QST
DEVOTED ENTIRELY TO
AMATEUR RADIO
PUBLISHED SINCE 1915 BY THE AMERICAN RADIO RELAY LEAGUE INC.

DECEMBER, 1929
25¢

XMAS LIST
SLED
BICYCLE
BABY SISTER
RECTIFIER TUBES
500-WATT SCREEN GRID TUBE
SCHEDULE WITH WIMK
A.C. OPERATED SHORT-WAVE KIT
Pilot's A.C. Super-Wasp, developed by David Grimes, John Geloso and Robert S. Kruse, employs a tuned screen-grid stage and a specially-created Pilotron 227—the only A.C. tube suitable for S.W. detection. 14 to 500 meters. Use your own ABC pack or Pilot K-111 ($16.50).
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(Power Pack Extra)

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WORLD'S LARGEST RADIO PARTS PLANT—ESTABLISHED 1908
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Accurate Operation

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INC.
Write Dept. for complete data

Buy Your Radio Equipment from
Make your own transmitting and receiving coils. Copper tubing transmitting inductance.

**Size of tubing**

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<th>Inside Dia.</th>
<th>3/16&quot;</th>
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<th>5/32&quot;</th>
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<td>2 1/8&quot;</td>
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<td>10c</td>
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<td>2 3/4&quot;</td>
<td>9e</td>
<td>10c</td>
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<td>10c</td>
<td>12c</td>
<td>17e*</td>
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Prices per turn

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

- 2" diameter .......... $0.30 per inch
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# Section Communications Managers of THE COMMUNICATIONS DEPARTMENT, A. R. L.

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<tr>
<th>State/Region</th>
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<tr>
<td><strong>Atlantic Division</strong></td>
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<tr>
<td>Don Lusk</td>
<td>WZIF</td>
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<tr>
<td>Forrest Calhoun</td>
<td>W3BBW</td>
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<tr>
<td>Norma R. Weible</td>
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<tr>
<td>C. S. Taylor</td>
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<td>A. W. McKeen</td>
<td>W3CBO</td>
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<tr>
<td>Fred J. Hinds</td>
<td>W9APV</td>
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<tr>
<td>D. J. Augs</td>
<td>W9TVQ</td>
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<tr>
<td>J. E. Warthen, III</td>
<td>WH2AJ</td>
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<td>Phil Wize</td>
<td>W5NMP</td>
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<tr>
<td>H. C. Spork</td>
<td>WH3YX</td>
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<td>C. N. Crapo</td>
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<td>H. E. Velte</td>
<td>W5ABH</td>
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<td>M. M. Hill</td>
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<td>James B. Witt</td>
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<td>H. H. Rossbach</td>
<td>W2GQO</td>
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<td>V. V. L. R.</td>
<td>W2KR</td>
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<td>A. G. Wester, Jr.</td>
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<td>H. W. Kerr</td>
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<td>L. B. Lins勒</td>
<td>W9RR</td>
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<td>C. B. Dehl</td>
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<td>W1AQL</td>
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<td>Otto Johnson</td>
<td>W1UM</td>
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<td>Dr. John A. Tsemer</td>
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<td>V. V. Hodge</td>
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<td>W8DN</td>
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<td>J. W. Hulford</td>
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<td>W3VE</td>
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<td><strong>Vanalta Division</strong></td>
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<td>J. K. Cavalsky</td>
<td>W4IDQ</td>
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<tr>
<td>A. V. Chase</td>
<td>V4HR</td>
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<tr>
<td>W. J. Pickering</td>
<td>V4FC</td>
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the General Radio Company has been manufacturing instruments for the amateur which have made a reputation for sound design, quality, and reliability. Among these are

Frequency Meters
Quartz Plates for
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Variable Air Condensers (for work on short waves)

New items are under development. Send for Bulletin 931-X and ask to receive future announcements as they appear in the General Radio Experimenter

GENERAL RADIO COMPANY
30 STATE STREET           274 BRANNAN STREET
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The American Radio Relay League

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

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

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

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

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ADDRESS ALL GENERAL CORRESPONDENCE TO THE EXECUTIVE HEADQUARTERS AT HARTFORD, CONN.
WHEN "KB" left for the Hague Conference he asked me to write the December editorial. I accepted the undertaking with a certain amount of pleasure, because it is a long, long time since I have written an editorial for QST, and it seemed like rolling back the years.

It used to be that I wrote every editorial. That was when "headquarters" consisted of Clarence Tuska, then a high-school boy, a wabbly old table, an aged and infirm rocking chair, and a hired typewriter in the third floor, rear, of Tuska's mother's house. After school, Tuska attended to League matters, and got out QST. I had my regular business office downtown, and Tuska used to come in almost every afternoon for half an hour, and together we would dig up the makings of next month's magazine.

QST at that time had a blue cover, some twelve pages, and possibly five or six paid ads. Toward the end of the month, things would get pretty frantic, and Tuska would get me to call for the magazines at the printers with my Franklin touring car. In the evening, Mrs. Maxim, my children, Tuska, 1 and a neighbor or the house maid, would wrap and address the issue. Then I would take it down to the Post Office, about nine o'clock, in a single bag, and hand it in.

What a contrast with getting out QST today! Now it takes a good many people and a fleet of motor trucks several days to get QST wrapped, addressed and mailed.

It's a lot of fun looking back to the start of things.

QST is fourteen years old this month. Unless we have things mixed, QST is the oldest all-radio magazine in the country. Many, many radio magazines have come and gone during the life of QST. The newstands of the country were flooded with radio magazines when broadcasting started. And for a while they made our little amateur magazine look like something very old fashioned. But most of them passed out of the picture, after strutting their brief lives, whereas our QST has kept right along and prospered.

The A.R.R.L. is about a year older than QST. Old-timers will remember that we ran for nearly a year without a magazine or bulletin of any kind, except two call books which the League compiled and printed. In those days it was so thrilling to know there were other amateurs in the country that we made a mere call book get away with it. Of course, we are talking now of amateur radio of 1912, '13 and '14, when a good QSO across a twenty-five mile gap was a real achievement. I remember that Tuska and I once ran a test with a chap twelve miles away, and although each of us used a good full-sized kilowatt, we never clicked once! This chap and I used to run over to each other's house two or three times in an evening, and listen, but a month of hard work failed to make those sets percolate through twelve miles. Just think of all the triumphs awaiting us in those days!

I wonder if there are not just as many waiting just around the corner as there were fourteen years ago. They will be of a slightly different nature, of course. In those days, DX was our sole aim; nowadays we have attained the earthly limit in DX, and our triumphs are along other lines. But there are so many, many different ways of "skinning a cat." I do not believe that amateur two-way communication runs up against a stone wall at twenty meters, nor ten meters, nor five meters. We used to think it stopped at 325 meters. I got a special license to transmit on this wave simply because we all thought the higher wave meant greater DX. We believed absolutely nothing in the way of DX was obtainable with waves below 200 meters. That is the reason we amateurs were given them in 1912 -- the engineers believed the same thing. But everyone today knows that we found a whole world full of unbelievable DX when we started to look around in that territory below 200. I have an abiding faith that there is a whole world full of undeveloped stuff lying just around the corner now, just as there was in 1914. I believe that from our number will emerge, in due time, a group of clear-thinking, unafraid minds that will unfold the ultra-high-frequency communication art, just as in past years the same kind of minds unfolded what we now call the high-frequency art.

Turn to the files of QST, and as you run the pages through your fingers you disclose the gradual development of one of the greatest branches of radio communication -- the high-frequency art. My confidence in similar future development work is based upon my knowledge of the membership of our A.R.R.L., and its uncanny ability in finding new ways and means for "skinning cats."

H. P. M.
The President's Corner

A WORD FROM

HIRAM PERCY MAXIM

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

It is when I receive letters like the one below that I am particularly glad there is one part of this magazine of ours that belongs to me — a part where I can insist on printing whatever I like, editor or no editor. For Warner hit the finger with the hammer recently when he said that editors are queer fellows. One of the queer things about them is that while they think it is quite all right to print criticisms of themselves, they balk like mules at printing anything nice someone may say.

When the Chairman of the United States delegation to the Hague Conference takes the trouble to write a letter such as this about our Secretary, I think the membership ought to know about it. So here it is:

INTERNATIONAL TECHNICAL CONSULTING COMMITTEE
ON RADIO COMMUNICATIONS

DELEGATION OF THE
UNITED STATES OF AMERICA

My dear Mr. Maxim:

Referring to the assignment of Captain K. B. Warner to the United States Delegation to the International Technical Consultative Committee on Radio Communications at The Hague, I wish to express my appreciation of the services rendered by Captain Warner.

Realizing his long experience and keen interest in the affairs of the American Amateur, I naturally expected him to specialize on that work at The Hague. I wish to say that Captain Warner not only carried a heavy load in our work concerning the American Amateur but was very useful in other work. On several occasions, I assigned him to special duties which were performed with promptness and efficiency. I consider that he contributed to the success of the United States delegation at The Hague.

Yours truly,

(Signed) C. McK. SALTZMAN,
Chairman.

Southeastern Division Convention

December 27th and 28th at Atlanta, Ga.

NOT many conventions are held in this division, but when we do they are events to be remembered. Therefore, hear ye fellow amateurs the call for the second Southeastern Division Convention to be held in the city of Atlanta, Georgia, on December 27th and 28th, at the Hotel Ansley, under the auspices of the Atlanta Radio Club.

A very fine program has been prepared and good speakers will be present. Secretary-Editor Warner and Treasurer-Fieldman Hebert of A.R.R.L. Headquarters are expected and every one can be assured a pleasant time. On Friday at midnight will be held the first meeting of the R.O.W.H. alumni. Those of you who have been initiated into the Royal Order of the Wouff Hong are especially requested to appear.

A cordial invitation is extended to all the amateurs in the Southeastern Division and surrounding states. It is your attendance that will make the convention a success, so let's all boost for this convention. The committee will take care of the rest at the convention.

A word to Director Harry F. Dobbs, 245 Spring Street, Atlanta, Ga., will be appreciated. Let's go, fellows!
Amateur Radio and the National Air Races

By Harry A. Tummonds

The Cleveland Wireless Association, Inc., handled the field communications in connection with the 1929 National Air Races. This was a difficult problem in the minds of the Air Race Committee; no definite plans had been made. The installation of special and expensive telephone lines was being considered. It follows that the Committee was receptive to our story, "What could we do? Who were we? What assurance had they that we could do the things we claimed? How much would it cost?" Mr. Huddelson answered all such questions quickly and accurately. He outlined amateur radio work in general to the committee. In this one contact the Race Committee became convinced that amateur radio would not fail, and accepted Mr. Huddelson's proposition, with details to be ironed out later.

Following a second conference with the committee to discuss details and obtain data in writing, Mr. Huddelson asked permission to be relieved of his contact work on account of personal business and the writer was appointed in his stead. Carrying on a well-organized programme is a snap, especially with the gang we have in the Cleveland Wireless Association. Next, a joint meeting was held with the Air Race Committee at the Hotel Cleveland. Evidently the committee was satisfied as another later meeting was called. Questions were presented in writing to the committee in advance to save time. These letters were read at the meeting and details settled to the satisfaction of both parties. We had to make the most of these meetings as the Air Race Committee had hundreds of things to take care of with Derby entries, contestants, telegrams, etc., all demanding attention at once.

We had plenty to learn about air races so Mr. Logan gave us a short talk and explained what it was all about. He outlined the 5- and 10-mile courses, using aerial photographs for locations, and then explained briefly just what we would be required to do, what information they wanted, to whom it should be delivered, what comprised the duties of judges, scorers, and timers. Housing equipment was needed for the apparatus at the pylons so orders were given to supply standard voting booths to be loaned by the City of Cleveland. The pylons were 75-foot angle iron towers, except at the grandstand where the special Navy mooring mast was used as a pylon and for the U.S.S. Los Angeles on its visit to Cleveland.

Many club meetings were held. A tentative daily programme was definitely decided upon,

THE U.S.S. LOS ANGELES

By Harry A. Tummonds

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*Chairman, Board of Directors, Cleveland Wireless Assn., Inc., Chairman Radio Air Race Committee, W8BAH, 2077 West 88th St., Cleveland, Ohio.
equipment pledged and operators scheduled for each day of operation during the meet. Turner, our president, then produced a bound volume of QST, proceeded to read the complete story of the work done by the West Coast gang in the handling of the previous National Air Races.

This write-up was a big help, but gave hardly enough detail. Also, we were to try 'phone for the first time which gave us a number of new problems to solve. While these meetings were being held, amateurs all over the country, no doubt, heard our preliminary Air Race net operating from the homes of the club members, over a period of two weeks' time. Assigned and re-assigned master control stations contacted eight stations simultaneously during these tests. We kept schedules, reported imaginary races, and then discussed the tests at the meetings.

The races were held at the Cleveland Municipal Airport, Cleveland, Ohio, a space occupying several thousand acres—an ideal location. Special stands were constructed, housing grand-stand seats; concessions; telephone and telegraph headquarters; visitors; executive offices; timers, judges, and scorers; Contest Committee; pilots; Army, Navy and Marine headquarters; police; hospitals; and special fire department booths. In addition to the above, the C. W. A., Inc., had a special room built at the right of the Administration Building, which housed all the apparatus used at Pylon No. 1. From this station each and every race was controlled. Weather throughout the meet was perfect. Approximately 2000 persons were included in the total personnel of operations and the spirit of every one was the spirit of showmen. This spirit held throughout the meet.

In order to be on the job at all times, we would have to have proper credentials to get into the race grounds. We were furnished individual personal season passes and official car signs for each man. Mr. Logan of his own free will unexpectedly furnished the gang with books of grandstand passes for the complete programme. In addition to the above, Cleveland manufacturers came to our aid by the donation of necessary supplies.

Special permission was obtained from the Department of Commerce office at Detroit, by the Air Race Committee, whereby we were allowed to use personal call signals as special portables for the duration of the Air Races. The calls were as follows: W8BF, Pylon No. 1 (Control Station at Grandstand); W8CJ, Pylon No. 2 (Engle and Snow Roads); W8BAH Pylon No. 3 (Engle and Brook Park); W8DBU, Pylon No. 4 (Stump and Snow Roads); W8BBE and W8DRD not used.

On August 23, 1929, we moved our equipment from our homes to the pylon locations at the Cleveland Airport. All sets were in operation in record time, and on the air at approximately 10 p.m. that night. Each group was assigned to the installation of one station with Roy Watterson appointed as Liaison Officer. Roy had the hardest and most important job of the whole meet and did it in A No. 1 shape. We worked DX that night and got out well, too. Everything worked out in fine shape and our president, Jim Turner,

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5 "B" batteries for transmitters and receivers: Donated by the National Carbon Co., Inc. "Just a few pounds less than a ton." All batteries to the club members after the races. "A" batteries for transmitters and receivers: Donated by the Willard Storage Battery Co. 6- and 8-volt type, also trucking service and service man at recharging panel. We were allowed to purchase these batteries at a reasonable price. Transmitting and receiving tubes: Kolster-Brandes Sale-Co, DeForest 250 and 251 type., M and M Co. Donatron transmitting tubes, National Carbon Co. Eveready Raytheon Screen Grid tubes. Station WWO loan of tubes in an exchange. 112th Observation Squadron, Ohio National Guard also loaned tubes. All of the donated tubes were distributed to the memberships. Antenna and hookup wire: Donated by the W. S. Tyler Co. Incidentally, they went outside and purchased the hookup wire as they did not carry it in stock.

These concerns all donated time, money, and whole-hearted support to the success of the amateur network.
immediately sent an A.R.R.L. radiogram to Mr. Floyd Logan, Air Race Chairman, advising him that we were ready to go, and wishing the officials every success.

Races were held over 5- and 10-mile courses for a specified number of laps. Each corner of the triangles was marked with pylons or towers, 75 feet high, draped with flags at the top and yellow and black wallboard on the sides. Each outlying pylon had a voting booth to house our equipment. These all-steel booths were hauled in on big trucks and equipped with tables, chairs, lamps, etc. They made ideal shacks. The Air Race Committee supplied National Guardsmen to watch our equipment night and day.

The officers of the Cleveland Wireless Association, Inc., constituted the Radio Committee. This committee put the general plan in effect and was made up of the following members: J. P. Turner, president; E. T. Huddleson, vice-president; E. Putzier, secretary; F. Sauer, treasurer; H. A. Tummonds, Chairman Board of Directors and Chairman Air Race Committee: Orrie Baumgardner, Chief Operator, all pylons: Al. Gyssler, Chief Operator Pylon No. 1; Russell Karg, Chief Operator Pylon No. 2; Paul Forrest, Chief Operator Pylon No. 3; Glenn Rogers, Chief Operator Pylon No. 1. Our operating personnel had all been planned.

The first transmitter and receiver used were installed by WSBE, Orrie Baumgardner, the transmitter being similar to that used at the home pylon except for the battery plate supply. Following a failure of the UX-210 tube and modulation choke, WSBE's emergency transmitter was installed in record time by Ivan Dough, WSBEI, so that not a single race was missed by this pylon. The second transmitter utilized one UX-210, a Hartley circuit and loop modulation.

ahead of time. Assisting each chief operator were assigned members of the club at the required positions. Every one had a definite job throughout the races, and an opportunity to operate at each location. Transmissions were carried on in the 80-meter 'phone band (3500 to 3550 kc.), Glenn Rogers had an emergency portable receiver on the job ready to go in at any time, and at the writer's home station, WSBAH, we had an additional National screen-grid receiver and a portable transmitter ready, with power supply if necessary, to be put in at any location. The emergency portable transmitter was loaned by Ralph Folkman, WSCOX of the Cleveland Police Department. This portable is the one featured in QST a few months ago.

From the top of the movie stand, short receiving antennas were strung in all directions. A common bus was used for ground connections with double-pole switches for grounding the antennas at night. Our operating period was approximately 11 a.m. to 7 p.m. We were forced to change the receiving antennas to the opposite side of the stand on the second day on account of telegraph pickup. This was called to the attention of the Western Union and Postal Telegraph officials on the job and they immediately instructed their men to build and install filters for all keys. These were installed the same day and interference practically eliminated from that source. With Mr. Spiller, WSACR, in charge of telegraph installations, we received most splendid cooperation.

We in turn caused slight interference to the public address system at the grandstands. To work together we had a special telephone in-
stalled from the announcer’s stand to our shack. We called when going on the air and they would tell the crowd, “Standing by for short waves” and then rebroadcast our transmission to the crowd. On one occasion when the coast to coast N.B.C. network was on the air, they also announced, “Standing by for short waves.” Mr. Logan issued orders the first day that short wave radio should have the air any time required, all other equipment to stand by for us. Everything worked out on a cooperative basis.

Each station was equipped with a monitor as described in QST and all stations checked with the monitor at the control station at Pylon No. 1. We were in the band at all times.

Pylons Nos. 1, 2, 3 were used in all 5-mile course races and Pylon No. 4 also in the 10-mile events. Pylon No. 4 was the thrill point of the races for both operators and the spectators. Several hundred people assembled at this pylon each day to see the planes go round in the vertical bank position. Each time a plane would pass at this pylon, there would be a slight decrease in volume due to the plane changing the wavelength of the antenna. In general each pylon operated with such ease that it was hardly necessary to report a plane passing as the roar of the motors would be heard at the receivers in the home pylon, although we had to have identification data on each contesting plane.

Race event bulletins were distributed each day from Contest Committee headquarters, giving all data on events except plane numbers. Jim Turner was stationed at a special telephone in the Judges’ stand at the top of the Administration Building, Huddleston, WSDBU, operated the other end of this ‘phone which was one of the special “ringer type” station-to-station ‘phones. Turner would announce a race to Huddleston, giving event number, plane numbers, type of ship, number of laps, 5- or 10-mile course. He took all this information down on paper, handed it to Gyssler at the transmitter and then Pylon No. 1 went on the air with “QST All Pylons.”

As all pylons used loudspeakers, they could hear Pylon No. 1 all over the shack and on one occasion No. 2 operator was on top of the pylon and heard No. 1 call him. Each pylon would acknowledge the “QST” through the separate receivers at the home station. If required, additional information would be given. Pylon chief operators would then inform the judges and scorers at each pylon of the data on the next contest.

Planes would then take off at specified intervals and when the first plane would cross the line, Pylon No. 1 would flash “Plane No. 139 off, Pylon No. 1 off air ‘till completion of the race.” Pylons would then report in turn: “Plane No. 139 past Pylon No. 2 first lap O.K.”, “Plane No. 139 past Pylon No. 3 first lap O.K.”, “Plane No. 139 past Pylon No. 4 first lap O.K.”, etc., including brief data on fouls, or forcedowns as these occurred. This method worked well throughout the races. Reporting continued on throughout the number of laps of the specified race. All this data was carefully written down by the operator in the home station, monitoring the transmissions of a particular pylon. After the race, each outlying pylon reported, “Last plane past pylon No. — standing by.”

Pylon No. 1 would then go on the air with “QST all stations please report all fouls or other data on the last race.” Each station would then report, “All planes passed Pylon No. 3, etc., O.K.” or “Plane No. 222 fouled Pylon No. 4, 9th lap,” and any other data of interest, then report, “Standing by.” No. 1 would then go on the air again and report all O.K., stand by for QST on next race, then sign off. As transmitters were on at all the outlying pylons during the race, no calling was done between races. All data broadcast by each pylon was given to the chief operator by the chief judge. They called out all plane
numbers, laps, fouls, etc., and the judges’ names were given with the final report from each pylon. This, of course, made the report official as the reports decided the winning of the race or disqualification in case of fouls. Reports of a certain plane passing any pylon were in the judges’ stand before the plane was out of sight of the pylon reporting.

All of these operations are recorded in a movie made by our official club photographers, Cliff Barnes and Frank Heisler of the Alpha Moving Picture Corp. This film will be available for showing at radio club meetings anywhere in the country, simply by paying the transportation charges. A complete set of thirty still pictures is also available.

The Master Control Station was located at the grandstand (Pylon No. 1). Our shack consisted of the ground floor of the motion picture stand. The transmitter was designed and built by Al. Gysler, WSBXB. A t.p.t.g. circuit with two UX-210 oscillators, two UX-250 modulators and speech amplification was used, the panel being equipped with meter jacks for measurement of all circuits. Having a.c. at the home pylon, this station was operated from the 110-volt outlet which usually checked around 100 volts. (The hot dog stands probably used the missing 10 volts at a dime apiece.) In this pylon were four receivers, one used for each of the three outlying pylons, and the fourth for control of all pylons. Three of the receivers were a.c. operated, also designed and built under direction of Gysler.

The fourth was the 1929 type as shown in QST. The a.c. receivers were installed by Al. Gysler, Al. Ziska, and Frank Heisler, and the d.c. job by N. C. Foster, WSazx. Except for the replacement of one receiving tube, we had no trouble at all with the equipment at this pylon. Pylons Nos. 2, 3 and 4 used antennas and counter-voices from pylon to shack, and Pylon No. 1 used a Zeppelin feed system. This had to be changed several times, but Gysler had it in operation at all times without delays.

On account of the large number of events scheduled, the Race Committee was forced to operate an additional day. Mr. Logan told the fellows that if we did not stay on the air, they could not operate. The gang came through for the extra time; amateur radio never fails when called upon.

We made many friends: newspapers, local and national, gave us space unsolicited; race, Army, Navy, and police officials visited our installations and were very much interested in the layouts. We have several letters from the race officials of which we are very proud. What the gang in Cleveland put over at the National Air Races was done for amateur radio in general. Of course, we got a lot of fun and glory out of it for ourselves, but in general, it all goes to the great Amateur Fraternity held together by the A.R.R.L. and QST.

Strays

Thordarson has available a log book containing a large amount of valuable information on power supply, filament supply, and filter circuits. This booklet will be mailed to amateurs free upon request, which must be made on a QSL card which gives the call of the station. Address your cards to the Amateur Department, Thordarson Electric Mfg. Co., 500 West Huron St., Chicago, Ill.

New Call-book Ready


The book is in much the same style as before. The power-rating column is now omitted. Portables are indicated by footnote references. The book also contains a list of experimental and of technical and training school stations (X and Y licenses), the Q code, etc.

This book deserves amateur support. You should send for your new copy now.
Arctic Auroral Radio Interference

By Paul C. Oscanyan, Jr.*

EVERY returning explorer who has ventured to take radio equipment with him into the Arctic has been questioned as to auroral influence on his radio reception. The operators of stations situated within the Arctic Circle have all been questioned and in most cases the answers have conveyed little of direct scientific interest.

Aurora has long been classified as to type and action yet there is no definition of what it is. Science has been frustrated by the height of the aurora it must be borne in mind that this classification is intended only for association with this paper.

CLASS A1—LOW AND INTERMEDIATE-FREQUENCY INTERFERENCE CLASS

The type causing interference on the low and intermediate frequencies is similar to a suspended curtain. It appears to the observer to be touching the horizon and extending for a relatively short height up into the atmosphere. It varies in bulk (apparent density) and in constancy of situation and duration. During displays of this class, the interference manifests itself as a form of marked fading. Signals of the intermediate frequencies (300 to 500 kc) swing in and out, in fairly direct proportion to the auroral change. The observed aurora in these cases was extending its field of visibility along the horizon between the receiving and transmitting stations. The effect upon lower or higher frequencies was not noticeable. Diminution of the effect was reasonably relative to the variation from the mean of the frequencies observed to be effected. Limitations as to observable

* R. C. A. Communications, Inc., New Brunswick, N. J.
1 That is, no generally accepted authoritative definition. — Earron.
3 Prof. W. H. Hobbs, Director.

FIG. 1 — MAP OF THE REGION OF THE UNIVERSITY OF MICHIGAN'S MT. EVANS OBSERVATORY WHERE THE AURORAL STUDIES WERE MADE

Arrows indicate the general course followed by the auroral displays.

signals somewhat hampered us because of our being located at such an out of the way corner of the world. Ship stations (moored in quiet harbors) were our best sources. Signals from vessels on the transatlantic route and from Reykjavik, Iceland, also were affected and therefore added to our source of signals.
CLASS S2 — VARIABLE INTERFERENCE CLASS
(LOW AND INTERMEDIATE FREQUENCY)

Owing to the scattering of the A2 variable interference class of aurora, the effect upon any set of signals in a given frequency band was not so marked and of necessarily short duration, inconstancy being often a feature of such displays. The border line of auroral classification, in so far as radio is concerned, lies near this class.

CLASSES B1, B2, B3, B4 — HIGH-FREQUENCY INTERFERENCE CLASSES

Because of the large number of high frequency stations on the air at practically all hours, the high frequency interference classes of aurora were best observed. This type of aurora starts in the western or southwestern sky and is well above the horizon. Its direction of movement and apparent density are generally quite constant and the change in appearance progresses as in B1, B2, B3, and B4. The effect upon the received signal varies as shown in the direction of the arrow, "S", from normal, down to inaudibility and then back up the scale again until the display has passed on and the field of its influence has gone with it. The movement of the display is in the direction of the straight arrow pointing nearly toward true north (N).

What really offers the most interest is the fact that there seems to be a point which can be calculated. When the corona formation is nearest to 17 degrees (or more) above the horizon, and between the receiving and transmitting stations, the signal is most greatly influenced. It is interesting to recall the experiments conducted by our expedition in 19261 to ascertain the angles and effects of topography on the possibilities of reception, especially short wave signals. It also appears that the corona of these classes of aurora is of considerable atmospheric depth and, therefore, its action will extend over a large reception area.

Bearing the foregoing in mind, some connection can be evolved between the aural coronas and the "blanket effect" (obscuration of signals) sometimes noted in the Arctic.

There appears to be a form of disturbance of that part of the atmosphere of the earth, more readily classifiable as the radiosphere,2 responsible for the occasional night or even short series of nights when no short-wave signals can be heard. During such a period one may maintain a tedious watch for hours at a time and find that only occasional "peeps" will struggle through from even the strongest stations. The auroral displays during those "blanket effects" observed were not particularly remarkable either as to class or types of radio influence. Ship stations and the other longer wave stations came through with normal clarity and volume, and until we became aware of the peculiarities of this "blanket effect" we spent a lot of time searching for the trouble in our short-wave receivers.

Listening to the radio stations of the Hudson's Bay Ice Patrol and also the signals of the schooner Morrissey, while in Hudson's Bay, indicated that radiospheric disturbances move eastward and could be expected about 24 hours later, in most cases.3 We could not find any definite connection

2 The "radiosphere" may be considered that portion of the atmosphere in which useful radio waves travel; that is, between the effective reflecting layer and the earth.
3 The same "blanketing" effect has been noticed in the North Central part of the United States (North Dakota). Certain types of auroral interference contemporaneously affect reception on the high-frequency bands although reception on the intermediate-frequency broadcasting bands might be normal at that time. Twenty-four hours later, broadcast reception is completely "blanketed" with the
between these radiospheric and coincident atmospheric disturbances. Agitations of the radiosphere due to storms would account only in part for the occurrences noted.

Direct reference to the station log has been avoided, because it is desired to prevent emphasizing any one observation and to facilitate the general statements which may only be made when there is a relatively large amount of data to work from.

The English publication, *Wireless World*, has lately carried notes concerning the reception of signals reflected back from the aurora. Through this article one may observe what happens on the other side of that screen.

![Diagram](image)

**FIG. 3. — HIGH-FREQUENCY INTERFERENCE CLASSES OF AURORAL DISPLAY**

The displays progress in the direction indicated by the arrows "N". The lower arrows, "S", indicate the relative strength of received signals during the various stages of the display's passage from southwest to north.

Persons concerned with radio traffic transmission and reception will appreciate that expeditionary results are often of interest only to those who expect to revisit the spot explored or its neighborhood. However, in this case, the author wishes to point out a difference. Greenland lies directly within the great circle path between the middle western United States and Northern Europe. The logical line of flight is along the great circle and we already know that radio signals follow such a path in their travels. Therefore, the writer submits that these observations have tangible value to anyone about to transmit signals across the Arctic or about to fly across and depend in any way upon radio transmission or reception. It is certain that there is more information still hidden up there for the radio engineer and the author looks forward to the day when he can again go north and resume this fascinating field of research.

*(Continued on page 84)*
The Amateur and the C.C.I.R.

International Technical Conference Agrees Each Nation May Make Its Own Amateur Regulations—Move for Uniformity in Europe

By K. B. Warner*

The Committee on Definitions and Standardization recognizes that it is not actually possible to draw up regulations relative to licenses for amateurs which could apply to all countries of the world and that this question ought to be made the subject either of regional agreements or of national decisions.

With these words the first meeting of the C.C.I.R. abandoned its endeavor to effect international uniformity in amateur regulations and yielded to the demand of the United States and other nations that each administration be permitted to remain free to make its own regulations for amateurs, of course within the limitations imposed by the existing Washington Convention. This consummation of the matter must be very pleasing to North American amateurs, being exactly what we were working for.

I shall endeavor to give here an account of all the features of the conference that are interesting to amateurs. The news this time is all good news. I'll have to start out, I presume, by telling what C.C.I.R. means and "what all the shooting has been about."

These mystic letters stand for Comité Consultatif International Technique des Communications Radiotélégraphiques, which in English is the International Technical Consulting Committee on Radio Communications, an assembly of technical experts created by the Washington Convention of 1927. It is therein provided that such a meeting shall be held about every two years, consisting of the representatives of governments and operating agencies, to deal with technical questions which arise under the operation of the Convention. The committee can make no binding rules; its functions are advisory, its recommendations to be transmitted to the governments and operating agencies via the Berne Bureau. It was provided in the Washington treaty that the Netherlands administration would be the host for the first meeting, and so, about two years having elapsed since Washington, the Dutch government called the meeting to be held at The Hague from September 18th to October 2d.

To this conference the United States sent a strong and able delegation, of which I had the honor to be a member in the status of technical adviser, especially appointed with the approval of President Hoover in order to advise on amateur matters. I was the only member of the delegation who was not in the government service, and it should be said here in the interests of accuracy and completeness that my expenses were paid by the A.R.R.L. This, it may be seen, was a very special arrangement, significant in indicating the very real interest of this government in the welfare of its radio amateurs. Except for this special arrangement we would not have had representation, for we are neither a government nor a public-service operating agency and could not otherwise have participated. The chairman of the delegation was Major General Charles McS. Saltzman, U.S.A., retired, member of the Federal Radio Commission; and the other two official delegates were Major General George S. Gibbs, U.S.A., Chief Signal Officer of the Army, and Capt. S. C. Hooper, U.S.N., Director of Naval Communications. Then there were five technical assistants: Dr. J. H. Dellinger, chief of the radio laboratory of the Bureau of Standards; Dr. C. B. Jolliffe, of the same laboratory; Lieut.-Commander T. A. M. Craven, radio expert of the Navy; Mr. Gerald C. Gross (W3GG) of the engineering division of the Federal Radio Commission; and Mr. R. H. Norweb, attaché of the American legation at The Hague. In addition to this official delegation a dozen American operating agencies sent over a total of fifteen expert representatives, many of them famous names in international engineering circles. From the standpoint of amateur interest special mention should be made of the presence of that well-known amateur, Ralph M. Heintsz, W6XBB, representing the Robert Dollar Co., but who of course interested himself equally in the amateur matter.

The United States' preparation for this conference had been thorough. Ever since May of this year the Interdepartment Radio Advisory Committee had been holding meetings at Washington, attended by all American radio interests, in a preparation which extended right up to sailing time and resulted eventually in a large mime-
graphed book of American proposals, acceptable to all of our people. It was the duty of our delegation to secure the adoption of these views as far as possible. In this preliminary preparation both Vice-President Stewart and I participated at Washington, I in fact being vice-chairman of the preparatory committee on amateur matters. The C.C.I.R. cannot amend the Washington Convention: reallocation of frequency bands is not within its province; it is concerned with technical matters which arise in the administration of that treaty. Its great concern this year, of course, was with the high frequencies and particularly with measures that might enable a more effective use of the limited number of channels there to be found. Thus the most important matters on the agenda related to a channelling system, separation between stations, permissible tolerances, stability requirements, monitoring equipment, the necessary accuracy in frequency-meters, comparisons of national standards, and similar studies which might help to overcome the world-wide shortage in h.f. channels.

We amateurs were particularly interested in Question No. 11 of the agenda, a proposal carried over from the European regional conference at Prague last spring, calling for an endeavor to secure international "uniformity, so far as possible, in the technical conditions imposed on the holders of amateur licenses." The Washington Convention gives each administration liberty to assign to amateurs as much or as little as it desires of the bands made available for amateurs, to fix their power, the required degree of technical proficiency in the licensee, etc. Naturally it was our view that that was exactly what was intended by the Convention, but amongst European governments there was no particular uniformity in the domestic regulations for amateurs, some holding back part of the bands, some other parts, power varying all the way from a modest 10 watts to the terrible power of 50 watts, and so on. Let us have international uniformity in these regulations, said Europe, so we'll know where we are. Now from the standpoint of the North American amateur the meat of the whole amateur matter is simply this: international uniformity at The Hague meant the lowest common denominator of European agreement, which through prejudice and ignorance of amateur matters would be highly restrictive. Our case, then, was a very simple one: we rested on the obvious intent of the Washington Convention to leave these matters to the determination of separate administrations, or to regional agreements, always of course within the limiting provisions of that document; and we determined to resist flatly the proposal for international uniformity because we knew that if that were settled on the basis of a division of votes we would be senselessly restricted to European dimensions. This viewpoint was unanimously accepted by the preparatory committee in the United States and was written into the proposals which we carried abroad. Let me say that this was really a unanimous American view, in which we were supported as much by our commercial people as by our government people.

Thus prepared we arrived at The Hague, one of the most charming cities of Europe, opened up a suite of offices, established our stenographers and interpreters, and went to work. The conference sessions were held in a large hotel in the center of the city. We found that about forty-eight nations and colonies were represented, with a total of around 180 delegates, not counting the numerous people of the secretariat, Dutch reception committee, etc. The work of the conference was to be done by committees, so the American personnel was apportioned to the various committees in such fashion as to enable each man to serve where he was best qualified and most interested.

And so, after a colorful reception and formal opening session, we went to work in committees, to labor for two weeks until our results came before the closing plenary session which accepted them. The main amateur question was assigned to Committee II, and that story I want to present in detail. We had another matter too, the question of frequency-meters for amateurs, which came before Committee III-A where our spokesman was Dr. Dellinger, assisted by Dr. William Wilson of the A. T. & T. Co. This committee was concerned with frequency standards and frequency-meters for all types of services, amateurs being but one. On the amateur angle the European view was to make the use of frequency-meters compulsory, so as to insure that "these amateurs" stayed within their bands. Our government, and we amateurs too, of course, equally recognized the necessity of staying within the bands but we seriously doubted that a frequency-meter of reasonably low accuracy was the proper method to insure this. We had in mind our American idea of using a monitor against a receiver, where the limits of the bands will be found clearly delineated, as has been so often expounded in QST and the Handbook. The American viewpoint was that amateurs ought to be obliged to use apparatus and methods which satisfied their own government of their ability to stay within the bands. In some countries this might mean frequency-meters but it would give us the opportunity of showing our government that the idea of the monitor beating against the receiver is vastly more reliable. There was a merry little scrap in this committee for a while, Dr. Dellinger ably presenting the American viewpoint and explaining the method which we amateurs have found so effective. Eventually, by the process of many additional clauses and much changing of wording, the committee adopted the following satisfactory proposal:
“... that each country will take effective measures to see that amateurs remain well within the band of frequencies allotted to them, in particular in requiring of amateurs, if there be need, the employment of a frequency-meter or similar device.”

THE MAIN QUESTION

This Question No. 11, about uniformity in amateur licenses, was assigned to a committee presided over by General Ferrié. On September 20th, after disposing of some other problems before it, the committee reached the amateur matter. We had arranged that on this important subject our spokesman would be General Gibbs, with Dr. Jolliffe and myself as advisers, and with Mr. Heintz also in attendance. At this juncture General Gibbs introduced the United States' proposal that each administration be left free to make its own amateur regulations, with no further international agreement. Mr. J. W. Bain, of the Canadian delegation, immediately announced that Canada wanted to endorse and support in fullest possible measure the United States statement.

Let me pause here to say that Canada at this conference richly redeemed herself from the unfriendliness of her spokesman at Washington, giving the United States 100 per cent backing on amateurs; in fact, I do not recall an instance in the amateur discussion where the next speaker, after an American, was not the Canadian representative giving the fullest measure of support to that viewpoint — it was FB! Getting back: the U. S. S. R. (formerly, but not now, Russia) and Spain supported Canada and the U. S. A., and so did Great Britain. That sounds like a different line-up than Washington, doesn't it? Yes, Great Britain's spokesman, Mr. A. H. Read, of the G.P.O., supported the United States and opposed even a regional European agreement; Great Britain wanted each nation on its own, exchanging data via the Berne Bureau. But France, Germany and Czechoslovakia maintained the desirability of effecting an agreement on the major provisions of amateur administration. It was plain to us Americans that any tendency towards such uniformity was confined to Europe, and although we had no objection to a European agreement as such, if it left us out, we said it did not belong in the C.C.I.R. proceedings. General Ferrié ruled that interested nations could submit a group proposal, if they so desired, which our committee could consider and then either accept or reject. Who wanted to join in this study? We kept out, and so did Canada, Great Britain, Spain and the U. S. S. R., but the following joined for that purpose: Belgium, Belgian Congo, Czechoslovakia, France, Germany, Italy, Japan, Morocco, the Netherlands, Norway, Poland, Romania and Tunis.

And so we adjourned while the petit comité undertook their dirty work. What with inter-

ruptions by excursions and disagreements amongst themselves, it was the 24th of the month before they were ready, and then our committee met again to hear them. It was an interesting report with an ingenious preamble and a whole set of detailed regulations, many of them frankly administrative in character. I noted in passing that it provided for 50 watts power, 100 kilocycles out of the 3500-4000 band, and other things in this same general key, but we were not interested in arguing the pros and cons of each technical matter. Our spokesman, again General Gibbs, characterized the proposition as an interesting and useful guide to the nations which had drafted it but not applicable to other nations and other groups; it involved some questions which were not technical but entirely regulatory; it violated the Washington Convention which plainly left each nation free on these subjects; it could not be regarded as applicable to the United States but we had no objection if it was intended only for use within the group who prepared it. Again Canada was the first to support us, followed closely by U. S. S. R. Then Mr. Adolpho Ballivian, delegate of Bolivia, spoke similarly, opposing any extension of the Washington provisions. Mr. O'Monahan of the Irish Free State was in entire agreement. Mr. Cota of Mexico was of the same opinion. Mr. Beakes, for Costa Rica, supported the view. (You see, fellows, somebody had been doing a little missionary work during those four days.) Mr. Read of Great Britain agreed that they prefer to be left on a national basis. China (spokesman XLI) supported that view. So did Colombia, especially because amateur radio is only beginning there and the administration does not want to impede it.

Well! It rather looked like our view was dominating the meeting. I looked around the room and noted the following additional delegations which to my knowledge felt the same way about it and had come there prepared to say so: Brazil, Chile, Nicaragua, San Domingo and Siam. That, with the others, was some crowd, and incidentally a beautiful example of the Americans hanging together. It was apparent that if this question came to vote in that meeting it would be defeated easily. But it never came to that. Our remaining friends did not even need to speak their piece. Nor was there any use in any European speaking in favor of the proposal — it was obviously lost. So the chairman announced that on our minutes the proposition would appear as a proposal submitted but not accepted, a useful guide to the administrations which drafted it, and interesting information to other administrations. To that proposal there was certainly no objection on our part, and so it stood. It is from this committee action that the statement which opens this article finally resulted and was unanimously accepted at the closing session. It is almost needless to say that it fully met our views.
General Gibbs handled the amateur question, as the spokesman of the United States, in masterly fashion. He was out to protect the American amateur and he did it. I suppose there are some of QST's readers who still do not know who he is. He is the chief of our Army Signal Corps, with whom A.R.R.L. has the affiliation which has resulted in the Army-Amateur Radio System. It is stated in that affiliation that one of its purposes is "to render such encouragement and assistance as may be desirable to firmly establish and perpetuate the American amateur." (QST, p. 21, March 1929.) Here was a concrete example of that assistance. It was F-B! I must say that throughout this show we received the finest kind of encouragement and assistance from all of our government folks, and I see in it the complete justification of our A.R.R.L. policies of reasonableness and high ethics and a renewed demonstration of the wisdom and value of our close relations with our Army and Navy.

Having just returned from The Hague and hurriedly preparing this report to reach our members as soon as possible, I must confess that I am not yet well informed on the non-amateur results of the C.C.I.R. meeting. They pretty well avoid entanglements, however, and I know that our people generally regard them as sound and helpful. Some matters were left unfinished, and these have been "farmed out" to various nations which volunteered to conduct a study on them, in preparation for the next conference, which is to be held at Copenhagen in the summer of 1931.

A EUROPEAN AMATEUR "ARRANGEMENT"

The failure of the C.C.I.R. to adopt amateur regulations which would be uniform throughout the world was a disappointment to many of the European administrations. They felt the need of some measure of uniformity in Europe. Effecting the same by a regional agreement is quite within their rights, however, and in fact the United States encouraged them to undertake it if they so desired, as we in fact have in part in North America. Our only point was that it couldn't be part of the C.C.I.R., couldn't be made binding upon us just because Europe wanted it.

It was not surprising, then, that the delegates of most of the European administrations had an unofficial meeting shortly following the C.C.I.R.'s rejection of the European paper, for the purpose of forming a regional agreement on amateurs. This they did, 23 administrations in all, 13 of them in Europe. The document was deposited with the Berne Bureau, to be communicated to the administrations. It is not a very binding affair, since each administration has the right to modify the application of its provisions to any extent permitted by the Washington Convention under no other requirement than that she announce her modifications when ratifying. Similarly, non-signatory administrations are invited to signify their adherence, stating their own reservations if any. It is, however, a document of the greatest significance to amateur radio in Europe generally. Great Britain, the Irish Free State and Sweden refused to sign it; Denmark didn't; Portugal and some of the other smaller countries of Europe weren't represented at the conference; but in general terms it seems that here is uniformity, or a close approach to it, in much of Europe.

We present herewith the text of the "arrangement," with apology for the lack of smoothness in the translating, necessitated by the haste which we must make to meet our press date with this article.

INTERNATIONAL AGREEMENT
CONCERNING THE REGULATING OF AMATEUR LICENSES

The Delegates of the administrations of the countries hereunder, present at The Hague on the occasion of the first meeting of the International Technical Consulting Committee on Radio Communications:

French Equatorial Africa  Hungary
French and other French colonies  French Indo-China
French Equatorial Africa  Madagascar
Algeria  Morocco
Germany  Norway
Austria  Netherlands
Belgium  Poland
Bulgaria  Romania
Belgian Congo  Switzerland
Spain  Czechoslovakia
Finland  Tunis
France

In accordance with Article 14 of the Washington Convention dealing with special agreements:

Recognizing the services rendered by the studies and the experiments of amateurs and without wishing to restrict their interesting researches:

Considering that the operating possibilities given to amateur stations by the General Regulations of Washington must not permit them to cause any inconvenience to the traffic of stations of general interest;

That the increasing development of radio communications at great distance establishes a solidarity of interest between the countries of the entire world;

Having reaffirmed the impossibility of effecting an actual agreement among all the countries of the world represented at the C.C.I.R. with respect to uniformity in minimum conditions to be imposed in each country on private transmitting stations known as "amateurs";

Considering, nevertheless, that there is very great benefit in establishing a uniform basis of regulation in the matter because it is not practically possible for a country to undertake to regulate the work of its amateurs without taking into account the inconvenience that these latter may cause to the radio services of another country;

That the adoption of regulations of a general order for a group of countries would have the effect of preventing disputes between the amateurs and their respective administrations;

Have considered it necessary to establish the basis of a private general agreement the adoption of which they will propose to their respective administrations with the least possible delay.

This agreement, while leaving to each country independent regulation and surveillance of the operation of amateur stations installed in that country (and) the imposition of all domestic regulations, administrative or otherwise, which it deems necessary, carries the following provisions:

1. No person will be authorized to use a transmitter be-

(Continued on page 70)
The Single Control Transmitter
By George Grammer*

ONE of the great drawbacks of amateur transmission for the beginner is the multiplicity of controls and adjustments which seems to be necessarily attendant upon use of our present-day "standard" circuits. The poor chap is confronted by an array of things which have to be done to a transmitter to get the right kind of signal out into the ether; and if, as is often the case, he has only limited power and no indicating instruments at his disposal, with the nearest ham help miles away, he is truly up against it. It was with the hope of dispelling some of the bewildermens of this class that the little set to be described was built. In spite of its simplicity, it is a capital low-power outfit, suited to the requirements of the newest beginner or most proficient operator.

Omitting any consideration of oscillator-amplifier sets, our self-controlled transmitters usually have at the very least four, and sometimes more, adjustments which have to be made, no one of which is independent of the others. It may be argued that this in itself is no great disadvantage, since the aim is to find the best adjustment and then let the set alone—but it rarely works out that way. There is too much temptation to change something, especially after a few calls have gone unanswered. Then, too, there is the antenna ammeter, with its fiendish beckoning to drain the last drop of current from the set, in spite of what the monitor and our better sense tell us. Besides it takes long practice to get the "feel" of a set, and the new man wants results first and experience afterwards.

Despite the vociferous refutations which its adherents will no doubt immediately voice, the Hartley circuit with a high-C tank is a hard one for a beginner to adjust for reasonable output. The filament tap on the inductance is a critical and unsatisfactory proposition, especially on the higher frequency bands where the coils are physically small. The Colpitts circuit does not seem to be so popular with the newcomers, but is perhaps even worse than the Hartley from the standpoint of adjustment. Because the two condensers in series make it impossible to change excitation without altering the frequency at the same time, and vice versa. It is true that a fixed feed-back ratio can be obtained by using three condensers, two in series and one, the main tuning control, across the whole coil, but this only partially eliminates the difficulty, and introduces an additional control.

There remains the familiar Armstrong circuit, the tuned-plate tuned-grid, which is about the easiest of the three to handle, since the excitation and output circuits are adjusted separately by means of condensers, and the two adjustments are comparatively independent.4 There is also the additional advantage that series-feed plate supply may be used, lessening the work of the r.f. choke, a thing which cannot be done in either the Hartley or Colpitts without split-

widest of our three most popular bands, with practically the same efficiency at all frequencies.

The lower the decrement of the grid tuning circuit, the more critical will be the grid adjustment. Consequently, for fixed grid tuning, extremely low resistance is not particularly desirable, since we want the tuning of this circuit to be broad enough

| L1 — Plate Coil. See photograph. |
| L2 — Grid Coil. See photograph. |
| L3 — Radio frequency choke. Any commercial receiver-type short wave choke will do, or it may be made by winding 2 inches of No. 38 d.c.e. wire on a half-inch tube or wooden dowel. |
| C1 — 2000 μfd. (0.00002 μfd.) micro fixed condenser, receiver type. |
| C2 — 2000 μfd. (0.00002 μfd.) micro fixed condenser, receiver type; if plate voltage does not exceed 500. |
| C3 — 5000 μfd. (0.00005 μfd.) micro fixed condenser, receiver type. |
| C4 — 550 μfd. (0.00055 μfd.) micro fixed condenser, receiver type. |
| C5 — 500 μfd. (0.0005 μfd.) variable condenser. Any good receiving condenser will be satisfactory. |
| R1 — Center-tapped resistor, 5 to 100 ohms total resistance. |
| R2 — Grid leak resistor, 10,000 ohms. Any small resistor rated at 5 watts or more will do. |

Two General Radio or similar stand-off insulators will be necessary, as well as 7 Farnsworth clips, some miscellaneous small machine screws and nuts, and a few feet of fine wire. A UX-210 with suitable power supply should be used.

to hold over quite a range of frequencies. The necessary tuning capacity can therefore be supplied by the grid-filament capacity of the oscillator tube, the distributed capacity of the grid inducance, and the capacity of the associated apparatus. It remains merely to wind a coil of the proper size to tune to the frequency band on which it is desired to work. These coils will be described in more detail later.

So far we have a single control oscillator. There is still the antenna problem, probably the worst of all, with its usual coupling coil and tuning condenser or condensers, and the necessity for some form of misleading current indicator. Happily the solution was contained in an article on the single wire fed Hertz antenna in the September, 1929, issue of QST. This type of antenna and feeder system at one stroke eliminates the troublesome adjustments mentioned above and at the same time provides a radiating system of excellent efficiency. For the benefit of those who may not have a copy of the September issue, the antenna itself is the usual Hertz so popular with amateurs, the energy being transferred to it from the oscillator by means of a single wire, untuned, transmission line of any convenient length. As in the case of all Hertz antennas which are not cut to allow the insertion of tuning apparatus, the antenna length determines the operating frequency.

It can thus be seen readily that the transmitter to be described is not an oscillator alone, but includes an antenna system as well. The oscillator itself may, of course, be coupled to any of the usual types of antennas if desired, but the simplicity of adjustment and the "fool-proof" features are then lost.

CONSTRUCTION OF THE SET

The schematic wiring diagram is shown in Fig. 1, together with the constants, while the photographs show how the set looks when constructed. The layout chosen is one which allows short r.f. leads, although others equally good will no doubt suggest themselves.

The grid coils, L2, are wound with No. 30 d.c.e. wire on 1½-inch lengths of 1-inch tubing, which may be of bakelite, paper, wood, or any other of the common insulating materials. After being wound the coils should be given a coat of Collodion or clear Duco varnish to keep them permanent. Two small brass angles, obtainable from any hardware store, serve as both connections and supports for these coils, the ends of the winding being brought out to small machine screws inserted at the ends of the coil forms.

The baseboard itself is a bread-board 1½ inches long by 10 inches wide. Two General Radio stand-off insulators are mounted at one end, as shown in the photographs, and serve as a support for the plate coil, L2. These insulators should be placed 4½ inches apart between centers. This mounting is very solid mechanically, and allows easy changing of coils, if changes from one band to another are frequent, it might be advisable to use wing-nuts to fasten the coils down instead of the hexagonal nuts furnished with the insulators.

The plate coils themselves are ½-inch soft copper tubing, wound around a pipe 2½ inches outside diameter. The ends of the coils are flattened in a vise and drilled to fit over the machine screws in the G.R. insulators. The 3500-ke. coil should have the turns so spaced that when finished it will just fit on the insulators without having the ends bent out, as is done on the coils for the higher frequency bands. The spacing between turns on the 7000-ke. coil is about 3/16-inch, and on the 14,000-ke. coil about 3/8-inch. After the coils are finished they should be polished with fine steel wool, thoroughly cleaned with alcohol, and
given a coat of clear Duco greatly diluted with "thinner," to keep them bright.

The tuning condenser, $C_2$, in this case a 21-plate Cardwell, is mounted on small brass angles of the same type used for mounting the grid coil. Connections between the condenser and the coil are made by pieces of copper tubing, since the leads in the tank circuit must be as heavy as the inductance itself. The connection to the insulator at the front of the baseboard should be from the rotary plates, that to the rear insulator going to the stationary plates. This puts the "hot" end of the coil at the back of the set and reduces the effect of hand capacity.

The plate by-pass condenser, $C_3$, is mounted close to the tuning condenser on the baseboard. The radio-frequency choke, $L_3$, is just behind it. The filament by-pass condensers, $C_2$, are directly behind the tube socket, while the grid condenser, $C_4$, and leak, $R_3$, are to the right of them. The condensers in this set, which are Sangamors, are mounted flat by means of machine screws running up through the baseboard. The antenna insulating or blocking condenser, $C_1$, is mounted on the left rear corner of the board, one side going to a Falmestock clip for the antenna connection, the other to a piece of flexible wire 8 inches long terminating in a small spring clip which fastens on the plate coil. The filament center-tap resistor, $R_3$, is mounted directly on top of the filament by-pass condensers.

All connections are run to the rear of the board where they terminate in Falmestock clips. From right to left in the photograph, the first two clips are for the key, the second two for filament supply, and the last two are for minus and plus high voltage, respectively. The wiring of the whole set is quite simple, and in case it is to be duplicated no difficulty should be experienced in following the diagram and photographs.

THE ANTENNA

The antenna is a very important part of the outfit, and the dimensions must be correct. The chart, Fig. 2, shows how to determine the right length to use for the working frequency chosen, as well as the proper point at which to attach the feeder. For the 7000-ke. band, multiply the frequency by 2 and divide all dimensions by 2; for 14,000-ke. multiply the frequency by 4 and divide all dimensions by 4.

The same antenna may be used for all three bands by making it the proper length for the lowest frequency used. It must be noted, however, that a length must be chosen so that the harmonics will fall within the limits of the higher bands if the band-changing feature is desired. For instance: If the antenna is to be used on all three bands, the length must be between 132 and 135$\frac{1}{2}$ feet, since only the harmonics between 3500 and 3600 ke. will fall within the limits of the 14,000-ke. band. Similarly, if the antenna is to be used on 3500 ke. and 7000 ke. only, the length must be between 130$\frac{1}{2}$ and 135$\frac{1}{2}$ feet, since only the harmonics of frequencies between 3500 and 3650 ke. will be in the 7000-ke. band.

The point at which the feeder is attached to the antenna is important. The data in the chart should be followed exactly. Once the operating frequency is chosen, draw a horizontal line across the chart for that frequency. The points of intersection of this line with the curves will give the proper antenna length and the distance from the center of the antenna at which the feeder should be attached, respectively. These distances should be measured as accurately as possible, preferably with the antenna stretched tight, as it will be when erected.

The antenna and feeder should be No. 14 wire, preferably enameled. The feeder can be any length, since its length has no effect on the dimensions for the antenna given in Fig. 2. Another point, which will be appreciated by the fellow with limited space at his disposal, is that the antenna itself need not be stretched in a straight line, although it is better to have it as straight and clear of surrounding objects as possible. The feeder can, of course, be bent as may be convenient, although it should be kept several feet away from roofs, walls, etc. Both antenna and feeder should be stretched tight so they will not be affected by wind.

TUNING

It is not until the time comes to start the process of tuning up that the real simplicity of the set begins to be apparent. The coil sizes shown are correct for use with a UX-210 with about 500 volts on the plate. A radio-frequency ammeter
in the feeder is of little utility, because the current with a UX-210 operating at usual input (25 to 50 watts) will be in the neighborhood of only 50 to 100 milliamperes. A plate milliammeter is a good thing to have but not entirely necessary. If the dimensions for the grid and plate coils are followed exactly, as they must be if best results are to be secured, the plate current will be just about what it should when the set is properly tuned to the antenna frequency. While the set will oscillate over a wide frequency range with each set of coils, the sizes specified for the grid coils are such that the optimum output and efficiency will be obtained in the respective amateur bands. The length of the antennas determines the transmitter frequency so closely that if it is built correctly and the oscillator tuned to it, it is almost impossible to be out of the band, even if no frequency meter is available. However, a frequency meter and monitor are as helpful with this set as with any other, and it is strongly recommended that they be used.

The problem, therefore, is to tune the oscillator to the antenna. Only one very simple piece of apparatus is necessary for this, the flashlight bulb and loop of wire shown in the photograph. The process is as follows: With the antenna clip disconnected from the plate inductance, press the key and bring the loop near the end of the plate coil at the front of the set. The plates of the tuning condenser should be about 3/4 of the way in, assuming the set is to be used on 3500 kc. (With the coils and condenser described, the center of the 3500-kc. band will be at approximately 85 on the condenser scale, 7000 kc. at 75, and 14,000 kc. at 45. The condenser has a straight line capacity curve.) The lamp should light, indicating that the set is oscillating, and the loop should not be brought too close to the coil or the filament will burn out. It will probably be found that the lamp will light when the condenser is turned over about 50 per cent of its scale.

The antenna clip should now be put on the plate coil four or five turns from the front end (the end connected to the rotor of the condenser). Hold the loop steady a few inches from the coil, and swing the tuning condenser over the upper portion of the scale. As the dial is turned the lamp will get dimmer, and if the loop is held far enough from the inductance a point will be found where it will go out. Moving the condenser beyond this point will make the lamp get brighter again. The point at which the lamp goes out is the point at which the oscillator is tuned to the antenna. Now move the antenna clip toward the front end of the coil one turn at a time, swinging the tuning condenser, as before, each time a change is made. The dip will always occur at about the same place on the condenser, but as the clip is moved toward the front of the coil it will be less pronounced. Continue this until the dip is just perceptible. Then move the clip back toward the plate end of the coil one turn, tune as before and, as a final adjustment, set the condenser at slightly less capacity than the point at which the dip occurs. The signal should be checked at this point by means of a monitor or by tuning the regular receiver to a lower frequency band, as the final adjustment of the tuning condenser sometimes has a very noticeable effect on the tone. There should be just enough detuning to make the frequency stable and the note clear.

The tuning for the 7000- and 14,000-kc. bands is done in a similar manner, except that the clip should be moved only a fraction of a turn at a time. The number of coupling turns will vary somewhat, depending on the frequency used and whether the antenna is being operated on its fundamental or on a harmonic. In general, about 3 turns will be sufficient on the 3500-kc. band, 1 on the 7000-kc. band, and 1/4 to 1/2 turn on the 14,000-kc. band.

Since a Hertz antenna will work quite well within a narrow band of frequencies about its fundamental, tuning over a small range of frequency is permissible. For this reason, it is possible to have the frequency fall outside the limits of the amateur bands if the antenna length chosen is near one of those limits and the tuning is not exactly correct. This is especially true when operating on 7000 or 14,000 kc., particularly when tuning to a harmonic of the antenna, the reso-
nance peaks on the harmonics not being as sharp as on the fundamental. A frequency-meter or calibrated monitor is therefore highly advisable.

Although this set was built primarily with the idea of working out something which would offer the minimum of constructive and operating difficulties, there has been no undue sacrifice of efficiency for the sake of simplicity. In fact, with so few controls, the chances are that a higher overall efficiency will be obtained than could be expected from the average amateur transmitter in which there are so many opportunities for maladjustment. It is not offered as a panacea for all transmitter ills, but despite its lack of complications it will compare favorably with any set of equivalent power capable of producing a "1929" signal.

A SUGGESTION FOR BEGINNERS

While monitors and frequency meters are every bit as essential to the operation of all good amateur stations as the receiver and transmitter, most beginners, sad to relate, put off constructing them until they get tired of guessing at what they are doing. This generally occurs months, and in some cases even years, after the transmitter has been functioning with apparent success. Since we know that the number starting off hopefully with only a receiver and transmitter is going to be quite large, we shall offer a few suggestions on getting started which do not require the use of a monitor and frequency meter, although it is strongly recommended that they be constructed at the earliest opportunity.

![A REAL BEGINNER'S VERSION](image)  

This one was built from the instructions given above by one Headquarters Mail Clerk, Ralph Hendin, so his first transmitter. Just to show that it is not necessary to make an exact copy of the original model, he has incorporated a few original ideas of his own. A National tuning condenser is used instead of a Cardwell and the grid coil is made plug-in by using G.R. jacks and plugs. Needless to say it works every bit as well as its forerunner.

In the first place, the frequency band on which every new man should make his first bid for the world's attention is that between 3500 and 4000 kc. The glorious super-DX possibilities of the 7000- and 14,000-ke. bands may have been extolled by an ardent ham friend, but in his enthusiasm he probably forgot to mention the freakishness of 14,000 and the congestion on 7000 kc. There is much good DX to be done on 3500. There is also the advantage, of prime importance to the beginner, that it is easy to get a set working right on this band. The interference is comparatively negligible and signals are dependable at all seasons. In addition, there is the opportunity for pleasant QSO's and rag-chewing,

![FIG. 2.—ANTENNA AND FEEDER DATA](image)

While the above curves are for fundamental operation in the 3500-ke. band, they apply equally well to 7000 kc. by dividing all dimensions by 2, and to 14,000 kc. by dividing all dimensions by 4, simultaneously multiplying the frequency by the same factor.

Traffic handling, participation in Army and Navy communication work; in fact, all the joys of operating as opposed to DX hunting. It is an ideal band for learning correct operating practices and improving code speed.

A good way to start out is to build a set such as is described above, making the plate and grid coils for 3500 kc. A UX-210 tube should be used with about 500 volts of the nearest thing to pure d.c. it is possible to get. If for any reason such a plate supply cannot be had, some form of rectified a.c., or as a last resort, unrectified a.c. may be used. The investment in a power supply is quite an item to some of our younger members who have more eagerness to get on the air than cash to do it with. 150 volts or even less supplied by a B battery or eliminator will tide over the period between desire and fulfillment for such as these. If the UX-210 is out of reach at first, a UX-201-A may be substituted with practically as good results at low plate voltages. Some other types of tubes will also work in the set without any changes being necessary, but if the grid- filament capacity of the tube is very much different from that of a UX-201-A or UX-210 a change in the number of turns in the grid coil may be necessary. It is better to stick to the UX-210 or UX-201-A.

(Continued on page 84)
Seventy-One Rounds
The Farewell Party at W1AOZ
By The Old Connecticut Yankee

W1AOZ, on the Rock Bound Coast, with tears in his eyes, closed down after four years of operation with the first farewell party or Long Distance Talking Marathon officially recorded on our thermometer. (If anyone else has had one, I beg their pardon.) The Farewell Party gives an idea of what can be done with a low-power 'phone and brings to light some interesting figures on who is listening in on the amateur bands.

This party was advertised by 'phones all over the east for a week and a half in advance, and thanks are extended to those who cooperated and helped put the party over.

On the night of Sunday, September 22, 1929, at 3:45 p.m., E.D.S.T., the bending started with Round One and W8BXY, the Old Backwoodsman, as the first combatant. The party continued until 4:45 a.m., September 23rd, making 13 hours on the air. The Old Connecticut Yankee was at the mike all except 15 minutes for supper, when W1BDS did his stuff. During this time, 71 stations were worked in the following states: New England, New York, Pennsylvania, New Jersey, Ohio, West Virginia, Maryland, District of Columbia, Indiana, Illinois, Michigan, Kansas, and one station in London, Ontario. Eighty-eight letters and cards were received the week following the party; 13 came from men who expressed their intention of becoming transmitting amateurs, 20 from BCLs, 6 from "c.w." men, and the rest from 'phone men who either worked or envied with the result that his house burned down. But telegrams were "acknowledged" just the same, even if we did write them ourselves. As early as 5:15 we acknowledged the following:

W1AOZ,
Waterford, Conn.
Your program coming in fine on 340 meters.
Your announcer's great but when does the music start?

A. B. C. L.

W1AOZ,
Waterford, Conn.
You're one more station I won't have to worry about.

Rev. Weston, R. I.,
Boston, Mass.

At 6:15 the warning whistle sounded; 10 seconds, and the gong; end of "Round 18." During this time no stations were called, but were picked up one after another at the end of each round. At 8:03 some more telegrams "came in":

and heard W1AOZ on the night of the 22nd. Every person QSO'd or writing received one of the QSL cards shown in the cut and drawn by Martin Branner, the man who draws "Winnie Winkle."

Five telegrams were received the next day, due to the fact that the special Western Union wire to the studio was out of order. This resulted from one of the 12 people on the line getting green with
W1AOZ, Waterford, Conn.
What are you trying to sell?

UNCLE DAVE,
Albany, N.Y.

W1AOZ, Waterford, Conn.
Save a card for me; my wife wants something to amuse the baby.

W2QN, Pelham Manor, N.Y.

More "telegrams" at 11 p.m.:

W1AOZ, Waterford, Conn.
Best wishes from me and the family.

HERB. HOOVER,
Washington, D.C.

W1AOZ, Waterford, Conn.

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**THE CIRCUIT DIAGRAM OF W1AOZ'S CRYSTAL CONTROLLED 'PHONE**

C1 — 500-mfd. fixed receiving condenser.
C2 — 6000-mfd. fixed receiving condensers.
C3 — 2-mfd. filter condenser (1000 volts).
C4 — 1000-mfd. fixed receiving condenser.
C5 — 250-mfd. variable receiving condensers.
C6 — 250-mfd. variable transmitting condenser.
C7 — 500-mfd. variable receiving condenser.
C8 — 10 turns tubing wound 5" diameter.

Plate supply for modulator, Class C amplifier and oscillator uses 2 UX-210 tubes in full wave circuit and a filter consisting of a 50 henry choke and 1 1/2 mfd. of capacity. "A" and "B" substitute used on speech amplifier. Grid bias supplied by batteries.

---

W1AOZ, Waterford, Conn.
Best wishes for a Happy Yom Kippur. Universal Pictures for the next year will be bigger and better.

CARL SCHMIDT,
Hollywood, Calif.

At 10:17, W1AOZ reached "Round 46" with W8BJW in Cleveland, Ohio, when the official egg report was given out, summing up the entire season for the 2000 white leghorn chickens. Nearby Henry Brown and Nearby Henry White came over to the house and it was decided that the best cure for lice on chickens is one of W1AOZ's cigars in a gallon of water, the hens to be bathed in the nicotine solution.

The drawing is of W1AOZ's only rooster knocking the tar out of Nearby Henry Brown's duck during one of the rounds.

Can offer you $56.37 for the cow if it hasn't T.B.

W2FR, Lakehurst, N. J.
The Receiver at W1AOF
Which Incorporates New and Novel Ideas

By H. C. Wing* and Clark C. Rodimon, Assistant Editor

Some time ago Mr. H. C. Wing, owner and operator of W1AOF, was in the office paying us a visit. He was looking around for some ideas on a new receiver he contemplated building. It seemed that the transmitter was working to perfection and that he needed a receiver to do it justice. We displayed what we had in the way of receivers at that time, which wasn’t so much, as they get torn apart as fast as they are built. We had nothing to suggest beyond a carefully-designed peaked audio screen-grid receiver. Just about this time W1MK had been telling fellows over the air of a new six-tube receiver just finished at that station. Mr. Wing, having overheard some of the remarks and enthusiastic comments, decided that he would like to build one like it. When Mr. Wing left this office he was equipped with diagrams, our well wishes and a suggestion that he use his ingenuity.

A few days ago Mr. Wing dropped in to say “hello.” We were glad to see him and had quite a rag chew. Then we were asked if we would like to see a new receiver. Yes, we certainly would. The photographs reproduced in this article illustrate what we saw and why we became so enthusiastic about the receiver’s features.

Here is a receiver that has a frequency coverage of 2000 to 15,000 kilocycles without pulling off the lid to change coils or condensers. It hits three of our amateur bands and spreads them as broadly or cramps them as closely as the operator may desire. Here is a solution to our problem of plug-in coils. Peaked or flat audio amplification may be had at will. This is all accomplished by means of knobs on the front of the panel. Heretofore we have had to put our hands inside our sets to change coils when going from one band to another and more times than not our hands came out faster than they went in because we forgot to disconnect the B supply. We allowed our wrist to become a “live” conductor across the 135 “jolts” of B battery for the screen-grid tubes. All the operator needs do with this receiver when going from one band to another is change coils by turning or twisting knobs. Simple. One merely pushes in a knob, turns it to the right about 120 degrees until a notch inside the set allows a spring to slip into place. This serves to inform the operator when the coil has been changed, so all that needs be done is pull the knob back out, into its original position, and the coil has been changed. Doesn’t this seem to be an easier way of doing it? It seemed so to us and before we would allow Mr. Wing to take his receiver home we had our photographer take the “shots” of it which are reproduced here. Then, not being content with merely seeing the receiver, we wanted to hear it perform under its native roof. Accordingly, two of us bundled up one morning and drove to Greenfield, Mass., which is 65 miles north of Hartford, on the famed Mohawk Trail.

Performance

The operation of this set is truly “different” — after one has become acclimated to it, as it were, and has become familiar with the important controls. Before we would turn the receiver off we had to change coils, tune in signals, marvel at the signal strength and lack of background, change more coils, and spread bands out. The more we tuned this receiver the better we liked it. In the hands of a capable operator who could use it to its utmost advantage, a set of this description would be all that one could desire.

One advantage over other receivers, which we noticed immediately, was the absence of back-
ground noises of any sort. All r.f. leads have been by-passed and choked and these precautions certainly seem to be most effective.

The primary tuning condenser has two sections. One section is of extremely low capacity. Its capacity has been adjusted until it just covers our 7-mc. band with the proper coil at hand. This tuning, everything is perfectly quiet. Then when a signal is heard it stands forth very prominently though it may be a comparatively weak signal. This importance of low background level cannot be stressed too much.

At W1AOF we tried different sizes of antennas and ended up with the proverbial "ten-foot piece of lamp cord." With this we heard the same signals we heard before but with less signal strength. Thus it can be seen that the set is sensitive. Enough on how the receiver works. Let's get at the construction so it can really be appreciated.

CONSTRUCTIONAL DETAILS

When laying out a receiver it must be decided whether or not it is going to be in a cabinet, shielded, or whether it is going to be on a series of breadboards extending into the next room. This receiver was designed to be shielded and compact. It is both. The only solution to compactness seemed to be in having a double-decked compartment back of the panel. Thus there are two compartments separated by a metal partition parallel to the top and bottom of the cabinet and about halfway in between.

The cabinet and shielding is aluminum which is used throughout. The aluminum is half-hard 14-gauge stock and a sheet 72" by 24" was originally purchased for $7. This was sufficient for all purposes. The completed cabinet is 20" long by 9½" wide by 12½" high. It is made of three pieces, two ends (separate pieces) and the top, back and bottom (one piece). The front panel is made of a piece of aluminum 20" by 12½" and is fastened to the top and bottom by Corbin hinge clasps. Two hinge clasps are used for the bottom and three for the top. This has the advantage of allowing the operator to get inside the receiver by tilting the panel forward on the two bottom

![Looking Down on Top Partition](image)

**FIG. 1.—COMPLETE DIAGRAM OF RECEIVER**

This is the audio frequency portion of the receiver. Notice the neat uncomplicated method of wiring. All wires are copper clad insulated. The battery can be seen at the rear. The aluminum can at the left encloses the peaked unit (coil and condenser).
hinges. Nickled machine screws and nuts are used to hold various corners and braces together as well as the various parts to the panel and partition. All battery connections are brought to the

along their edges and a hole is put in the center of each of these for fastening the can to the partition. Thus this stage is a shield within a shield. Directly in front of this can is the turret-head

rear of the set and there they are attached to a battery cable and jack. A hole is drilled in the rear of the cabinet to allow the battery plug to fit into the jack.

THE CIRCUIT

The receiver uses one stage of untuned radio frequency amplification to couple the antenna to the set. A UX-222 is used in this stage. This is followed by detector and two-stage amplifier. Between the first and second stage is a switch to another amplifier which is tuned. This stage is made up of a UX-222 and a UX-201-A. Thus it may be termed a 6-tube set, though all six are never used at one time. For radiotelephone reception four tubes are used and for peaked c.w. five are used.

The detector tube is a UX-201-A and has a grid leak of 6 megohms and grid condenser of 100 micro-microfarads. Regeneration is controlled by a variable Clarostat of 100,000 ohms in the plate circuit. This is shunted by a quarter microfarad condenser.

The volume control is a 50,000-ohm variable Clarostat and is connected across the secondary of the second audio transformer.

BELOW THE PARTITION

The r.f. portion of the receiver is below the partition. At the left is a metal can which houses the screen-grid antenna coupling tube with its associated apparatus which includes the 10,000-ohm antenna resistor, grid resistor and blocking condenser. Two sides of this can have "lips" which holds three coils at one time. The coil forms are Silver-Marshall and plug into Benjamin sub-base sockets which are mounted on the bakelite disk of the turret and have G.R. plugs fitted in the sockets in place of the original binding posts. This bakelite disc which forms the basis for the turret is ½" thick and 5½" in diameter. There are notches on the edge of the disc at every 120 degrees of its circumference. The reason for this will be explained later.

After the disc or turret-head is complete with its three sockets one now must fit up the bakelite holder which holds the four G.R. jacks. This bakelite holder is 2½" square and is mounted against the panel. Now one starts to get an inkling of how the arrangement works. This turret-head is connected to the front of the panel by a ¼" shaft which fits through the usual bushing in the panel. The holder of the four plugs is mounted as close to the tuning condenser as possible insuring short r.f. leads. Thus, to change coils or bands, the coil being used at the time is disengaged from the jacks by pushing in on the shaft from the front of the panel, the shaft is turned 120 degrees (to right or left depending upon which band is to be used next) and the next coil is in place. From the front of the panel one cannot tell just when these plugs are line up with the jacks and can be engaged. Therefore these three notches which have been placed equidistant on the bakelite turret are necessary. A spring made of copper or spring brass should be attached to the mount which holds the jacks and made to ride the disc all the time. When the disc is turned
and comes to the proper position, the spring will slip into the notch thus advising the operator that the coil is ready to be inserted in its jacks.

To the right of the coils (in the photograph) is the main tuning condenser. This condenser was originally an R.E.L. type 187 variable all band tuning condenser. This condenser has two separate rotors and two separate stators. A single rotor plate and stator plate comprise the main tuning control and the seven intermeshed plates to the rear serve as a variable capacity in parallel. Originally this capacity was varied by means of a bakelite disc at the rear of the condenser. This couldn't be manipulated from the panel so a gear had to be rigged in. To accomplish this it was necessary to put in a longer shaft in the larger section of the condenser. The gear used was made up of brass stock 5" in diameter with 32 pitch. This intermeshes with a 1/2" bakelite gear at the bottom. This gear should be of insulating material or there will be considerable "hush" when tuning this section of the condenser. This bakelite gear is turned by means of a 1/2" shaft and knob from the front of the panel. In the center of this shaft there is a worm which works into a gear which drives a drum. This drum has a scale and may be read from the front of the panel.

The photograph which shows this part of the receiver in detail should be consulted. This all sounds complicated but is in reality simplicity itself once the idea of the mechanism is clear. Probably the individual builder who makes up a receiver employing the novel features set forth in this one will have ideas which are different and more suitable to his own particular desires.

At the rear of this tuning condenser may be seen a G.R. 6 to 1 ratio transformer.

Several wafer-shaped cases may be seen in this under-partition view of the receiver. These are the r.f. chokes and are manufactured by Dremer. Two rheostats for the two screen-grid tubes may also be seen and are inside the cabinet because they do not require frequent adjustment.

The antenna is connected to the set by a telephone cord "jumper" which extends from the antenna coupling stage.

A double-pole double-throw jack switch is at the right of the tuning condenser. This is to select either flat or peaked amplification. A switch of this sort comes in very handy for changing from telephone to c.w. signals and should be incorporated in any receiver which has different types of amplification. Thus, also, a direct comparison of signals can be made readily and in turn, the form which is most suited to immediate needs can be used—all by a split second turn of a switch.

ABOVE THE PARTITION

The top section contains the detector tube and audio amplifier. The aluminum case to the left houses the Ford coil and condenser which are mounted on one piece of bakelite and fitted with G.R. plugs and jacks so the whole unit is plug-in. This makes it possible to determine by comparison, with little time and effort, the practicability of any unit that happens to be in use at the time. The jacks extend through the partition into the lower portion of the receiver where the screen-grid tube (which belongs to the peaked unit) is. Of course, these plugs are insulated from the partition by means of drilling oversize holes and "floating" the plugs through the partition where they are fastened to another piece of bakelite. Four tube sockets may be seen in this view. Practically all audio frequency wiring is in this top section. What little r.f. wiring there is here is dropped below the partition. All instruments are insulated from the panel. The Weston milliammeter has a bakelite case and requires no insulating bushing.

The battery cable jack may be seen at the rear. One of these is indispensable in a set of this

**FIG. 2.—DIAGRAM OF COIL MOUNTS ON THE TURKEY-HEAD**
nature as the set is portable (even houses are portable) save for the power supply. If the operator wants to change location he keeps the battery connected to the battery cable and merely disconnects the cable at the set. Thus when ready to set up again all that has to be done is plug in the power supply. One of these cables makes it easy to disconnect power supply and work inside a set. To hook on the power supply again it can be done in one motion and not take minutes. Pull the connection apart and then be free to roam around inside the set without danger of having whiskers singed.

COILS

The coils are wound on Silver-Marshall forms.

<table>
<thead>
<tr>
<th>Coil</th>
<th>Frequency Band</th>
<th>Grid</th>
<th>Wire</th>
<th>Plate</th>
<th>Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5000 kc. (60 m.)</td>
<td>20</td>
<td>30</td>
<td>32 d.c.</td>
<td>8 d.c.</td>
</tr>
<tr>
<td>2</td>
<td>7000 kc. (40 m.)</td>
<td>30</td>
<td>18 bare</td>
<td>6-8</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>14,000 kc. (20 m.)</td>
<td>1</td>
<td>26</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

The preceding table gives the specifications of the coils for this receiver.

It should be said here that these coils were wound to cover about 100 kc. above our band with the condenser at minimum. At maximum this probably can be run some 200 kc. below the band. That is one great advantage of having a variable shunt capacity with the main tuning control. The amateur bands can be spread over as many degrees on a dial as one wants. In fact if this small section of the tuning condenser is not of the proper capacity to cover some frequency band in itself (without adjusting the shunt capacity) the stator plate may be moved ahead on the threaded shaft to increase the capacity or retarded to decrease the capacity. Thus, as one has by this time deduced, you can cover just about any territory you want and just as you want it. From a tuning standpoint this is a valuable feature.

(Continued on page 60)

Financial Statement

By order of the Board of Directors the following statement of the income and disbursements of the American Radio Relay League for the second and third quarters of 1929 is published for the information of the membership.

K. B. Warner, Secretary.

STATEMENT OF REVENUE AND EXPENSES

<table>
<thead>
<tr>
<th>Revenue</th>
<th>For the three months ended June 30, 1929</th>
<th>For the three months ended Sept. 30, 1929</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising sales, QST</td>
<td>$14,462.20</td>
<td>$15,901.84</td>
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<tr>
<td>Newdealer sales</td>
<td>10,976.20</td>
<td>10,250.32</td>
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<td>Advertising sales, Handbook</td>
<td>1,630.00</td>
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<td>Handbook sales</td>
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<tr>
<td>Dues and subscriptions</td>
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<td>Back numbers, etc</td>
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<td>Emblems</td>
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<td>105.41</td>
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<tr>
<td>Interest earned</td>
<td>376.07</td>
<td>675.72</td>
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<tr>
<td>Cash discounts earned</td>
<td>270.72</td>
<td>275.00</td>
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<td></td>
<td></td>
<td>$39,151.18</td>
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<td>$41,316.54</td>
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<td>Deduct:</td>
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<td>Returns and allowances</td>
<td>$3,270.17</td>
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<td>Less portion charged to reserve for newspapers</td>
<td>1,312.32</td>
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<td>Discount 2% for cash</td>
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<td>Exchange and collection charges</td>
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<td></td>
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<td>4,274.81</td>
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<td>4,421.90</td>
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EXPENSES

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<th>Expenses</th>
<th>QST</th>
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<th></th>
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<tr>
<td>Publication expenses, QST</td>
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<td>Publication expenses, Handbook</td>
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<td>Salaries and commissions</td>
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<td>14,998.22</td>
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<tr>
<td>Forwarding expenses</td>
<td>667.46</td>
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<td>677.46</td>
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<td>Telephone, telegraph and postage</td>
<td>1,174.31</td>
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<td>1,242.69</td>
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<tr>
<td>Office supplies and general expenses</td>
<td>2,510.94</td>
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<td>1,929.18</td>
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<tr>
<td>Rent, light and heat</td>
<td>573.82</td>
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<td>910.98</td>
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<tr>
<td>Traveling expenses</td>
<td>2,190.80</td>
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<td>1,459.86</td>
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<tr>
<td>Depreciation of furniture and equipment</td>
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<td>505.93</td>
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<td>Communications Dept. field expenses</td>
<td>78.18</td>
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<td>174.55</td>
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<tr>
<td>Headquarters Station expenses</td>
<td>156.04</td>
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<td>117.19</td>
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<tr>
<td>Bad debts written off</td>
<td>18.75</td>
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<td>5.30</td>
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<tr>
<td>Total expenses</td>
<td>37,489.61</td>
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<td>36,007.16</td>
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<tr>
<td>Net gain or loss from operations</td>
<td>$2,481.22</td>
<td>$85.45</td>
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Loss

Gain
Coming—Operating Activities

January and February

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

During the last several months a number of amateurs have expressed increased interest in taking part in more message handling contests and in another international-DX Contest similar to the one held in early 1928. We are entirely in accord with these suggestions. Such tests make possible many new and enjoyable contacts, since the advocates of national and international competitions have about equal odds, we are planning to please both parties by arranging a double-barreled plan of action at the height of our radio season in the northern hemisphere. Any operator of an amateur radio station anywhere in the United States or Canada can take part in one or both our contests. The second February competition will be world-wide in scope. This will be the first international contest of which the A.R.R.L. is sponsor since the Washington Convention has been in effect.

Stations having truly modern equipment in line with the best practice will have the advantage and can take this opportunity to out-perform “just ordinary” installations not in line with the requirements of full operation in our present frequency bands. Our previous contests have in each case trebled and quadrupled the amount of operation normal at a particular season. Therefore it is inevitable that our coming tests will in a measure show up limitations of some of our frequency bands much more severely than do our everyday operating conditions. This will be true more especially if unreasonable amateurs center their operation on 7000 kc. during the evening hours. Intelligent use of all our bands is really the essential requirement to win. Much more than mere stations will determine who gets our certificates and trophies! Stations count, but this is primarily a question of operating skill. The best equipment made is only as useful as the ingenuity of the man behind the key can make it.

In the last tests the 14,000-kc. band proved itself best for daylight DX and for evening work until 9 or 10 p.m. The 3500- and 7000-kc. bands were fine for after-dark work over equally great distances. If we are not mistaken, 14,000 kc. will be used similarly during these next tests for work direct with remote Sections and with foreign countries during the hours when the 7000-kc. band is most congested. It is sincerely hoped that the tests will bring more amateurs a full appreciation of the value of our 400-kc. 20-meter privilege so that the work once started will continue. This highly valuable frequency territory should by rights carry a full load of DX communication work, relieving any unnecessarily crowded condition of the 7000-kc. band. It behooves us to maintain full and efficient use of all our valued frequency channels.

The fellows who swap messages easily and freely on the 14,000-kc. band (and perhaps the little used 1750-kc. band) will have a definite advantage over those who struggle with QRM in other bands. Those who complain of congestion in one band at hours when good work is being freely conducted without undue QRM on other frequencies will be showing merely their own lack of operating judgment. So it bears repeating that the most methodical and intelligent use of up-to-date amateur radio stations on all our different communication bands will determine the winners.

Better take a tip from those who know and start putting the station in the best of shape right away, planning operating schedules, advance tests, etc.

New contacts and friendships will be made. The first contest will put each participant in touch with others in many parts of this continent. The second will promote international friendships. Courtesy (or QSL) cards will follow in quantity if the experience of our forwarding bureau is any indication. Several months were required to clear the hook of the thousands of cards that were received to be sent through Headquarters after our last tests. The contest in February will show which foreign stations can make the best record for reliable QSO with this continent. Experimental or test messages will be required to insure that actual solid two-way QSO's are made. The nature of the test is so designed that governmental regulations of different foreign nations will not prevent anyone from participating.

In the first contest the list of Sections which appears in the up-front pages of January QST will be followed. In the second or international affair the list of international amateur prefixes,¹ and the few remaining intermediates still serving as prefixes at the time of the contest will be strictly followed as a basis for partitioning foreign

¹ The Fourteenth Edition of the Rules and Regulations of the Communications Department (November, 1929) contains an up-to-date list of these prefixes and will be forwarded free of charge. Drop a card today if you need this.
localities. To prevent reports from straggling in months afterward, definite closing dates for receipt of logs and message files from participants are specified in the rules so that the winners may be announced as early as possible.

THE JANUARY CONTEST—JANUARY 18 TO 31 INCLUSIVE

Entries are not required in our first contest between the Sections of our A.R.R.L. field organization. Any messages transmitted complete in standard A.R.R.L. form (see the R, & R, or write us for a copy if you need it) and having a text of ten or more words may be originated or relayed to stations worked in other Sections to be relayed or delivered, counting both for the contest and in the regular traffic totals in the usual manner. Participating stations will be limited for the purposes of the contest to sending but one test message to each station worked; that is, further messages can be transmitted but will not add to the contest score of either station. Two stations in contact must each transmit a message to the other station, making a score of one sent and one received for each participant, as proof of a solid two-way QSO, before any score will be counted for either. As soon as two stations have exchanged messages, the Section may be noted as "worked" and the two points entered. Messages must be kept away from the rubber-stamp type. This will call for individual originality in making up messages to be sent to each station worked. Such spurious messages will be ruled out of the count, which as will be seen, might be a serious matter affecting the total and final score provided the QSO ruled out is the only contact made with some Section. A method of grading logs has been designed which will credit the number of Sections worked in addition to counting the number of points gained by exchange of messages. As many messages can be sent to a given Section as you can work stations there, boosting the score a couple of points for each station worked. However, the final score will be obtained by multiplying the sum of all the points made by the number of Sections worked, by 68 if some station shall have succeeded in exchanging messages with at least one station in every Section, including his own Section. This will make our contest more interesting and general in its character. If you have never tried to work "all Sections" in a given time, this will be an opportunity. Any and all participating stations should be able to add to their list of Sections and states worked.

Certificates showing the highest score in each Section, the competition you will feel the keenest being that of the fellows in your own locality who will be out after that certificate. It will be interesting also to note the highest totals in the United States (including Hawaii, Alaska, P. L., Porto Rico, Cuba, etc.) and Canada. Sixty-eight separate records will be kept summing up the totals turned in by participating stations in the sixty-eight different Sections so that due credit can be given the most active Section organizations, too.

While stations owned and operated by members of the staff at A.R.R.L. Headquarters may participate and while the scores will count for Connecticut, the station owners and operators will be ineligible to receive any prizes or certificates as usual. The Headquarters station will transmit its regular official and special broadcasts at the usual times but whenever possible in the remaining time will participate in the contest work to add to the enjoyment and scores of those looking for QSO's.

There is no rule against making advance schedules by mail to assist in the message-handling work. All QST readers are equally free to start lining up such schedules now if they believe they will help. Hit-or-miss work over the air will be necessary in any case to run up a score as fast as QSO's can be made and messages put through in both directions. There will be no particular advantage in lining up a great many schedules. The main thing to be remembered is that only QSO's proved by copies of messages received and sent during the two weeks' test count. The two necessary messages with a certain station may or may not be handled both on the same day or during the same contact but they must both be handled sometime between the beginning and end of our message-handling all-Section contest. Most of the messages in our contest will probably be "originated and delivered," addressed to the station being contacted. However, when regular routine traffic happens to be in need of routing in a particular direction for delivery or further relaying, it should be handled and an extra copy made to be submitted with the report of work done in the contest. There is no excuse for routing messages in the wrong direction unless it is learned that a station can forward them by schedules or traffic routes, though. As in our last contest, off-frequency operation will result in disqualifications. The inclusion of messages with rubber-stamp texts or incomplete preambles will result in deductions from the scores of one or both stations responsible. In all cases in which Sections are smaller units than states, the name of the Section should be included in parenthesis in the preamble of originated messages to assist the award committee in identifying them. Thus a preamble might read, "Springfield (Western Mass.) W1BWY . . . Jan. . . . ."

To make this discussion more understandable, an example will be given. Let us suppose at the start of the test that W7AFO (Tacoma, Wash.) works W7PP in Oregon. Each station originates and transmits a message of ten or more words
which is successfully received and acknowledged by the other. The score of each station will be two (one originated, one delivered in this case). Next W7AFO contacts W6NX (San Jose, Calif.) and sends him a message which he originates, for the purpose commenting on some phase of the contest perhaps. This is acknowledged but W7AFO is unable to get the message which W6NX tries to send him due to a local power leak which blanks everything. W7AFO tells W6NX that he will look for him at the same time later in the contest and puts the traffic, on which a full record of the time and date and W6NX's call signal and the frequency band has been entered properly, aside, circling the single point entered in the log, since this cannot yet be counted either as a single point or as a contact with a new Section (Santa Clara Valley). The third station worked by W7AFO is W9RR in Missouri and messages are successfully handled both ways. W7AFO has now contacted two stations in two Sections. His score (2+2) can be multiplied by two for a final result if no more work is done. But he works another Oregon station, adding two points to the score. (2+2+2) 2 would now be the final score. Another contact with W6NX is made on the last day of the contest and W6NX gives W7AFO a regular message (of more than ten words) to QSP. This makes it possible to count the Santa Clara Valley as a section worked and now it is possible to restate the message sent to W6NX several days before, this counting together with the message just received as two points. Should the contest end, the score would be (2+2+2+2) 3. W7AFO contacts with two different stations in his own home town, exchanging messages both ways with both stations. He thus adds four more points and has qualified as working another (his own) Section. Assume that the contest closes. All the points made in QSO total twelve in number. Stations in four sections have been worked. The score will be 12X4 or 48. Of course in actual practise, much larger scores will be expected. Canadian, Philippine, Hawaiian, Alaskan, Cuban and Porto Rican, etc., amateurs residing in any territory in which we have a field organization will take part and the lists of QSO's tabulated and turned in to Headquarters after the contest will show numbers of points obtained with stations in these Sections counting exactly as shown in our example. We expect there will be much competition between the different Canadian Sections, between Hawaiian and Philippine amateurs, etc., too.

THE RULES

1. This contest opens January 18 at 0000 G.C.T. and closes February 1 at 0000 G.C.T. Only work falling between these dates and times will be counted. (E.S.T.: Jan. 17, 7 p.m. to Jan. 31, 7 p.m.) — (7 p.m. E.S.T., 6 p.m. C.S.T., 5 p.m. M.S.T., 4 p.m. P.S.T.)

2. Participating stations must each send and receive one complete individually worded contest message of ten or more words with one station in any Section. As many stations as desired may be worked in each Section.

3. The sending and receiving of two messages constituting an exchange in both directions between the contesting stations shall be deemed proof of satisfactory two-way communication only when these messages (or copies) bearing notation of the date and time acknowledged with the call signal and frequency band used by the acknowledging station have been properly filed with the award committee at the conclusion of the contest.

4. Unless messages are composed and transmitted in the proper form with city of origin, station of origin, number, date, address, text, and signature complete and unless the text comprise at least ten words (plain language count) they shall be discounted as incomplete. The award committee shall disregard such communications as insufficient evidence of satisfactory two-way communication.

5. A special log or tabulation of QSO's shall be submitted by each contestant, showing the number of Sections contacted, the number of stations contacted in each Section worked.

6. Credits: sending a message counts one point, receiving a message counts one point, but unless a message has been both transmitted and received with each station contacted, no credits shall be entered. The total station score at the conclusion of the contest will be the product of the number of sections worked and the summation of the credits obtained by all valid two-way QSO's. Section credits shall be the summation of the scores of all individual participating stations entering logs and message files and located in a particular section.

7. Reports, logs, and copies of all messages for which credit is claimed must be received at Contest Headquarters from all stations except those in the Hawaiian and Philippine Islands on or before noon February 20, 1930. Entries from those outlying points must be received on or before noon March 31, 1930. Entries should be addressed to A.R.R.L. Communications Department, 1711 Park St., Hartford, Conn.

THE INTERNATIONAL TESTS - FEBRUARY 15 TO 28 INCLUSIVE

In this contest United States and Canadian stations must be entered in advance to be able to participate and to be eligible for certificates. Stations in all other localities need only take part on the dates announced and report results in full at the end of the tests as provided in the rules to be eligible for the certificates which will be presented to the winning stations in each locality, the localities being determined by the assignment of international prefixes. Bear in mind that in this second contest, amateurs with the prefixes W and VE will be taking part in a QSO party with stations in all other parts of the world including Hawaii, the Philippines, Porto Rico, Alaska, etc., where K and KA are used.

Stations in the United States and Canada signifying intention to take part by card or letter will each be provided with official test messages just in advance of the opening date of the contest. Unfortunately, a number of the several hundred U. S. and Canadian entries in the last tests came in at the last minute so that valuable time was lost before these stations could be equipped with full information and test messages. The closing date for entries is February 1, 1930. Requests for entries, official logs, test messages and serial numbers must be received on or before midnight G.C.T. this date to receive
consideration. Only stations entered before this time will be eligible for certificates. Just as in our first contest, there will be certificates to the best or winning foreign contact stations in each of sixty-four Sections in the U. S. and Canada.

Of course stations in the outlying localities, Alaska, Hawaii, P. I., Cuba, Porto Rico and Newfoundland using prefixes other than W or VE will be awarded certificates based on their work with W-VE stations just as in the case of other remote localities.

Stations outside the U. S. and Canada will try to work as many W and VE stations as possible to get the test messages. As soon as each such station is in possession of one of the official test messages which has been acknowledged to the station from which it was received, a reply message will be prepared and assigned the exact serial number given in the North American test message. This reply contest message may be sent to any other W or VE station than the one from which the message bearing that serial number was taken. No address is necessary on any of the test messages but the serial number and identification group is very important for identification purposes. The return message will not count for anything in the score if returned through the same station that sent the original test message or if the text and signature duplicate a message already sent. No station can accept a reply test message bearing his own serial number combination on penalty or disqualification. Messages with incorrect or unofficial serial numbers don't count for any one. The text and signature (if any) of the reply messages must total at least ten words to count—ham abbreviations aren't words, either. Five figures or fraction thereof count as one word when sent in a group.

Just as soon as a few test messages are off the hook, the replies will begin coming back. Everyone will be looking for replies because these count for more in the scores of the stations handling them. Every station operator has an equal opportunity in this contest. Much depends on the judgment of the individual operators in determining the times and frequencies of operation of each station as well as on operating ability itself. Low power apparatus succeeds as often as high power on 14,000 kc, as was ably proven in our last international competition. Handicaps in power or in location can be overcome by careful planning. As usual a full report of our contest results will be printed in QST with the names and call signals of the certificate winners in each Section in the mainland United States and Canada, and in each and every remote locality in the world where amateurs participate. Reports are wanted from every station whether the score is one or one thousand, whether you live in the U. S. A. or in China. Get in on the fun and cooperate with your fellow ham by sending in your log and messages as confirmation of his score and so that we may mention your work with the rest.

In the coming tests participating stations will be limited to sending but one test message to each station worked. As many messages can be sent to a given locality as you can work stations there. This contest (we hope) will help you to add to the list of countries you have worked, and perhaps you will be able to submit your application for a WAC certificate after the fun is over.

Several different scoring systems have been tested out on logs placed on file in our last international relay party. The basic principle of both the W-VE station and the station in a foreign or remote locality receiving one point when the test message is acknowledged by the station in the remote locality has been followed. Also the count of two points for each station when a reply-contest-message is acknowledged is adhered to. A considerable amount of research has been attempted to answer the criticism expressed by several west coast stations that our last international tests employed a method of scoring that automatically discriminated in favor of east coast amateurs, due to the preponderance of European amateurs and the larger number of European countries.

Instead of awarding certificates to the high men in the national scheme of things, our contest this year will include awards to the highest scoring station in each continental section. This puts operators in the same localities in competition and is equally fair to all. It is realized that there are unavoidable differences in the ease of working certain countries from the east or from the west coast and in the numbers of active amateur stations in the different countries at any one time and so the plan to have amateurs in one section compete only with other amateurs in the same section is the only satisfactory solution for all concerned.

Nevertheless, the highest scoring stations in the national scheme of things will be of interest, so after due deliberation we are going to test a plan of balanced credits, stations in Minnesota, Iowa, Missouri, Arkansas, and Louisiana and east of these states being regarded as “eastern” stations, and all stations in states west of those named being classified as “western” stations. Stations in the Ontario, Quebec and Maritime Sections will be classified as “eastern” and in other Canadian Sections as “western.” The sum of the scores obtained with different continents will be multiplied by certain arbitrary factors built up from simpler ratios by juggling east-west comparisons with a consideration of the relative difficulties of working different continents from a position on either the east or the west coast. The factors are given herewith and you will note that due to the widely separated portions of North America, it has been necessary to group

(Continued on page 70)
W2FL

In the March QST we detailed the opening of a station-description contest. The final published entry, in this issue, describes a second district 1929 type station. The winner of the cup will be announced in the January, 1930, issue of QST. Although the station description contest is formally closed, QST will continue to publish the best station descriptions which are received.—EDITOR.

WHEN the government regulations requiring the use of the W prefix went into effect, the call of W2FL was assigned to D. C. Akers, 181 Greenwood Ave., of East Orange, N. J. NU2BDC, the call which had been held previously, was still retained and is sometimes used. With the change in call letters came many changes in the receiving and transmitting equipment. The receiver, which up to this time was a super-autodyne set, went into the discard because it was realized that 1929 conditions required a non-radiating receiver. The transmitter, which was a tuned-grid tuned-plate affair, fed by a 500-volt, 50-watt motor-generator, and operating on the 14,000-ke. and 7000-ke. bands, began to fade into the discard as plans for a crystal-controlled transmitter were completed. Then the new set began to take shape.

The main object in rebuilding W2FL-W2BDC was to put the station on the air with a steady 1929 note. By 1929 the new equipment had all been completed, and since its completion, has been in continual use.

One of the photographs shows the general layout of the station. The crystal-controlled oscillator-amplifier transmitter, a self-contained unit, is mounted on a wooden bench at the left of the picture. The receiver, a "Chinese copy" of the four-tube screen-grid receiver described in the November, 1928, issue of QST, may be seen slightly to the right. The operating table, containing the log book, and two keys, is slightly lower than the benches supporting the trans-

A better view of the transmitter is given in another photo. Except for the motor-generator, the transmitter is a complete and self-contained.
unit. The frame is built of 1" square hard maple, the joints of which are mortised and glued. The two shelves are also of maple, and like the framework, are given several coats of flat wax varnish finish to prevent the absorption of moisture. The

frame is completely enclosed with glass to make the transmitter dust-proof as well as fool-proof, while at the same time permitting the operator to view the operation of the transmitter as indicated by the meters.

The schematic wiring diagram is given in Fig. 2. A crystal-controlled oscillator using a UX-210 tube operating in the 1750-kc. or the 3500-kc. band is employed for operation in the 7000-kc. and 14,000-kc amateur frequency bands respectively. A feature of this oscillator is the tuned radio frequency choke coil in the grid excitation of the first frequency doubler which also uses a UX-210 tube. The final amplifier makes use of a UV-203-A tube. Fig. 3 gives a schematic wiring diagram of the transmitter. All of the inductances are made of 3/16" silver-plated copper tubing, and are mounted on General Radio porcelain stand-off insulators. The coil of the 3500-kc. tank circuit, \( L_1 \), has 15 turns of tubing 2 3/4" in diameter, and is shunted by a 500-\( \mu \)fd. tuning condenser. The 7000-kc. tank inductance, \( L_2 \), is made of 8 turns of tubing of the same diameter as \( L_1 \) and is also shunted by a 500-\( \mu \)fd. condenser. The 14,000-kc. tank circuit is also of rather high C construction, consisting of 5 turns of tubing 2" in diameter and is tuned by a 250-\( \mu \)fd. condenser. The choke in the oscillator circuit consists of 50 turns of No. 28 d.c.e. wire wound on a 1" form, and is shunted by a 9-plate midget condenser. REL chokes are used throughout, except in the oscillator circuit. The blocking condensers are Sangamo bakelite insulated condensers having capacitances of 200 \mu f
d, each with the exception of the plate blocking condenser of the final amplifier, which is a Wireless Specialty Co. condenser having a break-down voltage of 7500.

A complete set of transmitting coils for both the 14,000-kc. and the 7000-kc. bands is a part of the station equipment. Two 1750-kc. band crystals, ground so as to have harmonics at the top and bottom of the 7000-kc. band are used to QSY in the 7000-kc. band, while three crystals, having fundamental frequencies of 3554 kc., 3567 kc. are used for operation in the 14,000-kc. band. This permits sufficient QSY for all ordinary purposes and yet permits of the advantages of crystal control.

Meters are provided for each stage so that the operator is always informed as to just what is taking place in each of the various circuits. A special four-pole double-throw switch is used so that one milliammeter may be used either in the oscillator circuit or in the plate circuit of the first amplifier. Thus, one plate current meter is saved. The final amplifier is provided with a plate current meter. Reference to the photograph of the transmitter will show the following meters, reading from left to right: 30-15 thermo-ammeter-

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**THE FOUR-TUBE RECEIVER AT W2FL**

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**FIG. 1.—RECEIVER DIAGRAM**

- \( C_1 \) — 1-\( \mu \)fd. condenser.
- \( C_2 \) — Plug-in midget tuning condenser.
- \( C_3 \) — 4000-\( \mu \)fd. fixed condenser.
- \( C_4 \) — 1000-\( \mu \)fd. grid condenser.
- \( C_5 \) — 9000-\( \mu \)fd. by-pass condenser.
- \( C_6 \) — 6000-\( \mu \)fd. audio grid condenser.
- \( C_7 \) — 0.01-\( \mu \)fd. audio tuning condenser.
- \( R_1 \) — 10,000-ohm grid leak type resistor.
- \( R_2 \) — 100-ohm fixed filament resistor.
- \( R_3 \) — 5-ohm fixed filament resistor.
- \( R_4 \) — 5,000-ohm variable resistor.
- \( R_5 \) — 200,000-ohm variable resistor.
- \( R_6 \) — 5-ohm grid leak.
- \( R_7 \) — Filament ballast resistor.
- \( L_1 \) — Tuning inductance.
- \( L_2 \) — Plate.
- \( L_3 \) — Secondary of Ford spark coil.
for the tank circuit of the oscillator; a 0—1000 d.c. milliammeter; a 0—15 a.c. filament voltmeter which is provided with a double-pole double-throw switch as shown in Fig. 1 for measuring the filament voltage of the 210's or the 203-A; a 0—200 d.c. plate milliammeter for the final amplifier, and finally, mounted above the antenna coil and condenser, $L_a$, $C_a$, another 0—1.5 thermo-ammeter. Weston meters are used throughout.

A General Radio, amateur band, frequency meter is used occasionally for checking the old transmitter formerly operating under the call of NU2BDC, although its use is hardly essential since the transmitter is controlled by crystal.

**POWER SUPPLY**

The filament current for the two UX-210 tubes is taken from a step-down toy transformer which, because it is not provided with a center tap, requires the use of the resistors $R$ and the by-pass condensers, $C_a$. The filament of the UV-203-A tube is also supplied by a toy transformer, since these transformers serve the purpose and are cheaper than those designed particularly for filament heating.

Biasing is done throughout with C batteries, as these have been found to give much better results than bias obtained by the IR drop of a resistor. The bias voltages are rather high to keep the tube from becoming too warm since a tube operates rather inefficiently when used as a frequency doubler. The grid bias voltage is approximately 15% to 20% of the plate voltage used. This high grid bias does not seem to impair the output any, and gives the transmitter more stability than when low grid biasing is used.

A 1000-volt, 450-watt Esco motor-generator is used to furnish the plate power to the tubes, and is shown in one of the cuts. The motor generator is mounted by spring suspension in a heavy wooden frame to prevent vibration. Heavy coil springs are used for suspension, while lighter ones keep the unit on an even keel. Voltages of 600 and 1000 may be obtained from the generators. A 15,000-ohm resistor is placed in series with the 600-volt lead to drop the voltage down to 300 for operating the crystal oscillator. The generator supplies 600 volts to the plate of the first frequency doubler amplifier. In the upper left-hand corner of the generator photo may be seen a fiber strip, supported by stand-off porcelain insulators carrying the four jacks for the 1000-volt tap from the generator. Two of these plugs are connected to the oscillator amplifier, while the other two plugs are connected to the old tuned-grid, tuned plate transmitter formerly used at NU2BDC. The high voltage leads are equipped with insulator plugs so all that is required to supply plate power to either transmitter is a change of these plugs from one set of jacks to the other. The 15,000-ohm resistor used to drop 600 volts to 300 volts may be seen immediately above these four plugs. The starting box for the motor may be seen in the center of the cut, while the fused double-pole single-throw switch may be observed mounted on the right-hand supporting frame.

**THE ZEPPELIN ANTENNA**

The antenna used at W2FL is the familiar Zeppelin two-wire feeder type. The flat top is 30 feet above the ground and is 57 feet long. The feeders are 6 inches apart and are about 28 feet long. These are inductively coupled to the plate coil of the amplifier through an 8-turn coil, 23/4 inches in diameter and shunted with a 140-mfd. condenser.

There has been considerable argument as to the exact operation of this antenna in the 14,000-ke. band as a true two-wire fed Zeppelin antenna. But 57 feet is the maximum length which the back yard at W2FL will give up to the antenna and as results are the prime consideration there seems to be little use in curtailing gray hairs to figure out how an additional seven feet of wire on the far end of the antenna might be added to...
satisfy the more scientifically inclined friends of W2FL.

THE RECEIVER

Most readers will recognize the receiver immediately as being a copy of the four-tube screen-grid set described in QST last November. The 14,000-kc. band is covered by a rotation of 70 degrees on the dial with a 5-plate midget tuning condenser and a 5-turn grid coil. The other bands also, are spread over a large part of the dial. The receiver, a wiring diagram of which is given in Fig. 1, is extremely sensitive and is practically noiseless. Signals from all over the world come in with a gratifying punch, VKs being "among those present." The present receiving antenna, which gives better results than any other antenna which has been used, is a vertical wire, 20 feet long.

OPERATION

The operation of the station is simple. The operating switches for both the transmitter and receiver are very conveniently placed at the left of the operating table, and may be seen just behind the phones. A slight movement of the left hand makes all the changes necessary to change from receiving to transmitting conditions. Although activity is primarily confined to operation in the 14,000-kc. band, it requires only a short time to shift the transmitter to the 7000-kc. band. The same antenna is used for 7000-kc., as well as 14,000-kc. operation, and QSY within either band is accomplished by changing crystals and slightly retuning the transmitter. The arrangement is found to be very convenient.

The absence of a filter on the generator gives a very distinctive note which is slightly modulated and easy to identify. Judging from the reports that arrive by card, radiogram, and word of mouth, the note is certainly all that can be desired. Reports of QSA5 have been consistently received from stations in the middle west, with an occasional QSA4 report from west coast stations. Twenty-six countries have been worked and DX reports have ranged from QSA3 to QSA5, with the majority of signal audibility reports, R9.

The radio conditions for 14,000-kc. operation have been exceptionally good the last few months and little QRM, except from automobiles, has been encountered. The real pleasure comes when one can comfortably finish a foreign QSO. An incomplete QSO is annoying and tends to make an operator careless. The sharp steady note of W2FL's signals permit 90% of all foreign contacts to be satisfactorily completed.

Technical Information Service Rules

Please observe the following rules when writing the Technical Information Service:

1. Before writing, consult the Radio Amateur's Handbook and your files of QST. Nine times out of ten you will be able to find the answer in QST or the Handbook.

2. If reference is made to the Handbook, mention the page and the edition to which you refer. If reference is made to QST, mention the page and issue you have in mind.

3. Number the questions and make a separate paragraph for each question. Make the questions as brief and as direct as possible.

4. Give as much information concerning the operation of your set as possible so we can at least guess where the trouble might be. Don't simply tell us: "My set won't work — what's the matter with it?"

5. Write on one side of the paper only, and use a typewriter if possible.

6. Make diagrams on separate sheets of paper and fasten them to your letter with a pin or paper clip. All diagrams should be schematic — do not send pictorial diagrams.

7. Print your name and address in full on each sheet of paper. A return address on the envelope

(Continued on page 50)
The Experimenters' Section

The UY-227 as A Detector Tube

MICROPHONIC tubes are a serious source of annoyance in receivers, especially in those receivers which require the use of a headset. These noises are due principally to vibration of the electrode elements, and the various elements may have separate and entirely different natural frequencies at which they become resonant. Moreover, the tubes with the small elements are much more pronounced in microphonic noises than tubes with larger and better supported elements, as any user of a UX-199 or a UX-222 tube will testify.

The use of the UY-227 tube is therefore suggested by Mr. Francis Underwood, W9JN, for high frequency receivers to get rid of microphonic noises. The UY-227 tube has the same operating characteristics as the UX-201-A, except for the filament or heater voltage and current. When using the UY tube it is not necessary to tune slowly or to avoid bumping the operating table in order to operate the receiver successfully. The tube can be operated from a six-volt storage battery by inserting a proper resistor to pass 1.25 amperes, as shown in Fig. 1.

If more than one tube is to be used, the tubes may be connected in series, and with the series arrangement, three tubes may be operated from a six-volt storage battery. The voltage on the heater of the indirectly heated tubes is not critical and as these tubes will operate successfully with as low as 1.5 volts across the heater terminals, the storage battery can be used until it is rather thoroughly discharged.

It should also be kept in mind that the UY-227 tube has the same heater characteristics as the UY-227 tube, and any combination of three tubes can be operated either in series or in parallel from a storage battery. The tubes of the indirectly heated type may even be operated from alternating current, and although W9JN finds that "the slight modulation by a.c. is annoying" our experience has been otherwise. As a matter of fact, a high frequency receiver operating at frequencies as high as 16,000 kc. and using two UY-224 tubes and one UY-227 tube has been used in West Hartford for several weeks and has given very satisfactory results when operated from the 110-volt a.c. line.

When heater type tubes are operated in series from a d.c. source, the grid battery may be eliminated since the proper bias may be obtained from the IR drop across the heaters as shown in Fig. 2.

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Push Pull Antennas?

It is somewhat of a problem to couple the usual single wire fed antenna to a push-pull oscillator or amplifier and still maintain the effectiveness of the push-pull arrangement. After using up several pencils trying to figure out a method of hooking a voltage-fed Hertz antenna to a push-pull transmitter and keeping both tubes loaded, W9CRD decided that the best way out of the difficulty was to put up a "push-pull" antenna.

The antenna at W9CRD uses two 7140-ke. Hertz antennas spaced 6 inches apart. The feeders are clipped an equal distance apart from the center tap on the tank inductance. During the first fifteen days the antenna was up, W9CRD worked 84 stations in 18 countries. It would seem that the six-inch separation between the two antennas would not give sufficient phase displacement to make a very effective radiating system, but the antenna worked surprisingly well in this particular installation.

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Notes on a Voltage Fed Antenna

The July, 1928, issue of QST described a simple but practical voltage-fed antenna system for operation on several frequency bands. The par-
peculiar circuit is shown in Fig. 3, and should be very easy to operate. For some reason or another this type of antenna, originally described by Mr. Joseph Fuchs has not been very popular with amateurs and little has been heard of it. We have a letter from H. E. Hurley, W6CKS who reports the following success with this type of antenna.

"At Livermore, California, I used the Fuchs antenna idea with a tuned-grid tuned-plate semi-

portable set using a UX-112 tube, and B eliminator for power. The antenna was as follows: 25 foot indoor lead-in to set, a 35 foot rise at 45º and the balance, flat-top. The overall length was 126 feet. Operation was in the 7000-ke. band only. The antenna ran almost east and west except for the lead-in, and directional effects were very noticeable — the north strong, south weak.

"Signals were apparently stronger on 7000 ke. in the a.m. than in the p.m. Working the same station in Oregon about 800 miles away, signals would be reported R6 in the morning but at 7 p.m. they would be reported R3 to R4. It was found that the end of the tank to which the antenna was hooked made a world of difference. When hooked to one side of the tank circuit there would be plenty of current in the circuit but the signals didn't get out. Onhooking the antenna to the other side of the tank circuit, the tank current was half as much as before but signals got out very well."

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A CAPACITY BRIDGE FOR THE AMATEUR

By Walter Doyle *

Many amateurs have built up their own condensers for the transmitter but chances are ten to one that they do not even know the capacity of any condenser they have made. A handy instrument for the operating room is a capacity bridge. With one, the testing of antenna and condenser capacities becomes a comparatively easy matter and the amateur has the satisfaction of knowing he is right.

The cost of constructing such an instrument is within the financial reach of most amateurs. The parts can usually be found around the station and mounted and connected as shown, will be an asset to the testing equipment of the station.

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* 157 S. State St., Marion, Ohio.

The parts used are:

1. General Radio Type 247-H variable condenser. (This is the one that has the semicircular plates and is furnished with a dial reading micro-microfarads.)
2. Panel 3½ x 5 x 1/4 inches.
3. 50,000-ohm fixed resistor of the grid leak type.
4. 50,000-ohm Clarostal or similar type variable resistor.

Necessary screws and binding posts.

Mount the parts as shown in the photograph, and connect as shown in Fig. 4. The headset should be of the high resistance type, preferably around three or four thousand ohms resistance.

After the parts are all mounted and wired, you are ready to calibrate the instrument.

Across the posts marked "X," connect a small fixed condenser of 500 µfd. capacity. This condenser must be of good grade, such as Sangamo or General Radio, as it is the standard to which the bridge is calibrated.

Turn the variable condenser "C₁" to full capacity, that is, plates clear in. Then connect the 110-volt a.c. 60-cycle current supply to the posts marked such.

With the current connected to the instrument, you will hear very distinctly in the headset, the hum of the line current. By turning in the variable resistor "R₃," the hum will gradually diminish. Listening closely you will note a point where the hum fades out, this point is the balance point of the circuit, and the resistor should be fastened securely to prevent slipping.

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FRONT VIEW OF THE CAPACITY METER

FIG. 3. — THE VOLTAGE FED ANTENNA SYSTEM

The antenna tap should be tried at both positions A and B, as the antenna will be found to radiate better with the antenna connected to one of these places.
as slippage to either side of the balance point will again introduce the hum.

Now remove the small fixed condenser across

![Diagram of Capacitor Meter](image)

**Fig. 4. — THE BRIDGE DIAGRAM OF THE CAPACITY METER**

The resistance of $R_3$ is adjusted to be equal to the fixed resistor, $R_4$. The condenser $C_1$ is the General Radio type 257 with calibrated dial. $C_2$ is the condenser of unknown capacitance which is to be measured. The capacitance of $C_x$ will be indicated directly from the dial reading of $C_x$ when the hum in the balanced circuit is balanced out. If available, a 1,000-cycle a.c. source is much better than the 60-cycle source.

"X" and you are ready to measure unknown capacities.

Connect the unknown capacity across "X" and with the bridge connected to the a.c. supply, turn the variable condenser in until the hum in the receivers is at a minimum and note the reading on the dial. This reading is the capacity of the condenser under test.

For the information of those who do not use the General Radio condenser, the capacity readings on an arbitrary scale of 0–100 will be equally divided thus:

- 100 on the dial 0.0005 μfd.
- 75 on the dial 0.000375 μfd.
- 50 on the dial 0.00025 μfd.
- 25 on the dial 0.000125 μfd.

The readings between these figures are also equally divided, provided the condenser used is of the semicircular (straight line capacity) plate type.

These values of capacity hold for the condenser mounted in the round metal cans which G.R. makes, and will not hold exactly for the condenser mounted as shown. However, the accuracy of the calibration is not greater than 2 per cent, so that this difference may usually be neglected for amateur purposes.

This type of instrument can be used only to measure capacities not over or below the maximum and minimum capacities of the condenser "C_x." For those who would like to check higher capacities, another instrument can be built using the same resistor values but substituting the variable condenser "C_x" with one of a higher capacity value.

The balancing procedure is the same and the capacity readings are also direct from scale.

With the above described bridge, the amateur can measure antennas, condenser and wiring capacitance as well as many other tests that involve the use of a capacity bridge with results that will enable him to know how he stands.

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**R. F. CHOKES**

Most experimenters who have done any high frequency communication have run into some difficulty in keeping currents of proper frequency flowing in their proper paths. The radio frequency choke is still with us, and represents the same problem as ever. We are including three notes on radio frequency choke coils, and are concluding this month's X-Section with a reference bibliography on radio frequency chokes. The following articles on chokes are representative of the type of material we shall be able to use in this section. This section is maintained for the benefit of all experimenters. If you have a few notes which will help out someone else, let us hear from you.

The chokes used at W9ADS were constructed in the following manner: Old style non-renewable fuses were secured from the local power plant, and boiled in paraffine for an hour. For a 7000-ke. choke a tube five inches long, five-eighths inch in diameter and with sixteen inch walls was used. This was wound with No. 36 d.c.c. wire for a length of three and one half inches. The winding was then coated with a paint made of celluloid and collodion. Suitable binding posts were provided.

The performance of these chokes was surprising. The first choke built was used in a small transmitter using a UX-210 and was very satisfactory in operation. It was then tried in a transmitter using a UX-832 with a plate current of
150 milliamperes and was equally satisfactory. This high current carrying capacity of the No. 36 wire seemed rather surprising so it was taken over to a neighboring station which used a pair of UV-204-A's drawing 650 ma. The little choke carried the load with no heating to amount to anything and improved the note of the transmitter indicating better choking action than the choke which it replaced.

This large transmitter has burned out chokes using as large a size of wire as No. 24 so that it is no doubt the circulating currents that do the damage which are not present in a choke using No. 36 d.e.c. that is efficiently designed.

Having constructed a flat top for 7160 kc. from the information given in the September, QST, article by L. G. Windom may I say that it works fine? The radiator is thirty-five feet above ground. It is located in the thick of a lot of BCL antennas. There is something behind this writing that wants to come out so here it is for the benefit of the rest of the gang.

Before changing antennas, a single straight wire, voltage feed Hertz was employed without good results. Therefore the reason for trying to find a better radiator. However, the antenna gave some satisfaction and it was not uncommon to have some of the gang say crystal signals.

The beautiful new antenna was made and erected with great care. Now for some real good work and results, thought the builder. How badly I was mistaken! The tuning was easy, stations came back with reports strong r.a.c. signs. Some, a little more encouraging, said r.a.c. signals. There was not a change made in the transmitter, but something had to be done now, as a perfectly good m.o.p.a. should not act in this manner under a different type of aerial. A monitor was borrowed, and the trouble run down. It was found that with a good radiator it is essential to have the rest of the set in good condition. The trouble was located in the choke coils. It was necessary to change the number of turns from 150 to 180 turns in both the oscillator and amplifier. Reports are now again, good d.e. to crystal signals.

In addition to the chokes another point was brought out concerning the place of contact of the feeder to the plate inductance. If a high "C" tank circuit is used in the power amplifier it will only be necessary to use one turn of the coil. However, the tank is low C it is necessary to use three or four turns. The place of contact will also have a slight effect on the note and on the plate current.

--- Chris E. Hobson, WSBWP ---

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The radio frequency choke is one of the greatest of the small problems with which the experimenter has to deal. Especially in short wave work it is the choke critical. The writer has been doing quite a bit of work on a new screen grid set, and designed and built one of the chokes described to fill a long felt need. It worked so well that two more were built to make a complete set for the screen grid set. The construction of the choke is shown in Fig. 5.

A spool, five small brads, two soldering lugs, a strip of phosphor bronze, some Empire cloth, shellacs, and No. 30 wire are all the materials needed. First locate a point about one quarter inch from the edge of the hole in the spool and using that as a pivot, draw an arc with a radius of about three-quarters inch. Along this are mark five points, taking care that each is over the main body part of the spool. With a small drill, drill holes at each of these points at such an angle that they will come out on the inside of the flange of the spool. Now wind on No. 30 d.e.c. wire in a hazardous fashion, making turns at the 1st, 100th, 175th, 250th, and 325th turns, making each tap in the form of a loop and drawing each loop through the holes in consecutive order.

Now drive a brass escutcheon nail or small brad into the body of the spool at each hole. To prevent splitting, it is well to drill a hole straight into the body of the spool before driving in the pins, the holes being of a diameter slightly smaller than the pins. Scrape the insulation from the wire close to the head of the pins and take a turn around the head of each before driving it home. A drop of solder on each insures permanent connections. Cut a strip of phosphor bronze $\frac{3}{8}$" x $\frac{1}{4}$" and drill a hole in one end. The other end may be crimped to form a handle. Drill a small hole to take a wood screw at the point used for the pivot of the arc. Place a soldering lug under the switch blade and secure it with the small brass screw, leaving it loose enough to turn and yet it snugly. Wrap a turn of heavy empire cloth around the spool snugly, give it a coat or two or shellacs and the job is done. The choke may be mounted by drilling a counter-sunk hole nearly through the spool and fastening it down with a wood screw or small bolt, placing a small washer.

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(Continued on page 63)
MAJORITY vote of the member societies of the Union has been received on the matters put forth in the June calendar, and as a result Union Headquarters is happy to announce that the following additional societies are now full-fledged members of the I.A.R.U.:

New Zealand Association of Radio Transmitters (N.Z.A.R.T.) P. O. Box 779, Auckland, N. Z.
Experimenterende Danske Radioamatorer (E.D.R.) 5 Holmens Kanal, Copenhagen, Denmark.

All old members of the Union join in extending a hearty welcome to the new trio. The three organizations are well known as active and energetic amateur societies in their respective countries, and it is also worth mentioning that amateur radio flourishes in each of those countries.

At the same time the three new societies listed above were voted into the Union, it was voted to drop from membership the long-inactive sections originally organized in Argentina, Brazil and Switzerland. This action was taken because of the fact that the elementary sections created in those countries some four years ago have never complied with the requirements of the Constitution by organizing themselves into independent and self-supporting national societies, and furthermore have neither corresponded with Union Headquarters nor participated in any of the voting for the last few years.

Union Headquarters wishes to point out that it will be pleased, however, to consider applications for membership from any bona-fide national amateur society in any of these countries.

In this connection it is interesting to note that the Swiss amateurs have already organized themselves into a national society, and even now have an application for recognition of their new society as the Union member for Switzerland. In Brazil, too, we hope it will not be long before a national society is recognized. Mr. Vasco Abreu made a personal visit to Headquarters this past summer, while visiting the States, and expressed the intention of getting the amateurs of Brazil together on his return.

The next calendar of the Union will be sent out about the time this appears in QST, and it is hoped that at least two additional foreign societies will be proposed for membership at that time. Interest in the Union has increased considerably since the adoption of the new Constitution, under which, it will be remembered, individual membership was abolished, and a membership of national societies created instead. The Secretary of the Union will be pleased to enter into correspondence with foreign amateur associations desiring to affiliate themselves with the I.A.R.U.
Notice the new heading? We hope you like it. Perhaps it gives our readers just a little clearer idea of what the I.A.R.U. is, and what it is all about. We have a real international union of ham societies now; amateurs all over the world can be proud of the accomplishment. A world-wide association of real, live national amateur organizations — now in a healthy condition, and growing stronger every day. What a flight of imagination this would have represented on the part of the average amateur ten years ago, when international contacts were unknown, c.w. just emerging from the experimental stage, and when the amateurs of one country hardly knew that there were any other amateurs anywhere in the world! Yet here it is, and we think it not at all unusual!

We suppose there's a moral or something somewhere in that.

We got a real kick the other night when we talked direct with Warner at his hotel room at the Hague over the transatlantic 'phone; that "$75-for-three-minutes" feeling! Now we can high-bat all the neighbors. The best part of it is that we enjoyed all the nice part of that "$75 feeling" without any of the bad after-effects. It seems that the Netherlands Government very kindly extended the facilities of the T/A 'phone to the U.S. delegates. Rather sporting of the Dutch.

As for the conversation, we'll let "K.B." tell the story of the conference — though we may mention that things were reported as going nicely.

The Czechoslovakian Ministry of Posts has written us that it intends to get out official amateur regulations as soon as the Hague conference is over. More progress!

Last month we stated that by this time we'd know whether or not our pleas in the October issue produced any results. Well, we do know, and the upshot of it is that we have a blissful and expansive feeling toward the world in general and certain hams in particular.

With respect to the "best times for DX" matter, we acknowledge with thanks the very kind reports of G6ZR and W5AFB, portions of which appear below. In addition, other reports have come in, too late to make the column this month, but assuring a continuance of the feature to next month. These will be mentioned at that time.

W5AFB sends in a table carefully averaged from his 14,000-ke. contacts over the last 20 months, and as a result finds that his figures check almost identically with the dope given in the October table (Central States) for South America, Australia and South Africa. He agrees almost exactly with that list for New Zealand, finding good QSO's from 0400 to 0600 GCT, but notes his best single time as 0500. Better make a note of it, you fellows in the central part of the country. He also tabulates European QSO's somewhat differently: 2300-0100 and 0300-0800, with 0000 and 0500 as the best single hour in each case. He also adds a time for Hawaiian QSO's — straddling 0300 GCT.

Ponting, of G6ZR, did a bully job by sending in lists for both the 7000-ke. and 14,000-ke. bands, tabulated for seasons. His tables for this time of the year (November, December, January and February) are as follows:

<table>
<thead>
<tr>
<th>Continent</th>
<th>7000 ke.</th>
<th>14,000 ke.</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America (W1, 2, 3, 4 &amp; 6; VE1 &amp; 2)</td>
<td>2330-0800</td>
<td>1530-2100</td>
</tr>
<tr>
<td>North America (W5, 6, 7 &amp; 9; VE3, 4, 5)</td>
<td>0400-0730</td>
<td>1730-1830</td>
</tr>
<tr>
<td>South America (E. &amp; S. E.)</td>
<td>2130-0200</td>
<td>1930-2200</td>
</tr>
<tr>
<td>Asia (W. &amp; N. W.)</td>
<td>0400-0600</td>
<td>2300-0200</td>
</tr>
<tr>
<td>Africa</td>
<td>1900-2230</td>
<td>1530-1800</td>
</tr>
<tr>
<td>Oceania (Aust. &amp; N. Z.)</td>
<td>1930-2030</td>
<td>1500-1500</td>
</tr>
<tr>
<td></td>
<td>0500-0830</td>
<td>0600-0900</td>
</tr>
</tbody>
</table>

Remember that while this is a table telling the best times for Britishes to work the various continents listed, it also works the other way just as well; it tells the fellows in the U. S., etc., the best time for them to try to hook Britshers.

Remember, too, that all times are GCT (0000 being midnight), and that for EST you must subtract 5 hours; for CST 6 hours, for MST 7 hours, and for PST 8 hours.

Well, more of these lists again next month. Incidentally, does the gang generally want this continued as a regular monthly feature of this department? Drop a card or message letting us know.

And now about the other request, which was for foreign schedules to relay I.A.R.U. Section reports. We got three offers of help, up to this write.
On Rag Chewing

Editor, QST:

I have read W2AW's letter in the September QST with no little joy, and I wish to commend it to the notice of all hams. Since we are all, even including British hams, permitted to exchange “personal messages of an unimportant character,” there is no possible reason for not rag chewing more, far more, than we do.

At any rate, let it be known that here is one ham who is not only willing, but anxious, to tell you fellows across the pond all about the view from his window and what he has for breakfast. Should the great God of Ham Radio grant that the sigs of G2HJ shall ever penetrate beyond his own back garden, then will that station be ready to talk with those whom he works on any subject they care to name, to give them biographical details concerning himself, and swap funny stories.

Here is a second exponent of “the gentle art of radio conversation.”

—K. E. Brian Jay, G2HJ

Operating in Japan

1226 Keasumoku St., Honolulu, T. H.

Editor, QST:

In June of this year I took a trip to Japan for a vacation. There I met some “J” hams. They had been working without licenses and were caught by government officials. Some of their outfit was confiscated, and they barely got out of paying a heavy fine. It seems the officials were tipped off by some anti-ham person.

After some trouble they were able to settle the argument and the arrested hams applied for licenses. Owing to a lot of red tape licenses will not be forthcoming for about three or four months. After that, if they do get their licenses satisfactorily, it means that their operating hours will be limited by law to some four or five hours out of the whole twenty-four.

Government officials are always listening to the QSO's made by the "J" hams, and a little slip like mailing a card without enclosing it in a plain envelope may mean the arrest of several hams at once.

Let's get together 0M's and help our "J" brothers as much as we can.

—Y. Katsuki, K6DPG

Traffic Rules in Operating

Editor, QST:

From time to time in the past few issues of QST there have appeared articles condemning certain operators. The main exception taken to these men seems to be the fact that they, at some time or other, put some well intentioned beginner short or refused to accept his traffic. I quite agree with the authors of these letters, but on the other hand, there is the other side of the argument.

Consider the amateur operator whose business allows him only a few precious minutes a day or a week at the key of his station. As an example: Not so many weeks ago I had a period of two days at home, A Q at about 4:00 p.m. netted a “W7” about thirty miles distant. “W7” informed me he had QYC3 for Seattle so, in due form I told him, QSP K. All I got was a lengthy call with a request for his QRK. I told him he was KB WSA5 and to GA. He did — and how! Q8Z about 6 per. All three messages were sent like this, followed with 73's and CUL SK, never waiting for a QSL. Now maybe this chap was new at the game — but why not use a few of his traffic rules?

At about 11:00 p.m. I again sent out a QSO and raised a "W6" in the vicinity of San Diego. He said QTC and along came his message, all in the same breath. Fine stuff, time saver, etc., but the message happened to be for Mexico City. I refused to accept the message, explaining that this was my last night on the air for three weeks and that I did not have a schedule with Mexico. Said "W6" informed me that was O.K. with him as he didn't either and for me to do what I could with it. He signed off and I had the message. I hadn't accepted it or QSI'd in proper form or anything but do you think that he was going to waste more time with his copy? Guess again. Now both of these chaps sounded like they were new at the game, but I fail to see why newness should be accepted as an excuse for practice such as this. Also, I wonder if operators such as these really expect other fellows to take time out to work them.

A few minutes later I contacted with a "W9" back in Denver who asked me QRU? I gave this operator a string of four, originating on my ship, and he stuck with me through heavy QRM till every one of these messages was O.K.'d. At the end of traffic he explained that this was only his
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1750-kc. 'Phone

Editor, QST:
I am a 3550-kc. 'phone man and would like to offer a suggestion to relieve the QRM on that band.

Quite a few of the older phone men including myself, are going up to the 1750-kc. band this winter. Some of the fellows seem to have the idea that this band is no good at all for DX work, but W1GCR at Springfield, Mass., worked a fellow on the west coast with a spark outfit back in 1924. Then, with the 1929-30 transmitters and receivers, why will it be hard to do it with c.w. or 'phone?

If you want to dodge the QRM on the 3550-kc. 'phone band just QSY down to 1750 kc. and have some fun with the rest.

— B. L. Cupstaff, W3AVW

3500 QSLs a Year!

Editor, QST:
I have been a member of the League for the past two years and have noticed quite a bit of comment in QST regarding the QSL situation.

There seems to be some members who do not appreciate receiving a card unless it is from the north or south pole or twelve thousand miles from their own district.

Some claim it costs them thirty-six dollars a year for cards and while it may be true, that investment represents in the neighborhood of 3500 cards, I doubt very much, under the conditions we are working, if there are many stations that work 3500 different stations in a year's time that they QSL. Nevertheless, I sympathize with W6ETZ, but it appears to me that the present conditions will prevail, until the "Scotch" is forgotten, as most of us are in the same game for the pleasure derived. I would like to tell the gang to remember the old saying, "It isn't the value of the thing as much as the thought it expresses." In other words, if you are asked to QSL you
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Amateur Radio at the Sick Bed

2717 Derby St., Berkeley, Calif.

Editor, QST:

I should like to have the privilege, through the medium of QST, of expressing my appreciation for the service which amateur radio has rendered me.

Last March I was taken with a severe illness which resulted in my being sent to a hospital in Oakland for an operation. My folks, living in San Diego, were naturally somewhat interested in having speedy and reliable communication with me, or rather with those in attendance at my bedside. Two young men, one of whom I have known for some time, Mr. Paul Weinstock, W6AGJ, of El Cajon, Calif., and Mr. A. Thell, W6BW, of Oakland, Calif., arranged a schedule in such a fashion that Mr. Thell was in touch with the hospital and Mr. Weinstock with my folks. Quite as regularly as the clock strikes, judging by the messages, Mr. Thell and Mr. Weinstock sat down before their respective sets at 7 a.m. and proceeded to give and take messages. They proved to be fully as reliable as the telegraph or telephone, failing just once to make contact. That once was due to the failure of Mr. Thell's transmitting set, at which time he arranged with another amateur of Oakland for the handling of the messages. Neither of these two men received anything for their efforts save my thanks, recompense of doubtful value considering the time and electric energy spent.

All in all I am most favorably impressed by the ability and untiring efforts of these men. If they may be considered as examples of the radio amateur fraternity, then certainly American amateurs have just cause to be proud. To these two men, and to their "brethren of the air," I extend my sincere thanks.

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"An Unknown Friend"

10152 123rd St., Richmond Hill, L. I., N. Y.

Editor, QST:

There are many forces in this great world which will unite and cement strong friendships between two parties. To try to mention all of these forces would be quite a task. However, I will tell of one of them, to my knowledge and experience the greatest force of endearing mutual friendship today.

When the layman hears tell of a "radio amateur," he conceives the idea that said person is one pursuing the art of radio for technical reasons of his own. This is true to a large extent, but let us look at the amateur's view of the situation. First of all he spends his money for equipment and then time and self-sacrifice in putting this equipment into workable order. When the task is
Amateur's Bookshelf

Good textbooks and operating manuals should be on every amateur's bookshelf. We have reviewed practically all the books in which the amateur would be interested, and have arranged to handle through the QST Book Department at A.R.R.L. Headquarters those volumes which we believe to be the best of their kind. Take pride in a small but good radio library; buy a few good books and get into the habit of reading them.

Manual of Radio Telegraphy and Telephony, by Commander (now Admiral) S. S. Robison, U.S.N. Published by the Naval Institute. Covers both the theoretical and practical fields. A QST book review on this work stated in part: "Ranks with the very best of all published radio matter... It is perhaps the best radio book that ever came to this desk." Every amateur should own a copy. 895 pp., 6 3/8 x 9...

Principles of Radio Communication, by Prof. J. H. Morecroft. An elaborate general textbook, and one of the recognized standards on theory for the engineering student. A working knowledge of mathematics is desirable for the reader who expects to get the greatest benefit from this work. 935 pp., 5 3/4 x 9...

Elements of Radio Communication, by Prof. J. H. Morecroft. This is a new book by the author of the "Principles" listed above. It is about half the size of the larger work, and the subject is treated in more elementary fashion. Simple algebra is sufficient. An excellent book for the "first-year" student. 269 pp., 170 illustrations...

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The Radio Manual, by George E. Sterling. Another excellent practical handbook, especially valuable to the commercial and broadcast operator, and covering the principles, methods and apparatus of all phases of radio activity. Includes 1929 regulations. Over 900 pp., $6.00...

Radio Telegraphy and Telephony, by Duncan and Drew. Still another work along the lines of a general practical handbook. In size it is approximately the same as the two listed just previously, and the subject matter generally follows along the same lines. A good book in this class. 950 pp., 468 illustrations...

Practical Radio Telegraphy, by Nilson and Hornung. Written particularly for the student training for a commercial license, and covering theory and apparatus. A practical handbook. 380 pages, 223 illustrations...

Thermionic Vacuum Tube, by H. J. Van der Bijl. For many years this has stood out above all other works as a theoretical textbook and treatise on the vacuum tube and vacuum tube circuits. A knowledge of higher mathematics is required. Not a book for the beginner, but for the laboratorian and engineering student it is without a peer...

Radio Operating Questions and Answers, by Nilson and Hornung. Revised edition. This is intended as a companion volume to "Practical Radio Telegraphy" by the same authors. In conjunction with that work it should leave the commercial license applicant well prepared for his examinations. There is a chapter on amateur license questions and answers, too. 267 pp., 5 3/8 x 8...

How to Pass U.S. Government Radio License Examinations, by Duncan and Drew. Intended as a companion volume to "Radio Telegraphy and Telephony" by the same authors, as a guide to the applicant for commercial licenses. It is not a text in itself. The chapter arrangement follows that of the sections of the commercial theoretical examination, each being made up of typical examination questions and their answers. 169 pp., 92 illustrations...

Prices include postage

Read 'em and learn!

AMERICAN RADIO RELAY LEAGUE, INC.
1711 Park Street, Hartford, Connecticut
Ambassadors of Joy at Yule-tide

Let a set of new Cunningham Radio Tubes flood your home with harmony this happy Christmas season.

E. T. CUNNINGHAM, INC.

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finished, the amateur, man or boy, woman or girl, feels thrilled at what is to come.

The government tests passed and license awarded, the amateur gives a far call through the weird ethereal spaces; his hand with utmost care of manipulating his telegraph "key" spells out definite calls which his equipment hurl into the atmosphere. He listens for an answer; lo and behold! he hears another amateur calling him. "Contact," so to speak has been made. Conversation, signal reports, etc., friendly flow between the two "unknown friends." They do not know each other personally, yet with mutual understanding and sympathy, each has an "unknown friend."

Does not this factor, alone, make our "ham" radio hobby a most worth-while pursuit?

— Thomas B. Norris, W2ATT

I.A.R.U. News

(Continued from page 50)

ing, and anticipate more. One of those three hopes to make a definite schedule for one particular country, FB!

In the meantime, your compiler might state that he has a foreign ham, who contributes regularly with a report, fairly itching to land a good U. S. contact somewhere between the Mississippi Valley and the West Coast. Some "W" station in the 6th, 7th or 9th District, working on either 7000 kc. or 14,000 kc., and capable of consistent DX performance is needed. Apply direct to the compiler of this department. No reasonable offer refused. Who gets it?

And now to the reports of the Australian and German Sections and the newly organized Swiss outfit. In passing, we would like to point out that all these reports are exactly what we think a foreign report should be — an interesting account of what the hams in those countries are doing and planning to do. We hope other countries will follow their example when sending in reports.

AUSTRALIAN SECTION

By W. G. Sones, Hon. Publicity Officer of the W.I.A.

Scientific Expeditions: Australian amateurs are limited in the type of traffic which they are permitted to handle. Under the regulations governing radio in this country we are prohibited from transmitting anything other than information in relation to the tests in hand. A concession is allowed with respect to personal messages between two station operators, but nothing in the nature of a third party message is permitted. We would like to be able to handle the same traffic for scientific expeditions as is handled by U. S. amateurs, and have sought permission to do this in connection with an Antarctic expedition now be-
THORDARSON DOUBLE FILTER CHOKEs

CONTAINS TWO 18 HENRY 250 MILL CHOKEs

This Thordarson heavy duty, rugged double Filter Reactor is excellent for Filter Circuits in Transmitters, Power Amplifiers, "B" Eliminators and various other purposes.

Each Choke has a 2000 Volt insulation and the D.C. resistance of each Choke is 108.5 ohms.

When connected in series this Filter Reactor has a capacity of 36 henries at 250 mills, and when connected in parallel 18 henries with 500 mills carrying capacity.

Weight for shipment 14 pounds. Dimensions 3 x 7 x 5½ in. Equipped with mounting brackets.

SPECIAL $6.25

Dubilier HIGH VOLTAGE FILTER CONDENSER

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These Filter Condensers are designed for use in filter circuits in Transmitters, and all high Voltage Socket power devices and Power Packs.

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Finest non-inductive High Voltage Filter Block ever made. Designed for use with UX-250 Power Tubes but can be used safely in filter circuits of transmitters or high power Amplifiers in any combination of capacities desired.

Each Unit is equipped with long, heavy, flexible leads, convenient for easy wiring, and also has mounting brackets. Latest design.

The insulation resistance of these Condenser Blocks is in excess of R.M.A. and N.E.M.A. standard requirements. Due to the request of manufacturers of these Condenser Blocks we cannot divulge the high list price of same.

SPECIAL $3.25 PER BLOCK

50 HENRIES FILTER CHOKEs

These are very efficient Chokes for use in Filter Circuits for your Transmitter, A and B Eliminators or Power Packs.

The Choke Coils are very well constructed and are made with air gaps to prevent magnetic saturation from direct current.

SPECIAL $1.50

Faradon or POLYMET

5 MFD. HIGH VOLTAGE FILTER CONDENSER BLOCKS

This condenser block is ideal for use in "B" eliminators, Power amplifiers and experimental work.

SPECIAL $1.50 PER BLOCK

American Sales Co., 19-21 Warren Street, New York City

Say You Saw It in QST — It Identifies You and Helps QST
AmerTran Audio Transformers perfect the audio system, and bring the programs into your home exactly as they go on the air—reproducing music and the speaking voice in true tone, identical with the range of pitch and the rich fullness of sound quality as broadcast in the studio.

Ask your dealer about AmerTran Transformers, or write for complete information on how to improve the tone quality of your set by using AmerTran Products, of which there are thirty-odd in the field of radio reception.

The facilities of our engineering department are at the service of everyone interested in better radio and sound reproduction.

AmerTran Audio Transformers—Type 151—Between one input and two output tubes—List Price $15.00

AmerTran Power Transformer—Type PB-245A—List Price $22.00

Airplane radio is getting a good deal of attention from our members at present in connection with the activities of our Air Force Reserve, and by means of alliances with civil aviation clubs, three sections of which have been organized in Victoria, New South Wales, and South Australia. During the last few months in which the Air Force Communication Reserve has been in operation nearly 2000 words of traffic have been handled by Reserve stations, and the success of the scheme has been better than we hoped for. Our alliances with the civil clubs give us an opportunity to undertake experimental work in connection with airplane installations.

The attention of Australian amateurs is at present centred in the annual Federal Convention of delegates from each State Division of the Wireless Institute of Australia, which will take place in Brisbane (Queensland, 4th District) on the first of September. Delegates will meet and discuss the position of amateur radio in the same way as does the Board of Directors of the A.R.R.L. at this conference. They will lay down the policy to be followed by the Executive department, elect officers and decide the location of the Federal Headquarters for the ensuing twelve months. The organization of the W.I.A. differs somewhat from that of the A.R.R.L. because of local conditions outlined in the note and map on the geography of this country in the July issue of QST.

The deliberations of the convention will probably be of interest to amateurs of other countries (indeed they will!)—Ed.) and will be reported in detail after the convention.

Operating activities in all bands are increasing; there is a regular rejuvenation of short-wave interest just at present.

ing organized in Australia to proceed to the polar regions very shortly.

The expedition is a semi-Government one, and as no financial interests are involved it is feasible that we should be able to handle some of their traffic. The bulk of the traffic will be handled by the government organization here—Amalgamated Wireless (Australia) Ltd., which corresponds pretty closely to the R.C.A. in America, but it is probable that amateur radio may be able to assist in a number of directions.

A second expedition for geophysical investigation, financed by the Carnegie Institute is at present proceeding to the far northwest of Western Australia, which is very sparsely populated, and permission has been granted (with the same old restrictions as to personal messages) to handle the traffic direct to America. Most of the work will be handled by the West Australian (6th District), and to say that the gang is looking forward to this work is putting it very mildly indeed.

A third expedition, an aerial survey, has just been completed by the personnel of an Australian Air Force group of the north of Central Australia. Amateur radio participated in this work to the extent of handling a fair amount of traffic through stations (amateur) of the Air Force Communications Reserve.

Say You Saw It in QST — It Identifies You and Helps QST
The Radio of tomorrow

Chassis of the New 1930 Browning-Drake—Screen-grid and Heater types

**Compare The Features of Any Other Set With These New Improvements**

- Semi-automatic tuning with drum so designed that you can readily locate your favorite stations in the section of the country in which set is used.
- Each set locally tested to insure perfect reception under individual conditions in every locality.
- Television, phonograph, home movie and short wave connections.
- Special dynamic speaker enabling you to regulate tone, without distortion, from full volume to a whisper.

**New 1930 Browning-Drake Radio** has been designed with such rare foresight that its owners have the comforting assurance that any future changes in radio operation will be nothing more than efforts to approximate the Browning-Drake standard of quality.

**Voltage Regulation**
- Adjustment (Manual)

**Five Tuned circuits using nine tubes**

**Tuned antenna**

**Push-pull audio**

**Power detection (optional)**

**Hum eliminator**

**Band-pass filter effect**

In eight models — console and table — heater and screen-grid types. Prices, table models, $98, (heater), $102.50 (screen-grid)

Consoles from $137.50 to $188.50

**BROWNING-DRAKE Screen-grid RADIO**

*We welcome inquiries at any time and can present an unusually attractive franchise proposition to dealers*

Browning-Drake Corporation, 228 Calvary Street, Waltham, Mass.

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Bradleyunit Fixed Resistors are noiseless in operation

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

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

Oscillogram showing noiseless performance of Bradleyunit Resistors.

Oscillogram showing noisy performance of other types of resistors.

ALLEN-BRADLEY CO.
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Milwaukee, Wis.

GERMAN SECTION

By W. Rauch, Sec'y D.A.S.D.

DX has been very bad lately on the 7000-ke. band, and although many American stations have been coming over with a signal strength up to QSA5, we are unable to complete many QSO's. On 14,000 kc. conditions were somewhat better, and many contacts were made, mostly in the late afternoon. For 28,000 kc. we have no results to report.

The most important event recently was the great German Radio Exposition held during the latter part of August and first part of September. The D.A.S.D. had a booth at this show, and a complete amateur station was installed. Both the booth and transmitter attracted a great deal of attention, and the hams at the booth were kept busy explaining what amateur radio was. We feel that a great deal of good has been accomplished.

On the last night of the show a meeting of all the hams present was held. Many German amateurs brought friends from out of town, and we even had visiting hams from foreign countries present. A most enjoyable evening was spent; those who had not visited Berlin before were taken by motor all over the city.

Note: In addressing QSL cards do not forget that most German hams are not licensed, and cards should therefore be sent under cover to the D.A.S.D., 19 Blumenthalstrasse, Berlin, W. 57.

SWITZERLAND

It gives us a great amount of pleasure to inform I.A.R.U. Headquarters that on August 4, in Zurich, the first real Swiss short-wave amateur club was founded. The name of the organization is the Union Swiss Kurzwellen Amateurs, or Union of Swiss Shortwave Amateurs. The Zurich convention was a great success, and all those who had promised to attend were there. The spirit aroused at the meeting indicates that Swiss amateurs have finally attained a definite status in the world of amateur radio, and a rapid growth is anticipated.

The U.S.K.A., according to its Constitution, is a society formed for the promotion of short-wave two-way radio, and its purpose is to foster and protect the interests of amateurs — particularly transmitting amateurs. The officers are to be a President, Secretary-Treasurer and Traffic Manager. Mr. Degler has been elected the first president and Mr. Scheneberger the secretary.

Forty members are already enrolled, and we expect to grow steadily.

Well, here we are at the end of the "eolyum" again, and being just a little short of radio material to fill out with, are going to take liberties to the extent of relating a little experience we participated in personally. You see, it was like this:
Success may be judged by many standards, and you will discover how relative the term is, as applied to Radio, when you tie up with CARDWELL Condensers and compare Performance with what you considered was Success before.

The CARDWELL line is intended to, and does, meet a demand for the utmost in condenser value and efficiency. It includes transmitting condensers for broadcasting stations, commercial transmitters and amateur uses, and receiving condensers of several types and many capacities. The CARDWELL Taper Plate Condenser—unbelievably rigid and vibrationless—is incomparable for short wave receivers.

CARDWELL Condensers are not dressed up to delight the eye but are designed to do a job, and upon their preeminent ability to do that job is based the reputation of the CARDWELL.

CARDWELL CONDENSERS

"The Standard of Comparison"

THE ALLEN D. CARDWELL MANUFACTURING CORPORATION
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CAN'T you picture certain of your friends (particularly the fellow who borrows your copy) who would be as delighted as you are with QST?

A subscription present is unique, too. It serves as a monthly reminder of your thoughtfulness.

A yearly subscription costs only $2.50, little enough for the ones you have in mind. And — we'll send an appropriate gift-card conveying your Christmas Greetings.

QST
1711 Park St., Hartford, Conn.

Please send QST to the following, find my check enclosed, and send out the Greeting cards for me.

1. ........................................
2. ........................................
3. ........................................

W9CRD, C. C. Coleman, 308 Alta Ave., Danville, Ky.

7000 to 7500 kc.

4000 to 4500 kc.

3000 to 3500 kc.

Becoming thirsty while working around the shop recently, we walked over to a bottle which we knew to be customarily filled with nice, pure distilled water and took a healthy swig. Alas — that time it contained battery solution! Fortunately none of it got down so far as our tender insides. Incidentally, while we can't recommend battery solution as a beverage, it must be admitted that it is positively unexcelled for "removing that film."

Calls Heard
(Continued from page 51)

Cebab ceehe luaha luaha kaih kikyp zilfa zilba zilax zilaa xk2gj xk2b xk3w xk3p xk3t xk3h xk3b xk3n xk3t xk3f

VK3PR, W. R. Jardine, 264 Buckley St., Essendon No. 5, Victoria, Australia.

Becoming thirsty while working around the shop recently, we walked over to a bottle which we knew to be customarily filled with nice, pure distilled water and took a healthy swig. Alas — that time it contained battery solution! Fortunately none of it got down so far as our tender insides. Incidentally, while we can't recommend battery solution as a beverage, it must be admitted that it is positively unexcelled for "removing that film."

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Here's the Answer
to every question about the principles, methods, or apparatus of radio transmitting and receiving. A complete course in radio operation in a single volume.

The Radio Manual
A New Edition

Complete new chapters on aircraft radio equipment; Practical Television and Radiomovies with instructions for building a complete outfit; radio interference; 100% modulation; latest equipment of the Western Electric Co.; the Marconi Auto-Alarm System; and many other developments of the past year. All this information is added in the new edition and, besides, the entire book has been brought right up to date with much new material. The Radio Manual continues to be the one complete and up-to-the-minute handbook covering the entire radio field.

A Complete Handbook of Principles, Methods, Apparatus for Students, Amateur and Commercial Operators, Inspectors

By G. E. STERLING, Radio Inspector and Examining Officer, Radio Division, U. S. Dept. of Commerce. Edited by ROBERT S. KRUSE, for five years Technical Editor of QST.

20 big chapters cover: Elementary Electricity and Magnetism; Motors and Generators; Storage Batteries and Charging Circuits; The Vacuum Tube; Circuits Employed in Vacuum Tube Transmitters; Modulating Systems and 100% Modulation; Waveformers; Piezo-Electric Oscillators; Wave Traps; Marine Vacuum Tube Transmitters; Radio Broadcasting Equipment; Arc Transmitters; Spark Transmitters; Commercial Radio Receivers; Marconi Auto-Alarm; Radio Beacons and Direction Finders; Aircraft Radio Equipment; Practical Television and Radiomovies; Eliminating Radio Interference; Radio Laws and Regulations; Handling and Abstracting Traffic.

An immense amount of information never before available including detailed descriptions of standard equipment is presented.

Examine It Free

Never before has so complete a treatment of radio theory and operation been compressed into a single volume as in this Revised Edition of THE RADIO MANUAL. Here is information that otherwise you could secure only by consulting many different books. And every detail is backed by authorities of the first rank. The Manual is profusely illustrated with hundreds of photographs and diagrams. There are 960 pages, bound in flexible fabric that is extremely durable. The immediate demand for so valuable a handbook will quickly exhaust the first edition. To be sure of receiving your copy without delay, order at once. The volume will be sent for free examination. Pay on return in 10 days.

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Famous Improved VIROPLEX Used by tens of thousands of operators because of its ease and perfection of working. Black or Colored. $17 Nickel-Plated. $19

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825 Broadway, New York City
Cable Address: "VIROPLEX" "New York"
Yes Son, I told St. Nick to bring you all the Thordarson equipment you needed to build your new station—and there it is—Merry Xmas.

73 Merry Christmas and Happy New Year to all.

Thordarson
Electric Mfg. Company
500 West Huron Street
Corner Kingsbury
Chicago, Ill.

Say You Saw It in QST — It Identifies You and Helps QST
This Issue Completes the 1929 Series of QST

YOU'LL want to keep these copies as a unit — and the best way to do so is to put them in a QST Binder

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

$1.50 each postpaid

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"Tone tested" by America's foremost musicians! Alma Gluck, Edith Mason, Efrem Zimbalist, José Mojica, George Gershwin, Josef Pasternak and other equally famous artists regularly assist Crosley in developing its new tone beauty ... a purity and richness that mechanical tests alone could never attain!

Models incorporate every modern improvement: Screen Grid, Neutrodyne Circuits, Power Detection, etc. And prices are rock-bottom! Phone your Crosley distributor today — or, if you prefer, write us direct.

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CINCINNATI, OHIO
Home of WLW—"The Nation's Station"

You're there with a
crosley
Get your radio operator’s license!

See this book. It contains information essential for all men who are preparing to become licensed amateur and commercial radio operators. It contains hundreds of practical radio questions and answers.

Radio Operating Questions and Answers
By Arthur R. Nilson and J. L. Hornung
Second Edition
367 pages, 5 1/4 x 8, 91 illustrations
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This is the enlarged second edition of a book formerly published as Radio Questions and Answers. It covers the great advances which have been made since 1921 in the art of radio communication; it takes into account the new technique of broadcast-station operation which has been evolved through electrical, mechanical and physical improvements.

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Q.S.T.: 12-39

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YAXLEY MFG. CO.

Dept. S, 1528 W. Adams Street, Chicago, Ill.

Coming—Operating Activities

(Continued from page 49)

some countries. In addition, our records indicate that Mesopotamia must be segregated from the rest of Asia and separate factors applied. In our list the factor for the east coast group of stations is always given first. Europe 3, 11; Africa 15, 10; South America 3, 3; Mesopotamia, Iraq and Palestine 5, 15; Asia (China, Japan, Malay States, E. Siberia, Siam, French Indo-China) 20, 10; Oceania 4, 3; North America (Alaska 4, 3), (Mexico and all Central American countries 3, 3), (Porto Rico, Cuba, Bermuda, Bahamas and Antilles 2, 3), (Greenland, Iceland, Newfoundland and Labrador 2, 3).

After all the individual scores have been multiplied by the proper factor depending on whether you classify as an eastern or western station and the results added together this amount is to be multiplied by the number of continents worked to give the total score. The contest will then offer a distinct incentive to qualify for the WAC Club! With our own continent qualifying as one (except that W and VE QSOs with other W and VE stations will not count in the test, of course), we wonder how many stations can succeed in working all continents in the two weeks of our tests.

To make the contest scores of somewhat similar magnitudes and interest for participants residing in remote or foreign localities, we are ruling that their total scores shall be multiplied by the number of U. S. and Canadian districts they have succeeded in contacting. There are nine U. S. federal inspection districts and five Canadian districts making a possible multiplier of fourteen!

An example of the way messages should be handled under the rules of the contest will be given as briefly as possible. We shall assume that at the start of the contest G5BY works W6BTX and takes one of his test messages selected at random from his (W6BTX) list of messages provided by A.R.R.L. HQ, just before the tests begin. After the stations finish their QSO, W6BTX looks for other countries to work while G5BY writes out an answer to give to some other station in the U. S. or Canada the first chance he gets. On his next QSO, G5BY hopes to send this reply message and at the same time receive another message to boost his score all he can. If the message he takes on the second QSO happens to have the same text as the previous message, he can take it or ask for a different message if he likes. If he takes it, he must be sure to answer it differently before QSPing back to a U. S. or Canadian station. Late in the contest G5BY may work W6BTX again and while unable to take another message from him, he can give him (W6BTX) a reply to a message taken from any U. S. or Canadian station except W6BTX. W6BTX, W7OBY, will know it is a different message because it will bear a different serial number than the one assigned the similar message by W6BTX. Every set of message assignments bears a cipher number which must be used in
MINIATURE INSTRUMENTS of Remarkable Sensitivity

Pattern 68
for Radio Frequency

Pattern 78
for Alternating Current

Pattern 88
for Direct Current

JEWELL MINIATURE INSTRUMENTS

which have proved so valuable to radio manufacturers, are now available in new low ranges.

Pattern 88, the Direct Current Instrument in a moulded bakelite case, is available with scales of 200, 300, and 500 microamperes.

Pattern 54, the metal case D. C. Instrument, is also available in the above ranges.

Pattern 68, is available with 10, 25, 50, and 100 milliamper scale for high or radio frequency; also good on 60 cycles or audio frequency.

Why not consult Jewell Engineers about your instrument problems? More than likely their experience will prove of value to you.

Jewell Electrical Instrument Company
1642-C WALNUT STREET, CHICAGO, ILLINOIS

29 YEARS MAKING GOOD INSTRUMENTS

Say You Saw It in QST — It Identifies You and Helps QST
Use
Potter Replacement Blocks and By-Pass Units for Service Work

Condenser Replacement Blocks

<table>
<thead>
<tr>
<th>Code</th>
<th>Block Type</th>
<th>Price</th>
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<tr>
<td>4341</td>
<td>Majestic Standard &quot;B&quot;</td>
<td>$10.00</td>
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<tr>
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<td>Majestic Special Master</td>
<td>11.00</td>
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<td>4347</td>
<td>Majestic Super &quot;B&quot;</td>
<td>12.00</td>
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<td>4359</td>
<td>Majestic Master &quot;B&quot;</td>
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<tr>
<td>4360</td>
<td>Brown &quot;B&quot; Super Power (Green Brown)</td>
<td>11.00</td>
</tr>
</tbody>
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572-S Mohawk AC-272-226 Type Power Unit $12.00
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National Products
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A RELIABLE and efficient rectifier tube — low impedance due to mercury vapor — long life due to low temperature filament and oxide coated cathode of large area — of sturdy design which defies the roughest handling incident to shipping them.

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Normal Plate Volts: 3000
Filament Amps: 1.7
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Announcing repair of UX882. $16.50
We repair 283A tubes $19.00
284A tubes $27.00
WE 211 tubes $16.50
WE 212 tubes $40.00

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National Radio Tube Co.
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San Francisco, Calif.

numbering the reply test message for identification and checking purposes.
Sample messages as sent by U. S. or Canadian amateur stations:
TEST MSG DE G/A/K/ZE/ES/FE (Insert call signal)
NR 342G2F3 (Insert date)
WHO WAS THE REPRESENTATIVE OF YOUR COUNTRY AT THE HAGUE TECHNICAL CONFERENCE...

Answer as worded by any amateur in another locality and sent to some other U. S. or Canadian (W or VE) station:
REPLY TEST MSG DE G/A/K/ZE/ES/FE, etc. (Insert call signal)
NR 342G2F3 (Insert date reply returned to W or VE)

- - - - I AM INFORMED THAT MY NATION WAS NOT REPRESENTED AT THIS CONFERENCE...
(Sign name and address if you wish for identification)

RULES OF CONTEST

1. The contest opens February 15 at 0000 G.C.T. and closes March 1 at 0000 G.C.T. Work before or following these dates and times shall be disregarded by the award committee.

2. Although as many stations in each foreign locality as desired shall be contacted, U. S. or Canadian amateurs may send one and receive just ONE contest message to any particular station worked.

3. Similarly, but any ONE reply contest message shall be accepted from any one station in a foreign locality.

4. Reply contest messages must contain ten or more words in the text. Replies are prepared by the contestant himself who must see that each message is differently worded. Reply messages count only when sent to a station in the U. S. or Canada other than the station from which the original message bearing the distinguishing serial number was obtained.

5. Credits: (U. S. and Canadian stations.) Sending the contest message counts one point. Receiving a reply contest message from abroad counts two points. The score will be augmented regardless of whether a message is exchanged in one or both directions, differing in this respect from our January A.R.R.L. Sectional competition.

6. A report by mail is required of all participants at the close of the contest. Whether your score is 1 or 100, we want the dope for QST. All reports should be in the mails within three days of the close of the contest. Late logs and contest message files will not receive consideration in the analysis of results to determine the certificate winners or for QST mention. U. S. and Canadian logs and messages will be received up to midnight March 12, 1930. Reports and confirmation copies of messages handled in the tests will be received from stations in other localities up to midnight April 21, 1930. Reports received after these dates will be returned to the senders as they cannot be used in computing the results.

(a) United States and Canadian stations must return the message assignment sheets with the record showing when the message was sent, call of station to which message was given, date and frequencies used in the space provided on the special log sheets that will be issued. The copies of all messages received from foreign localities must be turned in as evidence of QSO with stations in the different localities. The information on time, call, date, and frequency should also be included directly on each message.

(b) Foreign confirmations: Copies of all contest messages received and reply test messages must be turned in with the information requested under (a). All reports should be mailed to the following address promptly at the conclusion of the contest: International Contest Headquarters, Care A.R.R.L., 1714 Park St., Hartford, Conn.
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Condensers, Dufier, mica, working volts 3000, capacity...

$3.00

Condensers, Century, volts 60, A.C., capacity 1 mfd.

$1.25

Condensers, Wireless Speciality, copper leaden glass int., 400 volt, working volts 60, capacity .1 mfd.

$2.00

Condensers, Dufier, mica, transmitting, 3500 working voltage 400 mfd.

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Condensers, Dufier, mica, transmitting, 12,500 working voltage 200 mfd.

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Transistors, Hofton-Cab, 22 volt, carbon granular.

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Transmitter, telephone, U.S. Army, 30 volt output.

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Huzzers, Western electric, Extra high quality high frequency.

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Receivers, Navy, C. N. 114, 900-2500 waves, Special.

$2.50

Receivers, Commissioner, 310, 1000-10000 meter.

$50.00

Receivers, E. S. 143 and L. J. 100, 400-2500 waves, on request.

$1.50

Hydrotone, Signal Corp., type B 110C. For use with SCR 9710000-400000, with detector.

$1.50

Indicators, Retarders, complete.

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Lookout Unit, Western Electric, 114, Ideal for monitoring your transmitter. Without cord.

$3.50

Magneto, Army Army and midget type, has large fixed magnets, good value.

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Switch, Telephone, toggle 4 or 6 point.

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Switch, Self, automatic, polished copper, D.P.D.T., 250 volt-5 amp.

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Telegraph and huzzers portable sets, mahogany case, D.P.T., 250 volt-18 amp.

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Transmitters, General Electric, current type, 150 to 2500, with center taps, 100 volt, 60, 40, 100 wave.

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Transformers, Simon, 200 to 11500 closed core, 3/4 K. W.

$2.50

Air compressors, Kellogg Model 71, 71/4 r.p.m., 4 cubic feet, 115 volt, 1125 lb. pressure.

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RECEIVERS — IP-501, SE-1420, SE-143, CGR-1, SE-1270, UN-204.

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7. Evidence of more than one test message to any one
station from a single U. S. or Canadian station will make
a contestant ineligible for either a certificate award or
honorable mention in QST. All stations must abide by the
regulations of their respective countries or become inel-
igible. Other evidence of intentional infraction of the rules
will make the contestant ineligible similarly.

8. The contest message serial number must be used in
the reply test message. It is suggested that foreign partici-
pants include name and QRA at the end, of their reply
test messages for identification purposes. This is not a
requirement necessary for proper credit but it is desirable
in a contest of this magnitude.

9. U. S. and Canadian amateurs must signify that they
desire to enter the contest contest by sending a QSL-card
or letter to the following address signifying their intention
to participate. This will be acknowledged promptly but
the actual message assignments will not be given out until
just before the start of the contest. The closing date for
entries is midnight of Feb. 1, 1930. There is no way in
which one may enter the tests after that or become eligible
to receive a certificate. Send your QSL card at once to the
following address if you expect to participate in the Febru-
ary international tests, INTERNATIONAL CONTEST
HEADQUARTERS, CARE A. R. R. L., 1711 PARK ST.,
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Every foreign amateur will have a chance to
make an unprecedented number of U. S. and
Canadian QSO's!

Every U. S. and Canadian ham will be in
on the fun!

Two weeks of opportunity to smash all
previous records!

All amateurs in the world are cordially in-
vited to participate.

COME ON IN, OM. Get your station in trim
now and plan to grab off some of those certifi-
cates. U. S. and Canadian amateurs, get your
QSL—entry cards in early to make sure that you
comply with the Rules and are eligible. We hope
to be able to show one of these splendid certi-
ficate—trophies in our next issue.

The February international test is announced
in this issue so that all stations may have time
to be in readiness. This early announcement is
absolutely necessary to permit all amateur sta-
tions in remote and foreign localities to have
information in time to work with us. Just think,
it takes six weeks for QST to reach some coun-
tries, and in a number of individual cases much
longer than that. A fellow ham in northern
U.S.S.R. is perhaps the last to receive his copy
of QST each month. Some of our expeditions
also receive mail only about twice each year
and they are completely frozen—in between trips of
the mail boat. Thanks to amateur radio they
do not have to depend exclusively on mail
service. And we are told that it's a great feeling
when several copies of QST arrive together.

Mark the dates on your calendar now! Keep
the contest article where you can find it for
reference when you need it in either the January
or February test.

Directional CQ's used in accordance with the
suggestions contained in the R. & R. should be
used profitably in both our contests by all
participants — when it is desired to work par-
ticular remote Sections, additional continents,
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There will be certificates for the high scoring
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REL Cat. No. 215 Basic CW Telegraph Unit is the typical modern multi stage transmitter for the amateur who desires to use the best. Frequency flexibility throughout each amateur band with crystal controlled note at all times. Shift quickly and easily anywhere in the bands.

The REL Cat. No. 215 transmitter kit is furnished with all necessary parts including metal case, drilled and engraved aluminum front panel and a very concise instruction booklet giving information on the assembly and operation. Extremely simple to operate. Consumes minimum amount of power. Employs standard broadcast receiver tubes. May be operated from B batteries, ordinary B eliminators or other similar sources delivering 300 volts D.C. A complete low power transmitter ready for immediate operation. Employs UY-227 master oscillator tube, UY-224 screen grid buffer tube and UX-245 power amplifier tube. Will deliver 10 watts to the antenna as a CW telegraph transmitter.

The Cat. No. 215 CW transmitter kit has been specially priced to meet the demands of every amateur. The price including one set of plug-in coils for any of the three popular bands is $56.00. (When ordering specify for which band you desire the coils.) Additional coils to cover other bands may be purchased at $7.00 per set of three.

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The same type of power supply may be used except that the plate voltage necessary will be 550 to 600 volts. The UX-250 tube is employed as modulator and the UX-227 tube is employed as speech amplifier. The No. 225 modulator kit sells for $42.00.

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---

stations in every Section in our A.R.R.L. field organization in our January contest. In the February world-wide tests there will be certificated to the winning foreign stations in every remote locality, and to the high stations in every U. S. and Canadian mainland Section. Entries are required in the second or international contest. Send them in NOW before you forget, and before it is too late.

---

The Amateur and the C.C.I.R.

(Continued from page 24)

fore having proved his proficiency in conformity with an examination established by the administration of the interested country; this examination carries, as a minimum:

Transmission and audible reception of Morse Code at a speed of 10 words per minute, both for amateur telegraphers and telephone.

An elementary understanding of electricity and radio-electricity and particularly that which deals with the operation and adjustment of an amateur station.

Legislation and national regulations dealing with radio communication.

The portions of the General Regulations annexed to the Washington Convention dealing with the operation of amateur stations.

The recipient of an amateur license must be at least sixteen years old.

2. Each government, in applying the rights which are conferred upon it by the General Regulations of Washington, Article 5, Section 18, line 1, will establish such restrictions as it shall deem necessary in the use by amateurs of the frequency bands allotted them at Washington; particularly in continental Europe amateurs will not be allowed to transmit on the frequency bands reserved to be shared between public services and amateurs; however, the band from 350 to 3600 kc. (65.71 to 85.33 meters) may be authorized for amateurs.

3. The administrations will assign to the holders of amateur licenses bands of frequencies and not definite frequencies; these administrations will assume no responsibility on the subject of interference (between amateurs).

4. The quality of the waves will be such that the entire width of the frequencies emitted by all amateur stations will be within one of the bands which are assigned to them.

5. The emissions, so far as practicable, must not produce noticeable harmonics.

6. Each amateur station will be obliged to have always available a wave-meter accurate to one-half per cent and of which the calibration will have been approved by the administration.

7. The total power employed for feeding all the plates of the last stage of the transmitter, including modulators if modulators are used, will be limited to fifty watts.

8. It is forbidden to use non-certified alternating current for feeding the plates, or (unfiltered) rectified alternating current or insufficiently-filtered direct current.

9. Radiotelegraphic transmissions will be exclusively accomplished:

(a) By pure undamped waves.

(b) By modulated undamped waves, on condition that this modulation does not cause inconvenience to other radio reception.

10. Amateurs may transmit or exchange only communications relative to the tests or the adjustment of the apparatus, to the absolute exclusion of all other types of messages.

11. The administrations will undertake in an effective manner the application of the rule in the General Regulations of Washington concerning the frequent transmission, by each station, of its call letters.

12. The administrations may establish such restrictions as they deem necessary relative to hours of operation of amateur stations, particularly with a view to protecting the reception of radiobroadcasting.
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The young men in Radio today will be the industrial leaders of tomorrow...that's what happened in the automobile business...in aviation...and in every other essential industry...Get in on the ground floor and climb with this tremendous industry! Free...everything you want to know about Radio...50 fascinating pages...each one packed with pictures and descriptions about the brilliant opportunities in this fast-growing profession. See for yourself why R. I. A. training has placed thousands of men in well paid positions—usually from 3 to 10 days after graduation. Mail this coupon now and receive your Free Book.

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QST 12-20

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13. Each amateur will be obliged to keep a log-book in which he shall make mention of the hours of transmission, the length of wave employed, and the calls of all stations worked.

14. The administrations will collaborate actively in the surveillance of amateur stations, by notifying each other of irregularities noted by them.

15. The administration of each country will communicate to the International Bureau of the Telegraph Union at Berne:

(a) Its regulations concerning amateur stations, particularly the examination mentioned under Item 1 hereof;

(b) The list of regularly-authorized amateurs in its country.

16. The administration of each interested country should notify as soon as possible to the International Bureau of the Telegraph Union at Berne its adherence to this agreement mentioning the reservations which it believes it necessary to make.

17. The countries whose delegates have not taken part in the drafting of this agreement, but which at a later date may agree to support the same, should communicate with the International Bureau of the Telegraph Union at Berne, mentioning the reservations which they believe it necessary to make.

The original of this agreement has been sent to the International Bureau of the Telegraph Union at Berne, with a view to its communication to the administrations.

Done at The Hague, 27 September 1929.

(Signatures)

The substance of this agreement is almost identically that which the European sub-committee of Committee II proposed as a world-wide basis and the adoption of which we prevented. Let it be clearly understood that the document above presented is in no sense a part of the C.C.I.R. proceedings but merely came into existence at the same time and place. Although some European countries will decline to have anything to do with it, to me it seems probable that it will become the basis for amateur regulation over the bulk of Europe. Truly, then, it is of wide-reaching importance. Let us examine it with those thoughts in mind.

The North American amateur shudders at some of the provisions. They would throttle us on this side to the disappearing point, because of our relatively vast numbers. For the European amateur, however, they do not seem to be so bad. The provisions in fact are the average of present European practice in amateur regulation. It should be noted that the signatory administrations do not promise to put the maximum of these facilities at the disposal of their amateurs; they merely agree amongst themselves that whatever they do will not exceed these maxima — except as they make reservations in the ratification of the agreement.

It then becomes necessary for the amateur societies of Europe to study this document and, if they find in it provisions harmful to themselves, open negotiations with their respective governments to secure modification when it is ratified. For example, Spain and the Netherlands now permit amateurs to operate throughout the band 3500 to 4000 kc. Many of the nations assign 1715–2000 kc, or a part thereof to amateurs. Amateur societies in these countries should make representations to their governments to continue in the present practice and so notify the Berne Bureau when ratifying — a possibility

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Commercial and Broadcast Transmitters
Radio Receiving Apparatus
Motors and Generators
Storage Batteries and Auxiliary Apparatus
Radio Laws and Regulations
Appendix

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No. 60—Length 60 feet. Price $12.50

Assembled—ready to string up. "BIG BOY" Size. (Same description as above, except that 300 feet of wire is used making this the most efficient and powerful aerial possible to manufacture.)

Manufactured by THOROLA RADIO PRODUCTS 1014 So. MICHIGAN BLV'D.

CHICAGO, ILLINOIS
I want to emphasize that this agreement was not prepared in any particular spirit of bitterness and hostility towards the amateur. It was, on the other hand, a distinct recognition of the fact that there were amateurs to be provided for, and I felt that the leading delegates fostering the agreement were sincerely desirous of establishing an equitable basis for European uniformity. Their magnitudes of course are European magnitudes and they are hampered by lack of knowledge of the amateur and some fear of him, but their general motive was not unkind. Almost every European amateur to whom I talked about the subject thought that the arrangement was fairly good. One fact is of outstanding importance: here is recognition of amateurs, provisions for them; these details having been agreed to throughout most of Europe, we may expect that many hesitant nations will now feel quite free to proceed with the more liberal licensing of amateurs. I know that some administrations, notably the Dutch, have held back awaiting this agreement. Let them now proceed, but let the amateur societies of those countries remember to appeal promptly any provisions of the document which to them seem improper for their country.

I should mention that on my trip I again had the pleasure of meeting most of the officers and, in some cases, many of the members, of the Nederlandsche Vereeniging voor Internationale Radioamateurs, the Radio Society of Great Britain, the Réseau Belge, and the Réseau Émetteurs Français, and in London I met Dr. Curt Lamm of the German D.A.S.D., and to all of them I am indebted for the courtesies shown me.

**THE FUTURE**

I spend a good deal of my time thinking about Madrid in 1932. Since my experiences at The Hague I am greatly encouraged. Because of the very powerful backing of this government and its plain determination to see us fairly provided for, a great change has come over the “non-amateur” administrations in their attitude towards this question. It emphasizes, incidentally, my repeated declaration that most of these administrations were strangers to the amateur matter at the first international congress in which we appeared — Washington in 1927. No longer at an international conference does an administration say “What is an amateur? Who are these people? What is the idea of giving them any facilities?” They know us now. Any administrations unfriendly to amateur aspirations know that even their own plans, to be adopted, must provide a place in the sun for the amateur. There
At Last! — a book containing all the rules of commercial and government radio traffic—and operating regulations.

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By R. L. DUNCAN and C. E. DREW

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Scientifically Prepared for Maximum Power and Unconditionally Guaranteed

1 in., square, sections, of your approximate specified frequency, supplied in 2 following groups:

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Short Wave Meter in Walnut carrying case. Range 17 to 200 meters

A New Audio Oscillator

Complete set of SHORTWAVE FOUR parts $62.50

Ask for quotations on special apparatus. Watch for new developments coming soon.

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TRANSFORMERS AND CHOKE

C.W. 2000-2500 volts each side, $40.00, 200 watts. 1000-1500 volts each side, $45.00. 250 watts.

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Chokes with adjustable core MA $7.50. 160 MA $8.00. 500 MA $12.50. $23.00. Specials to order. Write for specifications.

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STANDARD EQUIPMENT

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Storm, sleet, fog, darkness... the airplane pilot must "carry on". At such time Control is everything. Your radio must "carry on" whenever you snap the switch. Your control (volume control) must function smoothly... easily... consistently if you would be rewarded with clear-sounding entertainment. Your radio will do just that if it is CENTRALAB equipped.

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A Message of Great Importance to Radio Operators

Walter H. Candler, Former World's Champion Operator, Originator and Director The Candler System, will instruct you throughout the Course.

W2FR was acting as toastmaster from 6:30 on. He and several others were rounding up the stations and passing them on. We tried to work 100 stations but, as is the ease with lots of us, we talked too much for the purpose of keeping the interest of the gang and to cut down QRM and bring in BCL letters. The letters and cards that came in give an idea of how much interest there is in the amateur 'phone band, as perhaps but a very small percentage of those listening took the trouble to write.

The last station worked was W9GHI, Baldwin City, Kansas. The "round" numbers were then put in a hat and the lucky number drawn. "Doe" Dunn, W2CLA, of Brooklyn, won the 2-watt, 1000 (working) volt condenser.

The crystal controlled transmitter used was a la (April) QST with the linear amplifier and buffer stage omitted. The receiver was 3 UX-190 tubes in the usual circuit. The antenna was a Zepp 132.5 feet long with 40 feet feeders. And the location was Waterford, Conn., "On the Rock Bound Coast." — bless it!

We give thanks to the following for keeping us awake and "blabbing":

Axwell House Coffee,
Nicetino Cigar Co.,
Smyth Bros. Cough Drops,
Local Power Company.

See you from W3JZ.
LOWEST PRICES on TRANSMITTING and SHORT WAVE APPARATUS!

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Town ___________________________ State ______________________

HOLD EVERYTHING
Until you settle this power supply question — That’s the very foundation of your station. You want an absolutely reliable power supply, automatic and instantaneous in getting into action, no等待, no nursing, no watching to avoid critical peaks of either voltage or overload — Ten times as much power on tap as you’ll ever need — And there’s just one way to get it — The Mercury Arc. Put in an arc and operate,
Arctic Auroral Radio Interference

(Continued from page 20)

It would be a fine thing for radio if some expedition could and would major in that work. In passing, let it be said that observations of the type described require much doing in and out from warm but to sub-zero weather and will fare best when some definite planning is done in advance.

For instance, in our own case we had to do things on the spur of the moment. When the aurora would manifest its interest in radio, it was necessary to wake up the aerologist, Mr. Kallquist, and ask him to rush out into the penetrating cold night and take angles on the displays with a theodolite. That meant hardy dressing and only too often we had to evolve our own technique as we went. The observations were not always successful, because we were not at all sure of our course of operations. We were keenly aware that our other routine work interfered with explorations in this field of radio. If the reader will examine the illustration of the hut he will note that the entrance is like a tunnel, and actual practice demonstrates that while this style is best for general expeditionary work in Greenland, it is not adapted to the before mentioned rushing in and out, for the reason that one tends to stand erect before the passage is completed and the consequences of attempting to raise the building Ajax-wise seriously disturb one's mental notes.

The author has mentioned all this to show that he firmly believes a properly planned expedition, with coordinated observations being carried on at other points, will offer really interesting and important contributions to the radio art. It is indeed significant to point out that contributions such as those outlined in this and a previous article were spare time by-products of a meteorological expedition.

The author wishes to acknowledge his debt of gratitude to Mr. Clarence R. Kallquist, of the U. S. Weather Bureau, whose efforts and enthusiasm assisted greatly in gathering this data. The Radio Corporation of America and the Burgess Battery Co. both lent valuable apparatus which made the work possible, thus sharing any credit for discoveries made or scientific services rendered.

The Single Control Transmitter

(Continued from page 39)

The antenna should be 127 1/4 feet long. There seems to be considerable confusion among beginners regarding the terms "antenna" and "feeder." The function of the antenna is to radiate energy in the form of radio waves; that of the feeder is to transfer this energy from the set to the antenna without itself radiating. The antenna is a wire all by itself, and must, when of the type described above, have a certain, definite length, this length being determined by the operating frequency chosen, as shown by the chart, Fig. 2. The feeder, which can be thought of as a lead-in wire, must be fastened to the antenna at a certain,
Tune in on the TRIADORS every Friday evening, 8 to 8:30 (Eastern Standard Time) over WJZ and associated NBC Stations.

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Without Distortion!

Too long a technical tale to tell here, but the modern process which produces TRIAD INSURED RADIO TUBES, allows an unlimited power that retains all the truth and beauty of the original tone. So superior is TRIAD quality that every tube carries a printed certificate guaranteeing a minimum of six months' perfect service or a proper adjustment. Here is new tube quality undeniably. Ask your nearest dealer for TRIAD Tubes to equip your set throughout. Only then can you know what thorough, economical radio enjoyment really means.

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Model No. 11, base 3” x 0.28” x 0.75”. Wt. 4.5 lbs. Crackle finish, black, red, blue, green. (All nickel $1.00 extra.) No trade-ins taken.

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Sale to user only, no agents, no dealers, make these prices possible.

All products sold subject to “Satisfaction guaranteed or money refunded after five days’ use,” remit with order, or C. O. D. Shipment.

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Realizing that Handbook must be had, proceed as follows:

(1) Fill out below, tear off.
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(3) Clip together, mail us.

SEND IT AT ONCE.

(Name)

(Street or P. O. Box)

(City and State)

Say You Saw It in QST — It Identifies You and Helps QST
definite point, also shown on the chart, but it need only be long enough to reach from the antenna to the set; in fact, it is beneficial to keep it as short and direct as possible.

The feeder for our 127½-foot antenna should be soldered to the antenna at a point 17 feet 9 inches from the center, or, to make the measuring a little easier, exactly 16 feet from one end.

The natural or fundamental frequency of such an antenna will be 3750 kc., the center of the 3500-ke. band, and even if no frequency meter is available it will be almost impossible for the transmitter to be radiating outside the band if the tuning is done as described above by means of the flashlight bulb resonance indicator.

If the receiver can cover the 1750-ke. band, a good idea of what the signal sounds like can be had by tuning it in on this band. The information obtained in this way as to purity of note, steadiness, etc., is worth more than a hundred reports from other stations, particularly since there is always a very human and perhaps somewhat unconscious tendency to tell the other fellow what he wants to hear rather than the exact truth.

Of course we hardly need to mention the fact that before this or any other transmitter can be operated two Government licenses are required, one for the operator himself and one for the station. Information about getting such licenses can be obtained from the Supervisor of Radio for the district in which the station will be located, or by writing the A.R.R.L. Communications Dept., 1711 Park St., Hartford, Conn.

While this set is very easy to build and operate, there may be some points which are not quite clear. If the solution cannot be found in the diagrams or text, any questions will be gladly answered if addressed to the A.R.R.L. Technical Information Service.

The set shown has been tried out on just such an antenna as described above, which incidentally was bent in the shape of a “V,” in a rather unsatisfactory location, and a number of contacts over a few hundred miles were made in daylight, or early evening with 180 volts on a UX-201-A. When using such low power few stations are worked and the signals are perhaps not so strong as with a 210 at higher plate voltage, but we wanted to satisfy ourselves that it could be done. It can, and by any beginner!

The Experimenters' Section

(Continued from page 35)

under the head to keep it from pulling through, if necessary.

You will find, after constructing this choke, that there is nothing quite like the right size choke for your short wave set. If it is found that values between the number of turns tapped are needed, you can take off the connection from the 325th turn instead of the 1st, and then you have either 75, 150, 225, or 325 turns available instead of the 100, 175, 250, or 325 available when connected in the other way. Thus, in this way, you
QST Oscillating Crystals

AMATEUR BANDS:
(New prices effective October 1st 1929)

Winter is coming and no doubt you are going over your transmitter removing those weak links so as to get the most possible efficiency from your set.

One item of great importance is the frequency stability of your set. Does it stay on one frequency? If not, our power crystals will solve that problem. SCIENTIFIC RADIO SERVICE crystals are known to be the best obtainable, having one single frequency and highest output. With each crystal is furnished an accurate calibration guaranteed to better than a tenth of 1%. New prices for grinding power crystals in the amateur bands are as follows:

<table>
<thead>
<tr>
<th>Band</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1715 to 2000 Kc band</td>
<td>$18.00 (unmounted)</td>
</tr>
<tr>
<td>2500 to 4000 Kc band</td>
<td>$25.00 (unmounted)</td>
</tr>
<tr>
<td>7000 to 1300 Kc band</td>
<td>$45.00 (unmounted)</td>
</tr>
</tbody>
</table>

BROADCAST BAND:

Power crystals ground in the 550-1500 Kc band accurate to plus or minus 300 cycles of your specified frequency fully mounted for $35.00. 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 $250.00. Two matched crystals, ground to your assigned frequency in the 550-1500 Kc band with the heater unit complete $360.00. More detailed description of this unit sent upon request.

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The Fundamentals of Radio is a textbook for students of radio giving the fundamental theory of radio and its application to modern practice. All amateurs know "Experimental Radio." (If you do not read page 77 Sept. QST or page 87 Nov. QST.) You will want "The Fundamentals of Radio." It explains many theoretical and practical points which have not found their way into other books. "Ramsey manages to supply that missing fact which seems to be hidden in other books." QST.
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have a dual range choke making it very adaptable.
—Wm. N. Crawford, W4AET

R. F. CHOKEs
Radio frequency choke coils are useful and frequently necessary in both transmitters and high frequency receivers for the proper performance of these pieces of equipment. The use of the proper radio frequency choke coil may do more than anything else to make the transmitter perform satisfactorily and give the d.e. note so much desired.

A number of very excellent articles and suggestions on the proper design and use of radio frequency chokes has been published but the subject has certainly not been exhaustively treated. We are publishing a bibliography on radio frequency chokes and related subjects this month for those who may care to refer to papers on this subject.

BIBLIOGRAPHY ON RADIO FREQUENCY CHOKE COILS
QST References:
Plug-In Choke Coils, p. 42, March, 1926.
Buying Inductances by the Inch, p. 42, June, 1926.
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Condenser-Tuned Short Wave R. F. Chokes, by Binnneweg, p. 46, November, 1927.
An Effective Low Cost Phone and C. W. Transmitter of Modern Design, by Lamb and Dudley, p. 9, September, 1929.
Books:
Radio Telegraphy for Amateurs, by Ballantine.
Radio Theory and Operating, by Loomis.
Coils and Magnet Wire, by Underhill.

The Receiver at W1AOF
(Continued from page 35)

PANEL DESCRIPTION
In the upper left corner is the Clarostat volume control. Next comes the Clarostat regeneration control. The meter is a Weston 0-1 ma. This is in the detector plate circuit. At the right of the
“ESCO” Airplane Generators provided the power for this remarkable achievement

Two “ESCO” Airplane Generators (wind driven) were mounted on the Bell Telephone Airplane. One supplied power to the transmitter and the other to the receiver. Both were of standard “ESCO” design which insures reliable service under the severe operating conditions common to aviation.

Low wind resistance, light weight, non-corroding parts, ball bearings, tool steel shafts, steel shells, cast steel pole pieces, weather proof construction, many sizes to choose from, high voltage and low voltage windings to suit individual requirements, are a few of the many reasons for “ESCO” generators being the first choice.
It PERFORMS Better Because QUALITY- BUILT!

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Wire-Wound Transmitter Grid Leak

THOUGH but recently introduced, this grid leak, of ELECTRAD advanced design and quality manufacture, is fast winning friends among amateurs and professionals by its superior performance.

Unique design allows for winding more wire of larger diameter in a small space. Liberally insulated, and covered with moisture-proof enamel. Monel metal contact bands and soldering lugs provide equal expansion and positive connections. Guaranteed not to develop noise or open circuits. Three sizes (100, 40, 15 watts) and ten resistance values, tapped for all usual needs $1.50 to $5.50.

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100 sheets .................................. 50c
250 ........................................ $1.00
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Meter are two 30-ohm rheostats for the audio tubes and detector tube. On the upper right corner is the push-pull switch which turns off the filament power. One of these is not needed on a receiver when a battery cable is used as this cable may be pulled apart and the whole power supply is disconnected from the receiver. At the lower left is a 30-ohm rheostat controlling the last two audio tubes. At the right is the knob controlling the double-pole double-throw jack switch for audio selectivity. Next we come to the main tuning control which is a 4-inch G.R. dial with vernier. Above this dial to the left is the knob which controls the variable capacity in shunt. The peep hole which allows the operator to see the drum dial (attached to shunt capacity) may be seen here. At the extreme right of the tuning dial may be seen the knob which controls the coil turret. In the lower left corner is the 'phone jack which fits through an insulating bushing in the panel. All knobs are of G.R. manufacture. The panel is shiny as it originally was purchased.

OPERATION

To fully appreciate the advantages of a receiver of this design and magnitude one must become acquainted with its intricacies. After it has been completely wired and ready for reception the operator may be greeted by some unearthly scream or howl. This is nothing more or less than a tickler being of the wrong size or improper B battery voltage. After these minor difficulties have been eliminated one at a time, a receiver of unlimited possibilities is the result. Then one can sit back and enjoy acousting over and in between three frequency bands with as little trouble as is usually experienced with the coverage of a single band. All that is needed now is to become accustomed to the unusual audibility level.

Readers and admirers of this receiver may not wish to incorporate all the features disclosed or wish to give up their pet receivers, but there are features in this receiver that might well be incorporated in any receiver of amateur construction. It is with this thought in mind that this lengthy description has been presented.

Technical Information Service Rules

(Continued from page 41)

is not sufficient, as the envelope is destroyed by the office manager as soon as the letter is opened.

8. Keep an exact copy of your questions and diagrams, and mention that you have done so.

9. Do not ask for opinions on, or comparisons of, business concerns or their products.

10. Enclose postage for the reply but do not send an envelope. It is much more convenient for us to use our own envelopes with our stationery.

11. Address all questions to the Technical Information Service, American Radio Relay League

1711 Park St., Hartford, Conn.

(A) any back copies of QST to which we refer you may be obtained from our Circulation Department for twenty-five cents each.)
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THE EMBLEM CUT. A mounted printing electrotYPE, the same size as the personal emblem, for use by Members on amateur printed matter, letterheads, cards, etc. $1.00 each, postpaid.

THE "JUMBO" EMBLEM. How about the shack wall or that 100-footer? Think of the attention this big yellow-and-black enamel metal emblem will get! 19 × 8½”, same style as Automobile Emblem. $1.25 each, postpaid.

The American Radio Relay League, Hartford, Conn.
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PLATE power for your set, the very heart of its performance. For quietness DX ability, life-long permanence, absolute dependability, no other plate source even approaches the achievement of an Edison steel-alumina storage B battery. Built painstakingly; every joint pure nickel, upset electrically welded, each piece of the Edison Electrolyte. Our list describes complete batteries, enclosed contact parts, and all other plate source items. Send for our free catalog and plate transformer for the new 860 rectifier, complete plate power unit. Ham Radio Engineering Service, radio WAML, 48 Rockwood Road, Cleveland, Ohio.

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QSLa — plain at $1.00 per hundred. W9HEU, 9022 Windsor, St. Louis, Mo.

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RECTOBULBS, $10, Pilot super-wasp, $29.40. 25%, off on Leach, Sigual, REL, Jewell, Ward Leonard; 35% on Thordar- son, Sangamo, Cardwell; 35% on Tobe and Fleischmann. Any quantity you want at maximum discounts. Write Henry's Radio Shop, Butler, Mo.

WESTON 301 0-85 d. c., voltmeter, 0-5 d. c. ammeter used $5.00 each. Write for list. H. F. DeGarino, Early, Iowa.

TRANSFORMERS — 100-watt, 110 volt, 60-cycle, 750 volts each side center tap. One 71/2 volt, center-tapped filament winding, $7.25. Same as above, but two filament windings, $8.00. Above will operate with transformers as described, but 500 watts. $19. 25. Same as above, but 250 watts. $11.50. All mounted, heavy construction, no heating. Scott Coil & Transformer Co., New Albany, Miss.

SELL REL 3-6 tube amateur band receiver in metal cabinet, $25, W9SP, 2450 Jenny Lind St., Melroseport, Pa.

SELL 4-type a. c. 24, $3 each; 1 R-90 rectifier, $2.25, 2 L-45, $2.50 each. Coo tubes. 1 1/227, $2.25, Kenneth Ervin, Utica, Miss.

WANTED — Grebe CR-9 cheap, W9NH.

DEAD speaker units required. Send to Robert Seldescher, Pontiac, Ill.


QSLa — different, distinctive, You'11 like them. Free samples. W2AKE, 1317 Roseale, New York City.

QSL cards, $1.00 per 100. Two colors. Samples. W9CKA, Corvallis, Iowa.
PORTABLE transmitter and receiver described July Radio News for low-cost construction Now ready for full study. Best offer.

PORTABLE, 2 1/2-amp, 110-volt, general electric generators with 1-digit readouts from 1,000 to 3,000. Also separate generators, 1,000, 1,500, 2,000, 2,500, 3,000 etc. Send for full details.

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To Our Readers who are not A.R.R.L. members

WOULDN'T you like to become a member of the American Radio Relay League? We need you in this big organization of radio amateurs, the only amateur association that does things. From your reading of QST you have gained a knowledge of the nature of the League and what it does, and you have read its purposes as set forth on page 6 of this issue. We should like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio. You will have the membership edition of QST delivered at your door each month. A convenient application form is printed below — clip it out and mail it today.

A bona fide interest in amateur radio is the only essential qualification for membership

AMERICAN RADIO RELAY LEAGUE
Hartford, Conn., U. S. A.

I hereby apply for membership in the American Radio Relay League, and enclose $2.50 ($3 in foreign countries) in payment of one year's dues, $1.25 of which is for a subscription to QST for the same period. Please begin my subscription with the issue. Mail my Certificate of Membership and send QST to the following name and address.

Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of QST?

Thanks

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For Your Convenience

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For Your Convenience

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Here’s the Very Tuner for That Rack-and-Panel Job—and What a Tuner!

Never was there a tuner like the new S-M 712! Built along the peculiar lines of design which resulted last year in the unprecedented supremacy of the Sargent-Rayment 710, the 712 embodies every advantage and every essential engineering feature of its famous predecessor. Yet, along with its peculiarly perfect shielding, its five tuned circuits, and its precision coils, it has brand new features which add wonderfully to the charm of its outstanding performance—all-electric operation, strictly one-dial control (no verniers), band-selector tuning, power detection—culminating in a radio receiver which the most exacting engineer may be proud to install anywhere.

Even in rack-and-panel construction, where the finest possible performance is required, regardless of cost, the S-M 712 is absolutely ideal—and there are no projecting flanges on the front side of the tuner to prevent a neat job of bolting direct to any panel. Low-impedance power detector permits its use with any standard amplifier.

The 712 uses 3—'24 tubes, and 1—'27. It requires only 180 volts B, and 2½ volts for heaters. Price only $64.90 net, less tubes, in shielding cabinet shown. Component parts total $40.90.

S-M 722 and 735 Show Marvelous Performance at Surprisingly Low Cost

Broadcast reception approaching wonderfully close to the 712's magnificent standard can now be had in the S-M 722 (using 3—'24 tubes, 1—'27, 2—'45, 1—'80) at only $74.75 net, complete with ABC power unit, less tubes.

The first complete a-c-operated short-wave receiver is the new S-M 735, which costs, wired complete with built-in ABC power unit, less tubes, only $66.90. Tubes required: 1—'24, 2—'27, 2—'45, 1—'80. Component parts total $44.90. 735DC, for battery use, is also described completely in the new S-M catalog—see coupon.

SILVER-MARSHALL, Inc., 6400 West 65th St., Chicago, U. S. A.
The right insulating equipment to avoid radio energy loss at a close-coupled horizontal lead-in

This antenna insulator installation has helped Broadcasting Station WQAM, owned by Miami Broadcasting Co., Miami, Fla., to send its fine programs far into the southwestern, central and northeastern portions of the country without loss of clarity and with the moderate power of 1000 watts.

The PYREX Navy Type Entering Bowl coupled directly to the end of the antenna carries the lead-in squarely through the center of an opening in the wall, and two PYREX Strain Insulators in series on each anchorage and tension line keep the radio energy in and the disturbing stray secondary currents out of the antenna. Semi-tropical rains and moist salty atmosphere do not impair the protection because PYREX Insulators have a dense impervious surface that sheds water and collects no deposits. Likewise in dust and smoke-laden atmosphere, particles that settle on PYREX Insulators are blown off by wind and washed off by rain. In any location, there is no deterioration in insulating value.

The mechanical strength of PYREX Insulators is equally permanent, so that once placed, they assure continuous operation. In a number of instances, storms that wrecked wiring and towers did not break the PYREX Insulators.

Suitable types and sizes of PYREX Insulators for every antenna, lead-in, stand-off, base support and bus-bar purpose are illustrated and described in the PYREX Radio Insulator Booklet, which will be sent on request.

CORNING GLASS WORKS, Dept. 64
Industrial and Laboratory Division: CORNING, N. Y.
The Radio Amateur's Handbook

For Those Who Don't Know It:

The Handbook is a practical manual of amateur radio in all its phases, published by the American Radio Relay League, the amateur's own organization. It starts at the beginning and tells the whole story: What amateur radio is, How to be a radio amateur, How to obtain your licenses, How to build the simple apparatus of a simple station, How to build the best known apparatus for the most modern station, How to operate the station. Enough information to keep you busy and interested for five years.

For Those Who Do Know It:

For years the Handbook has been the practical working guide of successful amateurs the world over. It has been completely revised in terms of 1929, by Mr. Handy, the League's Communication Manager, as to all the aspects of operating procedure, and by Mr. Hull, the director of the League's Technical Development Program, as to all its features of apparatus and technical matters. Everything in it is on a 1929 basis, replacing the 1928 methods which used to be good enough but aren't any more.

[MUCH THAT IS NEW]
[ALL THAT IS GOOD]

NOW IN ITS SIXTY-FIRST THOUSAND

232 Pages 6 1/2 x 9 1/2 188 Illustrations

In wealth of treatment and profusity of illustration, a big book. Printing in the familiar QST format makes for handiness and enables distribution at ridiculously small cost.

In keeping with our policy of constantly revising the Handbook the copies now being distributed, although not advertised particularly as a new edition, contain new and modernized material on Crystal Control, Amateur Radiotelephony, Power Supply and Keying. Kept constantly up to date, this is by long odds the best edition of the Handbook ever distributed. Anyone at all interested in the technical side of radio can ill afford to be without it.

Blue-and-Gold Paper Cover, $1.00 Stiff Buckram Binding, $2.00

POSTPAID ANYWHERE IN THE WORLD

AMERICAN RADIO RELAY LEAGUE
Hartford, Connecticut, U. S. A.
BURGESS SUPER "B" BATTERY

21308

RATED 45 VOLTS
ESPECIALLY DESIGNED FOR VACUUM TUBE SERVICE
MADE BY BURGESS BATTERY

1929

"Ask any Radio Engineer"

BURGESS BATTERY COMPANY
MADISON, WISCONSIN
WHAT are the qualifications of a good radiotelegraph operator? In this day and age of speed and accuracy, you can bet that his ability must be of the highest order in his particular line of work.

Let us for a moment step out of our characters as amateurs, and consider the things that our brother the commercial telegrapher is doing. True, the sphere he occupies is somewhat removed from our own, but all the same an examination of his methods may be helpful to us in that it may show wherein we are delinquent, and may set higher standards towards which we should strive.

In order to see our brother operator in his element, let’s drop into the syndicate room of the nearest large newspaper. Amid sounds of clattering telegraph sounders we are directed to a man who is an able representative of the fastest class of telegraph operators in the world. He is a Phillips Code man. We glance over his shoulder at his flying fingers and smoking typewriter. And right here we lose any semblance of awed head which we may have had concerning our own operating ability. For this man has never even heard “20 w.p.m.”

He talks in terms of “9000 words per hour!” Not 20 words per minute for five minutes, but 60 words per minute for hours at a stretch. Nor does he stop at this measure accomplishment. He inserts all punctuation marks in their proper places; he capitalizes and makes paragraph indentations; he numbers each sheet with its proper page number and serial number; and his copy is as neat and perfect as a printed page in a newspaper. His memory is so keen that he often copies as far as twenty or thirty words behind, and keeps the story in his head while editing it, reading the sounder, and pounding his “mull” — and he hasn’t said “BK” for a year. Does he say “OK” at the end of each despatch? He does not. It’s unnecessary.

Phew! That was hard work just watching that bird. But here we are at the Western Union station. Let’s see how these boys work. We notice that here, too, there is a decided absence of the letters “BK” and “RPT.” The operator to whom we confine our attention is busily engaged in copying messages of less length than those which we saw coming in on the Phillips wire. He has to change blankets more often, and he has to write in more preambles. In addition to these operations, he tears the carbon copy off of each delivery blank, and spits it for his files. He’s in no hurry. They can’t show him under. The sending operator doesn’t ask if he’s been receiving well either. He leans on that bug for all he’s worth. But his Morse is good. It doesn’t sound like Japanese code. It sounds like what it’s meant to be, and that’s the way it comes out on the other end. We notice that the receiving operator here too is always a few words behind. He has a memory.

Now while we’re here, let’s ask our guide to show us the static room. Forthwith we are ushered into what seems to us a more natural-looking room, decorated here and there and everywhere with knobs, dials and wire. “Ah,” we sigh, “at last we’re getting into our own element. No sixty words per minute stuff here. These fellows are radioamateurs.” One of the large-earred gentlemen stops copying long enough to hand us a pair of phones. “Londom,” he says loquaciously, and types furiously to catch up on himself again. We listen attentively, but concentrate as we will we can’t get two words out of him. But this man is making solid copy, and at forty w.p.m. through static wipes that work a half dozen words at a time. He seems to concentrate on the signal and read right through the “X’s.” And furthermore, he seems always to be a few words behind. At another table a man sits in front of a short-wave receiver. He is copying slowly and with evident difficulty. “Bum signal,” he says as he hands up a pair of phones. We listen. We listen some more. Why, we can’t even hear the signal, and still he copies. And we thought we were good. But enough of this. Let’s run over to the R.C.A. office where we can see the signals without listening.

Well, here we are at Broad Street (R.C.A. transatlantic office). We crash the gate and are admitted to the large quarters of Radio Central’s operating department. Are these boys real operators? You can bet they are. Look here at this circuit. It’s going a hundred words a minute. Two men are punching on this one circuit, and how their fingers fly. Messages of all descriptions are pouring in and are placed before the operator to be converted into holes in a paper tape which runs through an automatic transmitter. These messages are not in plain English. They are in ten-letter code and languages of all nations. The operator must be accurate in punching these words. And he is — at sixty words per minute. Opposite him sits a man who is receiving. Slip is running before him a mile a minute. He selects the irregular ink line on the slip and grabs an XQ blank or what not. It’s a split second work. No delays here. And accuracy above all. All figures in the messages are repeated at its completion and are sent in abbreviated form (radiation) to save the fraction of a second necessary to repeat the long continental numeral characters. Speed. More speed. And accuracy above all.

We could make a trip to the transatlantic cable office, but that would only be adding insult to injury. We’re ashamed
enough now of our sloppy operating without being brought further into contrast with these boys. Let's go home and study this thing out. There must be something back of all this—something that we've missed entirely in our many years of playing with amateur radio. Playing! That's the word. We've just been playing without having taken the time to learn the fine points of the game.

We ask ourselves this question: "Is there not more fun playing a card game, of which we know the rules, than if we were to sit in on a game at which we were a total flop?" The answer is inevitable, and here's where we get down to business. Amateur radio is a game for our enjoyment. It's a more or less an accepted premise that nobody enjoys a game that's a long way from being solitary. The players number in the thousands, and one bum player can cause an otherwise pleasant pastime to become a disorganized riot. The rules have been laid down many a time and oft in QST, but the proficiency of the players is dependent entirely upon themselves.

Along the lines of proficiency, let's see what we have learned from our little exploration trip today.

First, we must learn to read code fast. This requires nothing more than serious study. It's actually easy to listen to slow sending exclusively, because it's too much bother to listen to a fast circuit. The remedy is obvious, we must pin ourselves down for a few minutes each day, to a signal that is just a bit beyond our reach in speed. The high frequency spectrum is teeming with signals of automatic character (which means they are not codeSenders), and we have but to twist the dial to find the speed we want. When we have arrived at the point where we can make the perfect copy at fifteen words per minute, the next step is to try something faster until we have mastered it.

Second, we must learn to copy a word or so behind, on account of static, fading, poor transmission, etc. It often happens that we miss a number of intermittent letters in a single word, and it is not until the word is completely transmitted that we recognize it. Copying behind, and memorizing what has gone before, is usually enabled by a rapid process of substitution, to supply the missing letters and perfect the copy without breaking or asking for a repeat.

Third, we must learn to concentrate so closely on the signal which we are copying that we will be able to distinguish its modulations even through interference of static or equal if no greater intensity. We must get away from that idea that a signal is unreadable on account of interference. As a matter of fact, it may be 100% readable to an operator who has trained his ear and his mind to reject a pitch other than that to which he is listening.

Fourth, we must learn to make a neat copy which will be readable to others as well as to ourselves. Proper use of a typewriter is an asset in this case, and incidentally may help us to increase our speed if we are not expert penmen. A start at a commercial typewriter is the thing. There are hundreds of types which can be seen in shops. The filing time, the origin, the signature, and all other parts of the message appear always in the same position and spaced properly.

Fifth, we must be accurate, which we cannot be until we have mastered the four previous points. And we must combine speed with accuracy in order not to hold up the game.

Sixth, we must not yell "13E" or ask for "words twice" while there is a chance to copy single solid by a slight effort on our part. For breaks and words twice slow up the circuit and cause unnecessary interference to other stations that may be on the same frequency. We must never give up trying to take a message unless the signal is so far in the mud as to be undistinguishable.

Last, but far from least, we must learn by listening to automatic transmissions, how to handle a key. If we will listen to all kinds of transmissions and get away from the idea that every receiving operator excepting ourselves is a mind reader, we will find many more interesting contacts with stations that have not worked us heretofore because our rotten list gave us away. We didn't know how to play the game then, just about as much as the other fellow, and so we usually change our list overnight from mediocrity to perfection. We will probably note that the operator who can make his bug sound like an automatic transmitter is the man who also has a hand-sending list that is a pleasure. The bug sender who makes his bugs conform to the speed at which he is sending is the man who knows his business. There is a peculiar tendency on the part of many of us to set our dots for a speed of forty words per minute and then send dashes for a speed of twenty words per minute. The inconsistency of the thing is immediately apparent. The characters are so far

O N S T FOR DECEMBER, 1929

**W1MK**

A.R.R.L. Headquarters' Station W1MK operates on frequencies of 3575 kc. and 7150 kc. Robert B. Parmeter, "RP," is the chief operator; his call 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:**

0500 p.m.: Sun., Mon., Tues., Thurs., and Fri.
1200 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 periods of the morning and evening bulletin periods under the two headings of 3500 kc. and 7000 kc.; to indicate whether the watch is devoted to listening on the 30-meter band or to the 40-meter band.

3500 kc.
8:10 p.m. to 9:00 p.m. on Sun., Mon., Tues., Thurs., and Fri.
10:00 p.m. to 11:00 p.m. on Tues. and Thurs. (No OBC sent before these periods.)
12:00 p.m. to 1:00 p.m. on the following nights (actually on the morning of the day following): Mon., Thurs., and Fri. (Only on Tues. and Thurs. does the OBC precede these periods.)

**SCHEDULES are kept with the following stations, and on any of which traffic will travel expeditiously to A.R.R.L. Headquarters, on 3500 kc.: W1ACH, W1KY, W2BA, W3KV, W3ZAS, W3WRA, W5R, W6HA, W9AG, WSCUG, WSSZ, W9AEV, W9APY, W9ERU and W90X; on 7000 kc.: W6AKW, W6C14, and W67M.**

**Traffic Briefs**

On September 22, when J9AA visited Seattle, Wash., W7BB and W7WBS were right on hand to show off the town. There is nothing extraordinary about this except the fact that J9AA is a YL and was dressed in her native costume, even to the wooden sandals, while the boys were showing her the sights. . . . J9AA, in turn, undertook to make W7BB feel at home on his recent visit to Japan.

K1AKV complains of being troubled by house lizards sleeping in his transmitter inductance and detuning the set. K1KD adds that he recently found a crested lizard in his antenna condenser. Hi. Life is tough as well as hot in the Tropics!

K1KD and KAAN listened in on the Lindbergh plane during its flight from San Juan, P. R., to Paramaribo, Dutch Guiana. They kept a daily schedule with each other. KAAN keeping a log of communications from the plane for the information of the Military Governor at St. Thomas, Virgin Islands.

W9GV has worked VK3W, 276 times and VK3PP 123 times on schedule. Some record!

Our list of Sudens is growing every day, W6DAU has gone and done it! W5UM took the fatal step! W6BBS was married on October 11! And we recently received the announcement of the betrothal of W6EGU-GZ. Who's next?
### Traffic Summaries

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<table>
<thead>
<tr>
<th>Region</th>
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<tr>
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</table>

452 stations originated 10,704, delivered 6009, relayed 21,997, total 39,610. (64.5% deliveries).

---

### Traffic Briefs

Among the various ham societies throughout the U.S., there is one with headquarters in Seattle, Wash., called the "20-Meter Flat Head Club." W7AAV is President; W7ACB and W7ABG, Vice-Presidents; and W7GA, Secretary. The rules of the Club are to encourage better stations and operating, reasonable CQ and to QSL 100 per cent. There are now over 75 members enrolled, located in many counties. It is purely a "just for fun" outfit. No money involved. Everything is free. Further information will be gladly given by any of the above officers.

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### BRASS POUNDERS' LEAGUE

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W9FO advises that Rudman, WU2KT, is now in China using call XU2UU.
In second year of three-year cruise. Sailed from Honolulu Sept. 19 for Apia, Lyttelton, So. Georgia, St. Helena, Cape Town, etc., Operator, Stuart L. Seaton of WSWL.

In the jungle conducting radio and other research work. Traffic should be filed with W1MK or W6AKW to be sent to PMZ direct or via K1AF or KICY. Operator, Harry W. Wells, exZ6D.

Sailing north from Gloucester, Mass., to Halifax, N. S., calling at ports en route. Operator, J. R. Foran, QSU to Box 188, Bradenton, Fla.

50-watt base station and 10-watt portable station with survey party. QSL via A. C. Edwards, G0XJ, 601 Stretton & Co. Ltd., "Eddystone" Radio, Bermoral Works, Bromagrove St., Birmingham, England. WFA calls CQ after regular schedules, also at 0400, 0700 and 1000 GCT daily, choice of frequency depending on season and conditions. Operators, Berker, Hanson (MP), Peterson (Pete) and Mason (MN).

In port at Dunedin, N. Z.

Bases at rubber plantation at Santa Ream, Brazil.

Worked by WSVS, Sept. 5, when at Nova Zembla (an island north of Russia).

On world cruise in mid-Atlantic QRD London when worked by W6CTH, 500-cycle note.

May be reported to Secretary, Discovery Committee, Colonial Office, Whitehall, London SW1, England. Now between South Africa and Kerguelen Island. Worked by W6AM.

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Traffic Briefs

FOREIGN CONTACTS

W1C2Z is keeping daily schedules with CM2YW and T3EV.

W1KH schedules VO8AE Mondays, Wednesdays, and Fridays.

W2API has efficient schedules with GB5Z, GB5M, G6VP, FS8A, FSSM and others. He invites traffic for all parts of Europe.

W2PM has a "sure-fire" schedule with K4KD at 11 p.m. E.S.T., Mondays, Thursdays, and Saturdays. Delivery is guaranteed at both ends.

WSWW is in daily communication with NN1NIC.

W0A3B keeps a twice-weekly schedule with K6RF. W06CA has daily schedules with NNCAB and NNEK.

W6CRD also schedules NNCAB daily, and NN1NIC likewise.

W0EF connects the United States and South Africa on his weekly schedules with ZT6X and ZU6N.

W06GH communicates with KDV5 daily.

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Did we hear some one say the 3500-ke. band is NG for DX? If this is so, bowwam Mark H. Conlon of Auckland, New Zealand, beg the following U. S. stations in that band?—W1BDX, W1SW, W2AG, W2SC, WA8NS, W3AWU, W3AJR, W5OM, WB8BY, W6EQJ, W6CZZ, W6EOP, W6DGI, W6FO, W6RJ, W6APA, W6AFB, W6BOQ, W7ADX, W5NT, W5AHC, W5CHC, W5DAQ, W5YE, W5BCS and W9DRM. Mr. Conlon says the best time for reception on 3500 ke. is from 1 to 2:30 a.m. E.S.T.

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With the coming of cold weather several coast-to-coast traffic routes are shaping up. We have information on the completion of a chain as follows: W0BP, San Francisco to W6ACI, El Cajon, Calif., to WSTV, Des Moines, New Mexico, to W6FKD, Colony, Kansas to WOAIP, Winnetka, Ill., to W1ZAD, Pittsfield, Mass., and W2AEG, New York City. This net is connected with branches covering the states of Oregon, Washington, Nebraska, and Minnesota. Other branches will be added from time to time, and, if any station wishes to leave the chain, he will be requested to secure another station to fill his place. Good luck to all connected with this new route!

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**Requirements for U.S.N.R., Enlistment**

The following, which we quote from a circular issued by the Chief of the Bureau of Navigation under date of Oct. 5, 1929, will be of interest to amateurs interested in joining the U. S. Naval Communication Reserve, Class V-5.

"Certain changes have been made by Radio Division, Department of Commerce, in the license requirements for commercial and amateur operators. The Bureau of Navigation hereby cancels former requirements for ratings in Class V-5.

"The following requirements will become effective immediately:

(a) Amateur and commercial operators holding licenses designated below will be considered eligible professionally for enlistment in Class V-5 and may be enrolled in ratings indicated without examination other than physical:

(b) Commercial—Extra First Grade: Chief Radioman.

Commercial—First Grade: Radioman, 1st Class.

Commercial—Second Grade (Note IV) Radioman, 1st Class.

Commercial—Second Grade: Radioman, 2nd Class.

Commercial—Broadcasting Station operator (unlimited): Radioman, 1st Class.

Commercial—Broadcasting Station operator (limited) (Note 2): Seaman, 1st Class, for Radioman.

Commercial—Radio telephone operator: Seaman, 1st Class, for Radioman.

Amateur—Extra First Grade Radioman, 1st Class.

Amateur—First Grade Radioman, 2nd Class.

Amateur—Second Grade (permit): Radioman, 3rd Class.

(Note 1.—Commercial 2nd grade may be enrolled as Radioman, 1st Class, when such commercial license has been issued as a renewal of commercial 1st grade license due only to applicant lacking commercial service necessary for renewal of commercial 1st grade.

(Note 2.—Commercial Broadcasting Station limited grade should be enrolled as Seaman, 1st Class, for Radioman, with understanding applicant may be rated Radioman, 3rd Class, as soon as a code speed of fifteen (15) words per minute shall have been reached.)

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**QST for December, 1929**
reply. At 3 a.m. he gave the reply to W3CV. And all this 2 a.m., he delivered the nae age to W6ABF and received a message from W3CV going to W6ABF. Next morning at 6 a.m., we copied weather reports from NAA. Nice work, fellows!

W7BB sends Pacific Coast football returns each Saturday night after the games on 7225 kc. Watch for W7BB's QST at about 6 p.m. P.S.T.

Speaking of QSL cards, W5ANC suggests that we call them "Courtesy Cards." He says the exchange of cards is the final courtesy of the QSO, so why not give them a more fitting term than "QSL cards."

W4ACO, W4AKF and W4VR, members of the U.S.N.R., played important parts in the hurricane that struck Pensacola, Fla., during the latter part of September. W4ACO and W4AKF ran an auxiliary power line to the Reserve transmitter, NDD, and kept the transmitter on the air during the worst part of the hurricane. Contact was kept with NDU at Jacksonville and NDZ at New Orleans. W4VR assisted by copying weather reports from NAA. Nice work, fellows!

W3OI, the station of the Lehigh Valley Amateur Radio Club, was kept quite busy at the Annual Radio Show at Allentown, Pa., during the week of September 16. A new transmitter using an 852 was built especially for the occasion by W3ATS, W3AWB, who erected the antenna, chose a 3000 kc. single frequency circuit (thanks to WSG2). W3NF, W3DX, W3AFE, W3ATS and W3OA did most of the brass pounding. The booth was "hymlessly" decorated with cards taken from W5CN's stock of 3000. A total of 148 messages were handled.

W2BNX installed his portable, W2AFU, at the Mineola State Fair (Mineola, N. Y.) and handled many messages during Fair week, September 17 to 21. The transmitter consisted of 25 tubes in series feed Hartley circuit. Traffic was handled for all points, schedules being kept with W1WV and W3AL. The station installation was in the manner of an exhibit under the auspices of the Boy Scouts, and the judges awarded a blue ribbon to W2AFU. FB!

W4TB has a novel way of telling when he is QRMing the neighbor's BCL programs. His neighbor has placed a light in one of his windows. When W4TBQ sees that light go out, he tries this out, fellows, it has great possibilities, Hi.

SPEED

SPEED to most hams means the ability to send and receive from 25 to 35 words per minute. This is very fine, and all hams should strive to work up as much of this kind of speed as possible.

But there is another kind of speed that is seldom taken into consideration. This is SPEED in the handling of messages. What is the use of copying a message at 30 words per minute, and then letting it lay around the shack for two or three days? How much better it is to copy the message at 10 to 20 per minute and then either relay or deliver immediately! Here is where the beginner and average ham can show real speed.

Let's have more of the slower and more careful sending that does not necessitate fills and repeats to get the complete message, and then some SPEED in handling the received message.

-E. D. Miller, W4QL

Following NAA's sign-off after the Navy Day Broadcast (QG de NAA BIS) we heard W2AVY calling NAA like mad!!

RADIO RIFLE MATCHES

Last year there originated in the Personnel Office of the New York Stock Exchange the idea of exchanging its rifle team scores by Amateur Radio. By means of notices posted on the many bulletin boards of the Exchange requesting employees interested in amateur radio to report same to the Personnel Manager, a small corps of "hams" was organized and given instructions to inform all interested stations of the coming radio rifle season.

Schedules were arranged with stations in all parts of the country, matches were arranged and confirmed, and the first bona fide radio rifle season was in progress.

Here's the way radio rifle matches are managed: The Exchange Rifle Team arranges the match by mail stating that it will be a radio match, and instructs its radio representatives to get in touch with the stations designated by the out-of-town team. When contact has been made and schedules have been satisfactorily completed, a short test is held on the date of the match followed by any information which might be necessary to complete the final arrangements.

When the team has finished shooting, the scores are given to one of the Stock Exchange stations assigned to that particular match and individual and total scores are exchanged.

The Navy Day Honor Roll will appear in January QST together with the complete text of the messages that were transmitted by NAA and W1MK on this occasion. This feature is held over this year as we find that copies are still being received from participants as forms close.

Army-Amateur Notes

SECOND CORPS AREA: A very successful Army-Amateur meeting was held at the Army Hq, New York City on November 4, in connection with the monthly A.R.R.L.-Hudson Division meeting. Captain L. J. Dunn, Col. Allison, Capt. Baldwin and Lt. Talley, W2PF, spoke for the Army. Director Walsh and E. L. Battey represented A.R.R.L. HQs.

The revised regulations for Army-Amateur stations will be given in January QST. Regular A-A schedules were resumed on November 11.

New York State Net: Net Control Stations W3AHR, W2ANY, W20P and W2RQP are busy lining up their Net schedules for regular stations. W2QDQ is N.C.S. of the Winchester County Net. W2BDG is now the N.C.S. of the Bronx Net.

New Jersey State Net: W2AOS, the N.C.S. of the state, and W2MI, the alternate, operate on the same frequency so that schedules may be kept with the minimum of delay to the Corps Area N.C.S. It is suggested that all N.C.S. designate a particular frequency in the 4000-3846 KC (765-76 meter) band and have all their stations operate on that frequency. Most of the old times such as W2AHN, W3ATJ, W3AWL and W3AOS have resumed their active A-A stations.

Delaware State Net: Lt. R. D. Wetherbee of the 198th Coast Artillery, Del., N.G., is the new State N.C.S. Lt. Pyle is in charge of the station.

FIFTH CORPS AREA: Army-Amateur activities in this area are on the increase. The Corps Area N.C.S., WSGZ, is handling much traffic with the Army N.C.S., W2CXL. The outstanding stations of the area are W4OKQ, W5EZ, W5MK, WSSBR and W5QRI. Any station in the Fifth Corps Area (Ohio, West Virginia, Indiana and Kentucky) interested in becoming an A-A station should communicate with the Radio Aide, L. G. Windom, 1375 Franklin Avenue, Columbus, Ohio.

NINTH CORPS AREA: W6DFR, the Area Control Station, handled 88 messages during the last month. W6DU, W6EAF, W6ALX and W6EDK are all going 100%. The southern California Net is beginning to function. The W6DFR-W2CXL schedule is working fine, A-A applications are coming in from Washington, Idaho, Utah, Wyoming and Northern California.
BEGGERS, ATTENTION!

Elsewhere in this issue you will find instructions on building a transmitter for the 3500-, 7000- and 14,000-kc amateur bands. This transmitter has been designed especially for men who have had no experience with amateur radio and is an excellent test of the listener to see how to build a simple receiver for the 1500- and 3500-kc bands appeared in November QST. This is an ideal set for receiving code transmissions on 1750 kc, which have been arranged for your benefit. A reprint of the description of this receiver will be sent to anyone requesting it. A list of the "volunteer" stations that are using code practice and other information for your special benefit appears in this issue. The Radio Amateur's Handbook contains useful suggestions for memorizing and learning the code. We invite requests for any information you may need. Just drop a line to the Communications Department and we shall do our best to help you.

Wanted!

More volunteer transmitting stations are needed to help in the 1750-kc, code broadcast program that we are conducting for beginners. The thirteen stations that have already volunteered are listed elsewhere in this issue. This is nowhere near enough stations to take care of the hundreds of beginners that are looking for code practice. An excellent list of stations now sending the code practice will show that stations in this part of the country are particularly needed. We should like to see a whole page of 1750-kc volunteers!

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

High Quality Signals


14,000-kc band: W1BJD, W2AEM, G8BY, CE2AB.

1750-kc, Volunteers' Schedules

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Freq</th>
<th>Days</th>
<th>Hours (Local Time)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3MM</td>
<td>Allentown, Pa.</td>
<td>1750 kc</td>
<td>F</td>
<td>7-8 p.m.</td>
<td>Phone and c.w.</td>
</tr>
<tr>
<td>W3T</td>
<td>Clark, Ala.</td>
<td>1720 kc</td>
<td>W-S</td>
<td>5-6 p.m.</td>
<td>i.e.w. and 'phone will be used.</td>
</tr>
<tr>
<td>W3BZ</td>
<td>Gouldbank, Texas</td>
<td>1700 kc</td>
<td>F</td>
<td>9:30-10 p.m. on Saturdays</td>
<td>Phone and c.w.</td>
</tr>
<tr>
<td>W3BZU</td>
<td>Readeley, Cal.</td>
<td>1750 kc</td>
<td>F</td>
<td>9-10 p.m.</td>
<td></td>
</tr>
<tr>
<td>W6F1L</td>
<td>El Monte, Cal.</td>
<td>1785 kc</td>
<td>W</td>
<td>9-10 a.m.</td>
<td></td>
</tr>
<tr>
<td>W6EAF</td>
<td>Independence, Cal</td>
<td>1750 kc</td>
<td>W</td>
<td>9:30-10:40 p.m.</td>
<td>5 to 7 w.p.m.</td>
</tr>
<tr>
<td>W6EQQ</td>
<td>San Leandro, Cal</td>
<td>1940 kc</td>
<td>S</td>
<td>8-10 p.m.</td>
<td></td>
</tr>
<tr>
<td>W6TJ</td>
<td>El Monte, Cal.</td>
<td>1765 kc</td>
<td>T-S</td>
<td>8-9 a.m.</td>
<td></td>
</tr>
<tr>
<td>W5DRG</td>
<td>Shemondash, Pa.</td>
<td>1715 kc</td>
<td>D</td>
<td>6:45-7 p.m.</td>
<td></td>
</tr>
<tr>
<td>W8AFP</td>
<td>Tabor, S. Dak.</td>
<td>1715 kc</td>
<td>S</td>
<td>9:30-10:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>W8BSP</td>
<td>Osle, Kansas</td>
<td>1750 kc</td>
<td>E</td>
<td>10:15 p.m.</td>
<td>Phone and c.w.</td>
</tr>
<tr>
<td>W8BHC</td>
<td>Dakota City, Nebr</td>
<td>1750 kc</td>
<td>M</td>
<td>8-8:30 p.m.</td>
<td>If QRM is bad 1935, is used.</td>
</tr>
<tr>
<td>W8BIC</td>
<td>Menasha, Wis.</td>
<td>1715 kc</td>
<td>S</td>
<td>10:15 a.m.</td>
<td>Phone and c.w.</td>
</tr>
<tr>
<td>W9FLS</td>
<td>Ave, Ill.</td>
<td>1715 kc</td>
<td>T-S</td>
<td>10:15-11:15 p.m.</td>
<td></td>
</tr>
</tbody>
</table>

WORC Worcester, Mass. 1200 kc (349.9 meters) Saturdays 7-7:30 p.m. QST for December, 1929
DIVISIONAL REPORTS

ATLANTIC DIVISION

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, F. Calheoun, W3BBW — This was a fine month of reporting, fellows. See if we can’t keep it up. Let’s try to win the traffic banner or at least lead our division. We welcome back some of our old gang this time, also several “non-ORS” Maryland; W3CCQ is on again with a new MOPA and SG receiver on both 3700 and 15 m. W3GF, a non-ORS, turned in a nice total. W3R8W is coming thru again and if I don’t reach a good total guess I’ll sell out. Hi, W2ALD, who is a commercial operator, stayed at the SCM’s station all night and missed his boat. W3NY, a new ORS, worked ON 4 FP in the afternoon. He is trying a Herta in Sept. O37, W3DG, our other new ORS, just can’t get going. More pep, OM. DELAWARE: Both of our Delaware ORS reported, W3ALJ is trying to get his receiver and smitter going at home. W3AJS has a new set now and operates at WDEI, Delt. of Columbia. Our RM, W3BWT, leads in traffic again this month. He has 4 ops on our territory. We welcome two of our old friends back, W3GT and W3CDQ, also some new non-ORS — W3PM and W3LX. W3GT is building a new hi C TPTG and hopes to resume his old skills shortly, W3CDQ. WASHINGTON YL, made application for ORS. W3PM threaten to hold lots of traffic. W3LX also wants an ORS and skeds. W3A0O sent in his report late and missed out on the Sept. issue. Sorry, OM.

Don’t forget, let’s see about that banner.


EASTERN PENNSYLVANIA — SCM, Don L. Lusk, W3LJ: Activity in this section is certainly increasing for leaps and bounds and the SCM is pleased with the showing of the stations, particularly those who are interested in securing an ORS certificate. W3MC and W3D9V will receive theirs this month, W3AHE has a nice total. The Lehig Valley Radio Club’s station, W391, handled 170 mags at the Allentown Football Show. W3KQ has a new set and plans and passed in a mighty fine total. W3DH is certainly an example for other ORS. Look at his total for this month! Miss W3AEB surprised me by reporting. She may take part in a coast to coast net that W3ERU is preparing. W3DAWO came through in fine style this month, W3AWB using AC until he can replace a 231 tube he hooked to W3NF. HN, W3AUIR is in fine for an ORS. W3DRG reported too late last month. W3LC has a new job now and here’s hoping for some good reports from him in the future. W3XX of the Sheffield Taber Radio Club in Scranon desires to thank those who were present when the annual meeting of the club was held. W3DFS said the Scranon Radio Show was a huge success. W3CDQ reported “no traffic” for the third successive month. We are sorry, OM, but your ORS will have to be cancelled now, as 10 messages per month is the law. Let’s make it only temporarily, the way says. W3ALJ and W3CDQ worked this month an ORS, OBS, Official Observer, Route Manager and coast to coast skeds just in touch with the SCM immediately? W3PB, who mentioned in a past issue of QST that his concern had several hundred “Q” signal sheets to give away, has had requests from all the U.S. and even one from England. He says he still has a few and first come, first served. Thanks are due to Raymond Rosen & Co. of 7 North 11th St., Philadelphia, Pa.

Traffic: W3AOW 303, W3NF 289, W3KX 251, W3DH 233, W3AVB 170, W3KQ 17, W3AGB 44, W3CJ 36, W3MC 36, W3AUR 17, W3AAB 16, W3D8RG 6, W3VD 5, WESTERN NEW YORK — SCM, Charles S. Taylor, W3PJ — The autumn leaves are falling and so are some of the regulars in Western New York. But there are a few who are trying their best to push Western New York to the front again. W3ABQ is now hot after schedules. W3AGC is reporting building to crystal control. W3AIE is a new ham from Granville, Ohio, who wishes to get some schedules in Rochester. W3AIE is at the Rochester University. W3AGC has been building new W3SG. W3AIZ has been busy traveling around with his orchestra, but he finds time to report anyway. W3ATH is building a new transmitter using 2 50-watters in a MOPA set. W3AYW hunts out with the news of a new club which has formed in Rochester. N.Y., called the Wireless Amateurs of Rochester. A. J. Manceco, W3CPR, President; David Melman, Sec.-Treas., and S. Cahay, W3AYN, Pub. Mgr. The club has a membership of about nine who are after new members, traffic and schedules. The Jamtown Amateur Radio Association held its first meeting at 143 Fairview Ave. The officers are: S. R. Sweeney, WHA, Secretary. W3AJS has a new DXQ and P him. W3BWW of Rochester has a brand new building new filter system. W3BLYT works California quite often now and has left to 2011 Tremont St., Syracuse, N.Y., W3BMJ states traffic PB, W3DPQ is after schedules and traffic.

The annual meeting of the Syracuse Amateur Transmission Association was held on Oct. 3rd. Election of officers resulted as follows: President, Bruce How, W3ACX; Vice-President, Walt Turner, W3AYU; Secretary, Arnold Weichert, W3AOV. Several new members were admitted. The club transmitter was decided upon as a Hartley.

W3BSL, a new ham, is after a W3A. W3BUP wants schedules in Rochester and Buffalo. W3BQY is now back with us again. W3CDB has his set busy with the Empire Airport on weather signs. They have a plane equipped and get his reports while flying. W3CDG will be back with the gang again soon with a 50-watter. W3DAB is another new ham from Utica, W3DAB has a timer. W3DB, Rochester. W3CDO visited Buffalo and whoops what a time he had. He gave the Radio Assn. of W. N. Y., an earful of home-done crystals and visited many hams in Buffalo as well as Niagara Falls. W3MSD saw the pretty lights at Niagara Falls to W3DSP. W3DPE promises wonders with a new 244A, W3EH, ex-QAR, ex-24PD is doing fine work on both 7, 5 and 3.5 m. W3QSL has a good total this month. He tells of a gathering at LeRoy, N. Y., in W3HFA’s new shack where future radio ops gathered and pledged schedules, traffic and A.R.R.L. support. Here’s a new one, W3AFM is celebrating the first birthday of his station this year Oct. 20th! From collected reports there seem to be many stations and operators who have not been bitten by the A.R.R.L. spirit and reports from these new hams due will be appreciated.

Let’s make Western New York section go over the top for the coming year of 1939.


WESTERN PENNSYLVANIA — SCM, A. W. McAdoo, W3CCE — W3CUG, again the section leader by a slight margin, is the proud possessor of a letter from President Maxim as a result of his work in the HPM Relay. W3DLM is a runner-up with W3CDQ. W3DLM is a new ham and has a schedule with WFA. W3AJE wants some schedules, W3AGO reported by telephone. W3GI has resigned as route manager and the job will be taken over by W3CGU, C. H. Grossarth, Eicher Road, Emsworth, Pa. Write to him about schedules, or get in touch with him over the air. W3AMU is still observing quiet hours. W3CNCZ says there are lots of folks who would like a QST for December, 1939.
away from home trying to get in touch with the other home town and that this should mean traffic. WSDUT says DX is slow but getting better. W9DHF has a built-in report of some music by the ATQ Report. W9AHH is working DX. W9KDK and W9DMN are breaking into the game in Erie. Welcome boys. The Erie gang report that they have a machine to tell good signals from bad ones before sending. The ATQ Report was treated as a demonstration of QTH with a good time table at their banquet in Pittsburgh this month. Here is the scope of the year. W9OW handled a message. Report regularly, if you would get a new ORS or keep an old one.

The Western Ontario Amateur Radio Association staged a very successful District Hamfest at London, Ontario, on October 18. The meeting started at 2 p.m. with a talk on "Some Contributions of Radio" by Dr. Desile of the University of Western Ontario. Practical talks of members are the association followed — "Power Supply for CW Transmitter" by VE9CC, "A Beginner's Transmitter" by VE2HEB, and a discussion of QST's low power 'phone transmitter by VE9KD and VE9LY.

A traffic meeting followed the technical discussion with talks on traffic conditions and amateur activities by VE9CF, the SCM, and VE3CS. After this the gang split up, some visiting the combined station VE3CS-VE3HH, and others the VE3CQ, the local BC station. A theatre party formed at 6 p.m. which lasted until 8:15, when everyone repaired to the Hotel London for the banquet. Prize donations followed the eats and nearly everyone present got a prize of some sort. The hamfest lasted up at about midnight with all expressing what an enjoyable day they had had.

CENTRAL DIVISION

ILLINOIS: SCM, F. J. Hinds, W9APY — W9CJ says DX reception has been good the last month. A squirrel got mixed up with the 2500 volt line near W9UF and blew the works. W9BMOQ is a new station at the Oak Park High School and is in line for an ORS. W9CF is a new station in Champaign at the U. of I. with W9AAR, W9CJ, W9QQV, W9APY and W9CBS as operators. The set consists of a pair of 240-A in a push-pull Hartley — sync rectifier. W9CBS will be on the air as soon as they bring up to 250 watts on 7 and 3.5 me. W9CJJ wants schedules. W9ANQ also wants schedules and reports DX coming in well. W9ERU was one of the stations handling the most HPM messages in the hamday relay of our president, Mr. Maxim, FB, OM, W9CJM had now recovered from the fire which took all his out to the happy hunting ground. W9AKA says that 3500 kc has real traffic stations and about the 28 QSO's are missing. W9JJ has an 862 on 14 mc, and W9TJ is doing a radio in Brookfield under name of Grand Radio & Electric. Then there is a crystal set W9CBK. W9F0 has schedule with VK3CX. W9IZ says traffic is picking up nicely. W9AIF will soon have an 862 in PA 210 ralaxer with WE 211-A in modulator for tone. Traffic is scarce at W9BNR at 1440. The input at W9AD is 8 watts using a stol. W9G1 says he wishes he had a virophone like W9A's. HI. (Christmas is coming.) W9AP says "Hark from the tomb — 1 am back on the air." W9AP did some fast relay by telephone the other evening. W9CJ, Report of a powerful tone set at W9G1, for traffic, has just been received for a southern schedule. W9AAS is now in New York preparing to enter school in February. W9BNI was a visitor at W9ANR, W9CJN, W9DOX, W9IZ, W9JO, and W9TV (Jenson). W9DOX has started traffic on 7 mc but needs the help of more transmitters with the 35,000 watt as W9DJ, for traffic, has just been released. W9JO has a southern schedule with ex-W9CJRJ on the Pacific and reports 7000 kc. DX good. Best DX was S242KR in the jungles of Brazil. A pair of new rectodubs are being broken in at W9CJRJ. W9CJRJ has a new monitor and a 15-mike bank for filter on 3500 kc. W9G1 has a new voltage divider which he likes better than the Zepp. W9DBK received all his eleven messages from one station. W9CUIH was R8 in Russia and worked W9AFL, W9CJL is coaching a new ham. FB, ED, GB, is now an official frequency station and wants the gang to move the books and may be have his messages handled in one day. W9DCX says traffic is picking up nicely. The new screen-grid receiver at W9BVP is pulling in the whole gang. W9G1L and W9CJRJ are busy with relays and relay circuits. W9FLT has been trying to get a mercury are going. W9FDY is still rebuilding the out. Ex-SM is doing fine work at W9QF.


INDIANA — SCM, D. J. Angus, W9CYQ — Radio activity is rapidly increasing in Indiana. Most of the old gang is now on and many new members are getting under way. Fort Wayne and South Bend report healthy clubs. The Indianapolis Radio Club is starting a new drive on and will start a new code school soon. W9RW has been with W9F1W, W9H and W9JL, W9GEO wants more skeds on 7000. W9CGO has been handling some Chinese traffic. W9EXW reports that two more stations are starting up. East Central and W9CJRJ is a new one at Bloomington. W9BBW and W9EPH have a station going at the Nu House, Indiana University. W9FIR is putting in a station at the High School at Bloomington. W9ER reports worked his 47th country with a contest with North Rhodesia. W9BBR rings the state bell with a total of 111. Good work W9GJS has applied for an ORS. W9CJL is moving to a new location in Indianapolis. W9GJS wants schedules.


KENTUCKY — SCM, J. B. Withen, III, W9BZ — Excellent work this month, fellows. Let's get it a little higher each month. W9CRD stacked 'em up in fine style. Also got in a lot of DX country — 22 countries on 3 continents. W9EYW reports all skeds are "dada." W9CSE has fallen prey to the fone urge. W9FBA has bestowed himself and turns in a report. W9AGL is thinking of installing a tone. W9AUU and W9FKM have been rebuilding. W9SG has added another sked to his list and this one is increasing in DX. W9AYZ does right well with his push-pull 201's. W9JL started the new year right with a gob of traffic. W9FQN repairs BCL sets. The Covington bunch are having a QSO contest. W9EGO, a new ham in Paducah, says W9BBJ has let him bear some of the brunt. W9HRL has received his appointment as Assistant to E. S. R. W9FZM had a misunderstanding with the R. I. but we believe all is OK now. W9AUU had a grand smash-up and was heard calling QTE, QRD a flarp — almost. W9BZ had a very enjoyable time in Henderson one weekend. W9QGC chased dukes in his speed boat. W9DLM I knew as "The Barefoot Box." W9DDH is bothered with YL QRM. W9BAN shies as a draftsman and sax artist. Reports from newcomers are welcomed. Several new ORS operating during the month reports. Come in.


MICHIGAN — SCM, Dallas Wise, W9SCF — W9DLY is high man with 519! W9BTO has been doing quite a bit of phone work lately. W9DDE is still on the map. W9AUG operates at W9SH at Michigan State College. The Amateur Radio Club has been recognized with W9DBR, Vice-President, W9AMJ, Pres., and Mrs. W9DRB, Secretary, and Treas. W9SAFE is still working out. W9SDC has always had the sine WOOD for the past two years, has left for New Orleans to enter the commercial field. W9DDE handled some of the QRP messages. W9BRO has the 852 stepping out in great style. W9FVE reports no operators for DX traffic can be available until after first of the year. W9SCAT has a new antenna and reports it much better than the old one. W9CUI is going to night school so not much doing with the radio. W9B1WS works a schedule with W9CS for Arrray traffic work. W9EGF, who also operates W9FVE, is now on the 852 and is now fielding for all bands and looking for a few more reliable daily schedules. W9AX has a C.C. set peaking with about 50 watts input. W9CSR promises more time on the air as the overtime work is about finished. W9CQO's both the 7000 and 852 has been very keen, both bands now. W9SLX looks like a fine shape lately. W9AX now has an 852 and a new antenna. W9SMV, a new station in Detroit, is using a TPTQ set with a 210. W9DYY has been on the job every day and

V.I.P. — SCM, L. F. R. Jones, W9CUE — W9CUE has been trying to
together with WSCAT and WJQ handled the bulk of the 65th Div. Cavalry traffic. WJQX, Helen M. Harrenee of Manistique, is Michigan's own YL.


OHO — SCM, H. C. Stock, W9BYN — Well, gang things are beginning to look like old times again. Ohio has three in the BFL this month, one making it two ways. FD3W is QST with the SCM until Oct. 4, BFL with 211. He reports that the RM work is coming along in great shape, and that the fellows are cooperating better. WSCAT, W9BRR and WSCMB are working hard to put Ohio on the map. W9SCN, who was Ohio's first full month with Les, was having a traffic blues into her, and is now with 208. Her schedule with K9BRB is one sure route to Hawaii, the Philippines, China and points that way.

Traffic to Europe goes thru W9SCN, W9BRR or W9CRI. Traffic is QST with the SCM until Oct. 4. On behalf of the section, the SCM wishes you and call having been changed recently. W9EGI.

Southern Minnesota — SCM, J. C. Pehlhubik, W9EFK — The Radio Show at the Minneapolis Auditorium did a lot to aid traffic this month. Jabs, SCM of Minnesota, had his pretty (and also efficient) crystal controlled set there and many a BCL was initiated into the inner intrigues of amateur traffic handling. A total of approximately 100 messages were sent for destinations from Hopkins to India, HI. The bulk of the traffic was sent to W9ICOS (by N, W. Airplane plane), W9AIC, W9CTW, etc. W9ICOS is back on top as usual with the W9AID-P.I. skid going strong. W9ON, the U. S. Power station, is on 10 40 or 40 W9GKX. A 35 mc, with an 826 remotely controlled for each band, Mears, W9BFI. Leshe W9HID, Cotman W9BIA, Adams and Soules all operate there. W9DHN is back at the university after a summer on the lakes. W9AIR turns a report bringing in news, likewise a 500 kite. If you have time, says W9KX blew both power generators. W9AUU and W9CYA are on now and then. Let's hear from you fellows that are so secretive about your activities, regardless of whether you are an ORS or not. W9DQG had a visit from W9KGOO, who has several showings up. W9FHZ says some of Ben Franklin's raythymes might come to get tangled with his antenna and took tube, meters, and condensers. W9DGH has a new stax job on 7 mc. W9XI has installed a 230-watt stax controlled set capable of almost instantaneous change to 3.4, 7, 14 or 28 mc. W9AIX and W9DOP are too fast for the University. W9EJD has just been assigned to a new man in Minneapolis. W9DBC, our old TC traffic head, is back on 3.5 mc with a 210. W9FLE has 400 volts of Edison cells to sell or trade. W9DMS is going strong with new xmitter and zepp. W9GDE says "Three trips, then whoop for 2000 kc." W9FYL is building and attending night school. W9EGI worked Belgium with his antenna lying on the roof. W9DHII, W9EH, W9KGO, W9FLE are, all prospective ORS.


Dakota Division

Northern Minnesota — SCM, Carl L. Jabs, W9BVH — Judging from reports and traffic, good weather is here. The SCM leads the Section in traffic this month. He had his transmitter at the Minneapolis Radio Show and originated a bunch of messages as a result. W9AH handled a bunch of mugs from the Duluth Radio Show. W9CIG had his station at the Duluth Radio Show. The station installed at the show by the new radio club of Duluth and Superior was a huge success, W9CTW has a 204A for his QZT transmitter. He had a hamset recently and the SCM had his. He and John are getting along fine when he will be back with us again. If you, each and every one of you, will only try to have just a little traffic to report each month instead of zeros, and will cooperate with W9S6, W9SCAT and W9BRR, there will be no doubt about Ohio.


Wisconsin — SCM, C. N. Crapo, W9VD — W9DLD is on the job again and on two transcontinental routes besides keeping a full quota of schedules. W9EBO says he has type writing. W9BRE has his license power. W9FXE has daily schedule with W9DLD on 211 each. W9AZN thinks he gets better results with his set self-exited than with C.C. W9FSS is on Monday, Tuesday and Saturday nights for Army traffic. W9DXTL still talks about his 1-kw. water-cooled Job. W9EMD is keeping schedules with WSCAT and W9FSS, W9DLQ has schedules with W9DDL, W9DEB and W9ZM, W9FAW is on 3500 kc. regularly and is looking for Minnesota schedules. W9BGT is taking a radio course and would like to hear from the boys. Address him at Stiles Dormitory, Valparaiso, Ind. W9BWZ says business is pretty rotten. W9SO is back on the job after the summer. He is in the midst of a screen-reader receiver and rebuilt transmitter. W9VD has installed Rectubes and shortened his Zepp — report 100% more kick.


80 QST FOR DECEMBER, 1929

IX
football again. W9DNS reports renewed activity after a summer off the air. W9CKT, Ed Marquardt, Madison, is back on the air after several weeks inactivity. He was in white docks so look for him, fellows. W9DRG though very busy with school, operates a little.

Traffic: W9YFV 53

DELTA DIVISION

ARKANSAS — SCM, Henry E. Yelte, W5AB — We have been hearing as many reports as we would like to see come from the fellows who have not heard reports because they only have a small traffic circuit. Don't let this discourage you for every little bit helps. W5HI is still working on his phone set. W5JK at DeQueen has been appointed ORS. W5AQX reports working W1MK. W5BO received a letter from someone for whom he has been searching for years and he is still working on his phone set. W5PQ states that he lives on "Battery" St. Evidently this is true because he is getting out with a pure DC code. W5LK is on with the aid of a 210. W5RCZ continues to get out very well with his 3520. W5MD has been on the air for quite a while and he is sending 1200 cps. We are glad to note that our traffic total has taken an upward jump this month. With cool weather and vacation time over, we hope to see a larger total next month.


LOUISIANA — SCM, M. M. Ward, W5VBO — Activity for the section is booming with the cool weather. A real traffic net is now in force making QSP anywhere in the state possible within 24 hours. FB, W5WF is again top traffic man. He is also on the Dixie Land traffic route which extends to Nacogdoches and the Coast Zone. The new station, W5AQG, comes in with a report of some skeds. His 210 in a high C circuit has a true 1920 whistle. W5ANA is a newly appointed ORS. W5MDJ received quite a write-up in the Monroe papers. W5BH has placed posters and boxes in the post office and tourist parks requesting the public to deposit their messages. FB, W5BDY has rebuilt from top to bottom and now has a fine steady signal. W5AXS was QSO Dutch Steamer S. S. Proctor with call PXR, W5ACI bought so much crystal grinding equipment that his station suite is made up. He made W1MK a present of a crystal that is within less than 100 ccs of his W20Q. W5CM has improved his H Class and made several contacts. W5BJB has dusted off the junk and has some B batters. W5EB has a 4-tube screen grid receiver & a qst and she is all they claim for it and then some. W5UK says business takes most of his time. W5SN has invented the 210 CC rig and is taking time off from the 7L.


MISSISSIPPI — SCM, J. L. Gullet, W5AKP — W5EQ is the owner of a new receiver equipped with two-stem audio amplifier. W5QQ is off the air until he can secure two radios to replace the two that he borrowed from W9OCG. W5QQ has moved to a new location and put up a voltage feed zepoline antenna. W5APW says phone DX is increasing. W5ANN is hitting better than ever and W5OPZ is working 7100 kc. W5VXX has schedules with W4AQ and W5BCLA and works in the 7000- and 14,000-kc. bands. W5AAP reports some messages handled this month for the first time. W5AKP has his new station finished and as soon as he receives a new transmitter he will report.


TENNESSEE — Acting SCM, J. B. Witt, W4SP — Things are picking up all over the state since cooler weather has set in and we hope to have increased activities right along. W4VK shows great activity of all ORS. W4F, W4ANU, W4ANV, W4APK, W4BN etc. are all active. W4AEP is also coming on with W5EQ and W5VXX.


HUDSON DIVISION

NORTHERN NEW JERSEY — SCM, A. G. Wescott, W2QR — A few stations who are not ORS reported traffic this month. All stations are welcome to send in their reports. W2CTQ is too busy with studies to operate his station. W2QX was QSO a station in Hong-kong. W2WR is on 7 mc. working good DX. W2APL has been working on his phone set and is handling a lot of traffic. W2AUP using an 820 crystal controlled transmitter is an initial reporter. W2AOP is a busy BCL service man. W2OP, our HAM, is back on and wants to start up some real traffic routes again. W2AOS is pleased with the results of his new station. W2AQG is still serving BCL sets. The BPL this month as a result of good skeds with W1MK and W6CWO. W2BY's serial came down in pieces. W2QG sends in a report after a long silent period. W2BDF finally got his 300 watt transmitter on the air.

The Nassau Radio Association, a new ham club, will try to put some pep into their W2AFU to divide its time between W2J3M, W3XS, W3KZ, W3BA and W3AFU.


**MIDWEST DIVISION**

Iowa — SCM, H. W. Kerr, W9DZW — A fine bunch of reports was received this month. Thanks, gang.

W9FZQ leads with W9DEA, W9FWG, W9FFD and W9FGQ trailing right along as a result of a radio show. W9DEA is rebuilding his MOPA, W9ESP has nice skeds and W9DYS is a good ham. I hope to see the BPL on deliveries. W9AIR is on the air at Iowa City college. W9EQJ resumed his daily with W9DLD on 3080 and is lining up other skeds. W9DWU gives us a nice total for golf but no schedules! W9FLEK promises more when his skeds go. GCD 5 and 7000 kHz. W9DFX says his new keying system is absolutely slick. on any wave with BCL sets full volume in the same house. FR. W9APM is looking forward to an 800 like W9DPZP. W9JEIT ground his rock too thin for 3500 kHz. W9HDJ has new Zepp, W9CZC is on Mon., Tues., and Thurs. W9TMB is making his call changes. W9DNZ checks in first report. He is AA pheloting the Sioux City totals. W9EUP reports from W. U. college at Le Mars. W9GCX radios his report. W9DL got excited when he saw W9DNA's skimmer. W9GLK shifted from TPTG to G. C. Hartley, W9DUN, another printer ham, brings Akron back on the map. W9DNC is moving to Muscatine, Box 326. W9EMK is another first reporter. W9CCE is busy with BCL sets. We want to thank every op that reports. W9DWU is the only Iowa man on the T.A. route. Report on your meetings early. Give us your sked data — the ICM and SCM can use it.


Kansas — SCM, J. H. Amis, W9CET — The Kansas gang are all getting the deck clear for a big traffic session. W9CET pulled a fast one on the CM and made the BPL. W9DWC took W9DWS old theory about skeds, keeping four and making the BPL. W9FZU had good luck with traffic this month. W9AES reports for the first time and keeps a sked with W9BJA. W9CFN is keeping 3 skeds; one with NFX. W9BTG is helping organize the Nebraska Radio Club. W9DPS has a very nice atom, a man from Iowa, doing that. W9DPS has his station on 2100 kHz. W9CRB is still going strong on 3000 kHz. W9DNZ reports on 7000 kHz and worked all districts last month. W9CSN would like to have more schedules in all directions. W9GFO has a new 750 volt MG. W9BHR has been too busy writing bed time stories to work the old set. W9FIS, our CM, has been working 16 hours a day so was unable to call. Operation is to be started again soon. Watch for the dope. The SCM would like to see every station in the section keep a few skeds. Let's go gang, more skeds, more traffic!


Missouri — SCM, L. B. LaDue, W9RR — Those who have QRM are reminded anew of their obligation to report it. W9FZI and W9DJL are keying all clear traffic from three or more radio shows (St. Louis, Denver and Louisville). W9BJA gets his biggest portion of traffic from handling weather reports for the USWB (Aerological Division). You fellows located on or near microtubes are in a hujus situation to report. The SCM is really running the service. It is the call of the new Volunteer Communication Reserve Station in Kansas City. Most of its delivery total comes from mail messages received on schedule from NDS, China. A triple watch is kept on the receiving end to avoid break in the copy due to QRM or QRN — one operator at W9ZJ, one at W9DQN, and a third at W9CFL.

Most of the gang are supporting Amis, W9CET, for Midwest Division Director. W9BMY is a high-power aspirant, now using a new 832. W9AMR was off temporarily to do some music business, W9QW in N-21 is a real ham. In St. Louis when Mr. Hebert of HQ was enroute home. FB. W9BCG has a KDV5 schedule at 4 a.m. daily. W9DUD is teaching radio at high school. W9BEU reports by special delivery air mail. W9FTA is coming up for a new QRS. W9DVR, our old RM and traffic bound, is now a member of the Advisory Board at St. Louis. W9QW at Harvard, Mass., is doing a fine job at the college. W9FFY would appreciate a visit from the gang passing thru Branson and Winona, Ill. W9CDU says Nevada hams will hit the HPL yet — we are from Missouri, you've got to show us. W9FMR says everybody is QSR at his college. W9ERG now doing traffic at Kent. W9HFR are having great time working DX with a WE2ID2. W9BEA keeps five skeds on the USWR work and three others for ham traffic. W9BKG will finish school this half and prospects are he will be a globe-trotter next summer. W9DHN is one of the consistent reports. W9WKT is looking forward to seeing W4YK. W9BFB reports W9ARA now attending M.I.T. at Boston. W9CIB is going to be an ORS soon. W9ALC does a regular trick at W9DQN. W9DQN is standing a regular guard watch for the NDS-W3Z2 USNR schedule. (Let W9ZZ know how you receive this stuff. THX. W9CIB) and W9DSS skeds. W9DNC is coming for another night to finish his report. He is AA at the BPL on deliveries. W9AIQ is now at 2100 kHz and 7000 kHz.


Nebraska — SCM, C. B. Diehl, W8BYG — The gang are all getting the deck clear for a big traffic session. W9AES is out of his station and W9DPS is looking for a western outlet on shoral. W9DLC is coming in a very encouraging manner.


**NEW ENGLAND DIVISION**

Maine — SCM, G. C. Brown, W1AQG — Well, gang, we have missed our chance to be heard. W1AQG is coming along in a very encouraging manner.

still has a lead on the OM. It is sure hard to get ahead of the OM's. HL WIACV has been transferred to Worcester and has an axial on the air. W1BZ reports no traffic this month due to business activities.

Traffic: WIATO 327, W1CDX 77, W1ANH 63, WI4Q 100, W1AV 50, W1BQ 29, WIAFA 21, W1AQL 17, W1AHY 5, W1AVC 67.

NEW HAMPSHIRE — SCM, V. W. Hodges, W1ATJ — W1IP made the BPL with a big total and is keeping a bunch of skins. EB, LJ, W1APK wants more skeds with Maine and Vermont. SCM reports the Bell Tel, Co. in N.Y.C. WIAEP is back with a good module, using /Btha.

WI1FT is digging up a lot of traffic at N. H. U WAUY is on with a new tone, using a 5X5 module, W1BK and W1CEQ are working together at Durham. W1AUE is working MUN, W1Q6 is trying to do much brass panding. W1AVJ is still working DX on 70C and W1IDJ is joined the W1AUE Reserve. W1MGB joined the benefiacy Oct. 7th. The YL being none other than the SCM's sister! Reports are that W1P is the next to jump off! Naval Reserve drills were resumed with most of the ORS taking part. Anyone wanting information on how to operate, come on in to see the SCM.

Traffic: W1P 337, W1BTF 114, W1AEP 70, W1APK 59, W1BK 10, W1ATJ 11, W1AUE 4, W1AUY 1.

VERMONT — SCM, C. Paullette. W1VT — It is very hard to make an interesting report for you to read if you don't know what you are doing. Only three stations report this month: W1A0O, WIHF and W1TF. W1VT figures to be congratulated, as he hasn't missed a single report all summer. WI6P reports that he is moving and will have a better set than ever. W1VT has one sked for every night. W1BGO is back home and is very active. He is the Chief Route Manager for the state and really cooks with you all to get FB skeds working. Hope I will get material enough next month to write out a real report.

Traffic: W1A0O 17, W1HT 1.

EASTERN MASSACHUSETTS — SCM, Miles W. Weeks, WIWV — This month has been one of Radio Shows and as result, traffic has shown a marked increase. Three stations make the BPL: WIACV, WIWV and W1JQ. The Eastern Massachusetts Amateur Radio Association obtains a separate booth at the Boston Radio Show and WIACV deserves great credit for the presence there of the show week with his portable. An a.c. receiver kindly loaned by Sears, Roebuck Company was used with very good results. WIKI, W1KY, W1HE, W1JY, W1AC and WIWV all had a turn at the key and all messages received were routed out before the show closed. Many amateurs from all points of the country registered as visitors at the booth and great interest was evinced by the public in general, few of whom had ever witnessed an amateur station in operation before. Among the visitors from New York City we were pleased to meet the League's Assistant Manager, most of us remember here as W1FL. It is with great regret that we announce the resignation as Route Manager of W1KY who has served us so faithfully and well in this position. A change in her business necessitates this step. W1KHE as her successor will have the continued cooperation of the gang and we wish him every success. W1RY is building an outfit for college use which he hopes to have on the air soon with the call W1VG. W1A1S says no skeds. WIWV is working for a d.c. note. W1RJ is studying at night school and does not dare to play more. Only three stations report this month: W1A0O, W1N1F and W1TF. W1VT figures to be congratulated, as he hasn't missed a single report all summer. WI6P reports that he is moving and will have a better set than ever. W1VT has one sked for every night. W1BGO is back home and is very active. He is the Chief Route Manager for the state and really cooks with you all to get FB skeds working. Hope I will get material enough next month to write out a real report.

Traffic: W1A0O 17, W1HT 1.

RHODE ISLAND — SCM, C. N. Kraus, W1BQR — The Radio Club of Rhode Island installed a 100 watt transmitter in an A.R.R.L. booth at the Electrical and Radio Exposition held at the State Armory in Providence. Over 100 messages were handled at the League's Exhibit. W1A1C took 24 messages in one string, W1DUE 22, W1BZK 15 and W1KIC 12. The call was W1BCR and SCM Kraus and Thomas L. Siglin (W1CPE) were the ops. W1AMU, W1BIL, W1MD and W1BGA also helped to serve the traffic. W1KRA has two old legs up for service. W1AMG has split back from sea and who is chief op at WPAW; and W1AMU who has been off for the past year. W1AWE will be with us soon with an $85. W1MO is on 14000 kc. with his 250 watt. W1BLY has his station parked at his new location. W1CPH 4 and 7 mc. W1GIO is about to go on 7 mc. with a 210. W1BQD has moved to a new location and should perk out FB. Kraus is looking for an operator to run the club station on Tuesday evenings for the Naval Reserve Net. How about it. OME?

Traffic: W1AQM 2, W1BOD 8, W1MO 105, W1AJB 8, W1WV 26, W1MK 65, W1B9 19, W1A1F 143, W1UBE 208, W1PD 35, W1CTI 116, W1AIO 122, W1RP 36, W1MO 30, W1ZI 25, W1AOW 10, W1KJ 34.

WESTERN MASSACHUSETTS — SCM, Dr. J. A. Tessmer, W1UM — Considerable time and effort is being continued in laying out the plans for the N. E. Convention. The Worcester Radio Asso. will appreciate letters from the
Oregon — SCM, W. S. Claypool, W7TN — Wanted! One adding machine for the Oregon section, yes, we need one this month. Everyone seems to be out for traffic and how! W7TP has the list with a total of 332. Twenty-five stations reported and fourteen were non-ORS, FB! 2175 is this month’s total and we think it is the largest this section has heard. By spending 22½ hours on the air daily, W7ABH made the HPI and worked Chile, Nicaragua, Canal Zone, P. L., Japan and Singapore on 7. W7LT was on the air every day except two this month and has a nice bunch. W7TB is back in the game after a season of fishing. W7ALX, W7EDD and W7IBW ran W7AP on the Clatsop Co. BCI. W7NEU and W7FJ are plugging along. W7FH envies W7WP and his 210 DX, W7AMJ reported by radio, W7MY, W7IF, W7AMF and W7WU keep Coos Bay on the map. W7BP was so busy this month with work and code class for YLs only that he forgot to report until now. There is a lot for a hand. SCM heard three VK and one ZL station answer one of his CQs. W7EO reports one message. Wonder if that is the number of deer he got this season. W7PL and W7CX report and say “Conditions in the eastern part of the state CQs. W7E0 reports one message. Wonder if that is the number of deer he got this season. W7PL and W7CX report and say “Conditions in the eastern part of the state CQs. W7E0 reports one message. Wonder if that is the number of deer he got this season. W7PL and W7CX report and say “Conditions in the eastern part of the state
report their activities. W6ALX is busy initiating a new class of neophytes in the mysteries of ham radio and changing his 3750- and 7200-ke. transmitters more to his liking. W6NM, the Naval Reserve station, is putting over some FB traffic work with the various other FB stations. W6BHY and W6AY are having exchanging transmitters with W6CZR and expects to know the P. I. hams dead with W6CZR's receiver later. W6ATT has been getting into the thin tail of a neophyte or lid at the Oakland Radio Club to rest on the top of his massive books. While working over the club initiation powdered out a small traffic total. W6EDK is back on the air on 3300 ke. sending out the league broadcasts and slaming much traffic from live skeds and the Army network. W6CTX maintains a sked every evening with W7Z5 and W6DKJ. W6CWM has just been holding his sked with 1400 words on each sked. W6JW is working Seattle on fone with less than 28 words input. W6CZR spent his vacation in Sacramento with portable W6DT, and maintained FB skeds with W6BWI and W6CTF. W6BKI reports W6DHE has been skipping up things for the ORC neophytes to do before the initiation. W6BZG is being praised for his FB signals on 7500 ke. W6EA reports things shuffling a little bit at Point Richmond. Houston, under his new chief of W6AQ, is getting the atmosphere of the exhibition of ham equipment and demonstration of ham radio at the East Bay Merchants and manufacturers Exposition at the Oakland Auditorium. W6DTM will be on the air as soon as he can build a MOPA. W6AVL is just busy with his new station, and has been getting his first DX thrills by working P. I. and Jap stations. W6SSB has been elected treasurer of the Oakland Radio Club. W6ZD, our Division Director and a member of the East Bay section, has been seriously ill in a San Francisco hospital following an operation.


HAWAII — SCM. F. L. Fullaway, K6FCG — K6DTG, the star station of the Hawaiian section, again handled a big bunch of messages. He has been appointed RM for the HAWAII Section, and we feel very fed with him. K6CSJ has a 60 watt on the air. K6BJ reports again. He has a pretty DC note. K6AVL is on the air every night from 5:30 p.m. until way late and is crying for more schedules. K6CB reports a few messages. K6DWS at W6DFC is working first time ever with a fifty-watt. K6BRA did some noteworthy work in getting the dope on a Honolulu doctor who was taken seriously ill in Australia. The work called forth several newspaper articles and one editorial on the usefulness of the A.R.L. For work, the K6EID in California is sounding better but will be back the end of January. N1JN — K6CFC had contact with WFA. The SCM requests all stations to report their activities.

Traffic: K6DTG 241, K6CSJ 171, K6BJJ 68, K6AVL 51, K6BUFF 17, K6DWS 11.

SANTA CLARA VALLEY — SCM. F. J. Quenent, W6NX — A large number of ORS reported this month and it is apparent that interest in this section is keen. W6DQH, newly appointed ORS, topped the list of traffic handlers with W6EID. W6ETD and W6DLC are the newly elected officers of the Modesto Radio Club. W6IM is handling his daily schedules with K1CE. W6YD, the Santa Cruz High school, is another new ORS. W6BMW is getting ready for 3790 ke. operation. W6BHY is looking for Ham and midwest schedules. W6BSEW is dropping from 3.5 to 7 and 14. W6JJ will soon start up with skeds. W6ALW maintains a 14,000 ke. sked with W2AAL. W6BAX is entering for the Wouff Gong Trophy. W6AME is QRL power looks. W6CTE is QRL on account of school. W6HNF changed from 50 to 75/104 watts.


Down in the Southland — SCM. W6VQG — W6ACJ leads the section this month with fine total and makes the BPL. He is at west coast station of a chain between the east and west coast. W6EPZ turned in a nice total. Our old friend, W6ANC, is back with us and says he is the most low down radio club member in the world (EI Centro, Calif., 52 ft. below sea level). W6EPF is now established and hope to get in touch with him and get skeds lined up for the winter. W6BM has rebuilt his receiver and says it works fine. W6VT has applied for ORS. W6CTR is coming on soon with a new 3 so it should be great fun. W6NK reports a good QSO with Alaska. W6EOM says he is coming on with his new symphony. As football season is over. W6BAS a xtal station is all ready for winter traffic. W6BGL will be on soon with a 75 watt in a new shack. W6BEE reports DX coming in good. W6CTP worked CE with a 112A and B batts. W6AKZ is on with a 112A, W6DNW has a new shack. W6AJM is still working some fine DX on 14,000 ke. and will be on 7000 ke. soon to handle some traffic. W6EOP wishes to thank the gang that elected him SCM and will do his best to keep this section up and coming. W6QY reports new skeds for others soon. All but three reported this month, sorry.


Here in the East — SCM. W6BHY — W6ZQ reports that he is back again in all respects. Our old friend. W6AJD is back again in full swing and leads the section, making the BPL. Fine work. SCM. W6ERR comes a good second and also makes the BPL. W6BMP reports with his usual good total and takes a place in the BPL. W6ERD reports DX coming in good. W6JW is running a Philippine sked in addition to his regular W1MK sked. W6DER hands in a good bunch due to Army-Amateur work. W6BDG, the RM, has a surprisingly good total considering he has been building a MOPA. W6DJS finds DX not learning for him. W6EPL reports taking traffic direct from China. W6DYB is QRL with school work and resigns as ORS. W6EPS has applied for ORS and sure will get it. W6EEG is now the proud papa of an eight and a half pound baby daughter. Congrats, Walt! W6WBB has the report that last week he couldn't use anything except. W6PW is rebuiling his xtal for 14 de and lower. W6AVQ is sure stepping out with his layout. W6BGI is about to blossom forth with xtal after a long absence. FB W6FK reports a QSO with VK with the Aussie using fone. W6FMH is getting ready to work on the air with higher power. W6DEK has closed his station. The A.R.A. of S. F. have started their regular meetings and are going great.


PHILIPPINES — SCM. S. M. Mathews, KAIY — This report by radio via W6AKW, W20O and W1MK. This is our first report under the new SCM — let's make it bigger and better next month. K1FRB has established U. S. contact. K1FAIAP maintained nightly nightly schedules with PMZ and W6AKW. Contact is reported with C622B, South America, thereby enabling K1AIF to a WAC certificate. K1AUU reports a good traffic total and maintains a schedule with W6BXY on 7300 ke. K1AMC has been putting a good show on and has not been as active as when Gisel operated. K1AXR is keeping the usual schedules. K1AJR is experimenting with low power phone on 3500 ke. K1AIO has a pretty signal with his crystal controlled transmitter. K1APW has had a recent trouble with ACST. K1AJT has top net work. K1AUX Net is now completed in this section and work will soon be started under Captain Riven. K1AJF has attained fame for his work with W6BRS and we feel that he has brought credit to the section. The usual report on Chinese activities continues to be the highest in the World. W6AMT and K1AMC are all working together trying to influence the Chinese Government to become interested in amateur radio. ACS-TF will soon be on the air at the Shantung. AC8AQ is building ACS-TJ a transmitter. AC8AM reports two newly hatched bands, AC8AS at Chefoo and AC8CO at Tangerow. AC8CZ has made excellent progress. AC2AY and AC2ZF are the

QST FOR DECEMBER, 1929
active Teuton hams. AC2CK has gone to Canada. AC2A is taking a rest. ACSR is Communications Manager of the L.R.A.C.

Traffic: KAIHR 616, KA1AF 294, ACSR 152, KAIAU 616.

ARIZONA — SCM, H. R. Shorman, W6BSB — For failure to report, all Official Relay Stations in Arizona, with the exception of W6JF, W6DTU, W6EAA and W6BBS are canceled. This makes it necessary for a complete reorganization of the SCM. SCM contains all members eligible for ORS appointments to file applications immediately. W6JSF has been appointed Route Manager for northern Arizona. W6DTU reported direct to HQs. He makes the BPL both ways, W6EAA is QRU with school and BC service shop work. W6WV is still on the air very little due to a lot of school work. Ex-W6CSO is back on the air after a few years' absence with call W6DRE. W6DIE is still pouting away. W6DCU is collecting apparatus for his new "he man" station. W5ANO is moving to Las Vegas. Nevada to operate for Western Air Express. We hate to lose Dan, for he was the best SCM Arizona ever had. Dale Hammerly, ex-EH, and W6BBS are working on a new quarter kilowatt station which they plan to keep on the air all the time. W6CWI, a new man, is doing excellent work on 7000 and 14,000 kc., using 210. W6EHE is still doing well, operating W6GTL in Kingman, Ariz. The SCM has a visit from W69K who has moved to Phoenix. Welcome. OM, W6DSR is back from Mormon Lake. W6AUI is still on the Phoenix police force, for which the gang are very thankful. Hi, W6AOW in a city in Virginia, is back on the 281 power supply. W6DCQ had some trouble with his receiver so is building a new screen-grid job. W6BWS received a card from W60J who is over in "darkest Africa" with a motion picture company making the picture "Trader Horn." He is F6CR over there.


ROANOKE DIVISION

NORTH CAROLINA — SCM, Hal S. Justice, W4TS — During the Radio Show held in Asheville, Oct. 9th to 12th, the Asheville Radio Club had a booth with a complete amateur station. Thousands of visitors had their "first close-up" of an amateur station and hundreds of messages were filed for transmission. W4TS leads the Section this month, making the BPL on traffic filed at the Radio Show. Ruck had concluded a long period of "resting up" and is now busy servicing BLC sets. "Doc," W4VZ, also handled a lot of the Radio Show traffic, W4ABV has made application for ORS appointment. W4AW is still rebuilding for power. Captain W4EI, formerly of Georgetown, S. C., will soon be coming on at Fort Bragg with his old xtal rig we knew so well. Welcome, OM, W40C says ND. W4WI is attending the Asheville Junior College. W4TS is using a 20-watt push pull transmitter. W4CAW leads the gang in terms of power and W6BWS leads Duke University. The club has seven members at present and has been assigned the call W4HP.


VIRGINIA — SCM, J. F. Wohlford, W3KA — W3KI says he's quitting the sea about Dec. 1st and will get back on the air. W3AER, ex-BFC, is still doing good work with JV4A and rectobuls. W3SHM has worked about 30 countries now. W3GI has gone astray again. W3EL is having trouble because seiner W3TN is at sea somewhere on the west coast. W3WJ is on occasionlly. W3KU attended the Radio Show in Boston and met W1AAT, W1CDO, W1IALG and W1ARR. W3ARU reports meeting W3MO and W3MT and having a bit of luck. W3JTY has done quite a bit of work and had a Cecil G time at WRN. W3ARU has skeds with W4A1W, W2CN, W3UN, W3BWT and W3IDC. W3AP is building a new 8' by 10' radio shack. W3IE opens with a bang at University of Virginia and has W3APU, W3QX, W4ABE and an 8th district ham with them using call W3AHV, W8ACE, located in college, should be on the air soon. W3NMT graduated last June and immediately made the fatal leap — QST for December, 1929.
SOUTHEASTERN DIVISION

ALABAMA — SCM, S. J. Bayne. W4AAQ — W4AX has found himself in the midst of business QRM with W4ZK. is very busy with a splendid new coupon with his new product. W4ALI is reported QSA5 regularly on the west coast. W4AHF is finding more time to pound brass. W4VC is again active with his good 1929 signal. W4OJ is operating on the S.S. Wildwood, a coast-wise vessel. W4RM is building an MOPA fence outlet with buffer amplification as per QST. W4ALG has the strongest signal in his vicinity. W4AKM and W4AAK have pooled their interests. W4JBJ, W4AKP and W4FX send in their first reports and we hope to hear from them regularly. Tuscaloosa botches the following stations: W4AAM, W4AJP, W4AKP, W4AJK, W4WX, W4ALI, W4AAJ, all of whom are doing nice work. W4TI is getting out nicely on 3500 kc. and is the section's newest O84. W4UT has a splendid tone on 3500 kc. as have W4A, W4E, W4ZI and W4VT. W4UQ's report was lost enroute. W4ALP has the prettiest moxifier in Montgomery. W4AJR says his emitter is perking better than ever. W4AHF is building a screen-grid receiver. W4AHO was heard on 3500 kc. recently. W4AKB is hard at work with school duties. W4KB is getting fine reports with tone. W4AAQ is also using fence within, modulation tying in cooperation with CW. Reports from the North Alabama fence hams are conspicuous by their absence this month. W4OA is back on the band on 3500 kc. tone band. The Montgomery Radio Club has been organized with W4AAQ, Pres., W4AKP, First Vice, W4APW, Second Vice, W4JAR, Sec’y-Treas.


FLORIDA — SCM, Harvey Chalin. W4AIL-W4PAW — W4AIG is back in the saddle this month. He sure handled some traffic during that hurricane. During a flood in the Everglades, W4WT and W4NB were kept in their houses due to high waters. W4AGP is the call now being used by W4MA at the U. of Florida. W4NIS'S "XYL" is at Pensacola, Fls. W4GN, W4SD, W4GD and W4AGP did USNR work during the hurricane. W4AGN is using rectobolts on 3500 kc. and has a FB note, WHY reports that his traffic was from Ft. Myers, Fls., during the storm. W4IG is still on the sick list, W4IAA, a new comer, reports, W4AGR is a new O84. He has four skeds at present. Sure glad to have old W4GK back with us, W4SBY has the parts for a 50-watt transmitter. W4TQ reports seven messages this month. W4UYV is on with his 50 and is doing some good "dx" on 14 mc.

Not to last the O84 do not report more often, their appointments will be canceled. W4ACK is wandering around in New York and writes that he wishes he had his transmitter and receiver with him. W4UQ, please get in touch with the SCM at once. Without reports your SCM cannot tell the world what's going on within our section. New stations are asked to report.


GERMANY — SCM, Walter Carola — CUBA - ISLE OF PINES — SCM, J. G. Cobble, WARM — This will be the last report of the SCM, as he has resigned at the Atlanta Radio Club. J. W. Alexander, W4HZ, has been nominated as my successor. My thanks and 73 to all the gang. CM2IM was printed last report as CMZIM through error. W4JH has moved to Fort Bragg. N. C. W4CL handled traffic in flood work assisted by W4AJK in Fls. They also handled Fls. storm traffic. We regret to announce the death of W4ST's father. W4VP is QRL with BCL work.

Operating plans for the Convention in Atlanta. Dec. 27th and Dec. 28th, are coming along under the guidance of W4UK, W4U, W4AA and W4ZN. W4PM has been nominated for director to oppose W4E2. W4GO is old W4AE and is very active again since his marriage. HI, W4KL and W4APW and W4PMY have an opening and W4PX is on some. W4KX is active and in competition with W4ZI for DX honors. Well, fellows, if you want your name in these reports, write your SCM, as he is no mind reader.


PORTO RICO-VIRGIN ISLANDS — SCM, E. W. W4KAQ, K4KD — This report received by radio at W1OSZ. K4KAQ has taken over the duties of Q8S on 7 mc. at 6:40 p.m. EST on Tuesdays and Fridays. Let him know we appreciate his good work. K4KD maintains daily schedule with K4AAQ and schedule with W2FEN 3 nights weekly on 7 mc. K1UR was entertained by K4KD. K4AIK has been appointed O8S and is arranging sched with K4KD to handle Ponce traffic. K4UR has new transmitter and Zepp antenna. Two new stations, one at the Naval Radio Station, St. Thomas, the other at Naval Radio Station, St. Croix, will be on the air shortly. Welcome, OMS. Interest is slowly picking up and the outlook is hopeful, at least. Traffic: K14AN 19, K4KD 12, K1AIK 11.

WEST GULF DIVISION

OKLAHOMA — SCM, W. J. Gentry, W5GF — W5PS and W5AE are back from a summer trip. Most of the Tulsa gang went and made the It. class ham ticket. Hi. W5H1H is a DX bound. W5ASQ and W5AEE took the exam for a commercial ticket. W3ZAV is waiting for rectobulbs. W5CB is high traffic man. W5A4V and W5AUV are getting fair traffic reports now. W5QG has been promoted to subj. of service. Let's see W5RHZ get going. W5QL has a super fine screen grid receiver. W5JR is off for a while. The O.U. gang at Norman is going to have W5VM on the air soon. W5ADK will be going soon. The Imperial Brass Founders, an organization of Oklahoma and Kansas amateurs, held their annual meeting at Oklahoma City on Oct. 29th. About 60 members were present and an excellent program was carried out. The next meeting will be at Wichita, Kans.

Now all together, gang, with more "news" and "reports."


NORTHERN TEXAS — SCM, J. H. Robinson, W5BG — W5SW leads in traffic and is keeping six schedules. W5RI is also bringing his cap in the Brass Founders' Valley. FB, OMs, W5QAM has arranged a trip to see the SCM of Texas hams. W5AE is keeping schedules with W5BBF, W5QO, W5MI and W5KGH. W5BAM is the newly elected president of the Dallas Radio Club. W5EY has moved to 2209 Cole Ave., Waco, Texas. He is the Route Manager for this section. W5KAM has moved to Waco, Texas. Gosh, the callbook will be all wet as regards the QTA of Texas hams. W5BBF is building a new transmitter and antenna system. W5BAD is keeping schedules with W5SE who has moved to Houston. W5OZ has his new Aero set about ready to do some good work. W5WZ has received his provisional for a good BCL receiver. W5DF has a new receiver and transmitter perking. W5MAY has had MG and heart trouble but all OK again. Sorry to see so many of the applicants for amateur operator's license missed the code test recently held. The SCM believes it is time we put in a lot of work and listen to all we are supposed to. We hope for better conditions next time.


NEW MEXICO — W5TT is at State College. W5EY (ex-W5CDE of La Junta, Colo.) is back on the air again. W5AOD is having QRM from school and work. W5AOU is a new ham at Clovis. W5BGN is getting out FB with a 210. W5BHY is with us on 'phone. W5GAX (ex-W5AEM from Trinidad, Colo.) is located in Clovis. W5AUL intends to be a W5 sometime in the next year. W5CIN is dependable on 4000 kc. and W5JET is using 8-cells of B batteries. He is on a newly-organized coast-chain.

Traffic: W5TV 192.

SOUTHERN TEXAS — SCM, Robert E. Franklin, W50X — It makes the SCM glad to note that some of the old W5E's are coming in as they have this month. We have two colleges on the reporting list and the promise of another. FB, W5AHB is a new O84 and makes the BPL, W5A6D, new O84, turns in a nice report. W5AQQ is the station of the Texas A. & M. College. There has been formed a club with W5IE as their secretary. W5BIO is now operating from Texas A & M. Engineering Institute, Kerrville, Texas. Using his portable. W5MS has been having trouble with his new 1929-type receiver. W5A6D, former Route Manager of AIO, is going to Texas Institute now route for templates getting the rice ham set perking. W5WN is now resident and in 802. W5AE4 has an H82 going on 14 and 7 mc.

Traffic: W5AHB 225, W5AJD 12, W5AQQ 56, W5B6J 46, W5MS 12, W5AE4 5, W5NN 3.
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- Type H-171, Push-pull Output for 171 or 250 power tubes for Dynamic Speaker... list price, 12.00
- Type G-210, same as type H except for 210 and 112 tubes... 12.00
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