3CX.....	21
		W8DGP.....	500	VE2CA.....	856	VK2HK.....	18
<i>Tennessee</i>		W8DDK.....	46	VE2AC.....	120	VK3WL.....	10
W4LX.....	171	W8KC.....	44			VK3AX.....	8
W4ABR.....	6	W8NP.....	32	<i>Ontario</i>			
		W8EZ.....	6	VE3BK.....	430	<i>France</i>	
<i>Ga.-So. Carolina</i>				VE3DA.....	60	F8FEM, ex-OK-1FM	116
W4PJ.....	126	<i>W. New York</i>				F8KZ.....	80
W4ABH.....	126	W8AXA.....	1112	<i>Alberta</i>		F8AXQ.....	8
W4AJH.....	54	W8ADG.....	540	VE4GD.....	9		
W4SS.....	18	W8DME.....	144			<i>Peru</i>	
		W8DUB.....	138			OA4J.....	1160
<i>Florida</i>		W8CVJ.....	110				
W48V.....	21	W8BAI.....	70	<i>FOREIGN SCORES</i>			
				<i>Cuba</i>			
<i>No. Texas</i>		<i>W. Pennsylvania</i>		CM8UF.....	3564	<i>Hawaii</i>	
W5WW.....	747	W8CCW.....	915			K6ALM.....	940
		W8AJN.....	564	<i>Ecuador</i>		K6EVW.....	530
<i>Oklahoma</i>		W8OF.....	464	HC1FG.....	3510	K6ACW.....	100
W5ZAV.....	405	W8PR.....	304	HC1LC.....	27	K6BHL.....	51
		W8CRA.....	96	HC1DR.....	1	K6ERH.....	40
<i>So. Texas</i>		W8DLG.....	32				
W5MS.....	342			<i>Porto Rico</i>		<i>Azores</i>	
W5TD.....	69	<i>Michigan</i>		K4KD.....	3300	CT2AA.....	395
		W8DYK.....	243	K4AKV.....	64		
<i>New Mexico</i>		W8BNT.....	104			<i>Argentina</i>	
W5TV*.....	6	W8CED.....	66	<i>Mexico</i>		LU3FA.....	330
				X9A.....	3278		
<i>Santa Clara Valley</i>		<i>West Virginia</i>				<i>Portugal</i>	
W6BAX.....	3210	W8DPO.....	240	<i>New Zealand</i>		CT1BX.....	180
W6AAZ.....	2180			ZL2AC.....	2981		
W6BYH.....	156	<i>Indiana</i>		ZL1FC.....	1296	<i>China</i>	
		W9UM.....	1476	ZL2BG.....	531	VS6AH.....	114
<i>San Diego</i>		W9EF.....	712	ZL2GQ.....	36	AC1BD.....	46
W6BZD.....	1200	W9AJA.....	624	ZL3BF.....	21	AC1TS.....	1
W6EPZ.....	1092	W9EXW.....	552	ZL1AP.....	1		
W6CTP.....	42	W9EMR.....	42			<i>South Africa</i>	
				<i>England</i>		ZS2N.....	100
<i>Sacramento Valley</i>		<i>Illinois</i>		G5BY.....	2552	ZS4E.....	18
W6BSN.....	976	W9ECZ.....	1440	G5ML.....	1078	ZU6W.....	1
W6CIS.....	518	W9DGZ.....	1068	G2GM.....	84	ZU1D.....	1
W6DGG*.....	64	W9CPH.....	804	G5YG.....	60	ZS4A.....	1
		W9CF.....	536	G6GS.....	12		
<i>San Francisco</i>		W9DCK.....	312	G6RB.....	10	<i>Uruguay</i>	
W6DPF.....	576	W9FDJ.....	129	G5RD.....	1	CX1FB.....	96
		W9AVP.....	9	G6LK.....	1		
<i>Los Angeles</i>		W9FMR.....	6			<i>Hungary</i>	
W6CUH.....	378	W9DWA*.....	8	<i>Jamaica</i>		HAF8B.....	95
W6DCV.....	288			NJ2PA.....	1575	HAF3C.....	1
W6AM.....	273	<i>Kansas</i>					
W6BGC.....	93	W9DEF.....	1420	<i>Brazil</i>		<i>Chile</i>	
W6DEP*.....	52	W9GDJ.....	405	PY1AW.....	1494	CE7AA.....	75
		W9BPL.....	207				

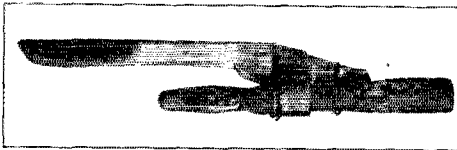
(Continued on page 80)

# SAY, SON—



get the gang together, have them pipe down, get their heels together, look me in the eye, and I'll spin a yarn that's never been told. Kitty, make fast over to leeward and close aboard — my aim isn't what it was.

On the wall at A.R.R.L. Headquarters, over the Secretary's desk, in a glass-covered case, since the days of Tuska, lies the Wouff-Hong. It



*THE ORIGINAL AND SACRED WOUFF-HONG which hangs at A.R.R.L. Headquarters where, by order of the Board of Directors, the Secretary guards it with his life.*

is a fearful and wonderful instrument of torture. It is old and worn smooth from years and years of use. Every ham in radio, old or young, stands in awe of it. Since the beginning of amateur radio it has meant "The one or the other" — either law and order or the Wouff-Hong, take your choice. Have a squint at the illustration.

On the wall, at the United States Naval Academy, at Annapolis, Maryland, in the historic auditorium, since the early days of a previous century, hangs a blue silk flag. On it appear, badly faded, an olive branch, a fearful and wonderful instrument of torture and an inscription. Take a squint at the illustration of this historic old flag and read the inscription. It says those same words, "The one or the other."

In the long ago there lived some especially offensive dark-skinned whops on the southerly shore of the Mediterranean. They used to make a business of stopping every merchantman that passed and collecting a wad of gold or capturing the ship and putting the crew and passengers into slavery. They were known as the Barbary Pirates. For centuries they worked this graft.

In the early days of our country there was a United States naval officer named Stephen Decatur. Steve was a double-fisted double-distilled hellion. The Navy in those days was mostly

hellions, whether ashore or afloat, having just finished off the British Navy in the unpleasantness of 1812. It was Stephen Decatur who put into immortal words the thought that appeals to every properly-built male American. Looking up at the Stars and Stripes he said, "My Country — may she ever be right, but right or wrong, my country!" It's that kind of stuff they put into a man at the Naval Academy and it's the same stuff that has made these United States of America what we are to-day. Stephen Decatur came from the U. S. Naval Academy and he had soaked up a lot of it. Well, after some American ships and American citizens had been seized by the Barbary Pirates, the Navy Department assigned a squadron to Decatur and told him to go the limit.

Decatur shoved off and decided to go to the mat on the matter at once. He picked up a couple



*Courtesy U. S. Naval Academy  
FLAG FLOWN A CENTURY AGO BY COMMODORE  
STEPHEN DECATUR*

Whatever the nature of the awful implement, the intent of the flag is clear: a choice between good behavior and sudden death. For the information of the curious, it seems probable that the gadget is a garrote, a gentle instrument used for twisting a rope around the victim's neck and so causing strangulation. Careful inspection of the Wouff-Hong shows that it would lend itself admirably to such an enterprise, and that is probably as good a method as any of applying its beneficial properties to wrongdoers in amateur radio. Frinstance, off-frequency operation.

— ED.

of pirates off Algeria, shot up the whole works, killed the admiral of the Algerian navy, took

*(Continued on page 80)*

# The Operating Characteristics of Vacuum Tube Detectors

## A Graphical Study of Grid and Plate Detection for Triode and Screen-Grid Tubes In Two Parts—Part I

By H. A. Robinson, W3LW\*

Here is an intensely practical article that does more to explain how our detectors perform than anything we have previously published in QST. The graphical data it contains make possible the intelligent choice of the type of detector tube and type of detection to meet almost any requirement.

This first part of the article covers grid and plate detection (including power detection) with the three-element tube. The second part, which will appear in the September issue of QST, deals with the same considerations for the screen-grid tube and ends with a graphical comparison of the two types of tubes for both grid and plate detection. An appendix of mathematical computations will complete Part II. However, no knowledge of mathematics beyond simple arithmetic is necessary for the complete understanding of the main part of the article. — EDITOR.

IT is the purpose of this paper to present to the average amateur radio operator, in terms which are within his grasp, the general fundamental principles underlying the operation of vacuum tube detectors. The effects of varying detector characteristics and

detector tubes, Type '27 and Type '24 being specific examples of these two classes of tubes. It is hoped that a better understanding of the operating characteristics of detectors, together with a knowledge of the desirable circuit constants, will enable amateurs to secure improved performance from this all-important element of the receiving equipment.

Generally, in radio reception it is the function of the detector in some way to transform the impressed radio-frequency signal into an electrical

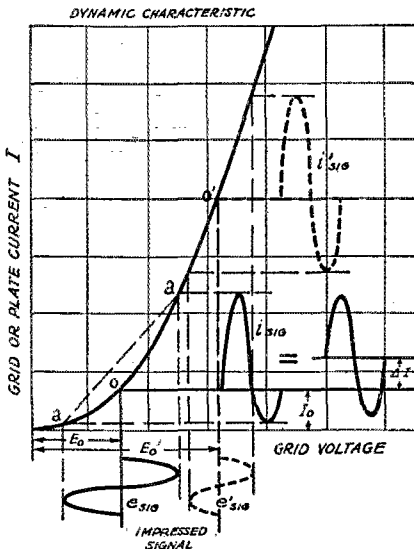


FIG. 1 — A TYPICAL DYNAMIC DETECTOR CHARACTERISTIC

It represents the relation between grid current and grid voltage for grid detection; or the relation between grid or plate voltage and plate current for plate detection.

circuit constants are considered and presented in graphical form for both triodes and screen-grid

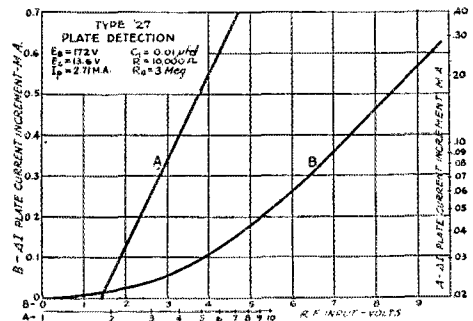


FIG. 2. — TYPICAL CURVES SHOWING THE VARIATION OF THE D.C. PLATE CURRENT INCREMENT WITH THE AMPLITUDE OF THE SIGNAL

Curve A is plotted on logarithmic scales and shows that detector output varies as the square of the signal voltage.

impulse varying at an audio frequency. Vacuum tubes as usually employed depend upon the non-linear relation between their inter-electrode currents and voltages for their detecting performance. This relation is shown by the diagram of Fig. 1. Here a typical dynamic characteristic is shown. This curve may represent the relation between grid current and grid voltage from

\* Silver Lake Farm, Willow Grove, Pa.

which grid detection is obtained; or it may be the variation of plate current with grid or plate voltage, corresponding to plate detection. The departure of this dynamic characteristic from a straight line, at least at certain parts, satisfies the

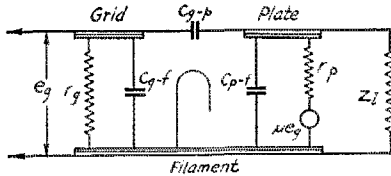


FIG. 3.—THE EQUIVALENT CIRCUIT OF A VACUUM TUBE

requirement of non-linearity necessary for detector operation.

Let us consider, for example, the operation of the tube as a plate detector, the principles of grid detection being analogous. Then the dynamic characteristic of Fig. 1 will be the so-called mutual characteristic, showing the relation between grid voltage and plate current. Remembering our fundamental detector requirement of non-linearity between current and voltage, let us choose an operating point in the region of greatest curvature as at "O." For a given tube, the general shape of the dynamic mutual characteristic will be similar to the curve of Fig. 1, although this is dependent also on the plate voltage and plate circuit load impedance  $Z_l$  of Fig. 3.

The operating point "O" is fixed for a given

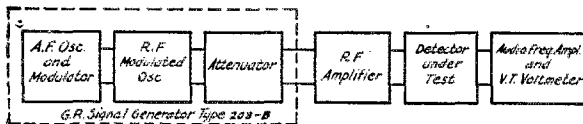


FIG. 4.—THE EXPERIMENTAL SET-UP WITH WHICH THE DETECTOR CHARACTERISTIC MEASUREMENTS WERE MADE

plate voltage (and given screen-grid voltage as well, in the case of a screen-grid detector) by the value of negative grid bias voltage. For any given operating point there is a corresponding d.c. plate current, indicated by  $I_0$  in the diagram. However, when the impressed signal reaches the grid, the grid potential varies around the bias voltage as a mean, depending on the character of the signal. The simple case of a pure sinusoidal signal is shown in the diagram, and by projection the resulting plate current variation is obtained ( $i'_{s+g}$  of Fig. 1). Because of the curvative of the dynamic characteristics, this resulting plate current variation departs considerably from a pure sine wave superimposed on the steady d.c. plate current  $I_0$ . By mathematical (see appendix) or graphical wave analysis this plate current variation can be shown to be composed of a direct current component ( $\Delta I$  in the diagram), a com-

ponent of the fundamental frequency of the impressed signal and components of higher harmonic frequencies. Only the fundamental component and the d.c. component are shown in the diagram at the extreme right. Thus, if the signal impressed on the grid is one of radio frequency, the resulting plate current will have a radio-frequency component which will not affect the headphones or audio amplifier, but is usually by-passed around them. However, the d.c. component  $\Delta I$  will energize the headphones resulting in a dull plop similar to a key thump when the impressed signal is interrupted. This d.c. increment of plate current ( $\Delta I$ ) which adds to the steady d.c. plate current  $I_0$  when a signal is impressed, can be read on a d.c. meter in the detector plate circuit, providing the impressed signal is of sufficient amplitude.

The curves of Fig. 2 show the variation of this d.c. plate current increment  $\Delta I$  with the amplitude of the impressed r.f. grid voltage. These measurements were made using a Type '27 as a plate detector at 1500 kc. The steady d.c. plate current  $I_0$  of 2.71 ma. was balanced out and only the plate current increment  $\Delta I$ , due to the impressed signal, read on the plate milliammeter. The mathematical analysis<sup>1</sup> of the detector action, for small signal voltages, shows the detector output to vary as the square of the impressed voltage (neglecting distortion terms). To check this conclusion, the d.c. plate current increment  $\Delta I$  and the impressed r.f. voltages were plotted on logarithmic scales resulting in Curve A of Fig. 2. This is a straight line, the slope of which is 2.1, thus giving an experimental check on the square law detection factor. Curve B shows the same current-voltage relation plotted with uniform scales.

It should be noted at this point that in the usual detector application, it is not this d.c. plate current increment which produces the useful output signal. However, the audio-frequency plate current variation produced by modulated or heterodyne reception, results from this curvature of the dynamic characteristic in a similar though more complex way.<sup>1</sup>

In the case where our operating point is not at a region of considerable curvature on the dynamic characteristic, as at "O" in Fig. 1, the plate current variation is identical with or approaches the grid voltage swing in wave shape. Thus the output is of the same frequency as the input and we have straight amplifier action ( $i'_{s+g}$  and  $i'_{s+g}$  of Fig. 1).

In the case of a grid detector, the curve of Fig. 1 would be the dynamic grid characteristic showing the relation between grid current and grid voltage. For this type of detector the operating point "O" is determined largely by the

<sup>1</sup> See appendix following Part II.

potential of the grid return to the filament and the resistance of the grid leak. The detection principle is exactly the same. Here the audio-frequency components of grid current, produced by the curvature of the grid characteristic when receiving modulated or heterodyned signals, cause audio-frequency variations of the grid

levels than for relatively high signal levels. It is usually this factor that limits the use of grid detection to relatively low signal inputs whereas plate detection is usually employed for detection at signal inputs greater than two volts — so-called "power detection." The consideration of distortion becomes of prime importance in the case of the reception of voice-modulated signals and may determine the choice between grid and plate detection.

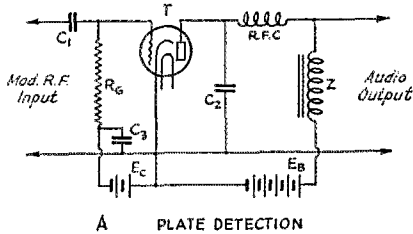
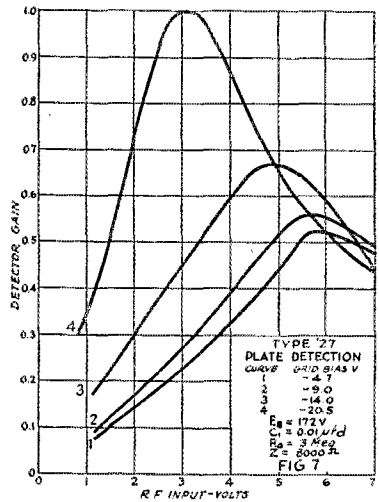
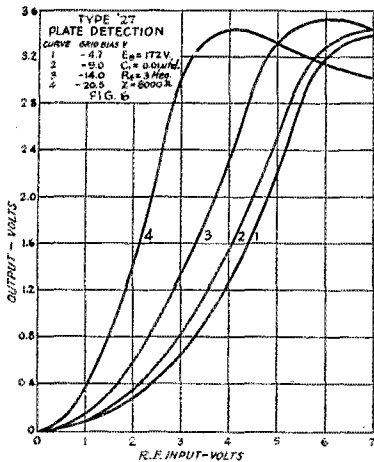


FIG. 5

- $C_1$  — Grid Condenser.
- $R_g$  — Grid leak.
- $C_2$  — 1000- $\mu$ fd. plate bypass condenser.
- $Z$  — Plate load impedance.
- $C_3$  — 1- $\mu$ fd. grid bias bypass condenser.
- RFC — Radio frequency choke.
- T — Type '27 tube.

potential which affect the plate current through pure amplifier action. Thus the detector performance depends on the curvature of the dynamic grid characteristic at the operating point. Usually, for small signal voltages this grid characteristic curvature is more pronounced than the curvature of the plate characteristic, resulting in greater sensitivity for grid detection. However, this cannot be taken too rigorously, since other

It would perhaps be well to note here that the terms grid and plate detection, as applied to vacuum tube detectors and as used throughout this paper, refer to the detector action resulting from the curvature of the grid or plate characteristic respectively. In the case of grid detection, detector action also may occur in the plate circuit — a condition which usually is undesirable and



which will not be considered here because of its complexity.

The diagram of Fig. 3 shows the equivalent circuit of a triode, or three-element vacuum tube. Here the inter-electrode capacities are shown as well as the internal grid and plate impedances of the tube ( $r_g$  and  $r_p$ ).  $Z_i$  is the external plate load impedance.

In the case of plate detection, the grid is usually negatively biased to get down to the regions of greatest curvature of the dynamic mutual characteristic curve and hence the grid does not draw current. The internal grid impedance ( $r_g$ ) is then very high, a condition which results in greater selectivity in the tuned circuit across which the detector is connected. In a circuit arrangement in which a tuned input circuit is also the coupling impedance of a radio-frequency amplifier, an increase in amplifier gain usually results when using plate detection. However, this increase was slight — but five per cent — for a screen-grid

factors which we will now consider also affect the detector performance.

It will be noted from the diagram of Fig. 1 that the effective curvature of the dynamic characteristic throughout the region of grid voltage variation ( $a-a$  of Fig. 1) depends on the magnitude of the impressed signal voltage. Thus the operating point for maximum detector performance may be considerably different for low signal

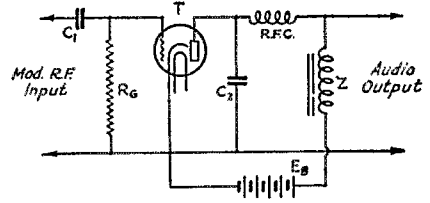
Type '24 amplifier giving a voltage gain per stage of 80 at 1500 kc.

As mentioned before, the curvature of the dynamic plate characteristic is affected by the plate voltage (and the external plate load impedance  $Z_L$ ), thus influencing the detector performance.

Considering the plate circuit of Fig. 3 it is apparent that the equivalent voltage acting between the plate and filament, resulting from the signal impressed on the grid, reduces to the simple consideration of a generator of internal impedance  $r_p$ , equal to the tube plate impedance, in series with the external load impedance  $Z_L$ . Thus for maximum detector power output (but not maximum undistorted power output) the familiar relation holds: The external plate load should be a pure resistance equal to the tube plate impedance. However, as usually employed, the detector output swings the grid of a succeeding audio amplifier tube and the detector output voltage across the external load impedance is the

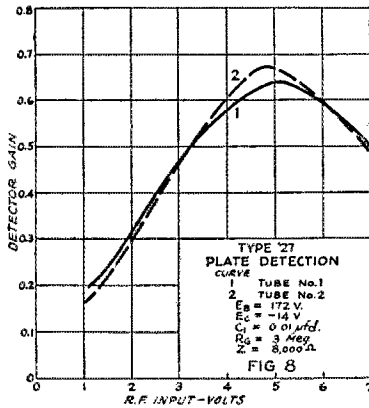
into the consideration of detection by means of vacuum tubes.

To demonstrate experimentally the variation of vacuum tube detector performance with the



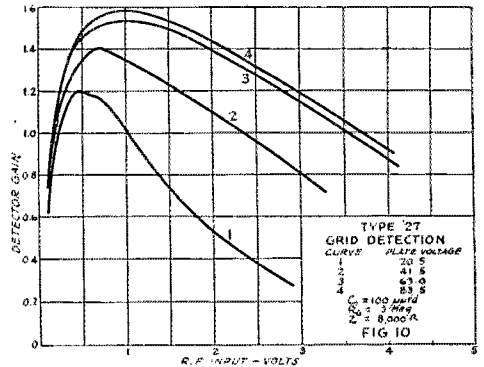
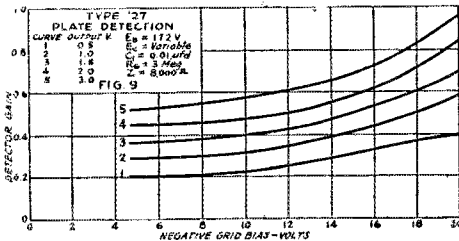
B GRID DETECTION  
FIG. 5

CONSTANTS SAME AS FIG. 5A



primary consideration. It can be shown readily that for the maximum output voltage across the load  $Z_L$  the internal plate impedance of the tube ( $r_p$ ) should be negligible in comparison with the external load impedance. Hence the detector performance depends on the values of external load impedance and internal plate impedance.

tube parameters and circuit relations as considered above, an extensive series of measurements were made. The experimental set-up employed in this study of detector operating characteristics is shown by the block diagram of Fig. 4. A General Radio signal generator Type 203-B supplied the modulated radio-frequency signal of a known percentage modulation and of a known and conveniently adjustable voltage. A screen-grid radio-frequency amplifier stage of known voltage gain was inserted between the signal generator and the input to the detector whose characteristics were being measured. The detector audio output (having the original modulating frequency) was magnified by an audio-frequency amplifier of known gain. The amplifier's output was measured by a vacuum tube voltmeter of the thermo-couple type.



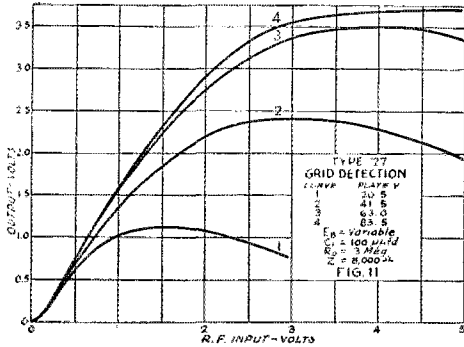
Moreover, the internal plate impedance of the tube is a function of the plate and grid (and screen-grid) voltages, and all these factors enter

Two representative types of vacuum tubes were employed and their characteristics measured as both grid and plate detectors. The Type '27 tube was selected as the typical triode detector because of its increasing use in receivers employing alternating current for filament heating. The rugged element structure of this type tube and general operating characteristics recommend it for use as a detector, as well as an amplifier, for applications requiring a three-element tube. The



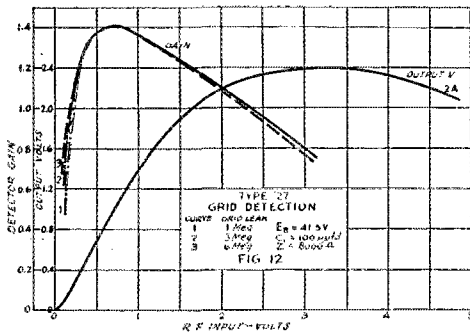
operating characteristics and detector performance curves which follow apply in principle to other types of standard three-element tubes, such as the Type '01-A', '12-A', etc., with some modifications.

The popular Type '24 tube was taken as the typical screen-grid detector because of its excellent operating characteristics and increasing use



as a detector as well as a radio- and audio-frequency amplifier.

Tubes having average constants for tubes of



their type were selected and several tubes were employed to check the performance. The greatest performance variation between tubes occurs (as would be expected) for tubes operating as grid detectors, since the grid characteristics of tubes of a given class are subject to considerable variation — more so than the plate characteristics.

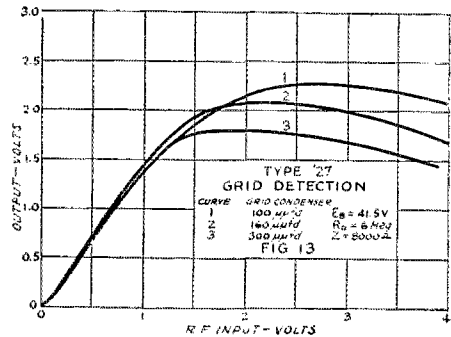
All of the following measurements were made at a carrier frequency of 1500 kc. A 400-cycle modulation frequency was employed with thirty per cent modulation of the output carrier except where measurements were made to determine the effect on the detector output of changing the percentage modulation. Although these conditions are not identical with those encountered in amateur c.w. reception, the detector performance is quite similar.<sup>2</sup>

<sup>2</sup> The measurements made by the author are for detectors without regeneration. Regeneration in the detector circuit will increase the over-all gain by increasing the ratio of alternating grid voltage to signal voltage, particularly at small values of signal voltage. The gain of the detector tube

TRIODE PLATE DETECTOR

We will consider first the Type '27 as a plate detector. The schematic diagram is given by A of Fig. 5. In this and the following schematic diagrams the circuit constants not listed were changed during the measurements and the detector operating characteristics determined for different values. Each performance curve indicates the operating voltages and circuit constants under which the measurements were made.

Detector gain is a convenient figure for comparing detector performance. It is simply the ratio of the audio-frequency output voltage of the detector to the radio-frequency input voltage to the detector. It should be noted that this gain



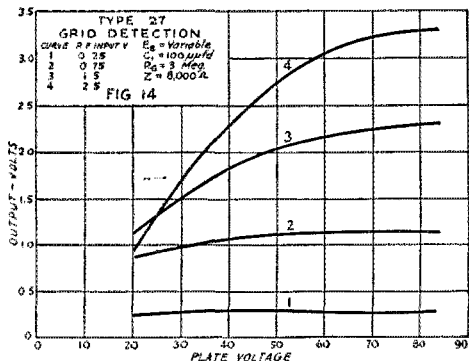
factor is directly proportional to the percentage modulation. This should be remembered when referring to the performance curves which follow.

The series of curves of Fig. 6 show the variation of audio output voltage (across an audio transformer primary used as the detector coupling impedance) with variation of radio-frequency input voltage. The effect of changing the operating point as a result of shifting the negative grid bias is clearly evident in the detector performance. The related series of curves of Fig. 7 shows the variation of detector gain with r.f. input for several values of negative grid bias. The maximum detector gain obtained for the particular value of plate load impedance employed in these measurements occurs with an r.f. input of three volts r.m.s. and with a negative grid bias of 20.5 volts. These values depend on the plate voltage and plate load impedance as well. It is evident from these results that the Type '27 as a plate detector requires a rather high r.f. signal voltage level for favorable operation. A radio-frequency input voltage level of two or three volts would have seemed impractical at these frequencies before the advent of the screen-grid radio-frequency amplifier with its high voltage gain per stage, but such detector signal levels are fre-

itself, however, should be approximately the same with and without regeneration. For information on the effect of regeneration on the received signal strength see the paper of that title, by Balh, van der Pohl, *Proc. I. R. E., Aug., 1928.* — Error.

quently realized in modern broadcast receivers and demand "power detection."

From the curves of Fig. 7 it will be noticed that the maximum detector gain is obtained with different bias voltages, corresponding to different operating points on the dynamic characteristic, for increased r.f. signal input.



The curves of Fig. 8 serve to compare the performance characteristic of two different Type '27 tubes. From the curves of Figs. 7 and 8 it is apparent that the detector gain reaches a maximum for a certain input signal level (depending on the tube characteristics, electrode voltages and circuit constants) and then with increasing signal input the detector gain decreases. The importance of securing the proper detector operating conditions for the signal level at which one plans to operate for maximum detector gain is evident.

The curves of Fig. 9 show the variation of detector gain with negative grid bias for several different output voltage levels. These curves serve to give quantitative data on the performance of a Type '27 plate detector but are by no means complete.

TRIODE GRID DETECTOR

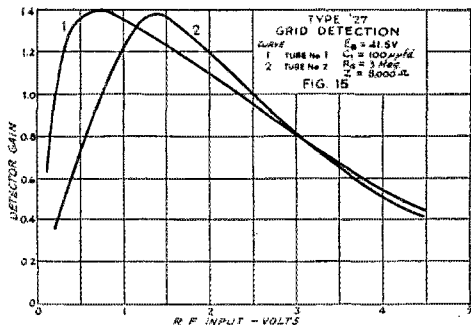
The performance of this type of triode as a grid detector is of greater interest to amateurs and is more closely related to amateur application. The schematic diagram of this detector arrangement is given by B of Fig. 5. It will be noted that the grid returns directly to the cathode of the tube through the leak,  $R_g$ .

The series of curves of Fig. 10 show the variation of detector gain with r.f. input for several values of plate voltage, and the corresponding series of curves of Fig. 11 show the audio output voltage variation under the same conditions. Again the detector gain reaches a decided maximum as in the case of plate detection; however, it should be noted that this peak gain is considerably higher than that previously obtained and is reached at a signal voltage level of 0.5 volts or less for the grid detector of this type. The increase in detector gain with increased plate

voltage is also well demonstrated, although a further increase over the values employed is not justified from the standpoint of either tube life or performance.

The curves of Fig. 12 show the effect on the detector gain of changing the value of grid leak resistance. The improved performance at the lower signal voltage inputs obtained with higher grid leak values is apparent, but the differences are rather slight. Curve 2-A shows the typical output voltage variation for these conditions.

The effect of the capacity of the grid condenser is clearly illustrated by the detector performance curves of Fig. 13. Here the audio output voltage variation with r.f. input is plotted and the in-



creased output with smaller grid condenser capacity is evident, though the effect is not great for grid condensers ranging from 100  $\mu$ fd. to 300  $\mu$ fd. At higher modulation frequencies (above 400 cycles) even better performance is obtained with the smaller grid condensers.

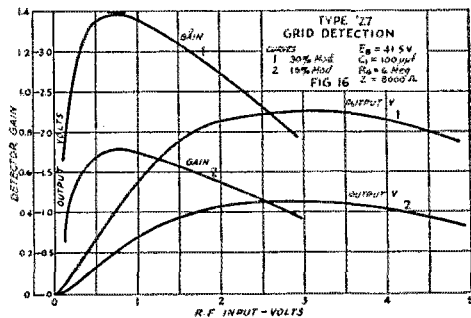


Fig. 14 shows the variation of audio output voltage with detector plate voltage for several input signal voltages. It is evident that for the low signal inputs — of the order of a quarter volt — there is little improvement in detector gain with increased plate voltage, but that at higher input signal levels the audio output increases considerably with increase in plate voltage.

The curves of Fig. 15 compare the performance  
(Continued on page 32)

# Naval Reserve Coöperates With Red Cross

## Instructions Drafted for Emergency Communication in Disasters

A PLAN has been worked out between the Navy Department and the American Red Cross for the employment of the Naval Communication Reserve in times of emergency, when the Red Cross functions to bring relief to distressed communities. Detailed instructions have been drafted to govern the work of each participant in such work. We believe this question is of much interest not only to members of the A.R.R.L. who are also members of the Naval Reserve, but to all amateurs. It will be noted that Communication Method C-1 (referred to in Table A and in the text) provides for using amateur stations not affiliated with the Naval Reserve in case of emergency.

It is important to understand that *this plan in no wise supersedes the Army-Amateur Radio System for emergency communication.* The Army is the agency of our Government chiefly and directly concerned in acting towards the relief of the population in time of disaster. The Army-Amateur system exists as a method whereby individual amateurs on the scene may contact direct with the Army, from whom relief is to be expected. Of course every branch of the Government desires to be of assistance at such times. That normal desire, and the wish to give communication aid specifically to the Red Cross, are the actuating motives in the present Naval Reserve plan. For details on the functioning of the Army-Amateur net in time of disaster, see page I, Communications Department section, QST for February, 1930.

The complete text of the Navy Department instructions follows:

NAVY DEPARTMENT  
OFFICE OF CHIEF OF NAVAL OPERATIONS  
WASHINGTON

7 June, 1930.

From: Chief of Naval Operations.

To: Commandants, All Naval Districts.

Commandant, Washington Navy Yard.

Subject: U. S. Naval Communication Reserve — instructions covering employment in emergency in connection with American Red Cross relief.

1. The National Headquarters of the American Red Cross conferred with this office on the subject of emergency communication in time of disaster when normal lines of communication are inoperative. Under such conditions, the Naval Reserve communication organization including individual members of the Naval Reserve owning and operating radio stations can be of very great help in saving life and relieving suffering.

2. The American Red Cross through the medium of its 3,500 local chapters is developing disaster preparedness plans so that when a disaster occurs in a given community the local chapter, through its disaster relief forces previously organized, can function immediately with the greatest degree of efficiency. Among the several sub-committees operating as a part of each local chapter's disaster preparedness plan is the Sub-Committee on Transportation and Com-

munication. It is on this Sub-Committee that the American Red Cross desires the members of the Naval Communication Reserve to be appointed as local liaison representatives of the Naval Communication Reserve.

3. In furtherance of the above, the following plan has been submitted to the Headquarters of the American Red Cross and has been approved by them. The Commandant of each Naval District will make appropriate arrangements so that the Naval Reserve Communication organization in his District, including each individual Reservist owning and operating an amateur radio station is furnished with complete instructions as to what to do in case of emergency.

4. Few serious local emergencies occur, but when these do arise, each Reservist should have the information that is necessary to permit instant and appropriate action.

5. *Types of Disasters.* — The types of disasters that may occur are divided into the following two major classifications:

- (a) *Predictable disasters;* such as
  - (1) General flood.
  - (2) Hurricane.
- (b) *Unpredictable disasters;* such as
  - (1) Fire.
  - (2) Earthquake.
  - (3) Tornado.
  - (4) Sleet storm or blizzard.
  - (5) Bursting dam, landslide, volcanic eruption, cloudburst, etc.
  - (6) Explosion.

6. Preparations for handling emergency communications for predictable disasters are not a difficult matter. Heavy rains or melting snows are usually responsible for floods. Hurricane centers can be located and the probable course predicted in advance. Under such conditions, Commandants of Districts involved should notify the Communication Reserve personnel of the District to prepare to man the Reserve stations of the District. Duty performed under instruction from the Commandant must be on a voluntary basis and without pay. Notices should be sent to insure delivery before commercial communication lines are destroyed. In addition, the Reservists should have instructions as to what to do in case of a major disaster over a large area, such as might be caused by floods or hurricanes. These instructions should provide for the following:

- (a) Unit or individual amateur stations (Number One) will contact section, master or alternate control stations as per Table A (Method A).
- (b) Section stations (Number Two) will contact master or alternate control stations as per Table A (Method A).
- (c) Master or alternate control stations (Number Three) will contact Naval District Headquarters stations (Number Four) as per Table A (Method A).

In case any link in the Method A chain breaks down, it will be by-passed and communications carried on direct with the next numbered station in the chain.

7. Unpredictable disasters, usually of a purely local character, are the most difficult to provide for. Being entirely unexpected, no specific preparation is possible. In case a local disaster occurs, any Naval Reservist should attempt to send a report of the disaster to his Commandant at Naval District Headquarters, routing the message as follows:

(a) To any Naval Reserve radio station that is prepared to forward despatch immediately to the Commandant of the District in which the disaster has occurred. Table A (Method A).

(b) By calling the Naval District Headquarters on a regular Navy high frequency upon which a Naval District Headquarters is known to maintain a continuous listening watch. Table A (Method B).

(c) If (a) and (b) fail, by communicating with any radio station (amateur or commercial) on any frequency

that will result in communication. Table A (Method C1-C2).

(d) If case methods (a), (b) and (c) fail, by communicating with the nearest Army Corps Area Headquarters station. Table A (Method D).

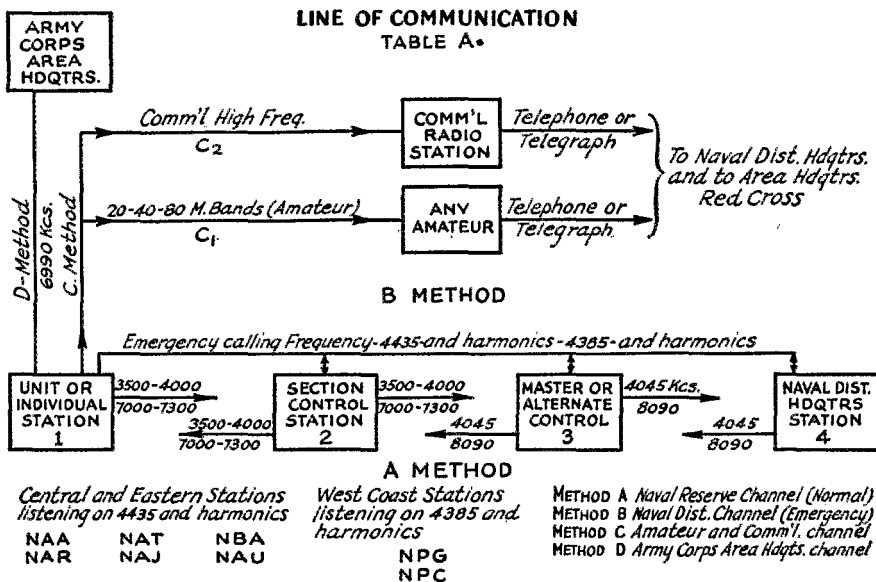
8. When loss of life or serious injury requires immediate assistance, in general equivalent to an "SOS" at sea, every means to effect communication should be adopted.

9. The foregoing plan provides for the delivery of emergency reports or messages to the Commandant of the Naval

furnished to individuals. A copy of Table A should be furnished to all Reservists.

12. The Red Cross requests that minor disasters be handled as above provided. However, a disaster of great magnitude should be immediately reported to the National Headquarters of the American Red Cross in Washington, D. C., in addition to the area branch office.

13. All messages addressed to the Red Cross where commercial charges are involved will be sent "Collect" and all messages sent by them will be "Prepaid."



District in which the disaster occurs. The Commandant will take such action as he deems necessary and will also immediately file an urgent despatch by Navy Radio or commercial landline, to the area office of the American Red Cross having cognizance. These are as follows:

(a) *American Red Cross, National Headquarters, 17th and D Streets, Washington, D. C.*, for disasters in the following States: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, District of Columbia, West Virginia, Indiana, Ohio, Kentucky, North Carolina, South Carolina, Georgia, Florida, Tennessee, Mississippi, Alabama and Louisiana.

(b) *American Red Cross, Midwestern Branch Office, 1709 Washington Avenue, St. Louis, Missouri*, for disasters in the following States: Wisconsin, Illinois, Minnesota, Iowa, Missouri, Arkansas, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Wyoming, Colorado, New Mexico and Michigan.

(c) *American Red Cross, Pacific Branch Office, Civic Auditorium, San Francisco, California*, for disasters in the following States: Idaho, Utah, Arizona, Nevada, Washington, Oregon and California.

10. Each Commandant will determine from the above list which States come within the jurisdiction of his Naval District and will therefore know to which area office of the Red Cross the disaster in any given State should be reported. In case a radio station in an affected area has no connection with the District Commandant, an attempt will be made to communicate with the next nearest Naval District Headquarters as per Table A (Method B).

11. A simple and complete system should be determined upon, inasmuch as it is quite probable that when a disaster does occur the individual who assumes the responsibility for sending the first word from such area may not have available detailed written instructions and plans covering the situation. Therefore, only necessary information should be

14. All Naval Reserve radio personnel will be informed that the following information is desired when reporting a disaster:

- (a) *First message to report:* type of disaster, location and as much additional information as is immediately available.
- (b) *Second message to report:* area covered by disaster.
  - Number of persons dead.
  - Number of persons injured.
  - Number of persons temporarily homeless.
  - Number of homes destroyed.
  - Number of homes damaged.
  - Number of families affected.

15. As soon as any of the above information is obtained, it should be immediately forwarded as outlined above. Additional messages will be forwarded as rapidly as information is procured. Personal messages should not be handled until official messages concerning relief messages have been cleared.

16. All of the foregoing refers to messages sent from any affected area. Messages to the affected area will probably have to be handled by the emergency channels until the regular channels of communication are established. For instance, from Red Cross area office to Commandant, to Reserve station or amateur station which handled the outgoing despatches. For this reason, it is very important that each station inform each other station in the chain of their operating conditions, frequencies upon which they will receive and transmit and what schedules will be guarded.

17. The American Red Cross is advising all its chapters of the above plan.

18. Each Commandant is directed to disseminate the foregoing throughout the Naval Reserve organization in his District and to all individual Reservists of classes C-V (S) and V-3.

W. H. STANDLEY,  
*Acting.*

# Standard Frequency System News

## Pacific Coast Standard Frequency Station Appointed— Headquarters Standard in Operation

IT is our pleasant duty to report decided progress in the improvement of the League's Official Frequency System during the last month. The new Elgin station, W9XAM, is well on the way to completion and Mr. Urie writes that inauguration of their standard frequency transmissions can be expected in September. While the transmitter is being built and tested at Elgin, the station's secondary frequency standard is being assembled by General Radio at Cambridge.

### THE PACIFIC COAST S.F. STATION

Our fondest hopes have been fulfilled. We are happy to announce the appointment of the Official A.R.R.L. Pacific Coast Standard Frequency station. This station will be operated by the Don Lee Broadcasting System (KHLJ) of Los Angeles, Calif., with Mr. Harold Peery, W6AQG, Chief Engineer of KHLJ, in charge. Associated with Mr. Peery in the S.F. work will be Mr. Ernest G. Underwood, W6ES, Technical Director of KHLJ; Mr. Robert W. Murray, W6CTB, and Mr. Dean Moffatt. The assumption of Standard Frequency Transmissions by this group is made possible through the interest of Mr. Don M. Lee, owner of the Don Lee Broadcasting System, in the technical advancement of radio and of amateur radio in particular.

The call of the new station has not been assigned at the time of this writing. It will take several months to get the necessary frequency standard and transmitting equipment assembled but October should see the beginning of transmissions. Tentative schedules may be announced in the October issue of QST.

The frequency standard for this station will be on a par with that of W9XAM and the transmitter power will be similar to that of the other stations in the System. The strategic location of the Pacific Coast Station will make possible effective transmissions for amateurs in Oceania and the Far East. It is hoped that early morning schedules can be arranged for amateurs in those parts of the world.

### THE HEADQUARTERS' STANDARD

The League's Official Frequency Standard has arrived in Hartford, after being calibrated at the Bureau of Standards in Washington, and is now set up in the laboratory. Its specified accuracy is 0.005% (1 part in 20,000). A special receiver to be used in conjunction with the standard is being built and frequency checking operations should be

under way by the time this issue of QST is distributed. A complete description of the whole Headquarters' Standard Frequency set-up will appear in an early issue of QST.

### W1AXV PROBABLY TO CHANGE CALL

The M. I. T. Laboratory at Round Hill has an application for a new license pending and it is quite probable that this station will be using a new call for the Standard Frequency Transmissions within the next month. The new call will be W1XP. This call will not be used for the QRG service, however, because the experimental license permits operation in the amateur bands for the transmission of Official A. R. R. L. Standard Frequency Schedules only. The old call, W1AXV, will be used for the QRG service described on page 47, May QST, and page 21, July QST. More fellows should make use of this direct calibration service as well as of the Standard Frequency Transmissions—and be sure to QSL. We always have plenty of S.F. report blanks here at Headquarters, yours for the asking.

The next two issues of QST are going to contain some of the finest articles on frequency measurement and frequency meters we have ever published, (if we do say so ourselves) and an entirely new and better type of frequency meter will be disclosed. Even though you may already have a frequency meter of an accuracy of within 0.1% or better, you cannot afford to miss this dope. Of course calibration from Standard Frequency Transmissions is an important consideration in this new development in frequency measurement. Get the habit of listening in on the S.F. schedules now and be ready to use them intelligently on your new meter next fall.

### STANDARD FREQUENCY SCHEDULES FOR AUGUST AND SEPTEMBER

August 8, Friday	A
August 15, Friday	BB
August 22, Friday	B
August 31, Sunday	C
September 12, Friday	A
September 19, Friday	BB
September 26, Friday	B
September 28, Sunday	C

Time (p.m.)	Frequency, kc.		Time (p.m.)	Frequency, kc.	
	A	B		BB	C
8:00	3500	7000	4:00	7000	14,000
8:08	3550	7100	4:08	7100	14,100
8:16	3600	7200	4:16	7200	14,200
8:24	3700	7300	4:24	7300	14,300
8:32	3800	....	4:32	....	14,400
8:40	3900	....			
8:48	4000	....			

The time allotted to each transmission is now 8 minutes, divided as follows:

2 minutes — QST QST QST de W1AXV (or W1XP).

3 minutes — Characteristic letter "G" broken by call letters.

1 minute — Statement of frequency in kc. to nearest integral figure and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

The frequencies *announced* by W1AXV are accurate to within 0.01%.

The time is E.S.T. 8:00 p.m. at W1AXV is 10:00 G.C.T. and 4:00 p.m. is 2100 G.C.T.

European listeners are urged to use and report on schedule BB which is transmitted particularly for them.

#### OFFICIAL MARKER STATIONS

Several applications for appointments as Marker Stations have been received and a number of others have signified their intentions of bringing their frequency measuring and transmitting equipment up to the standard necessary for Marker Station appointment. See July *QST* for details.

— J. J. L.

## New England Division Convention

Portland, Maine, August 22-23.  
(Maine Section)

**W**E are all set, fellows, for this year's Maine Convention to be held at Portland on August 22nd and 23rd at the Eastland Hotel. The Portland Amateur Wireless Association extends a cordial invitation to all hams; their mothers, fathers, brothers, YL's and OW's to be with us.

While there will be good talks, the committee contemplates plenty of entertainment; trips, moving pictures, etc. The Radio Supervisor or one of his deputies will be present. Everett L. Battey, Assistant Communications Manager, of A.R.R.L. headquarters, will be the official representative from Hartford.

Make your plans to attend and write Manley W. Haskell, 15 Hemlock St., Portland, Maine.

## The Midwest Division Convention

**I**OWA STATE COLLEGE, Ames, Iowa, again extended a warm welcome to amateurs on May 9th and 10th for the annual Midwest Division A.R.R.L. Convention and Ninth Radio Amateurs' Short Course. Thanks are due Mr. D. C. Faber, Director of ISC's Engineering Ex-

tension Service, for the courtesies extended by his department. President Huntsinger of the Campus Club, Mr. Konkle of WOI, A.R.R.L. Director Huber, Section Manager Kerr and all others who assisted them and extended coöperation should receive credit in due proportion for the success of this convention.

The first day brought a record registration, and there were about 140 present at the banquet Saturday. The sessions in the engineering building got under way on scheduled time Friday afternoon, George Hansen, W9FFD, of the Tri-State Club presiding. Section Communications Manager H. W. Kerr, W9DZW-W9GP, officially opened the convention, and following his remarks Director Huber gave an account of the subjects considered and action taken at the A.R.R.L. Board of Directors' meeting in Hartford, from which he had just returned. Ensign "Chuck" Morgan, W9EFH, spoke interestingly on the U. S. N. (C.) R., clearly explaining the organization and its purposes. R. J. Rockwell of Omaha gave a good talk on practical methods of calibrating and adjusting condenser microphones. Mr. Walter of the Jewell Electrical Instrument Company next spoke on measuring instruments. F. E. Handy of A.R.R.L. headquarters discussed the new regulations, log-keeping, operating procedure, and reported on the seasonal characteristics of amateur activity. J. P. Dobyns, W9DXP, spoke on the Army-Amateur Net organizations. The afternoon ended with a discussion of directive antenna systems by Technical Editor Lamb of *QST*.

The evening was devoted to inspection trips and informal "hamfesting." All departments of the college were open for inspection with special demonstrations in connection with VEISHEA, the college's annual exposition showing the work of the several departments of the university to the public. For the most part the interest of "hams" was in the electrical lab., in WOI, and in the Campus Club shack where W9DTI was in full operation, and the wealth of convention prizes donated by generous manufacturers was on display.

The second day of the convention opened with a plea for frequency observance by F. V. Sloan of the Radio Supervisor's Office, who had devoted his time two previous days to giving commercial and amateur operator's license examinations. Causes and effects of off-frequency operation were discussed by F. E. Handy, A.R.R.L. Communications Manager, leading up to the different parts and types of amateur transmitters and the effect of each on frequency stability. Professor J. K. McNeely of Iowa State College lectured on radio interference. This was made doubly interesting by the display of his equipment and slides showing oscillograms identifying different sources and types of interference.

After lunch, the meeting was resumed with

Vernon Holmes, of the University of Iowa Amateur Radio Club, presiding. A movie showing amateur stations was run off. The subjects for the afternoon disclosed an unusual amount of valuable technical information. E. O. Johnson, Service Engineer for R.C.A.-Victor, spoke first on "Transmitting Tubes." Carl Menzer, Director of WSUI, gave an intensely interesting and informative talk on "Improving 'Phone Transmitters," full of valuable tips for the proper handling of microphones and stations. J. W. Doty, KOIL-W9GDG, discussed the work of Mr. Tydberg and himself on "Screen-Grid Detectors." F. H. Schnell, Chief of Staff of the Radio and Television Institute, spoke interestingly, stressing frequency observance. After showing the details on blackboard and screen, his new shortwave superheterodyne receiver was demonstrated. J. J. Lamb, Technical Editor of QST, followed with a discussion of oscillator-amplifier transmitters as the final subject of the afternoon.

The Campus Radio Club deserves hearty thanks for the banquet at the Hotel Sheldon-Munn on Saturday, which proved the climax to this most successful convention. Director Huber kept things moving in his capacity as toastmaster. The banquet speakers were S.C.M. H. W. Kerr (Grandpa to the Iowa boys), Headquarters' representatives including Technical Editor Lamb and his bride, Lt. Bellew, Ensign Morgan, J. P. Dobyms and F. H. Schnell. Everyone enjoyed the Cleveland Air Race Film which was a special feature of the program. The Liar's Contest *extraordinary* was won by Dobyms, W9DXP, who displayed greatest "inventiveness." The *entertaining stories spun by Sadilex*, W9APM, and a dozen others added to the fun, and competition was keen. Phil Konkle of WOI auctioned off some big power tubes to the highest

bidder. Then came the wholesale distribution of prizes including apparatus of all descriptions! There will be some fine signals on the air with all the power supplies and other station equipment put into use. (We hope the recipients will not forget to drop a suitable note of thanks to the manufacturers.) The convention ended at a late hour that night, some of the discussions lasting into the next day. Many are already planning on next year's Ames Convention again to benefit from the "short course" and renew friendships made over the air.

— F. E. H.

### Strays

WINX had an unusual experience recently. His chemical rectifier is installed in the cellar, and one day he noticed that his input was below normal and the signal was very unsteady. An investigation of the rectifier disclosed that a snake had crawled into the jars to keep warm. This snake got all the warmth he wanted — and more!

While experimenting with screen-grid detectors, WIADF found that the secondary winding of a 3 to 1 Thordarson audio transformer makes a suitable coupling impedance for the plate circuit of the detector. The regular transformer connections cannot be satisfactorily employed because of the low impedance of the primary compared to the tube impedance.

The pocket testing device manufactured by the L. S. Brach Manufacturing Corp., Newark, N. J., contains a small neon lamp which will be found useful around the station. About 90 volts will start the bulb glowing.

— K6ECL

## Finding the Expeditions

<i>Expedition Station</i>	<i>Frequency (kc.)</i>	<i>Call Signal</i>	<i>Remarks</i>
S. S. <i>Morrissey</i>	9100, 7500 (500 cycles)	VOQH	Bartlett Northeastern Greenland Expedition, Ed Manley, Operator.
Schooner <i>Bowdoin</i>	5555, 8330, 11110	WDDE	MacMillan Expedition to Labrador, Greenland, and Iceland, Paul Davis of W9ADU, Operator.
Yacht <i>Antares</i>	8300 (200 watts) d.c.	WODK	Left Bermuda June 20 for Southampton England. Will go down coast of France to Gibraltar, then to Azores. Chance of W3AIQ, Operator.
Yacht <i>Mopelia</i>	6670	DAIV	Summer cruise* through the West Indies during July and August. Count von Luckner and party of fifty American boys, J. Pascal, Operator.
Cartwright, Labrador Greenland (east coast)	3500-band 7350, 13040	VOSO XORC	Grenfell Mission, Edgar V. Seeler Jr., Operator. Second Roumanian Arctic Expedition,** H. L. Bassett of W6BSB, Operator. Will start operation about Aug. 15 and be on lookout for all W signals.

\* Count Felix von Luckner is offering a cup to be presented to the amateur operator who gives the best communication service to and from the *Mopelia* during this course.

\*\* A worthwhile award is to be made to the amateur performing the greatest service for this expedition during its several months on location in Greenland.

# The First Conviction Under the Radio Act

## St. Louis Amateurs Coöperate in Running Down an Unlicensed Station

By Porter H. Quimby, W9DXY\*

**I**N St. Louis the amateurs, through the agency of the O.B.P. Radio Club, maintain what is called an interference committee. This committee operates in conformity with the A.R.R.L. policy of self-regulation. It investigates complaints against amateurs and makes recommendations for correction of interference, coöperating fully with the Department of Commerce in its endeavor to keep everybody happy under the Radio Act of 1927. The secretary of this committee is appointed by the club. He receives notice from the Radio Inspector, the broadcasting stations or the Radio Trades Association of St. Louis whenever one of these bodies receive a complaint of amateur interference. He investigates the complaint, calling on the club for men and materials to help him. If he finds amateur interference he makes the necessary recommendations for its correction, and usually gets immediate results. This or any other trouble he may find is reported to the club and also to the source of complaint. In this way very little policing is required from the Department of Commerce.

In November of 1929 a station started up in St. Louis, using the call letters W9ZR. It was being operated by one George W. Fellowes at 3633A Gravois Avenue, on about 1565 kc., broadcasting music, voice, telephone conversations, etc., and rebroadcasting such other programs as could be picked up out of the air.

Mr. Art Janssen, a neighbor of Fellowes, was unable to use his receiver when Fellowes was operating because the latter's signals covered about 75% of the dial and blanketed out other programs. Janssen asked Fellowes to correct the trouble and was quickly told where to go, with the comment that the station W9ZR was put up under the personal supervision of the Federal Government and must not be disturbed. Janssen then wrote a letter of complaint to the Radio Inspector, who referred it to our interference committee. The committee secretary called up Fellowes and asked him to correct the trouble. He also asked how he could broadcast music and entertainment on an amateur license, and whether he had such a license. He was told the station had been licensed by the Federal Radio Commission as an experimental station and could do about as it pleased, and if B.C.L.'s were inter-

ferred with it was just too bad. The secretary then reported his findings to the Radio Club and to the Radio Inspector. He also reported the matter to me as the then Director and asked that I take steps to correct the matter. I wired the Supervisor, and action started.

Radio Inspector William J. McDonnell appeared on the scene, made a survey and referred the matter to the U. S. District Attorney's office, which in turn called on the Department of Justice to make an investigation and collect evidence for a prosecution. The Department of Justice assigned their special agent, John E. Brennan, W9AC, to the case, who requested coöperation from W9DXY, W9BEQ, W9PW, W9DLB, W9ZK, ex-W9AOT and others. Under the direction of Radio Inspector McDonnell these men were deployed to various points to receive and record the transmissions of W9ZR.

The investigation established that W9ZR was operating on or about 1565 kc. with a radiophone which caused interference throughout St. Louis and was heard as far away as Park's Airport, near Cahokia, Ill., and in the Federal Building at East St. Louis, Ill. The ingenuity of the amateurs made possible the recording of the complete program transmitted from W9ZR. Brennan of W9AC is to be especially commended for his work in this connection.

When the necessary evidence had been obtained, warrants were secured from the U. S. Commissioner for the arrest of Fellowes and a search of his premises. These papers were served on December 16th by Deputy U. S. Marshall Norton, with the assistance of the R. I. and amateurs deputized for this work. The station was found in operation at the time and the apparatus was dismantled and confiscated, and Fellowes lodged in jail. At a hearing January 16, 1930, before the U. S. Commissioner, sufficient evidence was introduced to cause the defendant to be bound over to the Federal Grand Jury. On February 12th this body returned a criminal indictment against Fellowes, charging the operation of a radio station for communication between the States of Missouri and Illinois without station or operator's license; that this station interfered with the reception of signals emanating from a licensed station of another state; that he rebroadcast programs of a duly licensed station without the necessary consent of such station. The maxi-

\* Past-Director, Midwest Division, A.R.R.L. St. Louis, Mo.



mum punishment on conviction of any of these charges is a fine of \$5000 and a sentence of five years' imprisonment.

The case went to trial before Federal Judge Faris on May 6th in St. Louis. This being the first criminal prosecution brought under the Radio Act of 1927, Paul D. P. Spearman, Assistant General Counsel, John E. Baron of the engineering staff, and George I. Smith of the Licensing Bureau, all of the Federal Radio Commission, were in attendance. Mr. Spearman assisted U. S. Attorney Stattler with the prosecution, while Messrs. Baron and Smith were called as expert witnesses. Operators from KSD and KMOX and a number of amateurs were called on to testify. Every claim that was made by Fellowes in defense of his operation was refuted by testimony of government witnesses, composed largely of amateur operators, and resulted in his conviction by the jury in less than an hour.

The court commented at length on the necessity and value of a law regulating radio communication; and upon the wisdom and fairness of the Radio Act of 1927, stating that enforcement of this law was vital to the welfare of society. He stated that a violation should receive a substantial punishment, and thereupon sentenced the defendant to a term of one year and one day in the United States Penitentiary at Leavenworth, Kansas.<sup>1</sup>

While the defendant was not an amateur, and was not using an amateur frequency, he had usurped an amateur call and was using typical amateur equipment and calling himself an amateur broadcast station. It was therefore important to the amateur fraternity that he be shut down and prosecuted, as he was flying false colors and calling down the wrath of his neighbors upon the amateurs. We, as amateurs, should feel highly gratified with the effort made by the several departments of the Government in removing from our midst a station that was operating to our detriment. The Government, on the other hand, should and does feel highly gratified with the whole-hearted cooperation afforded by the amateurs, as is attested by letters I have received from Mr. Stattler, U. S. District Attorney, Mr. Spearman, Assistant General Counsel of the Federal Radio Commission, and Mr. H. D. Hayes, U. S. Supervisor of Radio at Chicago.

## Dummy Antennas

(Continued from page 16)

dummy and the other end in the neighborhood of the monitor. An untuned link circuit could be used for that super-low power set.

Monitoring for 'phone is also quite straight-

<sup>1</sup>Fellowes is a British subject. With his consent he is being deported to England, rather than serve his prison sentence.—EDDOR.

forward and may be done in the same way as for c.w. A system of continuous aural monitoring used universally in broadcast transmitters is shown in Fig. 2. It consists of a vacuum tube linear rectifier coupled to the antenna circuit and feeding a loudspeaker or headsets through an output transformer.

The commercial monitor has a big job. It actuates a signal relay, furnishes excitation for an oscillograph and operates a half dozen or so speakers through a one- or two-stage amplifier. Consequently, commercial monitors use tubes ranging up to the 50-watt size so as to supply sufficient power.

However, for our use we will find a Type '16-B or a Type '81 more than big enough to operate a loudspeaker, and a Type '01-A with grid and plate tied together will rectify sufficient power for headset operation. The filament supply for the monitor tube can be obtained easily from the transmitter filament supply, dropping the voltage by resistors if necessary. The size and the number of turns on the pick-up coil are relatively unimportant. For headset or small speaker operation, the output transformer might be done away with by using a by-pass condenser across the headset or speaker.

When using a dummy, phonograph records make a very good method of checking up on an amateur radiotelephone set. Lacking facilities for that, an assistant speaking into a microphone in another room might be substituted.

Come on fellows, help reduce the QRM! Two bits and a trip to the junk box will fix you up with that dummy antenna.

## Strays

The International Resistance Company has prepared a booklet entitled "Resistor Replacement Guide," which is a compilation of circuit diagrams of popular broadcast receivers marketed during the past three years, with particular reference to resistors. Power ratings and resistance values of all resistors used in the sets are indicated, so that the proper type of replacement unit to choose can be quickly determined.

Copies of the guide will be sent free of charge to dealers and service men on request. Inquiries should be addressed to the above company at 2006 Chestnut St., Philadelphia.

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The range finder of an ordinary Kodak makes a first-rate microscope for examining the edges of a crystal for small cracks and chips, since it has a great deal more magnification than the ordinary reading glass. The crystal should be held next to the finder and the latter close to the eye.

—EX-W6BOY, W6BZW

## Experimenters' Section

### 7-MC. CRYSTALS

By Herbert Hollister, W9DRD\*

**T**HE old order changeth, and our 1.75-mc. quartz plates are now in a class with our last summer's golf pants. They are not only obsolete, but they just won't fit.

Doubling into the 14-mc. band with 1.75-mc. plates requires too many tubes and more plate power than the result justifies. The trick is still being done with 3.5-mc. oscillators, but now that the 28-mc. band has been dished up to us on a platter by the pioneers, we are faced with the same old problem.

All of which forces attention to those terribly fragile little beasties, the youngest useful members of the piezo family: 7-mc. crystals. With plates of this frequency it is possible to operate in the 7-mc. band by straight amplification, the 14-mc. band by doubling once, and the 28-mc. band by doubling twice. It is the purpose of this article to emphasize the fact that these ultrathin plates are in every way practical and desirable.

The few 7-mc. plates which have been used during the past three years have been almost without exception cut on the thick axis ("X cut"). Plates cut on this axis average about 2.6 meters per .001" of thickness, which means a 7-mc. plate will finish up about .016" thick. This would seem to be a very desirable advantage over the .011" thickness of the thin-cut plates of the same frequency.

However, the thick-cut plates have earned for themselves rather a shady reputation through their erratic behavior.<sup>1</sup> After nearly three years of jiggling the holder to make the plate start up, carefully washing the plate in Carbona at least every third day and grinding out the burned spots on the holder plates once a week, the idea finally occurred to us to do something about it.

After reviewing the advantages of the thin-cut plates over the thick-cut ones at 3.5 mc. it seemed logical that the same advantages might hold for 7 mc. It was recalled that the thin-cut plates would oscillate more readily than the thick-cut ones even when the thickness of the plate was not exactly uniform. Edge finishing on the thick-cut plates was also much more important than on the thin cut. The "proof o' the pudding is in the

eating," so a thin-cut blank was ground down to about .011" thickness. From its first test in the oscillator, this little wafer has shown no tendency to develop the idiosyncrasies of the thick-cut plates.

Obviously a plate so thin requires careful handling, but even so it is easier to grind a useful 7-mc. plate from a thin-cut blank than from a thick-cut one. About the only precaution to be observed is to keep from grinding the center of the plate thinner than the edges. This is very apt to happen, because a plate so thin is quite elastic and will bend with the pressure of the grinding finger unless it is reinforced by a flat piece of glass or metal. A piece of microscope slide about one inch square, ground flat on a new piece of plate glass with FFF abrasive, makes a fine backbone for the grinding job.

The blank should first have one face carefully finished with FFF or No. 500 Alundum or Carborundum grain. If the plate is held so as to reflect light from an electric lamp, it will be possible to tell when the entire face is smoothed up. From then on all of the grinding is done on the other side. When a thickness of about .025" is reached it will be necessary to moisten the crystal with a drop of water and stick it to the previously prepared section of microscope slide. If this is not done it will be impossible to keep the hills and valleys out of the plate. After .020" is reached the pressure of the finger should be somewhat lighter than before or the crystal may be crushed to pieces against the abrasive. Down to about .015", No. 150 grain may be used but from there on nothing coarser than FFF will do. The finished plate may well be .0003" thicker in the center than at the edges.

The slab used for 7-mc. plates should not be too large, because of the danger of breakage and the greater difficulty of obtaining a plane surface. The ideal size seems to be about  $\frac{3}{4}$ " square, for there seems to be no greater output obtainable with larger sections.

Many of these very thin 7-mc. plates have been ground here and a few have been broken, so we feel competent to point out the most likely points of danger. Probably the easiest way to break a crystal is to catch it in the micrometer while checking it for thickness. Another excellent method of making little ones out of big ones is to bear down hard while finishing up the edges on a carborundum stone. But by and large there is nothing prohibitive in the grinding of a 7-mc. plate, and it is our opinion that anyone who can turn out a good oscillator at 3.5 mc. can do the same thing with a 7-mc. plate. Just a little more patience is required.

\* Edwardsville, Kansas.

<sup>1</sup> This conclusion does not agree with observations of other experimenters. The "thin" or "Y cut" crystals often resonate at two frequencies fairly close together, whereas the "thick" or "X cut" crystals do not exhibit this characteristic. See page 41, April, 1930, QST. — Ed.

One very interesting fact has been noted while testing these 7-mc. plates in various holders. It seems that the size and surface condition of the holder plates has a decided effect on the frequency of the oscillator. It has been possible to change the frequency of a 7-mc. plate by as much as 16 kc. by simply transferring the plate to another holder. No attempt has been made to learn the reason for this, but that it is a condition which has advantages and disadvantages is quite evident.<sup>2</sup>

Most any sort of a holder that works well with thicker plates will do for the 7-mc. plates but a rather light top plate is desirable. About 200 volts on the plate of a Type '10 oscillator seems to suit the thin crystals very well.

#### BIAS FOR THE POWER AMPLIFIER

The problem of obtaining fixed bias for an amplifier following a crystal controlled oscillator without investing in several blocks of "B" batteries has been solved by R. B. Lawrence, W6DXK, who uses the plate supply to the crystal tube to provide the bias for the amplifier. The circuit diagram is shown in Fig. 1, and here are his remarks about it:

"While constructing a piezo-electric controlled transmitter recently the item of negative bias for

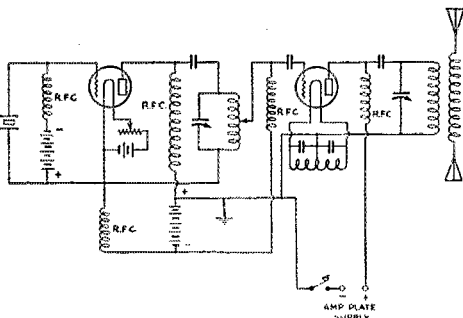


FIG. 1

the amplifier came under consideration. The price of the number of 'B' batteries prohibited their use, and a 135-volt 'B' eliminator is not entirely satisfactory. Consequently, it was necessary to dope out some form of circuit whereby the oscillator power supply might be made to perform a double duty and supply bias for the amplifier.

"The circuit diagram herewith sufficiently illustrates the idea. The constants of the circuit

are the same as in ordinary practice. The only noticeable difference between this circuit and the usual oscillator-amplifier circuit is that of a separate filament supply for the oscillator and a grounded positive supply for the oscillator plate voltage.

"This circuit may be keyed in any fashion the individual may prefer. I have shown keying in the negative supply lead to the amplifier but did not illustrate a key-thump filter as it would be up to the individual to decide upon the form satisfactory for his installation."

#### SOME HARMONIC PECULIARITIES

Most of us have, at some time or another, listened to our transmitters on receiver harmonics, or tuned the receiver to a harmonic of the transmitter, and wondered why a note which was always reported pure d.c. on the air had so much r.a.c. in it in our own receivers. The natural inclination is, of course, to doubt the veracity of the other fellows and believe our own ears. However, it may be that the ears are at fault and the audience is right! The following letter from E. G. Watts, Jr., of Miami, Florida, explains why:

"Most of us have used a receiver with one of its harmonics beating against another oscillator, and have noticed that some of the receiver harmonics produce beat notes having a queer twang quite unlike the ordinary pure beat note. It sounds like nothing so much as the 'meow' of a cat. I wonder how many of us ever stopped to figure the phenomenon out. I ran across it several years ago while checking crystal oscillator performance on the harmonics of a broadcast receiver. I have never seen mention made of it in any publication. It is very simple, and perhaps well known, but I would like to offer my version of the explanation.

"If the second harmonic of a receiver of the ordinary autodyne type is made to beat against the fundamental of an oscillator having an unmodulated output, in the absence of appreciable oscillator harmonics the beat note produced will be the ordinary pure whistle; to all intents and purposes, a single frequency. Let harmonics of strength comparable to the fundamental now be added to the oscillator. The receiver harmonics are already assumed to be of this strength. The second harmonic of the oscillator will now form a beat with the fourth harmonic of the receiver, and so on down the line, with all the even harmonics. While this collection of beats is at zero beat simultaneously, at any other audible beat frequency no two are alike. The frequency of the beat produced on any given harmonic is greater than that which would be produced on the fundamental (none is being produced on the fundamental in this example) by the number of the harmonic. Thus in an instance where harmonics of both receiver and oscillator are strong, we hear a composite collection of frequencies simultane-

<sup>2</sup> The oscillation frequency of any crystal is determined not only by the crystal itself but also by the conditions under which it is working. The frequency can be varied within small limits by simply changing the pressure on the crystal or, if there is any air gap between the top plate and the crystal, by varying the width of the gap. The *General Radio Experimenter* for February, 1930, will be found interesting in this connection. — Ed.

ously, caused by the harmonics as well as fundamental, instead of the single pure tone ordinarily heard. These tones combine and recombine, beating together to form new tones not fundamentally present, and the result is the queer sounding twang, which is quite unique. It is worth the effort to hook up the apparatus just to hear it. The usual crystal-controlled oscillator and the ordinary receiver have sufficient harmonic components to produce the effect noticeably. The reason it is present on some of the receiver harmonics and not on others, is that the even harmonics each produce a beat, while a little thought will show that only every *third* odd harmonic forms a beat, with the result that the effect is not usually discernible on odd harmonics. Therefore, we have in this a means of distinguishing even harmonics from odd.

"It is also plain to be seen why a monitor working on harmonics, either its own or those of the transmitter, cannot be relied upon to give an accurate indication of what the transmitter sounds like at the distant receiver. When a receiver harmonic is beating against a modulated source (transmitter with ripple, for instance) where the harmonics of the latter are also present appreciably, the note will sound worse than it actually is, due to the multiple beat effect and the combination of the modulation products. This effect will be greater on the even harmonics of the receiver than on the odd, because of the larger number of harmonics in the former case, which are effective in producing multiple beats. When the monitor is tuned to a transmitter harmonic the note will again sound worse than it actually is, since the defects in the transmitter wave are multiplied directly by the number of the harmonic.

"I have been repeatedly surprised at the number of otherwise well informed amateurs who are under the impression that harmonics exist on both — i.e., low and high frequency — sides of a fundamental oscillation. That harmonics exist only as multiples, and not fractions, of a fundamental, is clearly demonstrated by the following effect, which is useful as well: Tune an oscillating receiver to zero beat with an oscillator. Then tune another oscillator to five times this frequency, or any other high harmonic, as the effect is more clearly defined the higher the harmonic. Adjust for zero beat as heard in the receiver, and then detune the receiver, noting the beats. One will extend over a wider range than the other. In fact, the ratio of the two ranges is equal to the number of the harmonic to which the second oscillator is tuned. If the receiver dial can be read closely enough to compare the two ranges, as measured from inaudibility on one side, through zero beat, to inaudibility on the other, and the ratio thus determined, an unknown harmonic can be evaluated. The effect is due, of course, to the fact that the receiver covers more

territory on the harmonic, in proportion to the degree of the harmonic. Now, if a harmonic existed at one-fifth the oscillator frequency, as well as at five times, it would obviously cover the same range as the beat from the first oscillator, which is in resonance with the receiver. But it does not.

"Occasionally a quartz crystal in the process of grinding will cause its oscillator to generate myriads of frequencies which set up countless beats either side of the main oscillation. This is a condition of super-audible parasitic oscillation, of frequency generally between 10 and 40 kc. If the adjacent beat notes overlap slightly the frequency is likely near 10 kc., and if spaced apart, higher. The beats are the side bands of the super-audible frequency and its harmonics, beating against the fundamental frequency. The extent to which the beats extend either side is dependent on the strength of the harmonics. Since they usually extend several hundred kilocycles, harmonics as high as the 25th must be appreciable. This parasitic oscillation is probably a mechanical action in the vibration of the crystal, or may be a beat between two higher frequencies. I have known of several crystals producing audio frequencies in this same manner, sufficiently sustained to nicely modulate the wave. The tone was also audible directly from the crystal mounting. The lowest frequency I have heard thus produced was below 500 cycles."

#### SCREEN GRID DETECTORS IN PUSH-PULL

The use of the screen-grid tube as a detector for high-frequency reception is increasing rapidly, and some experimenters have been searching for means of obtaining oscillation at higher frequencies than the usual detector connections will allow. J. S. Cebik, W1ATG, found that the tubes would operate satisfactorily in push-pull on frequencies where a single tube could not be made to oscillate. He writes as follows:

"It has been occasionally mentioned that screen-grid tubes do not oscillate readily on frequencies above 18 or 19 mc. because of the internal capacity between the elements. A way to get around this is to use screen-grid detectors in push-pull so that the tube capacities are in series.

"It will be noted in the diagram, Fig. 2, that the tuning capacities are in series so that the capacity of each section of the double condenser must be about twice as large as the size normally used in a single-tube detector circuit.

"The rotor plates of condensers are grounded, thus allowing the inductance and the circuit to find its own electrical center and making it unnecessary to match tubes in this circuit.

"The screen-grid voltage has been found to be critical. Without the correct adjustment the circuit will not oscillate properly. A variable resistor in the plate circuit is used to control oscillation.

"The inductances are wound on tube bases and

the antenna coil is made adjustable to obtain best results. The receiver should either be completely shielded or the filament and plate supply be spaced at least three feet from the receiver to

portion of the low-power oscillator-amplifier transmitter described in September, 1929, *QST*.

W9AAG has been successful in working both coasts consistently with this outfit, and the signals are often reported "crystal d.c." A good d.c. plate supply is used, of course.

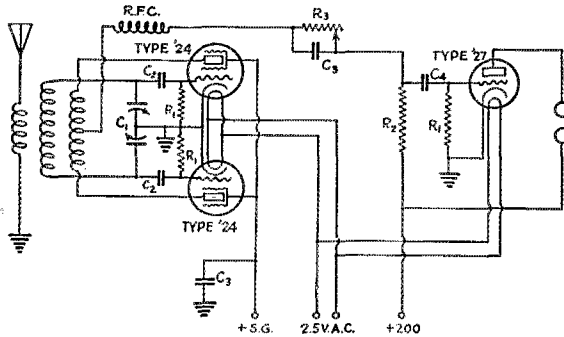


FIG. 2

- $C_1$  — 250- $\mu$ fd. Cardwell condenser (transmitting type) with stator divided into two equal sections, insulated from each other.
- $C_2$  — 100- $\mu$ fd. fixed condenser.
- $C_3$  — 1  $\mu$ fd.
- $C_4$  — 6000  $\mu$ fd.
- $R_1$  — 1-megohm grid leak.
- $R_2$  — .25 megohm.
- $R_3$  — 100,000-ohm variable resistor.

No data on the coils are given, since this will depend largely on the layout of the receiver itself. The proper sizes for the various bands can be determined by the "cut-and-try" process.

eliminate a.c. hum. This circuit requires a larger tickler to make it oscillate than the single tube detector circuit.

"The writer would be interested to hear from others who have done any experimenting along these lines."

CONVERTING THE SINGLE CONTROL TRANSMITTER TO PUSH-PULL

Dallas Johnston, W9AAG, of Viola, Ill., writes us that the push-pull version of the "TNT" transmitter described in December *QST* has better frequency stability with changes in plate voltage, as well as greater power output, than the original single-tube outfit. He has been using a pair of Type 12 tubes in the set with about 400 volts on the plates.

The circuit at W9AAG is shown in Fig. 3. The set has not been used on 3500 kc., so no constants are given for that band. As an approximation,  $L_1$  should have 14 turns of copper tubing 2½ inches in diameter, and  $L_2$  about 60 turns of No. 30 d.c.c. on a 1-inch tube. It must be remembered that the grid coil dimensions given in Fig. 3 are for Type 12 tubes, and other types will probably require some modification of these coils. The number of turns on each should be adjusted until best output is secured.

The two grid coils may be combined into one center-tapped coil, if desired. Approximately the same total number of turns will be required. This arrangement was used in the oscillator

AN A.C.-OPERATED RECEIVER WITH D.C. TUBES

A California experimenter, who wishes to remain anonymous, writes as follows: "I should like to call to your attention a method of constructing an a.c.-operated short-wave receiver which I have found quite satisfactory. It uses Type '99' tubes, with filaments, plates, and grid biases all supplied from a 'B' eliminator. Fig. 4 shows the circuit.

"A Claroostat is inserted, if necessary, between the eliminator and the set, and so adjusted that 60 ma. are drawn. The resistance  $R_1$  may be 367 ohms,  $R_2$  50 ohms, and  $R_3$  1000 ohms. These resistances are conveniently made by winding them one after another on thin bakelite strips about an inch wide, using No. 40 Advance wire and giving a coat of shellac after adjustment to the proper values. The wiring of such a set is very unobtrusive and simple, and because of complete separation of currents in the various stages, feedback is eliminated without any filtering. Of course, a second audio stage can be added using

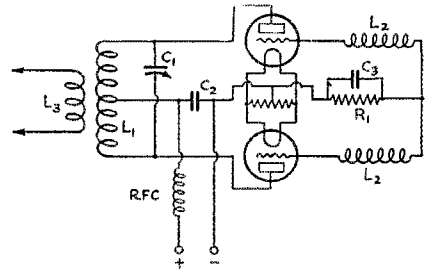


FIG. 3

- $C_1$  — 500- $\mu$ fd. variable condenser.
- $C_2$  — 2000  $\mu$ fd.
- $C_3$  — 250  $\mu$ fd.
- $L_1$  — 6 turns of ¼" copper tubing, 2½" inside diameter, for 7000 kc.
- 3 turns of ¼" copper tubing, 2½" inside diameter, for 14,000 kc.
- $L_2$  — 25 turns of No. 30 d.c.c. on 1" form for 7000 kc.
- 12 turns of No. 30 d.c.c. on 1" form for 14,000 kc.
- $R_1$  — 12,000 ohms.
- $R_2$  — 75 ohms, center-tapped.
- $RFC$  — 225 turns of No. 30 d.c.c. on 1" form.

The antenna coupling coil,  $L_3$ , will depend on the size of the antenna or the tuning system used. Any of the common coupling arrangements may be employed.

the same system; and it is also simple to put a screen-grid tube before the detector if desired. The DeForest people make a screen-grid tube, the

422-A, the filament of which draws only 60 ma.

"The freedom from hum of such a set is all that could be desired, particularly if the 'B' eliminator is so constructed that a choke is placed in each of the leads of the filter. Be sure, of course, that the B eliminator will give 60 ma. at the voltage needed. It is better to use a Type '80 tube than a Raytheon in the eliminator, since many small crackling noises are thus avoided, but a Raytheon will do quite well. The detector grid return works better on the negative filament lead of the '99 for me; but this seems to depend on the amount of plate voltage supplied to the detector. Fringe howl may be taken care of by any standard method.

"The main advantage of such a receiver is that it perks right away, without waiting for a Type '27 to warm up."

### THREE-WIRE REMOTE CONTROL WITH MERCURY VAPOR RECTIFIERS

By Eugene A. Hubbell W9ERU \*

**T**HE average amateur is generally quite aware of the advantages of remote control, but is discouraged at the prospect of running a pair of wires for the keying relay, a pair of wires for the power supply, and, if he owns a mercury-vapor rectifier, another pair of wires, or at least one more wire, for the filaments of these tubes. In the remote control system to be described three wires perform all these functions.

Fig. 5 shows a pair of 6-volt relays, arranged to turn on the power and also key the transmitter. Relay No. 1 consists of a single long electromagnet, with two armatures, each with separate spring tension adjustment. One armature is set with a loose spring, so that it will close with approximately three volts applied to the magnet, while the other is set with a stiff spring, and does not close until nearly the full six volts are applied. This relay can be constructed from any old magnet, and since it will remain in the circuit drawing current as long as the rectifier tubes are on, it should have comparatively high resistance, so the battery will not discharge quickly. The relay at W9ERU was wound with No. 30 d.c.c. wire, some 1500 turns on a soft iron core, and has approximately 12 ohms resistance. This draws a half ampere continually, which is but the equivalent of two Type '01-A tubes, and will run a transmitter a long time on a single charging.

The return wire from one side of the power relay is connected to one side of the keying relay, No. 2. In series with this center lead, a six-volt battery is connected. The other lead from the keying relay returns to one side of an ordinary jack, into which the key is plugged.

The dotted lines indicate the control box, which takes the form of a 4-inch cube at W9ERU.

The center wire connected to the two relays with the six-volt battery in series terminates at one side of a single-pole single-throw switch on the

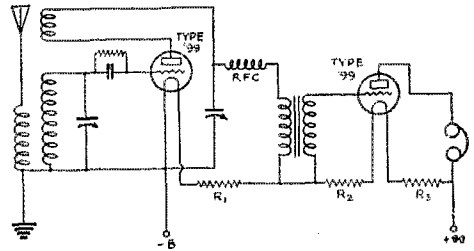


FIG. 4

control box panel. The other wire from the power relay terminates at the other side of the single-pole, single-throw switch,  $S_1$ , with a resistance in series of a value sufficient to cut the voltage on the relay down to about three volts, or whatever value will allow both armatures to work satisfactorily, yet not close the armature controlling the plate supply until nearly the full six volts is applied. The second single-pole single-throw

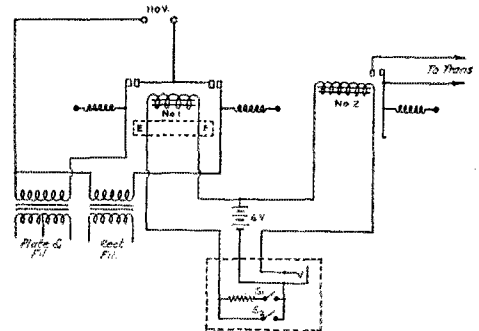


FIG. 5

switch,  $S_2$ , shorts the resistance out. It is impossible to close the circuit of the plate transformer until the rectifier filaments have been lit, although the circuit may be closed immediately after, with consequent damage to the tubes.<sup>3</sup>

Since the total amount of resistance in the relay circuit when the filaments of the rectifiers are lit limits the current to a small value, there is no need to build trick relays to lessen the drain. If good magnets are used, with a bar of iron at E-F, indicated by dotted lines, the full amount of current used to operate the transmitter should total not more than one-half ampere at any time,

<sup>3</sup> During a QSO switch  $S_1$  may be left closed, thus keeping the filaments of the rectifier tubes hot while receiving. Plate power is then switched on and off simply by throwing  $S_2$ . If a separate filament transformer is used for the transmitting tubes, its primary may be put in parallel with that of the rectifier filament transformer. — Ed.

\* 227 North 4th Street, Rockford, Ill.

depending quite a bit on the keying relay, of course.

The contacts for the 110-volt circuit may consist of heavy silver, or any metal of good current-carrying capacity which will not burn easily. At W9ERU carbon and steel contacts have been found very successful. The relay must be covered, however, or sparks may fly occasionally.

#### MOUNTINGS FOR TRANSMITTING COILS

Theodore Stahl, of Jackson, Mich., sends us a suggestion for mounting copper-tubing coils which not only provides for convenient changing of coils and good electrical contact but also allows variation of coupling.

A drawing of the mounting is shown in Fig. 6. It is made from a brass block  $1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$  inches, and can be constructed with the aid of a few tools of the type usually found in the home workshop. Two of these blocks are of course required for each coil.

The tapped holes are fitted with screws which serve to fasten the block to a sub-panel or bracket. The screw which is threaded through the right-

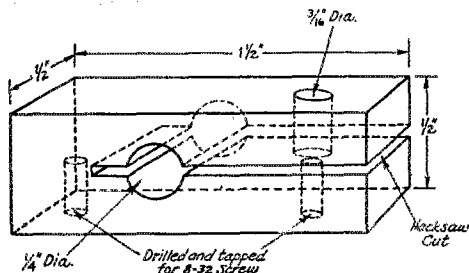


FIG. 6

hand hole should be long enough to project through the  $3/16$ " hole in the upper section of the block, and a nut is put on it to allow adjusting the tension on the coil end when inserted in the  $1/4$ " hole. A wing-nut will be handy for rapid changing of coils.

If the ends of the copper-tubing coil are straightened out for a length of four or five inches the coil may be slid back and forth in the blocks, thus allowing coupling to be varied.

#### RE: SCREEN GRID DETECTOR

Amateurs having troubles with screen-grid detectors may profit from the remarks of E. B. Redington, W8AJ, of Savannah, N. Y. His difficulties were many, and he writes concerning their cure as follows:

"Remember in *QST* a few years back the article entitled *If You Only Try?* I have been very much reminded of that while doing some work with screen-grid regenerative detectors.

"I built the receiver described in the April *QST* in the article, 'The Superiority of Screen-Grid

Detectors.' Apparently every screen-grid outfit is a problem in itself. Mine didn't perk at all well. I tinkered with the detector leak resistor and finally it worked after a fashion with 15 megohms but had a bad fringe howl. If I tried 10 or less, it had a hangover of from 4 to 5 degrees on 3500 kc. and 20 degrees on 14,000 kc. Too many, said I. Furthermore I was forced to use a 100,000-ohm leak in the audio stage. The amplification was terrific, however, and I can believe everything I have read about such receivers.

"It also had a bad tendency to howl if I brought my hand near. I cured this by shielding the control grid lead with copper tubing and grounding. But still the fringe howl and the need for such a high leak value. This may sound like a fairy story and apparently there is no reason in this madness of mine at all, but it worked. I built a shield for the detector bias battery, leak and condenser and put them all in it. I also shielded the r.f. plate leads and grounded them. Presto, I can use any value of grid leak down to 5 megs. and any plate voltage from 90 to 200 on the detector and the smoothest and quietest operation obtain. Even with the filaments lighted with 12.5 cycle current ( $1/2$ -wave 25-cycle rectified by a trickle charger) there is absolutely no hum. Normally I use either a storage battery or 25-cycle a.c. The filaments are in series.

"Measurements with a vacuum tube voltmeter show that my Type '01-A set is only about a quarter as sensitive as the screen-grid outfit. That is, signals which give one scale division deflection with a Type '01-A will show 4 to 5 with the screen-grid receiver. I found, however, that Type '24's are not very uniform when used for detectors on short-wave work.

"Here is a stunt which the gang may find useful. I use an 8-plate Pilot midget taken from my old plug-in Handbook outfit and also the 3-plate Pilot, connected in parallel. On the 3500-kc. band I tune with the big condenser and use the small one as a vernier. For the 7000-kc. and the 14,000-kc. bands I use the big condenser to bring the coils for these bands up to the proper point and then use the small one to tune. This way I get full-scale coverage on any band. Furthermore, I can run up to 9000-kc. and down to almost 5000-kc. with unbeatable tuning conditions."

Another experimenter, George E. Tower, W9DGJ, had trouble not with the operation of the set itself, but with noise from the a.c. line. Here is his letter:

"I have been experimenting with a high-frequency a.c. receiver since I received my April *QST* and encountered more troubles than I could record. I cleared them one at a time until but one was left.

"I was getting a weird noise that was halfway between a power leak and a spark transmitter with a rough note. Trying to detect its origin in any one part of the set proved futile. The only

thing that would cure it was eliminating the a.c. from the heaters and using d.c. on them. But I could not continue very long with a 7-amp drain on my battery, so I tried using a Type '24 tube as detector and two Type '01-A's as amplifier, using a.c. on the detector and d.c. on the amplifiers. This worked very well and was free from noise.

"I thought my noise must have been coming from the a.c. amplifier so I constructed an amplifier just like the one I had used in conjunction with the first a.c. set. The noise was not there, but as soon as I connected it to the detector it would reappear. So there I was; the two segments were quiet, but put them together and the little demon would appear. I then started anew, carefully shielding every detail and proceeding with caution, but all to no avail; the noise persisted. I tried by-pass condensers everywhere I could possibly put them. I almost gave up the idea of ever having a successful a.c. receiver. Then I found that my trouble was really coming from the line even though it did not show itself readily there. I tried the most unusual types of line filters, but they were only partially successful.

"I gave this up and after trying everything under the sun I found the only thing that would totally eliminate it — a single 1- $\mu$ f. by-pass condenser connected from one side of the 2.5-volt a.c. filament leads to the receiver shield. The odd part of it is that the noise is not eliminated if the condenser is connected to the grounded center-tap of the filament transformer, but only when connected to the receiver shield."

It is possible that the lack of success when the condenser is connected to any other grounded part of the set except the shield is caused by some local condition in the receiver itself. A good many of the measures taken by some experimenters to get satisfactory operation do not seem quite logical, but after a few days of sweating over a hummy receiver one is ready to try almost anything, logical or not!

## The Hudson Division Convention

WITH expression on every hand of the "best convention ever held," the fifth annual convention of the Hudson Division came to a close late Saturday, May 24th.

From the very beginning when Dr. A. L. Walsh, Director of the Division, greeted the delegates and speakers, until the closing event, every minute was taken up with interesting subjects. Mr. Heller of the Insuline Products had a wonderful exhibit of television apparatus; Mr. D. E. Replogle of Television Corporation gave a fine lecture on "Television for the Amateurs," and those listening to him realized what progress has been made in that particular field. It seemed good to see so many old-timers present renewing ac-

quaintances and with the younger amateurs taking part in the stunts so well managed by C. E. Sargeant, W2BCA. The interspersing of the stunts between some of the lectures was a good thing and helped to keep the fellows together. A. A. Hebert of A.R.R.L. spoke on legislation and the new regulations, emphasizing the importance of keeping within the amateur frequencies. One of the surprise speakers was David Grimes, formerly a radio consultant but now with the R.C.A., who gave a most interesting lecture on "Short Wave Radio Receivers," and if the number of questions asked afterwards was any criterion of the interest the speaker should feel gratified.

George Grammer, Assistant Technical Editor, QST, made his formal appearance as a speaker and covered the ground very thoroughly on the subject, "Avoiding Interference with Broadcast Receivers and Other Radio Services," being the concluding lecture Friday evening, but every one seemed loathe to disperse and groups were seen here and there "hamfesting" until late into the night.

With the weather much cooler on Saturday, the afternoon session started practically on time with A. O'Hara, W2OG, in charge. Clark C. Rodimon, Managing Editor, QST, was the first speaker and gave a very good demonstration on how QST is printed and the trials and tribulations of an editor before the magazine is ready for distribution. Mr. George Fleming, one of the engineers of Loftin-White Co., spoke convincingly on "Amplifiers," being followed by Chief Radioman Pomranz, U.S.N.R., who discussed naval reserve and the advantages of enrolling.

The big event of Hudson Division conventions is always the banquet, and this year Frank Frimmerman, W2FZ, outshone all previous affairs with one of the finest dinners with dance music by Ed Berlin's Orchestra between courses. As there were more YL's and OW's present this year, this feature of the dinner was enjoyed by a large number. Several professional entertainers kept up the interest with songs and specially dances, one of which was extremely interesting because of the fact that the performer was one of our "hams" — none other than Eddie Green (W2AKM) of the R-K-O vaudeville circuit, presenting his comedy act, "Sending a Wire." The speakers of the evening were Director Walsh, former Director Larry J. Dunn, Col. J. B. Allison for the U. S. Army; Capt. Overstreet of the Navy, who recounted his experience when the Battleship *Oregon* made her eventful trip at the beginning of the Spanish-American War, and radio was unknown in those days. A. A. Hebert, A.R.R.L., and last but not least, G. E. Mears, W2VQ, who in a humorous skit presented his "1935 Transmitter." The Long Island City, Bronx, Brooklyn and Bloomfield Radio Clubs were present with large attendance.

(Continued on page 82)



## W9ANZ

### A Pioneer 14-Mc. 'Phone Station

**W**9ANZ, owned by Louis F. Leuck, 1718 So. 14th Street, Lincoln, Nebraska, was one of the first stations<sup>1</sup> to use 'phone on the 14,000-ke. band when it was first opened for that purpose three years ago. Even after the privilege was rescinded, Mr. Leuck was so certain that the band would once more be opened for amateur telephony that the modulator unit was allowed to remain unmolested on the operating table and ready to go at a moment's notice, although telephony was not used in any other band. In the interim the set was used for c.w. on the 7000- and 14,000-ke. bands, although now used largely for 'phone on 14,000 ke. since the adoption of the present regulations some months ago.

The transmitter at W9ANZ is crystal-controlled, as most of the best of the present-day amateur 'phone stations are. In fact, as many amateurs have found from experience, crystal control is a practical necessity if the transmitter is to be really suitable for 'phone work, particularly on the 14,000-ke. band.

Digressing for a moment, W9ANZ had his first taste of amateur radio back in 1912, with an E. I. Co. receiver and an old ignition coil. This qualifies him without doubt for a place in the roster of old timers — anyone who cut his teeth on the old E. I. Co. catalog is eligible!

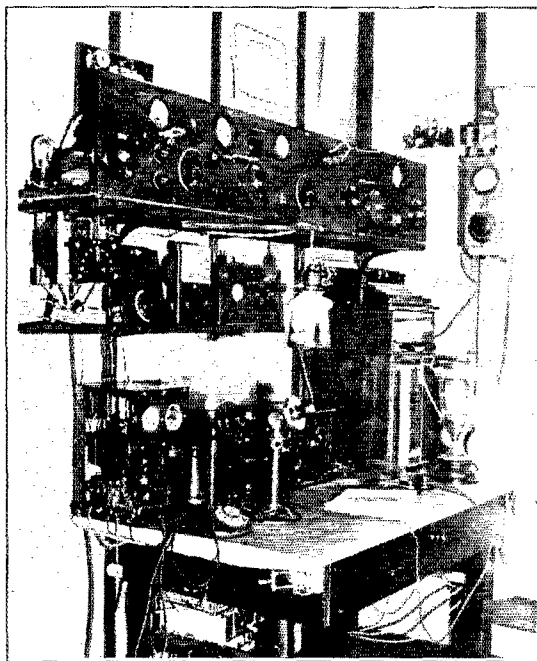
During the war he made his acquaintance with c.w. and telephony while serving in the Signal Corps, and opened up in 1922 under the present call with a 5-watt tube. Since that time the original outfit has been greatly enlarged upon.

One of the photographs shows a view of the station, which is located in a sun room on the second floor. W9ANZ says that there are at least four kinds of electromagnetic waves making their home in the operating room — sunlight, heat in summer, power QRM from three different power companies, and radio waves. The transmitter is on the top shelf above the table, and consists of two units, which will be taken up in more detail later. The lower shelf holds three frequency meters of various types, one of them a heterodyne meter. The filament transformer for the transmitting tubes is suspended to the left of them from the upper shelf. On the table itself are the modulator, the receiver, the microphone for the set, and the wire

'phone. The power supply equipment is in a separate room.

#### THE TRANSMITTER

The transmitter was originally built as a 7000-ke. crystal-controlled outfit, and an addition was made to allow it to be used on either 7000 or 14,000 ke. The two units are shown in separate photographs. The fundamental frequency of the crystal used is 1763 ke.



W9ANZ

*The c.w. portion of the transmitter is on the top shelf, the antenna tuning condenser, loading coil and ammeter being mounted on the wall at the right. The lower shelf holds the frequency meters. A pair of plug-in coils for the receiver are also on this shelf. On the operating table, from left to right, are the modulator unit, receiver, and a cabinet containing cards, station log, etc. The cup was won by W9ANZ during the Nebraska Week competition in 1927. Under the table are the batteries for both transmitter and receiver.*

A diagram of the c.w. portion of the transmitter is shown in Fig. 1. A Type '12 tube is used in the crystal oscillator, and is followed by a pair of Type '10's as frequency doublers. Two are necessary to reach 7000 ke., because the crystal is cut for the 1750-ke. band. A double tank is used in the plate circuit of the crystal tube, one tuned to the crystal frequency, the other to twice that

<sup>1</sup> QST, September, 1927, page 62.



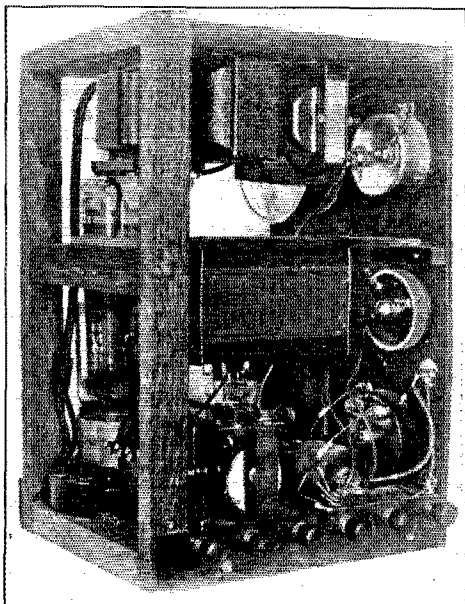


troubles.<sup>2</sup> A trap tuned to the operating frequency is placed in the lead from the grid to the key, in addition to the usual form of r.f. choke.

On 14,000 kc. the key is placed in the lead from the filament center-tap of the doubler tube to the positive side of the 400-volt supply. This corresponds to ordinary center-tap keying. The bias on the output amplifier is sufficient to reduce its plate current to zero when the key is up and excitation is removed. With this keying method no back wave is emitted and key clicks are negligible.

#### MODULATION

The modulation system at W9ANZ is the improved Heising arrangement in which the modulator tube is operated at a higher plate voltage



**SPEECH AMPLIFIER AND MODULATOR**

*The home-made microphone transformer is just behind the variable resistor on the near side of the panel. Some of the impedances mentioned in the text can also be picked out in this photograph.*

than the modulated amplifier. The modulator differs from the more common system used to obtain a high percentage of modulation, however, because a voltage booster is used instead of a dropping resistor.

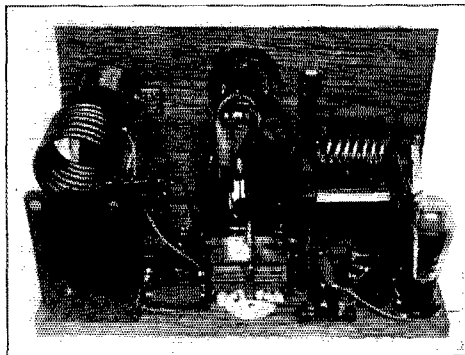
Several advantages result from this. No power is wasted in a dropping resistor, for one thing, and the r.f. tube is operated at the same plate voltage for both c.w. and 'phone without the necessity of changing connections. The '03-A is operated at 1000 volts, the nominal rating, in both cases.

The voltage booster is a power pack which fur-

nishes 300 volts at about 75 milliamperes. The output of this power pack is connected in series with the plate supply generator, making a total of 1300 volts available for the modulator tube. The booster employs a transformer and Type '80 rectifier, with the filter shown in Fig. 3. Since the negative side of the booster power supply is at 1000 volts potential above ground, the insulation of the transformer must be sufficient to stand the full plate voltage. A further consideration in the design of this particular transformer is that the capacity between the primary and secondary windings must be low in order that voice frequencies will not be by-passed to ground during modulation; for this reason the two coils are wound on separate legs of the core. The filament winding for the '80 rectifier is small and its capacity to the primary is negligible; therefore this winding is put on the same leg as the primary.

The modulator tube is a UV-211, which gives good results when working into the load furnished by a Type '03-A, and is more suitable than another '03-A would be for this purpose. Since the transmitter was built other types of tubes have been made available for modulation purposes, but the results with the present layout have been so satisfactory that the old tubes have been retained.

A Type '40-high- $\mu$  tube is used in the speech amplifier, and has given very good service. It is impedance-coupled to the modulator tube through a combination of inductances which has been used for a very definite purpose — namely,



**THE 14,000-KC. DOUBLER AND AMPLIFIER**

*A Type '10 is used as a doubler and a Type '03-A as power amplifier. The neutralizing condenser is in the center foreground.*

to obtain high inductance without at the same time increasing the distributed capacity, which is always troublesome when a single high-inductance coil is used, and is likely to cause a resonant condition in the voice range which will result in bad distortion.

A 30-henry choke and the secondaries of two audio transformers are connected in series in the

<sup>2</sup> An explanation of this system is given on page 46, QST for August, 1929.

plate circuit of the speech amplifier tube. The audio transformers are rated to carry 10 milliamperes in their primaries, and since the transformation ratio of both is 3 to 1, it was judged that the secondaries would carry 3 mils without difficulty. The actual plate current is 2 to 2½ mils and the transformers have carried this without any sign of burning up. The primaries of the transformers are left unused to avoid saturation of the core from the d.c. plate current. The plate voltage on the Type '40 is 370 aud, surprising as it may seem, the tube handles it nicely.

The coupling condenser between the speech amplifier and modulator is a 1- $\mu$ d., 1000-volt condenser. The impedances in the grid circuit of the modulator are also audio transformers, but in this case both primaries and secondaries are used, since there is no d.c. flowing and consequently no danger of core saturation.

The microphone is constructed from parts of three different mikes. The button was taken from an aeroplane microphone, the carbon granules from a desk-type mike, and the remainder of the parts from still another desk mike. Before assembling, the button and granules were thoroughly cleaned with carbon tetra-chloride. This composite microphone has given very good results; it is a great deal like an aeroplane mike in that it picks up very little background noise, and is sufficiently sensitive in conjunction with the speech amplifier, since the modulator tube can be easily worked to full output.

The modulation transformer was home-constructed by utilizing parts from an old Ford coil. The core was sawed in half, and 250 turns of No. 26 wire wound on it. One of the secondary coils from the Ford coil was slipped on top of this winding and serves as the secondary.

A trap tuned to the operating frequency is placed in one of the filament leads to the modulator tube to prevent radio-frequency feedback into the modulating system. When this trap is correctly tuned there is a noticeable decrease in the plate current taken by both the modulator and speech amplifier, proving that some r.f. gets back.

#### ANTENNAS

By means of three antennas of different lengths it is possible to get a number of combinations for work in any amateur band. One is 15 feet long, one is 45 feet, and the third is a two-wire flat-top antenna 75 feet long. Ordinarily the second harmonic is used for 7000-ke. work, and the fourth harmonic for 14,000 ke.

#### THE RECEIVER

A diagram of the receiver is shown in Fig. 4. The set uses a Type '01-A regenerative detector, A Type '40 in the first audio stage, and another '01-A second audio. Impedance coupling is used between the first and second audio stages.

The regeneration control is a variable resistor in series with the detector plate battery. In addition to the usual r.f. by-pass between the battery

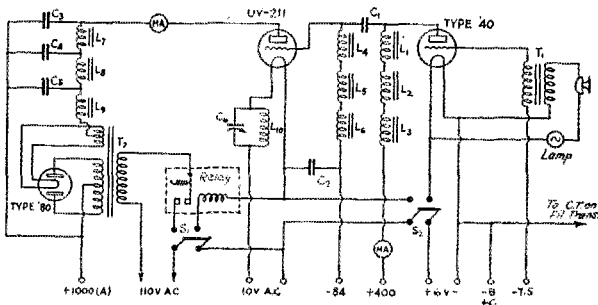


FIG. 3. — SPEECH AMPLIFIER, MODULATOR, AND VOLTAGE BOOSTER

*L<sub>1-6</sub>* — Coupling impedances. See text for description.

*L<sub>7</sub>* — 15-henry filter choke.

*L<sub>8</sub>* — 13-henry " "

*L<sub>9</sub>* — 13-henry " "

*L<sub>10</sub>* — Enough turns of No. 18 d.c.c. wire on 1" tube to tune to 14,100 kc. in conjunction with *C<sub>8</sub>*.

*C<sub>1</sub>* — 1  $\mu$ d. 1000-volt condenser.

*C<sub>2</sub>* — 1  $\mu$ d.

*C<sub>3</sub>* — 3  $\mu$ d.

*C<sub>4</sub>* — 2  $\mu$ d.

*C<sub>5</sub>* — 2  $\mu$ d.

*C<sub>6</sub>* — 50- $\mu$ d. midget.

*T<sub>1</sub>* — Microphone transformer. See text for description.

*T<sub>2</sub>* — Power transformer for voltage booster. 300 volts each side of center-tap on high-voltage winding. This transformer must be insulated for full plate voltage between primary and secondary.

*S<sub>1-3</sub>* — D.P.S.T. switches.

The milliammeter in the plate circuit of the speech amplifier reads 0-10; that in the plate circuit of the modulator, 0-150.

side of the tickler and the filament, a variable condenser is placed in parallel with this by-pass condenser and serves as a vernier tuning condenser or beat-note control. A pure d.c. signal occupies about 25 degrees on this condenser dial. The grid tuning condenser is in series with a small fixed capacity for band-spreading, and the fixed condenser may be short-circuited by a small switch to increase the tuning range.

The Type '40 tube in the first audio stage lends itself well to peaked audio amplification, and a tuned impedance is therefore included in its plate circuit, in series with an audio-frequency choke which serves as a coupling for straight audio amplification. By means of a two-point switch, either impedance may be short-circuited, thus selecting either peaked or quality amplification. The tuned impedance peaks at 770 cycles, and when in use a pure d.c. signal occupies only about two-thirds the space on the tuning dial that it does with the straight amplification.

THE FREQUENCY METER

Fig. 5 is the diagram of the heterodyne frequency meter. This meter is calibrated from standard-frequency transmissions, and covers the range from 6600 to 7600 kc. All batteries are con-

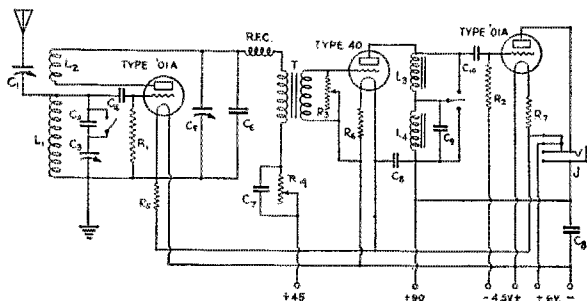


FIG. 4. — THE RECEIVER

- C<sub>1</sub> — 5-plate midget.
- C<sub>2</sub> — 50 μfd.
- C<sub>3</sub> — Cardwell condenser cut down to 2 plates.
- C<sub>4</sub> — 150 μfd.
- C<sub>5</sub> — 350 μfd.
- C<sub>6</sub> — 500 μfd.
- C<sub>7</sub> — 2 μfd.
- C<sub>8</sub> — 1 μfd.
- C<sub>9</sub> — .01 μfd.
- C<sub>10</sub> — 6000 μfd.
- L<sub>1-2</sub> — Homemade plug-in coils adjusted for various amateur bands.
- L<sub>3</sub> — Ford secondary coil. Inside space is filled with core wire.
- L<sub>4</sub> — Ford secondary coil — core removed.
- R<sub>1</sub> — 10 megohms.
- R<sub>2</sub> — 4 megohms.
- R<sub>3</sub> — 0-1 megohm variable resistor.
- R<sub>4</sub> — 100,000-ohm "
- R<sub>5</sub> — 30 ohms.
- R<sub>6</sub> — 4 ohms.
- R<sub>7</sub> — 4 ohms.
- T — Audio transformer.
- J — Filament control jack.

tained in the box, and a filament voltmeter is incorporated for adjusting the filament voltage to the correct value. The tube is a Type '99.

W9ANZ did not mention the other frequency meters shown in the station photograph, but from their appearance it is probable that they are of the absorption type.

OPERATION

The various filament voltages and plate currents are measured with the same meters wherever possible by utilizing plugs and jacks. The exact arrangement of the jacks and the various meters is shown in the diagrams of the transmitter.

Shifting from one band to another can be accomplished in a few minutes. It is simply necessary to place the '03-A in the proper socket, transfer the antenna clip from one pick-up coil to the other, tune the antenna condensers to predetermined settings, transfer the output of the 7000-kc. doubler to either the 14,000-kc. doubler or the 7000-kc. output stage as the case may be, and set the tank condenser of the 7000-kc. doubler to a marked value. The key is, of course, plugged in the proper jack at the same time.

When changing from 14,000-kc. 'phone to c.w. the switch S, Fig. 2, is closed, thereby short-circuiting the modulation choke and the filter choke; S<sub>2</sub> in the modulator diagram is then

opened, removing the filament voltage from the speech amplifier and modulator, and at the same time causing a relay in the power-supply equipment to open and disconnect the primary of the voltage-booster transformer, which in effect opens the plate circuit of the modulator and removes it from the circuit. The relay for this purpose is constructed from an old 150-ohm telegraph relay. The coils were connected in parallel instead of series, and it was found that 10 volts a.c. was sufficient to operate the relay satisfactorily. The relay coils are connected across the modulator filament switch, and when the switch is closed the relay is not energized, the contacts being closed in this case. When the switch is open the full 10 volts is across the relay, as the impedance of the modulator tube filament is negligible compared to that of the relay, and the contacts open.

W9ANZ hardly needs to be introduced to anyone who does any listening on the 14,000-kc. band. When conditions are favorable, it is possible to hold perfectly satisfactory QSO's with both coasts and Canada. Reports of "perfect modulation," "perfect reception," and "100% readable" have been received 75% of the time, even through QRM. Up to the time of this writing contact

has been made with 25 foreign countries on c.w., and the 14-mc. 'phone has been heard in Brazil,

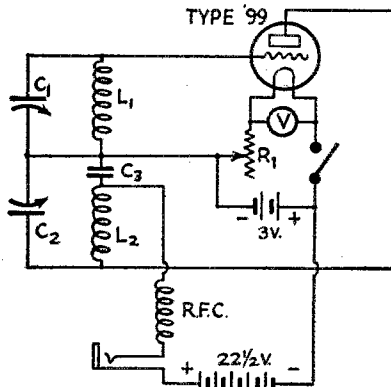


FIG. 5. — THE HETERODYNE FREQUENCY METER

- L<sub>1</sub> — 1 1/2 turns of No. 22 d.c.c. on tube base.
- L<sub>2</sub> — Same as L<sub>1</sub>
- C<sub>1-2</sub> — Two-gang condenser with 5 plates, double-spaced, in each section.
- C<sub>3</sub> — 2000 μfd.
- R<sub>1</sub> — 50-ohm rheostat.

Mexico, Chile, Peru, England, Prince Edward Island, Mexico and Spain. 'Phone QSO's have been established with some of these.

(Continued on page 88)

# I. A. R. U. NEWS

Devoted to the interests and activities of the  
**INTERNATIONAL AMATEUR RADIO UNION**

President: H. P. MAXIM

Vice-President: C. H. STEWART

Secretary: K. B. WARNER

Headquarters Society:

THE AMERICAN RADIO RELAY LEAGUE, Hartford, Conn.

## MEMBER SOCIETIES

American Radio Relay League  
 Asociacion E. A. R.  
 Associazione Radiotecnica Italiana  
 Canadian Section, A.R.R.L.  
 Deutscher Amateur-Sende-und Empfangsdienst  
 Experimenterende Danske Radioamatører  
 Nederlandsche Vereeniging voor Internationaal Radio-amateurisme

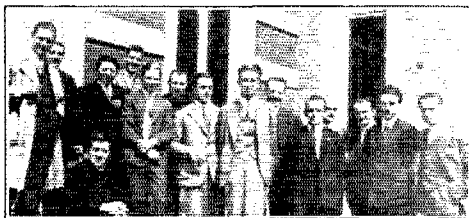
New Zealand Association of Radio Transmitters  
 Norwegian Radio Relay League  
 Radio Society of Great Britain  
 Reseau Belge  
 Reseau Emetteurs Francais  
 South African Radio Relay League  
 Wireless Institute of Australia

## Conducted by Clinton B. De Soto

WE are becoming overwhelmed with the increasing preponderance of 28-mc. material in the individual reports that are sent into this department as especial contributions, along with WAC Club applications, and hidden in other and more general correspondence. These individualistic, personal reports are greatly appreciated, and many times result in valuable and interesting items. But lately they have concerned themselves with little but 28-mc. stuff, and inasmuch as there are other places in *QST* where a special department on international ten-meter work would be more fitting, we can make no further acknowledgment or use of them than this general expression to all contributors.

A study of the material received brings out some most interesting points. 28-mc. work is more and more becoming a de-nationalized and international affair. The use of this band for practical communication purposes is now found to exist chiefly in those countries where general traffic handling is prohibited or limited. Whereas in the less restricted areas experimental and developmental work on this band is confined to certain experimentally inclined persons possessing necessary talent and equipment, and who in most cases make use of the better developed and more familiar bands for ordinary communication, a lot of amateurs in those unfortunate places where undue governmental restraint is exercised use the 28-mc. band exclusively for all their communication. And they are getting a very fair share of DX QSO's too.

This leaves us in a position to ask, who is going to be the first to achieve a special 28-mc. WAC Club membership? We obviously cannot institute many different grades and classes of membership in the WAC Club, and must normally con-



LOCAL MEETING OF THE RESEAU BELGE, MAY 2, 1930

*WSAVK is in the middle, near ON4FM, who is in the golf breeches. Between the two Catholic priests is ON4BZ, the Namur District Manager (where the meeting was held). Paul de Neek, ON4UU, is at the extreme right, and ON4PJ at the extreme left.*

tent ourselves with the single exception of the WAC for 'phone, but if it will add a little incentive to this work we will be happy to honor the first application received for WAC for 28-mc. as a special and extraordinary event. How long will we have to wait?

Continuing with the WAC Club, the second WAC for 'phone certificate was issued to Hilton L. O'Heffernan, G5BY. He considers himself doubly honored in that his is the first such certi-

ificate to be issued to a British station. The last confirmatory QSO occurred April 19, 1930.

The QSL Forwarding Bureaus maintained by the amateur organizations of the world are a system mutually coöperative, performing a great service, and productive of much good to amateur radio in general. Linking units are found in every recognized continental area, and in nearly all the important countries permitting amateur two-way communication. The work they do is worthy of praise and heartfelt thanks.

Spots on the globe still remain where amateurs are found in comparatively large numbers, and it is in reaching the new and unlisted stations in these places by mail that difficulty is experienced. This is a request to amateurs residing in such localities to do themselves and their fellow amateurs a great service by volunteering to receive and forward wherever possible communications intended for stations in their areas. May we have volunteers for this service? All present forwarding agencies have been listed in QST.

#### BELGIAN SECTION

By Paul de Neck, President of the Reseau Belge

Apart from the habitual European contracts, and some good DX on the 7-mc. band, the principal activity is found near 43 meters where all our 'phone hams assemble and hold long conversations with Spain, France, Italy and North Africa.

Two good records in low-power 'phone work are recorded: ON4WY, with 16 watts in a push-pull circuit and choke modulation, was in contact with PY1AN of Rio de Janeiro on 42 meters. His modulated signal was received R5. ON4QS with only five watts was heard R7 on 52 meters by EAR2O.

On the 14-mc. band DX is always good with the exception of some dead spots where none but European stations are received.

Our friend ON4BU is now working from Kalina, near Leopoldville, in the Belgian Congo, with the call letters ON4CAA and about 100 watts input on 14,030 kc. His first contact was with W1BUX QRK R8! The next was W4MK, who received him R4. Afterward the following Belgian amateurs were worked: ON4JC, ON4UU, ON4RO, ON4FP, ON4WW and ON4ZZ.

ON4JC in one glorious day worked the following DX: ZT2B (R6), FB8PHI (R8) of Madagascar, FO9SR (R7) and VS6AF (R5) of Hongkong. All contacts were made with 20 watts input, a Zeppelin type antenna, and took place in the period from 1800 to 2000 G.C.T.

After midnight (2400 G. C. T.) the Japanese stations J3CR, J3CF and J3FR are now heard full strength.

On the 28-mc. band nothing has been done yet, but several Belgian hams are preparing their sets for the June tests.

Sunday, May 4th, we had the pleasure of a visit from a good U. S. ham, W3AVK of Philadelphia, Pa., who together with several Frenchies came to a local meeting we held in Ciney (Namur district).

#### DUTCH SECTION

By W. Keeman, Traffic Manager N.V.I.R.

Reception generally has been poor this month. In most cases, however, those stations which were heard were easily worked. On the 14-mc. band conditions for VK and ZL communication were far worse than last month. During the night South Africa comes in regularly with good strength, and most countries of this continent have been worked by our membership.

Good "W" conditions existed on May 1st, 2nd and 3rd. On the other nights practically no "W" signals came through. The writer notices that during the last half year "W's" could be worked during short periods of a few days, separated by intervals of about 26 days (one revolution of the sun). In easterly directions only a few outstanding contacts have been made, but still several new Dutch stations have worked their PK countrymen, while PA $\phi$ ZF worked China. On May 3rd PA $\phi$ DW, our well-known DX-station, worked all continents; PA $\phi$ QF established this record some time ago. On 28-mc. the first PA-W contact was made by PA $\phi$ QQ on May 16th. As to DX, 7-mc. was a complete washout.

The news that the British Postmaster-General had opened the 3.5-mc. band to the English amateurs was received here with great satisfaction. Practically no difficulty now remains to prevent the I.A.R.U. from putting into action the uniform regulations for the use of the several bands, as proposed by our traffic department about two years ago and brought to the attention of I.A.R.U. Headquarters by the R. E. F. The general complaint of hams working in the 3.5-mc. band is the small number of foreign stations working there. Still PA $\phi$ QQ reported several good contacts, his best DX being Petrograd in Russia. Much trouble is caused by several commercials working inside our bands, i.e., FYA, FYZ, PPX, PLJ, RKV, RVA and IDO. PPX has even announced himself as being on 43 meters while actually working on 7,180 kc. A beginner hearing such an announcement and considering it correct, would regard it as a standard, thereby resulting in off-wave operation, interference with official traffic and a complaint to the Berne Bureau protesting against "those amateurs" working outside their bands, thus risking further restriction at Madrid.

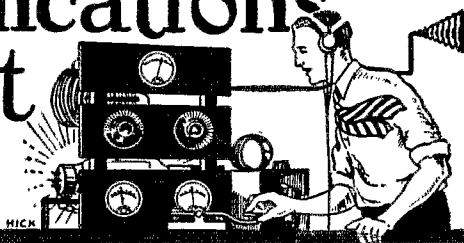
When RKV and RVA are both working, the greatest part of the 14-mc. band is covered with their broad r.a.c. or super-regenerative signals, backwaves and clicks. If possible something ought to be done about this matter. As no traffic

(Continued on page 78)



# The Communications Department

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



## The Springfield Air Races

The dedication of the new Bowles Airport at Springfield, Mass., was the occasion of the Springfield Air Races held on May 30th, 31st and June 1st. The Springfield Radio Association had been approached a few weeks prior to those dates to furnish radiophone communication between the pylons and the timing stand for the purpose of reporting the progress of the planes around the course, and for checking them to see that they did not "cut off" at the turns. As usual, the amateurs were not found wanting and at the start of the races the stations which we shall describe in the following paragraph were in operation.

The control station, located at the Timer's Stand (Pylon No. 1) used the call WIOF. This station used a combined transmitter and receiver with the tuned plate-tuned grid circuit. Cushing, WIAWW, was operator at WIOF. Station WIDE was located at Pylon No. 2 with WIBVR, WIBSI, W1BSN and WICCH as operators. The equipment at WIDE consisted of a portable transmitter-receiver owned by WIWP; the transmitter being a 15-watt affair using grid modulation, 540 volts of "B" batteries feeding the tubes and .6 ampere going into the antenna. A frequency of 3510-ke. was chosen for WIDE. At Pylon No. 3 was station WIAWW, operated by WIDR, W1BSN, WIBVR and WICCH. The outfit at WIAWW was a Baby Burgess split Colpitts  $7\frac{1}{2}$  watt transmitter with storage battery filament supply and 450 volts "B" batteries on the plate. Loop modulation was used on approximately 3505-ke. The receiver was a three tube job using Pilot coils.

The pylons were made of wood and were about thirty feet in height, shaped like pyramids. Four by four timber was used with boards nailed across lattice-like. Each pylon was covered with black and yellow bunting and had a checked flag at the top of the mast. At each pylon a tent was put up to house the station assigned at that point. Special tables had to be constructed in the tents to hold the equipment.

The first day of the race cooperation, Friday, May 30th, found all the stations in readiness. The weather was cold, raw and very windy. WIDE and WIAWW contacted WIOF at the Timer's Stand every fifteen minutes. Races were reported at 4 p.m. On May 31st three races were reported. WIOF, the control station, would announce when the planes had left on a race and then stand by for reports from Pylon No. 2. As the planes went by Pylon No. 2, WIDE would call out the numbers of the planes passing okay. Reception was so good that the roar of the motors as the planes passed the pylons could be heard at the Timer's Stand. After the planes had passed Pylon No. 2, WIAWW would begin reporting them as they passed Pylon No. 3, calling off the numbers of the planes passing. After this WIOF would O.K. the reports received. Four races were reported on Sunday, June 1st.

In addition to the regular reporting of the races several other interesting things happened during the three days at the field. The *New Arbella*, KHJQ, the *Boston Herald* good will plane, visited the field and arrangements were made to work KHJQ in the air. Contact was made without difficulty and after the ability of receiving the plane had been demonstrated the mike was turned over to the regular an-

nouncer on the ship and the receiver was in turn plugged through the loud speaker system at the airport. The announcer on the *Arbella* talked to the audience for about fifteen minutes while flying 3000 feet above the ground.

The wind became so strong on the last day of the races that Pylon No. 3 was blown down. As the antenna-counterpoise system of WIAWW was fastened to the pylon, it also came down and rested on the ground. WIAWW still got through but reports were very weak. This condition did not last very long, however, as two of the operators immediately went out to correct the situation, one holding the antenna up with a pole and the other the counterpoise. You can't stop a ham! Hi.

All in all the Springfield Radio Association's cooperation at the Air Races was a decided success. Each member took a personal interest in the work, and the resulting spirit of unity has tended to make the SRA 100% stronger.

The above report is furnished through the courtesy of T. F. Cushing, WIAWW, Percy C. Noble, WIBVR and Harry Fisk, WIDR. Thanks are due the National Carbon Company, the National Guard, the Wetmore-Savage Electric Supply Company and the B. H. Spinney Company for apparatus and supplies furnished.

## DAIV

The schooner yacht *Mopelia* has left New York carrying a party of fifty boys on a two months' cruise through the West Indies. J. Pascal, W2CEV-W9AQD, is radio officer in charge of the 100-watt high frequency installation aboard which will operate under the call DAIV. DAIV is expected to have frequencies adjacent to our 3500-, 7000- and 14000-ke. bands, but the only definite frequency known at the present time is 6667-ke. (45-meters). There will be plenty of traffic and Count von Luckner, owner of the *Mopelia*, is offering a cup to the amateur radio operator who gives the best service in providing communication with the yacht. The cruise offers a splendid opportunity to show what we can do and all amateurs are urged to listen for DAIV on 45-meters and cooperate in every way possible.

## Traffic Briefs

Send for the 15th (June, 1930) edition of the Rules and Regulations of the Communications Department. This contains the full text of the new amateur regulations, lists of Q code, international prefixes, information on the qualifications and duties of different officials in the A.R.R.L. field organization, how elections for Section Manager are held, etc. A postal will bring you the latest up-to-date edition of this information for your operating table free of charge. Mail it today.

YE5AW is the first Canadian "five" to work all continents. He also believes he is the second in Canada to do this. FB, OM!

Among the several transcontinental traffic routes now in operation is one running WIKH and W2SF to W8CNO to W9PX to W9EJQ to W9BOQ to W9FAM to W9CAA to W6BCO. A branch of this route connects W9FAM and W6BJF. Most of the stations on the route have numerous other schedules making quite an extensive hook-up.

W6CGM advises that China has lost two good amateur stations. AC3MA has been closed by military authorities and AC8RV shut down permanently when the owner returned to the States.

#### LONG BEACH AIR MEET

W6DQI of the Associated Radio Amateurs of Long Beach, Calif., sends us the following account of communications furnished by the A.R.A. at the Long Beach Air Meet held at the Long Beach Municipal Airport on May 24th and 25th.

At the regular meeting of the club on May 23rd Hal Nahmens, W6HT, was appointed chief operator, and Foster Strong, W6ELZ, liaison officer. Early Saturday morning all the equipment was in place — a 50 watt M.O.P.A. at the Judge's Stand operated without an antenna; a 7½ watt Ultra Audion at Pylon No. 1 operated with what amounted to a "hunk of wire" for an antenna; a 7½ watt Hartley at Pylon No. 2 using a Zepp antenna and a Ford Coil plate supply; and a 7½ watt T.P.T.G. with a Zepp at Pylon No. 3.

All stations were in working order and had been well tested prior to the first race at 10 a.m. Saturday, May 24th. They were in almost continuous operation all day Saturday and Sunday furnishing communication between the pylons and the Judge's Stand. The operators were as follows: At Judges' Stand W6HT and W6DEP; at Pylon No. 1 W6DYJ and W6EQW; at Pylon No. 2 W6CZZ and W6DYZ; at Pylon No. 3 W6CHW and W6EIF.

The A.R.A. was highly spoken of by Army, Navy and Airport officials for the work of its members at the Long Beach Meet.

## Official Broadcasting Stations

### CHANGES AND ADDITIONS

W9CFL (3750 kc.) Mon., Wed., Sat., 7:00 to 7:25 p.m.; (7100 kc.) Mon., Wed., Sat., 7:30 to 8:00 p.m.; (3750 kc.) Fri., 9:30 to 9:15 p.m.; (7100 kc.) Fri., 9:20 to 9:35 p.m.

W9DZAI-W9EJK (14200 kc.) cc. Daily 10:30 p.m.—(7018 kc. cc. or 3509 kc. fone) Mon., Thurs., Sun., 10 p.m. W9ERU (7120 kc.) Tues., Thurs., 7:30 p.m.

W7OV (7275 kc. approx.) Mon., Wed., Fri., 7:00 and 10:00 p.m.

K6EWB (7100 kc. and 14,300 kc.) Wed., Fri., Sun., 5:30 p.m. H.S.T.

W4ALH (7143 kc.) Tues., Thurs., Sat., 7:00 a.m., 8:30 p.m. C.S.T.

## W1MK

A.R.R.L. Headquarters' Station W1MK operates on frequencies of 3575 kc. and 7150 kc. Robert B. Parmenter, "RP," is the chief operator; his fist is familiar to most of the amateur fraternity. Occasionally other members of the Headquarters' staff operate at W1MK. Their personal signs may be found in the QRA Section of QST.

Throughout the following schedules Eastern Standard Time will be used.

OFFICIAL AND SPECIAL BROADCASTS are sent simultaneously on 3575 kc. and 7150 kc. at the following times: 8:00 p.m.: Sun., Mon., Tues., Thurs., and Fri.

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

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

GENERAL OPERATION periods have been arranged to allow every one a chance to communicate with A.R.R.L. Headquarters. These general periods have been arranged so that they usually follow an official broadcast. They are listed under the two headings of 3500 kc. and 7000 kc. to indicate whether the watch is devoted to listening on the 80-meter band or to the 40-meter band.

3500 kc.

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

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

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

7000 kc.

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

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

SCHEDULES are kept with the following stations through any of which traffic will travel expediently to A.R.R.L. Headquarters, on 3500-kc.: W1ACH, W1APK, W1BXB, W1CFI, W2JF, W2WK, W3BWT, W3CBT, W4PM, W9OX, VE2AC; on 7000-kc.: W6AIX, W6DEP.

## The New Arbella—KHIJQ

The seven-passenger monoplane New Arbella left Boston in early April on a tour sponsored by the *Boston Herald* in connection with the 300th Anniversary of the founding of the Massachusetts Bay Colony and the forthcoming American Legion Convention. The plane was equipped with a 100-watt radiophone-c.w. transmitter operating on 3106 kc. (96 meters) with the call KHIJQ. Huddleson, W8DBU, was the operator. Amateurs were requested to listen for and report broadcasts from KHIJQ, and we are here giving a brief account of work reported to us by various amateurs:

W9EVE heard 'phone transmissions from KHIJQ for twenty minutes after the plane left Milwaukee and CW until arrival at Madison.

April 26 — W9CPD, St. Paul, heard the plane while flying between St. Paul and Des Moines, Iowa. Strength of signals was between R6 and R9 on both 'phone and CW. W9GHO, Minneapolis, worked KHIJQ for forty-five minutes; reported signals QSA5, R9, p.d.c. ('phone and CW). One message was relayed during this QSO.

April 27 — W9HD worked the Arbella en route to Lincoln, Neb., from Des Moines. QSO was established at 10:03 a.m. C.S.T. when KHIJQ was 7 miles east of W9HD. Strength of signals at that time was QSA5, R9 ('phone). At 10:25 a.m. distance was 25 miles and audibility QSA3, R5 (CW). W9HD says that KHIJQ's signals were marked for their steady frequency and good modulation.

April 28 — The New Arbella arrived at Topeka, Kansas. Arrangements were made with W9ELG to keep a watch on KHIJQ's frequency until they reached Kansas City. Transmissions from the plane were followed until just before it landed in Kansas City and two messages were received by W6LKA one for the local Legionnaires and one for the Chamber of Commerce. KHIJQ's CW signals were QSA4-5, while the 'phone could not be copied.

May 3 — W8OV heard KHIJQ communicating with W8XK en route from Pittsburgh to Washington, D. C.

May 10 — W1AVK worked KHIJQ en route to Hartford from Newark, N. J., and exchanged messages relative to a hook-up with WTIC. WTIC was making plans to rebroadcast transmissions from the Arbella upon its arrival in Hartford. W1AOX and W1CNR heard both sides of the QSO between W1AVK and KHIJQ. The New Arbella landed at Hartford. W1AVK arranged schedules with KHIJQ for 11 a.m. E.S.T., May 11th, when the ship was to leave for Providence.

May 11 — W1AVK worked W1CNR at Fall River, Mass., who requested that KHIJQ be informed that he would watch for the Arbella as she neared Providence. KHIJQ got under way at about 11:10 a.m. E.S.T. and called W1AVK. It was found that W1AVK's receiver would not tune to 3106 kc., so station W1AOX was used. W1AOX held a two-way 'phone QSO with KHIJQ until the plane was about fifteen miles away, when W1AOX changed to CW. The plane used 'phone all the way to Providence. Contact was held with W1AOX until they had passed over Providence. W1AOX was then asked to stand by and KHIJQ tuned around to see if other hams were calling. W1CNR was heard and worked. At KHIJQ's request W1AOX sent broadcasts on 'phone and CW to all amateurs telling them of the Arbella's proposed afternoon flight over Rhode Island and Eastern Massachusetts. At 1:40 p.m. W1BXB heard KHIJQ working W1CNR, audibility QSA5, R8, modulation good. W1BXB heard the plane again QSO W1CNR at 3 p.m., location then over Fall River. At 3:15 p.m. KHIJQ sent a general call for Taunton, Mass., signing off at 6:00 p.m. resulting in antenna and getting ready to land there for one hour. At 5:18 p.m. W1BXB again heard KHIJQ, QSA4, R6, calling W1AIB and saying he was nearing Hyannis, Mass. W1AXV heard KHIJQ while en route from Pawtucket, R. I., to Hyannis, Mass., working W1CNR. W1AXV worked KHIJQ on 'phone all the way from New Bedford to Hyannis. KHIJQ landed at Hyannis.

May 12 — W1AXV was in continuous communication with the plane while flying between Hyannis and Providence, and between Providence and Brockton, Mass. W1AXV handled a rush message to the *Boston Herald*.

May 13 — W1AXV heard the plane leaving Lawrence, Mass., for Lowell. W1AXV and W1WX worked KHIJQ. W1AXV fol-

lowed the broadcasts from the Arbella as far as Manchester, N. H., but could not follow the trip to Concord.  
 May 14 — KHIJQ left Concord at about 11:20 a. m. E. S. T. and immediately called WIAPK on phone, and two-way communication was established. When the plane reached the Maine-N. H. boundary line, WIAPK changed to CW because KHIJQ could not copy his phone through the QRN from the plane's engine. KHIJQ and WIAPK were in communication until the plane neared Portland, Maine.

## Traffic Summaries

(MAY-JUNE)

Pacific led by Los Angeles . . . . .	\$206
Central led by Illinois . . . . .	2886
Atlantic led by Western Pennsylvania . . . . .	3219
New England led by Connecticut . . . . .	1833
Southeastern led by Florida . . . . .	1551
Hudson led by Eastern New York . . . . .	1255
West Gulf led by Northern Texas . . . . .	715
Northwestern led by Montana . . . . .	660
Dakota led by Southern Minnesota . . . . .	655
Midwest led by Missouri . . . . .	570
Roanoke led by Virginia . . . . .	554
Delta led by Tennessee . . . . .	273
Rocky Mountain led by Utah-Wyoming . . . . .	166
Quebec . . . . .	94
Ontario . . . . .	53
Vanalta led by British Columbia . . . . .	29
Prairie led by Manitoba . . . . .	17
530 stations originated 5798; delivered 4334; relayed 11,609; total 21,741. (74.7% del.)	



The Los Angeles section continues to set the pace and once again claims the Traffic Banner. This Banner goes each month to the section with the largest total of real messages. A traffic summary showing the standing of the various divisions for the past month is printed above. What place does yours take? What Section will carry the Banner next month and help its Division head the list?

## BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
K6EWB	233	55	758	1036
W9DZM	186	178	468	832
KAIHR	238	153	306	697
W6QP	97	72	468	637
W6BTZ	36	59	394	489
W1MK	49	67	310	426
W6BZY	55	10	371	416
W8YA	83	65	256	404
W3BWT	95	105	188	388
W4PM	1	18	358	377
W2QU	138	184	6	328
W9C08	84	98	146	328
W3SM	43	56	223	322
K6DUD	259	32	14	305
W6WA	82	211	7	300
K6BXW	95	8	188	291
W6DTU	144	34	104	282
W1CMZ	15	18	242	275
W6DEP	25	47	201	269
W6ALU	6	14	248	268
W6AOA	6	57	194	257
W6YG	114	12	130	256
W6AWY	2	56	183	241
W1AMQ	79	29	125	233
W6AXV	195	5	12	212
W6EGH	71	128	—	199
W2QN	64	75	2	141
W9DRG	38	64	6	108
W9CFL	9	60	12	81

All these stations appearing in the Brass Pounders' League are noted for their consistent schedule-keeping and dependable message-handling work in amateur radio. Special credit should be given to the following stations in the order listed responsible for over one hundred deliveries in the message month: W6WA, W2QU, W9DZM, KAIHR, W6EGH, W3BWT.

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

## DIVISIONAL REPORTS

### ATLANTIC DIVISION

**WESTERN NEW YORK** — SCM, John R. Blum, W8CKC — W8BCZ leads the list this month. W8CUT has built several screen grid a.c. receivers that work very well. W8AFM reports the off-frequency situation much better on 14 mc. W8AAZ is having filter trouble. W8IH has a new 851 for his high powered phone transmitter. W8DSP has increased power to an 852. W8CKC is monkeying with 28 mc. W8BWE took exam for ensign in U. S. N. R. W8BDV is in Brooklyn for U. S. N. R. training. W8BFG is honeymooning. W8DME is busy with schedules. W8QL is working with twenty watts input. W8BCZ is working in a B.C.L. station with his new commercial license. W8QP is a new Official Observer. The Jamestown Amateur Radio Association is now affiliated with A.R.R.L. W8AWM has a new license. QLC is a new Q signal up this way. W8BHK reports weather very poor for DX. W8CXH is trying out standard frequency work. W8CW is off the air until fall. W8DIL is having trouble with his receiver. W8CPC spends most of his time on 14 mc. Two new stations started up this month — W8CIL and W8AST. There are exactly 100 Official Relay stations in this section, 14 of which reported. Several fellows want Official Relay appointments, but the section is getting top-heavy. All Official Relay stations that do not report by September will have their certificates cancelled. Sorry, but you will do it yourself.

Traffic: W8BCZ 50, W8BYD 42, W8CPC 20, W8DSP 20, W9DME 12, W8QL 10, W8AAZ 8, W8DII 5, W8CSW 5, W8CKC 5, W8AST 2, W8CXH 2, W8BIF 2, W8CIL 2, W8BHK 1.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, Forrest Calhoun, W3BBW — The summer slump has set in for sure as there was a large number of non-reporters. You know, fellows, you must report even if you don't have any traffic. Let's see if we can't get more reports next month. Maryland: W3AFF, our new ORS, says

the QRN is bad during day and worse at nite. Hi, W3AIL, also complains of QRN and lack of traffic. W3BBW had a few but not so good as last year. W3ED says now that school is out he can report more often. W3LA was QSO his home while he was in a plane over Detroit with only 3 watts input. F.B. W3DG says summer and y-l-itis have him. Hi, W3NY was at the Radio Show in Atlantic City. Delaware: W3AIW will soon be an ORS. W3HC did his bit to help. W3ALQ doesn't get on much due to hot wx and bass fishing. District of Columbia: Our good traffic station W3BWT leads us all as usual. W3BF sent in his last report for our section and is now heard at W3GS in the E. Pa. section. Sure sorry to lose you, Jack. W3OZ finds traffic harder to get and skeds harder to keep. W3PM has a new AC receiver. W3AKR is going to put in an entirely new station. I have been requested to ask all amateurs in Maryland and District of Columbia, who are interested in A.A. work to get in touch with me or the Chief Signal Officer, U. S. Army 3rd Corp Area.. Baltimore, as they are organizing a chain and need your cooperation. Here is a chance to get traffic and skeds.

Traffic: W3BWT 388, W3BF 58, W3OZ 33, W3AIW 20, W3HC 8, W3AFF 5, W3AIL 5, W3BBW 5, W3ED 4, W3PM 4, W3LA 3.

**EASTERN PENNSYLVANIA** — SCM, Don Lusk, W3ZF — Now that hot weather is here and DX or traffic work are not so good let's turn our efforts toward bettering our station for the coming radio season, by straightening out the bend or chirp in our note, calibrating our monitors and frequency meters and getting all set for good WX, so that you will be a credit to both the League and our section. We have a nice bunch of ORS in this section and there are several prospective ones in the making so we should have little or no trouble winning the traffic banner. The SCM is proud to welcome home the traffic hand, W3GS. W8CWO seems to be bothered with tennis, spring fever or what have you. Miss W3AKB has at last succeeded in getting a 14-megacycle Xmitr perking and now she's after DX. W8EU

thinks that the great open spaces with YLs are heaps more appealing than these DELUXE warm evenings. WSDHT has a new antenna and an a.c. receiver perking. WB3NF is moving for the summer. WSAWO isn't bothered with school now and promises better totals. W3MC reported by telephone when the time got late. W3UH is proving he is entitled to an ORS. W3UX is using the 7- and 14-mega-cycle bands for the summer. W3ZF is fooling around with 14 mc.

Traffic: W3GS 140, W3ZF 123, W3NF 69, W8EU 47, WSDHT 31, W8CWO 24, W3AKB 8, W3UH 57, W3MC 55, W3UX 22, W8AWO 4.

**SOUTHERN NEW JERSEY** — SCM, Bayard Allen, W3ATJ — W3SM, our new Route Manager, makes the BPL with his first report of the year. He handled 322 with his 500 watt phone. FB! If you want skeds, drop him a line at 502 Oaklyn Ave., Oaklyn, N. J. W3ATJ has been very busy in the law office and only handled a few. W3KJ was off the air two weeks due to blowing his receiver tubes. W3BAN is still flirting with Old Man Hard Luck.

Traffic: W3SM 322, W3ATJ 10.

**WESTERN PENNSYLVANIA** — SCM, A. W. McAuly, W8CEO — This will be my last report as SCM for this section. As I turn over the work to my successor, Mr. Robert Lloyd, W8CFR. I wish to thank all of you for your cooperation and support and I sincerely hope that you will continue your good work under the supervision of Mr. Lloyd. I shall be glad to hear from any of you through the mail and station W8CEO will be kept on the air as heretofore. W8YA maintains the leadership but has dropped some schedules for the summer. W8DLG says the SG detector is FB. W8CNZ says there is plenty of traffic on 7000-ke. band. W8CMP had a narrow escape from serious injury when he got a shock from a condenser bank charged at 4000 volts. At last we have an ORS in Erie. W8GU is back at his old traffic game. W8CEO is building a 14,000-ke. transmitter to work in conjunction with the 3500-ke. set. W8AGO has his new crystal set going in fine shape. W8DUT reports a new station in New Kensington. W8CUG has been helping out with club work. W8CFR has returned from South America and reports a wonderful time visiting Brazilian amateurs. W8AVY is applying for an ORS and is going to get it. A fine letter from W8BTQ in North Braddock reports activity there. He is moving to Etna this month. W8CDH, W8DFA, and W8BTQ visited W8AEO and W8DCV of Altoona. W8ASE reports that his tube, reported as a 250 watter in this column last month is a "type 250" instead. Some difference. Wm. D. Craft, W8DNF, has been elected secretary of the A.T.A. Hunter Lohman, W8OC is now President. W8AIE is working on a transmitter for airplane use at Rodgers Field. W8BXG is Norman F. Pier's call at Union City. W8VF is active on phone and cw. W8BNU wants a schedule with South America. W8BYG says boat schedules for the summer are his dish. Any person or persons in the vicinity of Erie wishing to send in reports to the SCM can, if they care to, send them to the Erie Amateur Radio Club. They will then be forwarded in a bunch to the SCM.

Traffic: W8YA 401, W8DLG 48, W8CNZ 47, W8CMP 24, W8GU 20, W8CEO 17, W8AGO 6, W8DUT 6, W8AVY 14.

#### CENTRAL DIVISION

**MICHIGAN** — Acting SCM, K. F. Conroy, W8DYH — We regret that W8CEP is leaving us as SCM, but he claims he will be pounding brass more now, so all is not lost. FB work by W8AJC sure helped this month's total. W8AXM, W8CVU, W8CSG, W8BDI, W8AEM, W8BJT, W8CST, W8BPL and W8BTK are all new reporters. Welcome. Oms, W9AXE sez, "YLs", W8CKZ is keeping a few skeds. W8BRS claims 7 mc. Radio Freqs are just that. (Freaks). W8BGY and W8AUB both want their ORS certificates shelved for a YL. W9DFS is pounding brass at sea by now. W8DDO is trying 14 mc. W8TJ is just opposite to most of the gang — he reports tlc but says nothing. Some one raised Cain with W9EGF about something! Heh-beh. W8DSF will be on with new xmtr. and revr. and promises big things. W8BRO and W8CU say QRU. W8DED sez he's a RC now. W8DVQ likes AA work in a large way. W8AEO says QRL but his total says different. W9CE will be on all hands soon. W8ACB claims he's a cold wx tlc-man! Miss W9GJX sez swimming is all wet,

but she likes it. Say, Gang, did you get any cigars from W8DRB? (9 1/2 lb.) YL. FB! W8DEN says if the off-freq. 3.5 mc. phones would learn to talk with their hands, QRM would be more endurable. W8MW has a new 204a and only needs 6 or 8 more continents for a WAC. W8CWK is waiting for the gang to start something on 28 mc. (How about organizing a 28 mc. club? Write us). W8CAT is the new Route Mgr. for District 1. Who wants District 2 and 3 RM jobs? Lotta tlc will come from W8DAA this summer. W8DMS, W8JD, W8AJG, W8ALN and W8BAA will op. W8HL caught a lightning-bug and is teaching it the code. W8CEG and W8CST show the gang how to handle tlc with revg tube xmtrs. FB. Stations looking for tlc are W8AJC, W8CAT, W8JD, W8DDO, W8CEG, W8CST, W8AEO, W9EGF, W8BRS and W8DYH — unload on them for efficient QSP. W8FX-City of Straits fame is alive again. W8BPL is at 1546 Cadillac, Detroit. W8DYH still sends code practise (5-12 WPM) 10 a.m. Sunday, 7 p.m. EST Tuesday and Thursday on 3600 kc. and has lotta customers, including YLs! Mark THAT 16th of each month on your calendar now, and send in the reports. Let's knock 'em dead, Michigan.

Traffic: W8AJC 100, W8SH 1, W9GJX 13, W8ACB 10, W9CE 3, W8AEO 57, W8DVQ 15, W8DED 3, W8DDO 11, W9EGF 4, W8DFS 5, W8TJ 10, W8CVU 21, W8BTK 5, W9AXE 9, W8CKZ 5, W8BRS 16, W8CEP 9, W8CEG 17, W8DEN 11, W8MV 34, W8DYH 106, W8CWK 5, W8CAT 19, W8BDI 6, W8CSG 19, W8AEM 38, W8BJT 15, W8AXM 7.

**ILLINOIS** — SCM, F. J. Hinds, W9APY — W9DXZ and W9DOX are attending camp at Camp Grant, (Rockford, Ill.) W9DXZ is rebuilding for fall traffic. W9AVE is a new man on 3.5 mc. with a 210 at Yorkville. W9CYB blew out the old mercury arc. A buffer stage Xtal Control outfit is being installed at W9DAX to go with a Loftin White speech amplifier. W9DAX has logged 221 stations on the 1750-ke. band so far in 1930. W9EIR is home from school and pounding brass very hard now. W9FGW still has the fifty cent 210 he bought from W9BWK over a year ago and has worked 12 countries with it. Hi, W9ARY and W9FGW will hitch-hike to the Pacific Coast this summer. W9BDW is on again with a 203-A in HIC Hartley with 1500 V. for 7 and 3.5 mc. W9DGK was logged in England on 28 mc. FB, OT, W9ASY and W9APY both have new u.c. screen grid receivers. W9FR has just received a DeForest 503-A which will play on 14, 7 and 3.5 mc. W9DZM stayed home all month and put his time to good advantage by hanging up a total of 832 messages. That is a nice mark for us all to shoot at. OMs, W9BYK was the host at a hamfest of the Peoria R.R.L. and nearby hams on May 31. W9KB has sold his high power outfits and is on 3.5 mc. with low power. W9AFN is building a 210 outfit for 3500-ke. traffic work. The gang, including W9CYQ, W9RR, W9CFL, W9DTK, W9DOA, etc., gave W9CUH and the Waukegan gang a visit while they were at Great Lakes Naval Training Station. W9FPN worked N9Q on 14 mc. W9DJ complains of too much "Outboard Motor Boating." Hi, W9BNI is keeping his schedules very nicely with AA net. W9ERU is rebuilding to a Push-Pull TPTG. He took a message from WFAT. W9FCW lost his father this month. We are all very sorry, Om. Rectifier difficulties at W9BNI. W9FDY is receiving reports from Holland, England, Germany, etc. W9CCZ wants contributions of news from the gang for the CSRA news. W9AD has corn-field QRM. Hi, W9ANQ has now QSO'd 25 countries. W9AFF has left Thordarson Electric and Mig. Company to go into business for himself. W9LL will be on a farm during July and August, where there is no electricity so he will only be able to receive. W9CKZ says two of his messages were from WFBT to Mobile Press, FB.

Traffic: W9DZM 832, W9CKZ 77, W9BIR 53, W9FDJ 40, W9AMO 37, W9BVP 23, W9ERU 18, W9AFN 11, W9BNI 10, W9KB 9, W9FCW 8, W9CFL 6, W9APY 5, W9DGK 5, W9DOX 4, W9GIV 4, W9ASY 3, W9DJ 3, W9FPN 3, W9GJ 3, W9BMM 2, W9BZO 2, W9ACU 1, W9BDW 1, W9LL 10.

**OHIO** — SCM, H. C. Storek, W8BYN — I wish to say that I'm sorry so many of you report too late to have reports forwarded to me in Dayton, and therefore are not included. Last month several good ones lost out that way, and we need the totals too. Let's get up and at 'em, gang.

The Convention will be held here in Dayton the last few days of August, and already plans are under way. Better plans to come, because it's going to be good. Get further details from the Dayton gang via the air. W8LT, Ohio State University, leads the gang this month with 169. W9CZ comes next with 136. W8CNO has gone on a visit again this summer, and only had part of a month to work. W8BAC rolls up 70, which is not at all bad for hot weather. W8DDF is back with us until September, when he will go back to Purdue. W8NP, the faithful, turns in 51 without help of schedules. W8DU, another "9" to come to the "8th" is located in Columbus. W8BKM is still working fast and furious with AA and gets most of his traffic there. W8ADS has a complete new transmitter. W9DMX is out for traffic on 3.5 mc. W8CSS is taking a portable east with him July 14th to 28th. W8TK is leaving us for the summer. W8BGX and W8CX are keeping in touch with each other by radio while W9BGX is away for the summer. W8DVL reported by phone. W8BDU reports he and W8DMX took some messages, W8DMX calling the party on the phone, and enabling W9BKB to talk to his father. FB work, OMs. W8CX suggests that we run a "CQ Hound" column in QST. Hi. W8CFL is still plugging along. W8ARP leaves for Valparaiso, Ind., for the summer, but will be back in the fall. W8DDQ is going well, and the club is going to continue thru the summer for the first time in history. FB. W8DIH finds his time on the air very limited. W8DBK is off the air altogether on account of the YLs. W8BBR is still inactive, and darned if I blame him much. No "spanking" for you this time, W8APC. W8PL says air dead. W8RN is still on KFNA. The Warren Amateur Radio Club has been offering prizes to Warren amateurs for number of QSO's. W8DYC won first prize and W8BMF second. FB. Well, gang, this is a short report, but when so few report, there's not much I can write.

Traffic: W8LT 169, W8GZ 136, W8CNO 64, W8BAC 70, W8DDF 65, W8NP 51, W8DU 37, W8BKM 33, W8ADS 30, W8DMX 29, W8CSS 22, W8TK 17, W8BGX 10, W8DVL 3, W8BDU 3, W8CFL 2, W8ARP 1.

KENTUCKY — SCM, J. B. Watson III, W9BAZ — Heat Waves vs. Radio Waves! A knockout for the former. Get your old fashioned mint-juleps at W9AZY; he wins the Red Eye. W9DQC has a *speed-boat* for sale; a bargain at \$500. W9EYW says he was disappointed at the small bunch at the last meeting of the A.R.T.S. W9ACR is warming up and we hope he will be with us often from now on. W9AUH will celebrate the Fourth by opening up with Xtal. W9BWJ requests suspension from ORS duties for the time being. W9AIN had a nice trip and visited several of the Section hands. W9OX went fishing and got tanned. W9ARU with two ops and no traffic. How come? W9DDQ dropped to 14 kc. for the summer. W9FVZ is pounding brass at Kyroek. W9FQN has an AC receiver going. W9BAZ has one humming. Hi, W9GAL expects to have xtal shortly. W9GBX will be going as soon as his two new masts are up. W9BAN changed to push-pull with gratifying results. To the ORS having the largest total of traffic from June 15th to Sept. 15th, the SCM will donate an ORS A.R.R.L. pin. There are many active stations in this Section who never report. Give us a little dope once in awhile, OMs. Glad to see any of the gang if they get to Louisville. Just fone Belmont 2145. YLs acceptable, and how!

Traffic: W9AZY 104, W9OX 56, W9BAZ 15, W9AIN 11, W9BAN 7, W9FQN 7, W9AUH 6, W9EYW 3, W9FVZ 3, W9DDQ 2.

INDIANA — SCM, D. J. Angus, W9CYQ — W9CUD has just completed and delivered the crystal temperature control and the power supply for WLAP at Louisville. W9ENX is at the Valparaiso Radio School. W9EGE, W9RS and W9DZX and W9FBH are back from school and operating the home stations. W9DDB is now on with W8DDF at Cincinnati. W9BHE and W9DXM are new stations at Elkhart. W9CIC has been appointed chief radio officer of unit one, section three, U.S.N.R. W9FCX has moved to South Bend. W9FHB is a new ham at South Bend. W9GGJ had three more tubes go west. W9YV is the new call of the Training School at Valpo. W9RW is now the portable call for the school. W9ASX is in the land of the "spiks" doing commercial operating. W9EPH reports for the Richmond gang. W9CMQ says the Richmond Police Dept. received

their O.K. from the F.R.C. and as soon as appropriations are completed work will begin on a 50-W. Xtal control transmitter. W9BZZ is on the sick list. W9FXM is back on 7000 kc. after a trip to the hospital. W9FXO works 14 mc. every p.m. W9FKE is remodeling his home to fit his transmitting equipment. Hi. W9CWS handles some traffic.

Traffic: W9GJS 9, W9AKJ 29, W9GGJ 11, W9DDB 23, W9AIP 26, W9CYQ 13, W9RS 2, W9EPH 10, W9CWS 14. WISCONSIN — SCM, C. N. Crapo, W9VD — W9GFL is doing good work at Green Bay and has been appointed an Official Broadcast Station, operating mostly on 3750 kc. W9OT is still on the job and took a 136 word msg from WFBT without a break. W9CER is a new station at Jefferson. W9VD is working mostly on 7150 kc. and occasionally on 14240 for the summer months.

Traffic: W9GFL 38, W9OT 4, W9CER 2, W9VD 4.

#### DAKOTA DIVISION

SOUTHERN MINNESOTA — SCM, J. C. Pehoushek, W9EFK — W9COS is off daily schedules for the first time since October. Leach of W9RN has the 7000-ke. set getting out nicely. W9DRG lost his antenna in the Southern Minnesota cyclone. W9BXE will be on 24 hours a day with five operators after the first of July and is open for schedules. QRA is W9BXE, Corp. Marion Alewine, H. Q. Co. 3rd Inf. Fort Snelling, Minn. W9FFJ is on spasmodically. W9AKN — W9CTT worked WFAT. He also was host to CEIAX. W9GHO has been busy with orchestra and fishing. W9DGE is trying for the Minneapolis Police Short Wave Station. W9DMA is QRL. W9EYL is building a new a.c. receiver. W9BNF is on only Sunday evenings. W9FLE, a new ORS, will be active on 3500 kc. Sunday mornings. W9BQF says business is good, no time for radio. W9DSH is haunting Lake Minnetonka. W9EOH is busy at KSTP. W9ELA is at new QRA about six blocks from the SCM. W9FJK is a new man in South Minneapolis with a beautiful 210 transmitter and a screen grid receiver. W9BLG has gone back to Winnipeg. W9YC will be closed down for the summer. W9AIR is going on his vacation. Radloff attended a hamfest which Gobligh, W9FLE, sponsored. They got acquainted with the Western Minnesota hams, W9EJE, W9EJZ, W9BGG, W9BBN and W9DRK. All these except W9BBN operate on 1750-ke. fone. W9BBN has a 7-mc. xtal. W9DRK of Madison works on 14 mc. W9EJR has the memps. W9RNN is planning an elaborate outfit for next fall. W9FMB is assigned to a shut-in at Morrystown. He will be on 3.5 mc. and wants tests.

Traffic: W9COS 328, W9DRG 108, W9RN 144, W9BXE 10, W9EFK 8, W9FZ 3, W9GHO 3, W9DGE 1.

NORTHERN MINNESOTA — SCM, C. L. Jabs, W9BVH — W9AV leads the Section in traffic and sends in a lot of news. His sister, W9EXU, is still getting cards, letters and fotos by the bushel. W9BCT had his transmitter at the Northwest Aircraft Show in St. Paul. W9ADS is still on with his Hartley but has his CC job coming along fine. W9EHO is too busy with farm work to pound brass. W9CIY has business QRM. W9BVH is installing a transformer to increase the plate voltage on the frequency doublers and it is hoped the output will go up. Few reports were received and there will be some cancellations of ORS in the near future. Read the rules, fellows.

Traffic: W9AV 20, W9BCT 6, W9ADS 2, W9BVA 2.

NORTH DAKOTA — SCM, Guy L. Ottinger, W9BVF — The Jamestown Gang had a visit from W9IK. W9IK is hitting the fone strong and reports that four of the gang are going on N. R. cruises this summer. W8DM is also down in Jamestown teaching summer school and running W9RVF once in a while. W9DGS is busy with summer work. W9BVF visited W9DHQ in Wishek and found that we may have a new ORS amongst us soon.

Traffic: W9BVF 17, W9DGS 3.

SOUTH DAKOTA — SCM, D. M. Pasek, W9DGR — W9DB is on 3.5 mc. with a xtal and is trying to get a fone going on 14 mc. W9CTR went to the convention at Ames and while there passed the exam for Broadcast operator's license. W9CKT, Madison, got daily news direct from the National Guard Camp at Rapid City. W9DGR went to Duluth and took a broadcast operator's exam. A ripping good time was had with the operators of WRL of Duluth and KSTP of St. Paul. This is my last report, gang. I want

to thank those of you who reported regularly. Howard Cashman, W9DNS, Sioux Falls, is our new SCM. Give him lots of support and help him put the South Dakota Section on the map.

#### DELTA DIVISION

**ARKANSAS** — SCM, Henry E. Velte, W5ABI — With the arrival of the hot season it seems that most of the hams in this state have deserted their radio shacks for outdoor sports, which reminds us that W5IQ has seriously taken up miniature golf, while W5ABI is getting in as much fishing as possible. W5AGB and W5ADB are two new stations in Little Rock. Welcome, Oms. W5AY is the proud father of a new baby boy. Congratulations! W5BLG has been rebuilding. W5BMI has a new generator and has increased power. W5ABI is getting out well with a DC note. W5LY, our Route Manager, is rebuilding to a xtal controlled rig. W5BKT is on the 7-mc. band and looking for traffic. W5ACM is the proud owner of a new second class ticket and is operator at KFPW at Siloam Springs, Ark.

Traffic: W5ABI 27.

**TENNESSEE** — SCM, James B. Witt, W4SP — Here with traffic report for the month of June. W4KH handled traffic from OMITR and VK. W4VK has installed xtal. W4HK is moving his rig to roof of ten-story building and should have a good starting point for that. W4DG is collecting parts for MOPA. W4FX is watching W4DG to see how it's done. Knoxville will graduate three new hams this month. Come on, fellows, let's keep the amps flowing this summer on 14 and 28 mc. and let the SCM know what you are doing. W4SP is on a two weeks' auto trip through Canada and the East. W4GW is a new station.

Traffic: W4KH 17, W4VK 10, W4CW 6, W4FX 26, W4GW 36, W4AFS 19, W4RO 6, W4CW 6.

**LOUISIANA** — SCM, F. M. Watts, Jr., W5WF — Summer is here and with it comes reports of less traffic and dx. W5BJA leads in traffic this month. W5ANA is installing a xtal control outfit. W5YW reports that most of the ops have gone home for the summer. W5AKW is home from L. S. U. now. W5RR (the old man) is on 7 mc. and is getting out fb with his 50 watter. Hl. W5BHH will be at W5YW for the summer. W5BKL is pounding out on 7 mc. continuously. W5BHV is now in the Army-Amateur net. W5WF will be back on in few days from a new location. W5EB worked Canadian General Manager Reid, VE2BE, for the first contact on the Directors net for his station. The Shreveport gang is going to throw a big hamfest the latter part of the summer. All A.R.R.L. members in Louisiana, East Texas, Southern Arkansas and Western Mississippi are cordially invited to attend. Also, any others who desire to come please write. More particulars later.

Traffic: W5BJA 47, W5ANA 27, W5WF 17, W5YW 8, W5BKL 6, W5EB 20.

#### HUDSON DIVISION

**EASTERN NEW YORK** — SCM, H. Rosenthal, W2QU — With the coming of summer, the reports have fallen off and those reporting show a marked decrease in the amount of traffic handled. ORS are expected to report each month, even if no traffic is handled, so if you are away on vacation when the 15th rolls around send in a picture post card instead of the regular one. W2QN makes the BPL with all foreign messages. W2LU is practising on the new Vibroplex presented to him by the local power company in appreciation of the help he gave them during the December ice storm. W2BKN says every time he hooks a foreign station, it turns out to be one of the U. S. Marines on foreign duty. W2BAI is downhearted. He heard AC5SL CQing and missed him. W2AYK spent his time on active duty with the Naval Reserve copying the Graf *Zepplin*. W2ACB isn't sure whether it's good or bad luck to send in a report with thirteen messages for the total. W2ACY reports copying the Graf every night on its trip to Lakehurst. W2ANZ reports exams interferred with traffic this month. W2BJA reports the air dead during daylight hours since spring started. W2QU handled traffic for the Yancey plane on its South American good will flight.

Traffic: W2QU 328, W2QN 141, W2LU 95, W2BAI 17,

W2ACB 13, W2BKN 3, W2AYK 3, W2ANZ 3, W2ACY 2, W2BJA 1.

**NEW YORK CITY AND LONG ISLAND** — Acting SCM, V. T. Kenney, W2BGO — Manhattan: W2AFO leads his hobo with a total of 21. W2BDJ, a new 00, tells us there are still plenty of off-frequency stations. W2BNI can also be recognized as Portable W2ZZH, which will be operated along the Atlantic Coast. Bronx: After getting lots of traffic from RX1AA, W2AII had to quit the sked on account of QRN. Plenty of skeds gave W2BPQ a good total. W2AET tells us of W8BDV stopping at his shack and seeing the sights in N. Y. C. W2AQQ complains of other activities keeping him away from the set. W2VG QSOd XWTM and received a report from a New Zealander. W2APV still skeds NJ2PA and HH7C. Brooklyn: Now that exams are over W2BIV promises better traffic totals. W2ATZ is working lots of VK and K6 stations. W2ARQ is keeping 6 skeds a week. W2PF is off the air for a month while he attends Ft. Monmouth military training. W2APK has a third op pinch-hitting for him while he is on a vacation. W2BEV has forsaken 3.5 mc. until the QRN lets up. W2BO is closed down for the summer. Long Island: As usual W2AVP, RM for L. I., leads that part of our section and nominates W2AST for the office of ORS. W2AST is a new station in Long Beach. W2BFC tells that his 2nd op is having trouble getting his set perking. W2AYM, the Boy Scout station, is to change QRA. W2AIQ—W2AFP, our latest addition to the 00 list, is checking 'em on both 7 and 3.5 mc. W2BNX tells us that his portable outfit, W2AFU, will be at the Mineola State Fair for about a week starting Sept. 17th; several reliable skeds are wanted with New England, Phila., Chicago, etc., for U. S. traffic. W2AIQ is checking as a new 00.

Traffic: Manhattan — W2AFO 21, W2BDJ 13, W2BNI 4, Bronx — W2AII 75, W2BPQ 63, W2BGO 24, W2AET 9, W2AQQ 7, Brooklyn — W2BIV 85, W2ATZ 70, W2ARQ 47, W2PF 37, W2APK 16, W2BEV 5, Long Island — W2AVP 18, W2AST 14, W2BFC 2.

**NORTHERN NEW JERSEY** — SCM, A. G. Wester, W2WR — It is necessary to remind traffic reporters that reports are due here on the 17th on each month as some still are under the impression that the traffic month ends on the 25th. Please mail reports early. W2JF has been selected as Route Manager and your SCM is sure that he can arrange skeds for any of the gang. Please give him your fullest cooperation. W2AOS has enlisted in the U.S.N.R. W2API reports. W2CWK reports that the Raritan Valley Radio Club had a very successful banquet on June 14. W2JC has a new rectifying system under way using 866's. W2AGX is playing with 3500 kc. W2BPY won prizes at both the Hudson Division and the Raritan Valley banquets. W2BDF is still busy with BC station duties. W2CJX only operates on week ends. W2BY took a 10-day trip to Canada with another YL. Following are notes on the activities of the Bloomfield Radio Club. The following members are all on the air and with xtal control: W2BCC, W2FL, W2AFB, W2VQ, W2BVB, W2BA, W2MB, W2FP, W2GG and W2JC. W2BUH steps out with W8AOI at his home at Set Run, Pa. Ten members attended the Raritan Valley banquet. Colonial Airways at Newark Airport has the following amateurs on the pay roll under the supervision of F. W. Webster, RE., W2CO, W2VQ, and W2GG, who all are operators on the tri-motored Fords using calls W10XS and W10XAD. W2ZZA worked all continents except Asia last month on 14 mc. W2CFQ sends in his first report. W2BJZ is another first reporter. W2AFJ using 210s in push-pull is stepping to all points of the globe.

Traffic: W2JF 66, W2AOS 14, W2CWK 11, W2JC 1, W2AGX 3, W2BPY 11, W2BDF 6, W2CJX 10, W2ZZA 7, W2CFQ 12.

#### MIDWEST DIVISION

**NEBRASKA** — SCM, C. B. Diehl, W9BYG — W9ANZ is again laid up in the hospital. W9DFR had to take down antenna on account of roof repairs. W9EEW is very busy at this time. W9EBF is rebuilding KMMJ. W9FAM is still rebuilding with heavy fall and winter t/c in mind. W9EHW is experimenting with antennas. W9BHN is on vacation. W9DI built a new receiver. W9BOQ is very busy with farm work. W9RLW is on 7000 kcs. again. W9CPJ sends first report as ORS and works mostly on 1850

kes. right now. W9BEX sends first report and it is a "peach," too. W7CGW has sked with W7HX.

Traffic: W9DTH 1, W9DFR 6, W9EHW 1, W9BHN 4, W9BLW 3, W9CPJ 4, W9BEX 12, W9CGE 3.

IOWA — SCM, H. W. Kerr, W9DZW — W9CKQ keeps sked with VK5HG and has 393 QSOs to date; by special permission of the Radio Inspector in VK they are handling traffic between the Dept. of Research in Terrestrial Magnetism, Washington, D. C., and the Magnetic Observatory, Watheroo, West Australia. W9WJ is out for an ORS. W9FFD reports qso with WFBT. W9EJQ finds carpenter work fb. W9FUD is with us in spite of qrn. W9FZO got his qsl from a K6 and plans to rebuild. W9ACL adds his bit to Davenport's reputation. W9GKL finished hi-school, visited the Iowa City gang and got a bit of tfe on 3500 kc. W9DPL sez since getting the 8 mfd condrs at the Ames convention he gets PDC reports. W9CKD is schooling at Valparaiso for a conml ticket. The Tri-State Club have a "treasure hunt" the 22nd, prizes given for locating W9TA, the club's portable. The Co. Bluffs gang are interested in the "Radio Guild" a new club of Bluffs and Omaha hams and service men. W9GDG is appointed OBS. W9DDX is on the air with a 201a and 150 v B batts.

Traffic: W9CKQ 43, W9WJ 40, W9DZW 37, W9FFD 23, W9EJQ 22, W9FUD 18, W9FZO 13, W9ACL 8, W9GKL 3, W9DPL 2.

MISSOURI — SCM, L. B. Laizure, W9RR — W9DZN is still operating for the Miss.-Warrior Service, QRA SS Wynoka, home port Dubuque, Ia. W9PW led in traffic this time from St. Louis. W9FTA followed close with a majority of delivered messages. The balance of the activity came from W9GHG, W9AMR and W9DYJ. W9AMR reported twice to make sure of getting in, as did W9GAR, Kansas City: W9RR, W9CFL and Ensign Lowe, chief at WDAF, were on a cruise at Great Lakes with the U.S.N.R. and report a very pleasant trip. W9DQN lost his second op, as W9ECS went to Dodge City for the W. U. W9DQN handles a good many messages from Ft. Leavenworth to P. I. addresses. W9AKZ had to move but kept one sked going. W9DPA is on 14 mc. W9CFL is kept busy working U.S.N.R. skeds. W9DHN took a night off and went back to 3.5 mc. looking for old friends. W9GAR is still pounding brass through QRN. W9BJA says there is still some traffic moving. W9EYG sold his fone to W9FVM and is now using 3.5 mc. CW again. W9EPX just got back on the air. W9BGN reported QRX for filter to arrive. W9EMM is planning active organization of a U.S.N.R. unit in St. Joseph. W9DNO was too busy to operate much but still has hopes. The following will cruise with the U.S.N.R. on the Great Lakes or have already done so: W9CFL, W9RR, W9AJW, L. G. Riddle.

Traffic: W9DYJ 5, W9FTA 29, W9PW 33, W9GHG 6, W9AMR 4, W9DNO 2, W9BJA 33, W9GAR 9, W9DQN 25, W9AKZ 20, W9CFL 81.

KANSAS — SCM, J. H. Amis, W9CET — W9CET leads the section in traffic and has been on for the 28,000-ke. tests. Any one going on the fourth U.S.N.R. cruise please get in touch with W9BWW. W9BTG has left for the Gulf Radio school. A 3000-volt MG is the plan of W9DFY for fall. The YL, W9CGM, says she is ready for big business now. W9GHI has gone to the harvest fields. W9DEB has his xmitter at the U.S.N.R. Armory as a temporary unit station. W9FLG is working long hours so doesn't get to be on much. W9HL is forced to resign his ORS and we sure hate to lose him. W9EUX is out of town most of the time so is on little. W9BHR is working on a new idea in frequency meters. The KVRC report that plans for the Division Convention in Sept. at Topeka are progressing nicely.

Traffic: W9CET 43, W9BWW 28, W9BTG 6, W9FDY 3.

#### NEW ENGLAND DIVISION

CONNECTICUT — SCM, Fred A. Ella, Jr., W1CTI — W1AMQ makes the BPL with a rush. W1MK sends in their usual high total and continues to occupy space in the BPL. W1AFB has a daily schedule with VOQH and is experimenting on 28 mc. W1RP is taking a portable on a trip to Cleveland with W1AZP. W1HQ was visited by W9BYE. W1TD wants to know where the gang is on CTNITE. (So does the SCM.) W1AMG is active in the T.C.R.C. W1ADW has been playing with 28 mc. but doesn't hear anyone. He will use same call with his portable this

summer. W1BHM won the Third International Contest certificate for Conn. F.B. and congrats. W1UE is inactive but busy at Headquarters. W1AZG is having good luck with his low power set and will increase power soon. W1BBU sends in his first report and applies for ORS. W1BWW reported in person. W1CTI and W1VB attended a meeting of the T.C.R.C. at New Haven. W9KL and W1UE were on hand from Headquarters. The T.C.R.C. is to be complimented on their fine new clubhouse. They will have a station in operation with a lot of ops in the very near future. W1AJB asks to be placed on the inactive list for two months. He reports, W1AUT, a new station in Middletown. W1AGZ, (0) for this section, reports several off-frequency stations. Only twelve stations moving traffic this month. Let's see if we can do better than that and give Eastern Mass. a little competition!

Traffic: W1AMQ 233, W1MK 426, W1AFB 39, W1RP 10, W1HQ 12, W1TD 12, W1AMG 6, W1AZG 2, W1BBU 7, W1CTI 9, W1BWW 6, W1AJB 8.

EASTERN MASSACHUSETTS — SCM, Miles W. Weeks, W1WV — A number of the ORS forgot to report this month so our total has suffered in consequence. W1CMZ shows his usual consistency and is the only one to make the BPL this month. Most of the gang are either vacationing or rebuilding during this period of poor radio weather. W1ACH has been on 15 days' duty with the U.S.N.R. and reports visiting Portland hams during one of his cruises. W1LM is playing with 14,000 kc. but says spark plug QRM is bothersome. W1ASI is keeping several skeds on 3500 kc. A "B" eliminator is doing duty on W1ACA's receiver with good results. W1BOB reports by radio from Europe, where he is signing NAMS on 7000 kc. W1WU has built a new receiver. A newcomer is W1ABG who has been working some good DX besides a little traffic work on 3500 kc. W1ADK also submits his initial report. W1WV has acquired a fine cabinet in which to house one of his Xmtrs and has rebuilt accordingly. The new Norwood hams, W1CCP and W1CQN, are still experimenting with their transmitters but find time for some traffic. W1QZ has resigned his ORS due to what he calls an "incompatibility complex." W1KH reports being QSO with HAF3C. Due to a change of QRA for the summer he will not be on the air much until fall. W1LQ is active again on 3500 kc. Now is the time, gang, to be making your arrangements for good skeds, better traffic routes, and a good time to get the bugs out of your equipment.

Traffic: W1CMZ 275, W1WV 42, W1ACA 30, W1LM 28, W1LQ 23, W1ABG 16, W1ADK 5, W1CQN 4, W1CCP 3, W1WU 1.

MAINE — SCM, G. C. Brown, W1AQL — Word has just been received, from Chairman W. Haskell, of the Committee on Arrangements, that the Maine Convention has been approved by Headquarters and Director Fred Best. A fine list of speakers has been lined up and there will be a real "bang up" time for everybody August 22nd and 23rd. Make plans now to attend and help the Forest City gang put it over. W1BIG and his gang of hit-and-run ball players recently enjoyed a fine week-end at the Naval Station at Cape Elizabeth. The boys had a chance to inspect the station and visit one of the Eagle boats, which was in the harbor. The Queen City gang have organized a ball team and expect to take on the Augusta boys for a hot game sometime during the latter part of July. W1FQ recently enjoyed a two weeks' training trip at Fort Monmouth. N. J. W1CDX is on a two weeks' cruise at Cape Elizabeth. W1AHT is moving his station to Peaks Island, Portland, for the summer. W1KQ will be working for the W. U. in Northeast Harbor for the summer months. W1BEZ is getting out FB with his 'phone. W1GQ was a recent visitor to the Queen City. W1OG, formerly W1AIT, is on the air with a crystal now and has a fine signal. The many friends of Phil Gould, of W1ALZ, are very pleased that he is improving after an illness of several months. The station of the SCM is undergoing a rigid reconditioning prior to the fall rush of traffic. W1BFZ is high man this month. FB, Mel. W1QH comes in second and reports conditions still very poor. W1ARA, of Lynn, Mass., has been assigned the position of operator at station WABI, Bangor. Welcome, OM.

Traffic: W1BFZ 41, W1QH 9, W1AQL 2.

VERMONT — SCM, Clayton Paulette, W1IT — A



wonderful time was enjoyed by W1BD, W1CGX, W1BCK, W1BDX, W1TJ and W1T at our annual hamfest held at WITT's camp on Lake Memphremagog. I am going to extend the invitation to all Vermont hams who wish to come next year. Only one station this month, W1BD of Barre, turns in a report. He is joining the Army net, and also says he will have a low power outfit in Burlington this summer. W1FN in White River Jet, is now on 3500 and wishes to QSO any of the Vermont gang as soon as possible. We have a new amateur on the air in Hinesburg, Vt., now. Please extend a helping hand to him. His call is W1ATF.

Traffic: W1BD 20.

**WESTERN MASSACHUSETTS** — SCM, Dr. J. A. Tessmer, W1UM — W1BVR blew his fifty and is now back using his 3-yr.-old Meuller 30 watter. W1ADO is still building his long-awaited-for xtal fone. W1BEG is having a hard time trying to make his filament transformer keep cool on his 211 tube. W1BZJ reports that he will spend his vacation in Washington, D. C. W1UM finally put his 50-watt xtal outfit on the air and is getting out fine. Rumor has it that W1AM has a 250-watt xtal fone under construction and will soon join the ranks of the "Fone Boys" on 3500 kcs. W1ABY in Leominster is heard regularly on 3500-kcs. fone. Smitty, W1BMM is still upholding the Heart of the Commonwealth on 3500 fone and is experimenting with C.W. on 3900 kcs. W1CRX has come home from the Briny Deep and is now operating at WORC. W1BKF passed his Commercial and is shipping out as soon as his ship comes in. Worcester has two new hams, W1BDP and W1BAU. Both are pounding out fine on 3700 kcs. W1ASU is busy with Naval Reserve work. Any amateurs interested in either the Reserve or the Navy net are invited to communicate with him. W1AMZ is back from college and will be on during the summer. W1ZB has a brand new jr. opr. Here is WIN's uncensored report, "Dear SCM: Nothing much here this month, since I wrecked my car on Memorial Day and, same as ever, it was a YL driving that car, so it's no surprise, hi." W1ASY has a keen crystal outfit on 3700 kc. The Worcester Radio Association had their seasonal wind-up June 19th enjoying seven reels of movies wid east at their headquarters, no. 274 Main St. There will be no regular Thursday meeting until the first Thursday in September. With this report W1UM is signing off as SCM and thanks the gang for their cooperation. Leo Pelouquin W1JW-24 Arthur St., has been unanimously elected SCM to serve for the next term. Congratulations, OM, and best wishes.

Traffic: W1NS 94, W1ZB 4, W1BVR 40, W1BEG 10, W1BZJ 10, W1ASU 2, W1ZA 19, W1BEA 10, W1BSJ 10, W1ASY 6.

**NEW HAMPSHIRE** — SCM, V. Hodge, W1ATJ — As I was re-elected SCM, I wish to thank you for your support and ask for your cooperation in making this section one of the best during the coming two years. Congratulations are in order for W1APK who says he is engaged to a YL he met via radio. W1AUY manages to keep a couple of skeds during the hot WX. W1IP says ND there as the WX is too nice to stay indoors. Hi, W1BAC is reaching out with his 201-a on 3500 kc. W1BIS is DXing on 14 mc.

Traffic: W1APK 6, W1IP 4, W1BAC 4.

**RHODE ISLAND** — SCM, C. N. Kraus, W1BCR — W1MO built the push-pull job in June QST and has it going on 14 mc. W1BML is building the same set. W1CBS has a sked with WSBUI. W1AVH is building a new sky hook. W1BCR is on 14 mc, with an 852. Members of the Radio Club of R. I. are designing a new crystal control 500 watt CW and fone set which should be ready in the late summer or early fall. It is also planned to have television modulation on this transmitter. Hollis S. Baird, Chief Engineer of the Short Wave and Television Labs. of Boston, W1XAV-W1WX, addressed the club at an open meeting held at Brown University. Mr. Baird described his system of horizontal beam transmission using a steel tape held in a drum replacing the conventional scanning disc. He received pictures on one of his receivers from W1XAV and W3XK. W1CHP is back from Andover and expects to be active this summer. W1AWE is taking some of the Naval Reserve summer cruises and is having a fine time.

Traffic: W1MO 18.

#### NORTHWESTERN DIVISION

**MONTANA** — SCM, O. W. Viers, W7AAT — W7DD has a new receiver and transmitter and reports good results. W7FL is back at his old location in Butte. W7AAW turns in a nice total despite "spring has come!" W7AKO of Billings reports changing location to Butte soon. What has become of W7MI and his 50? W7JC will be in Billings for the summer. W7AEM has gone with the National Guard to the camp at Helena. W7AFY formerly of Bozeman is now in Billings. New hams will soon be on in Billings, Fromberg and Red Lodge. W7AAT will soon be on with a new 500 watt transmitter.

Traffic: W7AAT 125, W7AAW 60, W7DD 24, W7FL 4.

**WASHINGTON** — SCM, Eugene A. Piety, W7ACS — The plans for the convention seem to be keeping the Spokane gang off of the air. Let's see you all there this year. W7QF, the vice-president of the Spokane Club, is using a handbox super and it works fine. W7TK is installing a ham xmt at the Boy Scout camp for a few weeks. W7AFD can't see his xmt on account of a new Chev. six. W7AG is using fone set now. Alaskan skeds keep W7TX supplied with traffic. W7RT had the pleasure of visiting a Swedish op whom he had worked on the short waves. W7BB is back on the air again after touring around as radio op on a ship. W7AJS merely reports. W7VC reports for the first time. W7NR is too busy to be on the air much. W7AIT takes high place this month. W7ACS has been busy with school exams. The call of the sea has reached another: W7ACE shipped out for the Orient. W7KT uses 300 volts of batts. on a fifty watter and gets r6 fm K6. The Yakima gang have persuaded the Chamber of Commerce to furnish all their QSL cards. W7AAE divides his time between selling bonds and pounding brass. Don't forget the convention, fellows.

Traffic: W7AIT 51, W7TX 39, W7AAE 29, W7RT 24, W7AG 8, W7AJS 5, W7QF 5, W7NR 4, W7KT 4, W7TK 1, W7ACS 2, W7VC 18, W7BB 8.

**OREGON** — SCM, W. S. Claypool, W7UN — Cancellations are in order for all non-reporting ORS if their indifference continues. W7ALM handles a lot of worth while traffic with K7 stations. W7AHJ reports a nice total. W7AJX reports tic. W7AMF is hopeful for better conditions soon. W7WL is handling a lot of DX traffic and getting in some fishing too. W7ABH shipped out on the S. S. *San Gabriel* and doesn't think that he will be on the air for several years. W7QY reports keeping regular sked with SFEN, the S. S. *Indiano*, bound Brisbane. W7QY is a new ORS. W7AMQ changes his outfit so often he finds little time to operate. Ten members of the R.C.A.R.C. went on a week-end trip to a nearby lake and took along a complete transmitter but W7OM, the culprit, forgot to come and bring the receiver. Hi, W7UN just returned from a week-end cruise to Astoria with the U.S.N.R. W7WP is back in town after going to school, where he learned the crystal grinding trade. W7WV is struggling to get on the air with a real outfit. W7AP is on the air whenever QRN is not bad. W7AEU is planning to put an 851 stage on his 3.5 mc. fone. Hi. Let's hear from all the ORS next month!

Traffic: W7ALM 62, W7AHJ 32, W7AMF 27, W7WL 21, W7AMQ 10, W7AJX 10, W7QY 5, W7ABH 8, W7UN 23.

**IDAHO** — SCM, James L. Young, W7ACN — (Reported by Oscar E. Johnson, W7AKZ) W7ALW is busy on 7 mc. with an 852. W7AJQ finds some traffic on 14 mc. W7AHG is on now and then with a 210. W7AFN and W7AR are busy with "talkies." Work with power lines keeps W7QC off also. W7AKZ is trying to get on 28 mc. W7UM is moving to Kent, Wash. W7QB has sailed for Alaska as a commercial op. W7AF is on 7 mc. W7BY is too busy to be on. W7CG reports qrn but finds 14 mc. good. W7ACP, W7ALY, W7ALH and W7ANA, all of Parma, are all on and making lots of QSOs. W7AFE has quit ham radio. W7ACP has trouble keeping one of his transmitters oscillating. W7AFT reports QRN trouble, but manages to keep one sked twice a week. W7ZZF, portable call of W7ALC, is touring the U. S. A.

Traffic: W7ALW 20, W7AFT 11, W7AKZ 2, W7AJQ 6.



## PACIFIC DIVISION

**SANTA CLARA VALLEY**—SCM, F. J. Quement, W6NX—Congratulations are in order this month for W6BAX who ran up the highest score in the International Tests. The SCM is mighty proud of this achievement, bringing as it does such favorable publicity to the Pacific Division. W6YG closed up for the summer on June 15th with a nice traffic total putting them in the BPL. W6DQH, the R.M., is working with Army net and Boy Scout work—FB. W6ALW will have xtal 203A soon. W6BMW is still busy developing phone sets for Stage Fire Warden. W6EEC, a new arrival in this section, is working on 14,000 kes. W6AME moved again and between that and answering the lure of the trout streams, radio will be ND for the summer. W6QA is now on with a new CC job. W6NX's xtal set will soon be completed. W6HM is vacationing in British Columbia for the summer.

Traffic: W6YG 256, W6DQH 57, W6ALW 48, W6BMW 18, W6EEC 8, W6NX 6.

**EAST BAY**—SCM, J. Walter Frates, W6CZR—Conditions in traffic handling this month point to the fact that the entire section has moved to the country for the summer or that it is so concerned with present economic conditions that there is no time or thought for ham radio. W6BTZ was high man for the section during the past month, handing in a particularly high total before departing for Seattle to join the U. S. Geodetic Survey boat *Guido*. W6ALX, the next high man, has been holding an interesting schedule on 7 mc. with a party of East Bay Section Boy Scouts who are touring the National Parks of the West under the guidance of Ansel Hall of Berkeley. The Scouts have a Heintz and Kaufman portable transmitter which is putting a strong signal into the section. Their day by day story of the tour is being published by a San Francisco newspaper. W6AOY is a new candidate for an ORS. W6RFJ has been working a great deal on the plans for the "hidden transmitter" stunt of the Oakland Radio Club for the Fourth of July. W6RI of Berkeley sends in only one cryptic word to explain his low totals—"Vacation." W6BZU at Concord reports that the weather is too hot in his secluded valley for consistent traffic work. W6B1W is planning on building a sailboat for Lake Merritt and as soon as it is finished he will install a transmitter and receiver on it— if the boat doesn't sink. W6RMS says that his canoe is almost finished, and he may be back on the air soon if he is not too busy using it. W6ASJ has been doing his usual amount of work as an Official Observer, but reports the traffic as nil. W6CGM reports that he and W6DWT have been trying to get some DX with a fish line and sinker near Kedeo. W6RSB reports from New York that the Roumanian Arctic Expedition has been cancelled but that he is staying on in the east for a while. W6CZR and W6ARU have been too busy with the arrival of a new junior op—a YL this time—to think about putting the old coffee percolators back on the air. W6ARU plans to send out a QST of thanks soon for the flowers sent her in the hospital by the section members. W6AN has his transmitter on the air and plans to open his first schedule soon on 3500 kc. W6GQ has been keeping a sked with his son, W6CFD, who is on a camping trip with a party of Scouts in the mountains. W6AQ is working hard on plans for installing a traffic station at the Pacific Aeronautical Exposition at the Oakland Airport. The Northern California Pre-Convention Round Up and Hamfest was held by the section at KTAB and was a huge success. San Francisco, Modesto, San Jose, and Sacramento sent delegations. W6RJ acted as master of ceremonies and James Warner of KTAB fame was one of the principal speakers. W6ZD, Pacific Division Director, read the report of the decisions of the Board of Directors, and there was much entertainment by professional and ham talent. W6BAA officiated as usual with Oscar, the dummy.

Traffic: W6BTZ 489, W6ALX 169, W6AOY 25, W6RJ 21, W6B1 5, W6BZU 5.

**SAN DIEGO**—SCM, H. A. Ambler, W6EOP—W6ANV leads this month and makes the BPL. FB, O.M. W6EOP is very QRL with fone. The SCM visited W6FP in Oceanside and W6BGL in Escondido and had an FB time. W6CTP graduated from the Fullerton J. C. and says he will now have more time for tlc. W6AEP was also visited by the SCM. W6BGL is now on fone. W6EPF is troubled with

pwr leaks. W6EPZ says no more time for tlc and requests cancellation of his ORS. W6CTR is heard on fone now. W6BAM built the new a.c. receiver and says fb. W6BAS says to bring on those frequency meters and he will calibrate them for you. W6EOS is still building the xtal xmtr. The P. A. T. club had their semi-annual banquet and all had a fine time eating and dancing. Those present including the OWs and YLs were W6AJM, W6CTR, W6HY, W6DNS, W6BFB, W6EOP, W6FP, W6DAI and W6EOL.

Traffic: W6AXV 212, W6EOP 15, W6CTP 12, W6AEP 5, W6BGL 5, W6EPF 4, W6EPZ 3.

**ARIZONA**—SCM, R. Shortman, W6BWS—We welcome a new man to the gang in the person of Bob Lockhart, Jr., of W6EEB and W6ECW from Los Angeles. He comes to Arizona to take up duties as second operator at KGSI. W6DTU leads the state in traffic. W6ALU operated by W6CDU is second. W6BJF reports two new hams in Phoenix: W6COI and W6PK. W6EFC is on the air every night after 9 p.m. W6EAA reports moving to a new QRA one block from W6DCQ, and W6DIE one block in the other direction, and says "Sweet QRM" Hi! W6EOF has been having lotsa fun trying to learn Morse since KTAR became NBC. W6DRE reports a new 4-tube a.c. receiver that is the "berries." W6DJH is dismantling for a while, and plans on a 250-watt crystal using 3500 kc. fone. W6DGN reports that the Doc sent him to Los Angeles for the summer. W6BWS-W6VV is still giving the YLs a treat with his new Ford (Ahem) and says that, W6EEB-W6ECW, his new second operator at KGSI, is the proud possessor of his Ford's twin sister. W6ANO is still keeping silent about his activities in Flagstaff. W6DT wants sked East for the summer.

Traffic: W6DTU 282, W6ALU 268, W6BJF 67, W6EFC 54, W6AWD 18, W6EAA 1.

**LOS ANGELES**—SCM, B. E. Sandham, W6EQF—It is with sincere regret that we learn of the death of W6ZH. We will surely miss him and the section's sympathy goes to his mother. It seems fb to be back on this job again after a hard trip to Mexico City via automobile with an expedition and I.P.H. The following make the BPL—four of them making it both ways: W6QP, W6BZY, W6WA, W6DEP, W6AOA, W6AWY, W6EGH. W6QP heads the list with six skeds. The section's message total is 3309. W6AKD worked J4ZB on 28 mc. on June 8th. The Tri-County Club sponsored the quarterly banquet held June 7th at Pomona with over 100 in attendance. W6DEP tells us of a new ham coming on at Pomona with xtal. W6AWY has a good sked with Hawaii which puts him in BPL. W6EGH says 95 per cent of his large tlc total was handled with foreign countries. W6AKW missed the BPL for the first time in many months due to his Philippine contact closing down for three months. W6EAF renewed his code transmissions for beginners. W6ETJ, the new Chief Route Manager, is a live wire and can provide skeds for you. W6DAK is resuming sked with KAICE and states that W6DII is coming back on air after two years' absence; welcome, and don't forget your tlc report. O.M. W6DVA is rebuilding with xtal. W6TE is busy at college. W6EN took portable to Santa Cruz Island (YL) and handled 46 messages. W6AVJ is waiting for his 1-kw. water cooled tube to be repaired. W6ESA has rebuilt entirely. W6BGF is using low power fone. W6BTZ is also using fone. W6BJC sends in his first report and reports new club at Santa Monica. FB. W6OF sends in list of 1930 and prehistoric sigs. W6DZI complains about his plate block going up in smoke. W6AM has new QRA and is utilizing two 90-foot telephone poles. W6EJ is working nights in talkies at Hollywood hence low total for once. W6COT deserted 11 mc. for 7 mc. W6CIH was heard in Switzerland and worked 45th country. W6EEP is a member of the new Santa Monica Wireless Club. W6ACL will soon be on with xtal. W6LN is busy at KFOX but promises tlc total soon. W6ERL is rebuilding with 852. W6ID is having trouble wid new a.c. recvr. W6BVZ has weather-vane note and gets different QRI with each QSO. Two former Navy ops have put W6WV on the air on 3500 kc. W6BZY is in Chicago for a few months. W6AWP is going East with portable. Bakersfield news comes thru W6AOA this month: W6ETN is rebuilding. W6ENQ is still working on new shack. W6DQV is working good DX. W6ABI is trying push-pull with xtal. W6ENH is being married. Best of luck and hope she becomes a YL opr.

W6WA is still high man there with PI tlc and consistent skeds. W6AOA is building new power supply for PDC note. W6AOB is working for comm. ticket. Practically all of the Bakersfield Club belong to the Naval Reserve and will be operating at Naval shore stations and ships very soon. The A.R.R.C. membership and attendance is growing. Code class is in session before meeting and lectures are in progress for those working for comm. ticket. The Long Beach Club continues strong and is promoting a trip to Santa Cruz Island. The Pasadena Club were guests of the telephone company and shown through the plant.

Traffic: W6QP 637, W6BZY 416, W6WA 300, W6DEP 269, W6AOA 257, W6AWY 241, W6EGH 199, W6AKW 130, W6DQV 103, W6EAF 69, W6ETJ 68, W6DVA 51, W6DAK 55, W6DLI 55, W6TE 47, W6EN 46, W6AVJ 46, W6AWP 34, W6ESA 32, W6BGF 31, W6AOB 31, W6ENH 25, W6EQF 19, W6BUZ 15, W6EAU 14, W6CXW 14, W6AGR 13, W6BJC 11, W6GF 11, W6DZI 10, W6CZT 10, W6ENQ 10, W6AM 9, W6FJ 8, W6COT 6, W6CUH 5, W6AZL 4, W6FEP 3, W6AKD 5.

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6CDZ leads in traffic this month. W6UO is still active with Army-Amateur skeds. W6CRF is all hot for 3500-ke. phone. The Nevada Amateur Radio Assn. is going strong. All active amateurs please drop your SCM a line and let the rest of the world know Nevada is on the map.

Traffic: W6CDZ 55, W6UO 11, W6EAD 4.

HAWAII — SCM, L. A. Walworth, K6CJB — The following appointments were made in getting new machinery in operation: Official Broadcasting Station, Route Mgr., Official Observer, K6EWB; ORS appointments, K6CIB, K6ALM, K6ERH; Official Observers, K6ERO, K6DYC, K6DUD, K6DQJ and K6CIB. Sgt. J. C. Bailey of 'EWB edited *Ham-Aloha* for June and the boys say he is "past master of printers." The A.R.R.C. of Los Angeles is the first exchange list for our paper. K6DUD is a very active new station and will keep some older stations working to keep ahead. The Lahainaluna Ham Club is publishing an Amateur Call Book of Hawaii. K6SH gladdened the heart of your SCM by donating a nearly complete file of QST's beginning with 1922. These are being bound for permanent files to go with the office of SCM. K6DV boasts six new hams. Interest is increasing in 3500-ke. fone and 28-mc. CW. The congestion of the dx bands is forcing us to turn to 3500 ke. for inter-island work. ZL3AI says he likes *Ham-Aloha*. K6CFQ, former SCM, sent special radio from Aberdeen, Wash., to send him *Ham-Aloha* regular as it's good reading while at sea. K6AVL and K6BXW are leaving for Calif. All unlisted Hawaiian stations will receive all QSL cards addressed to K6CIB, whose call is correct in the Amateur Radio Call Book. Your SCM heard a big buzzing lately during a CQ and wondered what had gone west this time. It was only a swarm of bees, so he took 'em in reporting three stings. Fifteen stations reported with message total of 2097. When we find our stride, that Ka gang and W6 bunch will look like 30-cent roast dog.

Traffic: K6EWB 1036, K6DUD 305, K6BXW 291, K6DQJ 124, K6DV 118, K6EVW\*73, K6AVL 68, K6BOE 27, K6CIB 26, K6ACW 8, K6BJJ 8, K6ERH 5, K6ALM 4, K6ACR 3, K6ERO 1.

#### ROANOKE DIVISION

**WEST VIRGINIA** — SCM, Don B. Morris, W8JM — The following hams lose their ORS tickets because of failure to obey the rules of an ORS: W8SP, W8CJQ, W8DCM and W8ACZ. W8CBV and W8BWK, both of Wheeling, are new ORS stations. W8DPO was winner in Third International Contest for this section. W8HD is going to Europe in July for his vacation. W8CDV's 203-A went "West" after five years of service. W8ACL, Ex8BR, passed commercial and is going to sea. W8JM had pleasure of meeting W8HD, W8BUV, W8ATE, W8TI, and old 8WR during the last month. C'mon, Gang, shoot those reports in on the 16th please.

Traffic: W8HD 39, W8DPO 20, W8JM 15, W8CLQ 11, W8CDV 9, W8CBV 5, W8BCN 3, W8AYI 1, W8BTV (May.) 8.

**NORTH CAROLINA** — Acting SCM, John F. Bivins, W4AEW — The section will regret to learn of the resignation of Hal S. Justice, W4TS, as SCM of this state. We hate

to lose Hal and hope that he will still continue to lend us his moral if not material help. Yours truly will pinch hit until a new SCM is elected. W4ZB was visited by lightning with disastrous effects to his 210 tube. W4AEW is still sweating over the xtal. W4JR is getting a lot of kick out of the AA net. W4AA reports a lot of activity in Greensboro with several new stations on the air. W4DW has recently been appointed NCS for N. C. W4TN is home for the holidays and checks in for active duty. W4AHH had a lot of tuff luck with his antenna and receiver lately and seems about "regusted" with the works. We are glad to welcome W4ABV back on the air after an absence of a few months. It seems that the gang is going commercial as the following have recently acquired commercial licenses: W4AIW, W4AJL, and W4ABV. W4OC is now the proud owner of an Amateur Extra First ticket. W4AAU sez make way for his new xtal set.

Traffic: W4ZB 83, W4AEW 66, W4AHH 10, W4JR 9, W4TN 4, W4ABV 2, W4TS 2.

**VIRGINIA** — Acting SCM, Ted P. Mathewson, W3FJ — Director Gravely of W3BZ visited the Richmond gang. W3CA is still working hard on his transmitter. We extend our sympathies to W3ZA on the loss of his brother. W3CKJ is taking his ham outfit with him to N. Y. C. where he is taking a new job. W3KG and W3BGS are together now using a UV202. Come on back in W3WO, the QRM's the best ever. W3BDZ has completed a new receiver. W3AHW keeps a tri-weekly sked in Morrison, Va. Hi. W3MT is working in Quincy, Mass. W3IQ promises us great things from the Mrs. pantry. W3AJA sends in a newsy report for the gang down his way. W3APT has a fine traffic report. McDonald of W3ARU is now in Pa. behind W8CUD. W3HY is working at NKF and helping Hunton keep W3AG on air. W3HO is with the Gen. Motors Radio in Dayton, O. W3TJ visited W3BZ and had a nice gabfest with Gravely. W3ASA is putting 200 vlt. on two 50s and it perks fine. W3AEV is pursuing an MA degree at Duke Univ. W3FE met some of the Toronto gang on his visit up there. W3ALL and W3BCI are new hams in Richmond. W3AAJ, W3NO and W3FJ urge you to route your traffic via Richmond. W3AAJ will soon be on with a 250 watter. Oh! Oh! The SCM appreciates the way you fellows come across this month. Let's all plan to attend the State Convention in Richmond in September.

Traffic: W3AAJ 56, W3APT 60, W3ARU 12, W3HY 12, W3AQJ 12, W3AG 18, W3ALS 13, W3AMB 9, W3ASA 8, W3ZU 3, W3AEW 2, W3NO 6, W3AJA 2, W3ABC 5, E3FJ 54.

#### ROCKY MOUNTAIN DIVISION

**UTAH-WYOMING** — Acting SCM, C. R. Miller, W6DPJ — Very few stations report traffic this month, only two ORS reporting. There are several active non-ORS in the section who do not report. Let me hear from you, fellows. The section needs your support. W7AAH has been working 12 to 13 hours a day, but reports a good total. W6DPJ is operating as W6ZZZ for the summer. W6DPO, whose ORS was cancelled by request, continues to report. W6EKF is using fone on 3500 ke. W6DWH of Stockton reports his crystal control working fine. W6BTX is studying in California this summer.

Traffic: W6DPJ-ZZZ 111, W7AAH 27, W6DPO 23, W6EKF 3.

**COLORADO** — SCM, C. R. Stedman, W9CAA — W9CAA is moving again. W9CDE is busy examining firemen for promotion on the railroad. W9CJL says his ticket expired, so he hasn't been on the air. W9CSR is busy decorating the house and car. W9EDM is at the National Guard Camp now and will be going full blast soon at the Boy Scout Camp with a portable. W9EFP is busy with farm work. W9EAM says fishing is fine. W9CAB is on the air now.

Traffic: W9CJL 1, W9EFP 1.

#### SOUTHEASTERN DIVISION

**ALABAMA** — Acting SCM, Carroll Kilpatrick, W4AHR — W4AHP, our SCM is at the C.M.T.C. in Anniston. W4AG is afflicted by hot weather. W4AKM has been off the air lately. W4AAH is building an MOPA. W4LM is putting out a strong signal on 7009 kc. with xtal control. We welcome W4JY back after an absence of seven months. W4TI is still very active in the AA net. W4DS is

punching the ether with his 201A. W4DH is building a new xtal set. W4IA is back in Selma for the summer. W4AP is troubled by local QRM. W4AJR has just been made Alternate C.S. for the 1st Alabama area of the AA system. W4AKB is rather inactive due to interference from the YL's. W4AAQ is contemplating buying a xtal. W4AHR is working at the local swimming pool. W4ZI reports the organization of the Troy Radio Club. W4LT is on 14 mc. most of the time now. W4AIZ is on in Dothan.

Traffic: W4TI 25, W4LM 22, W4AHR 12, W4AHP 3, W4AAQ 33.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES — SCM, M. S. Alexander, W4RZ — Hot weather and vacations have taken their toll of the traffic and other work in this section. W4AJH says he can't hear any hams in Atlanta. W4SS has requested an ORS appointment. J. W. Hickman reports that due to the death of his brother in a distant state he has not been on the air for some time. We take this opportunity to extend our sympathy to W4JJ. C8SUF down in Cuba reports that he has received his W.A.C. Certificate and also reports that he made the highest score for Cuba in the February International Contest. Great work, OM. W4GT is a newcomer in Augusta, Ga., and we welcome him. W4AFQ has been busy preparing Augusta's broadcast station for its opening. W4ABS of Ft. Jennings, Ga., says that the station there will be on the air the year around and he expects to use all frequency bands possible.

Traffic: W4AJH 15, C8SUF 1, W4SS 21, W4JD 31, W4AAY 22, W4PM 37, W4KV 81, W4ABS 42.

PORTO RICO-VIRGIN ISLANDS — SCM, E. W. Mayer, K4KD — K4ACF handled a few as well as worked DX. K4AKV reports good DX but no traffic. K4KD wins another contest and you fellows let him get away with it without turning a hand. K4AAN is the lone delinquent ORS this month. Once more and you're out, OM. You fellows can probably figure out why this report is so short. It's up to you to turn in the news, otherwise we have no report.

Traffic: K4ACF 6.

FLORIDA — SCM, Harvey Chafin, W4IH, W4PAW — For the second consecutive year the Jacksonville Naval Communication Reserve Unit has been awarded the Lee cup trophy for maintaining the highest degree of efficiency during the year in the Florida area. The first report this month was from W4AGB in Jax, a YL operator. Congrats, Miss Hardin. Florida welcomes all new amateurs. W4IH is operating the Naval Reserve station at Tampa. W4ACM handled a few msgs. this month. W4JO in Miami is keeping the Naval Reserve schedule from Section Three. W4BG has been doing some fine "DX" this month. W4JH has a new 75-watt xtal transmitter on 7 mc, W4SK was in Tampa this month. W4MM says he is putting 520 watts on his 50 watter. W4GV is keeping his Army-Amateur sked every Monday night. W4WW and his brother have gone to Detroit, where they will stay until next fall. W4ALH says the weather is giving too much QRN lately. W4AFT sends in his second report with a good total. W4AKW is going to school seven hours a day and does not get much time for radio. W4QI has a new portable call. W4ZZA. W4OZ says the Naval Reserve station is enlarging its membership every month. Last month's QST has the call W4AFL. It should have been W4ALF. W4TG says he is thinking of installing xtal. W4QN has rebuilt his Schnell receiver like W4AI's. W4ADP is still thinking of building that push-pull transmitter. W4OK reports for W4ABK and W4APN. They all promise a larger report next month. The following ORS appointments will be cancelled if your report does not come in this month: W4IE, W4CK, W4CH, W4SD and W4DD. W4QV is on the air with his fone set again. W4AGR is changing his 14,000-ke. fone to 3500 ke. Send in a report, fellows, so we can tell the gang what is going on within our section. My QRA can be found on page 5 of this QST.

Traffic: W4ACM 123, W4QV 93, W4JO 78, W4AGR 75, W4ALH 66, W4TG 31, W4BG 57, W4QL 51, W4GV 38, W4SK 32, W4AGB 29, W4AFT 28, W4ADP 28, W4OK 25, W4WW 22, W4QN 14, W4OZ 14, W4AI 13, W4ABK 12, W4APN 12, W4AKW 8, W4MM 8.

## WEST GULF DIVISION

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5HY leads this month. W5BIP, a new ORS, turns in a good total. W5WW has a new receiver. W5BBF reports a new station. W5BLN, in Nacogdoches. Welcome. OB, W5ASP, another new ORS, has a fine total and is relief op at KGKO. W5BAM has been on vacation as dropped in on W5JC and W5UX in the rounds. W5BG has a new S.G. receiver. W5ARV, another new ham, shows wp. W5BGW has a d.c. note now. W5AAE is still pounding out a few. W5JV is also putting in xtal. W5BLU, also a new one, is doing fine. W5CF blew a grid leak and a 210 but handled some. W5LY reports a new station. W5ALA, in Dallas. W5BAD is working for W.U. at Dallas and will be on with portable W5AJS. W5GZ graduated from school. W5BND has rebuilt. W5AZP can't get on the air it seems. W5RJ has finally got the big xtal job going. We need a Route Manager who can handle the job, also another efficient Official Observer. If you can handle either of the above, let me hear from you at once. The Fourth West Gulf Division Convention will be held in Houston. Plan to attend.

Traffic: W5HY 56, W5WW 38, W5BIP 39, W5BBF 25, W5BAM 16, W5BG 15, W5BAD 12, W5ARV 15, W5BGW 14, W5AAE 8, W5JV 6, W5GZ 6, W5BLU 5, W5CF 4, W5LY 3, W5ASP 24, W5RJ 4.

SOUTHERN TEXAS — SCM, Robert F. Franklin, W5OX — I am sorry to report that the A. & M. College station, W5AQY, will be off the air until school starts again in September. Bill Evans, W5EO, was elected Club Pres. of A. & M. for the next term. Congrats, OM. W5BKW is pretty busy as Secretary of Houston's new radio club. W5EI has just been appointed Route Manager for this section succeeding W5TD. Get in touch with him for skeds. W5UX has two transmitters, one on 14,000 kc. and one on 7000 kc. W5AB reports activity slow out his way. W5ZG reports for Galveston as follows: W5AOC is doing BC work but expects to be on with a new transmitter soon. W5BBI, has a pair of 112's in a push pull rig. W5AFF is using his portable until he can get his xtal controlled 800 going. W5ZG reports his new Zepp working fb. W5MS is to be congratulated in that he has just received notice that he won the Third International Contest Certificate for this section. FB, Om. The Corpus YL, W5BKG, has been showing the OMs how to work real dx, having wkd Portugal and Aust. this month. W5ALV is a brand new "Ham" in Corpus. W5ZX is YL-struck hi! W5AHZ is having trouble making his a.c. receiver work. BC work has been keeping W5MX busy. W5TO is op at a BC station in Corpus. W5ATY, another new reporting "Ham" in Corpus Christi, is using a UX250 with 450 volts from a "B" eliminator in the old stand-by TGTP. W2ALD, who is working for Shell Oil Co., out of Houston, has a new portable call, W5AOCJ. The Houston Radio Club is in full swing again with a very good attendance. The officers for the coming year are Robert E. Franklin, W5OX, Pres., Jim Hunt, W5TG, V.-Pres., Leo Havard, W5BKW, Sec. and Treas. We want everybody to come to the fourth West Gulf Convention to be held in Houston. There are a lot of nice things planned. Make your plans now. Send in your reservations to W5OX or W5BKW.

Traffic: W5AQY 91, W5BKW 43, W5EI 30, W5UX 27, W5AB 22, W5ZG 19, W5AQK 12, W5TD 11, W5AFF 7, W5MS 2, W5ATY 2.

NEW MEXICO — SCM, Leavenworth Wheeler, Jr., W5AHI — A number of stations have shut down for the summer months. W5AJL is building a new crystal control outfit. W5TV is on a three months' vacation. W5JZ is a new station on a ranch eighty miles out of Roswell. W5AHI will remain inactive for several more weeks.

Traffic: W5AJL 42, W5AHI 1.

OKLAHOMA — SCM, Wm. J. Gentry, W5GF — W5AUV is getting an honorable discharge as ORS from the SCM. W5CB is too hot to do much the handling. Hi. W5MM is sure going good on 14,000-ke. fone. W5QI is still the ham commercial in Okla. with that power. Hi. W5SW seems to be overworked in the elec. business. W5OJ has our friend Hart Farwell from KFR6 visiting him. W5ASQ, our RM for Northern Oklahoma, is perking right along now. W5VQ reports working WFAT about 1000 miles west of

Panama. W5AAV reports graduating from OU. Fellows. I want to remind you of a FB West Gulf Convention coming soon at Houston, Texas, Sept. 4th, 5th, 6th. Sure want to see you there. W5GF is building a 14,000-ke. set now and is going gud on 7000 kc. wid a 210. Glad to hear from a new Ham, W5AVG, of Okla. City. Let's have more reports, gang.  
Traffic: W5AUV 48, W5VQ 29, W5GF 16, W5OJ 11, W5ASQ 8, W5CB 4.

### CANADA

Only a very few reports have been received on the number of messages handled during the Prince of Wales Birthday Greeting Relay. The Quebec boys made a fine record for their division and their SCM should be proud of them. G5ML was on the receiving end and copied twelve messages from Montreal. I would be very pleased if all those who took part in this relay would report direct to me, so a complete check could be made and a letter of thanks forwarded to the RSGB for the part they played in the Relay.

Reports from all Canada are greatly reduced this month. Old man static must be getting in his work, as he is reported the chief offender. Come down on 14 mc., boys, and try Wednesday nights for Canadian contacts.

Your CGM would be glad, if you intend visiting Montreal during your vacation, to have you call on him. Telephone Harbour 5151 and visits to local stations will be arranged.

#### CANADIAN GENERAL MANAGER

ALEX REID, VE2BE

### QUEBEC DIVISION

**Q**UEBEC — SCM, Alphy Blais. VE2AC — Through the efforts of our CGM we are welcomed to do 'phone work on 14,100-14,300 kes. under certain restrictions. VE2BE is working DX and handling traffic in spite of all the CGM work. VE2AC is back from his honeymoon. VE2CA has a 28 mc. sked with VE2AU. Congrats to VE2AP who got his B.Sc. degree. Mrs. VE2CA pounds away as ever. Our old faithful VE2BB is handling traffic and has a fine d.c. note. VE2BE got in a new tank condenser. VE2BH is using xtal on 7244 kes. VE2BG is going to put up new fuy-wires if the fellows will give him a hand. VE2BB had a visit from W2BY, a YL operator. Hi! Hi! Two new men join us this month: Crooker, VE2EM and Bonnett, VE2EY in St. John, former VE4EV. Welcome Boys. Pleasant vacations to all.

Traffic: VE2BE 28, VE2AP 8, VE2BG 7, VE2CA 5, VE2BB 12, VE2AC 23, VE2EM 5, VE2EY 2.

### ONTARIO DIVISION

**O**NTARIO — SCM, E. C. Thompson. VE3FC — VE9AL is still maintaining his two regular schedules, and holds his lead in traffic totals. VE3GK is active on 3500 kc. VE3GT says that ZL and VK come through FB in early mornings. VE3AD is hitting the trail with a 7000 kc. portable to Cedar Wild Hotel in Miskoka. VE3XC used 14,000 and 3500 kc. during the month. VE3DW is still plugging away at Beamsville with fine results. VE3FC is experimenting with AC tubes on high frequencies. Northern Dist: G. V. Lawrence, VE3ET. Acting SCM — VE3HU shot the 50 but will soon be back on with an 832 and a pure DC plate supply. VE3BG lost one of his 50 watters. VE3HD continues to bat 'em out. VE3ET met VE3AX and is looking forward to a visit from him and VE3RG. VE3BH will soon have some B Batts. for his 210. VE3DM's new TNT is perking FB with a 201A. VE3AR has a terrible noise in his receiver. What happened to VE3AG, VE3BD, VE3CO, VE3CR, VE3GC, VE3GD, VE3GG, and VE3KB.

Traffic: VE9AL 17, VE3GT 13, VE3GK 10, VE3XC 5, VE3DW 2, Northern Dist: VE3HU 6.

### PRAIRIE DIVISION

**M**ANITOBA — SCM, A. V. Chase, VE4HR — VE4FX, whose QRA is Fort Churchill, Man., was in Winnipeg recently. VE4DK has gone to Camp Borden for a further course in flying. VE4BU found it impossible to operate his set this month on account of bad QRM. A newcomer has started up in Winnipeg using the call VE4AG.

Traffic: VE4DJ 8, VE4HR 3.

**SASKATCHEWAN** — SCM, W. J. Pickering, VE4FC — The Regina gang are planning a convention to be held in Regina on August 1st. VE4BB managed to squeeze a few messages through. VE4IH reports. The rotten WX has put a crimp in the activities of VE4GR.

Traffic: VE4BB 5, VE4IH 1.

### VANALTA DIVISION

**A**LBERTA — Acting SCM, G. E. Panter, VE4AF — Fred Barron, our SCM, left the first of the month for Waterways and requests the gang to listen for him at 4HI-HJ. During his absence please send your reports to VE4AF, 25 Richardson Bldg., Edmonton. VE4FG is back with us again as 4BW with a TGTP outfit and promises big things. VE4DZ has a portable transceiver under construction which he will have with him on his holiday tour across the continent. VE4HM is experimenting with receivers. VE4EA reports a brace of cards from Zedders and a heard card from an Aussie. His brother is second opr. now. VE4AF has a combination 50-watt xtal and 250-watt TGTP. VE4GD and VE4BQ were visitors in Edmonton on the 24th of May. VE4BQ recently moved to Calgary, where he is setting up a 200-watt oscillator and 250-watt power amplifier rig. VE4GD has just completed rebuilding his xmitter and is now using a TGTP and VE4BQ says it's hard to beat for a beautiful job. FB. He writes to say that VE4CG and VE4DX are newcomers on the air, and VE4CJ and VE4CY are back with us again. Looks like Calgary might rival Edmonton again with active stations.

**BRITISH COLUMBIA** — SCM, J. K. Cavalsky, VE5AL — VE5AK has been off all month. VE5BM is back on sked with VE5GT. VE5DR has moved to Powell River. VE5BC is talking super hot and a high-power transmitter. VE5CR is on regularly now with a very nice signal. VE5CF is on more often. VE5FI is experimenting with push pull detectors and AC tubes. VE4EI and wife are visiting Vancouver with VE5AH. VE5AL has had several qo's with ZL and VK stations. VE5AC still finds time to handle the odd message. VE9AJ pulled off some snappy relay work recently. VE5BR wants a 3500-ke. sked with someone in Vancouver. VE5GT at Prince Rupert says he is the only active station there just now. VE5AW in the Yukon is still leading the DX hounds.

Traffic: VE5BR 1, VE5AC 7, VE5AL 21.

### MARITIME DIVISION

**N**EWFOUNDLAND — Acting SCM, E. V. Jerrett, VE0RZ — VOQH paid us a visit and has a very interesting layout on board. Good luck to Manley. VE0RAE will be operated all summer by a ham from Princetown while McNeil goes north. VE0SAN reports a brand-new transmitter with a pair of 852s. VE0SMC is doing some reporting for the RSGB and wants some reports from the gang. VE0RAW can be found most every evening on 14,000 kc. VOSWG will be kept going this summer by a volunteer ham from U.S.A. VOSZ spent an interesting hour on board the Morissey looking over VOQH.

### LATE AND ADDITIONAL REPORTS

KA1HR is keeping seven schedules.

Traffic: KA1HR 697.

# Calls Heard



**W5AYL, Ed Oldfield, 1415 N. Klein, Oklahoma City, Okla.**

vk2dy vk2jc vk2jt vk2hm vk2ns vk2dj vk2sg vk3bw vk3es vk3hl vk3pt vk3rg vk3zx vk4eg vk4tm vk5hg vk5it vk5ld zl1ft zl2ab zl2bz zl2gl zl3bb zl4aa k4kd k6avi k6hde k6dxw k6cb k6evw k6erh k6fwb kalcm kalhr ve4bm ve5ar ve5du em2wa x9b

**William Lockerby, Red Sea Patrol, c/o G. P. O., London, England**

au4aa au8am et1er ct1aa d4em d4gl d4nuw ear94 ear98 ear102 eulac eu9ac eu6nn fm8rt f8wrg f8edh f8aja f8gyn f8wba f8zb f8rg f8ror f8cs f8gd f8dt g2nz g2nm g5zn g8br g5tz f8olu g6fa g6wt ha9af hw8ay oh1dha oh6ng oz7jo sp3kx sp3or vs1ab w1arg w1adb w1awe w1dbs w1lg w2by w2ku w2avm w2ard w2bjo w3aws w3aul w3ahp w2aft w3anp w4ft w4he w8ct w8drj sm5ua k1zt x18rvl x18tpa y12gq y12gm zs5u zs4ra f8psc g2ej g5by g6vp w2aj zu6n zs5w

**Clyde Shaw, 218 Holmes St., Youngstown, Ohio**

7000-ke. band

w6adw w6ic w6eke w6astn w6pno w6exw w6eqz w6dzm w6os w6oir w6dwi w6hm w6ar w6wa w7ya w7ual w7lz w7amo k4kd k4tk k6oa k6icb zl1aa zl2ab zl2bb ac1bd vk5hg vk2hu vk5hd vk5it x9a x29a x2x em2uf em8yb em8lc em5fl em2yb ve4dj un1nic ear94 kdv5 un4jo

**J. F. Quigley, 645 Polk Blvd., Des Moines, Iowa**

3500-ke. 'phones

w1aby w2aca w3ej w3ey w4a w4on w5awg w5bie w5kx w6abf w6biu w6brk w6dqb w6kd w7acj w7ant w8ajh w8azo w8buw w8byr w8ecz w8cjb w8cjh w8doc w8dtk w8rw ve3br

14,000-ke. 'phones

g5is w1aqt w1bjd w1cel w2el w4gw w5ql w6kt w8cke w8ddl w8rd w8wm w9auh ve3bm x9a

**W2ABY, T. Sirois Jr., aboard U.S.S. "American Shipper"**

Heard between New York and London

w1abd w1ae p w1agn w1abh w1ank w1aku w1amb w1anx w1ape w1ben w1bez w1bsn w1bvr w1eio w1epi w1fn w1fx w1ld w1lm w1lz w1mk w1pk w1sz w1zd w2atx w2bai w2bff w2bha w2bia w2bjo w2bse w2ebp w2evj w2ewk w2exl w2fk w2jn w2qn w2rg w2rt w2sm w2wf w2wz w3ahp w3aw w3ba w3bnu w3cp w3im w3la w3pm w3sb w3ut w4ajh w4dg w4ft w4hd w4hd w5td w6am w8ark w7dd w7za w8agj w8agu w8amy w8bax w8bid w8lt w8hx w8pe w8qb w9abu w9egu w9fuq w9um ene ct1ep ct1ep ct2am earx eise f8ix f8gdb f8wiz g2gz g2nl g5bd g5dr g6bx k4acf k4kd nkoo on4uy ve20a ve3gd xearn

**W9AV-W9CBS, Douglas Rav, Clearwater, Minn.**

14,000-ke. band

lu8dy lu1ba lu4da lu2ea lu4fa lu3pa helfg helic he2jm he2ms zl2ac zl3cm ce3dg ce2ab oa4j g5ml cm5ox py2lk py1aa py2ba py9fb pylcm py2sb f8g

**W5AMH, Billie Basden, 215 N. Archer St., Groesbeck, Texas**

7000-ke. band

k4kd k4acf helfg heldr em1by em2jm em5fe em5fl kfr6 kfu5 fkzt falnx kalhr kalcm kalaf kalet vk3jk vk3wx vk5hg vk5it vk6sa vk6us vk7wi vk7ch un1nic an7aic nncab rx1aa ve2be ve2ea ve2ap vetbk vet4dj ae8rx pylaa x1j x5a x5z x9a x23a x29a ti2wd

3500-ke. band ('phone)

w4oh w5ive w5apw w9zby

**Warner Chaney (ex-W8GB) Box 17, aboard U.S.S. "California," c/o Postmaster, Varick St. Station, New York City, N. Y.**

w1asi w1abn w3dsw w8bnt w4qv w4akg w3anh w3nr w4suw w4alk w9umw w3utw w2bda w4ft

**W2BIH, C. Brewster Lee, 1329 Teaneck Road, West Englewood, N. J.**

ef8app f8fk f8pam f8pro xf8wb g6qb g6xn on4fp k4aci lu4dq xpaaja paowx f8acj f8gdb f8mst c2ax2 g6nt g6xb on4uu k4ni ct1aa su8an kdww f8cp f8hr f8rr g5nas g6vp on4gn earl pylcm py1bl nj2pa ox7x un1nic f8ct e8hs f8rko g5ml g6vy on4gm ear96 pylca uo1kr fvm2fy rwx f8eo f8jd f8rbv g5rm g6xo on4gp ear98 py6af ye2ab zw7eff umbx f8er f8igb f8tan g4jl g6xj on4ij early lu9dt ok2yd kfr5 fqpm.

**W4AHQ, Vernon V. Story, Route 2, Box 31a, Auburn, Ala.**

7000- and 14,000-kilocycle band

w1aze w1cfl w1zz w1cm w1emx w1daw w1aqi w2ake w2ai w2jn w2gf w2rs w2taf w2dab w2bfg w2afv w2bk w2atx w2bn w2aik w2bvg w2bnx w3aur w3alk w3aws w3awr w3db w6dkv w6iuk w6ect w6dk w6aoj w6aqj w6ern w6el w6dte w6cha w6ezk w6cru w6tj w6am w6ba w6euh w6arv w6aqq w7bb w7rr rx1r5 kfr5 un1nic nn7nie veldm ve3oe g2av g6mc g2eg g2oq nj2pa ear37 ear47 cb3ab cv3ab pylaw ct1aa em2jt fqpm cx2ak

**W8AVS, D. T. Byram, 43 River St., Homer, N. Y.**

14,000-kilocycle band

f8ct f8pro f8ix f8rko xf8wb et1by ct1aa ok1mx d4abg paowx xpaaja xpaooz g6xn g5ml g2av g2lz g6qb g5ux g2qv g6vy ce3ac ce3bm celah py2bg py1bl pylaw py2ak pylol umbx k4ni k4kd

**W6DTU, F. L. Easter, 1336 E. Monroe St., Phoenix, Ariz.**

14,000-ke. band

w1aep w1adz w1bux w1cek w1cje w1cmx w1cqr w1eru w1eri w1dq w1fk w1ry w1ow w1ve w1zz w2aof w2aqi w2bdr w2bjl w2bvg w2el w2fp w2gp w2jn w2mw w2tp w3ags w5cee w5sh w5ut w5zf 3zu w4er w4eq w4to w8era w8djv w8ke ao8rv ce2ac ce2ab ce2ak ce3ab ce3ac d4akg d4on f8aap f8aje f8axc f8bqr f8fr f8jf f8orm f8rko f8rrj g5hy g5bz g5ml g5wk g5qv g6hp g6vj g6vp g6wl jxix jxax k6alm k6eat k6akw ly7al ly2jf lx2nu un1nic oa4h oa4o oa4o oa4s pk1bh pk1jr pk1um rx1r5 rwx velac ve2bb ve2bh ve4bh ve5bu vu2kt vu2yz vk3go vk2rv zl2ac zl4ai wiat

# Correspondence

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



## Out-of-Band Policy

Hartford, Conn.  
May 13, 1930

MR. W. D. TERRELL, Chief, Radio Division,  
Department of Commerce,  
Washington, D. C.

Dear Mr. Terrell:

The Board of Directors of the American Radio Relay League was in session in Hartford on May 2nd and 3rd. These Directors, sixteen in number, come from all sections of the country, and in preparation for the meeting had made a thorough canvass of amateur radio conditions in their respective territories and informed themselves on the needs and desires of our members. It had been announced in advance that one of the most important items of business to be considered this year was a consideration of the amateur "off-wave" situation and a study of ways and means to keep amateurs within their allocated frequency bands.

The radio amateurs of the United States consider that the present situation on off-wave operating in the amateur bands is serious and that there is very little excuse for it. Our Directors report that our members in every section of this country are in favor of a more strict enforcement of the penalties of law provided in this matter. Every one of our Directors reports his membership in favor of a program whereunder the law will be demonstrated to have teeth and where, upon establishment of guilt, penalties will be meted out. Amateur radio wants more complete enforcement at the hands of the Department of Commerce, to aid in putting our house in order against the international situation which will confront us at Copenhagen and Madrid, and to protect ourselves against complaints from other United States services. Under the regulating of operator licenses, the Department of Commerce has the duty of thus controlling the operation of stations.

I am instructed by my Board to advise you that it is the desire of the American Radio Relay League that the Secretary of Commerce comply with Section 5 (D) of the Radio Act of 1927, as amended, by immediately putting into effect the policy of suspending the operator's licenses of all persons consistently violating the regulations of the Commission by operating outside the frequency bands prescribed for amateur services.

This office will be pleased to be of any assistance that it can to you in the carrying out of such a policy.

Our Communications Manager has also been instructed by our Board of Directors that, in all cases where the Communications Department of the League acquires evidence satisfactory to it of consistent off-wave operation, he shall forward such evidence to the Secretary of Commerce with a specific request for suspension of the operator's license. From time to time, as data accumulate here, our Communications Manager will correspond with you direct. If you have any instructions to give us concerning such cases in general, we shall be pleased to receive them.

It is earnestly hoped that the Radio Division now has the facilities to give some attention to amateur radio. Although we are to a huge extent a self-policing and self-disciplining organization, it has been so long since amateurs have felt the police power of the government that there is now the widespread feeling amongst the great majority of amateurs who are law-abiding that our activity should not be permitted to suffer from the wanton or careless sets of a minority, and we feel obliged to call upon the government for assistance.

I shall be very pleased to receive your advices, and with kindest regards to you and Mr. Downey, am

Respectfully yours,

— K. B. Warner, Secretary and General Manager

DEPARTMENT OF COMMERCE,  
RADIO DIVISION  
WASHINGTON, D. C.

May 15, 1930

My dear Mr. Warner:

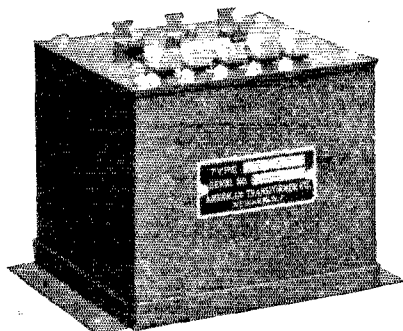
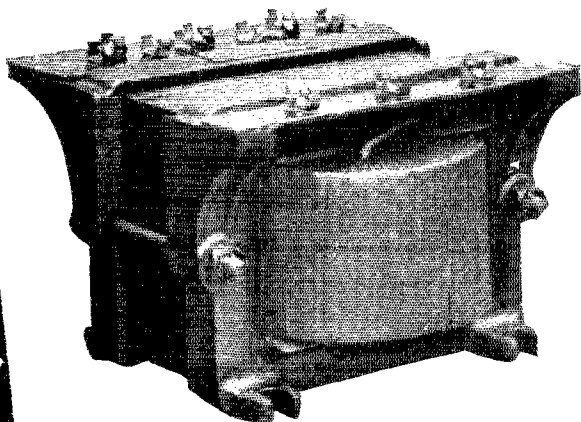
Receipt is acknowledged of your letter of May 13th, in which recommendations are made as a result of your annual meeting, with respect to the enforcement of the regulations governing temporary operator certificates and the penalizing of operators for operating outside of the prescribed amateur frequency bands.

I am forwarding a copy of each of these letters to the Supervisors of Radio, with the intention that such recommendations be carried out.

Respectfully yours,

— W. D. Terrell, Chief, Radio Division

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H-4649	37½	50/60	200/230	2.5	15	12,000	—66
H-4650	50	50/60	100/115	5	10	12,000	—72
H-4651	50	50/60	200/230	5	10	12,000	—72
H-4652	100	50/60	100/115	5	20	12,000	—72
H-4653	150	50/60	200/230	5	30	12,000	—72

These Filament Heating Transformers have a voltage regulation within 5%. Note insulation test voltage.

### Plate Transformers

P-4656	290/415	50/60	100/108 115/125	2360 1180	0.175	6,000	two 211 two 845
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The above Plate Transformer is designed to deliver 1000 volts D. C. with the average filter. Other Plate Transformers can be furnished upon receipt of specifications giving your requirements.

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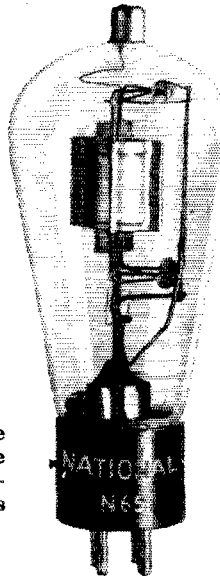
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well as a frequency  
multiplier.

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impedance than the  
average screen grid—  
plate load impedances  
are easier to design.



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Fil. Amps.....	2
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Max. Plate Dissipation (watts).....	20
Normal S. G. Volts.....	150
Normal Grid Bias:	
As Buffer Amplifier.....	25
As Frequency Multiplier.....	30-60
Plate Resistance (ohms).....	100,000
Mutual Conductance (Ma/V).....	1
Amplification Factor.....	100

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San Francisco, California

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San Marino, Calif.

Editor, *QST*:

In practically all radio magazines one will find advertisements painting in glowing colors a delightful picture of the life of the marine radio operator. While the statements made are not direct falsehoods, they are sometimes misleading and do not present to the prospective student a representative idea of the conditions actually encountered by the average marine radio operator. For the benefit of those amateurs who are contemplating marine radio operating as a means of making a living, I will try to present, in an unbiased and truthful manner, the conditions that actually exist in that field at the present time.

At least a year of practical experience is necessary before the radio school graduate can be classed as an expert and efficient operator. The Department of Commerce requires a person to copy twenty-five words a minute in Continental Morse and to have at least twelve months' experience in "stations open to public correspondence" before he is permitted to take the examination for a first class commercial license. In order to hold down a job on a passenger vessel it is necessary to have an intimate knowledge of the "Q" signals and operating procedure as well as the ability to copy from twenty-five to thirty words per minute on a typewriter.

Living conditions on board ships vary greatly. Large freighters, tankers, and passenger vessels usually provide their operators with fairly decent quarters, although many of them are not too well equipped with washing or bathing facilities. On smaller vessels, such as "steam-schooners," fishermen, and tow-boats, the quarters are usually far from satisfactory and, in some cases, almost unfit for human habitation. The meals on freighters and tankers are nothing to go into ecstasies over; there is usually plenty of plain, and more or less wholesome food. Steamship companies only allow their stewards from forty cents to one dollar per man per day for rations, so it is evident that there cannot be very much "turkey and trimmin's." There are a number of notorious exceptions, popularly known as the "starvation lines," which skimp on everything, and it is well for anyone to steer clear of these. At sea, nearly all passenger ships serve excellent food and the officers are given the same meals as the passengers, but when port is reached and the paying guests depart, the decrease in quality and quantity of the meals is astonishing.

The salary of a radio operator on a one-man ship will vary from \$65 to \$120 per month, most jobs paying either \$90 or \$105. As would be expected, the aforementioned "starvation lines" are the ones which pay the \$65 and \$75 salaries. There are a few vessels on which the operator, in addition to his regular duties, does the work of a freight clerk or purser and receives as much as \$175. On all except the largest passenger ships chief operators are paid from \$105 to \$150, second



# CARDWELL'S

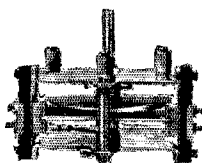
## BANNER

### PERFORMANCE

The Star Spangled record of Cardwell Condensers stands on a high peak, alone. They have always been the choice when Performance was the prime factor, when human life was at stake, when a condenser was needed that could stand up when the going was tough!

With Byrd over the North Pole—with Dyott in Brazil—with Byrd again making history over the South Pole—what a record!

With the Army and Navy, Signal Corps and the Coast Guard, Used by General Electric and Westinghouse. Are they good enough for you?



Transmitting Condensers for Amateur, Broadcast

The 201-E (2 plates). A taper plate condenser for short wave receivers. The stator plate is adjustable, affording maximum capacities of from 50 to 10 mmfd. Price \$4.

and Commercial uses. Receiving Condensers in a wide range of types and capacities. Order direct if your dealer does not stock. Write for literature.

## The Allen D. Cardwell Mfg. Corp.

81 Prospect Street, Brooklyn, N. Y.

“THE STANDARD OF COMPARISON”

# BETTER FILTERING SAFER OPERATION AND LONGER LIFE FOR YOUR TRANSMITTER

The filter condenser in the power pack of your transmitter can be made to do more than merely present a capacity to the circuit. It can also act as a very effective protective device for itself and its associate equipment against voltage surges.

In the filter circuit of the radio transmitter, voltage surge effects are present to a considerably greater extent than in the comparatively low voltage filter circuits of a receiver. There are heavy surges due to keying, surges when the plate voltage goes on and when it goes off — surges that have caused the untimely end of many a tube, resistor and condenser.

The Mershon Electrolytic Filter Condenser is SURGE PROOF. Without in any way short-circuiting the power source, it offers a path for the dissipation of the surge (when it occurs) and thus protects its associate apparatus. Immediately the surge has passed, the condenser HEALS ITSELF and continues in normal operation. It cannot create heavy charging surges, such as commonly occur in transmitter filters.

This SELF-HEALING characteristic, together with its LARGE CAPACITY per unit and its almost unlimited life in service, has caused its adoption for filter work by a large number of prominent radio receiver manufacturers.

More than 3,000,000 Mershon Condensers are in use today.

A constantly increasing number of Amateur Station Operators, also, are employing Mershon Condensers in their transmitters. The characteristically Pure D.C. note obtained is attributed to their use.

With Mershon Condensers, at their new low prices — and the discounts allowed Licensed Amateur Operators — you can re-build the filter circuit of your transmitter to one of high effectiveness — at a very reasonable cost.

The booklet "Puncture Proof Filter Condensers" tells how this can be done. It explains the principles of construction of the Mershon Condenser, illustrates its newest developments, and shows the most effective circuits for its use.

A complimentary copy will be sent you on request. Just attach the coupon to your station call card or letter-head, and mail it to The Amrad Corporation, 285 College Avenue, Medford Hillside, Massachusetts.

THE AMRAD CORPORATION  
285 College Avenue, Medford Hillside, Mass.

Send me booklet "Puncture Proof Filter Condensers."

NAME .....

STREET .....

CITY ..... STATE .....

operators \$70 to \$120, and third (if they are carried) \$60 to \$105. On one-man ships the operators are not required to stand any regular watches. They usually work from three to nine hours a day, listening for calls, receiving press, hydrographic and weather broadcasts, or transmitting traffic. On passenger vessels carrying over fifty persons, including the passengers and crew, a continuous watch is kept and the men are required to work either eight or twelve hours a day. There are still a number of ships having only two men who stand "watch and watch." Apparently some of our leading steamship companies do not believe in an eight-hour day for their employees when they can legally evade giving it to them.

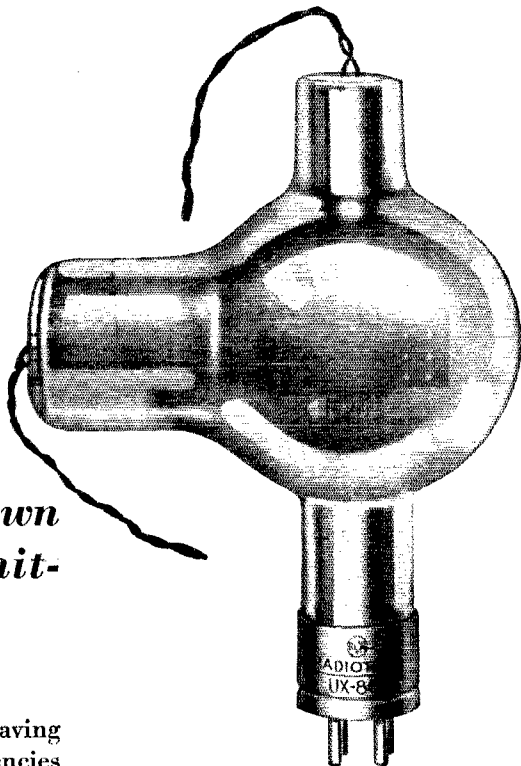
The "popularity and rollicking fun aboard ship" mentioned in some advertisements leads one to believe that radio operators mix indiscriminately with the passengers or take part in their sports and entertainments. Nothing could be further from the truth. Operators are not permitted to speak to or associate with passengers except in the line of duty; nor are they allowed to use smoking rooms, promenade decks, or any other places provided for passengers. These rules are strictly enforced by practically all steamship companies and their violation usually results in the dismissal of the offending operator. As for the "excitement, adventure, and thrills," the writer can only say that he has had five years' experience as a commercial operator and he has not encountered any more adventure than if he had stayed at home; certainly the long, monotonous days at sea are neither exciting nor thrilling.

The environment on board American vessels is not particularly conducive to either mental stimulation or the accumulation of many social graces. The mates and engineers, with whom the operators take their meals, are nearly all uneducated, and in some cases almost illiterate, foreigners; their table manners are not above criticism and their conversation is usually confined to lurid stories about women and liquor, or both. On many vessels these officers consider themselves far superior to mere radio operators and treat the latter with contempt.

Due to the competition between radio companies, these concerns do everything possible to keep in the good graces of the steamship owners using their service or equipment. In case an argument arises in which the radio operator is involved, he is placed in a very unfortunate position, because the radio companies will almost invariably uphold the cause of the steamship men instead of helping the operator. Because there is a surplus of operators no one is greatly concerned when it becomes necessary to dismiss one of them in order to preserve peaceful business relations or to keep operating costs down. This competition and their own lack of organization are the chief reasons why radio operators are unable to obtain better living and working conditions.\*

\* There is, we understand, a shortage of marine operators at present, in the lower-paying positions, because the better-qualified and more industrious operators have landed berths ashore in commercial radio, broadcasting, etc.

# RCA RADIOTRON UX-860



*One of the well known  
Screen-Grid transmit-  
ting tubes*

For the amateur or others having transmitters working at high frequencies (above 3000 kilocycles) this tube will be found advantageous, since its internal shielding obviates difficulties due to feedback and self-oscillation.

This Radiotron is primarily designed for power amplification at Radio frequencies. It is not generally satisfactory as an audio frequency amplifier or modulator, for which purposes other Radiotrons are available.

The user will find Radiotron UX-860 possesses the same rugged construction and performance qualities as the well known UX-852.

	75 Watt		
Filament Volts . . . .			10.00
Filament Amperes . . . .			3.25

Instruction book giving further rating and data information will be gladly forwarded on receipt of request giving the call letters of your station.

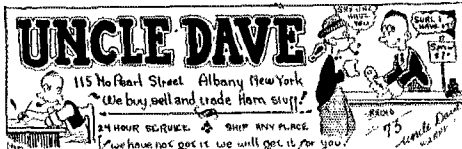
Firm net price, \$37.50.

## RCA VICTOR COMPANY, Inc.

ENGINEERING PRODUCTS DIVISION

233 BROADWAY

NEW YORK, N. Y.



## Special for This Month

<b>Power Type Crystals</b> \$5.75	<b>Power Type Crystals</b> \$5.75	<b>Power Type Crystals</b> \$5.75
--	--	--

Ground to .1 of one percent precision in the 3500 K.C. (eighty meter band). . . . . \$5.75  
 Crystal Blanks. . . . . \$2.75  
 Crystal dustproof bakelite holders. . . . . \$1.50  
 Any other product, including broadcast bands.  
 Crystals ground to specifications.

### Write for Special Prices

Temperature control box complete. . . . .	\$50.00
Four only, Exide six volt 250 AMP storage batteries. . . . .	\$14.75
net; list at. . . . .	\$60.00
G.E. tumbler switches D.P.D.T. . . . .	\$5.50
Jewell pat. 135 0-100 milliammeter, used. . . . .	\$2.45
Rectobulbs mercury vapor 281 new type list \$7.00 net. . . . .	\$4.50
Large mercury vapor net—R3, prepaid to your door. . . . .	\$10.00
Teleplex with four tapes (used). . . . .	\$12.00
R.E.L. 50 watt sockets. . . . .	\$1.40
R.E.L. 204A pair sockets, a pair. . . . .	\$3.00
Sangamo 5000 volt mica condensers .00025, .0005, .001, .002. List \$2.00. Net. . . . .	\$1.20
Victor power trans., supplies filament for four 2.6, one 2.7, one 280 and 250 volts plate. . . . .	\$2.50
Western Electric shielded five wire cable, per foot. . . . .	\$4.40
Esco 350 volt 370 mill motor generator used. . . . .	\$25.00
Samson 3000 ohm phones. . . . .	\$2.25
Gen. Radio stand off insulators. . . . .	\$1.12
New type National .00023-6000 volt transmitting condensers with velvet vernier dial list \$25.00, special. . . . .	\$13.00
Unmounted Splitorf fil. trans. with foll. voltages, two 1 1/2 volt, one 2 1/2 volt, and two 7 1/2 C.T. fil. windings, special \$1.45 10,000 ohm wire wound grid leaks 3/4" x 6", 50 watt special \$1.69	
25 only U.X. 281s tested and guaranteed to function, while they last. . . . .	\$3.85
Signal Corp 3/16" silver contact key. . . . .	\$1.95
Also aluminum panels and corner strips for any size cabinet. Flechtman 1500 volt porcelain insulator, 2 mid. . . . .	\$4.50
Flechtman 1500 volt porcelain insulator, 4 mid. . . . .	\$7.00
Used Mershon condensers. . . . .	\$1.75
New National 3000 volt cond., .00045 with velvet vernier dial. . . . .	\$9.50
Jefferson 300 volt center tapped trans. . . . .	\$1.65
Pilot D.C. super wasp kit. . . . .	\$26.50
Pilot A.C. super wasp complete with pack. . . . .	\$45.00
Allen-Bradley Radiostat new type "500 Watt". . . . .	\$5.50
Silver-Marshall coil forms. . . . .	\$3.39
Wire wound 5000 ohm grid leaks. . . . .	\$3.39
Fresman 375 volt net center tapped and two 7 1/2 center tapped filament windings. . . . .	\$1.95
Signal high frequency buzzer. . . . .	\$1.95
No. 12 solid enameled aerial wire \$1.95 a hundred feet. Two hundred feet coils. . . . .	\$1.75
Thordarson key click filter chokes 1 1/2 Henry 200 mill. . . . .	\$2.95
Latest amateur call books. . . . .	\$8.85
Used Western Electric 212D, 250 watt. . . . .	\$35.00
Sockets for same. . . . .	\$9.00
Slightly used UX 851 1000 watt. . . . .	\$1.75
Slightly used R.C.A. 211s. . . . .	\$17.00
Slightly used Western Electric 211A, D, or E 50 watt. . . . .	\$15.00
Slightly used 204A. . . . .	\$50.00
R.C.A. UV 217A. . . . .	\$7.50
R.C.A. UX 866s. . . . .	\$11.85

### Here's the Real Buy

Limited quantity new original cartons

Gold Seal UV 227. . . . .	\$ .89
Gold Seal UX 245. . . . .	\$1.15
Gold Seal UX 280. . . . .	\$1.05
R.C.A. high mu 240. . . . .	\$1.00
R.C.A. voltage regulator UX 874. . . . .	\$3.25
Broadcast Microphone cases. . . . .	\$2.25
Thordarson 400 volt, each side center 150 watt. . . . .	\$3.90
Chemically pure aluminum, sq. ft. . . . .	\$ .65

Include postage with all orders

Moved to larger quarters. Visit our radio shack when in town. Good time assured  
 What have you for sale or trade?

We carry everything for the Ham  
**MORE FOREIGN TRADE SOLICITED**

Write for free Ham sheet

## UNCLE DAVE'S RADIO SHACK

115 No. Pearl St., Albany, N. Y.

Radio operators, especially those who do not have to stand any regular watches, have unusual opportunities for fitting themselves for better positions; they have a surplus of spare time, and conditions are ideal for study. Many waste their time gambling or in reading cheap fiction, but there are a few who turn their leisure hours to good account by studying and preparing themselves to take advantage of the numerous opportunities which exist for the expert in any field. A number of operators have become successful authors, engineers, and lawyers through utilizing their leisure hours for study.

It is my belief that this unrivalled chance for study is the only feature which makes it worth while for the ambitious young man to become a radio operator. Radio operating should be used as a means to attain an end and should not be an ultimate goal. The novice will do well to keep this idea in mind when he considers entering the field.

— Mervyn R. Ruthbone, Jr., W6BGJ-KFDT

Five years at sea seem to have fed up our author with foreign travel, but life on the sea and the sight of foreign ports will ever have a thrill, particularly for the native inlander, even if to be viewed through the porthole of a tanker. Or do tankers have portholes? — Editor.

## Another Angle on the Beginner Problem

Detroit, Mich.

Editor, QST:

Perhaps the experience of one of the greenest of green beginners may be of some benefit to others in a similar position. It should in fairness to the great mass of amateurs be brought home to the fellow breaking in, lest he arrive at the same mistaken conclusion I did.

About two months elapsed between the time a station license was granted and the time the station actually was QSO. During that period exactly seven transmitters and no end of antenna systems were constructed. They appeared to function from every indication ever outlined in the *Handbook* or elsewhere. But no answers. Locals were heard and called day after day, with this adjustment and that, but no QSO. Until, at length, the rather disheartened op (?) arrived at the conclusion that those fellows had forgotten their early struggles and couldn't be bothered answering a feeble chirp originating in the same district. "High-battin' me," was the way it really looked.

Then the difficulty was located. The station, located in an apartment house, really had a handicap. A well-grounded metal roof was soaking up every speck of radiation obtained — which most of the time wasn't much. At length a high Hertz with a well-insulated feeder turned the trick. And a more cordial, considerate bunch of fellows doesn't exist than those behind the big, sweet notes in the Eighth District!

This isn't important except to warn others: If you don't get your first answers, you must and can look for the reason anywhere except in the hearts of the boys you call.

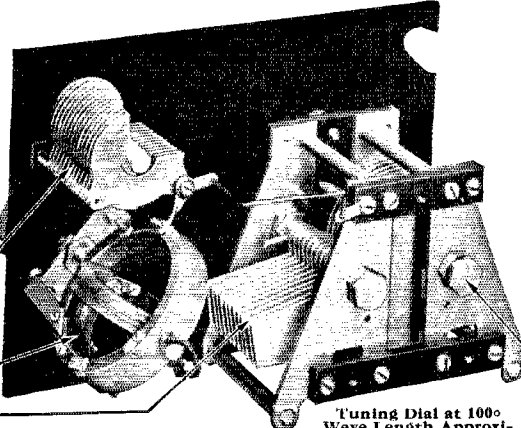
— Frank H. Pipp, W8BJ

# Hoffman & Mix, the well known short-wave experts, designed this **AERO SHORT-WAVE** **Automatic TUNING UNIT**

(Protected by patents pending.)

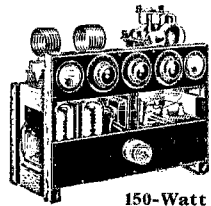


**NO MORE PLUG-IN  
COIL WORRIES**



Tuning Dial at 100-  
Wave Length Approx-  
imately 50 Meters

**SHIFT DIAL SET  
APPROXIMATELY  
HALF WAY 65°**



**Aero  
High-  
Power  
Xmitter  
and  
150-Watt Amplifier**

For operation on 10-20-40-80-100M. Bands. The first high-power amplifier to use the UX-860 screen grid tubes. New in every detail. 150 Watts of pure D.C. signals with a stability which has caused favorable remarks everywhere. Flexibility that fills every Ham need.

Kit No. 52 — Including the power supply, but not including tubes. List Price . . . . . \$259.00

Kit No. 53 — Less power supply and tubes. List Price . . . . . \$114.00

Aero Built-up Short-Wave Sets. D.C. Model, Complete . . . \$60.00 A.C. Model, Complete . . . \$125.00

## A Marvelous Improvement

### NO PLUG-IN COILS

Easiest tuning short-wave receiver known. The tuning unit consists of two controls. The right-hand control, which will be termed the shift control, and the left-hand control, the actual tuning device. In addition to these two controls it will, of course, be necessary to have a regeneration control.

For those who desire to employ it for television or the upper phone band, a special attachment may be secured.

### OPERATION

The tuner is operated in the following manner: As a specific example, with the right-hand dial set at nine degrees, revolving the left-hand dial through 180 degrees, you will cover from 19.1 to 22.6 meters. The next step will be to move the shift dial to 13 and tuning over 180 degrees, as before, this time covering from 21.9 to 25.7 meters. This process is continued through 180 degrees on the shift dial until you have reached the maximum automatic wave length, which is 90 meters.

You will note that the tuning dial, in the first instance, when tuned through 180 degrees, covers only 3 1/2 meters, whereas ordinarily when using plug-in coils your tuner, when passing through 180 degrees, generally covers at a minimum of 25 meters. This same speed of tuning is maintained throughout the entire short-wave spectrum, and it is for this reason that this tuning arrangement surpasses any known method. This unit is furnished completely assembled to the amateur, and may be built into either a short-wave converter or receiver.

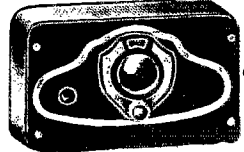
For those desiring to go from 90 to 200 meters a special device may be had, making its range then from 15 to 200 meters. Net price, \$5.90.

A general chart is furnished with each unit, specifying the settings for the shift dial, which will enable you to approximate the wave length for each setting on the shift dial.

This tuner is not sold through the usual trade channels, but is sold to amateurs only direct from factory at special low net price. Be sure to send post office or express money order for \$19.50 with your order. Shipments will be made in the order received. Be first to order. Attach your money-order to coupon below and mail today—NOW!

### FEATURES

Automatic range, 15 to 90 meters; full range, up to 200 meters. No plug-in coils used in automatic range. Easiest tuning device known. Tunes even more slowly than broadcast receiver. Special attachment enables it to reach 200 meters. Anyone can operate it. The days of fooling with plug-in coils are over. Amateurs can now have a real thrill by this new automatic tuning device. Read the complete story in February QST and then mail your order to Aero Products for the complete built-up unit. Get this remarkable short-wave apparatus now.



**Only  
\$15**

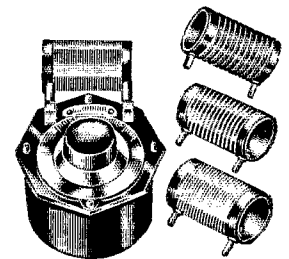
### Aero Listening Monitor

Enables any amateur transmitter to check his own note, to know whether it is pure D.C. or not. It is a safe, sure and accurate way of knowing your station without depending upon the reports of others.

Model M-29 Aero Monitor, including Dry Batteries, but no tube. List Price . . . . . \$15.00

Aero Short-Wave D.C. Converter, \$25.00

Aero A. C. Short-Wave Converter, \$25.00



### Aero Wavemeter

Using the principle of the "series gap," condensers, and having a definite fixed minimum capacity, the amateur wavelength bands are spread over a great many dial divisions. The velvet vernier dial has 100 divisions, each of which may be read to one-tenth of a division. List Price, each . . . . . \$24.00

Aero Shield-Grid Coils

LWT-11 Kit of 3 coils (16 to 90 meters) . . . . . \$11.50

LWT-10 Kit of 3 coils. List . . . \$10.50

Aero Transmitting Coil Kits

2040-K — 16 to 52 meter kit, \$12.00

4080-K — 36 to 90 meter kit, \$12.00

9018-K — 72 to 190 meter kit, \$12.00

## AERO PRODUCTS INCORPORATED

4611 E. Ravenswood Ave., Dept. 370, Chicago

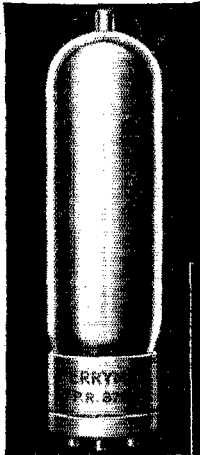
Dear Sirs:

I want to be one of the first to secure the new Aero Short-Wave Automatic Tuning Unit. Enclosed is money order for \$19.50 which is your low opening net price to amateurs only.

I am also interested in the following Aero Products:

Name . . . . .  
Street and No. . . . . City . . . . . State . . . . .

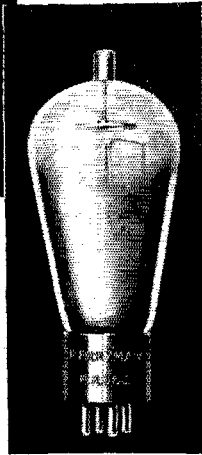




P. R. 872

Fil. Volts - - 5  
 Fil. Amps. - - 10  
 Peak Inverse  
 Volts - - 5,000  
 Peak Plate  
 Amps. - - 2.5  
 Voltage Drop - 15  
 Overall  
 Length - 8 1/2"  
 Overall  
 Diam. 2-5/16"  
 Price - - \$18.00

## FOR PURE D.C. POWER SUPPLY



P. R. 866

Fil. Volts - 2.5  
 Fil. Amps. - 5  
 Peak Inverse  
 Volts - 5,000  
 Peak Plate  
 Amps. - 0.6  
 Voltage  
 Drop - - 15  
 Overall  
 Length 6 1/2"  
 Overall  
 Diam. 2 3/8"  
 Price - - \$8.00

**U**NDER the new regulations all amateurs must use an adequately filtered D. C. current supply.

P. R. 866 and P. R. 872, both mercury vapor rectifiers, besides emitting a wave form easy to filter, furnish a stable source of plate voltage—full load or no load, because both tubes possess a low and practically constant voltage drop. The unusually long life of the P. R. 866 and P. R. 872 is due to the low operating temperature of the oxide coated filament combined with the extremely low voltage drop resulting from their mercury content.

Use these Perryman rectifiers, famous for their rugged strength, in bringing your station in line with the new regulations.

*Attractive prices for licensed amateurs*

PERRYMAN ELECTRIC CO., Inc.,  
 4901 Hudson Blvd., North Bergen, N. J.

Enclosed please find money order for \$.....for  
 check  
 ..... P. R. 872 at \$18.00. .... P. R. 866 at \$8.00.

Name.....Station.....  
 Street.....  
 City.....State.....

## More Stringent Regulations for 'Phone?

Wheeling, W. Va.

Editor, *QST*:

In view of the fact that there seems to be much arguing to and fro relative to the 'phone amateur and his rights, I thought I would write a few words to Headquarters giving my sentiments.

I do not believe that anyone should be permitted to obtain an amateur telephone license as easily as they are obtained today. Especially does this hold good for operation on 3500 kc. It must be remembered that modulating signals even at broadcast frequencies is difficult when men are engineers. And then think of the additional troubles when transmitters are set to 3500 kc.! Especially when the operators have little or no idea of theory and never intend to study it. If a fellow beginning in telephony would stay on 1750 kc. there would be no need of kicking.

I sincerely believe telephony should never be permitted when the amateur has only a temporary license, excepting on 1750 kc. Operating on the present 'phone band should only be permitted when a first-class amateur license, or higher, is held, except in cases when an amateur is extremely isolated from any town of license examination, whereupon positive evidence of technical ability should be furnished. In the case of c.w. positive evidence of technical ability should be furnished when only a temporary license is held.

I do not think the 3500-kc. 'phone band should be widened. The fact is, as stated above, that the majority of amateurs crying for this concession should never be permitted to use telephony, or if permitted should be on 1750 kc. for lack of technical ability. I even believe the 'phone band should be moved to the upper end of the present 3500-kc. band, retaining its present width, so code stations could work 3500-kc. crystal sets on all three bands.

To substantiate the above, it should be noted that the greatest use of 3500-kc. 'phone is by those who should never be permitted its use. To listen to their poor modulation, poor carriers, poor signals, and poor operating, the whole spectrum would soon be too small for them. I could name a score that know nothing of the principles of amateur radio and who are using telephone, and who do not even know the code. All of these operators have secured their temporary licenses through nothing less than pure perjury.

In other words, I believe that the amateur should be permitted 'phone, but only when he knows how to use it. Regulations for its use should be more stringent than for c.w. because it is harder to operate at the high frequencies. After all good operating is only governed by technical ability, and I am sorry to say a bunch of hams have less than zero. Also in the future, as in the past, the A.R.R.L. should make recommendations that would give the amateur who is really

# Crosley Brings NEW Beauty, Originality, Individuality and Distinction to Radio Cabinet Design and Construction

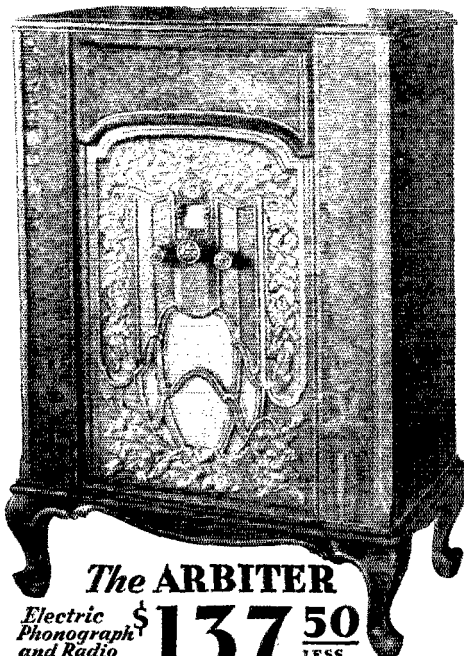
## The Sensation at Atlantic City

The NEW Crosley radio receiving sets are NEW in every respect. New chassis, new power speakers, new cabinet designs, new cabinet construction, new low prices for the big values offered and the super-performance delivered.

Eye-filling beauty, startling originality, distinct individuality, outstanding performance, amazingly low prices—these describe the NEW Crosley sets to the extent that it is possible for words to do so. Actually to see the marvelously designed and executed cabinets, to feel the supreme sensitivity and selectivity of the sets, to hear the astonishingly true tone of the speakers is the only way to gain a full appreciation of these truly exquisite and gorgeous new radio receiving sets. Neither mechanically nor from the standpoint of appearance is there the slightest ear-mark of anything that has gone before.

As an example of the beauty, value, originality and distinction of the NEW Crosley line, look at The CROSLLEY ARBITER shown to the right. An electric phonograph and radio combination at only \$137.50! A highly sensitive and selective Screen Grid, Neutrodyne, power speaker, A. C. electric receiving set housed in a delightfully designed and executed cabinet—plus—an electric phonograph and pick-up. Never before has such an outstanding value been offered in radio. The beauty of the cabinet is self-evident. The latest type Crosley moving coil dynamic speaker is used. The automatic volume control maintains a uniform volume all over the dial. The tubes required are: Three Screen Grid type -24, one type-27, two type-45, and one rectifier tube type -80. Dimensions: Only 35" high, 23½" wide, 14¾" deep.

An Amazing NEW Electric Phonograph and Radio Combination Sensationally Low Priced



**The ARBITER**  
Electric  
Phonograph  
and Radio  
Combination \$137.50  
LESS  
TUBES

The NEW CROSLLEY PAL, illustrated at the left, is another indication of the wonderful eye and money-value to be found in the new Crosley receiving sets. This magnificently beautiful cabinet is only 25½" high yet it houses the Crosley NEW Companionship Series radio receiving set and the newest type Crosley electromagnetic power speaker. The set is highly sensitive and selective due to the use of three Screen Grid tubes. The tubes required are: Three Screen Grid tubes type -24, one type -45, one type -80 rectifier tube. At the amazingly low price at which it is offered, The CROSLLEY PAL will be one of the most sensational sellers the radio world has ever seen. Dimensions: 25½" high, 21" wide, 10¾" deep. Get in touch with your Crosley distributor today!



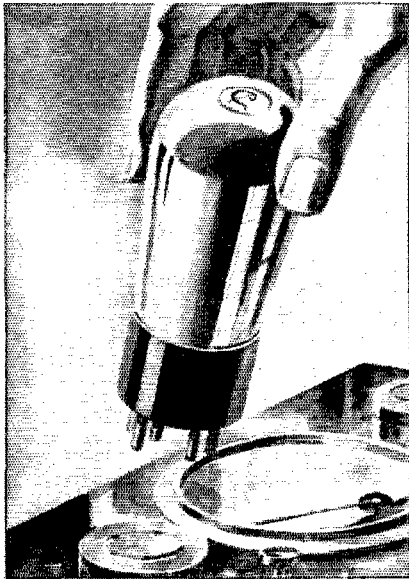
**The PAL**  
\$69.50  
LESS  
TUBES

Screen Grid  
Neutrodyne  
Power Speaker  
A. C. Electric

**The Crosley Radio Corporation**  
POWEL CROSLLEY, Jr., Pres. Home of "the Nation's Station"—WLW  
CINCINNATI, OHIO

YOU'RE THERE WITH A CROSLLEY

# CROSLLEY RADIO



## The True Test is the Test of Time

# Cunningham RADIO TUBES

have met the test  
and proved their  
faultless overall per-  
formance for the  
past fifteen years.

*Standard since 1915*

E. T. CUNNINGHAM, INC.

New York      Chicago      San Francisco  
Dallas              Atlanta

trying to operate a good station the preference and chance to experiment to the fullest extent.

This letter is written without prejudice, and my purpose is simply to submit what I believe to be a cure for a growing evil in amateur radio.

— C. S. Hoffman, Jr., W8HD

## One for T. O. M.

San Francisco, Calif.

*Hi! Old Man:*

Father says it takes the Old Man to get a rise out of mother, and I guess for once he is right. Yesterday was Mother's Day, and when my son handed me May *QST* opened to your "Say, Son" page and said "Here, Ma, this is for you," it was the best Mother's Day present I received.

You know, OM, we have moving pictures in our home too, the pictures move to the floor and the frames move to the "shack"; but who cares? The radio mother has long since passed the "why mothers age" stage and keeps in tune with her young hopeful.

When she finds the pilot light missing from the B. C. L. set, she immediately goes to the shack and invariably finds it in the wavemeter.

God bless their hearts, what if we do have to go and buy new paraffin every time we make jelly, and hold our breath when they try to reach the sky, putting a high pipe on top of a clothesline pole. Sometimes I think my son could qualify as a flagpole sitter. Then, again, the hams do not always tiptoe through the tulips, but after radio club sometimes tiptoe through the hall to the shack in bunches, looking for DX, and it is then the radio mother has a tough time holding the OM in bed when his slumbers are disturbed. Yes, the radio mother enjoys the QSL cards and can overlook the days when she picked radio tubes, coils and what not from the dinner table, mantel, and every nook and corner of the house. Believe it or not, watching a real ham start at the bottom and go up is one of the best thrills a radio mother can get.

Well, OM, here is where I have the last word, and Booth Tarkington has nothing on you when it comes to knowing your hams.

Here's to all the radio mothers, *QST* and you, OM (not forgetting the cat).

— A Radio Mother

## Mental Fading

354 Hunter Street, Ossining, N. Y.

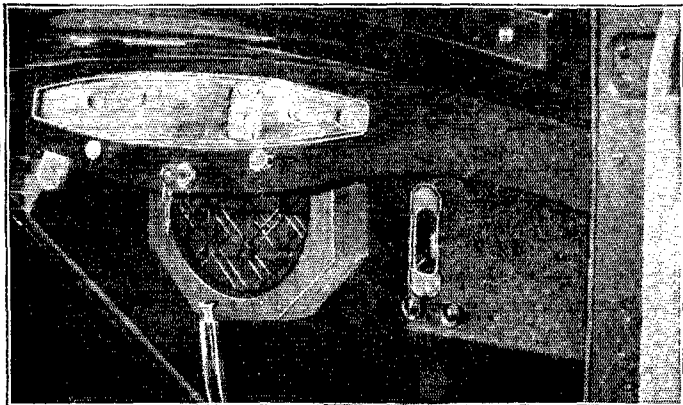
Editor, *QST*:

During the past month I have been spending much of my spare time as a disciple of William James. It is difficult to imagine any subject more remote from radio, and it must be this very remoteness that prompts me to write you these lines, for I have just realized how many times I have fooled myself into thinking a signal was fading when actually there may have been no variation in the signal strength at all. How many others, day after day, feel like spitting on the Old Man's cat because a weak, elusive signal



# SM

## Man, Oh Man —What an Auto-Set!



And why not? It's a bang-up little console-quality receiver, but every inch of it is especially designed for its job. No "toy machinery," either. Like a locomotive—it's all engine.

Get this: three screen-grid tubes (yes, it's s.-g. power detection)—sensitivity eight microvolts per meter—selectivity that slices 'em right off—*real* console tone—"vest-pocket" size (12"x7½"x6¼")—and direct tuning like its big-brother Silver-Marshall radios. All there!

You don't need a jig-saw to get it in the car, either—it doesn't even touch the instrument panel. You mount it under the cowl, to the right of the driver's seat. And if you want to take it out to trade in the car, *not a mark* will show!

The cost? It's *way* down. The list price is only

### The Short-Wave Bearcat Is a Bearcat!

Designed to lick anything in the short-wave class, the 737 Bearcat does—and how! It has two screen-grid tubes—will reach out and drag 'em in by the heels—is plenty selective—and you can spread the ham bands without taking the set apart and throwing half of it away. It's completely shielded—has its own cabinet—and its own built-in power supply!

Eight specially-designed plug-in coils (included

The Radiobuilder, Silver-Marshall's publication telling the very latest developments of the laboratories, is too valuable for any *seabuilder* to be without. Send the coupon for a free sample copy. If you want it regularly, enclose 50c for next 12 issues.

4,000 Authorized S-M Service Stations are being operated. Write for information on the franchise.

**SILVER-MARSHALL, Inc.,** 6409 WEST 65TH ST. CHICAGO, U. S. A.

\$112 wired, without tubes—and that includes the receiver, a hot little speaker that will threaten to win you back to magnetics for life, battery box, brackets, spark suppressors, and everything you need to install it.

Tubes required: 3—'24, 1—'12A, 1—'71A.

The Receiver—S-M 770 Auto-Set (only), factory-wired and RCA-licensed, \$79.50 List. Parts total \$61.40 List.

The Speaker—S-M 870 Automotive-Type Magnetic Speaker, \$15.00 List.

Accessories for Installation—S-M 771 Accessories, including all other required equipment except tubes and batteries, \$17.50 List.

Get in touch with your jobber for the low-down on price and performance!

in the list price) cover from 16.6 to 200 meters—all foreign and American short-wave broadcasting as well as the ham bands. Four extra coils (\$5.50 List) cover the American broadcast band. What more could you ask?

Tubes required: 2—'24, 1—'27, 1—'45, 1—'80.

737 Short-Wave Bearcat, completely factory-wired and tested, less tubes and speaker, \$139.60 List. Parts total \$119.50 List.

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

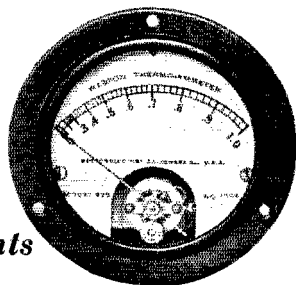
... Send your new catalog supplement with sample copy of the Radiobuilder.

... 4c enclosed; send Data Sheets giving complete information on the Auto-Set and the Bearcat.

Name.....

Address.....

# Weston model 425



*thermo  
instruments  
for*

## SHORT WAVE Radio Service

THE public is as yet little aware of the functions of short wave radio which occur in that mystic band below 200 meters where the middle man of distribution — the broadcasting station — is seldom required. But science and engineering know and appreciate its multitudinous services.

In aviation — for weather reports and beacon signals; in the marine — for land and sea communication; in railways — for long freight hauls in government service — for coast guard boats, tugs and tenders; for police alarms and for all manner of civil and commercial uses where quick and unlimited conversational contact is essential, two-way short wave communication is now in universal vogue.

For the operation of short wave transmitters it is necessary to employ a radio frequency ammeter to accurately gauge the amount of energy imparted to the antenna. In industry, also where radio frequency currents are used, such as in bombarding of tubes, and induction furnaces, the same type of instrument is required. It is used in telephony, in television, by manufacturers of a variety of radio apparatus such as crystal control equipment and, of course, by amateur transmitters the world over.

For all these services the preferred testing equipment consists of the Weston Model 425 thermo instruments made as ammeters, milliammeters and galvanometers, together with accompanying voltmeters — Model 301 for D.C., and Model 476 for A.C. service. All instruments are matched in size and appearance — 3¼ inch diameter — for flush panel mounting.

*For complete descriptions and  
prices write for Circular JJ*

**Weston Electrical Instrument Corp.**  
602 Frelinghuysen Ave. Newark, N. J.



seems to drift in and out of audibility, apparently due to unavoidable QSB, when actually the trouble is not with magnetic storms, atmospheric conditions, wave polarization or other *causae psychosi*, but with the thin layer of cortical cells overlaying the brain of the operator himself! Psychology gives us a very interesting description of the power of "paying attention" and it may explain away many instances of annoying QSB.

Let us assume that we are listening to a very weak signal from a crystal-controlled transmitter. We can barely distinguish the dots from the dashes. We concentrate our attention upon the signal. Perhaps we close our eyes or darken the room, and we find that this helps. (It shuts off light-stimuli that would produce sight-sensations to interfere with the sound-sensations, thus eliminating a great obstacle to concentration.) First we are able to catch several words, and then the signal *seems* to fade out and we miss several words. In a few seconds the signal *seems* to fade in and we catch a little more. This continues indefinitely.

Now psychologists tell us that attention is a state of consciousness which cannot endure over any but the shortest periods. In fact the average person is able to concentrate for only 5 or 6 seconds at a stretch. Oftentimes when we seem to be attending for a long period of time to some one thing, our attention is really drifting and wandering all over the background of our mind without our knowing it. When we find it hard to concentrate, it may be some consolation to know that no one has ever succeeded in maintaining strict attention over stretches of more than 24 seconds.

To a psychologist the reason for this is simple, and by an apt analogy any radio operator may understand it. The control brain cells receive the sound-sensation telegraphed over the nervous system from the ears in the form of a charge, and immediately "explode," just as an electrolytic condenser receives a charge at a pressure so great that the dielectric punctures or "explodes." When a cortical brain cell explodes we "get an idea"; i.e., we are conscious of hearing a signal. Thus, each dot and dash is telegraphed over a nerve fibre from the ear to the brain, and explodes a cortical cell. When a cell has exploded it must take time to recover; it cannot explode again until its "dielectric" repairs itself so it can hold another charge, just like the electrolytic condenser. When these cells are repairing themselves they will not respond to sound-sensations, and we are not conscious of hearing any signal until some sound cell in the cortex starts working again. That is why attention is interrupted, why we can concentrate for only a few seconds at a time, although we sit and stare into the darkness for hours at a stretch, "concentrating." The spurts of our attention correspond to the successive explosions of cortical cells, and as our attention spurts, the signal fades in and *vice versa*.

If anyone should doubt this, here is a simple experiment to prove that attention is interrupted, not continuous:



## Here's the Solution of Your Condenser Troubles!

**D**ON'T worry about condenser problems. If they involve 8 MFD or more—let the Sprague electrolytic condenser take care of them. For this new, perfected condenser is the most adaptable and efficient unit you ever saw. Only  $1\frac{3}{8}$ " in diameter and only 5" height overall. Yet it rates 8 MFD capacity with peak voltage of 430 DC.

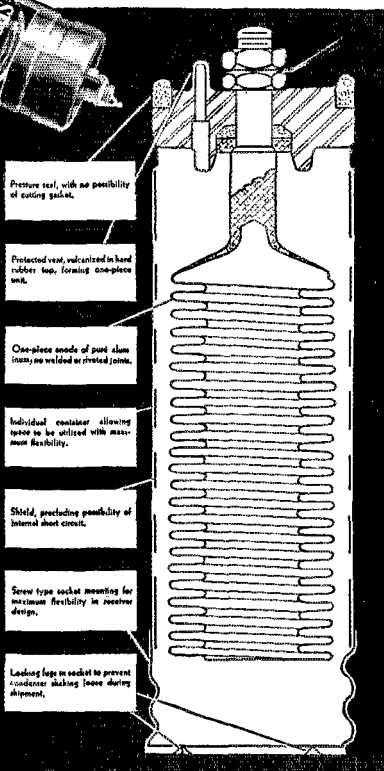
It has an exclusive, one-piece, round-edged anode without a single soldered or welded joint anywhere. The individual screw socket mounting makes it easily adaptable to use in any set.

And because of the Sprague standardized unit construction—you buy just the amount of capacity you require, without paying a premium for useless excess or for "special built" jobs.

Write for illustrated folder on the Sprague electrolytic condensers.

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Manufacturers also of the well-known  
SPRAGUE PAPER CONDENSER



# SPRAGUE

*Electrolytic*

# CONDENSER

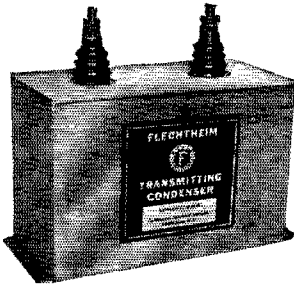
*Capacity 8 MFD*  
*Peak Voltage 430 DC*  
*Can Negative*

AN  
**EVER  
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 NUMBER**  
 OF BROADCAST STATIONS  
 AMATEURS, EXPERIMENTAL LABS

ARE USING **FLECHTHEIM** EXCLUSIVELY  
 SUPERIOR CONDENSERS

REASON #1 —  
 HIGHEST  
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Only the very  
 best materials  
 are used — and  
 then only after  
 the most rigid  
 tests. They  
 DO stand up!



TYPE VM 200-2 MFD.  
 5000 V D.C. - 3300 rms RAC

Send for Catalog #22

A. M. FLECHTHEIM & CO., INC.  
 136 Liberty Street New York, N. Y.

## THE A.R.R.L. LOG SHEET

### New Regulations Require Station Log

The new amateur station regulations of the Federal Radio Commission, announced in May *QST*, oblige every amateur station to maintain a log of operating activity. Every station ought to keep a log. A.R.R.L. has been preaching it for years. Now it becomes compulsory under the regulations.

A well-kept log gives proof of station transmissions. It is invaluable in checking up the records of your work. Its presence identifies your station as a systematic one. The Government now requires it as a record of transmitting activity.

Being purchased now in large quantities, the price of the Log Sheet has been substantially reduced. The new low prices:

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

(Postpaid)

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

Seat the subject blindfolded in a chair, so that he sits sidewise to the length of the room. Hold a watch at the level of his ear, and remove it until its ticking is only just audible. As he listens the sound will alternately disappear and reappear. Let him lift his finger at each disappearance. Count off on the watch the number of seconds between successive disappearances. Compare the interval with the interval between "fading" signals.

Of course there is no remedy for this kind of mental QSB, but it may be a consolation to some operator of a crystal-controlled m.o.p.a. to know that it is probably the brain of the operator on the receiving end that is fading, and not his transmitter.

— Earl Peacor, ex-W2ADH

## More Truth Than Fiction

75 New Haven Avenue, Milford, Conn.  
 Editor, *QST*:

Just a few words about things in general — especially 85-meter 'phone. There was a time once when you would only hear about thirty 'phones in any one day and everyone was having a good time working the same fellows; in other words, just like a great big family. (Ask W2GJ — hi.) Then suddenly everyone else goes 'phone-crazy and now look at the band! At least ninety fellows on regularly, and who works whom and how is more than most of us can figure out. I can't now — I used to.

I overheard some 'phone man once disserting on handling traffic on 'phone. He said that he couldn't see anything in it. But look at what some fellow out west in the wide open spaces (thank Heaven there are a few in that 'phone band!) did on the band with traffic — made the B. P. L.! I myself handled over fifty messages on the 'phone outfit with W1AJI at Naugatuck, who is one of the best traffic men on 'phone within the State. All these in two nights.

Alas for the 'phone band! After a very pleasant two months on the air, my poor 250 and 227 stand deserted in their sockets, while ye 210 is up to his neck in milliamperes down on the good ole twenties where you can come up for air whenever you feel like it.

Guess that's all this time but maybe I'll find something else to spill soon.

— Emil F. Scholz, W1AMQ-W1FJ

## I.A.R.U. News

(Continued from page 50)

is ever handled by these stations we can't help thinking it rather unnecessary to spoil our bands in this unscrupulous way.

### GREAT BRITAIN

By J. Clarricoats, Hon. Sec'y R.S.G.B.

It will be remembered that in our last notes mention was made of the fact that our licensing authorities had once again opened up the 80-

Just Off Press

5TH REVISED EDITION

**“Radio Theory and Operating”**

*By Mary Texanna Loomis*

America's best known and most successful radio instructor; President, Loomis Radio College; Member, Institute of Radio Engineers. This text has been enlarged to 1,000 pages and over 800 illustrations, and is made up of the same high class paper with red kraft leather stamped in gold. The book is written in a systematic style and is right up to date, thoroughly covering much new material on circuits required for obtaining Government licenses of different grades, amateur short waves, broadcast transmitters and receivers, aircraft radio, television and talking pictures. No other radio book is so comprehensive. In use by all Government radio schools, leading radio schools in U. S. and Canada and over 400 universities, technical colleges and high schools.

**Price \$4.25**

*Postage paid this and foreign countries*

This book is written in such a clear manner that the principles of radio can be easily grasped by anybody reading at home. While this is the standard text book in a great many educational institutions, it is not necessary to attend a radio school in order to gain a practical knowledge of radio from its contents. The users of this book are found at the top in every branch of radio work — some as designing and constructing engineers, many in research laboratories and talking movies, and a great many in broadcasting stations and on the ships. Recognized by radio experts as the book of outstanding merit in the radio world. The reputation of this book is so well established that each edition has sold out before the next edition was ready to deliver.

The 5th edition will be for sale by leading bookdealers  
in this and foreign countries

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Enclosed find \$4.25, price in full, for which please send me one copy of *Radio Theory and Operating*.

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**LOOMIS PUBLISHING CO.**  
405 Ninth St. N. W.                      Washington, D. C.                      Dept. 3

## FROST-RADIO engineers have banished noise from wire-wound volume controls!

THE necessary use of wire-wound Volume Controls in high gain Radio Receivers has presented fresh problems to the manufacturer of potentiometers and rheostats. Previous standards and methods of manufacture having proved to be wholly inadequate, radically new and different materials and processes were required, and it remained for FROST-RADIO Engineers to develop these.

They have perfected an automatic device for rounding and polishing the contacting edge of the wire. This process so perfectly forms the wire edges that there is not one ten-thousandth of an inch difference in height between any adjacent wires. A velvet smooth contacting surface is thus provided.

They have proven that the new FROST-RADIO Volume Controls will withstand a fatigue test of two hundred thousand half-cycles, at a speed of thirty per minute, without evidence of wear on wire edge or contact arm, and that they are as perfectly noiseless at the completion of test as before being subjected to fatigue.

A complete treatise on the subject of volume controls has been prepared by our research laboratory. We will be glad to send a copy to any interested engineer.

**HERBERT H. FROST, INC.**  
Main Offices and Factory: ELKHART, IND.



## PROCRASTINATION is a 75c word

But you'll lose more than that if you don't get your Handbook soon. You KNOW Handbook must be had. It's EASY to get. Don't procrastinate. Proceed as follows:

- (1) Fill out below, tear off.
- (2) Tap pocketbook for U. S. A. \$1 bill.
- (3) Clip together, mail us.

A. R. R. L.  
1711 Park, Hartford  
Send Handbook Immediately

(Name)

(Street or P. O. Box)

(City and State)

meter band for week-end work. Since that date some 150 of our members have received permission to operate on this useful band, and as result considerable activity is anticipated.

Arrangements have been made to hold the Annual Convention in London on September 26th and 27th. As in previous years amateurs from all countries will be heartily welcomed to this gathering. Intending visitors are requested to advise the Headquarters of the R.S.G.B. at 53 Victoria Street, London, S. W. 1.

The Annual Radio Exhibition has been fixed to take place between September 19th and 27th, so that visitors to the Convention will be given an opportunity of attending at Olympia.

The recent 28-mc. tests organized by our Contact Bureau Section were successfully concluded during May. The winner of the transmitting trophy was W. H. Winchcombe, G6ZH, whilst Miss B. M. Dunn, G6YL, won the receiving price.

The experimental section propose organizing their next 28-mc. tests towards the end of 1930. Detailed announcements will be given shortly.

Conditions on 14-mc. during May were again poor for the period of the year, and no outstanding work can be recorded.

On 7-mc. local "blanketing" was pronounced but moderate DX was workable.

Information concerning the Society can be obtained from the Honorary Secretary at the above-mentioned address.

The following Norwegian notes combine the reports for both April and May, as both were received within the month:

(Continued on page 84)

### The Third International Relay Competition

(Continued from page 21)

Belgium	Egypt	
ON4BC..... 42	SUSRS..... 9	
Philippine Is.	Irish Free State	
KA1CY..... 28	E18B..... 8	
KA1HC..... 3		
Spain	Denmark	
EAR37..... 14	OZ7Y..... 1	
So. Rhodesia	West Africa	
FO3SR..... 14	FQ-PM..... 1	

### Say, Son—

(Continued from page 22)

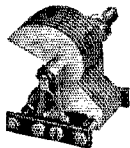
what was left into the port of Algiers and told the head devil there that if ever again an American ship was molested he would come back and bust the entire place wide open. A treaty was signed with some penalties in it that would make you think you had got a shot of bad home-brew.

Steve ambled on along the coast, found some

# Ideal Amateur Receiver!

## NEW NATIONAL A. C. THRILL-BOX DOUBLE SCREEN-GRID

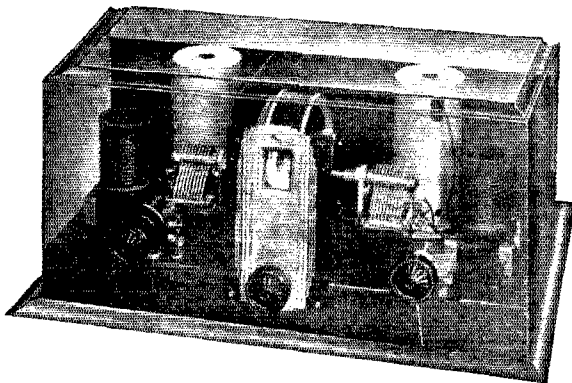
*Easily assembled by anyone with genuine NATIONAL Radio Products*



New type SB-100 S. W. Condensers. Insulated bearings, constant impedance pigtail, straight frequency line plates.



The coil-forms used in the new THRILL-BOX are made of R-39, the low-loss coil-form material recently developed by Radio-Frequency Laboratories.



Full A. C. operation — NO HUM, even on phones. Easily adapted for wide spread of Amateur Bands. Dial and Condenser construction eliminates "clicking" on higher frequencies. Completely new design by NATIONAL Co., Engineers in collaboration with Robert S. Kruse. *Made also in new battery Model, using the new UX 230, 231 and 232 tubes. Special S. W. Power-Pack, licensed under RCA Patents. Send for new Amateur Bulletin No. 141.*

NATIONAL CO. INC. SHERMAN, ABBOTT AND JACKSON STREETS, MALDEN, MASS.

## QST Oscillating Crystals

REDUCED PRICES EFFECTIVE APRIL 1st, 1930

### AMATEUR BANDS:

Summer is coming, and no doubt you are going over your transmitter removing those weak links so as to get the most possible efficiency from your set.

One item of great importance is the *frequency stability* of your set. Does it *stay on one frequency*? If not, our *power crystals* will solve that problem. SCIENTIFIC RADIO SERVICE crystals are *known* to be the best obtainable, having ONE single frequency and highest output. With each crystal is furnished an accurate calibration guaranteed to *better than a tenth of 1%*. *New prices for grinding power crystals in the amateur bands* are as follows:

1715 to 2000 Kc band . . . . . \$15.00 (unmounted)  
3500 to 4000 Kc band . . . . . \$20.00 (unmounted)  
7000 to 7300 Kc band . . . . . \$40.00 (unmounted)

### BROADCAST BAND:

*Power crystals* ground in the 550-1500 Kc band accurate to plus or minus 500 cycles of your specified frequency fully mounted for \$55.00. In ordering please specify type tube, plate voltage and operating

temperature. All crystals absolutely guaranteed regards to output and frequency and delivery can be made within two days after receipt of your order.

### CONSTANT TEMPERATURE HEATER UNITS:

We can supply heater units guaranteed to keep the temperature of the crystals constant to *better than a tenth of 1 degree centigrade* for \$400.00. Two matched crystals, ground to your assigned frequency in the 550-1500 Kc band with the heater unit complete \$410.00. More detailed description of this unit sent upon request.

### ATTENTION AIRCRAFT AND COMMERCIAL RADIO CORPORATIONS:

We invite your inquiries regards your crystal needs for Radio use. We will be glad to quote special prices for POWER crystals in quantity lots. We have been grinding *power crystals* for over *seven years*, being *pioneers* in this specialized field, we feel we can be of real service to you. We can grind *power crystals* to your specified frequency accurate to plus or minus .03%. All crystals guaranteed and prompt deliveries can be made. *A trial will convince you.*

## SCIENTIFIC RADIO SERVICE

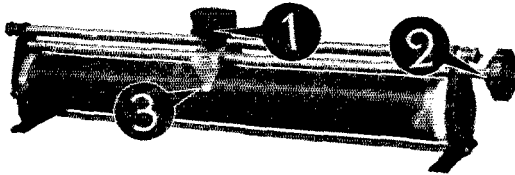
"THE CRYSTAL SPECIALISTS"

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# ● Radical Improvements that meet Modern Demands in this New Rheostat



- 1 One hand operates the HH Tubular Rheostat. Grasping slider knob automatically disengages screw mechanism for rapid sliding. Release restores screw engagement as soon as knob is turned.
- 2 Screw adjustment mechanism is self supporting, self aligning. No binding.
- 3 Heavy phosphor bronze contact shoe maintains firm contact with wire but cannot tear it.

Write us for COMPLETE DETAILS

## HH TUBULAR RHEOSTATS

HARDWICK, HINDLE, INC.  
218 Emmet St. Newark, N. J.

### Are YOU

willing to work for further success in Radio? Have YOU had enough experience to know that you can't get, for nothing, something worth having?

### If so,

clip this out and send in your name and address — it will bring you our new booklet, MODERN RADIO, describing an advanced course in PRACTICAL RADIO ENGINEERING — a course that is being studied by hundreds of experienced radiomen in all parts of the world — a course written and conducted by engineers with years of experience in practical radio work and in instruction work in ADVANCED RADIO.

Name .....

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Branch of Radio .....

### CAPITOL RADIO ENGINEERING INSTITUTE

Incorporated

3166 Mt. Pleasant St., N.W.  
Washington, D. C.

Tripolitan pirates and put on the same act with them. At Tunis he played another one-night stand and then, washing up, came on home.

In 1815, when Steve got home, they gave him a blue silk flag. This identical flag is the one that hangs in the auditorium at the Naval Academy to-day. Don't any ham with red blood in him ever go anywhere near Annapolis without going to that flag and standing at salute just a moment.

The instrument of torture hanging on the wall at A.R.R.L. Headquarters and the instrument of torture shown on Stephen Decatur's flag are suspiciously alike. Their meanings are exactly alike — a he-man type of law and order, or the works. And now, you all ask, whence came our Wouff-Hong? Thereby hangs another tale, lads.

*The Old Man.*

### The Operating Characteristics of Vacuum-Tube Detectors

(Continued from page 28)

of two tubes of this type as grid detectors under similar operation conditions. A greater variation than in the case of plate detection is evident, as would be expected from the greater variations in grid characteristics of the tubes.

The effect of changing the percentage modulation of the input signal upon the detector output and gain is shown by the curves of Fig. 16. It is apparent that the output, and hence the detector gain, is directly proportional to the percentage modulation as long as the detector is not greatly overloaded.

(The second and concluding part of this article will appear in the next issue. — EDITOR.)

### The Hudson Division Convention

(Continued from page 43)

And then came the distribution of prizes to those who participated in the stunts; also attendance prizes. The prizes far exceeded the anticipation of the Committee, but lack of space prevents us from giving the names of all the contributors; proper acknowledgment is, however, made and appreciation expressed to all those friendly manufacturers who helped so much to make the convention a success.

The report of this convention would not be complete without extending the thanks of all the delegates to Dr. Walsh, A. O'Hara, Ed. Finck, Dave Talley, Frank Frimmerman, C. E. Sargeant and other members of the Committee for making possible the best convention ever held in New York City.

— A. A. H.



# Vitrohm Stabilizing Resistors

When the plate potential of radio transmitters is supplied by filtering rectified A. C. it is common practice to connect a stabilizing resistor across the output of the plate supply.

The advantages are:

1. Protects the filter condensers from high peak voltages, which lengthens their life.
2. Steadies the note.
3. Tends to eliminate chirps.
4. Discharges condensers when key is open.

Send for circular 507, describing Vitrohm Resistors for radio. It will be sent without charge upon request.  
You will find in this circular Vitrohm Resistors to meet every radio requirement.

Output Voltage	Total Resistance	Vitrohm Resistors
250	25,000 ohms	1—Cat. 507-65
550	50,000 ohms	1—Cat. 507-68
1000	50,000 ohms	2—Cat. 507-65 in series
1500	60,000 ohms	3—Cat. 507-5 in series
2000	80,000 ohms	4—Cat. 507-5 in series

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### TRANSMISSION CONDENSERS



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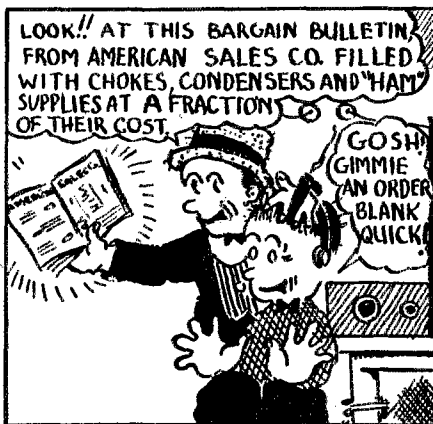
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Low Power Transmitter, adaptable for phone or code, With plug-in Coils.....\$14.75

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A.C.—A. B. C. Power Packs, completely assembled, \$8.75, 250 V. B. also has A. C. filament for up to 9-tube set, can be used as B eliminator. Make your battery set all electric, or build your A. C. set around this pack. 280 tube for this pack, 95c extra.

Thordarson Transformers, 1 to 1.....\$1.00

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4240 Lincoln Ave., Dept. H-8, Chicago, Ill.

DEALERS IN BANKRUPT RADIO STOCKS

## W9ANZ

(Continued from page 48)

A large number of reports have been received via mail, about two-thirds of which were from amateurs not worked or from short-wave BCL's. One of the latter wrote as follows: "I heard your station W9ANZ in communication with another station whose call I understood as CQ. Please verify!"

## I.A.R.U. News

(Continued from page 80)

### NORWEGIAN SECTION

By G. H. Petersen, Vice-Pres. N.R.R.L.

During April we organized local sections of our League in Oslo, and in Bergen the hams have long ago united to form a Society. While the number of Norwegian amateurs is still not very great, we sincerely hope that the formation of Sections to cater to the social side of the League work also will stimulate interest between members and non-members alike.

Our second WAC member is LA1W. He is a very active amateur, and incidentally has the first transmitting license issued and still in force in this country, so his WAC will be well deserved. His report points out that conditions on 14-mc. have been very bad during the last weeks, at least for DX, nothing but European contacts having been made. However, our President, LA1G, disagrees with him, still keeping up his list of ZL and VK's, and now deeply regrets that the world was not made bigger! The Oslo gang has got a powerful addition in LA1H, the Oslo Sailor School, who with its 500 watts is working all the world.

The Bergen gang also is still getting out. LIAR now works exclusively on 14-mc. and for DX, recently "made" two "W's" in an evening.

We are making our best efforts to improve the QSL service to Norway, asking all other hams to cooperate.

Conditions during May, as judged by our reports, have been distinctly bad, the only QSO's reported outside Europe being Australia and South Rhodesia by LA1G. However, the activity among Norwegian amateurs luckily shows no tendency to decrease with the approaching summer, several of our boys striving hard for the WAC Club membership. The general movement to the 14-mc. from the congested 7-mc. band is still going on. Wonder how the 14-mc. band will be in some months if the movement is general?

Our bi-annual General Meeting will be held at Oslo on August 9th and 10th, and we will try to combine it with a hamfest of the latest pattern. We want to repeat our invitation to all foreign hams to join us, if they should happen to visit our Land of the Midnight Sun at that time. In this connection we want to present our thanks for kind invitations to several conventions and congresses this summer. We certainly regret that we are probably unable to send special delegates, but



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Meters

Precision Wave Meters

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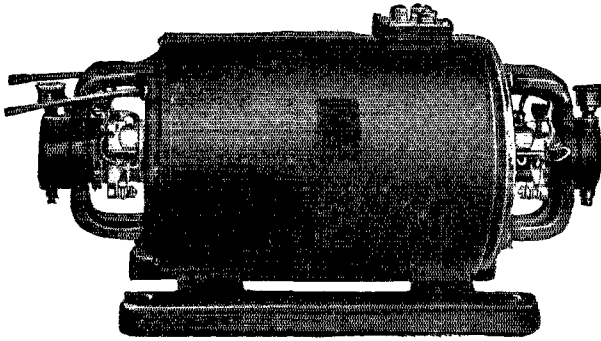
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LONG ISLAND CITY, N. Y.

# NEW GOVERNMENT REGULATIONS!

"Adequately filtered D.C. power supply or arrangements to produce equivalent effects must be used."

(Copied from Official Broadcast NR338, April 4.)



Type MG200, 2 bearing motor-generator set

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They are not expensive and they give you "More Miles per watt."

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250 watt 500—750—1000 each side	
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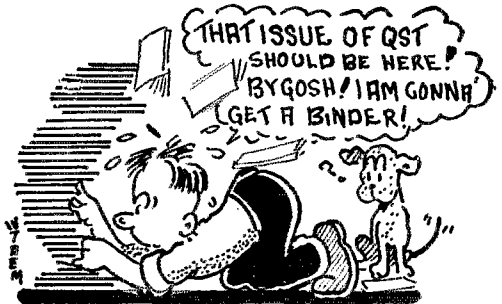
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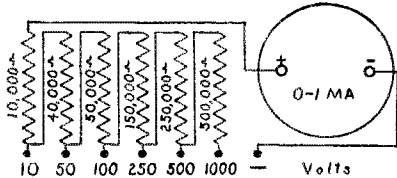
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# Teleplex

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have passed the invitations to our members, in case anyone might be able to attend.

### SOUTH AFRICAN SECTION

By A. Loquet, Hon. I.A.R.U. Sec'y, S.A.R.R.L.

The Fifth Annual Conference of the South African Radio Relay League was held at Durban on April 18, 1930. It was very successful from every point of view and a large amount of business was dealt with, including the drafting of a new constitution. This was necessary owing to the rapid growth of our League during the past two years. We are now over 300 strong and have members in all parts of the African continent, and our ranks are still rapidly growing.

"QTC," the official organ of the S.A.R.R.L., has also improved wonderfully during the past year, and every one should give a vote of thanks to those responsible for its production.

The delegates to Conference were the guests of Div. 5, and those of us who had the pleasure of enjoying their hospitality will long remember it.

At the Conference Dinner our President, Joseph White, broadcast his speech and told the public a few things about amateur radio and the S.A.R.R.L. which were good to listen to.

The Conference sends greetings and good wishes to kindred societies and amateurs the world over.

Having concluded the Reports of the National Sections of the I.A.R.U., we are happy to present for the information of the membership the following report regarding Jugoslavian amateur activity, which is made up of excerpts from a translation of a letter to the I.A.R.U. from the Udruzeni Jugoslavenski Radio-Amateuri, in connection with official business of the Union.

"Our Section started under Austria-Hungary in 1918, and after that year many nations were united into what we call Jugoslavia. On account of the war we could not have any outside contacts and worked among ourselves. On account of the tension after the war amateurs did not get much attention regarding licenses. We therefore trans-

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Calibrated Short Wave Wavemeter. \$12.50  
14 to 220 meters

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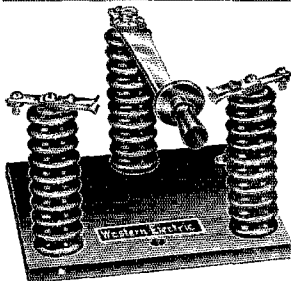
Scientifically Prepared for Maximum Power and Unconditionally Guaranteed 1 in. square sections, within 1/2 of 1/2% of your specified frequency, supplied promptly at the following prices:

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1 in. Tested blanks, 200-400, 400-600 meters	4.00
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Edison storage battery cells, nickel alkali, 225 amp. hour, 1.2 volt type A-6, weight per cell 20 lbs. . . . . \$4.00  
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Keys transmitting, Navy, back connected on bakelite base, 2 1/2 x 3/4-inch silver contacts. . . . . \$5.00  
Keys Navy, 1/4" silver contacts. . . . . \$1.50  
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Air compressors, Kellogg, Model T, 1 1/2 cu. ft. per min., weight 6 lbs., 600 R.P.M., 125-lbs. Requires 1/2 hp. . . . . \$3.00  
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Transformers, General Electric, 125 to 2500, with primary center tap, 60 cycle, 200 watt. . . . . \$7.50

Ammeter, R.F.O., 10 amp. zero adjust, 4 in. diameter. A real buy at. . . . . \$6.50  
West. Elec. Dynamotor, C.W. 027, two D.C. 32/350 volt dynamotors in noiseless hanger. Used in parallel gives 160 mils at 350 volts, series gives 80 mils 700 volts, suitable for transmitters and receivers. New low price. . . . . \$20.00

Condenser, Dubilier, mica, on. volts 8500 cap. .004. . . . . \$10.00  
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THIS ISSUE OF QST

*David Houghton*

QST Circulation Manager

mitted without licenses. In 1924 we had contact with YS7XX in Ragusa. In 1926 YS7KK in Velika Kekinda, YS7MM, YS7DD and YS7XO in Zagreb joined the above-mentioned station. The military station YS7WW joined also. It was located in Petrovaradin and worked amateurs. After a time we had the best stations in Europe and everyone was interested in us because of this. Most of our transmitting was in the Balkans and we were working 'under cover.'

"After 1928 the stations EJ7OO and EJ7QQ in Zagreb and EJ7SS in Belgrad joined us. The Central Station for the short wave transmitters in Jugoslavia is EJ7KK in Zagreb.

"In the same year we tried to get permission from the Postmaster to license our stations, but received a negative answer.

"We received QSL cards from Wien 'via Radiowelt.' A notice was printed in a magazine and we got into trouble with the Government.

"The station EJ7SS in Belgrad read the notice in the magazine and warned us so the Commission could not find anything. After this the Government did not make any more trouble for us. We wanted to organize a society but the Government would not give us their permission. We got together and drew up a constitution on December 23, 1929.

"The results of the organizing of this society depend on propaganda and we cannot tell what they may be."

The stations listed on the letterhead of the society are these: 7AA, 7CC, 7DD, 7FF, 7GG, 7JJ, 7KK, 7LL, 7MM, 7NN, 7OO, 7PP, 7QQ, 7RR, 7SS, 7UU, 7VV, 7XX, 7YY, 7ZZ. The address is Poslovnica: Zagreb, Puskanac 15B-22.

It should be borne in mind that these stations are not officially licensed, and all communications, QSL cards, etc., should be sent under cover.

## WWV Standard Frequency Schedules

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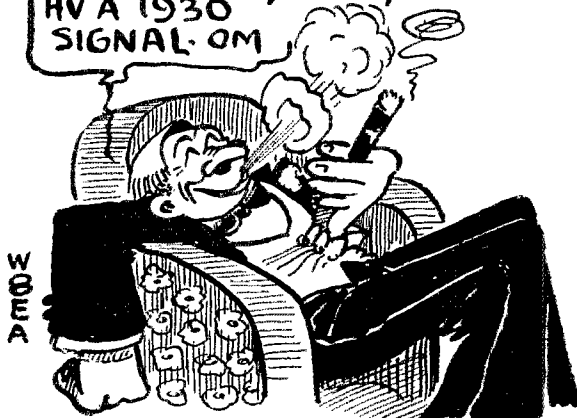
Literature on request.

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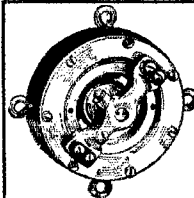
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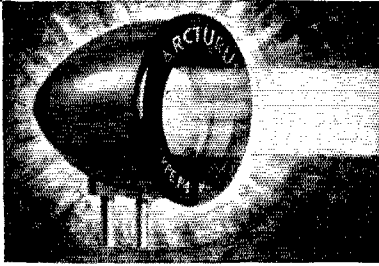
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# ARCTURUS

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*The Electric Eye for Every Industry*

MADE BY THE MAKERS OF ARCTURUS BLUE TUBES

from the Bureau's station WWV, Washington, D. C. They can be heard and utilized by stations equipped for continuous-wave reception at distances up to about 1000 miles from Washington.

The transmissions are by continuous-wave radio telegraphy. A complete frequency transmission includes a "general call," "standard frequency signal," and "announcements." The general call is given at the beginning of each 12-minute period and continues for about 2 minutes. This includes a statement of the frequency. The standard frequency signal is a series of very long dashes with the call letter (WWV) intervening; this signal continues for about 4 minutes. The announcements follow on the same frequency as the "standard frequency signal" just transmitted, and contain a statement of the frequency. An announcement of the next frequency to be transmitted is then given. There is then a 4-minute interval while the transmitting set is adjusted for the next frequency.

Information on how to receive and utilize the signals is given in Bureau of Standards Letter Circular No. 280, which may be obtained by applying to the Bureau of Standards, Washington, D. C. Even though only a few frequencies are received (or even only a single one), persons can obtain as complete a frequency meter calibration as desired by the method of generator harmonics, information on which is given in the Letter Circular. The schedule of standard frequency signals is as follows:

Eastern Standard Time	Frequency, Kc.					
	July 21	Aug. 20	Sept. 22	Oct. 20	Nov. 20	Dec. 22
10:00 P.M.	1600	4000	550	1600	4000	550
10:12	1800	4400	600	1800	4400	600
10:24	2000	4800	700	2000	4800	700
10:36	2400	5200	800	2400	5200	800
10:48	2800	5800	1000	2800	5800	1000
11:00	3200	6400	1200	3200	6400	1200
11:12	3600	7000	1400	3600	7000	1400
11:24	4000	7600	1500	4000	7600	1500



## I. R. E. Convention

The Fifth Annual Convention of the Institute of Radio Engineers will be held in Toronto, Canada, August 18th to 21st, with headquarters at the King Edward Hotel. This meeting will also be known as the First International Convention of the society.

A well-balanced program has been arranged, including technical sessions, exhibits, a golf tournament, tours to various radio manufacturing plants as well as points of interest in the vicinity, and other features.

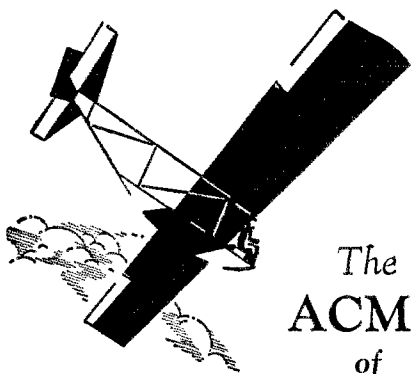
Information regarding the Convention may be obtained from the Institute headquarters, 33 W. 39th Street, New York City.

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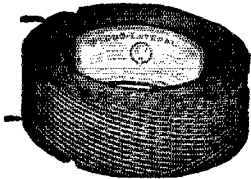
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THE finest in radio for amateur, broadcast and marine. The most modern short-wave receivers. Four to ten tube designs. Radiophone CW transmitters of any power or type. We make a complete line of apparatus, including speech amplifiers, filter coils, inductances, power units, etc. Any special apparatus designs, built to order, using your parts if desired. Prices on request. New bulletin lists complete line of apparatus. Write for copy. Ensell Radio Laboratory, 1527 Grandview St., S. E., Warren, Ohio.

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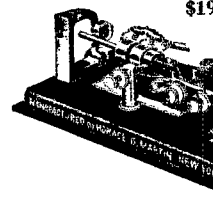
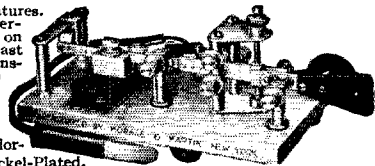
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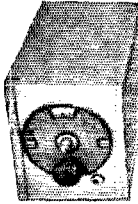
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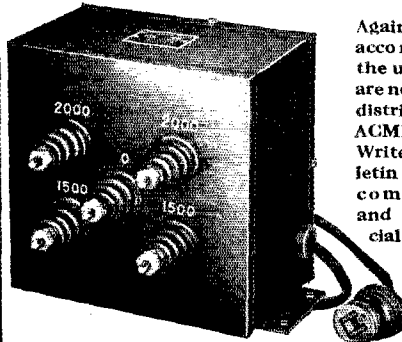
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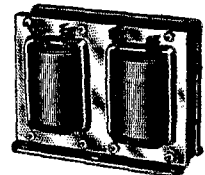


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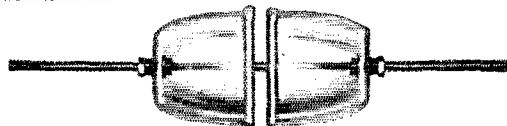
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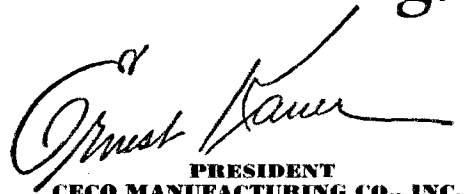
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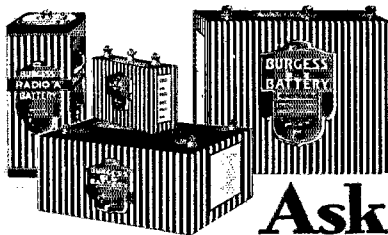
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