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february
1933
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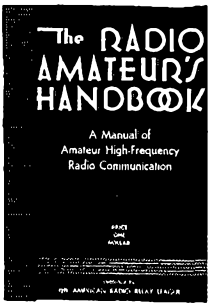

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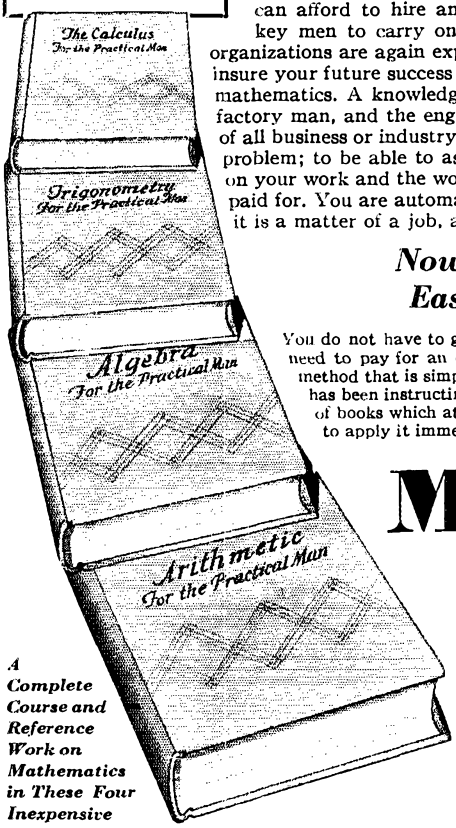

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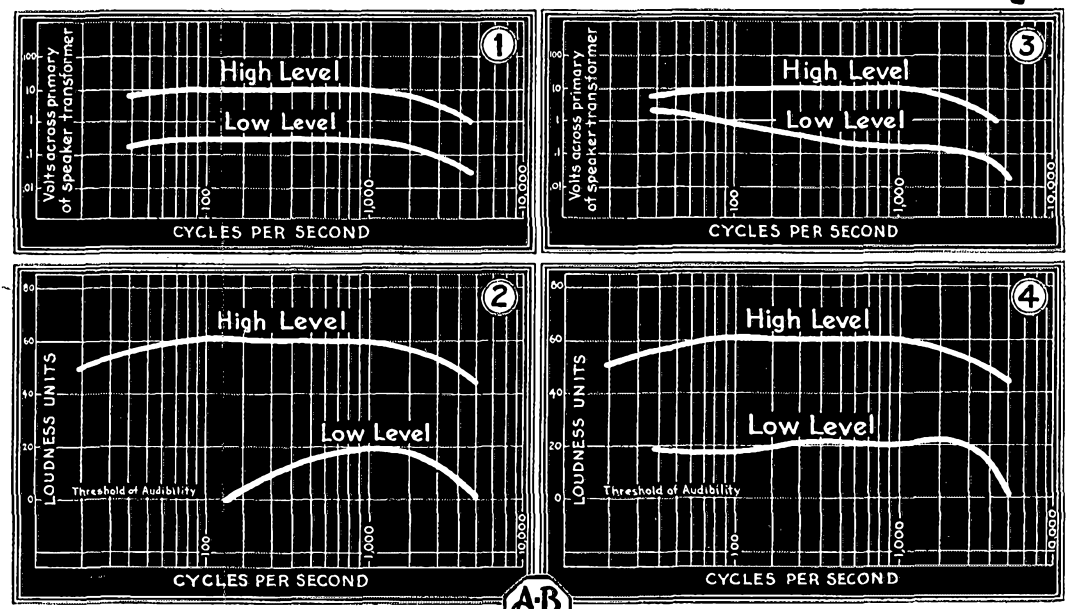

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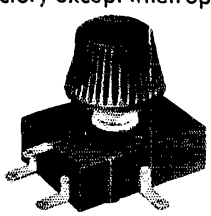

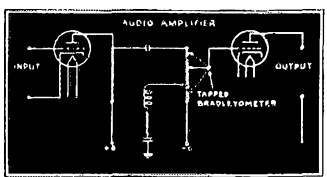

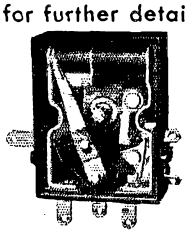

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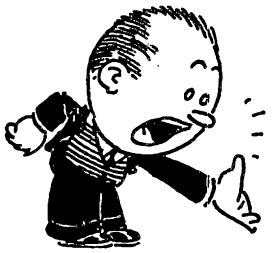

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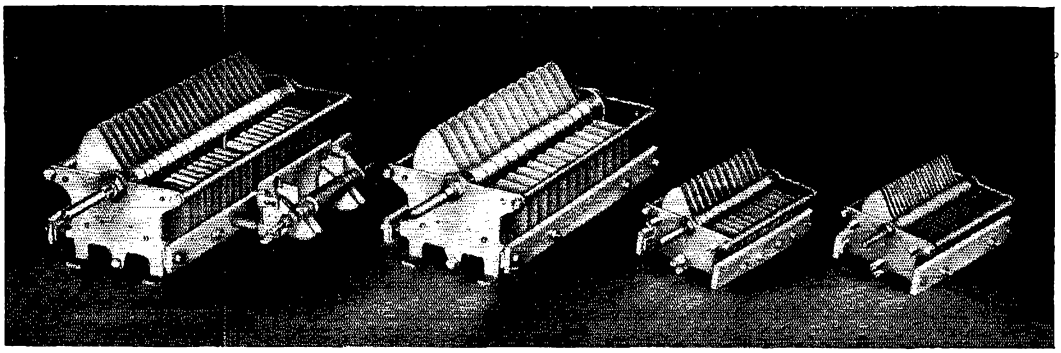

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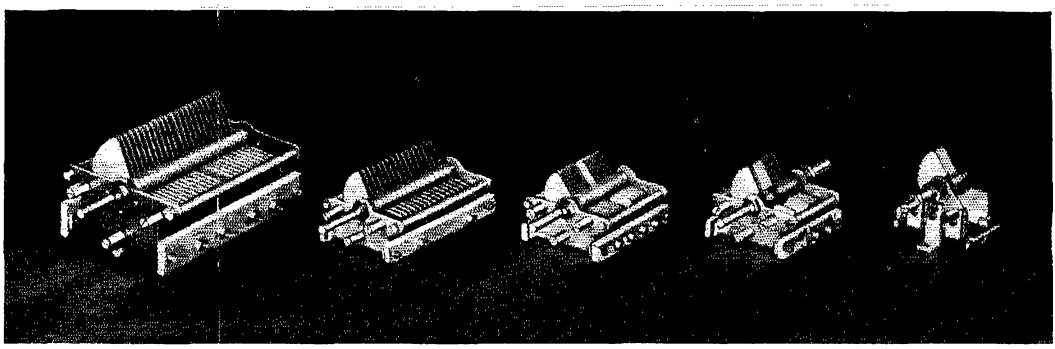

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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.

A directory of the amateur societies affiliated with the League showing their times and places of meetings, is available upon request.

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THE EDITOR'S MILL

EVER hear of "nippers"? It's a British expression — some of us Americans may need enlightenment. A nipper, be it known, is a cub — a beginner — a neophyte. Yet, to us, the word has always conveyed an atmosphere of verve and enthusiasm and youthful zest that isn't present in any of the other almost-synonymous terms. We've liked the word, for that reason, when we think of beginning amateurs. Brand-new amateurs. Young and hopeful ones. Nippers . . . egad!

Well, what we really want to get at is the idea of being courteous to beginners. Every once in a while, you know, some nipper writes us a letter filled with gratitude and a love of the world in general. In practically every case the reason behind the letter — and the feeling — is that said nipper has just started in the amateur game, had worked some well-known station, and that the OM of the w.k. station had been considerate and kind to the nipper. Invariably, such an experience causes the heart of the nipper to overflow with love of his fellow-amateur, and from that time on all amateurs are the salt of the earth.

Such a letter drifted in here a few days ago, and it reminded us that when we stop to think of it our own beginnings were similar. We lived in Washington, then, and our first halting steps as an amateur were with a half-inch spark coil. It is, perhaps, needless to say that this was many years ago — more than we begin to like to contemplate. But we got on the air, finally — somewhat nervous, decidedly self-conscious, more than a little doubting our ability to become an amateur at all. An initial rebuff would have sent us back to silence for another six months or year; a slight boost would raise us to the heights. After all, when one breaks into the game, gets on the air for the first time, all other amateurs seem part of a glorious brotherhood, with ourselves the sole outsider, hesitantly going about the business of seeing if we, too, can enter the charmed circle. Every amateur, already on the air, is to our minds an accredited representative of the whole group, and speaking for it. An unpleasant experience with the first station we work, and it is not unlikely we will go away from there disillusioned, hating all amateurs.

We went on the air one afternoon. We didn't dare call another station. So we decided on a CQ, having a sneaking idea in the back of our head that this was a safe and cautious way to go at it. We could always pretend to have missed a reply, if the fellow behind it seemed too fast for us. We CQ'd . . . and then, to our utter dismay, an almost immediate answer boomed out from the crashing rotary of 3—, an amateur who sat in the seats of the mighty, one of the foremost stations in the country. Pretend not to have heard him? Impossible — he lived on the other side of the same town! There was only one thing to do and with shaking and clammy hand and the sweat of despair on our brow we did it; we acknowledged the reply and, deciding to have it over with as quickly as possible, stuttered on to say we were having our first QSO as an amateur. Then we sat back, waiting for the axe to fall, waiting miserably for the terse sign-off that would indicate we were too small fry to bother with.

Ah, what a beautiful world it is, after all. And what a pleasant day that particular day was. We still remember it. For 3— came back, slowly and patiently, and asked us where we lived, welcomed us on the air and for half an hour kept pace with our plodding

efforts, telling us about a club where most of the real amateurs went, inviting us over to his shack (we never had the nerve to take him up on it, but the mere invitation was enough), encouraging us in innumerable small ways and finally signing off with warm good wishes. It was too much for us. Amateur station "AB" (*circa* 1913) then and there went off the ether for the rest of the day, and we had to rush upstairs to tell the folks all about it and what a fine thing amateur radio was, and what great fellows amateurs were . . . all amateurs! It is one of the twists of fate that we never again worked 3— or even met him personally, but if he were to walk in the office while we are writing this we know we'd still feel that personal friendship toward him which was engraved so deeply twenty years ago.

An exaggerated account, or a unique experience? We think not. The letters we get nowadays prove such things still go on. And it is within the power of every one of us now on the air to hand out similar encouragement to such new hams as we may work tonight, or tomorrow, or next week. It takes but a few moments to buck up the newcomer, to show him a helping hand, and welcome him into the fraternity. It costs us but little, and the returns in goodwill are 'way out of proportion to the effort expended.

Now that January has come and gone, and we've broken all the usual resolutions we made — and expected to break — it might not be a bad idea to make a couple that will stick. And for us amateurs, it seems to us that one of the first might well be a determination to be tolerant with the stumblings of the beginner, to give a welcoming hand to the nippers of amateur radio.

A. L. B.

More 28-mc. Tests!

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Saturday, February 25th (9 a.m.) to Sunday, February 26th (3 p.m.).

Saturday, March 4th (9 a.m.) to Sunday, March 5th (3 p.m.).

We are advised by radio (VK2FQ via VK3RJ and W2CIN) that the Association of Radio Amateurs N.S.W. will conduct a 28-mc. *contest* on these dates — assuring us of the excellent possibilities of two-way 28-mc. communication occurring on these dates, providing propagation conditions permit.

W2JN is now listening on 28 mc. *each* Saturday and Sunday, 9 to 11 a.m., E.S.T. W6FPU, W2ACN and W2ALW are similarly covering the band at this same time. VE2CX has 20 watts output on 28,360 kc. In the last tests W6CAL heard W9DZX at 10.50 a.m., P.S.T., December 19th — the best 28-mc. DX reported in December '32! W9GFZ got a letter from PAØAPX, who worked HAF4D on 28 mc. last summer. G5FV transmits on 28 mc., 1400–1800 Greenwich, Saturday and Sunday through February. W8TI will be on in these same periods, transmitting on 28 mc. and listening for replies on 14 mc. W9FUR had a '52 going throughout the December tests . . . he also moves to keep pegging away at it throughout the spring. W9FLH (20 miles) was heard R6 — two '10s. W1ZJ arranged some 28-mc. schedules with W9DZX. W2AGX, W2BPY, W9CGY, W7TS, W7VG and W4ZH were among the listeners throughout the December tests. W6CD-SO is planning to get in the swim on the next 28-mc. tests.

G5MP writes that he worked three different European countries on 28 mc. during last July and August, and has been very active on this band during December 1932 (65 watts input P.P. T.P.T.G. using 4/2 wave semi-vertical antenna). He believes propagation conditions will become more favorable in the Northern hemisphere as our spring and summer approach again.

Station Licenses Extended

For some time past the League has recommended to the Federal Radio Commission that amateur station licenses be issued for two-year terms instead of one. In the interests of administrative economy the Commission has now seen our two and raised us one. Effective January 6th every existing amateur station license was automatically extended two additional years from its stated expiration date, and all new station licenses issued after that date are to be for a term of three years. Both operator and station licenses are now issued for three-year terms.

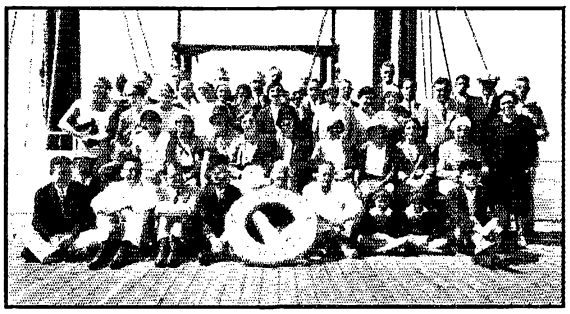
The Madrid Conference

Amateur Representatives Successful as Fourteen-Weeks' Meeting Continues All Amateur Bands

By K. B. Warner, Secretary, I.A.R.U. and A.R.R.L.

MADRID" is over. Amateur frequency bands have been preserved unchanged. General regs remain substantially the same. The communications world recognizes the amateur as an accepted part of the radio picture. The job is done, and A.R.R.L. did it!

This thing which hung over us like a dark cloud for so long a time has been met and dissipated: we are on the books for another five years and with a securer status than ever before. This conference, the plans for which absorbed our time and attention for months — even years — back, has come and gone, and the result is a clean-cut amateur victory. A.R.R.L. methods of planning and doing things have been put to the supreme test and have come home with the kilocycles. Although I as perhaps shouldn't am saying it, there was never a task successfully done that so well illustrated the soundness of A.R.R.L. preachments about how to do things in amateur radio: by hard work, knowing what you are doing, steadfastly maintaining high standards. Nor have we ever been quite so thoroughly convinced that if the ideas of some of our well-meaning but inexperienced membership had been followed, amateur radio would have come clattering down about our ears in one profound mess.



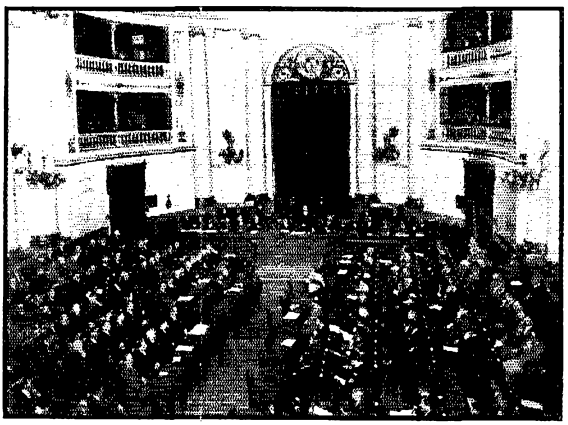
MADRID BOUND!

Fifty-three members of the American party on the S. S. "President Roosevelt" sailing from New York.

This was a world-wide communications conference. There were seventy-seven different governments represented and nearly a hundred international associations and operating companies, with a total attendance of about six hundred persons. The meetings ran from September 3d to December 10th, fourteen weeks with Columbus Day as the only holiday. It was big and it lasted an awfully long time. Excessive oratory caused it to last much longer than it should, but in any event it would have been one of the biggest and most important world conferences. The amount of work done was prodigious; the amount of talking done was unbelievable; the printed documents are to be measured only in terms of boxcarloads. The meetings were held in a building known as the Ancient Palace of the Senate. The "ancient" part of it is quite accurate but the word "palace" is very misleading; however, it sufficed. The plenary assemblies were held in the main chamber in this edifice, a room the arrangement and trappings of which caused it to look curiously like Gil's sketch in our Madrid article of a year ago, a sketch which was intended, by the way, to show what a conference was *not* like. Hi!

This was the scene to which the A.R.R.L. Board of Directors sent Paul M. Segal, our general counsel, and me. We sailed in middle August on the same steamer that bore the United States delegation and some of the American commercial people, to a total, counting wives and children, of fifty-three souls, as they become known when on shipboard. The radio delegates were headed by Judge Eugene Sykes, acting chairman of the F.R.C., and consisted in addition of Dr. C. B. Jolliffe, chief engineer of the commission, Dr. Irvin Stewart of the Department of State, and Mr. Walter Lichtenstein, of Chicago, representing the users of coded language. These four, with Major Wm. F. Freidman of the Department of War, were also delegates to the telegraph conference. Then there were seven technical advisers from various government departments, three delegation secretaries and a treasurer, half a dozen interpreters and translators, and a dozen stenographers and clerks. Besides the delegation there were about twenty-five representatives of private American interests in attendance at the conference, with the grand total of Americans present in Madrid reaching perhaps a hundred — enough to found a colony!

On the Madrid train out of Paris Segal and I were the only radio Americans but the German and Dutch delegations were aboard and soon we were greeting old friends from previous conferences. We had a letter from the Spanish embassy at Washington, identifying us as radio bigshots, and when we reached the border this letter secured for us the courtesy of the Spanish customs. Soon we had transferred to the Spanish train and were ready for the last lap to Madrid. Then we found out how important we really were: We heard the customs agent advising the train conductor that he had a precious cargo that night, in fact the official delegations of Germany, the Netherlands, and the United States of America! . . . Shepherding twenty pieces of luggage all over the European landscape, Segal and I duly arrived in Madrid, where we were met by a group of Spanish hams from *Red Española*, the active Spanish society. The American delegation opened offices in the Palace Hotel and set up what looked like a miniature Federal Radio Commission occupying sixteen rooms, which were soon the scene of fiendish activity, with delegates and technical advisers poring over documents, translators chanting bad French into worse English, electric mimeograph machines clanking away day and night, typewriters clack-clacking, and messenger boys scurrying along the corridor. There was also a big conference room, with red-plush-covered tables and gilt chairs, where several times a week the whole American crew would meet for battle conference. Paul and I opened Ham Headquarters in the same hotel, unlimbered our portable typewriters, stuck up our charts, arranged our files, hung out a sign, and were all set for action. For the next eight weeks that office was a busy place and many an amateur pow-wow was held there. In addition to representing A.R.R.L. I had the honor of representing I.A.R.U. along with Mr. Arthur E. Watts, vice-president of the Radio Society of Great Britain, and Mr. Miguel Moya, president of *Asociación E.A.R.* The latter is now inactive in amateur circles and took no part in the conference but Mr. Watts came over in middle September to represent his society, and most actively and helpfully associated himself with our work for a fortnight. This was the period of the initial formulation of attitudes, and Mr. Watts did a splendid piece of work not only as a general collaborator in the amateur campaign but particularly in establishing contact with the delegations from all the British family of nations, insuring a sympathetic amateur attitude on their part. Then we had as daily collaborators the officials of *Red Española*, which had representatives in constant attendance who worked closely with us for our common cause. I must make particular mention of Mr. Angel Uriarte, EAR12, their secretary — gentleman, scholar, good ham, and one of the hardest workers I have ever seen. We had prepared an abstract of the proposals affecting amateurs. This Uriarte translated into Spanish and mimeographed. Then we secured an interpreter and had some conferences with the R. E. gang, who, after studying the questions, split up and went out and nailed all the visiting firemen from the many Spanish-speaking countries. In this process Mr. Uriarte discovered that the delegate from Honduras was an old friend of his but one who, alas, knew nothing about radio. His enterprise is illustrated by the fact that he came out of that encounter with credentials from Honduras, which he promptly deposited at the conference, and thereafter to us he was the Honorable Delegate from Honduras. And that helped.



THE PLENARY ASSEMBLY OF THE CONFERENCE
In the main hall of the Ancient Palace of the Senate at Madrid.

The conference spent the first week getting organized, adopting internal rules, appointing committees and bureaus, and assigning subjects to its five main committees — and in the organization meetings of the committees to divide themselves into subcommittees and parcel out the work. The second week things started moving, with some real talk in subcommittees, countless people shooting off unbelievable hours of speeches and armwaving, thus disclosing the actual problems and resulting in the creation of subsubcommittees to study them. From there on for about half the duration of the conference it was a process of study, hit a snag, appoint another subsubcommittee, study, hit another snag, appoint a subsubsubcommittee, until finally much of the work was in the hands of a large number of these *petites comités*, the schedule of whose daily meetings filled the blackboard. There the real work got done. Then came the day when some of these little groups were finishing their jobs, reporting to

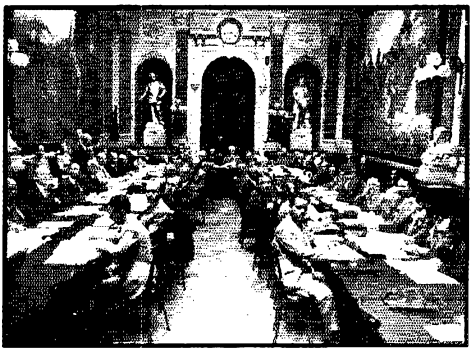
the parent committees and being discharged; then the parents would finish and report to the grandparents; and so the process of recombination took the place of subdivision, until finally the main committees were making their combined reports to the whole conference. The wording thus arrived at for the new treaty had then to be read twice before the entire conference in plenary assembly, for which purpose it was set in type and printed first on blue sheets, and then, with the modifications made, on rose sheets. When the rose sheets were finally adopted, the delegates signed the parchment copy and the conference was over.

Simple as it sounds, the general task of this conference was an extremely difficult one. It was not the simple matter of getting up some radio regulations. This was a joint meeting of the radio conference and of the telegraph conference with its telephone offshoot. Instead simply of regulations, which administrative and technical people could negotiate, the purpose there was to draft the basic treaty or convention as well, a job for diplomats and full plenipotentiaries; and not merely radio and telegraph conventions but a single combined one that would be acceptable to both groups and permit their merging henceforth.

The conference moved with a really appalling slowness because of the complexity of the "diplomatic" problems that confronted it, such questions as whether agreements could be found that would make possible combining the radio and telegraph conventions, the number of votes to be given each country and its colonies or whether colonies should be permitted to vote at all, the choice of an official language, and a raft of peculiar problems arising from the fact that the U.S.S.R., participating at Madrid, had not been a party to the Washington convention and in the intervening years had established its own radio system according to its own ideas of frequency allocation. Of course the part of one of these conferences that really interests us amateurs is the radio regulations, but they were only one part of the Madrid conference. Although I don't know much about the telegraph end of the conference, I do know both that the telegraph people had a terrible job reconciling their differences and that there were times when the work on radio regulations was a perfect madhouse; but I am attempting to show that the job was even more complex than that because of the endeavor to formulate a fundamental convention and, more than that, the joint one that would merge all forms of communication. When one considers the great complexity of the task, it is a real achievement that there was signed at Madrid an international telecommunications convention with four sets of annexed regulations.

The task was not made easier by being undertaken in Spain, a country whose customs and living habits are very different from those of most of the world. Spain has an unusual schedule of hours for doing things, a custom based upon the requirements of the climate and the temperament of the people but one to which foreigners have difficulty in acclimatizing themselves. As nearly as I could judge, your true Spaniard goes to bed about 4 or 5 o'clock in the morning, arrives at business about 11 a.m., lunches about 2:30 and follows it with a siesta of an hour or two, reopens his place of business from 5 to 7 p.m., joins his friends about 8 o'clock for a couple of hours of conversation, aperitifs or strolling, and dines from 10 o'clock to midnight. By bolting your dinner you can make an early movie or vaudeville at 10:30, but the social evening commences at midnight; theatres, dancing, visiting. True, some of the movies open at 7 p.m., but these are matinée performances for small children, who in Spain are obliged to go to bed early — say by midnight, well in advance of the rest of the family. Perhaps you don't believe that in a country with such a schedule of hours, and with waiters brought up to believe that every meal should consume at least two hours, it wasn't slightly difficult to get things done! The routine hours of the conference were 9:30 to 1:30 and 5 p.m. to 7. By the time business got really brisk and extra meetings were sandwiched in the afternoons, and with delegation meetings from 7:30 to 9:30 p.m., it meant a pretty respectable working day.

As everybody knows, the main problem of such a conference from a radio standpoint is the allocation of frequencies to services, and at Madrid the big question was broadcasting, and particularly low-frequency broadcasting in the region between 150 and 500 kc., and particularly as a European problem. Unlike America, Europe goes in for long-wave broadcasting and, in the years since the Washington conference, many European broadcasting stations have been established on low frequencies outside the bands primarily assigned to that purpose at Washington, on the



A TYPICAL SUBCOMMITTEE MEETING

Dr. Giess of Germany presiding at a subcommittee of the regulations committee. Four amateur representatives may be seen, upper left.

assumption that interference was not being caused to the services having primary assignments in those bands. We think we have plenty of difficulty in this country over the quota of frequencies for broadcasting in our different "zones," but in Europe it is a real problem of deepest hue. It is not so much a technical problem as it is a political one, involving the sovereign rights of adjacent countries to possess equal facilities or facilities sufficient for their economic and geographic conditions, and so on. One could scarcely find a better subject to illustrate the political jealousies, national ambitions and hates for which Europe is noted. The question speedily became one of broadcasting versus the maritime uses to which most of the desired frequencies have hitherto been assigned. Millions of words of flaming oratory were vented on this question, which for many weeks occupied not only the center of the stage but most of the opera house. It absorbed the entire time and attention of a big percentage of the delegates. Although it wasted much time for the other radio interests, this obsession for *radiodiffusion* perhaps had its desirable angle for us, for it diverted some of the attention from the high frequencies.

Our amateur bands, though, came in for plenty of attention. If Paul and I had to report to you fellows how it happened that we lost certain frequencies it might be a long story. But since we are able to report the preservation of every one of our bands, I propose to be reasonably brief about it. It is chiefly the final results in which you are interested, anyway. Well, the allocation subcommittee decided to set up two subsubcommittees to work on the frequencies above 1500 kc. When they decided to make 30 mc. the upper limit of allocation, the United States secured an agreement to the one exception of specifying 56 to 60 mc. as a shared amateur and experimental band and to the retention of the band 28 to 30 mc. in the same terms, both as they are in the Washington regs. This was contrary to some of the proposals that had been made, notably by Japan, wherein these bands were to be changed to accord with some general plan of harmonic relationship to lower bands, and there might have been a lot more talk if the whole idea had been examined in detail. But this method of prefacing the whole allocation with agreement on these two amateur bands short-circuited discussion and resulted in their adoption.

A subsubcommittee under the chairmanship of our old friend Captain Montefinale of Italy dealt with the frequencies above 4000 kc., embracing our 40-meter and 20-meter bands. No proposal at all had been filed on our 14-mc. band, the only one that escaped attention, and when it was reached it was promptly agreed to without discussion. Not so our 7-mc. band, however. In advance of the conference the Japanese had proposed the general principle of eliminating shared bands in all services and the definite subdivision of shared bands into narrow exclusive assignments. When the amateur bands came up for discussion the Dutch delegation presented the idea that in the case of amateur stations it was exceedingly important to have all of the assignments in absolute harmonic relationship, each band the "harmonic shadow" of the band on either side, a perfect harmonic family. Wherefore, they argued, the amateur 14-mc. band might remain at 400 kc. but the 7-mc. band would be reduced to 200 kc. and the 80-meter band to 100 kc. Many of the continental European nations, we must remember, permit their amateurs only 100 or 150 kc. in the 80-meter band and little or nothing in the 160-meter band. On the other hand there had been the Canadian proposal to widen the 40-meter band to 7000-7500 kc. *Had been*, I say, for Canada prematurely withdrew this proposal before it was ever attacked, before it ever reached the h.f. allocations subsubgroup — as if she were afraid it might be adopted! Although the United States could not support this proposal to widen, she did undertake to withhold opposition until it could exert its full effect to offset the proponents of narrowing, the better to insure the retention of the existing figures. It now seems to us that this Dutch proposal to narrow the band, and all the talk about the necessity for a true harmonic relationship, were hatched chiefly to offset the proposal to widen, and in the fear, before the United States made its position known, that the move would succeed if it received that same brand of United States endorsement that our delegation was giving other amateur matters! The same proposal to widen this band was advanced by our good amateur friend, the Honorable Delegate from Honduras, but by that time the Canadians had withdrawn their proposal, the United States could not agree, nobody else would, Great Britain and Germany opposed, and the Dutch and Japanese were willing to withdraw their proposal to narrow if assured of the maintenance of the *status quo*. Which, of course, is what happened — the retention of the Washington figures, 7000 to 7300 kc.

The study of the frequencies from 1500 to 4000 kc. was in the hands of another subsubcommittee headed by our own Doctor Jolliffe. When our 80-meter band came up for consideration, we got a long song and dance from some of the European nations and Japan about how this band ought to be the harmonic shadow of the higher frequency bands, say 100 or 150 kc. wide, which was also part of the Japanese idea of substituting narrow exclusive bands for the wider shared ones. I must pause here to say that Dr. Jolliffe was a splendid friend of the amateur throughout the conference and, as chief spokesman for the United States on allocation matters, had the duty on several occasions of stating in quite plain language the position of the United States with respect to her

amateurs (a position which, by the way, was seconded on almost every occasion by the Canadian delegation). He did a swell job for us from start to finish. It was he who replied to the European attack on our 3500-kc. band, pointing out that in the United States this band is used by 32,000 amateurs who at Washington received big reductions; that the United States could not ask its amateurs to take another cut; that the proposed arrangement was entirely unacceptable to the United States, which could not accept a plan that did not permit the amateur in North America to have the entire band 3500 to 4000 kc.; that the United States had proposed this band as exclusively amateur but since this was not approved, it was willing to accept the retention of the Washington shared status but could not go beyond this point. Canada, for some strange reason that we never could fathom, wanted the entire range from 2000 to 4000 kc. left subject to regional agreement, with no specification of amateurs in the regulations, which would have left us with little protection in this most important band. But Great Britain, perhaps largely to have freedom for the other services, chiefly naval, which she has in this band, demanded the *status quo;* and indeed it was soon apparent, as it had been at Washington, that the only possible solution was to maintain the wide shared band. And that was finally decided.

Harris & Ewing

DR. C. BYRON JOLLIFFE

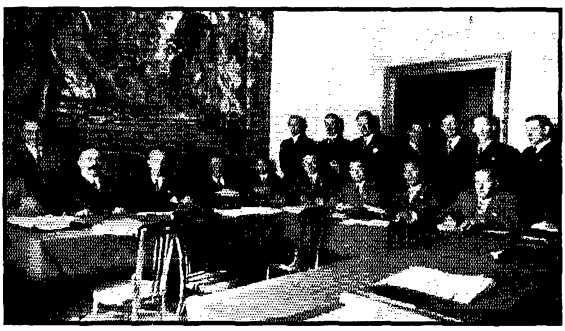
Chief engineer of the Federal Radio Commission, United States delegate to Madrid, Dr. Jolliffe was the U. S. delegation's splendidly-effective spokesman for the radio amateur.

In both our lower-frequency bands we had to resist this tendency to avoid settling the service allocation then and there and just to write it down as subject to regional agreements. This not only would have meant postponing the actual decision until a special regional conference but would have made it necessary for our government to ask the consent of every other government in this "region," including, for example, every island group in the West Indies. We held out, of course, for allocation right in the regulations.

As every informed amateur expected, the most difficult of our fights occurred on the 1715–2000 band. It took the whole month of October to give this question its initial decision in the subsubcommittee. The trouble arose from the fact that a group of North Sea and Baltic Sea nations, chiefly Belgium, Denmark, Germany and Norway, have established on these frequencies a flourishing low-power radiotelephone service for a large number of small vessels, chiefly fishing boats, and these nations came to the conference with the idea of shoving out the amateurs and securing the entire frequency range from 1500 to 2000 kc. exclusively for this service, with its own regulations concerning calling and distress waves, procedure, compulsory watch, operator's requirements, etc. They were sat upon sufficiently hard by the non-telephony mobile folks, the fixed people, and us amateurs to wind up with something approximating their needs but not what they first wanted. Again the United States and Canada let it be known that they did not care what Europe did on frequencies of such restricted range but that they insisted upon an arrangement that would permit the continuation of 1715 to 2000 kc. for American amateurs. The European nations had to yield to that and they then proposed to establish a double-barrelled allocation in this part of the table, maintaining the Washington shared status in America and other parts of the world but excluding amateurs from the European allocation. Under pressure they were reluctantly willing to permit even foolish European nations to have amateurs in this band but on the distinct condition that they cause no interference to either mobile or fixed services, or off with their heads. (And even ten watts on the coast of England . . . !) At this point the roar of the British lion joined the screaming of the American eagle and whatever it is a Canadian maple leaf does, and saved the day! Although there are many European countries where no amateur assignment is made in this band, it can be regarded as the chief band of the British amateur. It happens, as has been reported in *QST*, that this year the British amateurs, through their Radio Society of Great Britain, have established a liaison with the Royal Navy for a communications reserve, with training drills and so on akin to our own arrangement with our Navy Department. The creation of this arrangement resulted directly in the strongest possible support for the amateur from the Admiralty representative in the subsubcommittee, Colonel F. W. Home, who flatly declined to accept an arrangement that would not permit Great Britain to continue her amateurs in the enjoyment of this band. I consider that

Colonel Home's splendid piece of work is solely responsible for the preservation of this band in the European allocation. The eventual decision, after a month of argument, was a double-columned allocation which, although subdividing the amateur band as respects the admission of certain other services on a shared basis in Europe, nonetheless leaves the entire range of 1715 to 2000 kc. available on a shared basis to the amateurs of every nation in the world.

The small-boat telephony service, for some queer reason, had originally hit upon 1775 kc. as the most desirable international calling frequency for this service, a frequency smack in our band — but it was eventually set at 1650 kc.



THE H. F. ALLOCATION SUBSUBCOMMITTEE

Capt. Montefinale (Italy), chairman (third from left). The camera couldn't stand the strain of photographing Jolliffe and Warner side by side and so distorted them that it was necessary to trim them off the left edge of this photo, without a trace.

There is the story of the initial determination of each band. Then came the necessity for watching each band as it progressed up the ladder through subcommittee, committee, drafting, and the final plenary sessions. This required many weeks, for of course our amateur matters moved only as fast as the rest of the conference. I should say, by the way, that I didn't find any administration that was openly "out to get us." The high-frequency allocation discussions were confined to a small group of major nations: the United States, Great Britain, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, U.S.S.R. and Honduras — don't forget good ole Honduras! I don't remember any other nation even putting its head inside the door. The other British dominions took no part; possibly Great Britain spoke for them, in a way, although I doubt it. Denmark was informally representing the Scandinavian group, however, and doubtless other countries their allies. Most of this group was willing to let the h.f. allocations alone; and where we did bump into trouble it was not so much a case of an administration loving us less as of loving some pet service more. Belgium, Denmark and Germany were unfriendly on the two l.f. bands, having traditional European views on their widths. Japan and the Netherlands were at first generally hostile on amateur frequencies, yielding under pressure. France and Italy were agreeable to Washington status, France withal quite pleasantly friendly. U.S.S.R. believes in amateurs but has had its own ideas on frequencies; however, her many reservations at Madrid do not influence any ham band. Great Britain I would place at this conference as the amateur's best supporter next to the U.S.A. In general, I feel that by this time we have chiselled some real recognition for ourselves and are commonly accepted as one of the groups in radio for which adequate provision must always be made.

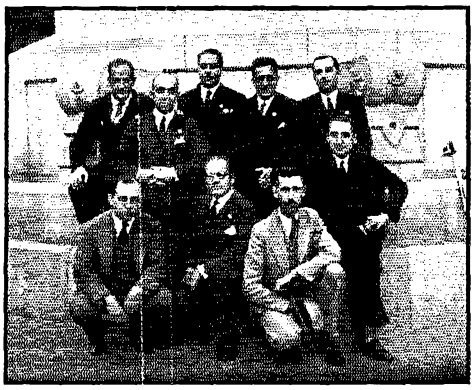
After the meeting where it was first proposed to cut our bands, Paul and I went back to our office and spent the rest of the day preparing a large colored wall chart of the amateur bands, showing their appearance before and after taking our medicine at Washington. Then with this chart as a foundation we wrote a knockout speech for the following day's meeting. It was not necessary to deliver that speech, because our delegation stepped into the breach. But then the dizzy harmonic question arose and we had to make more preparations. We found that that same chart would work admirably for it, so we wrote another speech around it. Again it was unnecessary to make the talk because the problem evaporated at the following meeting. Many times we had this identical experience. All in all, I suppose we prepared at least ten talks around that particular chart and actually never found it necessary to deliver a single one of them or to display the chart. I brought it home in its pristine condition and put it in my Madrid files as a souvenir. But it was splendid preparedness and every time it left us feeling that we were set to lick anything that came along.

We had another chart, originally started in fun but which proved very useful, to show our progress. Vertically on the left were listed the subjects in which we were interested. Across the sheet were columns entitled subsubsub, subsub, sub, committee, editing, 1st plenary, 2d plenary, signature. In the center of each column was an imaginary hurdle. The game was a steeplechase. Let us say we have a pet subject — for example, preservation of the 20-meter band. We start it with a red line in subsubsub. When it passes there we consider that it has successfully jumped its first hurdle; we extend our red line, showing the hump which indicates taking the hurdle, and we put a date alongside. We can tell our status any time, at a glance; we can see what the course of any one item has been; and when all the red lines are over all the hurdles, the conference will be over, the treaty signed. Of course a question

isn't safe just because it has passed two obstacles, any more than a horse has won the steeplechase because he jumped the first two hurdles cleanly — he may yet break his neck. P.S.: — All our horses came home!

We almost had a tolerance specification hung upon us. A specification of tolerance is a statement of the deviation permitted a station from its proposed frequency, and limitations of this nature were specified for every other kind of station. A French delegate, making the suggestion for amateurs too, reported how an unstable amateur station one night walked back and forth several times through seven commercial channels close to an amateur band. It was finally decided that it would be sufficient if each administration would enforce the general provisions that all such stations must be stable and observe their assigned frequencies. This is an opportune point to repeat what has often been said in *QST*, that the communications world is now so complex that we positively must keep inside our fences and must regard increased strictness of enforcement as only just and proper.

One article in the regulations deals with all the general provisions for amateur stations — everything except the frequencies. With United States, British and Canadian backing we defeated an attempt to incorporate in these regulations a whole mess of detailed specifications such as the limit of power, the kind of plate supply, the age of operators, the code speed and other details of the operator's examination, the accuracy of amateur frequency-meters, and so on. We didn't get anywhere, however, in our own attempt to put a reverse English on the language respecting amateur communication, wherein it is now prescribed that certain restrictions must be complied with unless special arrangements to the contrary are made by interested nations. Only the Honorable Delegate from Honduras supported the United States' proposal on this, while the roll of the nations voting opposed sounded like the index to the atlas! The reason, of course, is that communication is a state monopoly everywhere in the world except the United States and, to a partial extent, Canada. Amateur station licenses in all of these other countries have always prohibited communication on behalf of a third party under any circumstances whatever; and since this is a vital matter to these nations, both for revenue and for security, they are just as quick and forceful as lightning in their opposition to any liberalizing. Why, in fact, I am told that in England a door-bell is in violation of the telegraph act, because it provides electrical communication between two parties, one at the front door and one in the kitchen, without paying toll to the government and without submitting to government censorship! . . . Our general regulations stayed practically in the Washington language, then, until they came up for their first reading in middle November. Then we had some fireworks. Mentioning no names, somebody had given some A.R.R.L. message blanks to the chairman of the Dutch delegation (who headed the subcommittee handling our regulations) and sicked him onto an attack on amateur traffic handling. When the article came up for adoption he waved our familiar old green blank high in the air, read the dope on the reverse of the form, and said that this traffic solicitation was in violation of the Washington regulations and that it should be clearly understood that amateurs were forbidden to handle any communications whatever for other parties. It is too much to expect a European administrator to understand American ways of doing things and the system under which we have been reared in this country. With them it just ain't right for an amateur to handle a message, ever! We shot back, of course, but despite the defense that we immediately put forward, a hurriedly-worded amendment was adopted prohibiting the handling by amateurs of any communications emanating from third parties. Because of the crudeness of the language it was not apparent that this prohibition was subject to the right of interested nations to make other arrangements between themselves, such as we now have with Canada; and because it did not say in so many words that the prohibition was confined to international communicating, it was plain that there would be folks who would try to make it apply in this country. Something had to be done about it. After a couple of extremely busy weeks, with the help of the United States and Canada, further amendments were secured to make both points perfectly clear. So there is no change from a practical standpoint in our com-



THE AMATEUR GROUP AT THE CONFERENCE

But minus Mr. Watts, who had returned when this picture was taken, and Capt. Roldan, absent on maneuvers. Left to right, top row: Srs. Canete, EAR3, editor "Radio Sport"; Uriarte, EAR12, secretary of R.E. and the Honorable Delegate from Honduras; Roa, EAR80, also the Honorable Delegate from Cuba; Bellon, EAR110; Carmona, EAR234. Bottom row, Srs. Segal; Corcuera, EAR125; y Warner.

munication regulations. They do state plainly, however, where they did not make it entirely clear before, that we cannot handle messages internationally for others unless there is a special arrangement to that effect between our government and the other country, as we now have with Canada. Perhaps it hasn't been illegal since the Washington conference for us to offer to transmit unimportant messages to foreign countries, but the amateur on the other end has always been forbidden by his own license from accepting such traffic, so the practical effect of the change is zero. And, for the luvva*m*, let it be clearly understood that this Madrid treaty deals with international matters and that this provision has no application whatever within the United States and its possessions.

Now for a bunch of miscellaneous items:

Our frequency bands wouldn't be much use unless they were assigned definitely to us amateurs. Early in the conference Segal and I detected what seemed to be a move aiming at assigning our bands, by a simple editing change in the language after we had fought the battle, to some broader classification of stations of which amateurs would be only a subdivision. So, thus bright and early in the conference, we commenced a drive for separate classification and definition of amateur stations. The United States delegation took up the cudgels and plugged at that question for over a month against obstinate opposition, finally succeeding. In fact that particular little battle had to be won twice before it would stay won. Our amateur stations are now no longer a branch of private experimental stations. We sit on our own ground system, a class of our own, warranting the frequency assignments made us. The definition itself continues in the Washington language.

Amateur calls were retained in their present form. There was a British proposal to eliminate the use of the figures 0 and 1 because of possible confusion in logs with the letters O and I. Of course we opposed the loss of the figure 1 and the Dutch government spoke similarly for the figure 0 used in its amateur calls, with the result that the prohibition has been made to apply only to non-amateur stations.

Before the next world conference there is to be a meeting of the International Technical Consulting Committee on Radiocommunications, commonly called the C.C.I.R., so the Madrid conference had the duty of passing upon international associations that will be permitted to participate therein. Five such bodies were admitted and one of them is our International Amateur Radio Union, proposed by the United States and backed by Great Britain. This is an important recognition, one which greatly increases the importance and usefulness of the I.A.R.U. to the amateurs of every land. I expect that in the future I.A.R.U. will become more and more the spokesman for all of us in these world shows.

The Madrid convention takes effect the first of 1934 but we'll never know the difference, because it has no effect on us. You may be interested in seeing the actual text that relates to amateurs, and we hope to publish these excerpts next month; but for the complete text you will have to wait for a Government Printing Office or a Berne Bureau edition, because it runs to 224 type-set pages, of which 112 relate to radio. At that, it is a pretty good job of boiling down, for I have just measured the pile of mimeograph documents that I brought home from the conference and I find that these, for the radio meetings alone, make a compact pile forty-six inches high! And to think that I read every blinking word of that stuff, in both English and French!

From this rather sketchy account, wouldn't you gather that the communications world would have had enough of conferences for a while? But no: Four more are on the books. The European governments got absolutely nowhere in their attempts to solve the European broadcasting problem, so they decided to have a later European meeting for that subject and spent the last month at Madrid fighting on the language of the additional protocol which they were to sign there to cover that assembly. They finally agreed to have it out in Switzerland before next June. Then we're to have a regional conference of our own for North America, to occur in Mexico City next spring to revise the existing North American agreement of Ottawa; and, depending upon developments in the interim, we amateurs may have to be represented there. The third meeting of the C.C.I.R. is to be held in Lisbon, Portugal, late in 1934; and at that our I.A.R.U. must be represented. The next main world conference is to be in Cairo, Egypt, in 1937, and it may be preceded by a fourth meeting of the C.C.I.R. It is one of the ironies of fate that I, who invariably succeed in getting sucked into these international shows in distant parts, should be by nature a chap better content if he had never again to leave Connecticut. But that, Aloysius, is what makes up life!

The general results of the conference prove to me that amateur radio won through on this job because it planned its program with absolute soundness. The complete proof of that is in the result; it worked. Perhaps it isn't strange that, after all of these years of dealing with these matters, the A.R.R.L. Board of Directors and the A.R.R.L. officers should be able to dope out something that would work. But our policies have had their critics, nonetheless, and I daresay there will be somebody trying to tell you that the results this time were not based on any merit but were attributable to sheer good fortune. The officials of A.R.R.L., however, realized that at Madrid we would have to have the vigorous and

enthusiastic backing of the United States delegation. Much as we needed more kilocycles in certain bands, we contented ourselves with the maximum figures that our government would endorse (the present band widths) in return for the agreement that the United States would not accept at Madrid any reduction in those widths. The first result of this policy was that our delegation went over to Madrid with instructions to fight to the limit for those band widths (which it did), thus making the best possible preparation for a favorable Madrid treaty. And, where we amateur representatives would have been sunk without a trace if we had been trying to buck our own government, the most friendly administration in the world, and where in any one of a score of scraps at Madrid we would have lost the fillings out of our back teeth but for U. S. backing, with that backing we were invulnerable. Moreover, preparation for this conference necessarily went much farther than the best possible planning for a favorable treaty. Without putting all the lurid details on paper it still deserves to be said that our plans were such that we could feel confident of the continued happy existence of amateur radio on this side of the water, even if the rest of the world ganged on us and wrote an unfavorable treaty at Madrid. The point of all this is simply that the A.R.R.L. directors and officers, studying this problem for years back, devised and pursued the one course of tactics that was certain of producing the desired results.

Now rapidly shifting the scenery, let me tell you of a thing in Spain that would have intrigued you fellows — the nonchalant way in which 110-volt juice is handled in that country. All you seem to need to wire a building in Spain is plenty of double conductor and double-pointed tacks — no knobs, conduit, loom, tape, solder, and no particular insulation. Bare haywire is exposed everywhere. If we wired our buildings that way we would have conflagrations while you wait, but in three months in Spain I saw only one small fire. Perhaps a Spanish volt is not as potent as its American equivalent.

Watts and Segal and I are greatly indebted to the *Red Española* fellows for many kindnesses during our stay in Madrid. They treated us royally. Like good hams everywhere, they are a very splendid bunch of fellows. . . . Sixty per-cent of the amateur stations of Spain are crystal-controlled and they have some beauties. Much of Madrid is still supplied with direct current and some of the fellows who live in that area not only have a low-powered station at home but have gone so far as to rent a room in a house out in the a.c. district for no other purpose than obtaining a higher-power station. It takes an ardent ham to do that. . . . We three musketeers are now honorary members of R. E. and during our stay were given several dinners and hamfests and shown around town and introduced to Spanish life by a group of a couple of dozen of as fine hams as you would want to meet. I should mention particularly the courtesies received at the hands of their president, Captain Roldán, EAR10, their indefatigable secretary, Mr. Uriarte, EAR12, their well-known traffic manager, Mr. de Cordova, EAR96, and the editor of their journal "Radio-Sport," Mr. Cañete, EAR3. . . . We had an amusing experience one night when we were out to the apartment of OM Bellón for a very late hamfest. The OM is a famous guitar player in the genuine Andalusian manner and was entertaining us with gorgeous music while meantime the usual hubbub was being created that you would expect when two dozen hams crowd into a small apartment. To the non-radio population of Spain such a clandestine meeting has but one significance. Just as we reached the street after the party broke up we found the Director of Public Safety throwing a ring of gendarmes around the building, and with motorcycles and armored sidecars *en route*. Somebody had reported to the police that another monarchist uprising was being hatched! It was a near-pinch and our friends had to do some tall talking to keep Paul and me out of the *calabozo* that night! . . . Speaking of Andalusia, Segal and I have as souvenirs a genuine Cordoba sombrero each, presented and autographed (inside!) by a bunch of the brass-pounders in southern Spain. All I can say is that you ought to see Segal in his! . . . Readers who keep posted on amateur doings in other countries will be glad to know that arrangements have now been made which soon will result in the merging of *Red Española* and the older Spanish society, *Asociación E.A.It.*, in one strong nation-wide amateur society which I am confident, from my experience with those fellows, will be a splendid ham outfit. . . . I could go on and on and tell you of interesting things seen in Spain, of bull fights and tangos and smiling señoritas, of crystal holders for 72 cents U.S., of poor people's shoes made from discarded automobile tires, of taxi horns that almost invariably honk in Continental — but this isn't the Encyclopedia Britannica and, after all, even a beautiful sunset must have an ending. So — *adiós!*

THE DX CONTEST IS ONE OF THE BIG EVENTS OF THE YEAR. DON'T MISS IT.

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 should be in on the fun!

Two weeks of opportunity to smash DX records!

All amateurs in the world are cordially invited to take part.

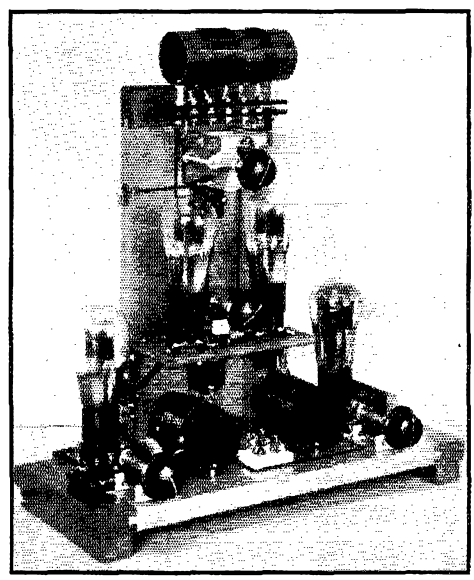
COME ON IN, OM. Get your station in trim now. Plan to grab off one of those special bronze-charm awards showing *your* call. See page 31.

An Amplifier for the Beginners' Crystal Transmitter

By George Grammer, Assistant Technical Editor

THE construction of neutralized radio-frequency amplifiers is a somewhat more difficult and advanced process than building a simple crystal oscillator and doubler such as was described in *QST* for November, 1932. In this article we shall take up the details of an amplifier suitable for use with that transmitter, with particular reference to operating pointers. The complete outfit — oscillator, doubler and amplifier — forms a very effective transmitter of moderate power, at least the equivalent of a Type 10 tube operating at about 600 volts (40 to 50 watts input). The cost is less, of course, because the tubes specified are cheaper and because the plate voltage required is only 400.

The amplifier, as the photographs show, is built on a vertically-mounted board. This type of construction has been adopted so that the output of the oscillator or doubler can be fed to the amplifier without the necessity for long leads that another horizontally-mounted unit would require, and so that all the controls are within easy reach. It also has the incidental advantage that less table space is required. Since all the parts making up the amplifier are fastened to the front of its baseboard, the complete transmitter takes up no more room than the oscillator-doubler unit.



THE COMPLETE TRANSMITTER

The horizontal portion will be recognized as the low-power transmitter described in QST for November, 1932. The vertical part of the set is an amplifier using a pair of Type 46 tubes in parallel, making three-band operation possible. The output is, conservatively, 20 watts on 3500 and 7000 kc., and 15 watts on 14,000 kc.

AMPLIFIER CONSTRUCTION

The amplifier consists of two Type 46 tubes in parallel in an ordinary neutralized circuit, with capacity coupling to the exciting stage and shunt d.c. feed to the grids. The physical construction is rather simple. The backboard on which the parts are mounted is 14½ inches high and 6½ inches wide. It is, in fact, a piece of the same breadboard from which the base for the oscillator-doubler was cut. A ¾-inch square wooden piece 6½ inches long is screwed to the backboard at the bottom, as shown in the photograph, and the whole assembly is fastened solidly to the horizontal board with wood screws after the wiring is completed.

The tube sockets and neutralizing condenser are mounted on top of a 3 by 6½-inch shelf which may be made of either bakelite or thin wood. This shelf is held to the backboard by angles and brackets made from half-inch brass strip, and is about five inches from the bottom of the backboard. The neutralizing condenser, C_8, is mounted on a right-angled piece of brass strip which is fastened to the shelf by machine screws. This strip connects to the rotary plates of the condenser, and one of the screws which holds it in place on the shelf also holds a small brass angle underneath the shelf to which the coupling condenser, C_{10}, is attached by one of its screw terminals. In addition to taking care of the mechanical mounting of these parts, this also forms the electrical connection between C_{10} and C_8. The grids of the tubes also are connected to the mounting bracket for C_8. Through an inadvertence the diagrams show the stator plates of C_8 connected to the grids of the tubes, but the actual connection is made to the rotor plates. Electrically it makes no difference which way the condenser plates are connected, but the mechanical arrangement used here is the more convenient.

The filament center-tap resistor, R_6, is fastened to the bottom side of the shelf just beneath the left-hand tube socket. The filament wires to the two tubes drop below the shelf from the sockets,

run to the outside ends of R_6, and from there to a pair of Fahnestock clips mounted on the left-hand edge of the board. The center-tap of the resistor also is connected to a clip on the edge of the board. On the right-hand edge a strip of thin bakelite about three inches long serves as a mounting for the gridleak resistor, R_7, and a binding post which is one of the terminals for the key. The radio-frequency choke in the grid circuit is soldered in place between C_{10} and R_7, as shown in the photograph.

The tuning condenser, C_7, is mounted near the top of the backboard, just high enough above the tops of the tubes to give sufficient clearance for the rotor plates. This condenser, a Cardwell Midway, is mounted in "reverse"; that is, the studs which ordinarily space the condenser out from a panel are used to do the same thing on the backboard. Longer mounting screws are substituted for the ones furnished with the condenser because of the thickness of the backboard. The condenser is mounted with the insulating strips at the top so that the coil mounting strip can be fastened to the stator assembly terminal screws.

The coil mounting strip is of bakelite, five inches long and ¾-inch wide. Small brackets made from brass strip make a solid support for it. The construction of these brackets is evident from the photograph. The strip could be mounted on other brackets fastened to the backboard if this type of mounting should be thought easier to make. The five General Radio jacks are ¾ of an inch apart, the measurements being from center to center.

There is only one other piece of apparatus in the amplifier, the plate by-pass condenser, C_9. It is fastened directly on the backboard just below the tuning condenser. The connection for the amplifier plate voltage comes directly from this condenser to a terminal clip on the left-hand edge of the board.

The two grids in each tube are connected together, as shown in the circuit diagram, giving a tube of high amplification factor. Each of these grid connections goes to the bracket which holds the neutralizing condenser, as has been previously explained. The plates of the two tubes also are directly connected. The connection between the plates of the tubes and the tuned circuit is taken off the plate terminal on one socket and not at the midpoint of the wire connecting the plates. Making the connection in this way upsets any balance that might exist between the grid and plate leads between the sockets and is effective in preventing ultra-high frequency oscillations between the tubes.

The amplifier coils are wound on bakelite tubing with an outside diameter of two inches. Each coil is mounted on a bakelite strip identical with the coil jack strip above the tuning condenser except that it contains G.R. plugs instead of jacks. Metal spacers at the ends of the strip keep the coil far enough away to clear the terminal ends of the plugs. In other respects the construction of the coils is just like that of the coils for the oscillator and doubler described in the previous issue. The end of each coil which is

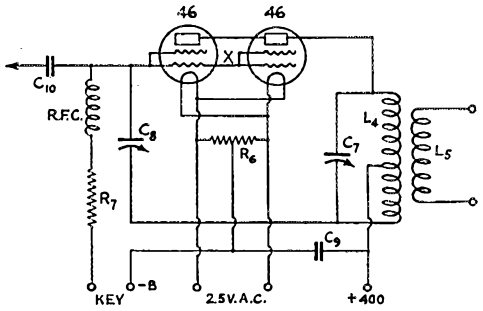


FIG. 1 — THE AMPLIFIER CIRCUIT

The components indicated in this diagram are all mounted on the vertical baseboard of the transmitter.
C_7 — 150-μμfd. variable condenser (Cardwell 405-B).
C_8 — 50-μμfd. midget condenser (Hammarlund MC-50-S).
C_9 — .001-μfd. mica condenser.
C_{10} — 40-μμfd. mica condenser (see text).
R_6 — 20-ohm center-tapped resistor.
R_7 — 1000 ohms, 2-watt (I.R.C.).
RFC — Short-wave choke (National Type 100).
X — Ultra-high frequency choke to be inserted here necessary.

Coil Data

Band	L_4	L_5
3500 kc.	20 turns tapped at 12th	8
7000 kc.	11 turns tapped at 7th	5
14,000 kc.	7 turns tapped at 4th	5

Taps are from plate ends of coils. L_4 turns are spaced to make length of 3500-kc. coil 2", 7000-kc. coil 1½", 14,000-kc. coil ⅞". L_5 spacing between turns equal to approximately half the diameter of wire.

connected to the plates of the tubes goes to the pin nearest the antenna coil; that is, the center pin of the five in the row on the mounting strip.

CHANGES IN OSCILLATOR AND DOUBLER

For convenience and most effective operation in using the amplifier in conjunction with the oscillator-doubler, it has been found advisable to make some minor changes in the latter unit. A double-pole double-throw switch, substituted for the single-pole single-throw switch previously specified, will make it possible to perform with one motion two or three operations when changing bands. This considerably simplifies band changing, since it is necessary only to plug in the proper amplifier plate coil, throw the switch to the right position, and make the required adjustments to the amplifier tuning.

A second change should be made in the tuned circuit of the doubler to use series instead of parallel plate feed. This simply means shifting C_4 from the plate side of the tuned circuit to the ground side, as shown in Fig. 2. The radio-frequency choke formerly in the plate circuit will therefore no longer be required for the doubler and can be used in the amplifier grid circuit. The

capacity of C_4 should be increased to at least .001 μfd. when this change is made.

When the amplifier is incorporated in the transmitter the doubler no longer works at the full voltage of the power supply, but receives its plate power from the same tap which furnishes the oscillator plate voltage. To increase the output at the lower voltage the resistance of the doubler grid leak, R_5, is reduced to about 4000 ohms. With this change the output will be entirely adequate at the lower plate voltage. Lowering the plate voltage also will eliminate any tendency toward "blocking." With 400 volts or more on the plate, receiving tubes of the oxide-coated filament type (such as the 46) often will start to run dangerously high plate currents when operated continuously over a period of time because of electron emission from the heated grids; consequently the set must be shut off and the tubes allowed to cool when this happens. It does not happen with 250 or 300 volts on the plate, however, and is not likely to occur when the tube is keyed. In this case the doubler runs continuously, hence it is advisable to use the lower voltage.

These changes are the only ones which need be made. Although not absolutely necessary, we feel that they are highly desirable. In addition, of course, the antenna coupling coil and its terminal clips should be removed from the oscillator-doubler unit to make room for the amplifier.

THE COUPLING CONDENSER

In nearly all transmitter specifications some deviation from electrical values given can be permitted, provided the substitution is made with an understanding of the function of the component under consideration. We cannot emphasize too strongly, however, the importance of getting the right capacity for the amplifier coupling condenser, C_{10}, in this case. The success or failure of the amplifier depends upon it. The reason is that the amplifier grid circuit has very low impedance under the conditions which give maximum output, and a condenser of too-great capacity will overload the oscillator or doubler to such an extent that the amplifier output will be greatly reduced. It is, in fact, possible that on the 3500-kc. band, where the amplifier receives its excitation directly from the oscillator, a too-large coupling condenser will overload the oscillator to such an extent that the crystal cannot "start."

A great deal of experimenting has shown that the optimum value of coupling capacity at C_{10} is approximately 25 $\mu\mu$fd. when the oscillator is working directly into the amplifier (3500 kc.). On 7000 and 14,000 kc., where the doubler excites the amplifier, the optimum value is 50 $\mu\mu$fd. The value specified in Fig. 1, 40 $\mu\mu$fd. is a compromise which will give very good output on both bands, although not quite as good as when the values mentioned above are used. If desired C_{10} can be a 100-$\mu\mu$fd. midget variable condenser instead of a fixed condenser and the correct settings for the different bands can easily be found by trial. An alternative scheme which will do the same thing without adding another control is to make C_{10} a 50-$\mu\mu$fd. fixed condenser and wire another 50-$\mu\mu$fd. fixed condenser in the circuit in such a way that it is put in series with C_{10} when the switch is thrown for 3500-kc. operation and is cut out when the switch is set for 7000 and 14,000 kc. This can be accomplished quite simply by connecting the upper end of L_1 to the lower center terminal of the switch, Fig. 2, and connecting the extra 50-$\mu\mu$fd. condenser between this point and the upper right-hand terminal of the switch, replacing the solid connection now shown.

TUNING AND NEUTRALIZING

The general process of tuning the amplifier is the same as for other similar amplifiers as described in the *Handbook* and in previous *QST* articles. A plate milliammeter is just about a necessity — it should have a range of at least 200 milliamperes — and another 50- or 100-mil meter to measure grid current is decidedly helpful. The latter should be connected in series with the key, with its plus terminal at the minus "B" end.

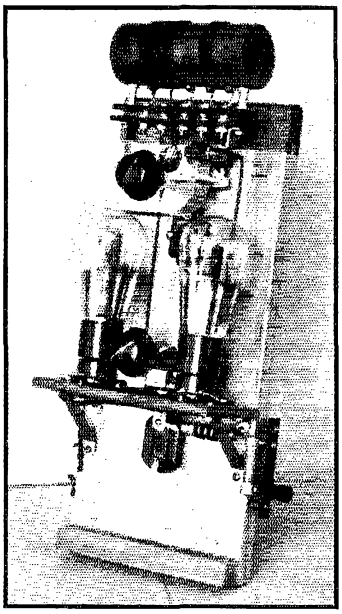
The first trial at tuning preferably should be on the 3500-kc. band, since there will be only two stages to handle. Start the oscillator running, but do not connect the plate voltage to the amplifier. Make sure the switch is in the right position and touch a neon bulb to the grid terminal of one of the amplifier tubes. Set the oscillator tuning condenser for maximum glow. Then touch the neon bulb to the stationary plates of C_7 or the plate terminal of one of the tubes and adjust C_7 until the bulb glows. Neutralizing condenser C_8 should be set at minimum and the key should be left open. Now increase the capacity of C_8, simultaneously watching the glow of the neon lamp. The lamp should get dimmer and finally go out when C_8 is at about the center of the scale. A further increase should cause the lamp to start to glow again. The correct setting of C_8 will be at the point where the lamp does not glow. It may be necessary to make slight readjustments to the settings of C_7 and C_1 while carrying out this process because the setting of C_8 will have some effect on the tuning of both the amplifier and oscillator. Next, close the key and note the grid current; it should be in the vicinity of 30 milliamperes. Now swing C_7 slowly about the resonance point and watch the grid meter. If there is any flicker of the needle, make slight adjustments to C_8 until there is no change in grid current when C_7 is tuned through resonance. When this has been done the neutralization will be exact. If no grid meter is used the neon lamp alone will suffice, although it does not permit the fine adjustment that the grid meter does.

This completes the neutralizing process. Now set C_7 at the resonance point, connect the amplifier plate voltage and close the key. Tune C_7 slowly about resonance. At exact resonance there will be a dip in plate current; the condenser setting which gives the lowest plate current is the right one. This minimum plate current should be approximately 25 milliamperes; on either side of resonance the plate current will go up to 130 ma. or more. Touching a neon bulb to the stator plates of C_7 should give a bright glow.

A dummy antenna will be helpful in determining the power output. A simple and inexpensive dummy can be made by soldering a pair of flexible wires about six inches long to the terminals of a 25-watt 115-volt lamp, fastening a pair of small spring clips on the loose ends of the wires. The lamp can be clipped across the portion of the amplifier plate inductance between the rotor plates of C_7 and the plate feed tap. It will light about to full brilliance if the transmitter is working properly. The amplifier plate current will be in the neighborhood of 100 to 120 milliamperes with the dummy antenna connected.

To tune the transmitter on 7000 kc. the switch should be thrown to the proper position, connecting the oscillator to the doubler and the doubler to the amplifier. Again start up the oscillator, touch the neon lamp to the grid of one of the amplifier tubes, and tune C_2 for maximum glow. Once more the amplifier plate supply should be disconnected and the key left open. Neutralize the amplifier following exactly the same method as described above for 3500 kc. The setting of C_8 for complete neutralization probably will be at about ⅔ full capacity. After neutralizing, connect the plate voltage and adjust C_7 as before. The dummy antenna again can be used to good advantage. The whole process is no more difficult than the 3500-kc. tuning except that there is one additional circuit to be handled.

The 14,000-kc. adjustment requires a little more care. This time the plate voltage should be on when the amplifier is being tuned. Adjust the oscillator and doubler as before, set C_8 at minimum, and close the key. The plate current should be in the vicinity of 130 milliamperes or perhaps more. Turn C_7 until there is a dip in the plate current or until a neon lamp touched to its stator plates glows. The setting will be found near the minimum-capacity setting of C_7. Now increase C_8 slightly and readjust C_7 for minimum plate current, at the same time readjusting C_2 if necessary. The neon lamp should show a brighter glow. Increasing the capacity of C_8 adds regeneration to the amplifier and raises its efficiency and output. The idea is to use a fair amount of capacity at C_8 so that the output will be fairly large, but there must not be enough capacity to permit the amplifier to oscillate of itself. The neon lamp will be helpful in determining how far this process can be carried. So long as the amplifier does not oscillate the lamp will glow only at the one spot — the resonance setting of C_7 first determined with C_8 set at minimum. If the amplifier breaks into oscillation the lamp will glow over most of the range of the tuning condenser, although generally it will be brighter at the same resonance spot. *Do not allow the amplifier to oscillate.* When it does, the frequency gets out of control and off-frequency operation is likely to result. It is perfectly easy to keep it from oscillating by checking its performance with the neon lamp as just described. A safe setting for C_8 generally will be found to be at about half capacity, but the performance of the amplifier should be checked in any case. The regeneration provided makes a big difference in the output of the amplifier on 14,000 kc., and if it is handled with a reasonable amount of care there will be no trouble from oscillation.



THE AMPLIFIER IS A DETACHABLE UNIT

It is mounted vertically to save space and permit convenient coupling to the crystal oscillator doubler. All the parts are mounted on the front of the board so the transmitter can be backed up to a wall, taking a minimum of table area. The tuning controls and interchangeable coils are within easy reach of the operator. This photograph shows how the grid coupling condenser, grid choke, grid leak and key terminals are placed. The filament and plate supply connections are brought out to clips on the left-hand edge of the board.

PARASITIC OSCILLATIONS

If the specifications of Fig. 1 and the foregoing instructions are faithfully followed there should be no difficulty in getting the amplifier working except for the possibility of parasitic ultra-high frequency oscillations, sometimes encountered with Type 46 tubes in a neutralized circuit when the leads to the tank circuit are more than a few inches long. Before trying to tune the set as described above it is just as well to apply a simple test to determine whether oscillations of this type can be generated. Close the key, disconnect the amplifier from both the oscillator and

doubler by opening the switch, and remove whatever amplifier coil may be plugged into the coil socket strip. Set C_7 at maximum capacity and C_8 at minimum capacity. Take the positive high-voltage lead from the power supply (this ordinarily goes to the plus "B" terminal on the edge of the backboard), place it in the center socket of the coil socket strip — the socket which is connected to the stator plates of C_7 — and note the plate and grid currents. The plate current should be small — 15 or 20 milliamperes — and the grid current should be zero. Now turn C_8 from minimum to maximum capacity and watch the meters. If the readings do not change regardless of the setting of C_8, well and good;

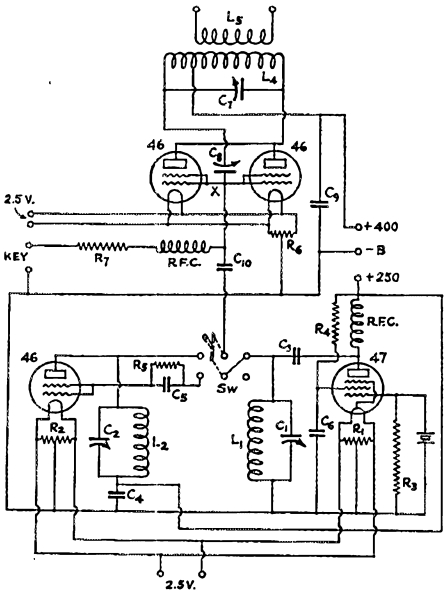


FIG. 2 — COMPLETE TRANSMITTER DIAGRAM

The parts designations are identical with those given in Fig. 1 and in Fig. 1, page 10, November, 1932, QST, with the exception of C_4, which is now .002-μfd., and R_5, which should be 4000 ohms.

Note the changes in the wiring of the doubler circuit and the substitution of a double-pole double-throw switch for the s.p.s.t. switch shown in the previous article.

there are no undesirable oscillations. But if, when the capacity of C_8 gets near maximum, the plate current takes a sudden jump to 100 milliamperes or more and the grid meter shows a reading of 20 ma. or so, there is an ultra-high-frequency oscillation which must be killed off. A neon bulb touched to the grids or plates of the tubes will confirm the fact of oscillation.

A simple but effective method of stopping these oscillations is to connect a small coil in series with the grid of *one* — not both — of the tubes, as in the leads marked with an "X" in Figs. 1 and 2. The size of the coil is not highly critical, but it will not be effective if it is too small or too large. One coil which works very nicely consists of 15 turns of No. 20 d.c.c. wire, the coil diameter being ¼ inch, no spacing between turns. A little experimenting will quickly settle the question of the correct size. Once it is possible to swing C_8 over its entire range (with C_7 set at maximum capacity) without any evidence of oscillation, as indicated by plate and grid currents or by a neon bulb, the parasite is eliminated. The coil will have negligible effect, if any, on the operation of the amplifier at the intended frequencies.

ANTENNA COUPLING

No provision has been made in the amplifier for variable antenna coupling. The degree of coupling will depend upon the type of antenna, the feeder length if feeders are used, and the method of tuning. It is obviously impossible to specify antenna coil sizes and spacings for all of the many methods of coupling in use. The specifications given in Fig. 1 probably will be about right for Zepp feeders with series tuning, but the right number of turns and the distance between the amplifier tank coil and the antenna coil must be determined by experiment in each individual case. Once found, however, the right-size coil and right degree of coupling is automatically plugged in each time the transmitter is shifted to another band, so a little extra work at the beginning saves time later on. If it should be thought more desirable to have a permanent antenna coil swung on a hinge so coupling can be varied, such a coil can easily be rigged up. It would be comparatively easy, also, to put the antenna coil on a piece of tubing slightly larger than the plate-coil form and slide it over the latter to vary the coupling.

Whatever the method adopted, the antenna coupling and tuning should be adjusted so that the antenna current is greatest, so long as the plate current is not more than about 120 milliamperes. It is a little hard on the tubes to load them beyond this, even though a higher plate current will result in greater antenna current.

KEYING

Plain grid keying is used with the amplifier. It is very effective with Type 46 tubes because they cut off completely when the grid circuit is opened, the output immediately dropping to zero. Grid keying is further desirable because the current keyed is small — 20 to 30 milliamperes under working conditions — and separate filament windings for the keyed tubes are not required. Grid keying also is less likely to cause key clicks; if they *do* occur, it is not at all difficult to put together a simple keying filter to prevent them. (See the *Handbook*.)

(Continued on page 90)

Velocity Microphones

Practical Construction of Two Types That Are Easy to Make

RECENT commercial introduction of the velocity microphone (modern technical label for what we have known as plain "ribbon mike" in years past) has aroused considerable interest among amateur 'phone operators. And well it may, for in addition to having excellent performance characteristics this type of microphone is perhaps the easiest of all to build. Still better, it is adaptable to hand construction from the kind of parts that can be obtained for nothing or next to nothing. In the articles following, two of the brethren contribute the practical dope on how they built their pet versions.

The D.C. Field Type

By C. W. Melotte*

THE velocity (ribbon) microphone is simplicity itself, consisting of a very light piece of corrugated metal ribbon mounted between the poles of an electro-magnet. The ribbon is suspended loosely and with its faces parallel to the magnetic lines of force between the poles. A sound wave, which is made up of alternate rarefactions and condensations of the air, striking the surface of the ribbon causes it to move backward and forward. This movement of the ribbon causes it to cut the magnetic lines of force between the poles of the electro-magnet and a minute alternating voltage is induced in the ribbon. This signal voltage is fed through an input transformer to the grid of the first tube in the microphone amplifier. Since the movement of the ribbon corresponds to the rarefactions and condensations in the air, the alternating voltage produced is of the same frequency as the sound. Unlike most microphones, the velocity type delivers a voltage which is essentially independent of frequency and dependent only on the amplitude of the sound — and, hence, on the velocity of the ribbon. Therefore the name, "velocity microphone."

A small but powerful electro-magnet furnishes the magnetic field. Since the sensitivity of the microphone depends on the number of lines of force cut by the ribbon, the electro-magnet should be designed so that it will produce as great a magnetic flux as possible. Therefore the iron used should have high permeability.

THE CONSTRUCTION

Get the best grade of electrical iron obtainable in your locality. Annealed cast steel having high permeability was used for the magnet of the microphone built here, and it is very sensitive. The coil consists of 400 turns of No. 24 d.c.c. magnet wire wound in layers, with the finished winding given a coat of shellac or Duco. The magnet is assembled as shown in Fig. 2, assuming that the parts have been cut, drilled and tapped as specified. The drawing should be self-explanatory.

Next the ribbon should be made. The material should preferably be duralumin, although brass

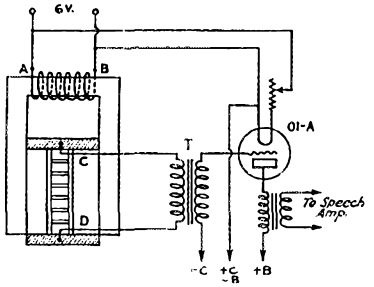


FIG. 1 — CIRCUIT CONNECTIONS FOR THE D.C FIELD TYPE MICROPHONE

can be substituted. From stock one-half mil thick cut a piece $\frac{3}{16}$-inch wide and 3 inches long. Corrugate it by running it through a set of coarse gears. This corrugation is to prevent standing waves on the surface of the ribbon and to keep the natural frequency of the ribbon out of the frequency range normally used. The ribbon is now supported without tension by the insulating strips shown in the drawing, being slipped into the saw cut in the strips and clamped with the bolts which also act as terminals. The ribbon and the two insulating strips are now assembled between the poles of the electro-magnet and the air-gap on each side made as small as possible, without allowing the ribbon to touch the pole pieces, by sliding the poles together. When the adjustment is complete, clamp the pole pieces to the yoke by the clamping bolts, tighten the four bolts holding the insulating pieces securely — and the microphone is completed.

Because the ribbon is short the impedance is low. To match this low impedance to the high impedance of the grid of the amplifier tube it is necessary to use a step-up input transformer. A suitable transformer can be made easily by removing the primary winding from an audio transformer and substituting a low-impedance winding (10 turns or so) to match the impedance of the ribbon. Such a transformer will enable you

*Melotte Radio Service, North Lawrence, New York.

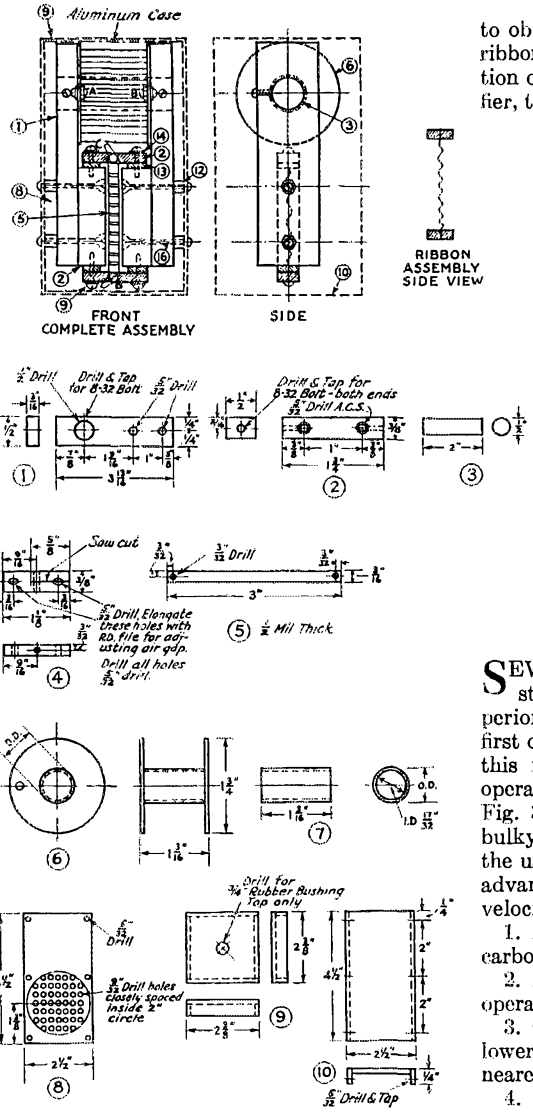


FIG. 2. — DETAIL OF THE D.C. FIELD VELOCITY MICROPHONE CONSTRUCTION

1 — 2 pole pieces of magnetic iron or steel.
2 — 2 pole faces of magnetic iron or steel.
3 — 1 yoke, magnetic iron or steel.
4 — 2 pieces bakelite for ribbon support.
5 — 1 Dural ribbon.
6 — 2 cardboard or fiber ends for winding form.
7 — 1 cardboard or fiber core for winding form.
8 — 2 pieces of aluminum for back and front of case.
9 — 2 pieces of aluminum for top and bottom of case.
10 — 2 pieces of aluminum for ends of case.
11 — ¼ lb. No. 24 d.c.c. magnet wire.
12 — 4 brass bosses.
13 — 4 fiber washers.
14 — 4 brass washers.
15 — 8 round-head brass bolts, 8-32 ½-inch long.
16 — 4 flat-head brass bolts, 8-32 1-inch long.
17 — 2 round-head brass bolts, 8-32 ⅜-inch long.
18 — 2 round-head steel bolts, 8-32 ⅜-inch long.
Also required: 14 brass nuts for 8-32 screws; 16 lock washers for 8-32 screws; 4 tinned copper terminals; ½ pint black Duco.

to obtain maximum transfer of energy from the ribbon to the amplifier. Fig. 1 shows the connection of the microphone to the microphone amplifier, the output of which can be fed into any good two-stage amplifier.

The frequency response of the velocity microphone is exceptionally good and this type is also directional, no sound being picked up from the sides. It is as good as a condenser microphone and better than a carbon microphone — and much easier to build than either, since no precision machining is necessary. However, care should be taken that the pole faces are parallel, that the air-gap is as small as possible and that the ribbon does not strike the pole faces as it vibrates. After assembly in the aluminum case it presents an appearance of which any builder can well be proud.

The Permanent Magnet Type

By George A. Elliot, W9ADZ*

SEVERAL ribbon type microphones constructed here have proven themselves superior to other types in a number of respects. The first one made had a six-volt field coil but, since this necessitated a 6-volt storage battery for operation, the permanent magnet type shown in Fig. 3 was developed. This is somewhat more bulky than the other, but still is not so large as the usual condenser head with its amplifier. The advantages of the permanent magnet type velocity microphone are as follows:

1. No background hiss like that common to carbon mikes of any type.

2. Ruggedness. This one has fallen off the operating table without damage.

3. Considerably higher output level and much lower impedance than the condenser type, its nearest rival in quality of performance.

4. No batteries required to supply field — or anything else.

5. It is directional. Room noise or echo coming from the sides does no damage.

6. Having no diaphragm, it is free from the usual frequency peaks in response.

The no-background feature is important because it permits running the level up further, obviating the necessity of talking close to the mike. This is helpful when an inexperienced talker is performing for monitoring purposes and in pick-up work. The feature of ruggedness is especially valuable in amateur work. A ham mike must stand the gaff — and then some. This type lacks the common fragility of stretched diaphragm types, including the dynamic.

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The relatively high output level obtained and the low characteristic impedance eliminate the necessity of having the first stage of amplification right at the microphone, as is necessary with the condenser type. Using a coupling transformer of

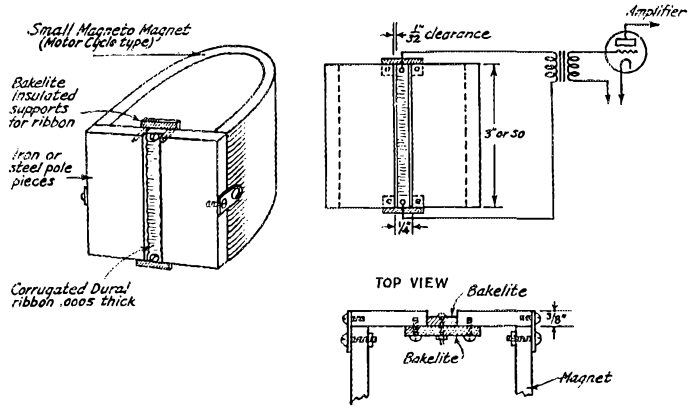


FIG. 3 — SUGGESTED CONSTRUCTION FOR THE PERMANENT-MAGNET TYPE VELOCITY MICROPHONE

There is nothing very critical about it. The magnet is of the type used in ignition magnetos, the motorcycle type being suitable. These can be picked up in junk yards and re-magnetized at a repair shop if necessary. The pole pieces should be suited to the magnet procurable. If dural cannot be had for the ribbon, a "stiff" type of tin or aluminum foil can be used. The corrugation is necessary to prevent resonance. The ribbon should be suspended loosely and not stretched.

500-ohm output impedance, the leads to the amplifier can be as long as 30 feet without appreciable loss. The output level is between that of a condenser head and that of a low-level double-button carbon mike. But the ratio of speech level to background is much better than with the carbon type, so there is an actual gain over the latter. The no-battery feature is a real drawing card for the ham who shies at the high polarizing voltage required for the condenser and the usual battery demanded by the carbon type. There are never enough batteries in any ham's shack.

The frequency characteristic of the velocity microphone is comparable to that of the condenser type, dropping uniformly towards the higher frequencies but being free from the usual humps. This one is flat to about 3000 cycles. Its output at higher frequencies could be equalized by compensation in an audio stage if such response should seem desirable. However, everything over 3000 cycles is so much wasted in voice communication and most of the useless noise components are in the higher frequencies.

The low impedance of the ribbon calls for a few turns of large wire on the primary of the coupling transformer, 10 turns of No. 18 being about right. If the microphone is to couple into the grid of the first amplifier through a short line, the transformer can be right at the grid of the tube. In this case, the 10-turn primary can be put on in place of the usual primary of the first audio transformer. If the microphone is to be removed some distance from the amplifier, a mike-to-line transformer should be used at the input end and a line-to-amplifier transformer at the output end. The input transformer can have the same 10-turn primary as the transformer just described and a secondary of about 500 turns of No. 30. The output transformer can be the usual amplifier input transformer with a 500-turn winding of No. 30 replacing its high-impedance primary. It should be unnecessary to mention that usual good practice in shielding microphone leads and grounding the shield ought to be observed.

Results Consistent DX QSO Contest

JUNE 5–18, 1932, was the period set aside for this new type of DX Contest. The point was to see which stations could roll up the greatest "total mileage" for their "20 best DX QSO's" during the allotted 14 days. 'Phone and c.w. stations alike, operating in the 1.7-, 3.5- and/or 7-mc. bands, were eligible to enter. However, each 20 contacts entered had to be in the same band and with the same type of transmission (c.w. or 'phone).

Entries were classified by frequency band and power used, there being three power groups, rated according to plate input to the last stage: Low Power, 50 watts or less; Medium Power, over 50 watts to and including 250 watts; High Power, over 250 watts.

A quantity of quartz crystals were donated by the staff at W8YA, the station of the Department of Electrical Engineering, the Pennsylvania State College, to be distributed among the several power groups as nearly as possible in proportion to the number of entries in each band falling in each power group. Ten crystals are being awarded to the highest 3.5-mc. participants, and ten to the highest 7-mc. participants. Due to the small number of participants on 1.7 mc., but three crystals are awarded the entrants using that band. The calls of the "crystal winners" are shown in italics in the score list.

In the case of the 1.7- and 3.5-mc. bands where there are both 'phone and c.w. entries, several of the final scores ("total mileage") have been modified by a correction factor (see June '32 *QST*) to

(Continued on page 80)

Regenerative Detectors

What We Get from Them—How to Get More

By H. A. Robinson, W3LW*

TO THE average radio amateur the subject of regeneration and its usual application in the regenerative detector might at first glance appear to be one about which a great deal is known. Actually, such is not the case and although we have been employing regenerative circuits and detectors for years, our store of definite information concerning their operation is very meager. The reason for this lack of exact performance data on this subject is apparent when one considers that only recently refinements in signal generator and measuring equipment have permitted such measurements to be made with any degree of precision. To be sure, we have all understood the fundamental relations of the principle of regeneration and amateur radio has made great advances by use of the relatively enormous amplification obtained by feeding back into the grid circuit a portion of the amplified energy in the plate circuit. However, how many operators really have quantitative data on the amplification of a regenerative circuit or the resultant selectivity, the effect of ticklers, tube characteristics, signal level, etc?

It is the purpose of this paper to present the results of an extended series of measurements of regenerative circuits and detectors. The diagram of Fig. 1 shows the experimental setup employed. The circuit elements for which no values are given are referred to in the text. Alternative circuit arrangements measured are shown in Fig. 2, including the screen-grid tickler circuit.

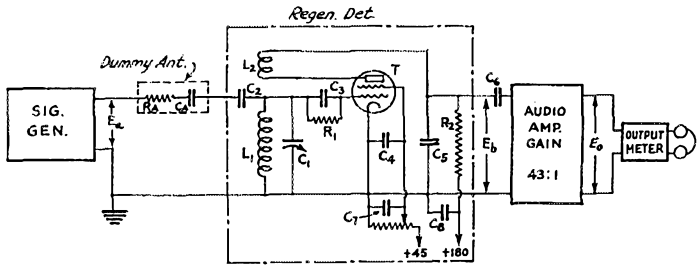


FIG. 1 — CIRCUIT USED FOR THE EXPERIMENTAL INVESTIGATION

C_A — 100 μμfd.
C_1 — 10 to 125 μμfd.
C_2 — 7 μμfd.
C_3 — 100 μμfd.
C_4 — .001 μfd.
C_5 — 150 μμfd.
C_6 — .006 μfd.
C_7 — 0.5 μfd.
C_8 — 0.5 μfd.
R_A — 100 ohms.
R_1 — 100,000 ohms to 5 megohms.
R_2 — 100,000 ohms.
T — Type '36 tube.
L_1 and L_2 — See Table II.

REGENERATION AND SELECTIVITY

The problem of what *L-C* ratio of the tuned circuit will result in the best selectivity is of interest both in the regenerative and non-regenerative cases. From a theoretical standpoint the selective characteristics of a tuned circuit employed as shown in Fig. 1 or as a coupling impedance for an r.f. amplifier are given approximately [1] by the relation of Fig. 3. The curves of Fig. 4 plainly illustrate the effects of the *L-C* ratio as well as the r.f. resistance of the tuned circuit on the selective characteristics of a typical single tuned circuit. A fairly high *L-C* ratio (19.5×10^4) and low resistance coil resulted in the selectivity curve A, while B was obtained with an *L-C* ratio only one quarter that of A and a correspondingly lower r.f. resistance. The relation between the r.f. resistance and inductance is the determining factor and no general formula can be derived since so many factors such as coil shape, size and spacing of conductors, insulation and surrounding dielectric, are involved. The curves shown are based on a variation of r.f. resistance proportional to the three-halves power of the inductance. A variation of this order is verified by experiment.

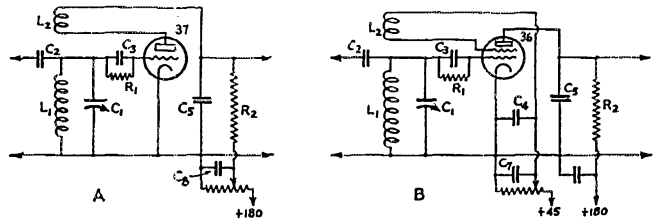


FIG. 2 — THE TYPICAL REGENERATIVE DETECTOR CIRCUITS STUDIED

The circuit constants correspond with those of Fig. 1.

The effect of changing the r.f. resistance of the

*Silver Lake Farm, Willow Grove, Pa.

[1] Approximations — (1) Antenna loosely coupled; C2 less than 10-μμfd. at 7000 kc. (2) Tuned circuit r.f. resistance low compared to reactance of circuit elements; r less than one-tenth X_L.

tuned circuit for a given *L-C* ratio can be surmised from the relation of Fig. 3, since only the impedance at resonance is affected. Decreasing the effective resistance of the tuned circuit, by improved coil design, looser input coupling or

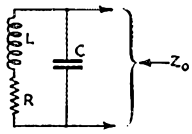


FIG. 3

Theoretically the selective characteristics of a tuned circuit are such that the impedance at resonant frequency

$$Z_o = \frac{X^2_L}{r}$$

while for frequencies more than 5% off resonance:

$$Z'_o = \frac{X_L \; X_C}{X_L - X_C} \text{ (neglecting sign)}$$

where $X_L = 2\pi fL$

and $X_C = \frac{1}{2\pi fC}$

are evaluated at the frequencies under consideration. The selectivity or relative response to signals off resonance is $\frac{Z'_o}{Z_o} \times 100\%$

regeneration, results in a decided improvement in selectivity as shown by Curve C (Fig. 4) which is obtained with the same *L-C* ratio as Curve A but with a tuned circuit resistance only one-tenth as great.

Experimentally determined selectivity curves obtained with the circuit arrangement of Fig. 1 are shown in Fig. 5. The tuned circuit was resonant at 7200 kc. for each curve. Curves 1 and 2 are typical selectivity curves for single tuned circuits without regeneration, the lower *L-C* ratio being somewhat more selective. (Tuned circuit data in Table II.) The dissymmetry at frequen-

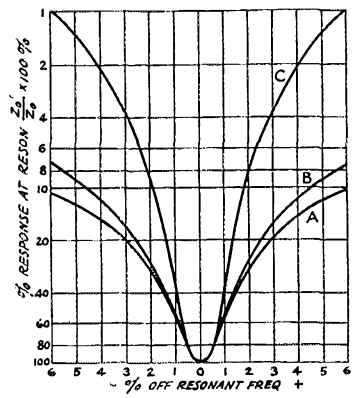


FIG. 4 — SINGLE CIRCUIT SELECTIVITY CURVES, NO REGENERATION. RESONANT FREQUENCY 7200 KC.

Curve	$L\mu h.$	$C\mu\mu fd.$	R_{ohms}	*Rel. Gain At Reson.*
A	9.75	50	6	1.4
B	4.88	100	2.1	1.0
C	9.75	50	0.6	14.0

TABLE I — EXPERIMENTAL DATA ON REGENERATION

7200 kc.

Tube Type	*Circuit Fig.*	*Det. Gain E_b/E_a*	*Sig. Level E_a volts*	*Tuned Circuit*	*Grid Leak Megs.*	*S.G. Volts*	*Remarks*
			30% Mod. Signal; Regen. Just below critical				
236	1	5,050	1.5	A	3	16.4	
"	"	3,400	"	"	"	12	
"	"	5,270	"	"	"	17.5	Adjust Tickler
"	"	7,750	"	"	"	31	
"	"	7,750	"	"	1	34	
"	"	7,750	"	"	3	31	Increase Gridleak
"	"	7,750	"	"	5	31	
"	"	7,750	"	"	3	30	
"	"	7,900	7.5	"	"	30	Increase Sig. Level
"	"	1,860	20.0	"	"	30	
"	"	7,750	1.5	"	"	31	
"	"	4,400	"	B	"	28.5	Effect of Tuned Circuit
"	"	4,830	"	C	"	32	
"	2B	4,850	"	"	"	30	S.G. Tickler
237	2A	1,650	"	"	"	—	Triode
236	1	9.2	"	A	"	30	Non Regen.
			C.W. Signal; Regen. Just above critical				
236	1	6,830	1.5	A	3	16.4	
"	"	13,500	"	"	"	23	Adjust Tickler
"	"	15,800	"	C	"	32	Plate Tickler
"	2B	15,800	"	"	"	30	S.G. Tickler
"	1	18,600	"	A	"	23	Sep. Het. Osc.

cies higher than that of resonance is a result of the capacitive input coupling which increases with frequency. Increasing degrees of regenerative feedback resulted in the sharpening of the selectivity curves as shown by the other curves of Fig. 5. The measure of the degree of regeneration employed in this case was the screen-grid voltage, as a percentage of its value at critical

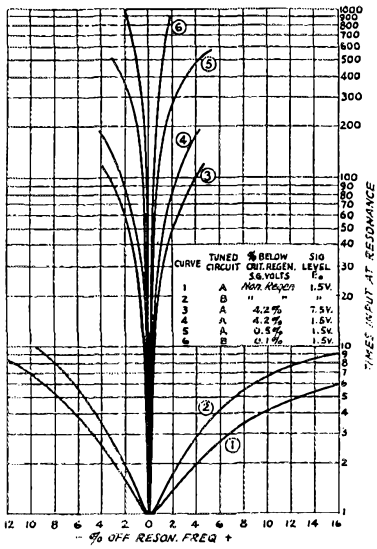


FIG. 5 — SELECTIVITY CURVES FOR REGENERATIVE CIRCUITS. RESONANT FREQUENCY 7200 KC.

regeneration (point of oscillation). The extreme degree of selectivity obtained at critical regeneration, when the effective resistance of the tuned circuit is practically reduced to zero, is clearly illustrated in Curve 6. This selectivity to a modulated signal still obtains when the regeneration control is slightly greater than critical and the circuit is self oscillating. However, as the regeneration control is further advanced the selectivity again decreases. The difference between Curves 3 and 4 of Fig. 5, which were both taken with the same setting of the regeneration control but for different signal levels, shows that the effective selectivity of a regenerative circuit is dependent upon the signal level. This might be expected when one considers that the tube parameters (plate impedance, mutual conductance, etc.) are dependent upon the grid swing when the tube is not operating on a linear portion of the characteristic.

REGENERATION AND AMPLIFICATION

The relatively high amplification obtained when operating a regenerative receiver near the point of critical regeneration is widely known. The relation of Fig. 3 for a signal frequency corresponding to that of resonance of the tuned circuit, shows that since the effective resistance approaches zero as the point of critical regeneration is approached, the tuned circuit impedance becomes increasingly greater. In the case of capacitive coupling employed as in Fig. 1, and in general where a tuned circuit is used for the grid circuit of a regenerative detector, it can be shown by circuit analysis that the resultant amplification is a direct function of the tuned circuit impedance (Z_o).

The experimental curves of Fig. 6 show the relative variation of the regenerative amplification (ratio of E_b to E_a, Fig. 1) as the regeneration control is varied. In plotting these curves, the screen grid voltage being the regeneration control, the screen voltage as a percentage of its value at critical regeneration was taken for the abscissa. Curves 1 and 2 for the regenerative amplification of a modulated signal show little difference, though Curve 1 was obtained with the screen-grid tickler arrangement of Fig. 2B while Curve 2 results with the more usual plate-tickler arrangement of Fig. 1. Curve 3 was obtained for c.w. reception with a non-oscillating regenerative detector and separate heterodyne (discussed later); while Curve 4 shows the change in amplification for c.w. reception with the regeneration control at values increasingly greater than the critical point. It will be noted in all cases that the

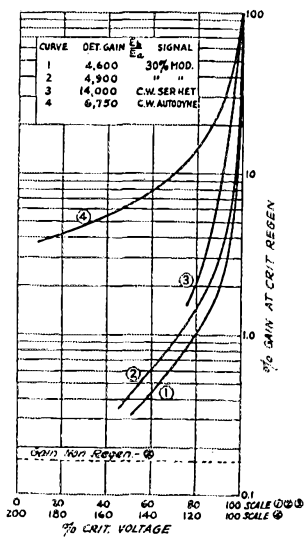


FIG. 6 — REGENERATIVE DETECTOR AMPLIFICATION. RESONANT FREQUENCY 7200 KC.

regenerative amplification falls off very rapidly for slight variations of the regeneration control voltage.

The question of the limit to which the regenera-

tive amplification can be carried and the effects of the tuned circuit, tickler, grid leak and tube characteristics are of interest. Considered from the standpoint of the reception of a modulated signal (detector non oscillating) the regenerative amplification is limited by the stability of the higher L-C ratio. Tuned circuit B was purposely made rather poor. The optimum screen-grid voltage for the Type '36 tube as a non-regenerative grid leak detector, for the plate load resistance and supply voltage employed in these tests, was approximately 30 volts at low signal levels.

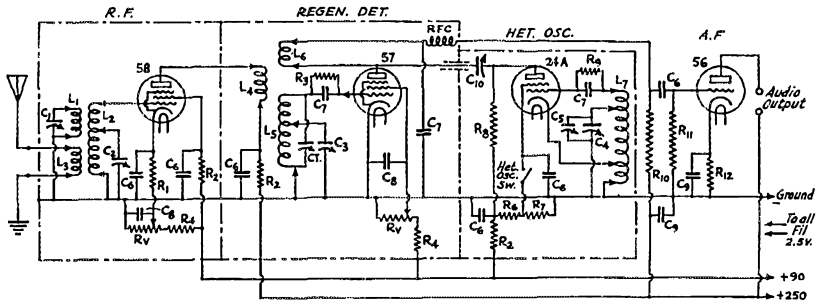


FIG. 7 — TYPICAL REGENERATIVE RECEIVER WITH SEPARATE HETERODYNE OSCILLATOR

Circuit values for the r.f. and regenerative detector stages and for the audio amplifier would be as usual. The oscillator circuit constants are as follows:

C_4 — *Same as* C_2 *and* C_3, *and ganged with them.*
C_5 — *Oscillator vernier trimmer, 25 μμfd.*
C_6 — *.01 μfd.*
C_7 — *100 μμfd.*
C_{10} — *Insulated wires overlapped 2 inches or so.*
L_7 — *Same as* L_2 *and* L_5 *but tapped for cathode about* ⅛ *turns from grounded end.*
R_2 — *5000 ohms.*
R_5 — *25,000 ohms.*
R_7 — *50,000 ohms.*
R_8 — *50,000 ohms.*
R_9 — *100,000 ohms.*

circuit elements, tube characteristics and supply voltages which determine the maximum value of regeneration obtainable without self-oscillation. This limitation is particularly serious in the case of regenerative receivers operating from the a.c. power supply which is usually subject to rapid voltage fluctuations of several percent. With this limitation, the regenerative amplification was found to be nearly directly proportional to the non-regenerative detector gain. In other words, the values of tuned circuit, grid leak, screen grid and plate voltages which give the maximum detector gain in the non-regenerative condition, also result in the maximum regenerative detector gain (non-oscillating) for the same output signal level.

This is substantiated by the experimental data of Table I. The automobile tubes Type '36 and '37 were employed and are representative of results obtainable with other types. The data on the tuned circuits referred to in this table are given in Table II. Tuned circuits A and C are both fairly low-loss circuits, circuit A having a considerably

The data of Table I show that by adjusting the tickler coupling so that the point of critical regeneration occurs at this optimum screen voltage, maximum amplification was obtained as a regenerative detector. The value of the grid leak seemed to be of minor importance and values from one to five megohms showed little difference. Increasing the signal level on the detector (here measured in turns of the output level E_o) results in a decided decrease in regenerative gain. The regenerative amplification was greatest for the lower-loss tuned circuits and increased with the L-C ratio. The screen-grid tickler arrangement of Fig. 2B resulted in practically the same regenerative amplification at critical regeneration as the more usual plate-tickler circuits. The triode Type '37 tube as the regenerative detector (in circuit Fig. 2A) gave only slightly over one-third the gain of the screen-grid tubes.

Considered from the standpoint of the reception of c.w. signals (oscillating detector), the regenerative amplification is also a maximum at the point of critical regeneration and hence is

TABLE II — TUNED CIRCUIT DATA

7200 kc.

Tuned Circuit	*L/C Ratio* × 10^4	C_1 *μμfd.*	L_1 *μh.*	*Coils — Tube Base; En. Wire Close Wound*			
				L_1 *Turns*	*Wire*	L_2 *Turns*	*Wire*
A	39.7	35	13.9	16¼	No. 20	7	No. 30
B	6.01	90	5.42	8	30	7	30
C	5.52	94	5.19	9	20	5	30

limited by any instability of circuit elements or supply voltage fluctuation which will not permit operation very near this point. A fairly high value of grid leak (3 to 5 megohms) decreases the amplitude of the self-sustained oscillations and results in a detector action over a restricted region of the tube characteristics. Hence the conditions for maximum detector gain for an oscillating detector approach those for a non-oscillating

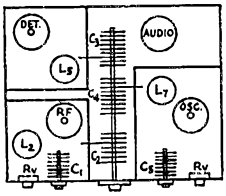


FIG. 8 — SUGGESTED LAYOUT FOR A REGENERATIVE RECEIVER WITH SEPARATE HETERODYNE OSCILLATOR

regenerative detector. The data of Table I confirm this, the detector gain for c.w. reception increasing as the point of critical regeneration is shifted to the optimum value by adjusting the tickler coupling. The effect of the tuned circuit impedance and other factors seem to be much less pronounced than in the case of the non-oscillating detector. The screen-grid tickler circuit of Fig. 2B again shows the same amplification as the plate tickler arrangement.

SUMMARY

Tuned circuit *L-C* ratios and losses are of minor importance in regard to selectivity in a regenerative circuit.

Lower loss tuned circuits and higher *L-C* ratios result in increased regenerative amplification.

Regenerative amplification and selectivity decrease very greatly for slight departures from point of critical regeneration.

Regenerative detector amplifications as high as 7000 for 30% modulated reception and 15,000 for c.w. reception are obtained at critical regeneration and optimum adjustments.

Critical adjustment and improved stability of circuit and voltages are of major importance.

Optimum regenerative detector voltages and circuit constants are practically the same as for maximum non-regenerative detector gain at the same signal output level.[2]

A REGENERATIVE RECEIVER WITH SEPARATE HETERODYNE OSCILLATOR

After having considered the relative advantages and disadvantages of regenerative circuits and detectors, as amateur operators our chief interest lies in their application. There follow a few brief remarks and suggestions concerning an unusual adaptation of the regenerative circuit to amateur receiver design. No attempt is made to give the detailed construction since every amateur will desire to suit his fancy in that respect. The receiver has been constructed and is rendering excellent service in active amateur work.

At first glance the amateur might question, "Why should one complicate a perfectly good regenerative receiver by adding a separate heterodyne oscillator?" In truth, it is necessary to hear a receiver of this type in operation and actually handle it in service to appreciate fully the improvement in stability, sensitivity and ease of operation. The suggested schematic diagram is shown in Fig. 7, although the circuit can be modified readily to suit particular needs. Fig. 8 is a typical layout arrangement. The receiver consists essentially of a more or less standard tuned r.f. amplifier and regenerative detector with the usual audio amplifier stages. The separate heterodyne electron-coupled oscillator may be either separately tuned or ganged with the main tuning control. In either case the small oscillator trimmer capacitor, variable from the front panel, is essential as a frequency vernier. The heterodyne oscillator must be very carefully shielded,[3] since only a very low level (less than 500 microvolts) is coupled to the detector grid. A switch is provided in the screen grid circuit to cut the oscillator off when not in use. Other methods of coupling the oscillator to the detector may be employed and the optimum coupling is not critical or difficult to determine in the initial adjustment of the receiver.

For c.w. reception the receiver is tuned in the usual manner as a regenerative receiver, with the regeneration control slightly advanced beyond critical regeneration causing the detector to oscillate and having the separate heterodyne oscillator switched off. When a desired signal is heard the regeneration is decreased just enough to cause the detector to stop oscillation, the separate heterodyne oscillator is switched on and tuned with the small variable capacitor. The result is an unbelievably stable signal, increased sensitivity and freedom from the a.c. hum modulation so common to a straight regenerative a.c. receiver.

As the data of Table I and curves of Fig. 6 have shown, the sensitivity with the separate heterodyne oscillator is somewhat better than for the straight regenerative detector alone. Instead of a very feeble oscillator (as in the case of an oscillating regenerative detector at critical regeneration) subject to very considerable variations of frequency and amplitude with power supply fluctuations, with the separate heterodyne oscillator one has a very stable, vigorous oscil-

(Continued on page 90)

[2] For detector data on Type '27 and '24 tubes, see Robinson, "Vacuum Tube Detectors," *QST*, August and September, 1930.

[3] Lamb, "Single-Signal Superhet," *QST*, August and September, 1932.

The Fifth International Relay Competition March 11th-19th

DX-QSO Contest—Hams Everywhere Can Take Part—Advance Entry Not Required—Exchange Self-Assigned Serial Numbers in Two-Way DX QSOs—New Charm Awards Bearing Station-Calls for Winners—Contest Is for All Parts of the World (with U. S. A./Canada)

By F. E. Handy, Communications Manager

GET on the air . . . any time . . . any amateur frequency . . . March 11th[1]–19th inclusive 1933. Any amateur station, anywhere, can take part without advance entry. The contest is for most DX QSOs. It is world-wide! All parts of the World — with U. S. A./Canada.

The American Radio Relay League invites *you* to take part with amateur operators everywhere in . . . THE FIFTH INTERNATIONAL RELAY COMPETITION.

No need to dwell on our previous similar contests. These have been referred to by hams in such terms as, "Vy FB," "Every hour solid fun," "Fine DX worked on low power," "The most stirring competition in the era of radio communication," etc., etc. Important features of this 1933 DX-Contest were covered in the advance announcement in January *QST*, and the full details appear this month, in order that these may reach all parts of the world before the dates of our "open season on DX."

GENERAL PLAN OF CONTEST

Amateurs with the prefixes W and VE will be taking part in a QSO Party with stations in all parts of the world.[2] When they effect DX QSOs, self-assigned serial numbers will be exchanged and jotted down in the contest-report. From this record each station will submit its score, as explained later in this announcement. From the scores (which the Contest Committee will verify by cross-examination of all logs submitted) the winners will be determined for *each* locality, and beautiful and unusual charm awards, each inscribed with the call of the winners, will be made.

Stations outside[2] the U. S. and Canada will try to work as many W and VE stations as possible to exchange serial numbers. Stations in *all* localities need only take part on the dates announced and report results at the end of the tests in the form explained herein, to receive credit in *QST*, and be eligible for the valuable new awards.

The main *competition* each operator must consider comes from operators in his immediate A.R.R.L. Section in the case of W and VE stations,[3] and in the case of all other amateurs it comes from the individual operators in their country or locality using the same prefix.[4] The awards are primarily for the operator running up the best record *for each Section.*

THE CONTEST PERIOD

To avoid misunderstanding and possible confusion the exact local starting and ending time for our DX competition is given in the following table. These times are based on "Greenwich" and should be computed for any part of the world from the Greenwich meridian. The contest runs from Saturday, March 11th, through Sunday, March 19th (*until* early Monday, March 20th).

SCORING

Both the W/VE station, and the station in the remote locality receive *one point* when the W or VE serial number is acknowledged by the station in the remote locality. Each operator, similarly, may add *two points* further when a six-figure number (*to* U.S.A./Canada) is acknowledged or OKed by a W/VE station.

After all the individual scores have been added together, this sum, in the case of W or VE participants, is to be *multiplied by the number of countries or localities (prefixes) worked to give the total score.* In the same way, those taking part in other

[1] 6 p.m., C.S.T., March 10th — see discussion under "the contest period."

[2] Alaska, Hawaii, Philippine Islands, Cuba, Porto Rico, and Newfoundland, in fact, *all* localities using PREFIXES *other than* W or VE will receive *QST* mention and awards based on their work *with* W/VE stations.

[3] Page 5 of this *QST* carries a complete list of the Sections of the A.R.R.L. Field Organization.

[4] Consult the Rules and Regulations (sent free on request) or, better, the complete list of *call-prefixes for different countries* of the world as given in the Tenth Edition of the Radio Amateur's Handbook.

Time	*Starts*	*Ends*
Greenwich	March 11th 0000	March 19th 2400 (Mar. 20th 0000)
A.S.T.	March 10th 8:00 p.m.	March 19th 8:00 p.m.
E.S.T.	March 10th 7:00 p.m.	March 19th 7:00 p.m.
C.S.T.	March 10th 6:00 p.m.	March 19th 6:00 p.m.
M.S.T.	March 10th 5:00 p.m.	March 19th 5:00 p.m.
P.S.T.	March 10th 4:00 p.m.	March 19th 4:00 p.m.

different countries (remote), *multiply their total of points by the number of U. S. and Canadian districts* (licensing areas) they have succeeded in contacting, to give the total score. There are nine U. S. and five Canadian licensing areas making a possible multiplier of fourteen!

All competitors are requested to submit their lists, even if they only show a small score, because by doing this they are helping to support the claims made in logs from other stations, and also so they may receive full credit for their work in *QST*.

The *highest* individually-attained score of any *one* of the operators of amateur stations having more than one operator is the *official score* for such a station. The summary of score must show *all* stations worked by *all* operators, however, underlining or circling the entries of stations that cannot count in the "official" total. Awards will be based on the "official total" and will be made to the individual operator accredited with this total. To show the possible scores that can be built up by several operators at one station, such scores (*all* countries (prefixes) or W–VE districts listed times all points listed) may be shown parenthetically after the "official" score that counts toward a possible award.

THE SELF-ASSIGNED SERIAL NUMBERS

Any amateur station, anywhere, can take part without advance entry. Each operator taking part will assign himself a distinctive three-numeral group and use this throughout the contest as the *first part* of each number exchanged. Numbers exchanged will have *six* figures, the latter three taken from the first half of each number-combination *received*. To confirm your first contact, since no numbers will then have been received, the six-figure group sent will consist of the three numbers which identify you in each log, followed by three "naughts."

"Handling" a serial number includes the transmission and receipt of radio acknowledgment (QSL) of same, and the entry of date, time and station call, and numbers as handled, for purposes of record. There is no object in working the *same* station more than once in the contest period *if* three points have been earned by a full exchange during a QSO. If but one (or two) point(s) result(s) from a first contact with a station, you can complete the three points (maximum that *can* be secured with any *one* station) by working this amateur later in the contest period, and handling a serial number in the opposite direction.

AWARDS

Beautiful, new, bronze charms, inscribed with the call signal of the winners and bearing a design symbolic of amateur radio work will be awarded[6]: (1) one in *each* remotely located country or territory — all hams using *the same prefix* compete for an award, and (2) in each of 64 A.R.R.L. Sections, *mainland* U. S. A. and Canada (see page 5 *QST*).

Since the special charm-awards will be made to the operator of the highest scoring station in each continental area, this puts all operators using the same prefix in competition with each other — and similarly each A.R.R.L. section-boundary circumscribes a competing group. DX-transmission characteristics being the same for all operators in each award-area, the chances of being a winner depend on operating ability and stations and are equally fair to all.

On the reverse of the charm will be a neatly worded inscription, THE AMERICAN RADIO RELAY LEAGUE AWARD — FIFTH INTERNATIONAL RELAY COMPETITION MARCH 1933. Additional lettering will identify the country (prefix-locality), or A.R.R.L. Section in which the winner is resident, also. Shall we reserve one of these awards similar to the one shown herewith to put with your trophies, or hang on your watch chain, bearing *your* station call?

'PHONE AWARD POSSIBLE

In addition to the North American awards in each W-VE A.R.R.L. Section, additional *special* awards may be made at the discretion of the Award Committee, for special accomplishment or scores submitted by W and VE *radiotelephone operators* using *any or all* the bands open to them individually for telephone operation. In this connection, all radiotelephone scores from the U. S. A. and Canada shall be classified (where possible) by frequency bands, or considered as a single group — and if in the opinion of the Committee, special recognition is merited, a number of awards shall be made, in proportion to the number of 'phone operators submitting reports in this competition. This special incentive to 'phone operators to enable them to demonstrate the DX *possible* using either 14-mc., 3500-kc., 2000-kc. 'phone (or all phone bands) is *in addition to* the Section-awards (explained above) and in no wise limits 'phone operators from competing with all other operators in his locality for the "Section"

[6] A ruling of the A.R.R.L. Board of Directors permits stations of A.R.R.L.-*QST* staff members to participate in contests with the provision that the operators of such stations shall be ineligible to receive any awards made by the League.

award. Stations *worked* may use either 'phone or c.w. telegraphy (it is not necessary that they use 'phone also); but to be considered for any 'phone award made, *all* communications made and logged must be those completed on 'phone, using the proper 'phone bands. Where an entry is to be considered for both the Section-award, and any special 'phone-award, two claimed scores may be computed — one for exchanges made using either or both c.w.t. and telephony, and a second log summary showing the score *based on 'phone points alone.*

REPORTING

Reports or summaries from participating stations must be received at A.R.R.L. Hdq. from all W/VE stations on or before noon April 24, 1933, to be counted in the results or to be considered in the awards. From all outlying localities, reports must be received on or before May 29, 1933. Play safe . . . *mail your report immediately* at the end of the contest period to avoid delay and insure that your results are credited. Show your "official" claimed-score in full, fol-

(*Continued on page 86*)

LOG, FIFTH INTERNATIONAL RELAY COMPETITION

Name..... Call signal.....
Address..... Transmitter.....
A.R.R.L. Section..... Plate watts (input last stage).....
(If W or VE call, otherwise leave blank) Type signal (xdc, pdc, rac, etc.).....

Date	*Time (local)*	*Station Worked*	*Country*	*Continent*	*Frequency*	*Serial Number*		*Points (1) or (2)*
						Sent	*Received*	

"Total" multiplied by *number* of { (1) countries or localities (prefixes) OR (2) U. S. and Canadian licensing areas } *worked* equals the GRAND TOTAL or FINAL SCORE..... TOTAL....

I hereby state that in this contest, to the best of my knowledge and belief, I have not operated my transmitter outside any of the frequency bands specified in, or in any manner contrary to, the regulations my country has established for amateur radio stations; also that the score and points as set forth in the above log and summary of my contest work are correct and true.

.....
Signature of operator (s)

(1) For W/VE entries. In computing points, each "received" serial number group counts *2*. Each serial "sent" and properly QSL-ed counts *1*.
(2) For entries from stations using any prefixes *other than* W or VE. In computing points, each 6-figure number "received" counts *1* point, and each number "sent" (with proper acknowledgment) counts *2* points.

EXAMPLE OF CONTEST LOG

STATION W9UUU Serial Number 543

Date and Time	*Station Worked*	*Country*	*Continent*	*Frequency*	*Serial Nr.*		*Points*
					Sent	*Received*	
March 10th							
6:01 p.m., C.S.T. (or 0001 G.C.T., March 11th)	G5ZZ	G. B.	Europe	7 mc.	543,000	*765*,000	3
6:38 p.m.	VK2LL	Aust.	Oceania	7 mc.	543,*765*	*856*,287	3
9:50 p.m.	ZL1EE	N. Z.	Oceania	7 mc.	543,*856*	*398*,657	3
11:50 p.m.	AC6UU	China	Asia	14 mc.	543,*398*	*395*,984	3
March 11th							
12:05 a.m., C.S.T.	PY1WW	Brazil	So. America	7 mc.	543,*395*	*777*,000	3
3:10 a.m., C.S.T.	VK5YY	Aust.	Oceania	7 mc.	543,*777*		1
							16
						Countries (prefixes)	×5
						GRAND TOTAL	80

STRAYS

Another Amateur B.C. Program—WBZ-WBZA-W1XAZ

Amateur programs of unusual interest are being broadcast each Saturday night at 11:15 to 11:30 P.M., E.S.T., over WBZ-WBZA and W1XAZ, the New England Westinghouse stations, and the attendance of hams in all parts of the world on the frequencies of 990 and 9570 kc. is invited at that time.

The first program was scheduled for January 21st, with A. A. Hebert of A.R.R.L. Hq. as principal speaker. Arrangements for the January 28th program include a grand club meeting of the Massachusetts radio clubs, while on February 4th the WBZA Players under the direction of Mr. W. H. Latham will present an original play dramatizing amateur work in a major catastrophe.

Equally absorbing features have been planned for the remaining programs of the initial six weeks period. Listener response will indicate whether the program will be continued after this period or not, so reports are requested from all listeners. These should be sent direct to WBZA, Springfield, Mass.

Forrest P. Wallace, W9CRT, announcer and director of the WMAQ "Ninth District Radio Amateur" program broadcast from Chicago on 760 kc. from 5:15 to 5:30 P.M., C.S.T., Saturday afternoons, points out that occasionally (actually, in two instances) some special event forces the amateur program off the air at its scheduled time, and waiting hams assume that the program has been entirely discontinued. Not so! Listen again next Saturday, and it will be there as usual. Sometimes these lapses simply cannot be avoided when some special program takes precedent.

A booklet which gives in convenient and compact form the procedure to use in calibrating a frequency meter from A.R.R.L. and Bureau of Standards Standard Frequency Transmissions can be obtained from the General Radio Company by dropping them a card asking for Bulletin 315B. An accurate method of obtaining a calibration from broadcast stations also is described.

In addition to the calibrating information, the booklet also contains a description of the new G.R. Type 535-A frequency meter and monitor, giving full details of the circuit and construction.

The Staff at W8YA, The Pennsylvania State College, State College, Pa., has awarded a special extra and additional quartz crystal prize to Mr. Elmer Kleppin, W9DBO, for his work in the Phone-C.W. Consistent DX QSOs Contest (reported elsewhere). The mileage-score was outstanding in that it was accomplished with relatively *low power* as mentioned with the contest results.

Eleven years ago when *QST* was a three-man job, Boyd Phelps (or "BeeP" as we know him) came from Minnesota to do his third and has remained east ever since, except for North American tours chasing the elusive five-meter signal. Now we learn of his returning to Minneapolis with his crystal and frequency measuring laboratory. Since winning the A.R.R.L. Frequency Measuring Contest he has had so many requests to measure all kinds of stations that he is going into it as a business, and believes a central location north of the heavy static belt to be ideal in many ways. Now, W9BP speaks of ordinary precision as five parts in a million and has developed a measuring system to give absolute accuracies in the broadcast band of small parts of one cycle.

We are just socialistic enough to wish there could be a more even distribution of such frequency consciousness.

W8FNX writes in to say that W8PJ goes one better in the "reverse power" idea, in that W8PJ uses a '52 oscillator and a '10 amplifier!

A ham writes in to remind the gang that junk yards which "store" *passé* Cadillacs and Pierce-Arrow automobiles should be broached, for these cars have aluminum bodies, and a few cents, plus paint remover, transforms this "junk" into aluminum panels as large as four feet square.

W2CC QSO's VK5HG Over 500 Times!

Worthwhile contacts are what we all strive for. W2CC and VK5HG seem to have no trouble in keeping a sked 3 times a week with comparatively low power — each station uses 35 watts input. Much traffic for the Department of Terrestrial Magnetism at Washington is handled between these stations, with VK6MO at Watheroo, Western Australia, the starting point. The new year found these two antipodal stations rounding out their 500th contact. When the sked first started several years ago these fellows kept a daily sked, but after 44 consecutive days of QSO it seemed "air tight," so the tri-weekly QSO's were formed and are still going strong.

About the Antenna

Space-Saving Schemes Explained Especially for the Beginner

IF all of us were blessed with unlimited backyard space, fewer hams would have premature gray hairs from worrying about the kind of antenna to put up. But since yards and roofs *do* have their limitations, and since the lower-frequency bands — on which we all want to work occasionally, if not exclusively — require antennas of some length, the antenna question often becomes a problem of husky proportions.

If there just isn't enough space available to put up a half-wave Hertz antenna of the length needed for the lowest-frequency (highest wavelength) band on which the transmitter is to work, the best plan is to build a good antenna for a higher-frequency band and use some special tuning system for the lower frequencies. The main point in such cases is to devise a system which can be tuned to the frequency desired. The radiating qualities of the antenna will have to be taken for granted.

Antenna length in relation to tuning is one thing that gives beginners trouble. Possibly it can be cleared up a bit by looking at Fig. 1. At A is the simple half-wave Hertz antenna with its normal current and voltage distribution. The current is maximum in the middle of the antenna and zero at the ends, while the voltage is maximum at one end, drops to zero at the center, and rises to a maximum of opposite polarity at the other end. An ideal current and voltage distribution like this can exist only when the electrical length of the antenna is equal to half the wavelength of the transmitter. This electrical length is not exactly equal to the physical length of the wire, but is very close to it. Under ordinary conditions only about 4% has to be deducted from the actual length of a half wave, either in meters or feet, to make the electrical length right. For example, an antenna for a wavelength of 41 meters will be approximately 19.7 meters, or about 65 feet, long. It is not necessary to worry about a few inches in making these measurements, because an antenna with good radiating characteristics will have such a broad resonance curve that differences of a foot or so will make little practical difference. That is why an antenna cut for about the center of a band will work well in any part of the band.

Looking again at A in Fig. 1, the voltage is zero at the center of the antenna, and there is therefore no difference of potential between the center of the antenna and ground. We can therefore connect the center of such an antenna directly to ground without disturbing either the current or voltage distribution in the antenna. We can go even farther than that. We can cut off half the antenna and ground the center, and the current and voltage distribution on the remaining half will stay just the same, because the current will flow into the ground just as well as it did into the now-missing other half of the antenna. Therefore we can use the ground as a substitute for half of the antenna if space is limited. This

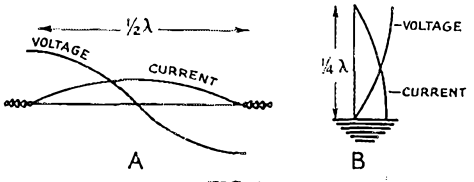


FIG. 1

is shown in B, and such an antenna is known as a quarter-wave or Marconi antenna.

Antennas such as those shown in Fig. 1 would hardly be useful, however, because there is no way indicated to get power into them. This has to be done by the insertion of tuning apparatus, which can be a coil or condenser or both. A condenser in series with an antenna has the effect of shortening the electrical length or lowering the wavelength; a coil increases the length or raises the wavelength. The wavelength to which the antenna system will tune can be increased indefinitely by using larger and larger coils, but the theoretical minimum wavelength to which an antenna can be tuned can only be cut in half by using a series condenser. This is not hard to understand. Suppose a condenser were inserted in series with the antenna of Fig. 1B at the grounded end, and its capacity was made smaller and smaller. The wavelength to which the system would tune would be getting shorter at the same time, but even if the condenser capacity was reduced to zero the length of the wire would remain the same. With zero capacity the antenna would no longer be grounded and would have the same characteristics as Fig. 1A; in other words it would now be a half-wave instead of quarter-wave antenna, and its natural wavelength would be approximately twice its actual length, just as it is in A. Obviously it cannot be further reduced without making the physical length shorter. In practical work it is not possible to reduce the wavelength of an antenna system to half its natural wavelength by using series capacity because there must still be some way of coupling it to the transmitter in order to make it take power, and this generally means the use of a coil — which raises the wavelength — and a certain amount of series capacity to permit

tuning. It is possible to reduce the wavelength as much as 25% without difficulty, however.

If all this is thoroughly understood, it is not at all difficult to build an antenna system which will tune to the wavelength desired. Suppose, for instance, there is a yard space which will allow a fairly straight stretch of about 70 feet and the transmitter is to work on 3600 kc., or 83.3 meters. The length of a half-wave antenna for this frequency would be $\frac{83.3 \times .96}{2}$, or 40

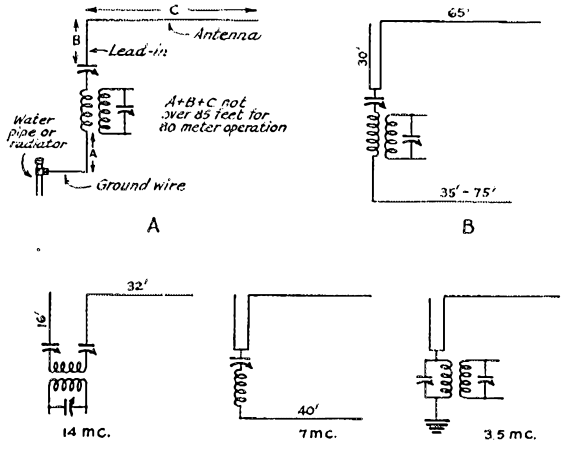


FIG. 2

meters, which is about 131 feet. A quarter-wave grounded antenna would only need to be 65.5 feet long for that frequency. It can be longer than that, however, because a variable condenser can be put in series with the coupling coil to reduce the wavelength of an antenna system. The total length of antenna, lead-in and ground lead should not be more than about 85 feet, though, if the system is to tune properly on 3600 kc. In computing the total length it is not usually necessary to take into account the length of the water-piping or radiator system to which the ground is made because these usually have large capacity to the actual ground, but if the water pipe is isolated from the rest of the system it may be necessary to make allowance for its length. Fig. 2A shows a system of this sort.

A different arrangement would be preferable if the transmitter is to work on the 7-mc. band as well. The space available permits putting up a regular Zepp antenna for this band, so we might use a straight stretch of 65 feet and a pair of Zepp feeders between 30 and 35 feet long. For 3.5-mc. work both feeders could be connected together at the set and grounded through a series condenser and coupling coil in the same way as at Fig. 2A, but the total length would be about 100 feet, which might be difficult to tune properly. In this case, instead of connecting the lower end of the coupling coil to ground, a 35- to 75-foot wire can be substituted to bring the total length of the system up to something which can be tuned to frequencies within the 3500-kc. band. This wire should be kept somewhat away from the antenna, although it can be parallel to it, and need not be as high. If the antenna is 30 feet or so in the air, the second wire can be put at a height of about 10 feet. It is better to have the length nearer to 75 feet than 35 feet in order to get good coupling between the transmitter and the antenna. On the 7000-kc. band the tuning would be as prescribed in the *Handbook*, and the second wire would be disconnected.

The system shown at 2A, or that at 2B with a ground connection instead of the second wire, can also be used on 160 meters by taking out the series condenser and using a coupling coil in the antenna with a larger number of turns. It may be necessary to connect a variable condenser *across* the coupling coil to make the entire system tune to the 160-meter band, because the short antenna length has to be compensated for in the tuning apparatus. A quarter-wave grounded antenna for 160 meters would normally be about 130 feet long, but by using enough inductance in series with an 85- or 90-foot antenna it can be made to work on that band. Of course it will not radiate quite as well, but when one has no space there is little choice.

Now, taking an extreme case, suppose that the only place where an antenna can be placed is on a small roof or in the attic. In even the smallest attics there will usually be room enough for at least a half-wave 20-meter antenna, which only measures about 32 feet, even though it can not all go in a straight line. This also will work for any small indoor transmitting antenna. Put up a regular 20-meter Zepp, length approximately 32 feet, with 16-foot feeders. Use it with series tuning on 14 mc., as shown in the *Handbook*. See Fig. 2C. For 7 mc. a second wire should be added, just as was suggested above at Fig. 2B. Make the second wire about 40 feet long, and use a series condenser to tune the system. For 3500-kc. work the lower end of the coupling coil must be grounded and the tuning condenser connected across the coil instead of in series. Although this is far from being an ideal 3.5 megacycle antenna, it will *work*, and that is the main point.

Of course there are lots of other combinations that can be adapted to the particular conditions encountered. But it will not be hard to determine what kind of antenna to put up to tune to a certain frequency if it is remembered that the electrical length of an ungrounded antenna must be equal

(Continued on page 88)

Magic—Ancient and Modern

Or the Mystery of Modern Radio

By F. S. Dellenbaugh, Jr.*

ONCE upon a time 600 years before Roman lions grew sleek on succulent Christian martyrs, THALES, the first AMATEUR, wrote a story about ELECTRICITY. He wrote it in Greek, because he was Greek. Much of such stuff has been Greek ever since. This first story described the fact that when amber was rubbed with cloth little pieces of paper would stick to it. He called it ELECTRICITY right away, since by a peculiar coincidence, this was the Greek name for AMBER. Other people joined him, with good old-fashioned names like THEOPHRASTUS, and began comparing notes on how many pieces of paper they could pick up. To compare notes you must

TWO SCHOOLS OF THOUGHT AROSE, THE "BRUTE FORCE" AND THE "INTELLIGENTSIA"

have a measure of results. Amber rods might be rated by the number of pieces of paper they will pick up. As the Greek letter *Pi* has something to do with dividing up a circle and hence tearing up paper amber rods could be rated in *"Pi-s."*

So-o-o-o, as ED WYNN says in his best heterodyned warble, we look back on the ATHENIAN AMATEUR ASSOCIATION meeting on the ACROPOLIS to compare the power, effectiveness and beauty of their AMBER AMATEUR EQUIPMENT. Two schools of thought arose, the "BRUTE FORCE" exponents, going in for bigger and better hunks of amber, and the "INTELLIGENTSIA" elaborating their skill in rubbing. Stimulated by competition so many pieces of paper were finally picked up that ratings were expanded to *Kappa-Pi-s* or *"KP"* for short, similar to our modern KC frequency unit. The artistic Greek temperament composed a song to be chanted in honor of the victor acquiring the largest *Kappa-Pi.* The modern version of this dear old song comes down to us as "Let's have another Cup of Coffee and another Piece of Pie," showing the introduction of scientific terms into popular language at this early date. The similarity between *"Kappa"* and *"Coffee"* and between *"Pi"* and *"Pi-s"* is obvious. The meaning has diverged far from the original use, undoubtedly due to the present chief industry of Greeks in this country being associated with comestibles rather than electrons. This question of popularizing scientific words to different meanings arises continually in philology and etymology.[1] To go ahead of our story for a moment, later investigators found that silk threads would insulate charged bodies. The electric battery was discovered by frogs' legs kicking when hung with copper wire on an iron railing. The association of ideas in silk and legs is now evident to anyone not totally blind.

When the GOTHS and VISI-GOTHS swept through Europe from the North, their military interests displaced amateur activities even as similar interests attempt to do today. A few enthusiasts escaped to ARABIA where science became thoroughly entangled with MAGIC AND MYSTERY. Everybody let it go at that for about a thousand years, and a great many of us seem to be content to let it go for another thousand years.

Just after SIR WALTER RALEIGH invented CIGARETTES, an English gentleman by the name of GILBERT wrote a book called "DE MAGNETE, MAGNETICISQUE CORPORIBUS ET DE MAGNA MAGNETE TELLURE."[2] Anything that starts off with a name like that will thoroughly frighten anybody, but in spite of the fact that since then more and more books, stories and articles have been written about electricity, habit, superstition and mystery still prevail.

The situation is something like this. If one RABBIT is equal to 100 watts and one SILK HAT is equal to a $5.00 transformer and there are 5,000,000 rabbits in AUSTRALIA, how many rabbits will have to come out of one hat to talk to CENTRAL CHINA?

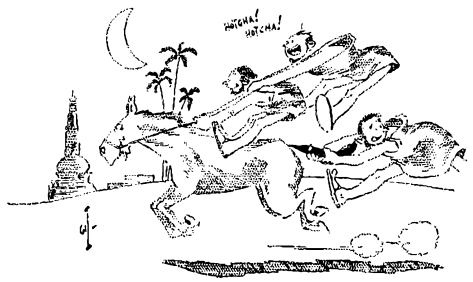
After the Indians were subdued so that your hair was safe, Vigilante Committees were organ-

* Delta Mfg. Co., Cambridge, Mass.

[1] Having something to do with the study of words and put in to make it difficult.

[2] "On Magnets, Magnetic Bodies and That Great Magnet, the Earth."

ized to keep more predatory activities suppressed by squeezing Adam's Apples against their Spines with appropriate ropes, riatas, or lariats depending upon which wild West thriller you happen to read. The amateurs themselves not long ago developed the WOUFHONG, which operated on just the opposite principle of squeezing the offenders' Adam's Apple and Spine as far apart as possible,



A FEW ENTHUSIASTS ESCAPED TO ARABIA, WHERE SCIENCE BECAME THOROUGHLY ENTANGLED WITH MAGIC AND MYSTERY

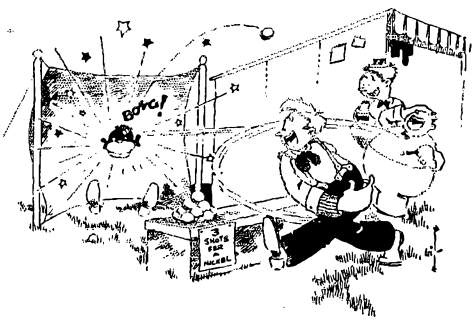
while a deft turn of the wrist eliminated further activities to the annoyance of his associates.

The use of the WOUFHONG, like other Medieval Mechanisms of Torture, has gone into the discard, but a similar instrument seems needed for the more modern chirps, birdies, and hums that emanate from many of the chambers of mystery accumulated by the modern young American. The motto seems to be "Pile on the Juice, give her the Soup and let her Rip."

One of the greatest troubles in improving knowledge lies in adequate data for comparing notes. It is easy to count the number of pieces of paper which an amber rod will pick up, but questions of transformer output, choke inductance and tube ratings are more elusive, requiring test by expensive meters or special circuits not available for the average amateur. The commercial confusion is extremely disconcerting. Pick up any mail-order house catalog, and even some better publicity literature, and you will find the greatest hodge podge of pseudo-science and ratings resulting from merchandising instinct rather than engineering. Setting aside some of the erratic voltage ratings on transformers, the output is really dependent on heat. It takes time to reach final temperature under load. Without some mention of duty the volt-ampere size of a transformer is meaningless. It may deliver its output for 5 seconds or 5 minutes or 5 hours. Almost any output can be taken for 5 seconds without damage. A small transformer may be satisfactory for 5 minutes and yet begin to smoke or melt wax all over the bench long before many hours have expired.

Chokes are rated by test methods which in general bear no relation to the value of inductance effective in smoothing circuits. Some time ago a well-known manufacturer recommended a 30-henry and a 1.5-henry choke in the two sections of a filter. The combination looked unreasonable, but worked well. More careful test showed that the 30 henry was actually about 18 and that the 1.5 henry was actually about 12, and the filter circuit was fairly good. In the days of B-eliminators a 30-henry rating became standardized, and it appears to be the ambition of many radio engineers to use 30 henrys for everything. A broadcasting station recently wanted to install a 30-henry 2-ampere choke. Such a choke would weigh about 500 lbs. Actually 4 to 6 henrys was adequate. Choke operation depends upon energy storage which is the product of inductance times the square of the current. The value of inductance alone bears about the same relation to the choke as voltage alone does to the transformer. Recently an amateur mentioned that the magnet coil from a dynamic loud speaker made an excellent smoothing choke of about 15 henrys. Proper tests upon a supposedly identical coil showed that it measured 0.15 henrys. The error was only 100 to 1.

Out of 15 chokes of various standard manufacture, tested by methods giving the proper smoothing inductance value, 6 had less than one-half their inductance rating, 4 were very little over one-half, and the remainder ran from 60 to 90%



CRACKING CRANIUMS IS LOTS OF FUN, BUT ACCOMPLISHES LITTLE THAT POSTERITY CAN POINT TO WITH PRIDE

of rating. The variation in inductance with load varied all the way from a range of 3 to 1 to a very flat choke with only 20% increase. When standard commercial ratings show such big discrepancies in smoothing value and variations of inductance with load, no wonder amateurs have trouble in obtaining similar results with apparatus of different manufacture. Fortunately condensers come fairly close to rating, probably because they can be easily measured and do not involve confusing elements such as saturation of iron and limits of output by temperature rise. Cracking craniums with a baseball in the midway of a county fair is lots of fun, but accomplishes little

(Continued on page 86)

Navy Day—1932

By E. L. Battey, Assistant Communications Manager

FOR the eighth consecutive year the Radio Amateurs of the United States participated in the celebration of Navy Day on the anniversary of the birth of former President Theodore Roosevelt, October 27, 1932.

Upon the invitation of the Navy Department, the American Radio Relay League again conducted receiving competition for all American amateurs. Messages from Secretary of the Navy C. F. Adams were transmitted from NAA (Arlington) and NPG (San Francisco) on preannounced schedule.

Twenty-five letters of commendation were offered by Secretary Adams to the operators showing greatest proficiency in copying the messages. The twenty-five operators winning these letters are listed elsewhere in this article. All amateurs submitting any copy of the messages are listed on the "Navy Day Honor Roll."

Participation in Navy Day receiving competitions has increased steadily from year to year, with a record number of *460* amateurs submitting copies in 1932. These 460 amateurs submitted 537 copies; 365 copied NAA only, 17 copied NPG only, and 78 copied the message from both NAA and NPG, making 442 copies of NAA and 95 copies of NPG.

The 1932 Navy Day Message was copied in 45 states and the District of Columbia, the states not reporting being Montana, Wyoming and South Carolina. The message was also copied in Nova Scotia, Quebec, British Columbia, Porto Rico, Canal Zone and the Netherlands. NAA was copied by PA0QQ. W5AB-BBY copied NAA while coming through the Panama Canal locks aboard the M. S. *Santa Barbara*, and copied NPG alongside the dock at Balboa. ExW6DTZ, aboard the S. S. *Ohioan*, copied both NAA and NPG in the Western Atlantic Ocean about 330 miles east of Miami. Participants in "outside" localities are attached for the purposes of the competition to the Naval District nearest them, except in the case of PA0QQ, who is not attached to any district due to his great distance from the States.

1932 NAVY DAY MESSAGE TO RADIO AMATEURS

All Amateur Radio Operators of the United States and Insular Possessions:

The Navy Department learns with interest there are now over thirty thousand licensed amateur radio operators in the United States and its possessions. To this fine body of American citizens we extend on Navy Day the best wishes of the Navy Department. We number among these amateurs many good friends and list on the rolls of our Volunteer Communication Reserve several thousand of the most competent and expert among them. During the past year we have increased the personnel of our Communication Reserve by six hundred men bringing the total up to four thousand three hundred persons. To those of you who have not already joined the Communication Reserve I suggest that you give thought to the desirability of so doing with the idea that in time of peace much information of interest is available and many fine contacts with the Service will be possible. Again I wish to express our appreciation of the fine coöperation that has always existed between American amateurs and the Navy Department.

C. F. ADAMS, Secretary of Navy

(This message transmitted from NAA; the message from NPG was a paraphrase of NAA's message. The above is not for checking purposes, since it is not "letter for letter as transmitted.")

The twenty-five letters of commendation from the Secretary of the Navy have been distributed throughout the various Naval Districts in proportion to the amount of participation in each district. The Ninth Naval District with 141 participants gets seven letters, the Third Naval District with 86 participants gets five letters, and so on. The twenty-five high are listed in order of rating. All participants other than the twenty-five high are listed by Naval Districts in order of their accomplishments as compared to other participants *in their district only.* Copies from each Naval District were graded separately.

Automatic tape transmission was used in sending the messages from NAA and NPG. Imperfections in punching the tapes at both stations caused one word in the text of the message from each station to be sent incorrectly, as follows: NAA sent ". . . appreciation of the fine *coopgation* . . . ," instead of ". . . appreciation of the fine *cooperation.* . . ." NPG sent ". . . increased the personnel of our *Communiera-*

tion Reserve . . . ," instead of ". . . increased the personnel of our *Communication* Reserve. . . ." The operators who noticed these errors place well above others on the "Honor Roll." NAA transmitted at approximately 20 words per minute, NPG at approximately 30 w.p.m.

The usual annoying forms of QRM were prevalent, varying from the common power leak to the "dough mixer" in the local bakery. When QRM caused operators to miss words or letters, they sometimes "filled" the missing portions with "what they thought it should be." Perhaps the most outstanding example of "guessing" was in the case of the two operators whose copies started out, "All Amateur Radio Operators of the United States and *Insulated* Possessions"!! And then there was the chap who thought "McAdoo" was Secretary of the Navy! An historical note might be that *John Quincy Adams* copied the message in Battle Creek, Michigan.

The Honor Roll follows. Every operator listed should feel with just satisfaction that he, on Navy Day, 1932, did his bit in respect to our United States Navy:

1932 NAVY DAY HONOR ROLL

The Twenty-five High

W6CBY-RB, Roy A. Jenkins, Escondido, California (11th Naval District)

W9DXY, Porter H. Quinby, Omaha, Nebraska (9th Naval District)

W8ABX, John J. Long, Jr., Brighton, New York (3rd Naval District)

W8DMJ, Hilton W. Gillett, Hartford, New York (3rd Naval District)

W8SS, Kenneth E. Stecker, Detroit, Michigan (9th Naval District)

——, Cy Finch, Marfa, Texas (8th Naval District)

W9ANT, Russell Johns, Laurium, Michigan (9th Naval District)

W1BML, Curtis G. Docherty, Providence, Rhode Island (1st Naval District)

W8APQ, M. L. Croft, Martinsburg, Pennsylvania (4th Naval District)

W4BL, L. W. Bryant, Lakeland, Florida (7th Naval District)

W6CIS, Kenneth Hughes, San Francisco, California (12th Naval District)

W9GGB, H. B. Davis, Danville, Kentucky (9th Naval District)

W9CDA, W. Chauncey Alcock, Danville, Kentucky (9th Naval District)

W9CEX, E. Seppla, Dollar Bay, Michigan (9th Naval District)

W3CAB, C. A. Briggs, Washington, D. C. (Att. to 5th Naval District)

W6CAC, M. J. Niklas, Petaluma, California (12th Naval District)

W7AJ, Peter Fakkema, Oak Harbor, Washington (13th Naval District)

W5FM, Guy A. Simmons, Jr., Little Rock, Arkansas (8th Naval District)

W1CU, Ralph J. Renton, Quincy, Massachusetts (1st Naval District)

W8AJE, C. B. Thompson, Oakmont, Pennsylvania (4th Naval District)

W8AND, Eugene Alden, Toledo, Ohio (9th Naval District)

W8OE, John H. Leighner, Butler, Pennsylvania (4th Naval District)

W2EDI, Philip Schifflin, West New York, New Jersey (3rd Naval District)

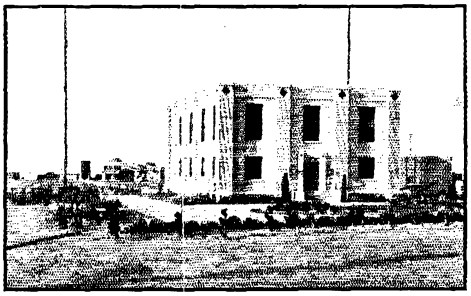
W2BNJ, Ralph Cabanillas, Jr., New York, New York (3rd Naval District)

W2CJI, Joseph W. Haluska, New York, New York (3rd Naval District)

The remaining 434 participants on the Honor Roll follow. They are classified by Naval Districts and are listed under their respective districts in the order of rating. Where calls are connected by dashes it indicates that those participants have equal ratings and are listed in a group, alphabetically:

First Naval District: W1ABQ-W1CFG-W1VV W1DPR W1DVJ W1CHF-W1QE-W1VF W1AAY-W1ANI-W1ATF-Geo. F. Crocker, Jr.-W1DMM W1CRP-W1DFQ-W1DUK W1BRU W1CCP A. F. Hilferty W1KH W1EWX W1AKR VE1EP-VE2BE-W1EQG W1AFF W1VE-W1WE W1BLA W1DWO-W1ZC W1BEU W1CKI W1BYF W1DTM VE2AH *Third Naval District:* W2LV W2AOJ W2BJX W2QM W2ACY W2BCB W2ALZ W8DME W1ASP-W1ES - W1HD - W2ATM - W2AZV - W2BEG - W2CUH-W3CMI-W8DBX-W8FDY-W8TZ W2BJA Robert F. Wilson at W1YU-W2ANM-W2BED-W2DFU-W2LR-W8EOA W1BBU - W1BWS - W2AOY - W2AXP - W2DJD-W2FW-W2LU James N. Whitaker W1BYW-W2AFV-W2AIQ-W2CPD-W2ENC-W8CWH W1DMP-W1DOV-W2AKH - W2BZZ - W2CJX - W2DLI W2CAO - W2GP-W8EMW W2DNK Frederick Best of W1BIG-W2AUP Joe Tucker W2JQ W1IJ-W2CC-W2DCT-W8OA W1BEW W2ALY W2DPU-W8FUD W1CDZ W8ATA W2BWZ-W2EGQ W2CSQ-W8FWH W2BRZ W1BJC VE3AD W2DIJ W2PY W8FOY W8COD-W8EKM W2BKO W2BOT W8FIM W1DBW W1EBT *Fourth Naval District:* W3AKB W8DVZ W3AHZ-W8ASE-W8ECH-W8VI W3JR W3ADE - W3CBF - W3CDN - W3CL - W8ELZ - W8FLA W3JN W3AKU-W8AFV W8BX W3BAK-W3WJ W3BVY W8AXH-W8DGW W3AGC-W3AOJ John A. McGinty W3BPJ-W3BRH-W8DYO W3BBK W3AEJ W3ML W8CLV W3ANA-W3AQJ W8BYS W3QM W3ABZ-W8BLL W3ATJ W8FDA W8CRK W8GNH W8DPQ Walter C. Missimer *Fifth Naval District:* W3CMV-M. E. Lundfelt at W3ADO W3ZD John N. Boland at W3ADO W3BCS-W3BST-W3NR W3EH W3BRQ-W4RE W3BAI W3OZ-W8AZD W4TP W3BNL W3IE W3VJ-W4SB W3BRA-W3CV W4JR-W8BWK W3CKH A. C. Heck at W8CLQ J. Roy Heck at W8CLQ W4AA *Sixth Naval District:* W4AHG *Seventh Naval District:* R. M. Hansen W4BG W4HC-Joseph B. Kuehl W4AEM W4BMN W4AKV W4AGN-W4BCJ-W4SK K4BU-Rufus M. Robbins W4BLF-W4BQH Arthur Hale W4UE *Eighth Naval District:* W5IQ W5BMI W5TR W5SU W5ALV W5KC W5ON P. W. Dansboe at W5SU W5AO W5AAD W5NW W5CT-Elmore Hebert W4RO-W5BTH W5ANU W5ALD H. B. Cowan W5JK-W5MD W5WW T. J. M. Daly W5BCW W5CCY W5ADZ W4APJ W5BJ W5BED W5AUX W5JA W5BHO W5BRQ Vernon Gibson *Ninth Naval District:* W9CTZ W9EVQ W9FFY W9GNT-W9IRS W9CNY W9DGR W9COS W9AQX V. Babcock at W8BGY-M. Klintworth at W8BGY-W8JO-W9AOG-W9DKF W9CZC W9AHH W9DJA W9BRA W9GBI W8BKM W8GHF Harry Adams W9BKK-W9CGP-W9GPM W8BAH-W9BXT-W9EVM-W9HWK-E. J. Jacobson-P. S. Pfeifer at NDS W9DGS-W9HYF-Ollie R.

(*Continued on page 84*)



REMEMBER TRYING TO GET BOLINAS ON THE LONG WAVES BACK IN THE "GOOD OLD DAYS"?
Here's the modern plant housing transmitters for world-wide high-frequency circuits.

"It's a Ham Paradise"

An Amateur's Impressions of KEL, Bolinas, Cal.

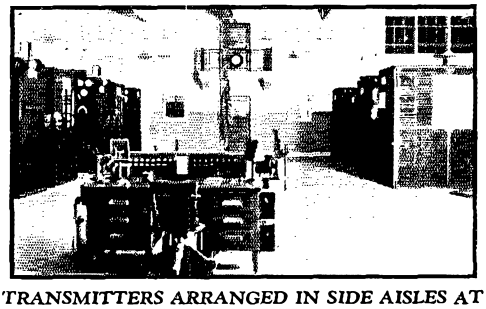
By A. W. Anthony, Jr., W1CTE*

NOT as a reporter of engineering feats nor as a spinner of tall travel yarns, but simply as a ham, curious and interested, I had occasion to visit the high frequency transmitter building of R. C. A. Communications, Inc., at Bolinas, California, late in May this year. I was driving perhaps six miles away, noticed the forest of poles and towers, drove over, was contemplating the "No Admittance" sign at the entrance to the mile-square enclosure when a man drove out, obviously going somewhere in a hurry. I hailed him, stating my desires, and was told to follow, that he would arrange it; back in the office, it turned out to be the Engineer-in-Charge of the whole plant. He very courteously issued a pass and introduced me to the operator on duty with instructions to him to do all he could for me — which instructions were admirably carried out.

I entered the transmitter room on the second floor. Man, oh Man! A room perhaps 60 feet wide by 80 feet long with maybe 16-foot ceiling; a wide central aisle flanked on both sides by rows and rows, it seemed, of black panels, meters, dials, switches, grill work, yellow gleams of filaments kept hot, here and there the blue flicker of mercury rectifiers under keyed loads; but not a sound, no monitor, no loud speaker, only an occasional click from a telegraph sounder as operators at the control office in San Francisco gave instructions regarding the transmitters. Gradually I came down to earth, so to speak, and began to take in details. There were some dozen transmitters, arranged in side aisles at right angles to the main aisle, two transmitters face to face across an aisle followed by two back to back, and so on. The more recent transmitters were built in two sections, the first containing the crystal, buffer, doubler and lower-power amplifying units, and the second the high-power output amplifier with antenna coupling apparatus. The output amplifiers usually had two 20-kw. water cooled tubes in push-pull, although several sets had four of these tubes in parallel push-pull. From the ham's point of view, they certainly were reckless with their plate volts and amps; yes, I said, "amps," and not milliamps, for real, honest-to-goodness power was used — say 6.5 amperes at 11,500 volts for one of the 40-kw. sets; most of the sets operated at less than full power, however, only enough to give reliable transmission under all conditions. Plate voltages could be varied by remotely controlled tap-changing switches on the primaries of the step-up transformers.

Another thing smote me firmly in the eye when I first entered. A sign gave the name of the other end of the circuit of each transmitter, and the list included New York, Honolulu, Tokio, Mukden, Shanghai, Java, Indo-China and several other points equally distant. Talk about DX!

In a far corner, I had glimpsed row upon row of neatly racked tubes. A little later I was privileged to enter the tube stock room, and gaze — and marvel! I confess to having felt nervous, and slightly piped down as well, to be in the presence of so much expensive glassware; I have seen literally hundreds of millions of dollars in gold bars in the below-ground vaults of the Federal Reserve Bank of New York, but that seemed as nothing compared to the $7,000 to $10,000 inventory of tubes there at Bolinas. The Type '10 was in the majority, since it was universally used in the crystal oscillator stages; but most of the others were big fellows in rating if not in dimensions, being water cooled, although to me they lacked the glistening splendor of the large size



TRANSMITTERS ARRANGED IN SIDE AISLES AT RIGHT ANGLES TO THE MAIN AISLE

*31 Horne Road, Belmont, Mass.

air-cooled tubes. I believe 1 kw. was the largest air cooled tube, with many of 500 and 250 watts, both triode and screen grid; the good old 50-watt bottles were there, with of course '66s, '72s and still higher powered rectifiers. On another wall of the stock room crystals were neatly arranged, classified according to frequencies; maybe 50 of them, maybe 100. I was told that the tube expert on the staff did nothing but look after the tubes, keep their logs, make periodical tests, and make full reports to the tube development bunch at the main offices in New York.

In the opposite corner was a small room containing the controls — the nerve center. The incoming control cable from San Francisco terminated in a panel similar to a telegraph switchboard, so arranged that any control circuit could be plugged onto any transmitter, various tests easily made, etc. An oscillograph was here, too, used a good deal in studying wave forms, key clicks and the like. Remote control of the incoming lines of the Pacific Gas and Electric Company was had from a small panel. Power came from separate sources, one at 60,000 volts, the other at 11,000, with suitable step-down transformer banks of perhaps 1,500 kw. capacity, and was distributed at 11,000 volts. Outside each building it was again stepped down to 230 volts three-phase, for use in the transmitters.

The whole ground floor was given over to power apparatus, main rectifiers plus necessary auxiliaries such as pumps for circulating cooling water, storage batteries, machine shop and electrical shop. Each transmitter on the floor above was located directly over its power supply on the first floor, so that high voltage leads were short and direct. Rectifiers were either three- or six-phase, so that filtering was at a minimum compared to the average ham station with its single-phase full-wave supply. Only a relatively small reactor (we call 'em chokes) with not much condenser capacity, and the deed is done — "PDC," nothing less. Simple, isn't it?

Antennas? A square mile of them. Transmission lines? Fifteen or twenty miles, for a guess. A mighty neat layout job was done in providing flexibility, for any antenna on one side of the building could be connected to any transmitter on the same side, with only a bit of changing of connections in the framework immediately outside the station wall. Most of the antennas for point-to-point circuits were of the broadside array type, with reflectors and all other improvements designed to deliver the maximum sock at the receiving points, with a minimum of power and apparatus; these were carefully aimed, *a la* great circle. Others were two-wire matched impedance systems (see The *Handbook*). There were some tall steel towers and poles erected for the long-wave stuff, but mostly wood poles were used, 40 to 75 feet high; and viewed from a distance they made a veritable forest — one might almost think of it as a Gargantuan No Man's Land of posts and barbed wire.

Because of the lateness of the hour, I did not visit other buildings wherein were located the long-wave transmitters for ship and other traffic, the Alexanderson high-frequency (for those days) alternators of large power, tube sets for KPH, quarters for personnel, garage. No, these were passed by; for wasn't I now one of the anointed? Hadn't I seen everything that mattered?

'PHONE, TOO

Each transmitter usually was arranged to work on at least two frequencies to provide for uninterrupted traffic both day and night. Often the same crystal would be used, sometimes a change would be necessary; the operator told me that he could change crystals, completely retune the whole 6 to 8 stages, and have the circuit back in operation in less than five minutes; that op certainly knew his transmitters.

There were a couple of portable modulator units on big rubber-tired castors, designed to be plugged into any transmitter, with self-contained power supply complete. One of these was used regularly to transmit program material to Honolulu for rebroadcast; the other was being used on special work. Modulation was done at low power levels, amplification being linear. Telegraph keying was done by plate absorption in one of the low level stages. There were meters all over the place, big ones, little ones, medium sized ones — about three per stage on the average, for a guess. Very many were of ham sizes, but they got up to the 7-inch switchboard types on the output amplifier stages. Low-voltage power supplies for crystals and early stages were built into the transmitters, only the main rectifiers being down below. Everything was reduced and simplified to take a minimum of time and attention from the operator, together with certainty of continued operation. Remote-control switches, time delays, electrical and mechanical interlocks to prevent wrong operation — such, for instance, as the opening of doors to the rear of transmitters when juice was still on, or applying of high voltage to cold filaments, etc., etc. Throw a couple of small snap switches, watch meters a moment, and a cold set is ready to turn over to San Francisco to operate.

A word about San Francisco control, which I visited later, and I am done. All transmitting and receiving is done at the office at San Francisco, which is connected by pneumatic tube with the wire telegraph companies. Messages are typed on to a perforated tape which is run through a machine sender (no bum fists tolerated). Usual transmitting speeds are from 50 to 70 words per minute, as most of us hams well know. The receiving station is at Point Reyes, some miles further up the coast beyond Bolinas; here the

(Continued on page 51)

Election Results

Four A.R.R.L. Directors Reëlected, Three New Ones in Office

THE A.R.R.L. elections for directors this year resulted in an unprecedented amount of interest by the membership. Not only was there more than one candidate in each of the seven divisions where elections were scheduled — thus necessitating balloting in all divisions — but three divisions put up three candidates and one had four! More than ever League members are displaying keen and intelligent interest in who shall represent them on the A.R.R.L. Board of Directors.

As a result of the balloting, four of the old directors were returned to office over their opponents, while three divisions bring new men to office.

CENTRAL DIVISION

In the Central Division three names were put in nomination, Mr. Windom, W8GZ-W8ZG, the director for the past term, Mr. E. A. Roberts, W8HC, and Mr. R. M. Crandall, W9FKE, Mr. Windom being reëlected with a majority of the total votes cast:

L. G. Windom	852
E. A. Roberts	538
R. M. Crandall	271

HUDSON DIVISION

Three candidates were named from the Hudson Division, too — Mr. A. L. Walsh, W2BW, the director since 1929, Mr. B. J. Fuld, W2BEG, and Mr. H. G. A. Mustermann, W2TP, with Mr. Fuld winning a closely contested election by the narrow margin of eleven votes:

B. J. Fuld	336
H. G. A. Mustermann	325
A. L. Walsh	256

The new director, Mr. Fuld, a resident of Brooklyn, is an attorney practicing before the courts of the State of New York and also, recently, before the Federal Radio Commission. An amateur for twelve years, he is an O.R.S., a director of the Radio Club of Brooklyn, and holds the rank of Ensign C-V (S) in the U. S. Naval Reserve.

NEW ENGLAND DIVISION

Two of the candidates in the special election held in this division last spring were again nominated, with the incumbent, Mr. Bailey, W1KH, winning over his opponent, Mr. C. B. Weed, W1BHM:

G. W. Bailey	569
C. B. Weed	164

NORTHWESTERN DIVISION

Former Director Weingarten, who has represented this division on the board since 1923, declined to be nominated again, and the election was between Mr. John B. Waskey, W7TX-W7UU and Mr. Ralph J. Gibbons, W7KV-W7BIX, the latter winning by a margin of eleven votes. The voting:

Ralph J. Gibbons	239
John B. Waskey	228

Mr. Gibbons has had wide experience as an amateur, both in the seventh district, where in 1927–1928 he was president of the Walla Walla Radio Club, and in the fifth district, where he was a charter member of the Galveston Radio Club. He is owner and manager of the Arrow Sign Co., at Walla Walla, manager of the Walla Walla Airport, and is a full-fledged Army pilot, holding a commission as lieutenant in the Air Corps Reserve. We wonder whether he will fly to the board meeting this spring in the Lockheed monoplane which he uses to get around the Northwestern Division!

ROANOKE DIVISION

Like his colleague in the Northwestern Division, former Director Gravely, who has seen service on the board since 1924, refused to permit his name to be put up again this year, and the election was a spirited contest between four candidates, Messrs. Caveness, W4DW; Eubank, W3AAJ-W3WS; Hoffmann, W8HD and Key, W3ZA. The balloting was unusually heavy, and represents a vote of approximately 75% of the division membership:

H. L. Caveness	121
R. N. Eubank	89
C. S. Hoffmann, Jr.	47
J. Frank Key	43

Mr. Caveness, the new director, hails from Raleigh, North Carolina, is a graduate of Duke University, and is now assistant professor of chemistry at North Carolina State College. He is S.C.M. of North Carolina, net control station for that state in the army-amateur system, and holds a reserve commission as first lieutenant in the Chemical Warfare Service.

ROCKY MOUNTAIN DIVISION

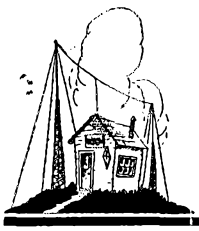
In this division, nominations were received for the incumbent, Mr. Andrews, W9AAB-W9ZZX, and for Mr. L. D. Stearns, W6BTX, of Salt Lake City, Mr. Andrews being returned to office:

R. J. Andrews	107
L. D. Stearns	76

WEST GULF DIVISION

Three candidates were originally named in this division — the incumbent, Mr. Corlett, W5ZC,

(Continued on page 84)



Amateur Radio STATIONS

W4AA, Greensboro, N. C.

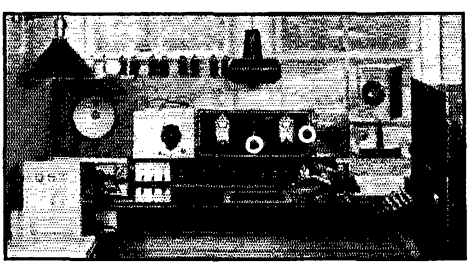
ATTICS have long been favorite roosting places for amateur stations. W4AA, two photographs of which are shown here, is a rather large station in a rather large attic. Wayne M. Nelson, 767 Percy Street, Greensboro, N. C., is the builder and owner. Here is his own description of it:

"The W4AA rig is intended to be woefully conventional insofar as circuits and design are concerned. Convenience of operation is a reality here. The operator's seat is within arm's reach of more than 12 feet of operating desk. Monitor, freqmeter, log, call books and stationery are on the desk portions on either side of the operator. The receiver is a battery-operated Pilot Super Wasp and reception is mostly on loud speaker. Not wishing to limit the frequency range of the receiver by cutting out plates, band spreading was accomplished by paralleling a midget across the regular tuning condenser. In actual practice the main tuning condenser is accurately set by the freqmeter. A bank of 15 switches, some d.p.d.t. for changing from speaker to 'phones, and others regular make and break for a.c. current, but all toggle type, are located directly in front of operator and just beneath the receiver. These control plate and filament (separately, of course) of two transmitters. Since the shack represents the upper half-story of a one-and-a-half story dwelling the summer temperature is fierce, and recently a duplicate set of controls was paralleled across the most-used 40-meter transmitter and a separate a.c. receiver installed downstairs. In the transmitters keying current is supplied by dry plate rectifiers such as were once the vogue for trickle chargers. A trickle charger of this type is also controlled from the switch panel and keeps the storage battery on the receiver well charged. One particular factory-built a.c. short-wave receiver proved to be unsatisfactory for reception but excellent as a monitor, giving loud-speaker monitor signals — extremely convenient when the operator is in the transmitter room making tuning adjustments.

W4AA TRANSMITTERS

"The transmitter used most of the time is the rig nearly out of sight at the far end of the transmitter room, the panel being a few inches taller than the three like panels in the center of the room. This set uses a 3600-kc. crystal with a 245 oscillator into a 210 amplifier or doubler, depending upon whether used on 3600 or 7200 kc. The final amplifier is an 852. 872 rectifiers supply 1660 volts plate for the final tube and dropping resistors supply the other two tubes. Bias is supplied by a rectifier using a BH Raytheon tube. This transmitter for the couple of years past has been the old reliable.

"The other rig, the three like-size panels, has been just about everything any of the gang could suggest. First a 'phone set, and at various times thereafter a 250-watt c.w., a push-pull rig, and, in general, an experimental rack. The center panel houses three power supplies: a 2200 plate supply from '72 rectifiers and two 500-volt supplies together with an extra bias-supply unit. Two filter chokes in this rack are of quite healthy dimensions, both being 1500-mil rating, one 50- and the



RECEIVING POSITION AT W4AA

other 70-henry size. These were built here in spare time in a motor repair shop.

"All crystals are worked in holders provided with center pressure adjustments, except that the holders are all worked upside down, the usual 'bottom' plate being connected to grid. Then, by a bit of manipulation on the pressure from the bottom side the crystal may be used, abused and sometimes misused, at will, without any hesitancy. An otherwise 'finicky' crystal may that way be made to perform nicely. The usual adjustment is really more of an air gap rather than pressure.

"The small rig in the right-hand side of the photo is a TNT built up one rainy day last spring when the weather was too bad to permit doing anything else. It cost exactly eight hours' pleasurable work, nothing more, but it is capable of working when given an opportunity, which is rare.

"A freqmeter was built after the enthusiasm imbued by a reading of a constructional article in *QST*, and is calibrated and checked by W1XP, and W9XAN s.f. transmissions. There is a great deal of satisfaction in knowing just what one's frequency is. These birds who seem to park just outside the fence on the 7300 end are someday going to wish they had given more heed to the 'no parking' admonition of Headquarters and all sensible amateurs.

"Three transmitting antennas, all of the Zepp type, are used, two are for the 40-meter band, the other for 80. One of the 40-meter aerial rigs is hung to the main antenna masts, these being two tubular steel masts each composed of three sections of 20-foot galvanized pipe, tapering from 4 inches diameter at bottom to 3 inches at top, giving an effective height of 55 feet each.

"DX is FB for the fellow who has an insatiable itching for it, but here at W4AA there is just as much genuine pleasure in an hour or two ragchewing with a genial ham in the next county or next district as in the next continent, although there has been plenty of DX piled up in the log.

"Pre-war call was issued April 16, 1916, as 4DV. My first vivid recollection of anything pertaining to 'wireless' was a magazine article which I copied in ink (still have the copy) entitled 'How to Make a Wireless Telegraph.' The receiver was a headphone across a 1½-volt dry cell. A V-groove was filed in the top of the carbon post (the type dry cell that had the carbon about 1½ inches above the rest of the battery). A sewing needle was laid across this groove and a hook in a wire fastened to the side connection of the battery. This was the detector, but it failed to 'detect' for me, even for the distance of about 200 yards.

"When the pink sheet in October, 1919, *QST*, said 'BAN OFF,' my application blanks were all filled in, signed and ready to drop in the mail, with the result that I got the first call to be issued. Companion calls which have been added at other locations in more recent years include W4AB and W4ABC.

"Have rating of Ensign in U.S.N.R. and Commander of Greensboro Unit of the U.S.N.R. Licensed as operator Radiotelephone first class."

W8DED, Holland, Michigan

ONE of the pioneer DX and traffic stations in Western Michigan is W8DED, owned by Rus and Bill Sakkers, 53 East 7th Street, Holland, Michigan. The call letters are well known to all DX and traffic men. This station has been on the air since 1924, and was one of the early stations to make a success of 20 meters.

The transmitter now in use is a 75-watt outfit using an 852 oscillator, worked on the 20-, 40- and 80-meter bands. Input power ranges from 125 to 150 watts. The transmitter is built in breadboard style with the tuning apparatus in the top shelf; the filter, filament transformer and relay key on the second shelf; and the plate transformer and 866 tubes on the bottom. A 1500-volt Thordarson transformer furnishes the plate power. The filter consists of two 2-mike Seimens Halske condensers and a 30-henry choke. Cardwell condensers are used to tune the outfit. These condensers have the coils mounted directly on them, held by thumb screws in small tubular mountings. This is done so the transmitter can be quickly changed to another band if desired. The operating switch is placed in the center of the receiver table.

A short-wave receiver is in the aluminum box at the right-hand end of the table. This receiver is similar to the one described in June, 1931, *QST*, and has a tuned r.f. amplifier and detector using 232 tubes and a 233 pentode as audio amplifier. Old Grebe dials with verniers on the bottom are

used to tune the set. The monitor is the usual type and is on the extreme right-hand corner of the table. When QRN is bad the BCL receiver on the left-hand corner of the table is used.

The operating room is located on the second floor of the house and all antenna leads come through the windows. The antenna used on 20 and 40 meters is a Zepp with 33-foot feeders and 65-foot top, 50 feet above the ground. On 80 meters a counterpoise 40 feet long is added and used with the live wire of the Zepp. This system has proved very successful.

W8DED won the DX certificate for Michigan during the 1931 tests, and placed 17th among the nation's leading stations. W8DED formerly was Michigan's leading traffic station. Contacts have been made with 60 countries and all continents have been worked at least four times each. W8DED now holds an ORS, OBS, RCC, AARS and WAC as well as ex-RM of Michigan. "Rus" does most of the operating and spends his time printing QSL cards for the gang. The usual QRH is 3800 kc. while 20 and 40 meters are used occasionally for DX and rag chewing.

The Governors'-to-President Relay

March 3 (5 p.m. E.S.T.) to March 4 (5 p.m. E.S.T.)

THE inauguration of the President of the United States takes place on March 4, 1933. We amateurs, in 1921, 1925 and 1929 successfully relayed messages from the governors of *each* state and territory, to the Chief Executive of the Nation, on the occasion of his inauguration. Plans have just been concluded with the Washington Radio Club making possible the announcement of a similar relay for the inauguration of President-elect Roosevelt in 1933.

Every active U. S. amateur who has a station on the air will be interested in assisting in this activity. The relay will start at 5 p.m. E.S.T. (4 p.m. C.S.T., 3 p.m. M.S.T., 2 p.m. P.S.T.) *March third*, continuing *until the same hour March fourth*, after which hour all the messages that have been received in Washington will be delivered at the White House. The traffic will be originated [1] simultaneously in the forty-eight states (we hope all 48, and of course messages from executives in the Territories of Alaska, Hawaii, and from the Philippines will be welcome too), *as soon as possible after the starting hour.*

All amateurs alive to this situation are invited to coöperate in the relaying of these dozens of messages which will be converging on Washington, D. C., on this occasion. Western stations should relay their messages to mid-west and eastern stations for QSP to Washington. Stations of the Washington Radio Club have brought glory to their organization before in handling Governor-to-President traffic, and you can depend on them absolutely to put over their end of this important relay creditably. Washington stations will CQ GPR de W3 — each time before combing the bands for this G.P.R. traffic. Help them! Handle messages whenever you can, but be ready to QRX, assist in copying when there is trouble with "OM skip" etc., too! Get your station in readiness and "make a night of it" on March 3.

Maybe President Roosevelt knows amateurs can accomplish these things — maybe not. Help us to show him that *amateur radio communication* is responsibly conducted, is *prompt, accurate,* and functions 100%!

Work "intelligently" in this relay please. (1) Do more listening. (2) Make calls short, broken with listening periods. (3) Route messages carefully. Use directional CQs, or better yet, *listen*, and call a reliable operator really in a position to handle effectively. (4) Keep on the job; help the Washington stations in any way that they may designate. In addition to 3.5 and 7 mc., these stations will also cover 14 mc. and 1.7 mc. and be ready for traffic on any band named. Regular W1MK schedules will be set aside March 3 in favor of "general" operation, to enable scheduled stations, as well as Hq. to assist in any manner possible in this relay. W3BWT will be the key station, assisted by W3CDQ. Stations in the net to receive incoming messages will be:

W3BWT	W3LX	W3NR
W3CDQ	W3ZD	W3ADQ
W3ASO	W3LA	W3IL

Reporting: Send A.R.R.L. complete *copies* of the message(s) *you* handle in connection with this relay promptly, please. Show time received, time forwarded, and both, or all stations with whom handled. A file of traffic showing the consecutive handling of the message of *each* state is essential, so we can show *complete* routes, and give you credit for your work in the report in *QST*. — *F.E.H.*

[1] Each Section Manager in whose territory there is a state capital is designating an amateur to approach and secure a message from his governor addressed to President Roosevelt for transmission on this occasion. We are depending on each operator so designated by his S.C.M. to do his level best to *get* a message and see it started on its way properly.

for the EXPERIMENTER

Break-in With Crystal Control

THE operating principle of most c.w. break-in systems for use with oscillator-amplifier transmitters in which the oscillator runs continuously — generally the case, particularly with crystal control — is to introduce some sort of time delay action so that the oscillator can be kept in action during the normal pauses between words and sentences, but will shut off automatically on a pause of greater-than-normal duration. Fig. 1 is the diagram of a system of this type devised by W8EXJ. A vacuum-tube is used to provide the time delay, in conjunction with a pair of double-contact relays for controlling the various circuits.

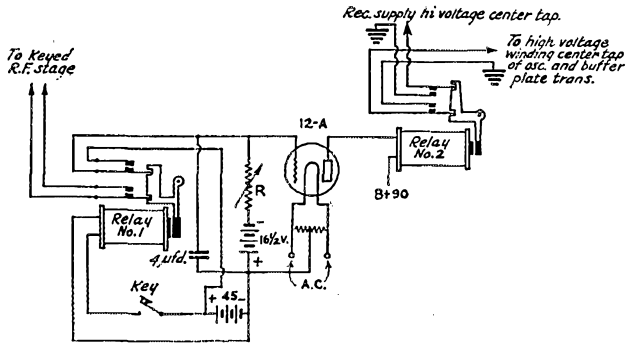


FIG. 1.— CRYSTAL CONTROL BREAK-IN SYSTEM

The scheme operates as follows: On closing the key, the contacts of Relay No. 1 close, and at the same time a positive potential is placed on the grid of the Type 12-A tube. The tube therefore draws plate current through the windings of Relay No. 2, which operates immediately, closing one set of contacts and opening the other. The contacts which close connect the power supply to the oscillator or oscillator and buffer. The other set of contacts disconnects the power supply from the receiver.

On opening the key, the 4-μfd. condenser connected between grid and filament of the control tube is positively charged and the tube will continue to draw plate current until the charge on the condenser drops to such a value that the plate current is too low to hold in Relay No. 2, which then will open, disconnecting the plate supply from the oscillator and re-connecting the receiver plate supply. The time lag between opening the key and the opening of Relay No. 2 will depend upon the rate at which the condenser loses its charge and the sensitivity of the relay. This can be regulated within limits by the value of resistor *R*. The higher the resistance the greater the time delay. A 50,000-ohm variable resistor should give a fair range, but higher values may be necessary.

The two relays are of the type used on telephone switchboards, the coil resistance being 2500 ohms in each case. As the diagram indicates, No. 1 is a double-pole single-throw affair, and No. 2 is the same except that one set of contacts is reversed. If it is not deemed necessary to shut off the receiver plate supply when the transmitter is in operation a single-pole single-throw relay can be used for No. 2.

Drilling Glass at Home

By Verdon Stones, W9BHF*

I have drilled lots of holes in plenty of different pieces of glass of all different shapes, but so far have found only one satisfactory method. My first real experience at it was an attempt to drill 49 holes in an inch-thick transmitter panel and measuring 41 by 56 inches. It split on the 47th hole. After that I went to an expert glass worker and found out how it was done. Here it is for the benefit of those in the ham ranks who wish to try any glass work.

First, the drill. It is made from a file of the three-cornered variety and must be picked so the size is correct for the hole to be drilled. The hole will always be slightly larger than the longest dimension through the file cross-wise. The file must be ground so that the drilling point is made on the large end, if the file is tapered. The handle end should be ground off on an emery wheel until the end is square across and it must be ground until all of the smooth part is gone and the teeth come clear to the busy end. This is the first step. From here on the grinding must be perfect or the drill will not cut.

Hold the file so you are looking at one flat side and mark that side with chalk. This is the No. 1 side. The No. 2 side is then on your right and the

* 571 Harper Pl., Webster Groves, Mo.

No. 3 side to your left. Now make your No. 1 grinding so as to get a face on the No. 1 side which is the same depth as the width of the No. 1 side and sloping back to the center of the end of the file. The actual cutting edge of this No. 1 face must be at the center of the file or it will break every piece of glass you put it in. The slope of the No. 1 cutting face is about 30 degrees from the No. 1 side of the file. Now, grind another face

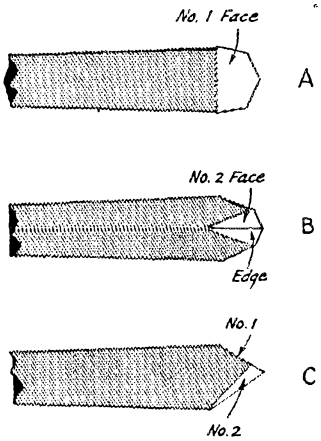


FIG. 2.—HOW THE GLASS-DRILLING TOOL IS MADE

exactly in back of the first grinding, so the center of this second face will be on a line with the edge of the file opposite the No. 1 cutting face. This second face will be triangular in shape and just deep enough to bring an edge at the center of the file. Now this second face must be ground on both sides to leave the back edge of the file angle in to the center of the edge of the first ground face. This will leave two small triangular facets whose outer edges are angular across the No. 2 and No. 3 sides of the file and whose inner edges are common and form the tapered cutting portion of the back edge of the file. The cutting edge of these two facets will be also the cutting edge of No. 1 face. If the grinding has been properly done you will now have a No. 1 face with a four-sided cutting edge and a No. 2 cutting face having a sharp ridge up its center to the center of the cutting edge. Fig. 2 should make this clear.

Now, as the actual cutting operation is started, put the file in an ordinary brace and push hard while turning the brace as *slowly* as you possibly can. As soon as the bit makes the first bite you must put some turpentine in the cut and keep the cut soaked in it until the hole is finished. While drilling, keep plenty of pressure on the bit and turn the brace very slowly. Take nearly all the pressure off the bit just as it starts through the final side of the glass and go very easy from then until the hole is completed.

The glass *must* be supported so that it cannot bend while the cut is being made. A piece of linoleum under the cut is about the best thing. The drill must be wiped off as soon as it picks up a little glass and more turpentine put in the hole. Never let the drill get dry on the point as it will get dull in a second and generate enough heat to break the glass. Do not let the top of the brace wobble.

As long as the drill is sharp it will make a slight grinding noise and when it stops it must be sharpened immediately by slightly grinding all the cutting faces a little more. Be careful when sharpening the drills over to keep the cutting faces at the same angles as before.

The slower you can turn the brace, the faster you will drill the hole.

Note on 'Phone Break-In

The 'phone break-in system described in the November, 1932, Experimenters' Section, has brought some helpful comments from Herb Walleze, W8BQ. Here they are:

"The control tube should have the same rating as the tube to be controlled (it can be any stage desired) and must have a separate heater or filament winding. In Fig. 4A, (Nov., '32, page 40) if a good-sized paper condenser (1 μfd. or more) is placed in series with the grid of the control amplifier, and separate "C" bias provided this tube through a suitable audio choke, and correctly adjusted by experiment, the entire operation will be very much more smooth and the extra control rectifier shown in 'B' will be unnecessary. The control tube must be biased to cut-off (and that doesn't mean more or less) for smooth operation. All in all it is as simple and fool-proof a stunt as I have seen."

Silvering to Lower Crystal Frequency

Don't throw away that oscillating crystal which you have unfortunately ground to too high a frequency. The most useful feature of silvering electrodes on crystals lies in the fact that, after silvering, the crystal will oscillate on a lower frequency. The silver deposited upon the crystal surfaces produces a higher-capacity holder than can be secured by the usual pressure-type holder, and of course the higher the capacity shunted across the crystal the lower the frequency.

By controlling the amount of silver deposited on several crystals at W4PAL their respective frequencies were thereby lowered by 10 kilocycles, in the case of a broadcast crystal, to nearly *200 kilocycles* in the case of a 40-meter crystal. The 40-meter crystal was silvered several

times, lowering its frequency from 20 (first try) to 200 kilocycles.

The length of time the crystal remains in the silvering solution, the strength and quantity of the solution, and the temperature all play a part in determining how much the frequency will be lowered, all factors interlocking in controlling the results, of course. If the temperature is too low the solutions may not precipitate the silver until the temperature is raised. Incidentally if too much silver is deposited the frequency can be raised or increased by carefully grinding some of the silver off with the finest abrasive just as you would grind the crystal. Caution; the deposit of silver is not a hard metallic surface but is a comparatively soft precipitate, so handle accordingly. If too much silver is deposited and you prefer to remove the deposit and resilver to arrive at the frequency desired, the deposit can be quickly removed with nitric acid.

Your local glass company can furnish you the silvering solutions ready mixed in the right proportions, thus saving you considerable time and the risk of failure. Before silvering be sure the crystal is absolutely clean (see March, '32, *QST*) then wash thoroughly in tin chloride solution to make the silver take better. Experiments at W4PAL with silvered crystals developed the following information:

1. The same crystal would oscillate just perceptibly easier when silvered than when not silvered.

2. The same crystal would deliver approximately three percent more power when silvered than when not silvered.

3. The power output, frequency, and "ease of oscillating" for a silvered crystal were all approximately the same whether the crystal was used with just two fine wires contacting the surfaces or whether it was used in the usual pressure type holder.

4. When delivering high power output the silvered crystal used with two fine wires contacting its surfaces became inoperative many times, due to the burning off of the silver at the point of contact with the wires. When the wires were moved to another place the crystal worked again until the crystal current again burned off the silver. No such trouble was ever experienced when the silvered crystal was used in the usual pressure type holder.

An experimental crystal holder, developed here for use in a portable station, made of bakelite and lined with cotton (for mechanical shock absorption for the crystal) and using two fine wires for contact, was discarded for the above reasons.

A pressure (top plate weight) holder is being used here with a 40-meter crystal. The holder is filled with just enough cotton to keep the top plate from moving around. This combination has been subjected to very rough treatment in the portable many times and is still going strong. The set consists of one 47, 40-meter crystal, with 35 to 40 watts input, keyed in positive high voltage lead with a 100,000-ohm resistor shunted across key to keep the crystal just oscillating when the key is open.

— *W. Powell Hunter, W4PAL-W4TZ.*

Home-Made Phonograph Pick-up

A SERVICEABLE phonograph pick-up for testing audio amplifiers, modulator systems, etc., can be made from an old headphone and a few parts from a phonograph reproducer. The design shown in Fig. 3 is by Stacy Steed, W4GC.

No changes need be made in the headphone itself except to drill a hole in the back and thread it for the purpose of mounting the unit on a movable arm. A stylus taken from a phonograph reproducer is fastened to the edge of the ear-cap as shown, and the business end of the stylus is soldered to the center of the diaphragm. Connections from the magnets can be brought out to a cord which connects to the audio amplifier.

The mounting arm can be made of a piece of brass rod or strip long enough to clear the edge of the turntable. The screw which fastens the pick-up to the arm should be left loose enough to allow the pick-up to ride freely on the record. The pivot at the other end may be any sort of standard it may be convenient to make. W4GC uses a brass tube with a long threaded rod running through it to bolt it down to the baseboard of the phonograph.

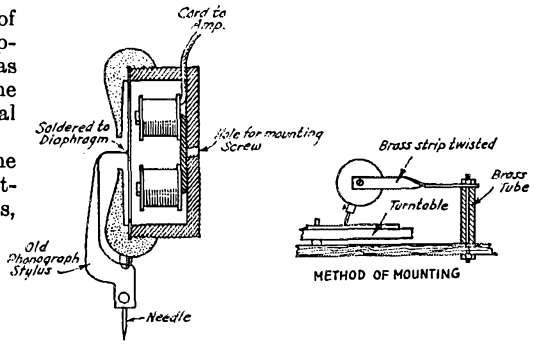


FIG. 3—PHONOGRAPH PICK-UP MADE FROM AN OLD HEADPHONE

The frequency characteristic of a pick-up of this sort will be about like that of the ordinary head-set. Since the impedance is high, probably the best way to couple it is directly in the grid circuit of the first audio tube or through an ordinary amplifying transformer, rather than through a microphone transformer with a low-impedance primary.

A V.T. Bug

AN electrically-operated bug key has as its chief advantage over the mechanical type the ability to make evenly spaced dots indefinitely, a feature which often is helpful when testing a transmitter or trying out key-click filters. Here is a stunt using a vacuum-tube oscillator to make the dots. It is an adaptation by Cristoph Schmelzer, D4AAR, of a similar device originated by H. Evertz.

The transformer T in Fig. 4 is an audio transformer. The secondary usually is placed in the grid circuit of the tube and the primary in the plate, although it may be found that the other way 'round will work better. Condensers C_1, C_2 and C_3 are 0.5 μfd. each, while resistor R is a variable with a total resistance of about 100,000 ohms. The key itself is an ordinary sideswiper with the two stops insulated from each other. The relay should be a high-resistance affair which will work on a few milliamperes to permit using a tube such as a '27 or similar type. A high-resistance telephone relay will be OK in most cases.

The speed of the dots is controlled by the size of C_2 and the setting of R. With the constants given above D4AAR is able to control the dot speed within such limits that keying speeds between four and thirty words per minute can be

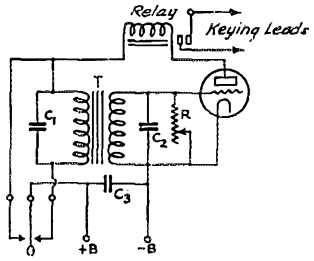


FIG. 4 — ELECTRICAL BUG KEY

obtained. The operation of the device naturally will vary with the type of audio transformer, which means that some experimenting with condenser sizes may be necessary. The "heaviness" of the dots can be adjusted by the spacing of the relay contacts and the spring tension. Care also must be taken to keep the generated voltage below the transformer breakdown voltage, which is best accomplished by making C_2 fairly large.

R.F. Transformer With 5-Prong Coil Forms

THE advantages of transformer coupling between r.f. and regenerative detector have been pointed out several times in *QST*, but the difficulty often is that the owner of the set with impedance coupling wants to use the five-prong coil-forms on which his old coils are already wound, while the usual transformer arrangement requires six prongs for the detector coil. One way of getting around this was shown on page 29 of December, 1931 *QST*. Fig. 5 shows another one which Everett Kick, W7EK, has been using with success.

The heart of the stunt is to use the Hartley circuit for the detector instead of having two separate coils for grid and tickler. Only three

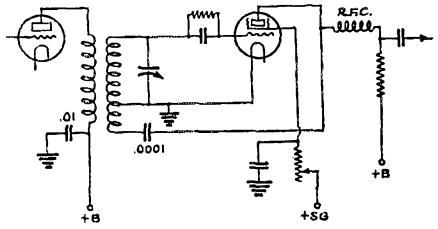


FIG. 5 — R. F. TRANSFORMER FOR DETECTOR CIRCUITS

Only 5 prongs are needed on the coil form with this circuit.

prongs are required for the detector circuit, leaving two open for the transformer primary. The ground tap must be placed at the right point on the coil for most satisfactory oscillation control, which may require a little cut-and-try but is not difficult. The radio-frequency choke in the plate circuit must also be good at all frequencies at which the receiver is to work, otherwise there may be some "holes" in the tuning range at which the detector will not oscillate. W7EK says that with this arrangement the signals are at least twice as loud as with the impedance-coupling previously used, while the background noises have gone down considerably. It will pay to experiment a little with the primary to get the right number of turns for maximum signal strength.

A Socket-Hole Punch

FIG. 6 illustrates an excellent tool for securing those perfect tube socket holes in any kind of sheet metal.

Cut a 9-inch length of pipe of the correct diameter, thread one end and grind the other perfectly flat. Fit a pipe cap to the threads and tighten it well; center a piece of drill-stock, or any other piece of round steel, in the center of the pipe and fill with babbitt. A flat piece of ½" steel 4" square is drilled in the center with a bit slightly larger than diameter of the pipe.

This plate is then mounted solidly on a wooden block in which a hole is drilled to pass the pin.

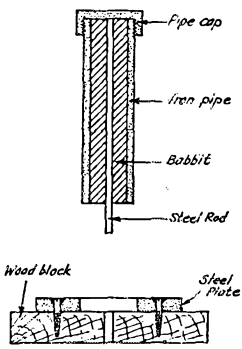


FIG. 6 — SOCKET-HOLE PUNCH

The material to be punched is first centered and drilled to pass the pin, then laid on the plate and the pin inserted through the material and into the block. One good swing with a heavy hammer shears out the slug, leaving a clean, perfect circle. A cross-piece with punches can be placed across the punch to make the rivet mounting holes in the same operation. I have used this tool successfully in putting perfect holes in heavy furnace metal.

— *W9HMQ*

Switching the Monitor

QUITE a number of fellows are not using their monitors while transmitting because of the trouble of shifting the headset every time they want to transmit. Consequently, if something happens in the transmitter they go blissfully along for some time before they discover it. Hence this suggestion for a simple switching arrangement.

At W3ADI the monitor is built right into the receiver case, the receiver itself being an a.c.

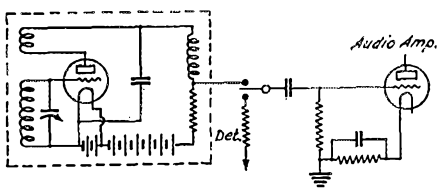


FIG. 7 — MONITOR SWITCHING ARRANGEMENT

outfit. The resistance coupling between detector and audio amplifier in the receiver lends itself nicely to switching between receiver and monitor with only a single-pole double-throw switch, as shown in Fig. 7. The resistor shown in the plate circuit of the monitor is an old headphone, although an actual resistance could be used if it does not cut down the monitor plate voltage too much. If an anti-capacity or jack-switch is used the extra contacts can be made to do other work also; for example, a single switch here takes care of the monitor filament circuit and operates a relay which starts the transmitter, as well as switching the 'phones from monitor to receiver.

The idea can be applied to receivers having transformer coupling between detector and first audio by inserting a coupling condenser (about .006) in the lead from the minitor and breaking the lead to the grid of the audio tube.

— *Allan R. Muncey, W3ADI*

"It's a Ham Paradise"

(Continued from page 42)

signals are received, monitored, amplified and put on a wire to San Francisco, where they are again amplified, and put onto a tape by a syphon recorder. The receiving operator, therefore, has nothing to do except transcribe this tape with its wiggles on to a telegraph blank. No QRM, no QRN. Soft, eh?

Who said VVVVV de KEL? At San Francisco I saw how it was done; a loop of tape of 6- or 8-inch diameter is made, and is kept running through the sender at low speed when there is no traffic. Those high speed dots? They come out automatically when there is no tape in the sender, as when changing tapes, etc. Yes, and one transmitter on experimental facsimile work or picture transmission was making plenty of dots, too.

Unanimously voted: The most interesting inspection tour I ever made.

Strays

A. D. Conant of Danvers, Mass., tells of the ham in embryo who asked him if in drilling a window pane for a lead-in one should first start the hole with a prick punch and hammer!

The secretary of a Brooklyn, N. Y., high school radio club writes: "Allow me to mention that we have had to rule that the privilege of taking radio magazines home for one day at a time had to be changed when applied to *QST*, because of its great popularity. We keep it under close watch when being used for reference."

Reading of the account of Clyde DeVinna's recent miraculous rescue, W9UZ comments that it's a good thing overloaded power tubes don't generate C.O., as there would be a gap in the ranks.

Professor A. E. Kenelly has been elected to the presidency of the International Scientific Radio Union (U.R.S.I.) to succeed the late General Gustave A. Ferrie, in view of the unfortunate death of Dr. Louis W. Austin, in July, 1932.

CALLS HEARD

I1ER, Milan, Italy

7000-kc. band

W1cgn w1duq w1mk w2amr w2bcg w2bcr w2cnv w2cwc w3bce w3cm w4ab w4abs w4abv w4aqq w4arl w4bjj w4bp w4pq w4vp cm2na cm2sv cm5za cp1aa lu2ql lu3ez lu5ar up9r vk3bw vk3hl vk3je vk3kr vk3lq vk4wl vp2pa zl2bz zl3ax zl3cx zl4ap

PA0IM, Amsterdam, Holland

During November '32

7 mc. only

ar8gyn cm8yb lu8en su7hl su7ma ti2fg vk3bw vk3bl vk3cw vk3or vk3zb vk4gk vk5aw vk5pk vk6hf vk7ch vu2lt vu2ut w1edd w2bxa w2dn w2ds w2ei w3cop w4eg w8gz x1ax yi2ds zs2a

VE3HT, H. Richardson, 92 East Ave. North, Hamilton, Canada

7000-kc. band

w6adp w6aqc w6atw w6axv w6bau w6bky w6caz w6cbi w6ccl w6cmw w6dbq w6dio w6dta w6dwa w6dvu w6ehy w6fcl w6fff w6fmu w6fzy w6cd w6er w6hx w6ro w7pc w7abo w7atc w7amx k3bu cm2fm cm2gr cm2mg cm2ww cm2rc cm2rz cm2zb cm3fg cm5ag cm8ri x29b x1h ti2cc lu2lj lu5fv lu9ax veldm ve4dj ve4lh vk2bq vk2wd vk5ml zl2bz zl3aj ear96 y2np pcj

W5BCW, J. A. Creech, 120 S. Ave. B, Olney, Texas

7000-kc.

cm2lc cm2mm cm2sv cm2vc cm2ww cm8yb f4d k5ab ve3kj ve5hr vk3es w2apx w2bie w2bix w2btt w2byp w2czp w2mt w2ul w3anf w3anh w3bai w3bdc w3bje w3bii w3bm w3caa w3fq w3lo w3om w3wx w4bbg w4ce w4cf w4dd w4gh w4gi w4hi w4if w4nd w4ov w4qf w4qg w4th w4to w4tp w4uc w4van w4vb w4zh w6alw w6aop w6apj w6arz w6bbp w6bdp w6bfh w6bjc w6bki w6bnc w6ccc w6cem w6cfe w6chw w6cox w6cxw w6czq w6dbb w6dcp w6dep w6der w6dju w6dnq w6eff w6efr w6ehp w6ei w6epb w6esy w6etx w6evl w6 eyj w6itn w6ly w6uu w7amv w7bdu w7bra w7pc w7qi w7ud w8aac w8ayg w8awk w8bis w8bny w8cii w8cut w8cvi w8dyk w8edv w8eis w8evs w8fcb w8fky w8uq w8ya w9aag w9ah w9ahx w9aim w9ale w9atr w9aug w9ax a9ayw a9bjl w9bjn w9bkz w9bse w9bsz w9btu w9bvk w9bwx w9byu w9ccw w9cid w9cje w9cm w9cme w9cne w9cot w9csm w9cu w9df w9dka w9do w9eby w9ecz w9ems w9ena w9eqc w9ert w9esn w9etb w9eut w9fcf w9fdt w9fhb w9frq w9fru w9gbc w9gbr w9gcg w9gdh w9gha w9ghg w9gnk w9gst w9gsv w9guq w9hfi w9hhk w9hkw w9hrs w9hsz w9htu w9hvo w9jw w9ls w9rh w9rp w9st x9a x23a

W9BTU, Thomas W. Hamilton, 11107 S. Hoyne Ave., Chicago, Ill.

cm2ay cm2fn cm2gc cm2gr cm2jm cm2lc cm2op cm2rc cm2sv cm2vm cm2wd cm5ry ear96 f8bh g2bm g5by hc1fg hc2ea hc2jz hh7c k4ad k4bu k4ry k5aa k5ab k5ac k6af k6ain k6aja k6arb k6auq k6baz k6bmy k6boe k6cab k6cbj k6cqz k6crw k6dv k6ebr k6en k6fab k6ir k7hf ny1aa ny2ab oa4u obgr om1tb om2ma ti2fg ti2rc ti2tao ti3la ti5fi vk2ax vk2ba vk2bq vk2br vk2bu vk2bv vk2bz vk2cr vk2dr vk2ek vk2he vk2hg vk2hq vk2hz vk2jo vk2jz vk2kl vk2lv vk2no vk2nr vk2oc vk2oj vk2ok vk2oo vk2op vk2px vk2wk vk2xh vk2yr vk2zk vk2zw vk3bq vk3bw vk3bx vk3bz vk3cw vk3dt vk3ei vk3ek vk3es vk3fm vk3gj vk3go vk3gp vk3gx vk3hl vk3hm vk3je vk3jf vk3jj vkajt vk3ka vk3kw vk3lb vk3ln vk3lq vk3nm vk3or vk3ou vk3ox vk3qm vk3rg vk3rj vk3tb vk3tm vk3vp vk3wo vk3wl vk3zb vk3zw vk3zx vk4eb vk4fn vk4gl vk4gx vk4jb vk4ju vk4ry vk4wo vk4wt vk5bp vk5gk vk5gn vk5gr vk5gw vk5hg vk5mb vk5ml vk5pk vk5rc vk5rx vk5wi vk5wj vk6ca vk6gf vk6hd vk6lj vk6lk vk6rx vk6wi vk7ag vk7ch vk7cr vk7ar vz3 x1a x1aa x1l x1n x1u x1v x10a x23a xbaf xlals ys1fm zl1aa zl1ap zl1ar zl1cl zl1fg zl1gq zl2ab zl2ai zl2bx zl2ce zl2ci zl2cu zl2di zl2dv zl2fi zl2gn zl2gr zl2gw zl2hi zl2je zl3ah zl3ai zl3aq zl3as zl3aw zl3az zl3bj zl3bn zl3cc zl3cl zl3ct zl3cx zl4af zl4am zl4ao zl4ap zl4ba zl4bj zl4db

W9DZG, Earl R. Linder, 713 St. Louis Ave., East St. Louis, Ill.

3500-kc. band

w1efi w1eld w1eof w1erx w1hd w1id w1mk w1ns w2asg w2cef w2cun w2cvt w2dgd w2dqq w2dsh w3ade w3akz w3apt w3arr w3bmg w3bsc w3bzi w3cnm w3cod w3ej w3un w4am w4bei w4bmj w4bqk w4cc w4ll w5abo w5amx w5chx w5cox w5im w5kb w6bvz w6cjz w6cth w6dve w6fii w6frt w6fse w6gmx w7asf w7auh w7awh w7bfr w7bvi w7cct w7zzt

7000-kc. band

w1cej w1cjk w1dbu w1kc w2azs w2bfj w2bjs w2boq w2ciy w2clc w2czg w2ec w3coa w3fj w3qt w4abs w4acr w4add w4aij w4ajs w4anb w4aoe w4avx w4bep w4bfp w4bgf w4ut w5ahk w5ail w5apm w5asw w5avv w5bda w5bdv w5bmi w5bsr w5bzt w5cdy w5cks w5cpg w5gr w5hj w5mf w5mu w5ow w5pm w5qu w5ru w5zzs w6afu w6amq w6bam w6bdp w6bei w6bq w6brw w6byq w6cav w6chv w6cso w6ctx w6cvf w6cxe w6cyv w6de w6dep w6dgu w6dhr w6dj w6dli w6duc w6eak w6ebv w6eea w6ei w6ell w6env w6ezg w6fal w6fcn w6flq w6fmh w6frb w6fvq w6fzq w6ga w6gal w6gfi w6ggl w6ua w6ug w6uk w7btk w7kk w7wy cm2op cm2ra ve2ew ve3hd ve3lj ve3tt ve4kw ve5gf x1h x1r x23a zl2bx

W2AJD, Rev. Bernard Montgomery, 46 Crescent Place, Yonkers, N. Y.

7-mc. band

cm7cx k6auq nn7xj py1ff ti2fg vk3jt vk5hg vk5lc vk5mx vk5pk

14-mc. band

c7z ce1ai cm2do cm2lm cm2jt cm2lc cm2mg cm2mm cm2ra cm2sh cm2vo cm2ww cm2xr cm5ry cm8az cn8mj ct1ay ct1bg ct1bx ct1cb ear96 ear98 ear136 ear185 ear224 f9ex f8fq f8sm f8tv f8vd fm8cr fm8eg g2bi g2bm g2dz g2ig g2oa g2xh g2yd g5bj g5by g5fv g5qc g5sy g5vl g6qb g6rb g6vp g6yk g6yl g6yt hc2jm hj1ak k4ph k4rj k5aa k5ab k5ae lu2ca ny1aa ny1ab ok2ma on4au on4fe on4rx pa0arl pa0ll pa0xf pa0xd py2aj py2az py2bf py2bk py2bq py2qa rx1aa ti2rc ve4ag ve4ai ve4bc ve4bq ve4ci ve4ed ve4dl ve4ft ve4fx ve4gu ve4ha ve4he ve5cf ve5fg vo8aw vo8mc vo8z vp2ja vp2mr w6ahp w6aj ['phone] w6alm w6alw w6am w6and w6apj w6arl w6avj w6awp w6bbz w6bif w6bja w6bvx w6bwk w6cal w6cbp w6cdo w6chy w6cjq w6cld w6cul w6cuu w6cvs w6dak w6dgl w6dgq w6dio w6dop w6dre w6dwe w6dwi w6ejc w6eou w6egb w6exq w6eyo w6fth w6re w6sc w6uc w6uo w7acu w7afs w7ajq w7aw w7ay w7bac w7bfa w7dl w7ec w7in w7jf x1aa x9a xzn2a yv3lo

• I. A. R. U. NEWS •

Devoted to the interests and activities of the

INTERNATIONAL AMATEUR RADIO UNION

President: H. P. MAXIM *Vice-President:* C. H. STEWART *Secretary:* K. B. WARNER

Headquarters Society:
THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn.

Conducted by Clinton B. DeSoto

WE'D like, if we may, to take up this month the matter of the size of QSL cards sent by many amateurs, particularly as concerns those handled through QSL bureaus and forwarding agencies. There are a lot of these bureaus in operation, as will be seen by a glance at the list given later in these columns, and they perform a tremendous and largely gratuitous service for their fellow amateurs. Proper appreciation of this service means that every effort should be bent to make their job as easy and trouble-free as possible.

One of the greatest incidental problems faced by QSL bureaus is the handling of oversize cards. They are difficult to send, in the first place. If the card is sent with a bunch of other cards in a standard size envelope, it must be folded, and this is resented by the recipient. Special wrapping is time-consuming and expensive. Every amateur would sooner receive a normal size card intact than a huge expanse of cardboard that has been mutilated by folding.

If the card is sent without a covering envelope, the matter of postage expense becomes a consideration in many countries. The U. S. Post Office Department, for example, places a size limit of $3\frac{9}{16}$ by $5\frac{9}{16}$ inches (approximately 9 by 14 cm.) upon post cards, which are delivered for 1 cent. Cards larger than this require the regular first-class rate of 3 cents. The A.R.R.L. QSL department incurs a considerable annual expense in this connection alone, quite unnecessarily. It might be well to mention here that it is not only the oversize cards which carry this penalty, but undersize cards as well, the minimum limit being $2\frac{1}{4}$ by 4 inches (approximately 7 by 10 cm.). A few stations, notably in the U.S.S.R., send very small cards of a size similar to large calling cards, which are difficult and expensive to handle.

There is really no reason for sending cards of freak sizes. Display is not accentuated as greatly by a huge card as it is by proper makeup and typography. Economy is no consideration, either, for standard size cards are always the most readily available. And, too, it doesn't impress the receiving amateur. He finds it difficult to mount the odd cards on his shack wall or in his scrapbook, or even to store them away, and he resents the desire to occupy a large amount of his space, or the sending of a dinky, unmanageable little calling card notification.

A. S. MATHER, VK2JZ, OUTSIDE THE SHACK

QSL's and QSL card sending are quite well stabilized right now. Let's keep them so, and save everyone concerned some expense and a lot of trouble.

In further connection with this QSL business, W2BSR suggests that amateurs sending cards internationally give both local and G.C.T. time, for the convenience of the amateur receiving the card. The G.C.T. would definitely fix the time of the QSO, so that logs could be accurately checked,

and yet the local time would be on record for the information of the other chap. If every QSL card sender would put down both "times" it would make things easier all around.

Then, too, this practice of indicating dates by means of numerals separated by diagonals is ofttimes confusing. In some countries the month is put first, in others the day, and when the latter figure is small it is often difficult to determine just which is which. The better way is to write out the name of the month, or if one just must use numerals, make those indicating the month in Roman characters so that there is some opportunity for differentiation.

THE FIRST ANNUAL CONVENTION OF THE LIGA MEXICANA DE RADIO EXPERIMENTADORES

The application of this organization for membership in the I.A.R.U. as the Mexican amateur society is now being voted upon by existing members.

Enough of QSL cards, and on to WAC. After a lapse of more than two years another 'phone WAC has been issued. Col. J. Skala, OK2VA, is the recipient of the fifth WAC-on-'phone certificate, issued November 29, 1932, having worked the six continents by radiotelephony from his QRA at the Flying Field, Olomouc, Czechoslovakia. The stations worked were W1BXC, LU8EN, 8FDY (Asia), FM8BG and VK3WX.

Col. Skala is Commander-in-Chief of the Czechoslovakian 2nd Flight Regiment, and one of the best known amateurs in that country. His transmitter was originally built in 1928 and has been used without change since that year, its good crystal control design having proved adequate for all purposes.

Congratulations, OK2VA, and may your other radiotelephone brothers follow the 'phone WAC tradition established by ON4UU, VK2HC, G5BY, GI5NJ, and yourself.

The second WAC certificate to go to Jugoslavia was issued to N. L. Norkovic, UN7PP, on December 10, 1932. Nearly every important country in the world is to be found mentioned in the WAC lists, now.

Ten district conventionettes were held by the R.S.G.B. during 1932, in as many of the principal cities. R.S.G.B. headquarters was represented at all of these meetings, which provided an opportunity for attendance on the part of every amateur in the British Isles. The national convention, of course, the seventh annual, was held in London in August.

Coincident with the resignation of W. Tappenbeck, Vice-President of the N.V.I.R., that society changed its official headquarters address to that of the new secretariat, Postbox 150, The Hague. All correspondence should be sent to this new address.

At the inaugural ceremonies surrounding the opening of the Avenue du General Ferrie in Paris, newly dedicated to the memory of the late chief of French military radio, the R.E.F. was represented by its president, A. Auger, F8EF. The boulevard, dedicated in December, was so named in commemoration of one of the world's outstanding radio scientists, builder of the famous old Eiffel Tower station, and recipient of the first amateur message sent by short waves across the Atlantic Ocean.

A unique bit of international work resulted in the saving of a life, as a result of quick thinking on the part of an unnamed New Zealand amateur. Clyde De Vinna, W6OJ-K7UT, chief cinematographer with the M-G-M motion picture expedition now encamped near Teller, Alaska, was working the Zedder one evening this winter from the small shack just offshore from the party's frozen-in supply steamer *Nanuk*, where he had installed the 500-cycle c.c. portable. The hut was heated by a coke fire in a small stove.

Unnoticed by him, the fire began to generate deadly carbon monoxide fumes, which slowly permeated to the operating table. Not realizing their slow effect, unconsciousness seized him before he realized it. His hand faltered; the key stuttered and stopped. In far away New Zealand the amateur he was working frantically called back to him, unable to understand the sudden break in the words from Alaska.

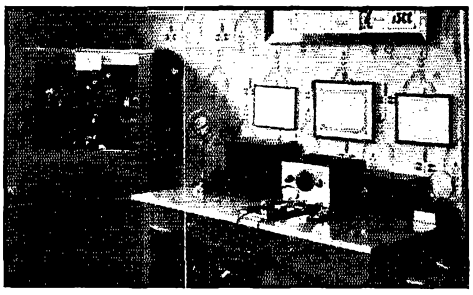
Alarmed, when no response came, he called "CQ Alaska," and had the great good fortune to contact another Alaskan station, who notified the authorities in Teller, near the M-G-M camp. In 20 minutes an investigation was under way. De Vinna was found unconscious, but the rescue party had arrived in time to save his life.

To those who have endeavored to locate Djelfa, the remote spot in the Sahara Desert mentioned in this department of the December,

1932 issue, we pass along the following information from FF8BG, via W2BSR:

Djelfa, 250 miles south of Algiers, is near Laghouat, or El Aghuat. This town is on the road from Algiers to Ghardaia and is about halfway between Algiers and El Golea, places that can be found on most good maps.

UH1AA, the station mentioned in the January issue as representing a new prefix, is now found to be actually located in Ojibouti, French Somaliland, East Africa, according to W8AYO. It is probable that the correct prefix would be F, but



OK2VA, FIFTH WAC-ON-'PHONE

The frequencies in use are 3532, 7030, 7072 and 14,210 kc., with from 3 to 80 watts input. The receiver has 1 s.g.r.f., detector, and 2a.f. The antenna is a 3.5-mc. Zepp. Left to right, on the operating table, are seen: W.E. mike, amplifier, receiver, monitor, and wavemeter.

since the station is presumably unlicensed this point must have been overlooked. It seems to be a new country for amateurs, at least in recent times.

One of the principal organization activities of the R.S.G.B. centers in the Contact Bureau, under the leadership of H. C. Page, G6PA, which has at the present time some 300 members and about 30 active groups. The various groups combine in studying all phases of amateur radio, including the 1.7-, 3.5-, 28- and 56-mc. amateur bands, and such subjects as fading, skip, blanketing, antennas, television, low power, etc. A great deal of routine investigation and detail work is accomplished under the careful supervision of the leader, and quite frequently essentially new and interesting results are uncovered through the Contact Bureau's work.

The listing of QSL bureaus of the world which we have been in the habit of giving annually in these columns presents a number of changes this year, not only in addresses but in certain instances in the agencies handling the cards. There are, probably, still further corrections and additions to this list of which no word has been received. We should appreciate hearing of any such instances.

We wish to emphasize, again, that when a station is found listed in a callbook, or the QRA has been obtained during the contact, the card should be sent direct in order to minimize the heavy load being borne by these bureaus. It has been conservatively estimated that a million cards have been handled by these various agencies; the number of individual cards forwarded during 1932, not including duplicate handling by several bureaus, probably reached several hundred thousand. Sending of cards direct where possible, particularly in the case of receiving stations, in those countries where QSLing through the bureau is not specifically requested, will help greatly to reduce this total to reasonable proportions.

Argentine: "Radio Revista," Rivadavia 2170, V.T.47, Cuyo3183, Buenos Aires.
Australia: W.I.A., Kelvin Hall, Collins Place, Melbourne, Victoria.
Austria: D.A.S.D., Blumenthalstrasse 19, Berlin W57, Germany.
Belgium: Reseau Belge, 33 rue Alphonse Renard XL, Brussels.
Brazil: L.A.B.R.E., Rua Annita Garibaldi, 7-6°, Caixa Postal 286, Sao Paulo.
British West Indies: Ian C. Morgan, "Southlands," Warwick East, Bermuda.
Canada: A.R.R.L., West Hartford, Conn. U. S. A.
Chile: Luis M. Desmaris, Casilla 761, Santiago de Chile.
China: I.A.R.A.C., Box 685, Shanghai.
Cuba: Pedro Madiedo, calle Santa Rosa, Buen Retiro, Marianao, Habana.
Czechoslovakia: C.A.V., Box 531, Praha II.
Denmark: E.D.R., Postboks 79, Copenhagen K.
Dutch East Indies: N.I.V.I.R.A., Bothstraat 4, Bandoeng.
England: R.S.G.B., 53 Victoria St., London, S. W. 1.
Estonia: V. Suigusaar, Hobe t. 4, Pernau.
Finland: S.R.A.L., Pohjola, Helsinki (Suomi).
France: R.E.F., 17 Rue Mayet, Paris 6°.
Germany: D.A.S.D., Blumenthalstrasse 19, Berlin W57.
Guam: Foster D. Brunton, Box 45, Agana.
Hong Kong: H.A.R.T.S., Box 651.
Hungary: M.R.A.E., I Zirken Janka, Utca 14/B, Budapest.
India: R. N. Fox, c/o Messrs. Lyons (India), Ltd., 11 British Indian St., Calcutta.
Iraq: Kenneth S. J. Rancombe, R.A.F., W/T Section, 30 (b) Squadron, Mosul.
Irish Free State: R. V. Sadleir, Esq., Lonsdale, Roebuck, Clonskeagh, Dublin.
(Cards for Northern Ireland go to R.S.G.B., England.)
Italy: A.R.I., Viale Bianca Maria 24, Milan.
Japan: Kyozo Asamura, 3 Minami-Tanabe, Simiyosi-Ku, Osaka.
Java: Th. F. Leyzers (vis), Van Heutz Boulevard 2, Batavia, Centuz.

Jugoslavia: D.A.S.D., Blumenthalstrasse 19, Berlin W57, Germany.
Kenya: George F. K. Ball, Posts and Telegraphs Dept., Mombasa.
Latvia: A. Karklin, 2 Lenca dz. 8, Riga.
Luxembourg: J. Wolff, 67 Avenue du Bois.
Malaya: Thomas G. Laver, Supt. Govt. Electrical Power Station, Johore Bharu, Johore.
Mexico: L.M.R.E., Sinaloa 33, Mexico City.
Morocco: R.E.F., 17 Rue Mayet, Paris 6e, France.
Netherlands: N.V.I.R., Post Box 150, The Hague.
New Zealand: N.Z.A.R.T., Box 25, Ashburton.
Norway: N.R.R.L., P. O. Box 2253, Oslo.
Peru: Radio Club Peruano, Apartado 538, Lima.
Poland: L.K.K., Bielowskiego 6, Lwow.
Porto Rico: Francis M. McCown, Family Court No. 7, Santurce.
Portugal: R.E.P., 93 Rua Senhora da Gloria, Lisbon.
Roumania: Lt. C. Bratescu, Str. Ciru Ilescu 6, Bucarest 6.
South Africa: S.A.R.R.L., P. O. Box 7028, Johannesburg.
Spain: Association E.A.R., Apartado de Telegrafos, Santander; or, Red Espanola, Apartado 262, Madrid.
Sweden: S.S.A.-QSL, Stockholm 8.
Switzerland: U.S.K.A., Postfach, Zurich 22.
Uruguay: Resident, Casilla de Correo 37, Montevideo.
U.S.S.R.: S.K.W., Ipatievsky per 14, Varvarka, Moscow.

Standard Frequency Transmissions

Date	*Schedule*	*Station*
Feb. 3, Friday	A	W6XK
Feb. 5, Sunday	C	W1XP
Feb. 8, Wednesday	A	W1XP
Feb. 10, Friday	B	W9XAN
	B	W6XK
Feb. 15, Wednesday	BB	W1XP
	C	W9XAN
Feb. 17, Friday	B	W9XAN
	A	W6XK
Feb. 22, Wednesday	B	W1XP
	BB	W9XAN
Feb. 24, Friday	BB	W6XK
	A	W9XAN
Feb. 25, Saturday	BX	W6XK
Feb. 26, Sunday	C	W6XK
Mar. 3, Friday	A	W6XK
Mar. 5, Sunday	C	W1XP
Mar. 8, Wednesday	A	W1XP
Mar. 10, Friday	B	W9XAN
	B	W6XK
Mar. 15, Wednesday	BB	W1XP
	C	W9XAN
Mar. 17, Friday	B	W9XAN
	A	W6XK
Mar. 22, Wednesday	B	W1XP
	BB	W9XAN
Mar. 24, Friday	BB	W6XK
	A	W9XAN
Mar. 25, Saturday	BX	W6XK
Mar. 26, Sunday	C	W6XK
Mar. 31, Friday	A	W6XK

STANDARD FREQUENCY SCHEDULES

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

Time (*a.m.*)	*Morning Sched. & Freq. (kc.)* BX
6:00	7000
6:08	7100
6:16	7200
6:24	7300

The time specified in the schedules is *local standard time at the transmitting station*. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XK, Pacific Standard Time.

TRANSMITTING PROCEDURE

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

2 minutes — QST QST QST de (station call letters).

3 minutes — Characteristic letter of station followed by call letters and statement of frequency. The characteristic letter of W1XP is "G"; that of W9XAN is "O"; and that of W6XK is "M."

1 minute — Statement of frequency in kilocycles and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

THE TRANSMITTING STATIONS

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Henry G. Houghton in charge.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

REPORT BLANKS

Blanks for reporting on the S.F. transmissions will be sent postpaid upon request. Just send a card or message to Standard Frequency System, *QST*, West Hartford, Conn., asking for s.f. blanks.

WWV 5000-KC. TRANSMISSION

The 5000-kc. transmissions of the Bureau of Standards station, WWV, are given every Tuesday from 10:00 a.m. to 12 noon and from 8:00 to 10:00 p.m., E.S.T. The accuracy of these transmissions is to better than 1 cycle (one in five million). Information on how to receive and utilize the signals is given in Letter Circular LC-335, obtainable on request from the Bureau. Communications concerning these transmissions and reports on their reception should be addressed to Bureau of Standards, Washington, D. C.

—*J. J. L.*

THE COMMUNICATIONS DEPARTMENT

F. E. Handy, Communications Manager
E. L. Battey, Assistant Communications Manager

Traffic Brief

CORRECTION: In the report of the October '32 O.R.S. QSO-Party which appeared on page 57 of January *QST*, we should have listed W5BMI's "other O.R.S. heard" as numbering 77, instead of 6. Also we inadvertently omitted W9EPJ, which station was 6th highest in the country. W9EPJ's score — 6804, 57 worked (55 with traffic) in 28 different A.R.R.L. Sections, and 74 additional O.R.S. heard.

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ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:

(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead to the dates given herewith. In the absence of nominating petitions from Members of a Section, the present incumbent continues to hold his official position and carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in Hartford on or before noon of the dates specified.

Due to a resignation in the Sacramento Valley Section nominating petitions are hereby solicited for the office of Section Communications Manager in this section and the closing date for receipt of nominations at A.R.R.L. Headquarters is herewith specified as noon, February 15, 1933.

Due to a resignation in the Manitoba Section of the Prairie Division, nominating petitions are hereby solicited for the office of Section Communications Manager in this Section, and the closing date for receipt of nominations at A.R.R.L. Headquarters is herewith specified as noon, February 15, 1933.

Section	*Closing Date*	*Present SCM*	*Present Term of Office Ends*
Mississippi	Jan. 10, 1933	William G. Bodker	Jan. 15, 1933
Rhode Island	Feb. 15, 1933	N. H. Miller	Dec. 1, 1932
Sacramento Valley	Feb. 15, 1933	Paul S. Farrelle (Resigned)	.....
Los Angeles	Feb. 15, 1933	H. E. Nahmens	Feb. 24, 1933
Manitoba *	Feb. 15, 1933	John L. Green (Resigned)	.....
Iowa	Mar. 15, 1933	George D. Hansen	Mar. 20, 1933
Western Fla.	Mar. 15, 1933	Edward J. Collins	Mar. 20, 1933
Maine	May 15, 1933	John W. Singleton	May 25, 1933
West Va.	June 15, 1933	C. S. Hoffmann, Jr.	June 20, 1933

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian General Manager, Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager, for the next two-year term of office is about to be held in each of these Sections in accordance with the provisions of By-laws 5, 6, 7, and 8.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The Ballots mailed from Headquarters will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned. Ballots will be mailed to members as of the closing date specified above, for receipt of nominating petitions.

3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League as candidate for Section Manager. The following form for nomination is suggested:

(Place and date)

Communications Manager, A.R.R.L.
38 La Salle Road, West Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the.....Section of the.....Division hereby nominate.....as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.)

The candidates and five or more signers *must* be League members in good standing or the petition will be thrown out as invalid. The complete name, address, and station call of the candidate should be included. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit of the number of petitions that may be filed, but no member shall sign more than one such petition.

4. Members are urged to take initiative immediately, filing petitions for the officials for each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

— F. E. Handy, Communications Manager

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections on or before the closing dates that had been announced for receipt of such petitions. As provided by our Constitution and By-Laws, when but one candidate is named in one or more valid nominating petitions this candidate shall be declared elected. Accordingly election certificates have been mailed to the following officials, the term of office starting on the date given.

Arkansas	Henry E. Velte, W5ABI	Dec. 15, 1932
Louisiana	W. J. Wilkinson, Jr., W5WF	Dec. 15, 1932
Southern Minnesota	Norman Beck, W9EPJ	Jan. 9, 1933

In the San Joaquin Valley Section of the Pacific Division, Mr. G. H. Lavender, W6DZN, Mr. J. V. Date, W6COJ, and Mr. Frank Cuevas, Jr., W6AOA were nominated. Mr. Lavender received 42 votes, Mr. Date received 24 votes and Mr. Cuevas received 12 votes. Mr. Lavender's term of office began November 14, 1932.

In the Colorado Section of the Rocky Mountain Division Mr. T. R. Becker, W9BTO, and Mr. Melvin Williams, W9DNP, were nominated. Mr. Becker received 73 votes and Mr. Williams received 41 votes. Mr. Becker's term of office began November 30, 1932.

LOS ANGELES reclaims the Banner — and Boy! how she does it! This is an outstanding month in A.R.R.L. Traffic History — we have more stations reporting traffic, *2061*, and a higher traffic total, *165,288*, than ever before in the existence of the present field organization, dating back to 1926. Records have been broken "right and left." Los Angeles makes a new "all time high" in number of traffic reports for any one Section with *240* stations handling traffic; L. A. also breaks Washington's long-standing record of +40 in "gain in reports," with +*71* this month. Michigan didn't give up the Banner without a fight and released her two months' hold only to rate "second place" this time. Missouri continues to elbow her way to the top and again makes "third place" (for the third consecutive month). Michigan and Missouri both go over the "one hundred" mark in "traffic reports" with 139 and 102 respectively.

During the traffic reporting month November 16th–December 15th, 2061 stations originated 39,029; delivered 34,780; relayed 91,419; total 165,228 (89.1% del.) (80.1 m.p.s.).

We regret that the volume of activity reported, the greatest this month in the history of A.R.R.L., was so great, space does not permit inclusion of articles on operating or report on the relative traffic standings of the 69 A.R.R.L. Sections. Interested in how many hams actively take part in their Section organization? If your Section placed highest in reports? Or in traffic handled? A postal to Hq. will bring you a bulletin with this information.

BRASS POUNDERS' LEAGUE

(NOVEMBER 16TH–DECEMBER 15TH)

Call	Orig.	Del.	Rel.	Total
W3CXL	482	634	1822	2938
W2DIU	642	445	1424	2511
W5BMI	—	—	—	2030
W4WZ	70	96	1856	2022
W6PQ	411	293	1146	1850
KA1HR	286	209	908	1403
W5OW	226	159	967	1352
W6DPJ	109	23	1175	1307
W3BKQ	195	160	900	1255
W9KG	22	41	1188	1251
W9FUT	139	130	941	1210
W9BNT	246	585	360	1191
W9BN	48	95	970	1113
W2AFV	145	217	740	1102
W9ENH	73	122	896	1091
W9BMA	428	445	182	1055
W3NB	175	110	730	1015
W9FRA	39	27	824	940
W9ESA	7	59	855	921
W8PP	45	51	823	919
W6BMC	43	28	844	915
W8BJO	202	94	582	878
W6ETL	116	236	516	868
W1CJD	23	76	726	825
W1VS	92	158	543	793
W8YA	88	110	595	793
W9EPJ	157	106	526	789
W6CDU	145	205	420	770
W2BZZ	188	175	390	753
W9VS	112	180	460	752
W9BKK	129	95	522	746
W7AWH	21	16	708	745
NY1AB	185	157	420	742
VE3AD	66	68	604	738
W9BKX	59	56	620	735
W9KBM	118	21	580	719
W3BWT	132	203	368	703
W6DTN	68	298	314	680
W8EWT	47	117	484	648
VE3GT	231	244	164	639
W9FAM	31	14	594	639
W4VP	562	27	34	623
W9EIV	27	41	538	606
W9YB	278	141	183	602
W6CDA	41	54	506	601
W2BJA	42	43	511	596
W9AUH	255	215	116	586
W4UT	96	42	448	586
W8GBF	52	33	500	585
W3BRH	220	163	196	579
W3CL	84	139	354	577
W1BDI	111	157	308	576
W3OK	36	122	417	575
W1MK	135	150	288	573
W6SU	320	141	110	571
OM1TB	224	141	104	569
W8DBX	54	50	465	569
W3ATY	268	43	242	553
W9DG8	112	72	368	552
W6YG	297	191	60	548
W9EYG	127	35	386	548
W6BPU	49	136	355	540
W7BHH	9	21	506	536
W9DHA	65	23	445	533
W4DW	19	89	414	522
W9DMY	125	105	290	520
W9JNV*	167	38	314	519
W9FJV	53	117	345	515
W9HK	109	74	330	513
W4ZH	265	53	194	512
W3SN	251	64	194	509
W4NC	365	30	114	509
W8DLG	11	81	416	508
W9FUW	40	25	436	501
W9JPT	..	..	501	501

These stations "make" the BPL with totals of 500 or over. Many "rate" extra credit for one hundred or more deliveries. The following make the BPL for *delivering 100 or more messages;* they are listed in order of number of deliveries. Deliveries count!

VE2BB 218,	W6DKM 133,	W6EKZ 108,
W9NP 216,	W6AFO 130,	W6FBW 107,
W3CXM 209,	W9ZZRZ 125,	W5WF 107,
W8CUG 186,	W1ASF 125,	W8APQ 105,
W9JHY 165,	W1BVP 123,	W9BAN 105,
W6ZZD 162,	W1BCX 121,	VE3WX 104,
W6HM 154,	W2DBQ 118,	W4HA 103,
W8EX 151,	VE5HP 114,	W1CFG 103,
W9FKJ 146,	W1CPT 113,	W9BNN 102,
W8EIS 143,	W8FDY 111,	W9GBJ 102,
W6NF 143,	W6EDW 111,	W9HCP 102,
W3UT 140,	W6GVL 109,	W6NK 101,
W2SC 134	W6CTP 108'	W6EXH 100.

A total of 500 or more, or just 100 or more *deliveries* will put *you* in line for a place in the B.P.L. Make more schedules with reliable stations. Take steps to handle the traffic that will qualify *you* for B.P.L. membership also.

*Listing for this station for October-November.

DIVISIONAL REPORTS

ATLANTIC DIVISION

SOUTHERN NEW JERSEY — SCM, Gedney M. Rigor, W3QL — W3UT is now RM for lower Jersey. W3QL attended Allentown Hamfest with W3AYA. W3ARV has antennaeitis. W3BYM is on 7 and 3.5 mc. W3BDL sends first report. W3PC worked 77 countries. W3AEJ renewed his ORS. W3ASG is an OO. W3ZI is working A.A.R.S. W3ADL is getting three youngsters interested in radio. W3CLE is back on air. W3CGY and W3BLR are out for traffic. W3BEI heard no off-freq. hams. W3ALG is new reporter. W3CO reports "off indefinitely." W3IS applies for ORS. W3APV has new aerial. W3CRC is new ham in P'ville. W3CRY is new in Atlantic City. W3BYR, pre-war W3UZ and after-war W3BA, an ORS years ago with one KW spark, NOW wants ORS. W3AXU is putting in c.c. W3BPD and W3ARW are rebuilding. W3AWL is after traffic. W3BMC is professor of math in Pitman. Hi. W3ZX is home again. W3AN gets DX grinding molars. W3BVE will report traffic soon. W3AQC was elected President of South Jersey Radio Club. The S.J.R.A. was honored by a visit from Paul F. Godley. Harry Sadenwater, of NC4 fame, is coming back on the air. W3CNI reports from Los Angeles. W3CLQ is new ORS. The Atlantic Radio Club has a regular meeting every Tuesday. The Greater Camden Radio Club meets second and fourth Tuesday evenings. W3APN handled traffic from Honduras to N. Y.

Traffic: W3UT 329 QL 220 ARV 118 BYM 89 BDL 58 PC 32 AEJ 44 ZI 18 BMC 16 CLQ 14 ASG 47 ADL 13 BEI 12 AKI 10 ALG-CO-BIC 9 ATJ 8 AWL 6 IS-APV 5 BYR 4 AXU 3 BPD-ZX-AYA 1 VX 2 APN 18.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsberg, W3NY — W3BAK, E. L. Hudson, RM. W3BWT, E. W. Darne, Chief RM. On Monday, Dec. 19, 1932, the Institute of Radio Conferees held its first luncheon meeting with about 75 present. Later, at Johns Hopkins University, Dr. Dumont of Montclair, N. J., gave an illustrated lecture to an audience of about 150 men on "Commercial Applications of Cathode Tubes." Mr. George Sterling, W3DF, presided. The A.A.R.S. is sure doing things. Write W3SN for all dope. District of Columbia: W3CXL leads with a stupendous total! W3BWT is sure in his "element" when traffic is FB! W3ASO connects Baltimore with Washington via 3.5 mc. W3IL got some traffic on 7 mc. W3NR reports via Western Union. W3CDQ did her "bit" during the SS. W3AJL was QRL college. W3ASE finds NAA's key-clicks annoying. Maryland: W3SN makes the BPL. W3CJS ran up a nice total. W3CDG is trying to replace some lost schedules. W3BGI plans a 50-watt MOPA. W3CV finds only excuse for not sending a QSL, through W8GIR: — A silent key! W3ADO is back again. W3WN wants 56-mc. schedules with Washington and Baltimore. W3ZT does his work on 7 mc. W3CQS is out for ORS. W3CTD is a new ham in Hagerstown. W3CIZ stands ready to QSP anytime. W3NY took his first aeroplane flight with W3HT and W3IZ as pilots. W3BHE keeps early morning schedules. Delaware: W3BAK is back and Delaware totals are starting to mount. W3CPG has joined A.R.R.L. W3CER finds 14-mc. FB for DX. Non-ORS are invited to get into the main line-up — the ORS gang. Write SCM for details.

Traffic: W3CXL 2938 BWT 703 SN 509 ASO 219 CJS 182 BAK 92 CDG 57 BGI 52 CV 37 ADO 19 IL 15 WN 14 NR 12 CPG 11 ZT 11 CQS-CDQ 8 AJL-CTD 6.

WESTERN PENNSYLVANIA — SCM, C. H. Grossarth, W8CUG — W8YA again leads the Section. RM W8DLG says, "Something ought to be done about this skip." W8EIS nearly went crazy pounding brass during the SS. W8HGG just missed the BPL. W8APQ reports a nice total. W8GBC is going after ORS. W8ELZ sends in his highest total. W8DVZ uses pentodes. W8DML will be on during vacation. W8EDG moved to warmer quar-

ters. W8FKU is playing radio checkers with W8EIS. RM W8AJE will be on regularly with new c.c. rig. W8CMK is ex-W8FGL. We are informed by W8CIR that the meeting nights of the Beaver Valley Radio Club are now the first and third Wednesdays of each month. W8DYF puts 200 watts into his final amplifier. W8CMP had a "tuff" time copying W8CUG through W8YA's QRM recently! W8CCD reports via telephone. W8HPQ is waiting for W8BSO to come across with that new transmitter. W8CLG reports W8GAP on c.w. and W8AOL and W8NE on 3.9-mc. 'phone. W8BKS reports a decrease in activity. The long lost W8DYL comes through. W8FCV is QRL school. W8CEO now has a Comet Pro. W8VI-GN, W8FPD and W8HXV report. W8GYH built new receiver. W8GUB promises a huge total. W8DRO changed to 3.5 mc. W8CFR may be back on the air. W8ECH reports W8DDU on 1.75-mc. 'phone. W8CAF is on 7-mc. c.c. W8BFZ is getting ready to go on 7 mc. W8CUG schedules W8CMP. W8HUJ reports traffic. W8DKL is building new receiver. W8FSZ is coming on the air.

Traffic: W8YA 793 DLG 508 EIS 462 CUG 353 HGG 302 APQ 227 GBC 175 ELZ 150 VI-GN 149 DVZ 118 DML 117 EDG 98 FKU 88 AJE 76 CMK 58 DYL 43 CIR 40 DYF 39 CMP 34 CCD-CLG 27 BKS-FCV 23 CEO 19 HXV 13 FPD-HUJ 10 GYH 6 GUB-DRO 2.

EASTERN PENNSYLVANIA—SCM, Jack Wagenseller, W3GS-W3BF—W3BKQ tops the list! W3BRH makes second place. W3CL is lined up for ORS. W3OK has 28 schedules per week. W3BKQ, W3BRH, W3CL and W3OK make BPL. W3CHU reported via radio. W3AHD reports arrival of a new YL op. Congrats, OM. W8FCB continues the FB work. W8AFV has 12 schedules. W3MC is always losing his fountain pen. W3AKB is installing c.c. W8FLA is going to try DX. W3ADE reinstated his ORS. W8CFI was home at W9EWV over Christmas. W3YC is in line for ORS. W3ALX applied for appointment also. Four RF stages are in use at W8EUX. W3ATR worked his first European. W3BEY is going to start 1933 right. W8EOH blew his '81s. W3AQN reports for W3CIK and W3BCD. W3AZF is progressing. W3BF was heard in England and W3JF in Germany on 3.5 mc. W3TX has only 5 watts input. W3EO is on all bands. W3ZZD is going to Florida. W8CFF has been appointed OBS. W8VD is QRL work. W3AVI is back on. W3ABE, W3CFA and W3FX are helping the Section along. W3BPX is keying his crystal oscillator. W3CB reports for first time. W3CLG is putting up a new sky wire. W3CJA wants to be ORS. W3ANS is on 14 mc. W3BIS is third op at W8CVS. W3CPV reports a few. W3CEM worked HI8X. W3BVX schedules D4ZUA every Sunday. The "D" wants everyone to listen. He will be on every hour on the hour from 0100 to 0400 a little out of the band at 7000 kc. W3BUG handled one.

Traffic: W3BEY 61 EO 48 CB 10 CL 577 BKQ 1255 ALX 106 OK 575 ABE 20 BRH 579 TX 49 CHU 335 ADE 198 ANS 5 AQN 55 CIK 17 BCD-CJA 6 ATR 81 BIS 4 ZZD 40 BPX 14 AKB 237 AHD 305 MC 240 CEM 3 AZF 54 CFA 20 CPV 4 BVX 1 YC 146 CLG 7 FX 9 AVI 22 BF 51 BUG 1. W8CFI 171 EOH 56 VD 27 FCB 276 FLA 227 EUX 89 AFV 261 CFF 39.

WESTERN NEW YORK—SCM, Don Farrell, W8DSP —This report is being compiled at HQs, since W8DSP is ill with bronchial pneumonia. W8BJO, W8EWT, W8DBX and W8FDY, in order, are the Section's hardest traffic pushers; each make BPL. W8AOW is no slouch! W8DII originates a bunch. W8DHU likes 1.7 mc. W8AFY's rack and panel job FB. W8EUY worked K7UT on 14 mc. W8GBK is coming on with '52 c.c. W8EXG and W8FYB are on with MOPA. W8BHK says the STTA is going places. W8CJJ has new c.c. rig. W8GWT sends some news. W8DX has c.c. MOPA. W8AVF and W8EHM are new men coming on. W8AZN is working 'em FB. W8CYQ-AUO and W8BGN are QRL business. W8BFG has moved QTH to Auburn. W8BWY is rebuilding. W8AGS reports d.c. better than r.a.c. for "getting out." W8DHQ and W8BR reports just get under the wire. W8FTB is printing QSLs. W8BFF says, "Happy New Year." Portable W4PAU is reporting in W.N.Y. W8DEQ is rebuilding for 1.7 mc. W8ABX made third place on Navy Day Honor Roll. W8AED is trying to get on. W8BJI reports hearing an NBC announcer report an "80 meter Hartley" instead of "Hurdle"—hi. W8AFM is "hitting on all 8." W8AWX has his '52 rig back. W8ERU sends oodles of news: W8FFL, formerly of Rochester, is in partnership with W8EIV at Sugar Grove, Pa. W8ERP worked Germany. W8EFO is a traffic man. W8FKA and W8DEA are QRL. W8EEB is trying PP-parallel. W8CBE is active at Sodus Point. YL W8HJT has new antenna. W8CID is back on air. W8ECA schedules W8EFO. W8CN and W8DOD are on 1.7-mc. 'phone. W8BXL has an SW3. W8EBR and W8CXQ send first reports. W8TZ is back with '04A. W8AAC worked W7BCE on 3.5 mc. W8BEX blew '10, '81 and filter condenser. W8ASG has new panel job. W8FHO is going c.c. on 7 mc. W8ESB is using MOPA. W8HVO has a keen antenna. W8CUY and W8FYF are on 1.7 mc. W8AXC has c.c. rig. W8GWS wants ORS. W8AKX schedules BWI on 3.5 mc. W8GZM is rebuilding to c.c. W8DMJ was fourth on Navy Day Honor Roll. W8CLP asked Santa for subscription to *QST*. W8AYI is new 7-mc. man. W8JV got in on the SS. W8AIE reports traffic. W8DLA is now remotely controlled. W8AKC reports STTA QSO Contest. W8EWE has been experimenting on 1.7 mc. W8GPL blew '81s and blocking condensers. W8FSY is new 'phone in Norwood. W8FFU is handling traffic. W8ABM has portable W8ZZAS. W8GZV and W8CDC are using grid-modulation on 1.7-mc. 'phone. W8DZC and W8AYD are working DX. W8BGL has a new job. W8DES has been awaiting renewal of station license.

Traffic: W8EWT 648 BJO 878 DBX 569 FDY 410 AOW 261 DII 155 DHU 114 AFY 71 EUY 69 BHK 49 CJJ 43 GWT 41 BFG 28 BWY 27 AGS 37 DSP 22 BFF 21 GWZ 8 DEQ 7 ABX 1 DHQ 35 BR 18 FTB 4 AAC 105 DMJ 43 ASG-GWS 42 ERU 39 ABM 30 BGL 26 GZM 25 CLP 24 TZ 23 AXC 9 EBR 7 FFU 6 AYI 5 AKX 4 BEX 3 FYF 2 AKC 10 EWE 26 DLA 32 AIE 48 JV 54.

CENTRAL DIVISION

KENTUCKY—SCM, Carl L. Pflumm, W9OX—W9AUH leads state again. W9JYO is second best. W9BWJ rigs up in new location. W9BAN makes 3.5 mc. at last! W9DLG has nice total. W9CIM is increasing power. W9HAX handles Red Cross reports. W9BJA is fighting rotten location. Death message direct from California was handled by W9KKG. W9BAZ has biggest tank condenser in these parts. W9FQQ has temporarily cancelled schedules. W9EQO is building Class B modulator. 3.5-mc. traffic schedules give W9IFM big kick. W9CNE has Class B outfit. DX on 14 mc. holds W9ERH fast. W9FBJ is going to 1.75 mc. W9LCD is new station at Cave City. W9ACN is QRL 00 duties. W9CIS reports by radio. New super-het graces W9BZS's shack. W9ELL is building c.c. job with '51. W9GJZ is moving to 14 mc. W9HBQ uses e-c oscillator. W9IQK has National SW-3. W9KYA has new junior opr. W9JCI spends most of his time on 7 mc. Work interferes with W9EPI's brass pounding. W9AOW is working on 1.75-mc 'phone. W9FZV wins month's honors at tinkering. W9GNV is building 1.75-mc. outfit. W9ETT is ironing out bugs in 3.9-mc. 'phone. Sunny South calls W9ARU away. W9DK threatens activity. W9DLU took 109-word message and dropped in on W9BAN. W9DQC received license for new location. Flu has W9EYW down. W9HCO is back to c.w. W9OX makes additional schedules. W9CKH is shooting trouble. All stations please note—SCM's new QRA is P.O. Box 359.

Traffic: W9AUH 586 JYO 326 ZZBZ 301 BAN 220 DLG 218 CIM 195 OX 169 HAX 147 BJA 105 KKG 103

BAZ 101 FQQ 77 EQO 59 IFM 47 CNE 45 ERH 41 FBJ 27 ACN 26 CIS 22 BZS 16 JL 16 DGN 16 EYW 12 AJY 11 QT 9 GJZ 7 HBQ 5 IQK 5 FZV 2.

ILLINOIS — SCM, F. J. Hinds, W9APY-WR — RM NE Section W9DDE Ed Wilcox. — RM NW Section W9ERU E. A. Hubbell. W9PA has one of the most complete crystal sets available. W9FKI did excellent work in the SS. W9CEO is the first Illinois ORS to have his certificate validated for 1933. W9IYA wants reliable schedules. W9BSR helped put over the University of Chicago Radio Club. W9KEH is a southpaw. W9KIM worked his first "6." W9FRA is hard at it. W9IPV's Zepp doesn't "Zipp" right. W9HQH is doing fine in traffic. W9IWY blew up the '66s, 211Es and one '03A. W9KSB has c.c. W9FOD uses '10s as buffers. Some BCL grounded W9CTP's antenna. W9DGD hooked his first ZL and VK. W9LW and W9FQU have new Comet Pros. Schedule trouble at W9IVF. The 1.75-mc. fellows are W9PA, W9JJV, W9GIY, W9IMG, W9SA, W9IKQ, W9IBC, W9HPQ, W9CUQ, W9KTY, W9HRV, W9DOU, W9FRA, W9KKA, W9CGV and W9IVF. W9IAH has a '10 on 7 mc. W9EZV is using MOPA. W9KKU has a Zepp on 7 and 3.5 mc. W9KOQ and W9AGM send first reports. W9GFY, W9AWD and W9AAY are forming a radio club in Oregon High School. W9AAY built an '01A TNT. W9ERU passed the new Radiotelephone First. W9BYZ is on 1.75-mc. 'phone. W9GCD has BCL troubles. W9DZM and W9BAV are working duplex 56-mc. work. W9EGA moved back to Chicago. W9HUX has been busy servicing sets free to the unemployed. W9IVU has worked all "W" and "VE." W9JSP uses MOPA on 3752 kc. W9KA is installing c.c. W9BRX is using Heising Modulation system with Class "B" Linear amp. Receiver troubles at W9JCK and W9GYO. W9KJE likes "QTC." W9NN and W9FXE say skip is awful. W9ARN has his 85-foot mast well initiated. W9EGD is working out fine on 14 mc. W9FHR is dancing away his time. W9FXZ shot the filter. WMBD of Peoria, Ill., broadcasts a "Ham" program on the 2nd and 4th Saturday of each month from 12 midnight — please report reception to WMBD. W9BTT says Rock River Radio Club is connecting with the Y.M.C.A. for permanent quarters. W9KOR is getting a crystal. W9FKO let the sheet expire. Watch for "JN" at W9DBO and QRS a little when you hear him; he is W9DBO's brother. W9DOU is NCS of the Sixth Corps Area and Radio Aide. W9ISM says he had to break into the scoring column sooner or later. W9AFB says W9LEP is a new ham in Evanston. W9FGD has new filter. DX and traffic at W9CZL. W9AMN is now on 3500 kc. W9HPK has new a.c. receiver. W9CSB has new c.c. rig. W9IEP works in the Triple R and Governor's Nets. W9EMN prefers ORS parties to SS Contests. W9DZU is using new '56 and '58 tubes in all-a.c. receiver. W9BYZ and W9LAI are on 1.75-mc. 'phone. W9BPU uses crystal on 3675. W9DZG has terrible power leaks. W9IWZ has fine schedules. W9IPP reports for the Hinsdale Amateur Radio Club. W9RO says superhets are "Fooey" for ham work. W9AVB is going better and better. W9IUF has a 150-watt c.c. outfit. W9FCW is fourth district A.A.R.S. station. W9HFK is new A.A.R.S. Dandy crystal at W9ALA. W9ATS says skip ruined schedules. W9AAR is rebuilding. W9FYZ is rigging up remote control. W9DCI can't get out at all for traffic. W9ACE was held up and relieved of 170 smackers late one night. W9AFN is running about ½ KW into the set. W9VS is finishing up a 1.75-mc. c.c. rig. W9ACU worked K6BAZ with 250 volts on plate of '12A final. W9ANR is installing 500 W c.c. W9DXZ tried 7 mc. W9CUH is working on 500-watt rig. W9FF is going full speed. W9HKC is out for ORS.

Traffic: W9ENH 1091 FRA 940 VS 752 FCW 379 DOU 221 FKI 170 IVF 170 EWN 145 CSB 144 CGV 143 FXZ 132 ANR 128 HQH 127 IEP 111 CRT 110 KEH 100 ATS 96 HKC 90 IYA 86 FO 80 AFB 55 FKO 52 HFK 51 AFN 49 ALA 47 DBO-IJA 43 GDI-KA 40 CZL 35 FXE 32 APY-FYZ 27 LW 26 IWZ 23 ACE-HPK 22 FF 21 DZU-FGD 18 PA 17 IUF 16 DZG-IPV 15 BTT 14 JCK 13 AVB-NN 12 BTU-FGV-HVA-ISM 11 CUH-HUX 10 EMN-KJE 8 IVU 6 AMN-BRX-DPD 5 ACU-BIR-CEO-CHD 4 AGM-DCI-GJJ-IBA-KIM 3 BPU-BYZ-BSR-DXZ-HNK-RO 2 AAR 1.

WISCONSIN — SCM, Harold H. Kurth, W9FSS — W9GVL makes the BPL. W9AUX is organizing a state ORS Net. W9RH is a mailman. W9GWK is going to the U. of Wisc. W9FAF thanks the SCM for his card. W9HSK is after traffic. W9DRO reports little traffic on 7 mc. W9DXV and W9DNU are new ORS. W9DKH renewed ORS. W9HRM visited hams in Tenn. W9HTZ is A.A.R.S. W9BCF visited Milwaukee gang. W9FSS had about 25 out of town visitors. W9ZY is working fine. W9IAQ-ZZN has four schedules. W9IFV spent time on 1910 kc. 'phone. W9GPQ, W9IQW, W9DJQ and W9DJH are building c.c. sigs. W9HDP sends first report. W9AON is manned by two ops. W9KJR blows '80s with 1100 volts! W9EEQ has two schedules. W9JNU was out of town for Christmas. W9HFH is back after a year's inactivity. W9BCV works DX. W9ESZ is grinding new crystal. W9EHD-HA is QRL school and YF. W9HOR is organizing a radio club at Manitowoc. W9IZQ is on 14 mc. W9HKL goes ice fishing. W9EWY is experimenting with crystals. W9BWZ isn't on the air much. W9DNE has high power. W9EAR is getting new rectifier. W9HBH is going to try 14-mc. 'phone. W9AVM is on 56 mc. W9DXI is rebuilding. W9FII has a.c. receiver. W9AVG is working on 56 mc. W9SO sends Official Broadcasts. W9KLF had his antenna cut by irate BCLs. W9HFL is coming on with c.c. W9HAH is interested in traffic. W9IQB and W9DJA are on 1.75-mc. 'phone. W9EBO is getting the bug again. W9BXZ is working DX. W9AHJ and W9BXZ combined on a 1.75-mc. 'phone. W9GHN put up new sky wire. W9BQM says DX good on 14 mc. W9JVD is on after vacation. W9JCW has new crystal. W9FXH has SS receiver. W9IHG rebuilt at cost of $0.30. W9HTN wants dope on c.c. jobs. W9FTH gets out FB with c.c. rig. W9GVF is QRL YLs. W9GVX built a SS receiver. W9KTK is QRL club duties. W9FAV and W9EBM are members of Fond Du Lac Radio Amateur Club. W9AUV and W9BUG are in sunny California. W9BFM is active. W9BIB is laid up with grippe. W9AFU is a distributor of Triad Tubes. W9AVG has been appointed SNC-A.A.R.S. W9GXY is in California with call W6GXE. W9HQK took the radiotelephone exam. The Fond Du Lac Radio Amateurs Club was organized recently with W9JCW as President. The Sheboygan Radio Amateurs Club is planning a Hamfest. The Four Lakes Radio Club held an exchange party for Christmas. W9HFI is on 3.5 mc. W9JBI sends out a rotten signal. W9JDP, W9JXU, and W9KLL took the exam. W9ACK visited W9FSS. W9DKA is having trouble with crystal. We welcome these new Wisconsin hams: W9KVC, W9ERZ, W9KXA, W9GTJ, W9IYL, W9GSL.

Traffic: W9GVL 329 AUX 245 RH 167 GWK 165 FAF 155 HSK 113 DRO 104 DXV 100 DKH 96 HRM 85 HTZ-DNU 66 BCF 57 FSS 52 ZY 43 IAQ 33 IFV-GPQ 40 DJH 39 HDP-AON 37 KJR 30 EEQ 28 JNU-HFH 26 BCV 24 ESZ 22 EHD 19 IQW 14 HOR-IYL 13 HKL-IZQ 11 EWY 9 BWZ 7 DNE 2 JDP 27.

With deepest regret, we must mention the death of Ralph J. Stephenson, W8DMS. "Steve" will be missed not only by Detroit amateurs and D.A.R.A. members, but widely known and liked in his work in the club and as S.C.M. of the Michigan Section his loss will be keenly felt throughout the Section and the whole Central Division. A friend and a real 100% amateur in every sense of the word, Steve gave liberally of his time and energy to amateur radio, and he will not soon be forgotten.

MICHIGAN — Acting SCM, Kenneth F. Conroy, W8DYH — 139 stations handling traffic, gang, for a juicy total of 7446 messages! Swell work — keep 'em coming,

fellows. W9FSK waits for parts — c.c. W8DLX got something and then lost it! W9IOV and W9EXT are brothers — W8HSH and W8FVP (our new peppies from Ann Arbor) are also. W8CPY tells us of a "Spider-man" who claims that he'll "get" anyone using RAC in Ludington — our Pa-al! W9CE has worked 100 VKs and ZLs. W8EYH seems to be losing his traffic spirit — pep him up, gang! W9IHM has 3-way QSO. W8HL and W8DCT are trying to dig up men for A.A.R.S. W8CFM — antenna trouble — and in this br-r-r-r-rr wx! W9HK is everyone's pa-al . . . wonder what the Mrs. thinks! W8AZQ has his worries! W9CGP sends in a welcome donation for the continuance of the Bulletin — thanks. W8HBZ is a hot-cha-cha! W9DCN DXers. W8DOV silently awakens — FB! W8CSG has made no changes in his set for over a week! W9CWD complains of 3.5 mc. QRM — heh! W8BUH reports, "Sans dope." W8AEQ BPLs — FB, Jack. W8AW does things FB except no dirt on report card! W8HSH tells us W8BJP drove 40 miles to Hamfest and then had to leave car with Canadian Customs! W9CEX made 14th place on Navy Day Honor Roll — W9ANT was 7th — FB! W9AAM reports. W8IAV, 14475 Rochedale, Detroit, just graduated from W8ARR's school! W8HPH, W9DSJ, W8GVN, W8ICX, W8GUN and W8FUQ (ex-W8AJC) all bow to you. W8ICX and W8DYH are still looking for their long lost pal, Bob Clark, formerly of Buffalo, N. Y. Mrs. W8DYH sends code practice for beginners on 3830 kc., Mon., Wed., Fri., at 6:30 p.m., E.S.T., and Sun., 11 a.m., E.S.T. Whew! and look what happened to W8BTK — he sure needs a stove or red-hot mama operator! W8QM wants more OMs to bring their OWs and YLs to Hamfests. After W8JF sat on his YF and locked her in the house, thinking the Windsor affair was purely stag, he finds the wives of W8FCU, W8QM and W8DYH and W8FX's YL there . . . wonder how he wiggled out of that spot when he got home! W9BBP would have given half his Kingdom to be at Hamfest . . . what? You'd geeve five cents for a Hemfest? Oiy. Yes, W8BIK, the Canadian Hamfest was a great success because of the intense interest in . . . Radio. . . . Says Hooey? W8CSR, W8GSP, W8DM, W9GQF, W8FRW, W8CTD and W8NR are all going, or have gone crystal. The bugs in W8GRN's rig are getting in his hair! W8WO is helping the boys out his way to get crystals working — the Doc isn't so-o-oo dumb! W8EBQ claims it's so cold the electrons are frozen to the filament! W8GMB remote controls — from between the blankets? W8FCU is out to pep 'em up! YOUR ATTENTION PLEASE: ONTARIO SECTION CHALLENGES THE DETROIT AMATEUR RADIO ASSOCIATION TO A TRAFFIC-HANDLING CONTEST!! All Detroiters pul-leeze send us your reports — we *have* to win. W8GO is going to start the old origination plan at his dad's apartment house to help and W8DYH will be back on the air as of yore — c'mon, you Detroit gang, of two years ago — let's show 'em we aren't dead! W9EGF, W8GBB (the boy who loses his juice into W8BE's receiving antenna), W8FAV, W8GOZ, W8GUC, W8FWG, W8DA, and W8GTN are all rebuilding. W8DOI reported after we knocked him down and stood on him . . . thanks! W8FDK, or something like that, gave his YL a receiver for Christmas present — so she could listen to him. W8CUX has the license "T-73"! W9HSQ, sorry we missed your card last time. W8BRS lost hopes of high-power and is back with Hi!-Power? W8FX wants to know: "Which costs most? pair of fifties, washing machine or diamond? All outa room; see DARA-MICHIGANG TFC BULLETIN.

Traffic: **W8PP** 919 AEQ 484 FX 466 BMZ 253 BMG 347 DZ 244 FTW 213 GRN 176 GUC 174 CST 173 AYO 139 BGY 138 DNY 129 QT 116 DM 113 EGI 111 EHD 86 DYH 83 DED 62 BXJ 59 CPY 52 JX-FRW-EGX-BJT 51 ARR-EVJ 46 DA 42 HOT 41 HBZ 38 GDR 35 BUH 34 CFZ 33 CEU 31 AZQ-FAV-BIK 30 EVC 31 CSR 27 JO 24 HPH-CSG-AW 23 GTN 23 AJL 22 HA 21 DOV 20 BDI 17 EDO-GQB-GQS 16 DSF 15 BRS-CFM 14 AIZ 13 BIU 12 CUX-GBB 11 NR-HL-DUR-DMS-CUP 10 AKN 9 CUE-WR-BDH-HSH 8 HHQ-EYH-BJ 7 HFU-DOI-EJR 6 DSQ-BEP-HKT-FEE 5 ALL-HZN-GSP-DLX 4 EFI-FXB 3 GUN-CTD-WG-ECG-WO-FQD-FRE-ICX 2 W8AFH-AWE-BNS-BTK-DNT-ERQ-FOV-FUQ-FWG-GOZ-GVN-KJ-QM 1 COW 7 DCT 82 HXI 30 FTV 144 ERX 56 CVU 51 BTP 20 GHP 5 DFE 19. **W9HK** 513 HXB 152 CE 82 FSK 61 IHM 59 BBP 48 CWR 45 DCN 42 CGP 41 HIS 36 GQF 36 VL 20 DQT 20 GJX 20 CEX-EQV 16 EEM 13 IOV 12 HSQ 8 EXT 5 EQQ 4 AAM-EGF 1 CSI 11. Fred Passenger 4.

INDIANA — SCM, A. L. Braun, W9TE — Don't forget that every one who reports gets a copy of the Indiana ORS Bulletin. W9ESU keeps his totals above the 300 mark. W9GGJ works on 7 mc. W9EPT received 10 QSLs in one day from VKs and ZLs. W9DHJ blew a filter condenser. W9AKJ is ready to build an e.c. frequency meter. W9BXT reports traffic. W9AET made nice score in the SS. W9HML has two ops. W9KNJ uses a pair of '45s. W9DJU is new ORS. W9EXL hears W6s on 1.75 mc. W9CKB is organizing a local A.A.R.S. Net. W9KPD gets out fine with single '45. W9ABW is ready for schedules. W9HSF, W9DWX, W9DSN are ready for 56-mc. tests. W9FKI moved to Illinois. W9RS' new antenna helps him get out. W9AEB handled a little traffic in the SS. W9FUT is state traffic champ. W9HKH is trying 1.75-mc. 'phone. W9GFS has a 211E. W9YB will be off during vacation. W9HPQ has portable W9LBT. W9HIU has an '04A. W9IMT changed his receiver tubes. W9CB, W9HPQ, W9JZA, W9DRJ are ready for 1.75-mc. 'phone chain. W9EXW, W9KKA, W9CRQ are in it, too. (Yep, the "chain gang"!) W9EUJ is doing nice traffic work. W9JRK is trying c.c. W9BHC threatens to put in c.c. W9FIY is lining up Indiana traffic schedules. W9AHA uses an e.c. rig. W9CRZ is new A.A.R.S. W9AUT likes MOPA. W9BCP is trying 1.75 mc. W9JIY had to QRP due to QRM from OM and the light bill. W9AMT has portable W9JTY. W9JHY has portable W9ZZBO. W9CZP is ready for unlimited 'phone ticket. W9JNH uses a pair of '10s. W9CIN was heard off-freq. W9FSP doesn't get enough traffic. W9GGP uses a pair of 211Es. W9BDE is installing "Class B." D. L. Hope of Goshen has operator's license. W9DJJ has W9LCU for a call, too. W9JHQ is going c.c. W9FYB is rebuilding. New Indiana hams, welcome: W9KLG, W9LDV, W9KQV, W9FRY. W9BKJ reported traffic for W9AEU, station at Boy Scout Exposition. W9FQ operates at W9EEO when not too cold.

Traffic: **W9FUT** 1210 YB 602 ESU 325 JHY 394 FIY 116 AET 110 GGJ 1 EPT 51 DHJ 78 AKJ 7 BXT 12 HML 49 DJU 10 EXL 14 CKB 87 HSF 22 RS 12 AEB 32 HKH 5 GFS 20 HPQ 65 HIU 4 EUJ 45 JRK 8 AHA 4 CRZ 22 AUT 17 BCP 28 TE 52 JIY 11 JNH 8 FSP 34 KPN 3 HUO 14 BKJ 129 AEU 261 HUV-CLB 46.

OHIO — SCM, Harry A. Tummonds, W8BAH — Ohio RM W8DDS. Each month on the Sunday preceding the 16th we will hold an ORS party, ORS to work the RM in their district. All Ohio stations are welcome to attend this party. On the Sunday following the 16th of each month, the Ohio RMs will hold their regular party. The time is 2 to 4 p.m. District No. 1 RM W8DVL: W8CIO is active in A.A.R.S. W8DDS says CATA net starts Jan. 1st. W8BYD got his in the SS. W8FF is the station at the Central Y.M.C.A. in Cleveland. RM W8DVL has four good schedules. W8EIN helps the Section. W8DVI handles some important deliveries. W8FNX, Secy. of the Mike and Key Club, announces election of officers first Tuesday in January. New 'phone at W8FFK. "Anybody heard the 1.75-mc. 'phone?" asks W8AOJ. W8AGL is the ONG station in Cleveland. W8HUS says W8HZI is new ham. Euclid is on the map with W8ANR, W8EBJ, W8GFA and W8GNG. We hear from W8BFT. An '03A at W8FJE. W8EBY says too much homework. W8UC says W8IAW is new ham at Chagrin Falls. W8AZU is rebuilding. W8BMX is putting in c.c. W8EBJ reports by QSL card. W8FGP wants schedules. W8GUL has YLitis. The West Technical High School Radio Club is on the air with W8CQF. W8FFM is on 3528 kc. Rebuilding at W8CEJ. W8AVV gets crystal reports. W8ZZB is busy at W8FJE. No schedules at W8FVL. W8FXH is using an '01A on

1000 jolts. W8FGC is chief op at W8CQF. W8GDQ will get his ORS. W8DVI reports. W8HBF joined ONG. W8DQI has a crush on W8BYD's cousin "Babe." W8EBT is getting the old rig together. Welcome back, W8GGA, exW8DOB W8DOV. W8GPG is QRL. New rig at W8BGC. The Lakewood Radio Club is awaiting renewal of W8EGO. Cleveland's YL ham, W8HRI, reports. W8EFW is on 1.75-mc. 'phone. W8IAF is new ham. W8BAH would like to see Ohio back at the top. District No. 2 RM W8BKM. RM W8BKM signs "Guzz." W8GHF is a U.S.N.R. member. Report this month from W8GHD. W8UX applies for OBS. W8EEZ wants dope on traffic handling. W8EJY needs '03A. District No. 3 RM W8APC. RM W8APC is using tube keying. W8GOD applied for ORS. W8EXD schedules W8APC. W8BTT is U.S.N.R. station. W8CMY is back on the job. W8DIH is QRL service work. W8GE has been busy in his dad's store. Glad to get report from W8CSB. District No. 4 RM W8EEQ: W8UW sends nice report. W8PO had trouble with skip. RM W8EEQ is getting schedules working. W8BPC will be a traffic man soon. A nice report from W8WE. Sure we can use that report, W8DEM. Please fill out your card next time, W8EMK. A letter from W8DIO; the YL has learned to walk. District No. 5 RM W8FGV: RM W8FGV schedules W7AHQ, W1EFM, W8FDV, W8APC and W8BAH. W8BZL resigns ORS. W8FDV wants ORS. W8BMK passed exam for ORS. W8EXI has usual good total. The Medina County Radio Club meets at Paul J. Andersen Barn, East Smith Rd., every Monday night. Everyone is welcome. W8HTN wants to know all about reporting. District No. 6 RM W8BBH: W8BBH, RM, leads the Ohio Section this month. FB. New rig at W8GFA. New QRA W8GDC is 4215 N. High St., Columbus; will use portable W8ZZCY 'phone. W8HEY reports W8ICQ new ham in Piqua. W8GB (W. Va.) sends 73 via W8CKK, who has just moved to this Section. District No. 7 RM W8VP: W8VP operates the Antler Restaurant in Cambridge. The service business is good with W8CKX. W8FRV schedules W8CYV, W8DJD, W8DSC. District No. 8 RM W8CGS: RM W8CGS leads his district. We welcome report from Lt. H. F. Breckel, 3815 Edwards Rd., Cincinnati, for U.S.N.R. station W8NC. Write him if interested in U.S.N.R. W8BRQ swapped messages with W1MK in SS. W8BKC worked VK3YP. W8ALQ will be heard back at old schedules. District No. 9 (No RM): W8EQB is only reporter from this district. W8AFU reports by radio. The Maumee Valley Radio Assn. gets plenty of newspaper coöperation, and has special car stickers for members' identification. Visitors are welcome to attend the meetings at Toledo; just look up W8ESN at the local Fire Dept. A hamfest is planned for the Medina Radio Club Jan. 2nd. W8DXB is in charge.

Traffic: W8BBH 441 BAH 373 DVL 318 FDV 284 FF 226 VP 178 APC 172 EEQ 169 BYD 149 PO 138 BKM 101 CGS 107 FGV 96 EQB 77 DDS 72 CIO 67 UW 66 BMX 59 DEM 56 GOD 55 UC 52 EXI 49 CMY 46 BRQ 41 WE 40 EBY 31 GHF 28 FJE 27 BTT 25 BFT 21 FRV-GNG 20 HUS 19 AGL 18 BMK 15 AOJ-FFK 14 DVI-EIN-NC 13 EXD-BPC 11 CKX-GHD 9 HEY 8 BKC-FVL-ZZB-AVV 7 CEJ-GDC-GFA 6 FFM-FNX 5 CQF-GUL 4 EMK-FGP 3 EBJ-UX 2 FXH-FGC-GDQ 1 AFU 5.

DAKOTA DIVISION

SOUTHERN MINNESOTA — SCM, H. Radloff, W9AIR — W9BN maintains the grip on traffic honors. W9EPJ has prepared a So. Minn. traffic map. W9BKX was host to a meeting of S.M.R.A. W9BKK, W9BNN, W9EYS, W9HCW and W9AIR enjoyed a banquet of bear steak and venison given by W9JBA. W9LN and W9FCS are new ORS. W9YC awarded 5 prizes as the conclusion of a successful traffic contest. W9BHZ has a flock of daily schedules. W9CSY is sold on E.C. oscillators. W9DMA worked his 46th country! W9HRH handled his traffic on 1.75 mc. W9JID is good for reliable QSP with 16 schedules. W9EFK enjoyed the Sweepstakes. W9AFR is "bumping off" his '10s. W9JLV mixes DX with traffic. W9DH reports consistent activity. W9IAE is rebuilding W9HFF. W9DRG resumes schedules. W9FNK uses '46s as buffer. W9DEI kept schedules with G6NJ a solid month. W9CPP is installing '03A. W9GLE is interested in 56 mc. W9GCN wants report cards. W9GFH handles some. W9EPD experiments with super-hets. W9DGE goes "ham" after his summer in commercial operating. W9GUX put his crystal on 3575 kc. W9IJD put in rack and panel. W9FOX would like to use 'phone. W9FCC is back with us. W9IAK has school QRM. W9JMV tries '46s in MOPA. W9FFY is looking forward to vacation. W9HZU has 2000 volts for his '03. W9EYS is on 3.5 mc. W9FMA divvies frequency with W9GTE to cut QRM. The Minneapolis Radio Club has meeting quarters in the Y.M.C.A. W9EYL finds it too cold to pound brass. W9FWN has a pair of '10s. New hams: W9LDQ, Lamberton, W9DAV, Red Wing; W9ADQ, Faribault; W9HEO, Graceville; and W9JWL, W9KKM, W9AYA, and W9CRO, all of Minneapolis. W9AQH-HCC is using National AGS. Rifle Club and U.S.N.R. keep W9COS busy. W9DBC wants holiday traffic. W9EGG has c.c. on 3870 kc. W9IJN tried 1900-kc. 'phone. W9EFW and W8BXT pound brass at W9KDI. W9HEX' 14-mc. transmitter has 22 tubes!! W9CGNU built a 3.5-mc. job. The Faribault Radio Club had W9EPJ speak at their meeting. W9ATD is building his own tubes for 2½ cm. experiments. W9DVH has '10s in p.p. W9BWM is QRL at WCCO. W9IUD is rebuilding. W9BTW spears DX. W9ZT is selling the 1 KW! W9KHY has new receiver. W9FLK and W9BVP are rumored QTH Minneapolis. W9IXQ is having PA trouble. W9BTZ is QRL S.M.R.A. organization. W9CKU has new transmitter. W9FPY moved to Red Wing. W9CSJ finds the Greek alphabet in the Handbook handy in working crossword puzzles. W9DHP visited with the gang in St. Louis, Keokuk, and Dubuque. W9CSU and W9ESZ got their 3-year tickets. W9JHG lists W9KJU as a new Minneapolis ham. In retiring I want to thank you all for the splendid coöperation you have given the office of SCM. It has been a pleasure to serve you, and I know you will carry So. Minn. to new records under my successor. Vy. 73.

Traffic: W9BN 1113 EPJ 789 BKX 735 BKK 746 BNN 453 LN 388 YC 270 BHZ 240 CSY 218 DMA 203 FCS 180 HRH 128 EFK 33 JID 120 JBA 102 AFR 119 IXQ 106 DH 93 JLV 82 AIR 75 IAE 48 DRG 42 FNK 39 DEI 31 CPP 28 GLE 24 GCN 23 GFH 20 EPD 24 DGE 14 GUX 14 IJD 14 FCC 14 IAK 10 JMV 6 FFY 6 HZU 3 EYS 3 FMA 2 CSJ 8 CSU 25. November: EFK 50 DH 35 ZT 1.

NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS-IFW — W9EGI is looking for the coefficient of expansion to be applied to a '10's plate. W9HJC's schedules are still clicking. W9EVQ and W9CRL are awaiting license renewal. W9JVP is having a try at 14-mc. DX. W9IK is rebuilding for 1933. W9IGR finds electron-coupled oscillator is FB. Thanks for the reports, but let's have some news, W9DYA, W9FSF and W9CRL. W9DPT is trying to line up traffic schedules. W9GCB is rigging a windmill so he can QRO. W9JAR is our newest ORS. Please include traffic total, W9JZJ. W9BMR will have c.c. rig on air in February. Ex-W9GXY is now W6GXE. W9DM is struggling with final stage. W9DHQ is on air occasionally. Happy and Prosperous 1933, gang.

Traffic: W9DGS 552 HJC 363 EGI 206 EIG 190 EVQ 176 JVP 115 IK 101 IGR 47 DYA 44 CRL 40 FSF 26 DPT 25 GCB 7 JAR 4.

SOUTH DAKOTA — SCM, Carroll B. Miller, W9DKL-GIO — W9DGR and W9FKL take traffic honors. W9GEE gave a party for Pierre hams. W9LBL is a new ham at Pierre. W9GRJ is keeping quiet hours. W9FJR has c.c. now. W9IQZ is experimenting with flea power 1.75-mc. 'phone. W9FOQ has power leak troubles. W9CAU has new 50-watter. W9DKJ has a 1.75-mc. 'phone under construction. W9IEK is on 1.75-mc. 'phone. W9KCV and W9IRO are new hams in Aberdeen. W9FDD is having trouble getting his receiver working on 1.75-mc. W9GPB uses 3 '45s in Hartley. W9KPQ reports chemical rectifier. A Farand loud speaker is used for microphone by W9LDU. W9IDW worked ZL2JE. W9DGR reports a radio club in Huron. W9CFU is awaiting crystal. W9GYG has moved

to Huron. W9BAE changed his address to 1132 Dakota Ave., S. W9FLO went to Chicago to get his amateur class ticket. W9IQD is getting out FB. W9FKL is carrying 7 daily schedules. W9ALO will be back on OO job first of year. The Aberdeen gang paid Java gang a visit. W9BJV *is thinking of putting in* 'phone. W9KGG reports for traffic at Tri State Fair. W9HHW reports things quiet around Lennox. W9IDW reports building an MOPA. W9JLA is putting up new antenna. W9JAA is on again. W9EUH is building an experimental 1.75-mc. 'phone. W9GQH sends Official Broadcast each day at 5:30 and 7:30 p.m., C.S.T., on 3976 kc. News comes that the "Voice of the Amateur" covers the Dakota Division; any one interested in this bulletin write "Voice of the Amateur," Java, S. Dak.

Traffic: **W9**DGR 175 FKL 164 KGG 105 IQZ 117 HHW 86 DKL 77 IDW 70 FOQ 57 BJV 42 IEK 23 DKJ 8 CFU 4 CAU 15. ALO 23.

NORTHERN MINNESOTA — SCM, Palmer Andersen, W9DOQ — The Arrowhead Gang is just getting over the big ARA Christmas party. W9BRA reports 20 below zero weather. He and W9HED are rebuilding W9HDN is *working a little* DX. W9HZ and W9AEL have new receivers. W9CDV has new set built. W9FNQ is working on 3750 kc. W9EHI has been listening on 600 meters. W9IPA is QRL. W9IAA was visited by W9HCW. W9BAR with W9JT and W9BBL spent a week-end at W9BAR's cabin in the North Woods. W9GWR is active on four bands. W9BHH won a fresh herring as a distinction for being most popular 'phone man present at ARA Christmas Party. All 'phone men in the ARA Section are known as "fish peddlers," hi! W9BCT is active on 7 mc. W9HRB gets quite a kick out of 'phone. W9HIE is rebuilding. W9ISA wants to know why Northern Minnesota doesn't have a bigger report. W9DJW is building a new outfit for W9IPN. W9FNJ is putting in remote control. W9KFF says the air has been quite dead lately. New Year's Greetings to you fellows, and let's get started on some of the big traffic totals you have been promising.

Traffic: **W9**BRA 33 DOQ 32 HDN 8 DJW 75 IPN 2 AEL 31 HZ 127 FNQ 35 IPA 5 IAA 112 BAR 13 BBL 97 GWR 3 BHH 94 BCT 6 JIE 43 ISA 9 HRB 19 KFF 52 FNJ 4.

DELTA DIVISION

MISSISSIPPI—SCM, William G. Bodker, W5AZV—After the recent sleet storm, which brought telephone lines down, W5BQX provided the sole means of communication from Parchman, Miss., for several days, schedules being kept with W5ACF. W5CLD reports trouble with power QRN. W5ANX has been sick with flu. W5BUI reports by radio. W5AZV-W5BJO has new 1500-volt power supply. W5VJ is proud possessor of a '45 modulator. W5BTL is worried about his temporary license. Report, fellows, if you expect to be mentioned in this report.

Traffic: **W5**BUI 252 ANX 103 BJO 89 CLD 55.

TENNESSEE—SCM, F. F. Purdy, W4AFM—W4HA leads the traffic list. W4ATE was heard in New Zealand. W4HA and W4OV are new ORS. W4HA and W4AFM are Tennessee contacts for Trunk Line "E." W4RO is Route Manager for East Tennessee. W4LU visited W4AAD and W4AFM. W4VK is pursuing an electrical engineering course at Purdue, and has the call W9DZJ as well as portable W4ZZAM. W4EM of Memphis is a physician. W4AGW works in the Federal Reserve Bank at Memphis. W4PL left for Florida to catch up on his fishing. W4EX sure piles up the traffic. W4BBT has aspirations to ORS. W4AYV sends his first report. W4AAD passed unlimited 'phone exam. W4LU, NCS for Tennessee A.A.R.S. 'phone system, holds drills on Tuesday mornings. W4AAO keeps things straight in Bristol. W4OV has rebuilt outfit. W4BOZ works 'phone and CW. Active stations in the Tennessee A.A.R.S. 'phone net are W4LU, W4AAD, W4KA, W4BOZ, W4ACU, W4ABM. The East Tennessee Amateur Radio Association, a membership of thirty odd, with headquarters in the club room of the Central Fire Hall, Johnson City, meets the first and last Thursday of each month at 8 p.m. EST. W4BQK is a new ham in Jonesboro. W4ATE hung the crepe on two 50 watters and four '81s. W4SP wants some schedules with the gang. W4BOZ says, "Watch my traffic smoke." W4ZZ is located at Tusculm College. Big Tennessee QSO Contest to be held February 16th to April 15th. All interested drop the SCM a card. All new stations are encouraged to report promptly each month. Let's go, fellows.

Traffic: **W4**HA 402 EX 310 BBT 132 BOZ 93 AAO 90 ADX 80 RO 76 PL 54 AYV 22 AFM 87 AAD 46 OV 20 ABX 3.

LOUISIANA—SCM, W. J. Wilkinson, Jr., W5WF—Thanks, fellows, for the honor of being your SCM. I will do my best to keep our Section on top during this term. W5YW closed down for the Holidays. W5AYZ is being overhauled. W5KC is the only one who sent his ORS certificate for renewal. W5BYQ is planning on A.R.R.L. membership. W5BZR applies for ORS. W5BFB puts out two frequencies in same band. W5CEN works plenty DX. W5BID likes traffic. W5HR is on 'phone. W5WF handled quite a bit of traffic. Let's have some ORS and OBS. LET'S GO, LOUISIANA.

Traffic: **W5**BYQ 14 YW 13 KC 27 WF 227.

HUDSON DIVISION

NORTHERN NEW JERSEY — SCM, Walter A. Cobb, W2CO — W2DIU again makes the BPL. The RM, W2BPY, makes a good showing and is followed up by W2TP. The SCM thanks all who sent Christmas greetings. W2AUQ will report on time. W2BRT keeps in trim by scouring the ham frequencies in his off hours from Naval Compass Station. W2EKM reports from the hospital. W2CPZ makes first report as inhabitant of North Jersey. W2BCG is another first reporter. W2CIM has double frequency crystal. W2CWK and W2DV had their ORS certificates cancelled and immediately applied for reinstatement. W2AMR got R9 from ZS4M. No ink is wasted by W2CJX in filling out his report. Whitnah of W2DIU got *gay with the high voltage and it hauled off and landed* him one. W2CIZ complains there is no traffic handled on 1.75-mc. 'phone. W2AGX was QSO ZT1Z and ZT2L. W2BLV tossed off a neat 6594 points in the SS. Santa Claus left a pair of '81s at W2CWL. W2AIB is planning to increase power. W2WC has gone back to his old self excited rig. W2BJM is building a 14 mc. rig. W2CJR is busy "hamming." W2GT and W2DOY are building single signal receivers. W2CHZ is studying for E.E. degree. W2TK claims origination of RAC (Royal Air Crusher). W2CFW blew himself to a new National receiver. W2EH is dreaming of c.c. W2HL never is able to make his antennae work! W2WY is in a dormant state. W2CO woke up at 4 a.m. and smelled smoke. Investigation showed the high voltage power supply headed South due to leaving juice turned on for 3 days. W2BZR has started a weekly sheet entitled *Amateur Radio Club News*. Send him your items. Results of election of officers of the Bloomfield Radio Club for 1933: W2AFB, Pres.; W2VQ, Vice-Pres.; W2DAB, Corr. Secy.; W2QG, Rec. Secy.; W2BUH, Treas., and W2EOC, Chief Opr. The Ocean County Radio Assn. Hamfest was a great success. W2FR stays up all night to work DX. Receiver trouble at W2AUC. W2AQP is busily working 1.75-mc. 'phone. W2BYM received his 3.9-mc. 'phone permit and threatens to give W2AWR a run for his money. W2DZW is temporarily off the air. W2BQV tries to outdo Floyd Gibbons every time a mike is shown him! W2CMI is now at Union College. DX on 3.5 mc. proves irresistible for W2EDH. W2CPZ is too busy to be on the air much this year. W2BOA is building a station for the State Police. ExW2AFU is coming back with an MOPA. W2ALD is organizing a transcontinental Naval Reserve Net. A card in the local hardware store keeps W2DUJ supplied with traffic. Traffic will pick up for W2BXM when he resumes W8CFI schedule. W2EIC is now U.S.N.R. W2BWZ applied for ORS. W2ABT and W2CGG will be ORS before another month passes. Fifteen men from this Section entered the SS.

Traffic: **W2**BPY 385 TP 185 CIM 76 DV 63 AMR 29

CJX 20 CWK 17 CIZ 14 DIU 2511 EKM 90 EIC 45 ALD 42 BXM 37 CGG 34 CPZ 32 AOE-DUJ 29 BCG 26 ABT 15 CO 8 AUQ 2.

EASTERN NEW YORK — SCM, R. E. Haight, W2LU — Many thanks for your Good Wishes for this New Year; your SCM wishes all hands the same. Schedules with five stations puts W2BZZ in BPL. Another fine record, W2BJA's. "Pop goes the filter. Presto change RAC," says W2DVY. Greetings, W2ENC, new ORS. W2BC reports new station, W2EOA of WOR fame. W2ACD and Pal W2DTB rock the ether with DX QSOs. "The SS great sport," reports W2ATM. Red Cross and Navy message handled by W2ANV. W2NT reports for 27th Sig. Co., N. Y. N. G., W2NY. W2DRC chews with G5JU on 14 mc. W2ENY QTH 106 Second St., Troy, N. Y., seeks schedules. W2UL built and calibrated an e.c. oscillator. W2DSH visits SARA meeting. W2DQT is pounding away. W2DMH's hartley '10 is stepping out. W2CQH is news reporter for SARA. W2CJP is chief op at W2ENR. W2BLL is proud possessor of new BUG. W2ENB is handling traffic. A new Radio Club with W2QY sponsor at Cornwall on Hudson. A visit at HQ with FB time reports W2CFU, W2AN and W2JQ. ND, W2ACY, we can't lose you. W2ACB gets many thrills from 1.75 and 56 mc. W2BJP relays direct to K5AA Panama. W2CJS is experimenting. W2SZ knocks off VKs and ZLs. W2OP is all set to go in new quarters. W2CMI reports Union College Radio Club reorganized. "'26s perk FB in 56-mc. oscillator," says W2EHG. W2BXC reports odd coincident in keeping schedule. New officers for SARA 1933: Pres., W2CAZ; Vice-Pres., W2DC; Secy., W2DUG, Treas., W2BZW. The Crystal Radio Club 1933 officers: W2ECC, Pres.; W2DIB, Vice-Pres.; W2CTE, Secy. W2DMC, C.R.C. station, has 'phone on 1.75 mc. W2DFV gave up 56 mc. for 1.75 mc. W2DON has new modulator. W2EIZ is heard nightly on 1.75 mc. W2DIB calls his engagement to a REAL YL. W2DIN worked his 1st DX. W2AUX has FB Class B mod. W2DXJ, W2DEL and W2BGH are remodeling. W2CSC tried 3000 Volts Plus on '52! W2BKM is heard at new QRA.

Traffic: **W2BZZ** 753 BJA 596 LU 261 ENC 180 DTB 105 DVY 102 BJP-BC 76 ACD 72 ATM 58 ANV 54 NY-ENY 50 UL 47 DRC 36 DQT 31 DMH 22 CQH 21 BLL 16 ENB-QY 9 CFU-ACY-CJS 6.

NEW YORK CITY AND LONG ISLAND — SCM, M. J. Grainger, W2AUS — W2DBQ wins the crystal for greatest improvement in totals. W2WP gets the 1mfd filter condenser as second prize. W2QM gets special prize of Handbook. W2AFV gets special prize donated by Dr. Walsh. Handbook was donated by B. Fuld, W2BEG. Brooklyn: W2PF is QRL A.A.R.S. W2AZV has new receiver. W2DBQ is building new receiver. W2ASG is on 3800 kc. W2BHB is new reporter. W2BAS likes 3.5 mc. W2LB is working at VCR schedules. W2COH reports schedule with Louisiana. W2BEG has Police schedules. W2AAK rebuilds to c.c. Bronx: W2QM is handling more traffic than ever. W2BGO's schedules don't produce traffic. W2CYX is grinding crystals for 3.5-mc. Navy transmitter. W2BMH worked Portugal. W2FF says TPTG is better than c.c. W2CBB schedules W2UL. W2DBA reports a new ham, W2ERC. Queens: W2AGL is now ORS. W2AIQ says skip on 3.5 mc. got him. W2CUH is after ORS. W2ATU is a new ham in Queens. W2BVB reports after long absence. W2COI reports by radio. W2BOM is rebuilding to c.c. W2AUS rebuilt. Long Island (Nassau and Suffolk): W2BVL has new chief operator, W2AWQ, replacing W2VL, who resigned. W2VL reports as usual tho'. W2BST-W2EQP puts 500 watts into the '52. W2CYA has portable W2EOJ. W2CHK relays to Philippines. W2BRB is getting fixed up in Bellmore. W2DJO at Great Neck reports. W2BWD uses a '45 on 14 mc. W2DOG has FB '52 outfit. New York City and Staten Island: W2SC was off due to broken cable. W2AWT is on 7290 kc. W2WP now is TL worker. W2AHO works on a "CQ basis" only. W2DUP will soon be ORS. W2AFV leads the Section! We still have room for some good ORS.

Traffic: **W2AFV** 1102 DBQ 432 WP 376 SC 346 QM 226 BGO 177 AUS 232 CBB 114 AZV 100 BHB 95 ATU 92 ASG 91 CHK 85 DOG 78 FF 60 AHO 49 BVL 54 VL 38 AGL 14 DUP 61 PF 69 CYX 27 COI 24 AIQ 26 CWP 31 LB 20 BAS 21 BST 54 COH 15 DFW 18 CUH 59 DYJ 19 LR 18 BMH 18 CYA 12 DBA-AAK 6 DJO 8 BWD 21 DJP 39 ELK 10 EBT 4 AWT 3 BRB-BVB-CLM-BEG 1.

MIDWEST DIVISION

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9BNT comes forth with an FB total. W9FAM takes second place. W9DHA hasn't been sleeping either. W9DMY makes the BPL. W9FUW is knocking 'em stiff. W9HYR has new receiver. W9EHW is keeping lots of schedules. W9DGL is out "Champion DXer." W9DI is busy in school at Lincoln. How about an ORS appointment, W9HTU? W9IFE is handling a gob of traffic. W9FGS is after some one's hide. W9EDI is trying to keep up the spirit of the Lincoln gang. W9DHC, Editor of *Static*, asks for dope on all Nebraska stations. W9BB, Doane College, is well represented. W9ESY started the ball rolling again. W9KQK is a new station at Overton. W9DCC wants to help Nebraska in the contest. W9HGO and W9EW consolidated. W9JEE reports for first time. W9KPA is getting the traffic-handling habit. W9DFF is using flea power. W9IFQ has been working on W9AFD outfit for Natl. Guard. W9EWO rebuilt transmitter. W9FZX reports good total. W9CWM turns in nice report. W9ATB and W9EKP report by radio. W9EEW is having transmitter trouble.

Traffic: **W9BNT** 1191 FAM 639 DHA 533 DMY 520 FUW 501 HYR 380 EHW 86 DGL 35 DI 22 EWO 21 HTU 479 IFE 267 FGS 238 EDI 137 DHC 103 BB 45 ESY 32 KQK 27 DCC 41 HGO 25 JEE 19 KPA 27 DFF 8 IFZ 3 FZX 85 ATB 6 EKP 11. CWM 19.

KANSAS — SCM, O. J. Spetter, W9FLG — W9KG brings in a total for one month of 1251 messages!! W9CFN says Trunk Line "K" is in fine shape. W9GXV, Secretary of the Hiawatha Amateur Radio Club, sends a nice report. The club meets each Monday night with code, theory, operating and general information classes. The officers are: F. H. Merriam, Pres.; W9PB, Vice-Pres.; W9GXV, Secy.; G. Jackson, Treas.; Clyde Zimmerman, Activities Manager. W9FXM, Secretary of the Sunflower Amateur Radio Club, reports Sunflower is planning big time January 6th at the Armory. The Sunflower QSO Contest is under way. W9BSK worked 15 states the first three days, bringing his score up to 20,000. W9FMX only got 10 QSOs out of 40 times to bat. W9GXD kept quiet as to his activities. The first prize is a genuine crystal. We understand there is a new club being organized in Wichita. W9GXD went to Kansas City to take Broadcast examination. W9HLD returned from veterans hospital at Ft. Lyons, Colo. W9AWB moved into a bigger house. W9FMX sends us a short story the moral of which is "Look at the thermometer before you start rabbit hunting." W5AKX has moved to Kansas. W9HNU is a newlywed. W9CYV reports 7 mc. good for low power. W9NI is on 1750 kc. W9FRC is trying to run a PP211 P.A. with fewer tubes in amplifiers to lower light bills. W9ESL raised his power 300 volts. W9IOL is down with the flu. W9FEL never hears W9FLG. W9BUY reports new condenser mike. W9IQI handled one important sick message from Penn. to Okla. W9IEL joined the A.A.R.S. W9CKV has been down with the flu. W9HSN is putting in two '03As. W9LFN is new Topeka call. W9CET worked NZ 12 times, Hawaii twice and Chile once. Let's have those reports, gang.

Traffic: **W9KG** 1251 CFN 420 FLG 348 KCR 160 CUF 131 FEL 111 ESL 93 HSN 92 IEW 85 IOL 83 KFQ 82 BNU 71 COA 63 CKV 60 IQI 48 GCL 55 GXV 39 NI 35 PB 32 KDO-GQA 28 CET-BGL 25 KUP 23 BTG-ICV 22 DEB 20 BUY 18 ABR 17 FRC 16 BSK-BBM 15 GUZ 14 GBA-AWP 13 BYM 12 IEL 11 JVC-JDH-EYY 10 HLE 9 KWA-HWW 8 CSK-HJF 6 IQV 4 CYV 3 AWR 1 HNU 2 FMX 15 AWB 5.

IOWA — SCM, George D. Hansen, W9FFD — W9EIV and W9BPG, RMs. W9KBM heads the list for the BPL. W9EIV is high second! W9ABE and W9IO follow. W9FFD was called to Florida, and W9GP is writing this

report. W9BJP didn't count his SS messages in report. W9ACL says W9LEZ runs the Davenport count to about 30 stations. W9CWG handled 6 Red Cross messages. W9BWF has trouble with receiver. W9FYC has portable W9KVJ. ExW9BKV is back with call W9LCX. W9AHX-W6ZZBL is working on 1.75 'phone and c.w. W9ERY has c.c. rig perking FB. W9DHE is on 3700 kc. W9CWT is QRL night work. W9DUN is out for ORS. W9DJX says "No QSP turned down here." W9DEA boosts Soo City Club traffic. W9JZC sends first report. W9CYL is looking toward ORS. W9FEB is experimenting. W9DMX handled Red Cross reports. W9EOE says skip and weak signals at his QRA. W9JXO says Neon Christmas bulbs FB to locate RF. W9DNZ has local QRM. W9JSO is building c.c. rig. W9LAR is new in Co. Bluffs. W9BPG is QRL for "kale." W9AFQ is trying to get new 'phone on air. W9GPL is experimenting in television. W9FEA sends first report. W9FYX is QRL school. W9JZM reports traffic. W9IYE has gone to Calif. W9JAD is on 1.75-mc. 'phone. W9CS is building 7-mc. rig. W9JMB is c.c. on 7 mc. W9HPA reports for W9FOF and W9FUN. (W9GP in making this report notes some report totals ONLY 2 - Let's have the number originated, delivered and relayed as designated by A.R.R.L. practice, else we may have to eliminate when we check up the traffic in the Midwest Banner Contest.) Des Moines Club has application in for affiliation. W9FAI comes back to the fold. W9IFI says a red-headed girl arrived recently in his family. W9DFZ has a siege of flu. It is with our sympathies that we note the passing of W9HMM's father.

Traffic: W9KBM 719 ABE 285 IO 258 FFD 214 BJP 212 ACL 188 CWG 173 BWF 140 FYC 126 AHX 95 ERY 77 DHE 67 GP 67 GWT 58 DUN 55 DJX 35 DEA 34 JZC 31 CYL 24 FEB 22 DMX 19 EOE 15 JXO 14 DNZ 11 JSO 12 LAR 6 BPG 5 AFQ 4 GPL 1 FYX 6 JZM 8 JMB 5 CS 2 FEA 14 FOF 18 HPA 57 FUN 8 EIV 606 FAI 48 IFI 28 DFZ 26 HMM 32. W6ZZBL 7.

MISSOURI — SCM, C. R. Cannady, W9EYG-HCP-JPT — RMs: W9BMA, Denzil Lane for Western Missouri; W9PW, H. J. Becker and W9FTA, Harvey Glatstein for Eastern Missouri. This month MISSOURI has 102 STATIONS with TRAFFIC and SEVEN BPL men: W9BMA, W9EYG, W9FJV, W9JPT, W9NP, W9GBJ, and W9HCP. Let us list your station as a traffic station next month and SWELL OUR LIST! W9BMA led the state traffic as well as the ACTIVITY CUP RACE. W9FTA, however, held his lead in the year's CUP standing with W9CJR a close second, displacing W9CRM. W9AIJ and W9GBJ follow W9CRM very closely. St. Louis: W9IJW is QRL school and YLs. W9GCH continues as a traffic station. W9HVJ is installing c.c. W9APW put in '66s. W9KYF reported by W9HVJ. W9KSX decides c.c. is a bad job. W9HVI is operating on 3.5 mc. W9FCH moved to Hematite. W9HWE received QSL from Germany. W9HWD and W9BSH are adding crystals. W9HEL has new MOPA. W9HIP is using a '52. W9HWP turned DADDY — it's a YL. W9KEI installed new 15-watt '10s. W9KHU is trying to land W6 and W7s. W9HHK is on the rocks. W9KFL gets a kick out of working K signals — even YKs. W9EFC is doing nice work on Trunk Lines. W9CCZ reports no luck with c.c. W9ILI is operating on three 'phone bands. W9KIK installed higher power. W9FAB and W9GSO are QRL job. W9HVP traded his rig for motorcycle. W9GTK-ENK lost job. W9FZJ and W9CLT are trying for DX on 14 mc. W9COD will be back soon. OBP: W9PW-NH will be on full force by January 1st. W9BGE-KJK is putting up new 'phone. W9ECT reported by radio. St. Louis Amateur Radio Club: W9DUD-EWT is working lots of DX. W9AUB reports hamfest in St. Louis second Saturday in February. W9FIZ is building 50-watt c.c. rig. W9HVC is operating remote control from kitchen stove! W9FTA is doing lots of FB RM work! W9GTY is second op at W9AUB. W9EVV does FB work with a '71A and 180 volts. W9GTF has trouble getting receiver working. W9GDU swapped type '11 for a '52. W9DGI is QRL work and night school. W9EOW is QRL work. ON4UU instead of OM4UU visited St. Louis recently. Kansas City: W9BMA sends in mighty FB RM report. W9AUC has entirely new rig. W9CU got some traffic. W9EL is rebuilding to 500 watts c.c. W9FHV is upholding the Trunk Lines. W9FNO is chasing 14-mc. harmonic. W9FPI blew his kw bottle! W9HFO handled schedule with Springfield. W9DPA has whole new outfit. W9AOG-KEM got some Central College Traffic. W9FCF-KHT handled 1.75-mc. 'phone traffic. W9EQC handled nothing but VK and ZL traffic. W9HON is a new ham on 3.5 mc. W9GCG is QRL dance orchestra and school. W9RR-ZZ sends an FB U.S.N.R. report. W9NP made BPL on Deliveries. Ensign M. B. Lowe got new call, W9LEO. W9AQX was promoted to Ensign in U.S.N.R. W9KUT is new call at Parkville. W9IMZ uses c.c. 50-watter on 1.9-m.c. 'phone. W9GSF reports by radio. State News: W9GQY promises more activity. W9IOU reports W9JYE new ham at Rock Port. W9FJV reports A.A.R.S. helps traffic! W9ENF is added to Missouri's O.O. Corps. W9AIJ installed c.c. W9HNM is experimenting with 56 mc. W9ECE is holding four AA schedules. W9FSL's c.c. rig is working FB. W9JBV needs east schedules. W9JVL is increasing traffic. W9CHE in THIRTY DAYS worked 276 DIFFERENT STATIONS! W9FSU is mixing activity. W9KLJ is rebuilding. W9KTH is new ham at Bethany. W9COZ gets traffic spirit. W9FYM continues AA and OBS work. W9BGS shows increased activity! W9DPF, W9JYC, W9IGP and W9EME report by radio. W9ANG has FB 'phone at Wm. Jewell College, Liberty. W9DHN has been QRL at M.U. in E.E. W9JBZ gets back on. W9BWX comes in with FIRST REPORT IN EIGHT YEARS. W9DLC gets back after QRL license renewal. W9HIZ sends FB report. W9LBO is new station at Pleasant Hill. W9HVW gets in on traffic work. W9CRM reports activities slowing up. W9IGX is going strong on 1.9-mc. 'phone. W9FYU is trying for BPL. Hannibal Amateur Radio Club: W9GBC is building 1.9-mc. 'phone. W9FGJ just completed his portable. W9FSZ is building 7-mc. rig. W9CJH is active A.A.R.S. W9KNH thinks 1.9-mc. 'phone FB. W9HBJ is experimenting with 46 and 47s. W9IRR has new ham shack. W9CNS needs exercise — he can't ride his bicycle in the snow! W9HSZ, W9FSB, and W9EFZ QRL. The Club is very proud of its new A.R.R.L. Affiliation Certificate. South Missouri Association of Radio Amateurs: W9DUM returned to Van Buren, Ark., W9FVM-W5CR to Monett and W9CLU to Willow Springs for the holidays. W9GBJ put in c.c. W9HUG is rebuilding. W9CJR-FEH has new 60-c.c. rig. W9GMI is QRL power supply. W9CXB was QRL appendicitis operation. W9GAR moved to 3.5 mc. W9GBR-HOW reports from Springfield. W9HUI reports by radio. W9BLR is active in A.A.R.S. W9LCJ is new ham at Bois D'Arc. W9IXO is doing FB with '12A. W9EHS says, "How can you tell whether you hear the signal or HARMONICA?" The YL of W9CLU threatens come-back. W9JPT may be heard in lieu of W9EYG soon, so give a call! Let's keep our REPORTS ABOVE 100! 73.

Traffic: W9BMA 1055 EYG 548 FJV 515 JPT 501 CJR 360 NP 283 GBJ 241 ENF 211 FHV 188 AIJ 184 HNM 171 EFC 155 HCP 106 ECE 95 IJW 87 FSL 78 AUC 75 IXO 71 FYU 69 EHS-FTA 67 GCG 59 JBV 52 CJH 50 EQC-JVL-CRM 44 GSF 37 FPI 34 CHE 31 HVJ 30 FNO 29 CU 27 GIH-RR-KYF 25 JBZ-HVW 22 HUI 21 AOG 20 GBC-KLJ 18 JYC-EL 15 KEI-AQX-HWE-DUD 14 INX-HFO-HUG-IMZ 12 FSU-APW-HIZ-COZ 10 DLC-HON-DPF-BC 9 HVC 8 FIZ-DUM-FSZ 7 DOE-ANG-DPA-FYM-GBR 6 AUB-EME-ZZ 5 FEH-FAL-FKF-IOS-BLR-GMI 4 BGS-BGE 3 CGA-KIP-GTK-ENK-BWX-PW-GLY-HLK-FCF-KHT-KNH 2 KJK-NH-HOW-FZJ-KEP-GCH-DHN-EWT-FVM-CON-LCJ 1.

NEW ENGLAND DIVISION

VERMONT—SCM, Roy L. Gale, W1BD—W1ATF regains the traffic banner. W1BZD sends his usual FB report. W1EJK has been moving. W1DGU is handling much traffic. W1AXN's and W1DHX's licenses expired. W1CGX and W1BEB were among those who took exam for first-class license. W1CGV had a fever of rebuilding. W1BJP is receiving DX reports. W1AOA gave the RI

a ride! W1BNS reports everything new in his shack. W1AJF is located in Waterford. W1BZG is a new ham in Hardwick. W1CBW has installed c.c. on 3875 kc. W1CBE is building a 1.75-mc. 'phone. W1EJF is trying 56 mc. W1AHN reports traffic. W1EFC will take traffic for Dartmouth College. ExW1BIQ is now W2EOA. W1ERJ lost his reputation as an antenna expert. Hi. W1BD pounds away with main interest in A.A.R.S. work. Any reliable operators wishing to become A.A.R.S. members should communicate with your SCM. Drills are now held on Sundays at 10 a.m.

Traffic: **W1ATF** 259 BZD 118 DGU 62 CGV 55 BD 54 BJP 37 AXN 14 DHX 10 EFC 9 AHN 8 CGX 2 AOA 2.

CONNECTICUT—SCM, Fred A. Ells, Jr., W1CTI —W1CJD maintains his position as king of Section's traffic handlers. W1BDI and W1MK are nearly tied in traffic. "RP" of W1MK has personal station, W1RP, on 3505 kc. W1AFB on Trunk Line "C" turns in the same total as W1AMG. W1AMG is now officially connected with the Department of Police of Stamford. W1ES with good schedules turns in a hot total. W1BFS sends a six-page letter full of dope. W1DGG gets c.c. reports from his new c.c. transmitter. W1BHM has offered a Handbook for a prize in the TCRC Traffic Contest. The TCRC puts out a mighty nice bulletin called "Haywire." Get in touch with W1TD for your copy. W1CDS and W1AHC work together on schedules; in case one can't be on air, the other handles the schedules. W1CIG closed down over the holidays. W1DOW keeps a half dozen schedules. W1AVB is on the air noon times. W1AUK reports via W1AMG. W1DEP reports via W1BDI-W1UE. W1DGC worked all W districts on 3.5 mc. W1DDX says exK5AE paid him a visit. W1BFU claims to be the heaviest ham in the first district! W1BMP schedules W7BVI on 3.5 mc. W1CVD should apply for ORS. W1DMK says W1HD is active on 56 mc. and 3.5 mc. W1ERU put in a new power supply. W1EAO, O.O., reported over 75 off-frequency stations this month. W1AJB reported by radio from W1CJD. W1APW has overhauled his schedules. W1EAP passed the exam at Hartford. W1CTI got some filter condensers at last! W1TD, President of TCRC, says the club is growing fast. W1EFW has a new Gross "Eagle." Station license of W1BIQ expired. W1APZ bought an '04A. W1BGJ is busy earning a living. W1FDM sends his second report. W1UZ worked some EARs. W1AOK is back with us again. W1FIO cured a case of creeping frequency by adjustment of crystal holder. W1BNP is building an S.S. receiver. W1BNB is rebuilding transmitter. W1BAX, Secretary of the H.C.A.R.A., reports as prize winners in HCARA Traffic Contest, W1BNP, W1AFB, and W1APJ. W1BQS is QRL in New York City. W1APJ has received honorary cancellation of his ORS. W1CNU-ZZBM has a new Taylor 25-watter. W1FL now has 75 watts in antenna. W1CDR lost his apparatus when a high tide flooded his radio shack. The following member stations of CBA are entered in a traffic contest for club members: W1NE, W1FL, W1APZ, W1BWM, W1EER, W1AXB, W1FIO, W1CNU, W1AMG, W1CTI. The following Official Observers in Conn. will be glad to give you accurate QRG service: W1FL, W1EAO, W1CNU, and W1APZ. See *QST* for Standard Frequency schedules and QRT if your frequency is the same as the scheduled transmissions. W1QV reported by radio. The W1YU gang have been QRL studies.

Traffic: **W1CJD** 825 BDI 576 MK 573 AFB 267 AMG 267 ES 264 BFS 135 DGG 137 BHM 105 AHC 91 CDS 85 CIG 76 DOW 75 AVB 63 AUK 59 DEP 57 DGC 46 DDX 43 BFU 37 BMP 35 EAO 33 CVD 26 DMK 29 ERU 25 AJB 21 APW-EAP-CTI 18 TD 16 EFW 15 BIQ 14 APZ 13 BGJ 10 FDM 9 UZ 8 AOK 7 FIO 5 RP-BNP 4 BNB 6 BAX 1 YU 75 QV 43.

MAINE—SCM, John W. Singleton, W1CDX—W1CFG and W1CRP lead the list. W1BOF has new c.c. rig. W1CPT makes the BPL. W1OR has been experimenting with MOPA. W1EEY has bought a hardware business in Hartford. W1APU is looking for schedules. W1APR and W1BWS visited the SCM. W1BNC is keeping Waterville covered for traffic. W1APX expects to go south for the winter. W1CHF is in line for ORS. W1BUO is busy as ever. W1DHH has new MOPA. W1BLI is QRL these days. W1CEQ and W1EFX are rebuilding. W1DAW will soon be ORS. W1QH enjoys hamfests. W1VF is doing a fine job as O.O. W1AQW was QSO the hospital this month (he says the nurses are FB). W1CIP was also on the sick list. W1BYV and W1BWB report. W1AXJ has had bronchitis. The SCM wishes the gang a very prosperous New Year. W1BZS is going in the traffic game. W1AQL had sickness in the family. W1EF, W1DOB, W1EUL and W1GG are on 1.75-mc. 'phone.

Traffic: **W1CFG** 388 CRP 329 BOF 274 CPT 238 EF 215 CDX 180 OR 157 EEY 106 APU 78 APR 65 BNC 58 APX 55 CHF 48 BUO 42 DHH 35 BLI 24 AQW 32 CEQ 16 DAW 9 QH 8 VF 6 BYV 4 AXJ 2 BWB 22.

EASTERN MASSACHUSETTS—SCM, Joseph A. Mullen, W1ASI—The Section ORS "Bull" was discontinued due to lack of interest by the gang. The Division Director W1KH and the SCM W1ASI made a trip to the Springfield Hamfest and enjoyed a "swell" week-end. W1CHF dropped in on the SCM for a short visit. W1VS insists on being high man as usual. W1LQ spent the Dec. 10th week-end in the White Mts. with W1IJN. W1WV has completed over 1000 DX QSOs, 467 of them with 190 different "G" stations. W1ABF is on the beach. W1AGA was heard in England on 1.75 mc. W1LM is just rolling along—AND HOW. W1BBY keeps a daily schedule with Canada. W1CHR is tied up with college. W1CUO reports the formation of the Norfolk County Radio Assn. W1CAW is President. W1BFR wants daytime schedule on the Cape. W1BGW requests the I.L. W1BMW says two of the gang down the cape let their licenses expire. W1CD says there is need of a good traffic handler just south of Boston. KRK? "Boot." W1BEF sends a fine report. The weather man refuses to give W1JL a break. W1BZO applies for ORS. W1ELZ is pushing 75 watts into his '10. W1ETX has new c.c. outfit. W1BO received 119 foreign cards in one week. W1CUY now fills that gap for traffic in Plymouth. W1ALP feels thirty messages per month is too much to expect from an ORS. W1VA is running his 'phone outfit. W1CWA gets on occasionally. W1DMT is pounding out a c.c. signal. W1BBX is using a pair of PP 50 watters. W1AJK has most of his code work concentrated at NDA. W1DL is going to change his QRA. ExIRL is coming back with call W1FIU. W1CAW reports a new man in Norwood, W1FBC. W1ME says it's too chilly in the shack to do any brass pounding. W1ATX delivered some rush traffic from China to Boston. W1AAL feels the SS did his total a world of good. W1ABG is rejoicing at acknowledgment of delivery of one of his messages. W1ASF has sprung into action again after a busy summer on Mt. Washington.

Traffic: **W1VS** 793 LM 322 CD 213 BFR 112 BBY 95 WV 90 ASI 82 BEF 56 AGA 48 KH 46 JL 43 BZO 31 LQ 23 BMW 23 CUO 19 CHR 9 ASF 162 AAL 99 ABG 47 CAW 41 ATX 13 ME 12.

WESTERN MASSACHUSETTS—SCM, Earl G. Hewinson, W1ASY—W1BCX leads the Section for the third time. W1BVP is second and makes BPL. W1BPT reports by radio via W1BVP. The SCM wants to thank the WMARA and the SRA for their fine coöperation in putting over the sectional "Hamfest." The "Hamfest" was honored by the presence of Mr. George Bailey, W1KH, A.R.R.L. Director for N.E., and Mr. Joe Mullen, W1ASI, SCM Eastern Mass. W1EFM went to Washington, D. C., to look the big fellows over. W1AZW, RM, reports the RI in his section for license exams. W1COI says: "All tired out from the SS." W1DGW reports traffic hard to find. W1DCH reports W1CCJ and W1DKX got first-class tickets. W1APL is frying eggs

on his '52. W1TX got a permit to use 3.9-mc. 'phone band. W1OF is still looking for the Christmas rush on radio parts. W1AQM worked Montana on 3.5 mc. W1BAQ has a bone to pick with the RM and SCM for not keeping schedules. W1BNL is sweating over the transmitter. W1AJD reports business interfering with radio. W1BVR is doing a fine piece of work for the A.A.R.S. W1CCH, President of the WMARA, is QRL the club's new c.c. job. W1EFQ spent three cents to report his traffic. W1BPN says his ORS ticket must have got lost in "Uncle Sam's" mail. W1DVW got his first-class license. W1ARH schedules VE3WK. W1BXF is loafing. W1CCS is having hard time getting PDC. W1AIC says wx too cold in his shack for brass pounding. W1CJK reports for first time. W1AUQ resigned as ORS. W1EOB was late reporting. Richard L. Burt reported, but forgot his call. W1FFJ requests report forms. W1FAJ is building new power supply. W1APP says his licenses still drape the walls of his shack. W1ADF requests ORS. W1ASU says U.S.N.R.-VCR is now sixty strong in Western Mass. W1CTK has given up 1.75-mc. 'phone. W1FFK is getting out well.

Traffic: **W1BCX** 405 BVP 248 ASY 202 EFM 110 AZW 103 COI 78 DGW-DCH 76 APL 75 TX 62 OF 45 AQM 39 BKQ 35 EOB 36 BNL 33 AJD 30 BPT 30 BVR-CCH 26 EFQ 22 DVW 24 ARH-BXF 21 CCS 19 AIC 17 EJM 15 CJK-FFJ 8 FAJ 6 APP 5 ADF 4 ASU 3 CTK-FFK 1 BWY 30.

NEW HAMPSHIRE—SCM, V. W. Hodge, W1ATJ —W1FEX, our highest station in terms of altitude, handled a bunch of traffic. W1AUY is trying low-power 'phone. W1EES complains of skip. W1BGL of Dover is trying for ORS. W1APK's 1973-kc. 'phone is working fine. W1CVK tried the SS. W1AXL is building a c.c. rig. W1DNC shut down for vacation. W1UN is kept busy with weather traffic from W1FEX. W1EFK is off the air for a while. W1AVJ says the SS was FB. W1BAC has been active this month. The SCM expects to be on soon with c.c. rig.

Traffic: **W1AVJ** 202 UN 185 BAC 155 DNC 121 AXL 108 FEX 92 DMI 46 CVK 32 APK 15 BGL-CCM 8 EES 6.

RHODE ISLAND—SCM, N. H. Miller, W1AWE—W1BUX is on daily. W1CAB works good DX. W1GV has four schedules. W1EOF increased power. W1AWE is still finishing his c.c. It is with much regret that we must report the passing of one of our old-timers, Franklin B. Rowell, W1AMU. Our sympathies to his family. W1II-W1ZS is experimenting with c.c. W1DDY, W1BOP, W1BML, W1CMY, W1AXS and W1BOY uphold the Navy standard. W1BOS was heard in Germany. W1TZ is busting the air with c.c. W1AAD spends most of his time with traffic. W1ALI reports the Pawtucket Amateur Radio Association going along at great pace. Meetings are held Tuesday evenings at 82 Greenslitt Ave., Pawtucket, R. I. W1BGA, our RM, is going along in great style. W1CGO reports punk traffic. W1ASZ is short of cash. W1CPV is active. W1BTP is on 3.5 mc. W1AFM is attending Eastern Radio Institute in Boston; he and W1FDS have combined their resources.

Traffic: **W1AAD** 60 BUX 56 GV 54 BGA 46 ASZ 36 CAB 33 EOF 30 BOS 17 CGO 5 AWE 4 ALI 3.

NORTHWESTERN DIVISION

OREGON — SCM, Ray Cummins, W7ABZ — W7AWH leads and breaks his station record. W7BTH spends his time on 14 mc. W7AQY and M7COR visited the SCM. W7AMF and W7WL are experimenting with 14-mc. crystals. W7CGD applied for ORS. W7SY says 1000 volts on a '10 is not so hot. SS gave W7HM a nice total. W7UJ is QSO lots of DX. A Class "B," 3.9-mc. 'phone at W7BEK is working nicely. W7KL has c.c. MOPA. W7CEJ blew filter. Cold wx kept W7QW and W7BOH out of their shacks. W7BGF returned to the air. W7BRH has a pair of '10s. W7BDU is c.c. on 7 mc. W7CFM can't get the watts into his antenna. W7WR is new OBS. His broadcasts are: Mon., Wed., and Fri., 5:30 p.m., 3780-kc. cw. W7BWD worked 25 states and 14 districts in SS. Fifty stations in two months is FB for beginner W7AVB. W7AZJ is going in for archery. W7AJX has new radio den. W7BUF is on 1.75-mc. 'phone. W7MY took unto himself a wife. The Coos Bay Club enjoy eats after each meeting. W7AHJ will show that an OW can handle traffic. W7DP and W7AIG had a lot of fun in SS. W7PL has been laid up with the flu. W7AQX schedules W9EDW. W7AIP has a keen rack job. W7KR renewed license. W7BZS is on 1.75-mc. 'phone and c.w. W7BO is lonesome for the old days. W7AMR, W7BYC, W7PK, W7BDN, and W7ED are rebuilding. W7BKD has plenty of time to pound brass. W7MQ has a severe case of YLitis. W7AMQ reports the downfall of his antenna. W7CCU is going c.c. Increased power at KO1N is bad QRM for W7BZO. W7AJM is QRL drug business. W7BTS had to move. Hi. W7BTF pounds in on 1.75-mc. 'phone. W7AEM is looking for schedules. W7BXU's fire goes out on account of lengthy rag chews. W7CKF worked K6EGE with a single 'O1A. W7HD wants traffic. W7BMR worked his 41st state. W7ZZAL is old W7LI. W7AWI will try 7 and 14 mc. W7AXJ's schedules make him lose a lot of sleep. W7QY says snow storms cause QRM in his receiver. W7AKY has unlimited 'phone ticket. W7ACH had his ORS renewed. The OW at W7BDU donated the only pair of "cans" to the T.B. hospital. W7IP is c.c. W7CBA, W7BWK and W7COU are proud possessors of new receivers. W7BOO sends a traffic report every month. W7AYV is putting in a '60. W7AXO handles some traffic. W7BMA has a 50-watter on all bands. W7BKL keeps his nose in school books. W7BNK puts a husky signal down to the VKs and ZLs. W7AES and W7BBO are new Astoria hams. Back to the regular working schedule gives W7ABZ more time to devote to the job of SCM. Everybody get to work on this "All Oregon Traffic Contest," and show the rest of the world some real traffic handling. 73.

Traffic: **W7AWH** 745 ACH 461 AXJ 220 HM 147 BMR 127 AHJ 110 DP 87 KL 57 WR 48 AWI 46 BWK 47 HD 44 AMF 43 AQY 40 AYV 39 BOH 34 CEJ 25 SY 23 ABZ 21 CFM-BOO 20 ZZAL 16 CBA-QY 10 BLN 9 AXO 7 AJX 6 AMQ-BUF-COU 5 BDU 4 AEM 3 BTH 2 COR 1.

IDAHO — SCM, C. R. Thrapp, W7AYH-CKO — W7ALY, W7ACP, W7ATN and W7BAR are all going on 56 mc. W7CEH reports too cold for radio. W7BAA is keeping Firth on the map. W7DD is QRL experimenting. W7CAP reports changes in c.c. rig. W7BBE has new MOPA. W7BHN has returned from Calif. W7BOM is rebuilding. W7CAT has new a.c. receiver. W7CHT is working ZLs. W7BRY is increasing power. W7CAT and W7COW should be eligible for the "barnyard Club." W7ACD reports W7BKJ the first licensed YL in Idaho.

Traffic: **W7BAA** 56 ACP 23 AYH 18 CAP 11 AT 5 DD 5 BBE 3.

MONTANA — SCM, O. W. Viers, W7AAT — W7ASQ is high traffic man. W7BCE comes second with almost 200! W7FL works 14, 7 and 3.5 mc. W7AFY is almost ready to put new rig on the air. W7BGC has portable W7BDM. W7AOD says it's hard to move traffic. W7CNE is installing a '52. W7CHW is hunting DX. W7BYR is on a new traffic net. W7BQG wants schedules. W7CRD is new station in Great Falls. W7AFS has '03A final. W7BMX has the old "buster" perking. W7BVE has a handful of crystals. W7BOZ and W7BIZ are c.c. Russ Richmond, Somers, has just received his new call, W7CRH. W7AHF has moved to Kalispell. W7BKM has portable W7CQU. W7COY reports lots of trouble with new layout. W7COX is the SCM's wife and, so far as we know, the only YL operator on the air in this Section. W7AAT will soon be completely off the air due to bias battery trouble. W7BSU helps out with traffic.

Traffic: **W7FL** 66 ASQ 209 AOD 10 BYR 64 BCE 187 AAT 16 BSU 42 BQG-AFS 11 BMX 8 BVE 65 BOZ 10 BKM 14 COX 38 AQN 96. (Oct.–Nov. figures: **W7BZA** 110 AQN 37.)

ALASKA — SCM, Richard J. Fox, K7PQ — This report received by radio at W7UU and mailed to HQs. K7FF deserted traffic for trapping. K7TF complains of

lack of appreciation on the part of BCLs. K7BMY is building a 200-watt c.c. rig. K7CNF has gone south for a three-months vacation. K7PQ expects to have his 200-watt c.c. perking in a few weeks. K7BOE is also trapping. Navy net is being organized at Anchorage. Oil burner QRM caused by cold weather is ruining the peace of mind of K7BNW, K7BZX and K7PQ. K7AZN is a new ham at Cape Prince of Wales. K7BVH is new at Ugashik, K7CDV at Egegik and K7LW at Anchorage. K7ADY is going to quit the game. K7BFO reports good DX on 7000 kc.

Traffic: **W7TF** 13 CNF 43 FF 82 PQ 119.

WASHINGTON — SCM, John P. Gruble, W7RT — W7BHH and W7BKE capture high places this month. W7AFC schedules W7AQN. W7BYS uses 1.7-mc. 'phone "Slop-jar" rectifier at W7CHH froze and all jars broke. W7QI operates on 7276 kc. W7CND is planning c.c. Welcome to the first report from W7BTV. Skip effects trouble W7WY schedules. W7AJ is still active. W7CJS and W7BDW QSO each other's harmonics. W7AXT's brother passed away recently. W7BNI reports probable formation of a VCR unit at Wenatchee. W7BCV reported by radio via W7UU. W7BRS has 200 watts input to '52. W7ATW is making up for lost time. W7UO is rebuilding for 1.7 mc. Ex-W7BKW has moved to Wenatchee. W7CGK has trouble with '47 oscillator. Work causes decline in radio at W7AZI. W7AYO got letter from W6EK (YL at Pomona). W7BSX needs eastern schedules. W7AG is building new receiver. W7FP clicked all districts on 'phone. Ed Cross received license, says W7CCF at Renton. W7APS schedules Tacoma. Cold weather causes slump at W7CCN. W7AKP and W7NR keep Everett on 3.5 mc.; W7BMU, W7ACY, W7CEC, and W7BLX are active on other bands. W7CRY is new station at Naches. W7AHQ worked all districts during SS, using W7CNW, portable. W7CKH is active at Anacortes. W7ALZ worked three ZLs in succession. W7AAF is the sole reporter from Kirkland. W7AF reports in person. W7ASW is ready for DX. W7BGL is trying 1.7-mc. 'phone. W7BGH worked G6QB. W7VY worked ZS1Z. W7VO is interested in VCR. W7BRC uses an '01A with c.c. W7AUP works for Weather Bureau. W7BVR handled his first traffic. W7BFG clicked CE7AA. W7BQR moved to Yakima. W7BUQ handles traffic for Yakima. W7AAK has c.c. on 3585 kc. W7BB averaged four foreign QSOs per day in month. W7APR reports air conditions improving. W7JT has a pair of '10s. W7AQB and W7TZ moved downstairs to warmer winter quarters. W7CNS-K7CKK sends dope on Alaskan reception. W7ATV has left for California. W7EX worked his first ZL. W7TK has had all sorts of unusual experiences due to depression. W7BCC is troubled with falling arches and dropping schedules. W7KO receives many fine letters on his O.O. reports. W7LD is interested in OBS. W7BDD wants the gang to watch for him at Orlando, Calif., where he uses W7ZZM. W7ADR and W7AVM are rebuilding a 1/3 H.P. d.c. motor into a.c. generator. Trips to Tacoma cause smaller totals at W7IG. W7CPD and W7AWY apply for ORS. W7WY's ORS appointment has been renewed. W7CLK, W7ACS, W7CJG, W7AHW, W7CLH, W7CMX, W7BDW, and W7AMN report. W7AAO is leaving for Chehalis. Unusual and attractive Christmas card received from W7MM-W7ZZT. W7RT is c.c. now on 7040 kc. W7BEY, W7WG, W7DL, W7BXF, W7UX, W7LD, W7ASY, W7VF, W7BSX, W7JZ and W7ARW are all c.c. at Seattle. W7RB, W7HE, and W7VK are among the hams busy at U. of W.— W7BCB, Seattle YL, clicked W6FMT, San Jose YL. W7ASN clicks Seattle on 7 mc. The SCM thanks those sending cards and letters for Christmas and New Year.

Traffic: **W7**BHH 536 BKE 333 NR 219 IG 141 BCC 90 LD 78 BGH 74 BSX 72 BIW 66 BB 54 WY 45 BCV 39 CJG 38 AQB 38 APS 37 CNS 30 AXT 27 ACS-TZ 26 AHQ 25 AMN 24 AYO 23 QI 26 BUQ-CHH 22 AFC 20 UU 26 BFG-AF 20 TX 19 BYS 17 BNI 16 BTV 15 IC 14 AG-CCF 12 CAM 13 BYB 11 RT-AJ-CGK-BRS-BUW 9 CJS-CCN 8 JT 7 AZI-ANF-KO 5 AAX-AYC 4 APR 3 CND-BFR-AAF 2 AVM-AUP-AUT-CES 1 CKH 10 CNW 69.

PACIFIC DIVISION

SAN DIEGO—SCM, H. A. Ambler, W6EOP—W6BMC leads the Section and makes the BPL. W6CTP made 10,976 points in the SS. W6DGN turned in a nice total. W6GNT attended the Banquet at Pasadena. W6FWJ has a new receiver. W6CNB sends a nice report. W6EOP is building 1.75-mc. 'phone. W6EFK has two daily schedules. W6DKN is with us again. W6AXN worked VK and J. W6DWA is working on 14 mc. W6BAM says eastern 'phone stations are coming in well. W6BCF is arranging schedules. W6AKY worked ZL. W6GTM is a new reporter. W6FQU is trying to get receiver to work. W6BKZ has a dandy 'phone on 3.9 mc. W6AMO is working DX. W6AYK was in bed sick. W6BAS is rebuilding. W6CNK will be back with good traffic report soon. W6BGL has a new 'phone. W6CNQ has c.c. rig. Imperial Valley news via W6QA: W6DDJ is busy selling flowers. W6EFD has a daughter who knows how to use the mike. W6BEY is going into the radio service business. W6CXN is on 7 and 3.5 mc. W6DFU is handling traffic. W6QA is awaiting station license.

Traffic: **W6**BMC 915 CTP 228 DQN 155 CNB 119 GNT 53 FWJ 60 EOP 47 EFK 39 DKN 19 AXN 16 DWA 16 AMO 6 BKZ 6 FQU 5 AKY 2 BCF 2 BAM 2 GTM 2.

SANTA CLARA VALLEY—SCM, Bruce Stone, W6AMM—Activity seems about the same this month. FB gang, keep it up. W6YG sent in a fine total. W6FBW kept three good schedules. W6HM has another fine Trans-Pacific total. W6DBB is looking for more 1.75-mc. 'phones. W6AMM found time for a few KA and OM schedules. W6CEO schedules KA1CO daily. W6DNY is breaking into traffic. W6QR is getting on 1.75-mc. 'phone. W6BDR reports two way QSO with CE3DE on a Ford horn while driving down the highway. W6DSE is QRL college. W6CW has a 100-watt 'phone on 3.9 mc. W6DHV worked the east coast with a '10. W6FIK is rebuilding. W6FPL and W6GFW are on 1.75 mc. W6GGL and W6DBQ have been QRL school and outside work.

Traffic: **W6**YG 548 FBW 279 HM 232 FQY 222 DBB 112 AMM 112 CEO 109 NJ 85 DNY 31 AZC 28 QR 26 ALW 19 BDR 15 CDX 11 FMT 11 CW 6 DSE 6.

SACRAMENTO VALLEY—Acting SCM, Geo. L. Woodington, W6DVE—W6EWB is busy building a set for the Sacramento Valley Radio Club. W6UM is building MOPA using c.c. oscillator. W6CDC completed a new radio shack. W6DVW is rebuilding MOPA. W6AHN and W6BYB are our most active ambassadors having attended all the hamfests of late in California. W6CAW, W6FRP, W6EWB and W6DVE report traffic. W6GTW and W6GMY are new men. W6APT and W6ENC are busy with the Navy Net. Come on, gang. Let's go places and do things. Report every month!

Traffic: **W6**DVE 13 EWB 7 CAW 5 FRP 4.

PHILIPPINES—Acting SCM, N. E. Thompson, KA1XA—Philippine Amateur Radio Assn. is now a going concern with 25 members. Officers are: Grove, KA1LG, Pres.; Castro, KA1TS, V.-Pres.; Dakes, KA1UP, Secy.; Thompson, KA1XA, Treas. Address all mail P.O. Box 849, Manila.

Traffic: **KA1**HR 1403 NA 413 LG 344 CO 196 JR 144 PB 107 CM 107 WX 72 TS 51 XA 35. **OM1**TB 569.

ARIZONA—SCM, Ernest Mendoza, W6BJF-QC—Don't neglect sending in your traffic and activity reports each month, and urge your fellow hams to do the same. The SCM wishes you all a happy and more prosperous New Year. W6CDU is QRL BCL repairs. W6BLP has a new mast. W6CEC has c.c. 'phone on 3910 kc. W6DOW is working remote control. W6ZZBC makes good contacts on 1.75-mc. 'phone. W6GBN is experimenting with antennas. W6BRI is Secretary-Treasurer of the Arizona Short Wave Radio Club. W6BJF piled up 141 points in the last A.A.R.S. Contest. W6DVJ is on for A.A.R.S. drills. W6CLL works VKs, Js and KAs. W6DDZ has a beautifully compact portable rig. W6GFK is preparing to operate on 3.5 mc. W6CQF says the gang in Tucson are

wishing for single signal super hets since W6CVW started up his 1000-watt station!! W6GGW is having trouble with 56-mc. receiver. W6CKW has been doing some research work on a stenode. W6CBA will soon be active. W6EFC and W6DKF are regular operators at KOY. W6DIE has replaced W6DHA at KTAR. W6FKX is a busy radio service man. W6BVN works W6DSQ daily. W6EKU reached into Douglas on 1.75-mc. 'phone. W6BYD works 3-way duplex on 3 bands. W6EJN has traffic for his sister, who is employed in Phoenix. W6FNM is scraping up parts for an a.c. receiver. W6GGS gave an excellent talk on single signal supers, at one of the radio club meetings. W6DCQ is to build two more rack and panel jobs for his speech amplifier and power supply units. W6GCU is on 56 mc. with W6CWI and W6GGW. W6AEK is heard daily. W6FAI alternates from 14- to 3.9-mc. 'phone in between WZP Army schedules. W6AGL has schedule with King Tut at Fort Huachuca. W6GDD is getting the ham fever from W6AEK. W6FLG makes his daily run to Chandler Post Office on newly acquired motorcycle. W6GFS manages to keep on the air. W6DJH is up to his neck in work. W6GJC likes 3.5 mc. W6AND was ill in bed. W6FGO changed to 3.5-mc. zepp. W6AYW built a converter.

Traffic: W6CDU 770 BLP 98 CEC 48 DOW-ZZBC 14 CLL 12 GBN 9 BRI-BJF 6 DVJ 5 DDZ 3 GFK 2 CQF 1.

EAST BAY—SCM, S. C. Houston, W6ZM—Alameda County: CRM J. H. MacLafferty, W6RJ—W6CDA makes the BPL for the 'steenth time. W6RJ is QRL with Trunk schedules. W6AF blew his plate transformer and kept schedules from W6CIZ until he got a new transformer. W6AKB says K7ATD is icebound. W6GMX resigned his Trunk Line appointment. W6WX comes back to life. W6YM handled unemployment relief traffic with W6AFO. W6YJ wants ORS. W6DHS is on low power. W6ZM started the Section "BULL" going again; a station has to report in order to get a copy. Send in your reports and get your "BULL." W6CIZ has been busy making sockets and crystal holders. W6ABE has moved across the street from W6CIZ! W6CDP says not much doing. W6EVQ is putting two 59-watters in PP in final. W6FQE is building a single signal receiver. W6BNR reports for first time. W6CBF handled a few messages on 1.75 mc. W6DKJ says it has been too cold to go out in his shack. W6AD has schedule with a ZL every other day. W6EDR is rebuilding his 3.5-mc. rig into rack and panel. W6CSV is building a.c. receiver. W6CQS is putting a pair of '52s in final. W6AGQ reports. W6CIQ and W6AHI have been QRL school. W6DBP has no time lately. W6PB received a QSL from Germany. W6JO says there is a red-hot Republican near him, W6GOP. Hi. W6CSS renewed his membership. Contra Costa County: W6EJA is going on 1.75-mc. 'phone. W6AAT is working on his power supply. Solano County: W6BPC turns in a nice total. Napa County: W6FII reports a new ham, W6GYA. W6CZN and W6APT say it is too cold to operate. W6GPT has a new call, W6DYA. W6AUT has been laid up with the Flu. W6BYS is rebuilding. W6CAN is on 7 mc. W6EDO's big transmitter blew up. W6FBH changed QRA. W6ADM has moved to Oakland. W6ZM, W6EGM, and W6ADM visited through the county. W6IT was elected President of the Oakland Radio Club for 1933. The former President, W6CUG, has left on a trip to the east coast, down to Florida and back through the north, hitting home some time next fall. He has portable. W6ZZS along. W6BSB has returned from the east.

Traffic: W6CDA 601 RJ 387 AF 246 BPC 104 AKB 80 FBH 75 GMX 55 WX 48 YM 35 FII 34 YJ 32 DHS 31 ZM 28 CIZ 25 CDP 19 EJA 16 EVQ 16 FQE-BNR 11 CBF 8 DKJ-AD 6 EDR-CSV 5 CQS-AGQ-CIQ-CAN 4 DBP-AAT 1.

LOS ANGELES—SCM, Hal E. Nahmens, W6HT—We asked the gang to come across, and they CAME! What a glorious ending to an eventful year! 264 reports with 240 handling traffic—a 400% gain for the year! From the standing start of an "all-time high," we crashed through Washington's record gain of 60 reporters to a new record of "plus 71"! These 48 new reporters deserve a place of honor: W6AWP, BDD, DTS, DPT, DYH, ESK, FZY, GMC, GUE, EGF, DJJ, BDZ, CJS, VJ, BQF, NR, BYG, BWE, DFG, BMZ, FLY, FSF, FQG, GYS, FRV, GTN, GRF, GIG, CTZ, DOK, FHQ, CMK, CAH, BXU, AOS, FQM, ATG, CJZ, DWN, CKJ, CQM, GCI, BHO, YBC, DRQ, GOY, SU, CES. Los Angeles County: NINE make the BPL: W6ETL, W6DTN, W6SU, W6BPU, W6EDW, W6AFO, W6DKM, W6NF and W6EKZ. W6ETL schedules OM1TB, W6BMC, VS6AG, XU1U and KA1JR. W6DTN holds an amateur license, unlimited 'phone, radio telegraph second and radio telephone first—but no job! W6SU, new control for unemployed relief net, is operated by W6SU (Pete Wilson of old W6LX), W6FRB and W6EZH. Much credit is due W6BPU, RM and Editor of *The Dope Sheet*, for the excellent showing this month. W6CVF with daily KA1HR schedule barely misses BPL. W6DKM sent us TEN reports besides his own. W6FGT is right there. Remote control line at W6EBK is 250 feet long. W6ACL handled flock of Christmas traffic from Hawaii. Ops of W6ZZAR are now at W6SU. W6BLS is rebuilding. W6CXW worked HR1FR, VP4AA and VP1AJ. HR1FR makes the 49th country for W6EXQ. W6CKT is chief op at W6YBB. W6AKW was heard in Germany and Austria on 3.5 mc. W6HG schedules KA1LG, KA1LY and VS6AG. W6ADH is back on air. W6CVZ says there's a swell bunch of fellows on 1.75 mc. W6AAN has been nominated for SCM of the Los Angeles Section for the next two-year term. A Navy transmitter from NDT was installed at W6ALD. A break for W6EQW as his 3.5-mc. c.c. rig has been doing all the work there. Newly appointed ORS are: W6EGJ, W6EDW, W6DTN, W6CIX, W6FVD and W6CNH. W6EK is the first YL ORS of the Los Angeles Section! W6EIW handled important death messages. W6CJQ and W6FFN prove that 'phone hams *do* handle traffic. W6DNA is trying out new ideas for monitor. W6AHP gets QSA5 R9 reports from everywhere. W6BVC gave message for Jugo Slavia to W2CWC who had schedule with Spain. W6DQG and W6DEP have s.s. supers. W6BOB is going to try to break the ice on 28 mc. W6GYP is new YL in San Gabriel. The Edison Co. cleaned up their leaky insulators around W6FGS' shack. Three directional receiving antennae have practically eliminated QRM on DX reception for W6AM. W6FZY is on air with 500 watts input. W6DWP using his portable W6GCI acted as net control during Coast Artillery maneuvers at Hawthorne, December 11th. W6AFU is installing c.c. 7030 kc. W6TE has gone to sea as radio operator. W6DVV and all please note: Non-receipt of your copy of *The Dope Sheet* indicates we haven't your correct address. W6CZT is awaiting "change of address" license. W6EOG has new portable, W6GZV. W6BSV was heard R7 in New Zealand on 3.5 mc. W6DIO worked Trinidad for 53rd country. W6EUV received an ORS certificate for Christmas! W6BVZ cut down noise from power leak by doubling length of receiving antenna. W6EV received couple South African cards. About 25 hams gave W6EGH a surprise party just before he left on trip to New Zealand, December 16th. W6ADP received card from EAR96. All Christmas traffic at W6DEL. The contenders of last month lose to W6EHZ and W6GFI, whose sky wires are only 7 feet apart according to W6FMP. F6PD wants QRA of VX3L. W6AWP is back from Florida. W6VB worked F3SMI for 43rd country. We were sorry to hear of the death of W6DQZ's father. W6DTX will take Los Angeles west side traffic on 56 mc. W6BGF overhauled his Ford. W6FEW reported two weeks early. W6BER passed unlimited 'phone exam. W6ANN is having antenna trouble. W6DH is building transmitter and receiver for W6GEX.

W6VH does most of his hamming on 56 mc. W6AAE says early morning is excellent for traffic on 3.5 mc. W6ON reports the quarterly Los Angeles Section Banquet a huge success with 172 present. W6HT received 7-mc. heard card from G2AXM. W6FJT reports for W6BIF and W6YBC. W6FUF installed '03A c.c. rig. New rig at W6TN. W6BXL has output of 350 watts with matched impedance antenna. W6ERL is back on air. W6DYH has a '61. W6FXF uses 600 volts on a '45. W6CLY needs a crystal. W6CRM is on unemployed relief net. W6GAL heard broadcast from EAQ in Madrid on 30.3 meters. W6ARY is checking WWV's QRH with his new frequency meter. Stealing W6EKS' stuff! All Edison wiring is under ground at W6CUU's new house. W6DSP reports large attendance at recent Glendale Radio Club meeting. W6DSB is using Class B modulation. Rectified a.c. supply was installed at W6MA for primary keying relays. W6DZP is revamping for 3.9-mc. 'phone. W6ZZA was QSO five countries from the Mark Hopkins Hotel in San Francisco. W6AUB garnered flock of reports at P.S.W.C. meeting. W6ZZBK, YF of W6FKF, won the '52 at Section Banquet! W6CGE refinished shack. W6AKT, portable of W6ANH, worked a K6. W6EAK worked Cocos Island for 45th country. W6DJJ had to change antenna due to QRMing Police Cars. More QRM says W6FXL, as W6NMQ moved in less than block away. W6GFE reports W6GPU and W6GZW new Pasadena hams. W6GUE moved. W6DLN is building an attic room for the outfit. W6ESA is inactive due to illness. W6EJZ had trouble with his Comet "Pro." W6BEE let his ticket expire. Double spaced antenna condensers are over at W6GNM! W6VJ makes first report. W6WO moved again. W6BQF is experimental station. W6DZR is QRL DX. W6ECC is rebuilding to QRO. W6HAW is new ham in Long Beach. W6CGP changed from single feed to doublet. W6BUP was home for Christmas. W6VO worked F8PZ for WAC. Sickness kept W6EII off. W6FGQ is building c.c. rig. Three sets of filter condensers went out at W6FXR. W6FYA built s.s. super. W6EYJ was on continuously for 28-mc. tests. W6BHP is using portable W6GYS. 7-mc. rig at W6BZX. W6FJS is building new receiver. W6EMJ, on 7 mc., QSOed W6BOB on 56 mc. W6FMH is on with MOPA. W6LY has new s.s. super, and W6BFL and W6FZ are each building one. W6BRO has e.c. frequency meter. W6DOK is on 7 mc. W6DOP sold his crystal to W6FVV so he could take his YL to a show. W6DZI launched his boat November 26th. W6FWN is the best looking romeo at PJC! W6GPX has couple of new 50-foot sticks. Santa Barbara County: W6BZF leads the county as usual. W6EDZ is building c.c. rig for 7256 kc. W6EMY did his bit in helping the section to break "200." W6LC has novel card for delivering and obtaining traffic. W6DYQ and W6CNO are working DX. W6GKB was visited by W6DCH. W6ZBJ is back on air. W6BYG is portable of W6EMY. W6DFG makes first traffic report. It is rumored that W6BZG is getting a Comet "Pro." W6AWY, W6DJS, W6FNK, and W6DBJ all report. San Bernardino County: W6FTV is in lead with Sweepstakes traffic. W6FNG joined A.A.R.S. Portable rig in service at W6BIK. W6GKZ applies for OBS. W6HIQ is new ham in San Bernardino. W6CVV puts 400 watts on a pore lil '50-watter. An emergency power supply from battery and Ford coil in use at W6DZC. W6FHQ built the condenser mike described in *QST*. W6GPS has e.c. rig. San Luis Obispo County: W6ALQ is going c.c. W6DWW managed to get on for couple of weeks. W6FNP reports. Riverside County: Final '10 at W6DLV went west. W6DZF received QSL from ZS5U. W6EFY reports extremely cold wx. W6TJ built new c.c. job. Mono and Inyo Counties: W6FVD is new ORS. W6CUY is new reporter. WHEW! No promises for next month, gang. Hi! 73.

Traffic: **W6ETL** 868 DTN 680 SU 571 BPU 540 CVF 461 EDW 387 AFO 310 DKM 291 NF 282 FGT 230 EGJ 213 EBK 200 EKZ 173 ACL 172 FMK 160 BLS 127 DBC 126 CXW 125 EXQ 124 YBB 119 ZZAR 108 AKW 107 HG 102 ADH 100 DEP 98 BZF 90 CVZ 80 CES 79 FTV-AAN 74 BGN 68 AWY 67 EDZ-DER-CZZ 64 EQW 62 EMY 59 TE-AIF 57 CTD 56 DJS-EK 54 AFU 52 DVV 51 BYF-GZT 46 ALD 45 EOG 44 BSV-DIO 38 DLI 36 FSE-EUV 35 CQM-AHQ 34 FNG-BVZ 31 EV-FVD-DXU-EGH-ADP 30 BVD 29 FGH-EIW 22 ERC 21 CNO-CJQ-FFN 20 FEX 19 DNA 18 AIX-CIX 17 FNK-AHP-BVC 16 LC-DQG-BOB-FGS 15 GCI-AM-FZY-DWP 14 DEL-FWN-FMP 13 PD-BIK-TH-AWP 12 DYQ-DTY-GKZ-VB-DQZ 11 DTX-WO-BGF-CVV-BDD-FZ-FEW-BER-DTS-DPT 10 BIF-ANN-DH-VH-GEX 9 DLV-ALQ-ETJ-DJC-AGF-AAE-ON 8 HT-FJT-GKB-GDU-FUF 7 AQD-TN-BXL-ERL-DYH-DWW-GLA-ZBJ-FEC-FMH-CNH 6 FXF-BME-DZC-GFG-GAL-FNP-GMC-CMK-ETX-FMR-DBJ-ENJ-BFM-CRM-GUE-ESK 5 FET-EWC-ARY-CUU-DSP-MA-FDE-CAH-DZP-FMI-ZZA-EAK-AUB-EGF-FKF-GOY-CGE-FDM 4 ANH-DJJ-BXV-BDZ-FXL-GFE-GEU-DLN-ESA-EJZ-DRQ-BYG-BEE-EHZ-EFY-CJS-GNM-VJ-BQF 3 DFG-CUJ-CUY-AOS-DZR-BHO-BWE-EAN-ECC-CUH-CGP-VO-BMZ-EII-FGQ-FXR-CKJ-DWN-GJA-YBC-YAS 2 CSC-DCJ-FLY-FSF-FQG-ATG-FQM-FYA-EYJ-GYS-UU-BZX-FJS-EMJ-GTN-LY-GRF-BFL-GIG-BRO-BXH-GRS-FHQ-CTZ-DOK-NR-FRV 1 CJZ 74 BXJ 10 DFO-EVL 4 GNZ 2.

SAN JOAQUIN VALLEY—SCM, G. H. Lavender, W6DZN-W6WJ—Keep up the good reporting work, gang, and watch our smoke. W6EXH is high traffic man. ORS appointments are W6EXH, W6GKE and W6BFH. W6BIP sends in a swell report. W6GTI is now in Dos Palos. W6BRU is the Fresno checker king. W6GZE is new ham in Tulare. W6ZZAK got R7 from a "J." W6ASY moved rig in the house by the stove. Ted Brown of Tulare passed the exam. W6EUQ is QRL A.A.R.S. and YL. W6FNY worked his first "J." W6GUZ joined A.A.R.L. The 3 Boiled Owls in Tulare are putting in 1 KW. W6FZA worked K4 and K5. W6FAM is on 3.9- and 1.75-mc. 'phone. W6YBK is on 1.75-mc. 'phone. W6CCW sent description of his 150-watt job to A.R.R.L. W6ABJ put up an FB Zepp. W6TP is QRL KMJ. W6CYY QSOed his second "J." W6GCF has new 1.75-mc. 'phone job. W6BVM has transmitter trouble then receiver grief. W6DWE is Alt. control station in U.S.N.R. W6TO showed up at San Joaquin Valley Radio Club. W6CVT of pre-war spark fame is the man who swings the gavel at the Fresno Radio Club. W6FFY is making some FB crystals. W6AVV sold his intake equipment. W6CLB and W6ETZ are QRL college. W6CLU changed QRA couple of doors. The recent cold WX increased W6DCK's business 100%; he is a radiator repair man. W6DTL is moving in country. W6EOM got his antenna hooked to a horse collar plus the horse—Yep, the pole came down. Hi. W6KB is QRL XYL. W6NE is taking the fatal step. W6COL, portable of W6GBT, is visiting Fresno. W6BIP had over 400 foreign contacts in 1932. W6ENA is U.S.N.R. NCS for Fresno. W6DQR says crystal shows big pickup in traffic. W6BIP says we can soon expect some cigars from W6FFP. NU6BEN of the spark days has been assigned the call W6GWM. W6GGN rebuilt his '10 rig like a Heintz and Kaufman job. W6BWK has '52 on 7 and 14 mc. W6EML has a Comet Pro. W6EPQ says salt is n.g. for crystal. W6BAR is helping W6CVT with A.A.R.S. work. W6DQV is working A.A.R.S. and U.S.N.R. W6DJQ is on with c.c. W6AOA ran up a score of 13,000 in the SS. W6FKV is awaiting call from Navy. W6ENQ and W6AOB have 100-watt c.c. on 1.75 mc. W6GEG is looking for more power. W6CGM is head man in A.A.R.S. W6BRP is putting a 100-watt 'phone on 1.75 mc. W6GEI is getting out nicely. W6FJI and W6EJE are rebuilding. W6GXE is a new ham in Visalia (exW9GXY and W9ITI). W6FBQ is trying to get an antenna that works. W6GKE had a flood in his shack, but being in U.S.N.R. saved him. Hi. W6AGV is building a PP rig. W6GXL is new ham in Turlock. W6EXB reports for the Lodi gang. W6EXB has crystal on 3625 kc. W6FAG moved to Lodi. W6CUL is unit control station for U.S.N.R. W6EBH and W6EHD are

building new receivers. W6FLS is leaving for a six months' visit to Hong Kong. W6AL worked a Siberian. W6CNM is doctoring BCL receivers. W6GMI got 2 QSL cards from Japan. W6AV has been assigned Commanding Officer Unit 5, Section 5, U.S.N.R. W6DVI is working everything he hears. W6FRH has radiotelephone first license. W6GQZ is the only YL op in the north end of the Section. W6BHQ is on air again. W6DZN is working on 3630 and 7260 kc. The Fresno gang held a Section Hamfest, November 26th, and a good time was had by all. W6FFU has new frequency meter. W6CQT is new Modesto ham.

Traffic: **W6EXH** 332 AOA 295 BIP 292 DQR 130 DQV 127 DZN 98 ENA 77 DWE 44 AV 36 FRH 34 CYY 32 DVI 75 CVT 20 DJQ 39 AGV 14 FYM 11 EUQ 30 GKE 9 GJO 7 BVM 7 FFU 64 FFY-GSX 5 ZZAK 6 GCF-ASV 4 FBQ 3 BRU-GUZ-GFR-CCW-ABJ-TP-TO-EOM-BAR-EJE-GWM-GGN-BWK 2 EML-DTL-GTI-GZE-CLU-GQZ-GEI 1.

SAN FRANCISCO—C. F. Bane, W6WB. Acting SCM, Byron Goodman, W6CAL—26 stations reporting traffic! Three stations in the BPL: W6PQ, W6ZZD and W6NK. W6PQ says unless he can dope out a way to let go of the bull's tail he'll have to resign from the Army and handle traffic. Hi. W6ZZD had fine time in SS Contest with W6AZX at key. W6CIS won a Navy Day letter. W6NK can always be depended upon for a good total. The shack at W6AZK is strewn with blueprints and solder. W6EYY keeps four schedules. W6DZZ sports WAC certificate. W6DNC sends an interesting report. W6BVL is our newest ORS. W6BTZ sends a nice report. KJBS keeps W6DQH busy. W6BGW worked all districts on 7 mc. from 2 p.m., P.S.T. W6MV is getting his SS super to say "Uncle." W6FPU was heard by ZL on 3.5-mc. c.w. W6IU handled a 135 ck message for HU. W6GIS, an old sea op, says he gets out OK with his '10s. W6WF received Ensign commission in U.S.N.R. W6BIM reports again. W6DNQ and W6GIT have consolidated. W6DXT showed up after a long siesta. W6ABB sends out a plea for traffic. W6GMD wants advice about crystals—see the ol' maestro, W6ADA! W6WC is reorganizing schedules. W6ARG reports by radio. W6COP says c.c. '10 rig kicking out OK. The new officers of the A.R.A. are: Pres., W6ZF; Vice-Pres., W6MV; Sec.-Treas., W6FPU. W6CAL and W6AZX were last heard frantically calling CQ on 28 mc. W6WU was QRL school. W6COC promises traffic. W6ZS will be on again soon. W6WB wishes to thank the Section for the support given him the last four years. As retiring SCM, he wishes his successor the best of luck, and we all hope his successor can do as well at the job as Bane did.

Traffic: **W6PQ** 1850 ZZD 366 CIS 171 NK 167 AZK 139 EYY 89 DZZ 87 CAL 86 DNC 74 BVL 47 BTZ 45 DQH 43 MV 33 FPU 28 IU 25 GIS 21 WF 14 BIM 12 DNQ 12 DXT 7 ABB 6 GMD 6 WC-ARG 5 COP 2 BGW 154.

NEVADA—SCM, Keston L. Ramsey, W6EAD—W6UO is high this month. W6AJP had trouble with east schedules. W6AFR has worked all continents except Europe. W6GZH is the first YL op in Nevada. A new ham at Yerrington is W6GYX, and his OM W6UO is making a real op out of him. W6CRF is building a super. W6FMS is building an s.s. superhet. W6EAD and W6EEF have new receivers. Mr. Rosemark, a marine at the Hawthorne Ammunition Depot, is awaiting a call.

Traffic: **W6UO** 103 AJP 72 EAD 32 AFR 19.

ROANOKE DIVISION

WEST VIRGINIA—SCM, C. S. Hoffmann, Jr., W8HD — W8GBF leads the state, making BPL, with W8GEG taking second place. W8GAD, W8GAL, and W8DFC are rebuilding. W8BDP and W8AKT are doing radio service work. W8ESQ and W8IB are moving. W8FNS says he has quit radio. W8BTV and W8FQB are home from college. W8CLQ, W8AIC, W8GEG and W8HCL are working on remote control transmitters. Congratulations to W8DSJ who got married. W8AAI is doing fine work on 1.75-mc. 'phone. W8TI is Official Observing. W8CFB and W8CVX are on 7 mc. W8DPO has been snowed in! W8CSF is Editor of "ARC," the mud slinger of the Ohio Valley Amateur Radio Club. W8HWT showed an FB movie on radio at a recent meeting of that club. W8BWK is heard on U.S.N.R. work. W8HCL has portable. W8HXE. W8AZD is working VKs and ZLs. W8BOW works west coast on 3.5 mc. W8HBQ reports W8HVY going c.c. The SCM and Mrs. W8HD had a splendid few days with Mr. and Mrs. Ex-W8AIN, also visiting W8CPC, W8KU and W8RL. W8ELJ is putting out a dandy signal. W8GRJ was heard in Germany on 7 mc. W8ASI reports a club station will be erected at W. Va. Wesleyan College. W8CMJ is working a lot of schedules. W8CKE is taking over U.S.N.R. Net. W8EIK is QRL with arrangements for Roanoke Division Convention. W8HHP, W8GOQ and W8EIP have joined the c.c. ranks. W8EWM is new station in Bluefield. The Bluefield Amateur Radio Club is six months old and boasts 31 members. WHIS donated a 100-watt transmitter to the club.

Traffic: **W8GBF** 585 EIK 281 GEG 245 AZD 54 TI 66 CMJ 47 CVX 41 CFB 76 HSA 38 BOW 35 HD 35 CSF 30 GOQ 30 FUM 23 DPO 18 HCL 18 FBQ 16 CDV 7 DFC 3 ELO 1 ELJ 31 GRJ 11 ASI 4 DSJ 2.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — The SCM wishes to take this means of expressing his deepest appreciation to the members of the entire Division for the support given him in his election as Director. W4DW leads in traffic and makes the BPL. W4ZH and W4NC also make the BPL. W4TO missed it on deliveries by only two messages. W4BRK is a new ham in Wilmington. W4DQ is reappointed ORS. W4AGD and W4BHR are rebuilding. W4ATS handled a death message. W4BX says some of the Charlotte gang are planning on going to 3.5 mc. W4BFL is interested in pushing traffic. W4MR schedules TI2WD on 14 mc. W4TP reports a good total. W4AEH wants schedules. W4ABW is on 3.5 mc. W4AWP is with WRAM. W4AOE had receiver trouble. W4ACY has new super-het. W4TR, W4OC, and W4RV visited W4ACY. W4AGF handled Red Cross messages. W4JR has been QRL. W4AVT was QRL post office. Skip distance has been ruining schedules for W4NC. W4ABT is still single. W4ZN is going to 14 mc. W4BJZ is c.c. on 3.5 mc. W4PA has '45s in push-pull. W4RA and W4APZ are racing in DX contacts. W4BIU has a junior op at his house. W4OG has been working W4NC. W4VN sends in fine report. W4ALD got on 3.5 mc. and found some traffic. W4MB wants to know what makes a doubler oscillate when it shouldn't. W4AMC has his 50-watt c.c. rig almost completed. W4AAE is back in a new shack. W4TJ rigged up a '45 in TNT. W4EJ got back on 7 and 14 mc. W4AWZ now has 50-watt c.c. job. W4HX joined the 3.5-mc. 'phone gang. W4WL, W4GW, W4AXZ, W4ABN and W4QJ are interested in single signal supers. W4QJ is using an '04A on c.w. W4ANN reports traffic. W4BDC, ON4CSL, is on his way back to Belgian Congo. W4QA can't decide, YL or radio. W4LY is on 14 mc. W4TO uses a single signal super. W4JB has his 'phone ready to go.

Traffic: **W4DW** 522 ZH 512 NC 509 VN 267 TO 223 TP 155 JR 147 AGF 120 MR 34 ALD 30 BJZ 27 TR 26 ATC 23 TJ 17 ABN 13 AMC 12 DQ 11 AVT 11 ANU 10 BFL 10 ACY-AEH 9 JB-PFA 8 HX-ATY 7 NP-EC 6 ATS 5 BX-AGD-BKS 4 ANN 3 ABW-BHR-ADY 2 BRK 1 TS 8.

VIRGINIA — SCM, R. N. Eubank, W3AAJ — Chief Route Manager, C. E. Hedrick, W3WO. W3NB leads with 1000 total! W3ATY's first month's report is FB. W3BLE says SS helps traffic. W3AAJ thanks all for reports. W3AGH is expected back in old stride soon. W3CKM keeps V.P.I. traffic rolling. W3CMJ is doing FB with club. W3BNH is going strong. W3AEW is back on air. W3BRY uses crystal Pentode. W3AHQ moved to Hagerstown, Md. W3TN moved to 319 Crawford St. W3BPA is pounding with c.c. '47. W3HV is old timer on at Phoebus. W3KA, ex4CK, is in Cape Charles. W3MQ

uses '47s in c.c. W3BAD helps west end out. W3AAF is rebuilding to e.c. MOPA. W3GY schedules W7FP daily. W3AMB renews ORS. W3AKN was heard in Denmark on 3.5 mc. W3BIW has new receiver. W3CLH uses 7-mc. antenna. W3BPI visited SCM. W3BZ enjoys RM NITES. W3BXN is planning big 1933. Wind blew down W3BXP's Zepp. W3BRA had ORS duplicated. W3AVR was QRL exams. W3BSY reports. W3APU is plugging 'em. W3BGS blew another filter. W3CDW finished rebuilding. W3CLD worked first "6." W3NE is experimenting on 7 mc. W3BTR is fixing remote control. W3AEI worked W6 on 1883 kc. W3ABM is also on 1883 kc. W3ADJ has Nat'l SW3. W3BFQ heard a "J" two nights in row. W3BUR has new YL Op. W3BSB worked all W and VE districts. W3BEP says Nov. report went astray. W3WM is after all kinds of meters. W3COO moved to Portsmouth. W3NO is using '66s. W1ZZAR, Rundlett, is located at Norfolk. W3API was off due to sickness. W3AJK reported would be on after Christmas. W3GE has gone c.c. W3AIJ has High Quality Signal. W3BYA schedules W8ELJ. W3KA and W3AAF are new ORS. W3ASK's OW gave him a c.c. rig for Christmas. W3CA is on 3500. W3BPB is rebuilding. W3API gets a lot of fun out of low-power rig. W3ADD is on little. W3BRQ got job. W3COJ is building '47-'47-'10 c.c. W3AGW is R.M. W3BTM is planning plane 56-mc. test. W3BWA wants schedules. W3CSY is new call at Hampton. W3CAH is using buffer without Bias per W2AMN. W3BAI is building rack job. W3BFS is adding PP '47 Amp. W3APT sends new station QRA. W3FJ has been sick. W3BJX was QRL Christmas work. W3FE was waiting for Santa to bring choke. W3BSW is traveling lots. W3CXM is on 3554-1749-3684 c.c. W3ZA reports traffic via 'phone. W3AUG is going 56 mc. W3BEK is on 56 mc. W3AEW is c.c. on 7 and 3.5 mc. W3BZE is going '47 crystal. W3CFL is doing fine work for club. W3CPN has W3WW portable. New stations reporting traffic this month: W3ATY, W3ASY, W3BPR, W3BZD, W3AGH, W3BRA, W3KA, W3II, W3BTR, W3BSY, W3NE, W3AG, W3CPN, W3CDW, W3BEK, W3BLE. The Richmond Club sponsored a farewell party for Director W. T. Gravely at Richmond, Va., Saturday and Sunday, December 17th-18th. The gang expressed their regrets at losing Mr. Gravely and thanked him for fine work. Mr. Gravely was well pleased with the attendance, telegrams, letters and messages wishing him best of health and QSOs. Following were present: W3BZ-W3CDQ and Marie-W3NT-W3ADD - W3BUO - W3BRQ - W3BPI - Zigler - W3AOT - W3BRA-W3AGH-W3CLV-W3AJK-Dot W3QN-Miss Ford and Miss Harrison-W3AHK-W3AMB-W3FJ-W3BFQ - W3AEW - W3BKG - W3BCI - W3CFL - W3ZU - W3AAJ-W3BSM.

Traffic: **W3NB** 10515 ATY 553 FJ 370 CXM 357 BLE 234 AAJ 228 CAH 221 BUR 153 BJX 135 AGH 97 BEP 91 BAI 82 APT 75 CKM 59 CMJ 57 BNH 56 BRY 55 AHQ 50 TN 49 BPA 48 AIJ 37 BTM 31 HV-MQ 25 BAD 23 AMB 20 CSY 19 AUG-AAF 17 GY 16 BWA-COJ-AKN 15 COO-BAN-BIW-CLH 10 AG-AGW-BPI 8 BXN 7 BXP-WM 6 BEK 5 BSB-BYA-BRA 4 AVR-BSY 3 APU-BGS-CDW-CLD-NE-ZA 2 BTR-BPR-BZD-GE 1 AEW 10 BZE 7 CPN 2 II 7 BKS 59 AHC 25 KA 17 BUR 6 AZU 1 BSM 24 ADJ 48. **W1ZZAR** 90.

ROCKY MOUNTAIN DIVISION

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — Utah: W6FRN keeps several schedules. W6AFN says his 7-mc. unity-coupled PP oscillator with '45s is the best he has tried. W6EYS works east coast consistently on 'phone. W6DPJ is now an OO. W6DAM reports W6FYP, Stockton, and W6GCK, Ophir, on occasionally. W6EQY has '10s in final amplifier. W6GQN is new S.L. ham. W6EWW has become articulate on 3.9 mc. W6GQS blew his '30s. W6GQC changed to PP '45s. W6GPJ will be on 3560 and 7120 c.c. after January 1st. W6DTB works DX. W6FPJ, Murray, is on. Wyoming: W7COH is working for an ORS. When W7ARK returned from New York he found the line voltage down below 70 volts, if any. Hi! Hence he and W7COV were off the air. W7COV opened up November 3rd with PP '45s TPTG.

Traffic: **W6DPJ** 1307 FRN 27 EXL 23 EYS 22 DTB 4. **W7COH** 20 ARK 1.

COLORADO — SCM, T. R. Becker, W9BTO — I wish to take this opportunity to thank those who gave me their support in the SCM election. The Pikes Peak Amateur Radio Assn. is now affiliated with the A.R.R.L. One of this club's members is a YL, Clara Urquart. W9EHC is the lucky guy so far. P.P.A.R.A. has a very FB permanent meeting place now, 1315 N. Webber St. Meetings 1st and 3d Thursdays, 7:45 p.m. New program committee consists of W9JCQ, chairman, W9EHC and Mr. Jentz. W9JNV has been QRL photo work. W9EYN is on 14- and 3.9-mc. 'phone. W9JCQ blew field coil in his M.G. W9IQS is pouring 1000 volts into a pair of '45s. W9EPN goes him one better by putting 900 volts on a '45. W9EHC, W9JCQ and "Doc" Foster built a complete ham station for airport manager in New Mexico. ExW9HF "Doc" is threatening to come back. W9HDI is QRL cutting paper dolls. ExW9DUI is awaiting license. W9AMS is doing FB work. W9DYP is going to give a lecture on "How to Stay Married and Still Be a Good Ham." W9EXV is QRL honor student college. Dick Martin, a new ham, is awaiting station license. W9HDI delivered the transmitter he lost on Hoover. W9IQS and W9JCQ were invited to join Transcon Relay route. ExW9FGK is back with call W9KZS. Keith O Kee and Lee Simmons have MOPA all ready to go. Those interested in the U.S.N.R. get in touch with J. Shisser at KOA. Colorado Springs was visited by the following out-of-town hams: W9GUW, W9AQN, W9GLI and W9HCM. W9DNP is putting 500 watts into a lone '03A. The C.R.E.A. and A.R.O.D. of Denver are going to combine under the new name of Denver Radio Amateurs. W9RJ is working Aussies consistently. W9IPH is dividing time neutralizing his final '03A and building the Single Signal super. W9IAV is getting out FB. W9IJU is servicing BCL sets. W9IJM has '10s final c.c. W9FYY has new 50-watter in final. W9CJJ, the Colo. Phone, has a 50-watter in final. W9EMU has a complete new super. W9AUJ has a very FB super. W9FRP was heard telling a "5" that Denver had an area of 350 to 3200 sq. miles. W9BQO is threatening to get on with low power. W9BNK is QRL school exams. W9ASD will be on soon. W9GUW has joined the Army. W9AQN is on 3.9-mc. 'phone. W9AAB is building c.c. rig. W9DDF is dispatcher at the Denver Police Station. W9APR is on once in a while. W9ESA has about fully recovered from his illness — take a look at his report — he makes the BPL. W9EAM has moved. W9CWX is still working DX. W9BJN is going to build 211s in PP final. W9CBU spent the last three months looking for "gold in them thar hills." W9JB has a service shop on the North Side. W9BYK just finished a new a.c. receiver. "Pop Fernald," Secretary and Treasurer of the C.R.E.A., is building a Single Signal super. W9KIN just returned from a two months' visit in Paris. W9HOO is on the air with MOPA. W9HGL is busy teaching school. W9FFH reports: W9HRI is QRL new Ford V8. W9HOU is using a '10 in TPTG. W9JGF is back in town. W9ACV is getting out FB. W9ATM is on quite often. W9CSR is QRL school. W9BCW is keeping the Navy Net active in Denver. W9CND has '52s in Hartley. W9GBQ has about decided to become a promoter in the social affairs of Sedalia. Hi. W9WO will be on soon. W9BYY rebuilt. W9KFJ will be on again soon with W9FCK. W9HPY has portable W9LCM. W9FA has 5 schedules weekly with W1MK. W9CNL still has his '52s PP. W9HPY is QRL. W9BXQ is busy at KGPX. W9JGF uses 2 '10s in parallel. W9EHZ will be on the air soon with a "6" call. W9FUQ is owned and operated by the "Four Fellows Club" of Denver. W9DOC changed his QRA to Calif. W9EKQ holds up the Army work for Denver. W9HJS is on some. W9HFW blew his filter condensers. W9BTO will be on soon with c.c. '52s final. W9ESX will be active soon. W9HFZ is using '10s in parallel. W9BVO will soon be on. W9HGK has been QRL school. W9DGJ has been busy selling insurance. W9CHV is the proud father of a Jr. op. Congratulations, Glen. W9FYG passed unlimited 'phone exam. W9LCM is on with a '10. W9EJW has been working both coasts con-

sistently. The personnel of W7NY paid W9BJN a visit. W9LFA is a new ham. W9CVE expects to be on more consistently. W9GGW manages to keep things warm. W9FXQ will be back home for a permanent stay. The Boulder Radio Club is very active, with W9BYC as President. W9FYK paid some of the Denver fellows a visit. W9BYK has YLitis. W9YL is using 50-watter in final. W9HIR gets FB reports on 'phone. W9FYL is bothered with QRM from a certain YL. W9JFQ-W9KGZ are busy with exams. W9FFU is building an FB c.c. rig. W9JRV is active on 7 mc. W9HKN gets on now and then. What's the matter with having some ORS in Boulder, fellows? W9CDE handled important ZLVA and Red Cross reports. W9CIW at Pueblo is on the air again. W9GLG is having trouble with MOPA. W9GNK is active in all branches. W9CKO is trying c.c. with low power. W9IFD is heard on all bands. W9KKY built a new TGTP. W9JFD's power supply blew up. W9GQX is new portable of W9IFD. W9FPZ has been keeping schedules with W9FMX. W9FSJ has a nice total. W9APZ uses the OW's (BC) Batts for a QSO occasionally. W9EFP has been pounding brass on 3.5 mc. W9EIZ and W9HNG have been on 1.75-mc. 'phone. Let's have reports from every active man over the entire state each month on the 16th.

Traffic: W9EHC 6 IQS 3 EYN 22 JCQ 49 FSJ 58 FPZ 7 CKO 14 EPN 2 CVE 66 CDE 9 IFD 68 FA 380 GNK 140 JGF 81 ESA 921 JNV 79.

SOUTHEASTERN DIVISION

WESTERN FLORIDA — SCM, Eddie Collins, W4MS-W4ZZP — Route Manager, S. M. Douglas, W4ACB-W4PCN. W4AGS leads in traffic. W4KB shows how a phone should be operated. W4BMJ dreams of a bigger and better transmitter. W4AQA promises to be a real traffic station. W6FTB expects to operate his sixth district portable from Pensacola soon. W2ABC passed his commercial exam. W5ZZR is stepping out nicely. W4ZZAO is on the air again. W4ASV-W4ZZW is rebuilding receiver. W4ARV is on with crystal control. We regret to record the passing of a real radio mother in the death of W4UW — W5NO's mother. W4AUW has been in Daytona Beach. W4AUV has been working DX. W4BKD and W4BOW are QRL school. We welcome a newcomer in W4BKV. W4AUA keeps the U.S.N.R. Net going. W4QR is going to Atlanta to get a new OP license. W4ACB is NCS for the A.A.R.S. W4SC keeps the FNG well represented. W4AXP has new Zepp. W4AQY is a regular visitor to Milton. YL? W4ASG has an FB MOPA. W4BGA is our newest ORS. W4AQA is operating from W4ABK. W4BFD has two FB new towers. W4BGA has "National SW3." W4MS-W4ZZP got jealous and bought one, too. W4ZZR is resuming his Western Florida schedule. W4QU is busy with U.S.N.R. W4QK is code instructor. W4VR was kept off the air by the Christmas rush. W4ALJ promises c.c. for W4ZZAE. W4BCB is a frequent visitor to Tallahassee. W4BNE is now the "forgotten man" because he has no transmitter on the air. W4BEW is operated by W4ALJ. W4BPI boasts a new all-a.c. receiver a la "QST." W4AWJ is getting ready to get on the air. W4BGB represents Pensacola on 3.5 mc. W4MS and W5ZZR have new unlimited 'phone licenses. Let's hear from you fellows interested in forming a 56-mc. 'phone net.

Traffic: W4AXP 16 AQY 14 QR 11 AGS 126 AUA 13 BGA 28 MS 48 AUW 11 BKD 6 AUV 8 BFD 12 ACB 40 W5ZZR 16.

EASTERN FLORIDA — SCM, Ray Atkinson, W4NN — The East. Fla. Section is becoming more active every day. I want everyone to know that I am very thankful for the coöperation you have given old East Fla. this past year. W4VP is at the head of the list with a grand total of 623. Those in the 100 total class this month are W4VP, W4NN, W4AWO. W4BIN is recovering from a broken leg. W4ZU is renewing his ORS. W4BGG is a new ORS. W4ANY is on 1.75-mc. 'phone. W4NN is using 'phone on 3.9 and 14 mc. W4ACZ, 'phone, worked all districts, including VE3BX, in 55 minutes on 3.9 mc. W4GS was heard talking over W4ASQ's 'phone. W4WS is as full of pep as can be. W4MF is on 'phone again. W4DU added power to his 'phone. W4LS, W4KM, W4PT, W4ADB, W4ANR, W4AOK, W4AGY, W4AKA, W4MM and W4MB are active on 'phone. W4PK was heard handling traffic with W4LU up in Signal Mountain, Tenn. W4UH has a peachy 'phone. W4UX is back from the sea. W4AZB has been on the sick list. W4AKH is grabbing DX. W4BGL has a pretty signal. W4AFV reports traffic slow. W4TK is handling traffic. W2AKC, W2AMT, exCM2FN, will shortly be a new W4. W4NI is the new call of old W4AGJ. W4QN promises to be on 'phone. W4HY is busy at his radio store. W4BMN schedules NH1HRS at Honduras daily. W4AEM is active on 7 mc. Thanks for all the greeting cards, gang, and a successful 1933 to all.

Traffic: W4VP 623 NN 234 AWO 176 UX 90 GS 61 BGG 60 BMN 51 AVD 39 PQ 39 AZB 36 AGB 35 ACZ 17 WS 25 ANY 23 ZU 17 BIN 17 AKH 13 QN 16 TK 11 BGL 10 ASQ 10 PT 10 ANR-DU-ADB-LS-BDM 8 HY-UH-AGY-MB-BAM 6 AEM 5 PK-KM-MF 4 AKA-AFV 2.

ALABAMA — SCM, L. D. Elwell, W4KP — High traffic man is W4DS. W4AAQ is second. W4AP is getting out well on 14-mc. 'phone. W4AEZ is on 3.9-mc. 'phone. W4AZH's license expired. W4AHO will be on soon. W4AJY took part in the SS. W4AYK works VE3LU on 1.75 mc. W4BAI and W4FL are doing fine with A.A.R.S. W4AJC is QRL change of address. W4ALA is planning all band c.c. rig. W4APU had a great time in the SS. W4PDX is planning a 150-watt rig. W4AGI and W4AG are new Extra First Class Amateurs. W4BPY uses a '45 in TNT. W4BDH is using PP c.c. rig. W4BMM is trying a '10 on 1.75 mc. W4ADJ is QRX due to station license. W4BFM and W4BEI are both active. W4BFA is having FB time with 3.9-mc. 'phone. W4AHU is building several rigs per week. W4BCC leaves for Hampton Roads Naval Base. W4RS has an ex9 as one of the operators. W4ANB will be off for a while. W4BOE, W4BCV, W4BMF, W4DD and W4ASW all have 56-mc. rigs. W4DD and W4BCV win the crystal blanks as prize for the first 5-mile QSO on 56 mc. in Alabama. Keep the reports coming, gang.

Traffic: W4DS 127 AAQ 117 AJY 88 APU 77 ALA 31 BAI 26 PDX 23 FL 11 AYK 8 BPY 7.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, Chas. W. Davis, W4PH — W4WZ totals 2022 for this month! W4UT, W4SM and W4ABS also make fine reports. W4IS schedules W5EB, W4WZ and W4PM. W4AZT-AKU, PFW is rebuilding. W4AAR has weekly schedules with W4BBT and W5AAY. Excitement prevailed at W4PM when he finally got the last amplifier to double. W4WN was married a couple of reports back — wishing him best of everything. W4ADE also has YF now. W4ATZ schedules W4WZ. W4JD wants schedules. K4BU reports K4RK has given away and is pounding at WPR where K4KD is also operator. K4UG is on 7 mc. K4RJ is busy at WGT. K4JA has '45 TPTG. K4PCI is on 3.9 'phone. CM2WW says CMB7 was moved to 7600 kc. by Cuban Secretary of Communications. W4AQL, Ga. Tech. Radio Club, will be on after first of year.

Traffic: W4WZ 2022 SM 310 ABS 192 IS 127 ATZ 94 AAR 81 BED 59 MA 11 PM 77 JD 1 UT 586 VX 36 SS 30 AAY 35 BW 1. CM8YB 27 AZ 23. K4BU 22.

WEST GULF DIVISION

NEW MEXICO — SCM, Jerry Quinn, W5AUW — Albuquerque: W5CPO worked a ZL. W5AOP has been QRL changes in QRA. W5AOE is putting in Class B modulation. W5ASR is planning new 'phone. W5AAX is running a few schedules. W5AUW is using '52s c.c. Santa Fe: W5AIC is moving to better location. W5CGJ will be back soon. W5CJP is heard regularly on 7 mc. Roswell: W5ZM finally has his 1.75-mc. 'phone going. W5ZU left for Arizona for the holidays. Las Vegas: W5ND has been heard. W5BQE was home from "collitch" for his vacation. The contest is called off due to disregard of rule nr. 10.

Traffic: W5AUW 406 ZZQ 32 ZM 4 ZU 1 CPO 2 AAX 1.

OKLAHOMA — SCM, Emil Gisel, W5VQ — W5ALE

is new ORS. W5BOE has hopes of making the BPL. W5AKX has moved to Wichita, Kans. W5CPI is building c.c. rig. W5AVB has an FB transmitter. W5ALJ is new OBS. W5AMS works 1.75-mc. 'phone. W5ABK threatens to build a high-power 'phone. W5ASF is QRL BCL repairs. W5ASQ has a 50-watt c.c. rig. The Ponca City Key Klickers and the Tulsa Amateur Radio Club are planning their 4th Annual Meeting in Ponca City. W5JP is back on the air. W5PP-W5AJO went to Illinois. W5BDX is after ORS. W5AUA is perking FB. W5BPM reports good schedules hard to get. W5CEZ hoped that Santa would bring him a crystal. W5YE boasts 6 ops. W5CJZ is coming on with c.c. W5BEP says too cold in his shack. W5BAR is active A.A.R.S. W5BQA is having trouble with BCLs. W5GA works 14- and 3.9-mc. 'phone. W5BCO ops at the Police Station.

Traffic: **W5**VQ 350 BOE 146 CEZ 67 BDX 325 BPM 25 YE 23 AMS 28 BAR 6 CPI 6 ASQ 4 AUA 2.

SOUTHERN TEXAS — SCM, D. H. Calk, W5BHO — Fort Sam Houston: W5OW sends a whale of a total! W5PF worked nine Js in one month. Port Arthur: W5YH sends FB traffic report. W5BKF reports by radio. W5CSF is new ham. W6BCF is back on the air. W5BUZ is building a 'phone. W5CNH is doing FB work with low power. Beaumont: W5APX is rebuilding 'phone. W5AFG is about ready to come on with 'phone. Kerrville: W5BKE reports new ham club has large membership. San Benito: W5AEV is new ORS and a Trunk Liner. W5AHJ worked some DX. Bay City: W5BZO and W5BSP (New Moniker W5CAZ) worked FB DX. W5CHM is QRL school. W5CQE moved to Bay City. W5FT is building new receiver. W5ABH will be on with 1.75-mc. 'phone. Kingsville: W5ABA has new 3.5-mc. rig. W5FH and W5CLP are on quiet hours now. Harlingen: W5CQH is now c.c. W5CMY reports working all districts. W5AXV is lucky in working all the YLs. W5CNA wants traffic. W5ATW is trying to make a living. McAllen: W5BBB is in Newark. W5BBR is on 14 and 7 mc. W5PM gets FB c.c. reports. W5AGG is having trouble with c.c. W5BFS has new c.c. rig. W5CFK is getting ready for c.c. Corpus Christi: W5QO returned from the West Coast. W5BRF is QRL BCLs. Mr. T. J. M. Daly, Chief Operator at W5BXX, is dividing his time between hunting and operating. W5BRY is QRL State University of Texas. W5ZN is QRL Western Union. W5CHI is experimenting with antennas. W5ALV keeps A.A.R.S. schedules. W5AB is operator on the SS *Santa Barbara*. W5HP and W5CHN made an airplane trip to Galveston to see the RI. Rock Island: W5BKL sends FB report. El Paso: W5AEC is QRL KTSM. W5AEP has trouble with keying relay. W5AFN says QRN and QRM bad. W5AUI wants schedules for A.A.R.S. W5AOT tried to put his c.c. rig on 14-mc. 'phone. W5BNJ has his receiver going FB. W5ES is new O.O. W5GI works from the sand hill. W5BQU is using a pair of '10s PP. W5DE moved his transmitter three feet, and says it refuses to work. W5CGD is having trouble with crystal. W5BXM works FB DX. W5CFI is using '52 c.c. rig. Waco: W5CCD reports the Waco Ham Club get-together was a success. Houston: W5TD reports QRN and QRM nil at his shack. W5ADZ is working FB DX. W5BTD uses remote control. W5ON is the most popular station on 'phone in Houston. W5BKW is building 3.9-mc. 'phone. W5ANW and Miss Simpson are to be married on Dec. 31, 1932. W5CEI is now located in Houston. W5BRC doesn't have much time for radio.

Traffic: **W5**OW 1352 BKE 113 BKL 71 YH 60 AHJ 59 AEV 41 ADZ 7 BTD 7 TD 6 PF 25 ON 13 AOT 27 BNJ 96 BQU 29 ES 42 APX 3 CMY 4 AXV 1 CNA 3 ATW 1 ABA 28 CLP 16 MN 131 YL 59.

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5AUL comes back with a fine report. W5BII reports everything OK except "too cold." W5ANU is losing half of his power due to ice on the insulators. W5AJG reports W5FL has gone c.c. and W5IF has gone crazy (DX). W5IT turns in his customary fine report. W5BBQ-W5WW resigns as OO and ORS. W5AID handled health reports from W5BII to W5ATG, whose dad was sick at Dodd City. W5BNF worked a TI5 and J5CE. W5AHC is now an ORS. W5ARS of Wichita Falls is the only reporter left up there, it seems. W5BCW has been rebuilding. W5CAV has had the Flu. W5SU handles some occasionally. W5AFQ is after ORS. W5LU has new 50-watter. W5COJ is on 14, 7 and 3.5 mc. W5IA is on 3.5 mc. entirely. W5SH was about to go to U. S. C. in California, but it is all off now. W5JM reports that W5JA and W5TR have a hot Morse wire loop between their homes via rented 'phone wires. W5BKJ is building a low power 'phone. W5CMR is c.c. on 3.5 mc. W5CPU is busy driving a truck. W5BAD and W5GZ are at college. W5CHJ reports little activity. W5NW has married. Congrats! W5BTW has revamped Super Wasp. W5ARV has secured W1OXV as an Aëronautical Experimental Station, and will be playing around on 41.2 mc. and 51.4 mc. These tests start in February. If interested in taking part, write W5ARV or W5HY. W5BÛA will also be in on these tests as he is W5ARV's OM. W5AUL has resigned as Editor of *Sparks*. W5BAY expects to get new 'phone on soon. W5BST is talking of rebuilding 'phone. W5QA is QRL BCL service work. The National Guard has three calls now, W5AW, W5AVX and W5CPH. W5AUJ burnt out the 211D. W5AUN is QRL Woolworths. W5BTB is off due to license trouble. W5BJU is on with PP '45s. W5BXY is trying to get a receiver he likes. W5BCE is on regularly with MOPA. W5AZB is starting a new c.c. job. W5SP will be on with a new 100-watt 'phone soon as the cotton season is over. The Mayor of Abilene is an SW enthusiast. W5CT has Blonditis. W5RJ has a new 73-ft. pole. The Central Texas Amateur Radio Club is increasing its membership rapidly. W5AMK will be heard on 7-mc. c.c. after January 15th. W5AKA has gone in radio repair game. W5BEQ is getting out FB. W5LM and W5CKP have new AAA1 supreme Portable Radio Lab. W5BEO finally got on 7 mc. W5AHZ is waiting for a power pack. W5AMW finally got the lacquer dry on his Dynamic mike. W5BXV sold out and is rebuilding.

Traffic: **W5**AUL 343 BII 306 ANU 165 AJG 150 AID 146 IT 113 BBQ 106 BNF 108 AHC 78 ARS 73 BCW 57 CAV 42 SU 12 AFQ 11 LU 17 COJ 18 IA 16 NW 6 BTW 3 ARV 3.

CANADA

MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1ER is eastern terminal of trunk line "I." VE1CY has new 50-watt rig. VE1EP schedules VE1ER. VE1BV QSO'ed G, ZU and VK. VE1CW uses remote control from shack to house. Active on 3.9 mc.: VE1ET, VE1ES, VE1EK, VE1BC, VE1DI. VE1AX has been giving more time to c.w.

Traffic: **VE1**ER 200 CY 115 ER 26 EP 110 CW 3.

ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — VE3LI says the O. A. R. T. A. is looking for schedules. VE3RO and VERWJ are new in Windsor. The SCM has been promised a story about VE3RO and some lady's undies. Hi. VE3FJ and VE3WA are working for WAC. VE3OC, VE3IC and VE3OM are on 'phone. VE3OH worked a VK. VE3LA is QRMed by a cold shack. VE3BW is going in for high power. VE3XA and VE3XL are experimenting with 56 mc. VE3WX worked VE3CP 180 miles away with an '01A and no antenna. VE3EC is QRL gas station. VE3RK has been QRL organizing a club in Ottawa. VE3OZ is new ham in Ft. William. VE3FW puts it all on a rack. VE3LY is increasing power. VE3HU is rebuilding CKPR. A new ham buys VE3FW. VE3BD is in Winnipeg. VE3EK tries West. VE3AT is heard occasionally. Ex-VE3GD fails to apply for new call. VE3FQ says, "Tear 'em apart and leave 'em." VE3GB is back from Winnipeg. VE3OK is new ham in Red Lake. VE3ET tries low power on an island in Lac Seul. VE3GG wonders why signals nil (Northern Lights). VE3RA is at RCC and Marconi in Toronto. VE3GS has a big station. VE3HN expected to get home

for Christmas. VE3HA is a Route Manager now. VE3XC has been working "G" and "F." VE3JZ and VE3JA are busting up the ether. VE3IH is applicant for ORS. VE3ID is thinking MOPA. VE3AA built new shack. VE3HW is going to try '45s in shove-jerk. VE3MR came out of hibernation. VE3IQ has a 50-watter. VE3HK is having trouble with doubler. VE3HY is giving the works a thorough overhaul. VE3GT made an FB score in SS. VE3NM is on 1.7-mc. 'phone. VE3LR wants to use Class "B" mod. VE3MI is reported sitting on the key while testing. VE3LE is QRL new receiver. VE3VA will soon be on with MOPA. VE3LJ is building a super. VE3KE, VE3NB, VE3KV and VE3NQ are newcomers in Toronto. The Toronto gang on 1.75 mc. are VE3NM, VE3LR, VE3EW, VE3JG, VE3JO, VE3GM, VE3EU, VE3SK, VE3NZ, VE3BP, VE3MJ, VE3GD, VE3CF and VE3EZ. VE3GF is putting in c.c. VE3BV says he is getting R9 reports. VE3DD bought a car. VE3DJ has worked all U. S. VE3DC is on 3677 kc. VE3IA is on 7 mc. VE3JU is getting FB results on 3.5 mc. VE3KM is heard on 1.75 and 3.5 mc. VE3OF handles football score dope. VE3OJ is heard. VE3PG has new transmitter. VE3HP keeps four schedules. Welcome, VE3NC, formerly VE2CB. Congrats to VE3JW and OW on the new Junior Op. VE3SA is on 3539 kc. VE3NX is using pair '45s. VE3HB had trouble getting on 14 mc. VE3WM has '52 PP in amp. VE3KC is rebuilding. VEKC is working DX. VE3CM is hibernating. VE3AH is doing good work with low power. VE3DU is very painstaking — took five years to build a transmitter. We will soon hear from VE3FD. The SCM wishes all the gang a Happy New Year. VE9AL has single signal receiver going. VE3CH is QRL patching up pearlies or making new ones. His brother, VE3DR, is more or less active. VE3GG has a son who has had a call for six years.

Traffic: **VE3**AD 738 GT 639 WX 339 IH 104 JI 98 WJ 99 DW 87 CP 390 RO 63 IB 55 HB 49 HA 45 HP 38 WA 36 SA 30 HY 25 LA 19 RK-LI 9 DJ 8 OF-RT 5 MX 4 BV-NM 3 OM-XC 2. **VE9**AL 16.

QUEBEC DIVISION

QUEBEC — Acting SCM, John C. Stadler, VE2AP — VE2CT has MOPA. VE2CQ enjoys 1.75-mc. 'phone. VE2CA reports good DX. VE2DW found the tin roof removed from under his Zepp. VE2CS handles traffic. VE2AB visited VE2EO, VE2FR and VE2DB. VE2DB plans a larger 'phone. VE2DY is trying his hand at traffic. VE2CX is our RM; if you want schedules, let him know. VE2BG reports his 3.5-mc. 'phone fine for schedules in the division. VE2CH was reported in Asia. VE2CU has trouble with c.c. VE2AC is recovering nicely. The McGill Radio Association, VE2CP, had a hamfest with 53 present. Welcome to VE2FQ, VE2FY, VE2GA and VE2DS. VE2EM reports his Class "B" doing wonders. VE2DX was heard in England on 3.5 mc.

Traffic: **VE2**CT 13 CA 2 DY 4 FE 106 CX 72 AC 187 DR 20 CO 9 AP 111 BB 227 BG 10.

VANALTA DIVISION

ALBERTA — SCM, C. H. Harris, VE4HM — VE4GX had fun in SS. VE4BV is on occasionally. VE4DQ is increasing power. VE4EA is making a new mike. VE4BJ is on consistently. VE4EC rebuilt MOPA. VE4GT had a card from England. VE4EO is working DX. VE4FR is building superhet. VE4GY has numerous schedules. VE4DT is on trunk line. VE4FJ hears lots of DX. VE4IZ is QRL University studies. VE4JK is on 7 mc. VE4JP is active again. VE4DX, VE4GD and VE4JI have been down with "Flu." VE4HQ is on 14-mc. 'phone. VE4KI is on steadily. VE4CY has a "Lizzie." VE4HM divides time on all bands. The SCM wishes all a Happy New Year.

Traffic: **VE4**GX 142 DQ 48 DT 34 KI-JK 19 HM 9 IZ 8 HQ 6 DX 5 EC 4.

BRITISH COLUMBIA — SCM, J. King Cavalsky, VE5AL — New officers of B. C. A. R. A.: VE5FI, Pres.; VE5BJ, Secy. New Westminster amateurs met recently and formed the N. W. A. R. C. VE5FY is the first President. VE5AC has trouble with receiver. VE5AM threatens some traffic. VE5FG has a nice total. VE5HJ hopes to be ORS. VE5DX is using c.c. VE5CM has new MOPA. VE5EH collects traffic on all bands. VE5GI has been down with the Flu. VE5GS borrowed a power pack. VE5HQ is on daily. VE5HY is in the wilderness of Vancouver Island. Victoria: VE5EZ is closed down. VE5DF is back from Vancouver. VE5CO has a short wave converter. VE5IE is a new ham. VE5GE is making horrible noises with a '45. VE5IC, VE5GB and VE5JC are heard occasionally. VE5DQ acquired some nice condensers. VE5HP is nursing a slightly bunged up face.

Traffic: **VE5**FG 263 HQ 72 EH 67 AC 64 AL 63 FE 64 GT 25 GS 16 HJ 12 GI 10 CG 1 HP 342 EC 84 DV 36 DQ 4.

PRAIRIE DIVISION

MANITOBA — Acting SCM, Reg. Strong, VE4GC — Greetings, gang. This is my first report as Acting SCM. I would be glad to have monthly reports from you all by the 16th of each month. My QRA is 284 Marion St., Norwood. VE4FT, VE4CI, VE4KX and VE4AG are going c.c. A vigilance committee has been formed in Winnipeg. VE4AG is hunting DX. VE4KX was heard in Germany. A newcomer appears signing VE4WK. VE4DJ raised ZL3 and K6. VE4AC is handling nice traffic schedules. VE4DK is QRL lately. VE4KU hooked K5AA. VE4BQ was heard in Germany and Russia. VE4LL has two "ops," OM and YF. VE4TD, VE4LH, VE4IU, VE4PX and VE4EF are heard on 7 mc. VE4GC schedules 6 stations. VE4FU migrated to 7 mc. Look at VE4FT's total! VE4CI pounds heavy brass. W9BAY was a visitor and attended the MWEA meeeting.

Traffic: **VE4**FT 124 GC 120 AC 40 CI 19 FU 15 KX 11 KU 9 DJ 10 AG 7.

SASKATCHEWAN — SCM, Wilfred Skaife, VE4EL — VE4GR reports much activity in Saskatoon. VE4AV is heard now and then. VE4AZ was pleased with QSOs this month. VE4AO enjoys Sunday parties. VE4IY and VE4EL have c.c. VE4BF has c.c. rig. VE4HS completed 4-tube receiver. VE4AT has dandy note. VE4AM decides to build PP MOPA. VE4CN wants ORS. VE4AU has his ORS. VE4JS cannot get both d.c. and R9 from his fifty. VE4KA hooked an "F." VE4JU and VE4IG are on 1.75-mc. 'phone. VE4IX plans 1933 rig. VE4IY, VE4CN, VE4BN and VE4AV want local schedules on 3.5 mc. Club at Moose Jaw is again active. VE4CM expects to be on early in New Year.

Traffic: **VE4**BB 194 AU 93 AT 76 GR 72 HX 44 EL 38 EH 28 BF 22 AZ 18 GO 10 JH-FF 8 HS 5 AM-CN 2 IY 17 JS 5 AV 3 CM 72.

LATE AND ADDITIONAL REPORTS

NY1AB reports OA4U, station of the Magnetic Observatory, Carnegie Institute, in operation again. W4DZ has a homemade bug. W4AWS and W4OT were on for the Christmas holidays. W3CHE helps to swell Virginia's total. James R. Mills of Lebanon, Mo., reports that Bill England of that city will soon be on the air. W1FME is new ham in Chicopee, Mass. ExW6FJJ is now signing W2ESG.

Traffic: NY1AB 742, W3CHE 60, W4DZ 36, W3ARK 86.

Traffic Briefs

RENEW YOUR O. R. S. APPOINTMENT

At this time of year many Official Relay Station Appointments are expiring. Look at *your* certificate now. If the date when last signed by your SCM is over one year ago, the certificate is in need of immediate endorsement. If you are one of those who neglected to send your certificate to the SCM for annual endorsement, DO IT NOW before he drops you from the rolls. Non-O.R.S. are again invited to apply to their respective SCMs for appointment.

CORRESPONDENCE

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

Are Monitors Expensive?

4530 17th N. E., Seattle, Wash.

Editor, *QST:*

I am a "depression ham."

Some months ago when I was building equipment preparatory to going on the air, I visited one of my more well-to-do amateur friends, and he at once conducted me out to the shack and proudly displayed a brand-new shiny monitor.

Now, one of the main stumbling stones, to my mind, was a monitor. I had heard they were expensive and hard to build. So I was not surprised when I asked my friend how much this job cost and found the shielding alone came to nearly three dollars, the tube a considerable amount and the portable "B" battery much higher than I could ever afford. He explained that he had "economized" all that was possible.

So I went home determined to disprove all that I had heard as to the shielding and parts necessary for a workable monitor. A week later, using my spare time and the circuit hookup in the A.R.R.L. *Handbook* and some junk parts I had laying around here, the result was a neat-appearing, firmly calibrated and perfectly practicable listening monitor built at a cost of less than two dollars! Here's how I did it —

For shielding I used plain ordinary tin from a large square tin can and cut and soldered it to the right size.

The tube (one of the cheaper varieties of a 199) cost	.50
Socket	.05
Cut-down tuning condenser	.05
Dial	.05
Jack	.05
Two dry cells	.40
45-volt "B"	.50
.001 fixed	.05
Miscellaneous wire, screws, coils	.10
	$1.75

This monitor has retained calibration sufficient for a general purpose listening monitor for several months now. The shielding requires that I leave the lid of the monitor off with the monitor sitting about three feet from a p.o. TNT 245 self-excited transmitter. The signal fades out completely about eight feet from the transmitter, so tin shielding appears to serve the purpose and costs nothing. So I say let the rich hams buy the aluminum, for I cannot see that such shielding is justified for a monitor to be used with low-power transmitter. I am not at all ashamed of the appearance of mine and certainly not of its performance.

I realize that aluminum is the ideal shielding material and that only the best material should be used in amateur equipment, but I believe also that it's better to have a monitor such as the one described above than to take chances without one or to keep off the air because of the prohibitive price that is paid for some monitors

— *Harvel Baker, W7ALH-W7BKE*

Sending Speed

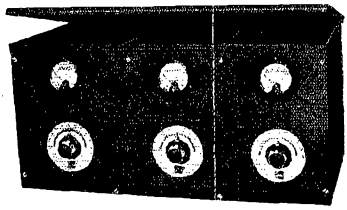
2979 Hampshire Road, Cleveland Heights, Ohio

Editor, *QST:*

Can you send faster than you can receive? At least 50% of the hams who read this question will answer in the affirmative. Some of this number will heed the advice that is to follow and they will be rewarded by a big increase in their DX cards.

Twenty years ago I pounded the key of my first transmitter. From 1912 to 1917 my signals cluttered up the local ether. Great satisfaction was derived from sending out CQ and then signing off at a terrific speed. How the other hams must have marveled at that wonderful "fist" of mine! Then came the war and I was off to sea as a Navy operator. I was amazed at the "lack of skill" on the part of old operators with the fleet and shore stations. They were continually asking me to QRS! Then I would hear these same operators communicating at a speed which I was unable to copy and, strange to say, they never asked one another to QRS. How come? Well, I finally grasped the idea that no operator living could copy accurately what I was trying to transmit as long as I attempted to send faster than I could receive. From then on, I kept this thought in mind and immediately the requests for QRS were discontinued.

After the war I taught radio telegraphy in the Naval Flying Corps and later at a commercial radio school. This gave me an excellent opportunity to observe hundreds of students, the majority of whom labored under that same old delusion — that they could send faster than they could receive. But I never failed to convince a class that there was not a man in their group



The Famous GC-30 Crystal Control Transmitter

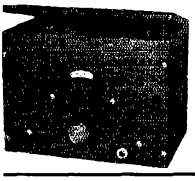
Now a greater value than ever — HOYT METERS — GERMAN SILVER DIALS — BAKELITE INDICATOR KNOBS and other refinements at no increase in price.

Your choice of 210 oscillator 210 buffer 210 amplifier or Pentode oscillator 210 buffer 210 amplifier. Can also be supplied with two-210's in push pull in output stage. Completely assembled ready for you to wire with three Hoyt meters, **$29.50**; with three Weston meters, **$42.50**; 210's push pull in output stage **$8.00** extra.

CLASS "B" MODULATION UNITS — for modulating the GC-30 complete kit.....**$39.50**

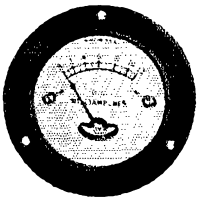
RELAY RACKS — fine for mounting the GC-30 or GC-100 and all power packs. Black crystalized finish, price.....**$12.50**

GC-100 — Same construction as GC-30 — a new higher powered job for use with 203-A or 211 in the output stage. Completely assembled.....**$39.50**



MONITOR USES FULL SIZE DRY CELLS

A real advantage for continuous monitoring. Again Jerry must say this is SOME job. Has back of panel vernier dial shielded in black crystalline finish cabinet with hinged cover, complete with three plug-in coils for 20, 40 and 80 meters, all batteries and tube, wired and tested.....**$9.95**



HOYT ANTENNA METERS!!!

Hot wire antenna meters 1½, 3 and 5 ampere ranges. Why do without antenna meters when you can buy them at Jerry's who knows what the "Ham" wants? Special low price.....**$2.95** each Hoyt perfectly damped meters at a price. These are not to be confused with the usual meter "bargains." 2" mounting hole, flange 2½" diameter, supplied in the following sizes: 10 m.a., 50 m.a., 100 m.a., 150 m.a., 250 m.a., 300 m.a., 4 volt A.C., 10 volt A.C., 15 volt A.C., 10 volt D.C. Price each.....**$1.60** three for.....**$4.50**

All aluminum panels including aluminum chassis and eight brass ¼" square rods for Tuned R. F. receiver in January *QST*.....**$5.95**
KEYING RELAYS Work on one dry cell.....**$ .65**
50 watt sockets with side wiping contacts.....**$1.35**
Tube shields for type 58 tube.....**$ .15**
Eby Isolantite sockets, 4, 5 and 6 prong.....**$ .28**
Black crystaline finished cabinets undrilled front panels same as used for "EAGLE" S. W. receiver.....**$2.75**
Egg strain insulators.....**$ .05**
Filament transformers, 2½, 2½ and 5V.....**$1.25**
Filament transformers, 2½, 2½ and 7½ V.....**$1.35**
Filament transformers 2½, 7½ and 7½ V.....**$1.50**

NEW!!!
STAND OFF JACKS
1½ inches high — make better contact — can be screwed on top of any stand off insulator — fit any G.R. type plugs — sold thousands — only.....**$ .05**

The "Eagle" a new sensational 3 tube S. W. Receiver

$16.95

Here at last is a short wave receiver embodying features comparable to those in sets selling at a much higher price. Unusually flexible, designed for continuous short wave broadcast coverage or ham band spreading. Constructed of finest material available, such as Hammarlund Isolantite Insulated Condensers, etc.

This Receiver was designed for the discriminate buyer desirous of purchasing the finest short wave receiver of its kind, and should not be compared with any of the "junk piles" selling at anywheres near the price of the "EAGLE."

The "EAGLE" is guaranteed to give you the satisfactory performance you would naturally expect from apparatus produced by JERRY GROSS.

Economical to operate. Employs the new 2 volt tubes which can be operated from two dry cells on the filaments for extended periods of time.

Altho the "EAGLE" is the ideal amateur receiver incorporating such features as full band spread, etc., it is not limited to this purpose alone, but is also an unusually efficient short wave broadcast or police alarm receiver. While full dial coverage on each ham band can be had, the "EAGLE" may be adjusted to cover continuous range from approximately 15 to 200 meters. This is very easily done by controlling the tank condenser which is operated from the front of the panel.

CHECK THESE FEATURES!!

SCREEN GRID 232 R.F. and screen grid detector offering highest possible gain and most efficient regeneration.

PENTODE POWER AUDIO — 233 gives more audio gain than obtained from two ordinary transformer coupled stages. Will operate speaker on most stations.

TANK CONDENSER — is operated from the front of panel and eliminates the objectionable necessity of lifting the cover. Speedy range changes at your finger tips. The ADDITIONAL condenser employed here gives much finer tuning than is possible with the ordinary large condenser.

BAND SPREADING CONDENSER — very small capacity permits widest possible calibration spread over a multitude of ranges. This feature gives you really two receivers for the price of one.

DIAL — Latest design, real vernier control over any position of the frequencies covered. Absolutely will not jump or slip — very rugged.

REGENERATION CONTROL — Employs condenser for stability, ruggedness and velvet-like smoothness, not noisy like resistances.

POWER CABLE — Eliminates possibility of wrong connections and insures absolute electrical contact.

CABINET — Size 6" x 7" x 9½", metal, compact, hinged cover, crystalized finish. Completely shields the receiver. Also ideal for portable use.

RANGE 15 to 200 meters — 4 plug-in coils are supplied with each receiver.

The "EAGLE" completely wired and tested.. Price.....**$16.95**
The "EAGLE" complete kit of parts with diagram. Price...**$12.95**

SPECIAL!!!
MOVING COIL METERS
100 M.A., 200 M.A. and 300 M.A. only.....**$3.00**

COMPLETE STOCK OF NATIONAL — HAMMARLUND — CARDWELL — JEWELL — WESTON and other standard lines always in stock — write for prices

PRICES CUT
Plated copper tubing inductances wound and ends drilled free

Inside dia.	3/16"	¼"	5/16"
1⅝"	5c turn	5c turn	
2½"	6c turn	6c turn	10c turn
3⅛"	10c turn	10c turn	12c turn

ALUMINUM
Cut to size specified
1/16" thick per sq. inch.....7/10c
3/32" thick per sq. inch.....3/4c
⅛" thick per sq. inch..... 1c
Beautiful plug-in crystal holders....**$1.15**
(limited quantity)

Bliley superior crystals exclusive in New York with Jerry's — 40, 80 or 160 meter guaranteed crystals.....**$5.50**
They must be good — otherwise Jerry would not sell them.
Bliley plug-in moulded bakelite crystal holders, polished chromium electrodes **$1.50**

ACME SOLID ENAMELED COPPER ANTENNA WIRE
No. 14 (any length) per 100 ft.....**$ .30**
No. 12 (any length) per 100 ft.....**$ .45**
No. 10 (any length) per 100 ft.....**$ .80**
No. 8 (any length) per 100 ft.....**$1.20**

High grade filament transformers shielded in metal cases, center tapped secondaries
2.5 volt 10 amperes for 866's
10 to 12 volts at 8 amperes — either type.....**$2.50**
Special — 10 to 12 volt 7.5 amp. filament transformer extra special.....**$.95**

No. 10 stranded Tinned Antenna wire strong and extremely flexible only **$.85** per 100 ft. (Any length.)
Na-Ald S.W. coils 20-200 meters, set of four.....**$1.15**
Glazed beehive stand off insulators. **$ .07**
Guaranteed 210 tubes.....**$1.40**
DeForest 450 tubes, spec.....**$1.95**

20% deposit with all C. O. D. orders. Include Postage.

A COMPLETE LINE OF STANDARD AND "HARD TO GET" PARTS

"JERRY'S PLACE"

25 WARREN STREET, N. Y. C. TELEPHONE BARCLAY 7-6698

Gross RADIO

who could send faster than he could receive and do a good job of it.

Because of business and family responsibilities, I dropped out of the ham game several years ago. Last week I happened to buy a short-wave adaptor for the family radio set so my wife and I could listen to police broadcasts, foreign programs, etc. My wife is already anxious to throw the thing out of the house, for all she hears is the roar of code signals whenever I am home. Guess the old bug has me again. I am not as rusty as I thought I would be, and have no difficulty in copying the commercials. But the amateurs; that is another story! So many of them sign off at a speed far beyond their natural limit; and their spacing is so poorly executed that it is often difficult and sometimes impossible to make out their calls. I hear hams from districts 2000 miles away who come in with ear-splitting signals but who CQ by the hour before raising anyone. Judging by the strength of their signals, they are certainly spanning the ocean, and if they would change their slogan from "How Fast Can I Sign Off?" to "How Distinctly Can I Sign Off?" they would receive a flock of cards from the foreign boys who hear them now but who cannot make out their calls.

— *W. E. MacLaren*

Those CQ Hounds

713 St. Louis Ave., East St. Louis, Ill.

Editor, *QST:*

I have been an active amateur operator for the past fifteen years and this is the first time I have rounded up enough energy to register a kick via the good old correspondence column of *QST*. It is about this CQ business. Marathon CQ'ing is the biggest nuisance and curse in ham radio to-day.

Rotten notes only cause me to tear half my hair out by the roots; I can even listen to descriptions of modulation without going entirely insane, but a 101 times 2 CQ is the last volt the mind will stand and I blow up completely.

Every band is full to the brim with long-winded CQ calls. I don't believe there are any good operators left in the game. The last 3 times 3 CQ I heard was back in the spark days. If you take the advice handed out to-day not to answer long CQ's, you won't answer anyone.

My time for operating is limited; it is certainly disgusting to spend half of it waiting for stations to sign so they can be called. The higher the frequency the longer and more agonizing the CQ. The A. R. R. L. has overcome quite a few evils in amateur operating in the past, so why not tackle this CQ problem?

Prevail upon the F.R.C. to reserve a part of each band for the three or four good operators left, and if anyone is heard sending a CQ more than 3 times 3 in these reserved bands immediately take his license away, not for a year and not for a day, but *forever*. Then let the lids do their stupid CQ'ing to their hearts' content in the lid end of the bands. That would be one solution to the problem. Sumpin should be done.

— *Earl R. Linder, W9DZG*

HERE'S HOW

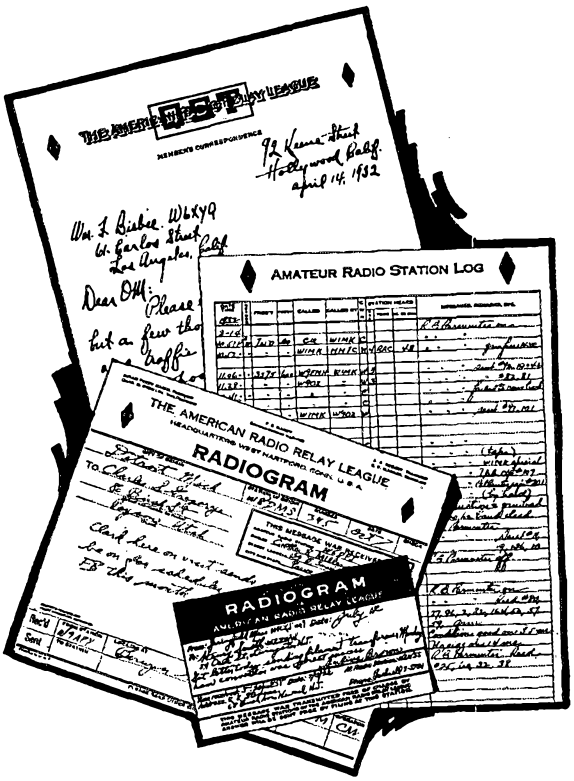
To Run Your Station the Way it Should be Run

OFFICIAL A.R.R.L. MESSAGE BLANKS—The proper and most convenient form. Designed by the A.R.R.L. Communications Department to make speedy and accurate handling easy. A great aid to good operating practices which reflect credit on your station. Bond paper, size 8½ x 7¼. Put up in pads of 100 sheets. *One pad 35c or three pads for $1.00. Postpaid.*

+

MEMBER'S CORRESPONDENCE STATIONERY

Write your radio letters on this A.R.R.L. stationery. It identifies you. Used by most old-timers and prominent amateurs. Excellently lithographed on 8½ x 11 bond paper. Now using heavier 20-lb. stock instead of 16-lb. as heretofore. *100 sheets — 50c; 250 sheets — $1.00; 500 sheets — $1.75. Postpaid.*



OFFICIAL A.R.R.L. LOG BOOK

A well-kept log is an essential part of a well-run station. This book, with 39 pages for operating records and 39 blank pages for miscellaneous notes, forms a complete history of your station — your most valuable radio record. Contains list of Q signals, message number sheet, bound-in page of cross section paper for receiver or frequency meter calibration, etc. Size 8½ x 10¾, bond paper, bound in heavy paper covers. *One book 40c or three books for $1.00. Postpaid.*

+

MESSAGE DELIVERY CARDS

Neatest, simplest way to deliver a message by mail. Good looking and easy to use. Saves writing an explanation of method in which message was handled. *On U. S. stamped postals, 2c each; on plain cards (for Canada, etc.) 1c each. Postpaid.*

THE AMERICAN RADIO RELAY LEAGUE

West Hartford, Connecticut

The West Gulf Division Convention

THE climax of the West Gulf Division Convention held at Fort Worth, Texas, October 7th and 8th, under the auspices of the Fort Worth Radio Club, was the initiation into the Royal Order of the Wouff Hong. The degree team consisting of Director Corlett, Porter T. Bennett, Perry Jones, R. C. Harris and Boothe, all of the Dallas Radio Club, carried out in due form the ritual of this ancient radio fraternity.

With words of greetings from Mr. Kraft, President of the Fort Worth Baseball Club, the program was carried as planned. Director Corlett greeted the delegates in his official capacity, followed by Hebert of A.R.R.L. Headquarters. W. C. (Bill) Joy of the National Carbon Company came all the way from Kansas City to talk on the latest type of "Receiving Tubes" and the Air Cell Battery. Glen Talbutt, W5AUL, Editor of "Sparks," entertained for a few minutes with a monologue. Mr. Straiton, of the So. Bell Tel. Co., gave a lucid description on "Radio Broadcast Transmission Procedure" and what "Decibels" mean. Lieut. Mandelbaum flew from Fort Sam Houston and talked for the Army. R. C. Harris of the Naval Reserve spoke well for the Navy. "Soupy" Groves, W5NW, who spent a year in Batavia, Dutch East Indies, gave a good talk on his radio activities in that country, illustrating same with motion pictures. Mr. A. B. Tinsley, KTAT-W5OT, demonstrated signals from amateur stations on an oscillograph. One of the exciting events, and more than pleasing, was the "barbecue" supper at Lake Worth. Mr. T. C. Ruhling of the Weston-Jewell Instrument Co. told us of the importance of meters in radio circuits. W. O. Jones, W5BNN, carried out the duties of toastmaster satisfactorily, and had everyone fooled with the Amos & Andy 11 o'clock program. The speakers were: Roy Taylor, Director Corlett, A. A. Hebert, SCM's Calk and Geesel and Harold Hartman, candidate for director. Cliff Wells, W5BWJ, entertained us with his banjo. The Amateur Radio Auxiliary, known as "Wives of Radio Amateurs of Dallas," was represented by its president, Mrs. F. M. Corlett, and secretary, Mrs. Roy Flynn. ON TO SAN ANGELO, 1933, and our thanks to Fort Worth Convention Committee for a good convention.

—*A. A. H.*

Results Consistent DX QSO Contest

(*Continued from page 26*)

equalize 'phone and c.w. results. In these cases the modified score is given with the other scores in order, and the actual "mileage" claimed by the contestant is given parenthetically.

The list of scores speaks for itself. It shows what band was used, what type of transmission ('phone or c.w.), and the power input. If nothing else, this contest shows that "power isn't everything"! The station with the highest "total mileage" is W2BSR, with an input of 162.8 watts on 7 mc. On 3.5 mc., W9DBO with only *21.6 watts input* has a "total mileage" of 7670, well above some of the stations with considerably

higher power. W1CSV, with 1.5 watts, totalled 2762 miles! Note that the scores of the "low power" group on 7 mc. compare favorably with the "medium power" stations; and the "medium power" stations did as well as the "high power" entrants. A noteworthy piece of 3.9-mc. 'phone DX are the contacts with K7AOC, Waterfall, Alaska, by both W2HY and W9EDW. The usual amount of "new DX" was worked all around, especially on 7 mc.

— *F. E. H. and E. L. B.*

SCORES — CONSISTENT DX QSO'S CONTEST

Low Power

Frequency Band	*Station*	*Total Mileage*		*Input Power (Watts)*
1.7 mc.	*W1ATW**	805	(2,660.5)	30
	W9DI	805		35
	*W1APK**	650	(2,142)	45
3.5 mc.	*W6AW*	31,225		50
	*W9BON**	31,225	(12,840)	50
	W5AL	28,635		33.75
	W9EVQ	24,945.6		50
	*W2BCO**	9,880	(4,055)	48
	W8DTN	9,825		25
	W7LD	9,495		15
	W9DBO	7,670		2.16
	W9HUO	6,901		15
	W9DI	6,135		35
	VE4EO	5,985		42
	W8AWX	5,575		22.5
	W1DUR	5,480		36
	W8GQB	4,582		25
	W1EFM	4,147		15
	W7BLX	3,790.1		35
	W9HNM	3,775		18
	W1CSV	2,762		1.5
	W8EEQ	1,770		12
7 mc.	*W4AKH*	180,470		45
	K7PQ	161,139		44
	W7AOL	152,000		40
	W6BBZ	144,200		40
	W6AHQ	137,800		45
	W6EYJ	132,800		45
	W9BTU	113,775		30
	W4AUE	104,500		45
	W9BVI	103,191		47
	W5CCW	80,791		42
	W5BSG	78,216		41
	VE2DF	73,910		35
	W4VB	62,900		40
	W5LY	55,975		46
	W5ADZ	47,750		48
	W9TJ	42,775		32
	VE5DD	42,144		50
	W9EMY	37,908		49
	W6TE	34,375		45
	W4AQV	22,540		20.1
	W5BDX	22,470		24
	W6DBQ	21,930		45
	W1CLH	19,125		50
	W9GBJ	19,019		45
	W7CEB	17,125		15
	W9HNM	12,265		18
	W8FGC	10,386		42
	W2AWT	9,990		25
	W8GME	8,915		16
	W5PR	2,011		7.5

Medium Power

Frequency Band	*Station*	*Total Mileage*		*Input Power (Watts)*
3.5 mc.	*W3BMS**	14,790	(18,295)	200
	W8ECF	14,790		110
	W3CBF	8,940		130
	W9GRW	2,515		120

7	mc.	*W8BSR*	203,920	162.8
		W4AJX	193,280	220
		W6CQF	166,823	75
		W2BHW	164,540	180
		W8AHP	163,750	250
		W9DRQ	149,550	125
		W6CRI	143,800	200
		W6DOU	113,694	165
		VE2CA	109,140	150
		W7HM	105,282	160
		K6AUQ	92,510	230
		K5AB	47,215	105
		VE4BF	46,425	110
		W3AIR	43,138	170
		W2BQK	32,460	220
		W7DP	22,715	80
		W4AUL	20,555	133
		W9GGZ	16,740	65
		W2DZA	8,980	97

High Power

Frequency Band	*Station*	*Total Mileage*	*Input Power (Watts)*
3.5 mc.	*W9EDW**	19,836	300
	W2HY*	18,003	300
7 mc.	*W9EQC*	187,500	350
	W6CUH	168,420	1000
	W7TS	94,150	500
	W1ANC	75,950	430

* 'Phone station.
Italics indicate crystal winner.

Election Results

(Continued from page 43)

Mr. Harold Hartman, W5QL, and Mr. H. C. Sherrod, Jr., W5VY, but the Executive Committee was obliged to rule Mr. Sherrod ineligible under the terms of the constitution, since he is engaged in radio servicing. The balloting, therefore, was between Mr. Corlett and Mr. Hartman, Mr. Corlett winning:

F. M. Corlett..... 250
Harold Hartman..... 148

In welcoming the new directors we know we speak for the membership in expressing warm appreciation for the past services of the three retiring directors, who between them have contributed twenty-two years of service to the A.R.R.L. Board.

— *A. L. B.*

Navy Day—1932

(Continued from page 40)

Bissey W8GAE W9ACN-W9GSF W8BYD-W8CCP-W8GOD - W8HBT - W8HER - W9ACS - W9AQL - W9CFL-W9FJV W8FWG-W9AXT W9FZQ-W9VW W8AYO-W8EGX-W8ETP-W8PP-W9ICN-W9ILH-R. W. Billett-Robert E. Shank-C. H. Zeller W9EBI W8APC-W8CSR-W8ECD-Willis Hudgins at W9BNT-W9HZ W8AOJ-W8EVJ-W9ANB W8FGV W8DMS W8BAS-W8EBY-W8QC W9BAN - W9BUC - W9CIM - W9CKV - W9DMY W9AYT-W9EQQ W8RD W9ESY-W9FAB W9AIR-W9EMN-W9FFD W9HGN-W9IBK W9IVF W8DM-W9HJC-Leslie C. Vickery W9AIJ-W9AKJ-W9BOF-W9DQV-W9IYA W9EWN W9DBO-W9DKL-W9HBK-W9JTY W9FCW W9HDN W8CIO-W8DWT-W8WG-W9HNV W8VS W8APE W9EQW W9AYC-W9EDQ-W9GBJ-Frank A. Teach W9EGI W9EAL W9GUT W9DMX W8KC-W9CSQ W8CIP-John Quincy Adams

Thomas Wells W8ESN W8GGA-W9IML W8FVP W9GEN W9IZQ W8AZQ W9FPB W9KCJ W8GOG *Eleventh Naval District:* W6BAJ W5AAX-W6BMC W6FGT W6TE W6AHP W6CTP W6DLI W6CDU W6CFN W6BCF Geo. M. Grening at W6YAU W6CIX W6BXV W6CVZ W6CLY W6DKM *Twelfth Naval District:* W6FVO W6GMX W6BTX W6DQP W6DPJ W6BVY W6UO W6AOA W6DOU W6EJU W6BUF-W6FFU W9FYG W9CDE W9AUI W6GEG Jack Rugar W6AEW W6FFP W6DBB W6DJQ W6DSR W6NK W6BMK W6CDG W6BQB W9FSJ W9GNK W6FIO A. H. Haase W6CGM *Thirteenth Naval District:* W7NR W7AF W7LD W7CHT W7AHJ W7QY W7BCV VE5HP W7ACY W7TK W7DP W7CCN W7BMR *Fifteenth Naval District:* Richard T. Parks, Jr. of W5AB NY2AB.

Magic—Ancient and Modern

(Continued from page 38)

that posterity can point to with pride. The trained craftsman takes pride in his skill. Let the amateur take pride in his work, accomplish much with little, and report results with more facts and fewer fancies.

The Moral of this Story seems to be Twins. First, an Appeal to the Manufacturer to Standardize upon Consistent methods of Rating so that Amateur Equipment is Definite and not a Cat in a Bag. Second, an Appeal to the Amateurs for more Analytical Methods so that their Observations may be of Value to Others and their own Efforts may be directed towards the Greatest Gain with the least Expenditure of Time and Money.

About the Antenna

(Continued from page 36)

to half the wavelength of the transmitter. If the physical length is shorter than this the electrical length can be increased by using an inductance in series with the antenna. If the physical length is too long, but not longer than ⅝ of the wavelength, the electrical length may be brought down by the use of series condensers. The length specified here includes the antenna and the second wire as well, if one is used. If the antenna is to be grounded, the electrical length must be equal to ¼ of the wavelength. If the physical length is too short, the electrical length can be made greater by using a loading coil in series with the antenna; if too long, it can be decreased by using a series condenser if the physical length is not greater than ⅛ the wavelength. —G. G.

The Fifth International Competition—March 11th–19th

(Continued from page 33)

lowing a tabulation of points *in the log form indicated* with this announcement.

EXAMPLE OF CONTEST WORK

As explained, every operator taking part in the contest assigns himself a distinctive three-numeral group, used by him throughout the contest *as the first part* of each number exchanged (sent). *All* numbers exchanged are SIX figure groups. The *last* three digits of the serial number *sent* are

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be eligible to vote for Director and Section Comm. Manager (only A.R.R.L. members receive ballots)

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have YOUR part in the A.R.R.L., which has at heart the welfare of all amateurs

Use the application blank on page 94 of this issue.

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Acme 2000 Ohm Headphones complete with cord. List..$2.25
Acme 4000 Ohm Headphones complete with cord. List..$2.50

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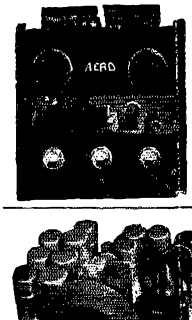

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Complete power pack for this transmitter. *Price*.....$14.75
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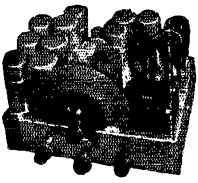

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Completely assembled with two matched full dynamic speakers from 15 to 550 meters. One-dial control. No plug-in coils. Latest superphonic tubes.

Attention Hams! This set can be furnished for operation on the ham band only, for $10.00 extra.

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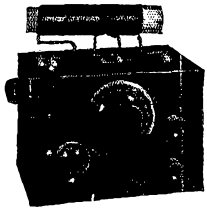

AERO WORLDWIDE 1-TUBE SHORT WAVE SET
For Headphone Operation

Listen in *direct* to London, Paris, Berlin, Buenos Aires and other broadcasting stations throughout the world via short waves. WORLDWIDE RECEIVER gets 14 to 550 meters. Aero 2-Tube Short Wave Set, **$8.75.** The same as above set but it has one stage of audio frequency added to it.

Aero 4-Tube Midget Radio....$10.90
Aero 5-Tube Midget Radio.... 11.90
Aero 6-Tube Super-Heterodyne 18.50

Price $5.95

Send for catalogue

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always taken from the *first half of the number group just received* (the one from the last participating operator with whom a two-way exchange in the contest has taken place).

Since no exchanges have taken place at the start of the contest (and whenever a "partial" or incomplete exchange has been made so no "foreign" identifying number is available), the FIRST (or next) foreign or remote station worked will receive from you a six figure group made up of YOUR three-figure identification plus three zeros, constituting the six figure group.

Assume that these are some self-assigned identifying numbers: W9UUU 543, G5ZZ 765, VK2LL 856 (he has already QSO W8ZXY-287), ZL1EE 398 (he has just received a number from VE3YY-657), AC6UU 395 (who last worked W1YXZ 984), PY1WW-777 and just starting his contest work, also VK5YY-852.

At the beginning of the contest W9UUU contacts G5ZZ. He works all the other stations we have named above, and exchanges numbers with each during the contest period. Here is W9UUU's log, which will show (by italic figures) just how the "first half" of numbers received are used as the "last half" of subsequent transmitter serial number groups.

IN GENERAL

Stations with good d.c. notes and real frequency stability will have the "edge" over those with poorly adjusted or otherwise inadequate equipment. But more than station equipment will be required to win! Most effective use of the available operating hours, intelligent choice of the different amateur bands, and a high degree of operating proficiency will take one a long way toward superlative results in this contest — or in any amateur radio work for that matter. The best equipment is only as useful for communicating as the man behind the key or "mike" can make it. Use any amateur frequency band, more than one if you wish. Take your pick of operating hours, 'phone or c.w. equipment. All active ham stations are invited to take part and report.

You can't help but work a new bunch of stations, run up some new DX records for your station, get a new bunch of QSL-cards, have a whale of a lot of fun, and perhaps rate an A.R.R.L. award at the conclusion. Any neatly kept tabulation in the form given with this announcement will be an acceptable and welcome report. Any operator you work that doesn't know "what it's all about" can be referred to these pages of *QST*.

The contest offers a special incentive to W/VE amateurs to qualify for membership in the WAC Club. We wonder how many W/VE's will work all continents in the nine days of our contest? Of course many more will complete QSOs with continents most difficult to work, which operation supplementing present achievements will put them in line for "WAC"!

Operators of all stations have equal opportunity insofar as this can be arranged 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 clearly demonstrated in our last international competition.

As usual a full report of our contest results and the awards will be printed in *QST*. 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 coöperate 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.

Overlooking *either* the 3.5- or 14-mc. bands this year is likely to prove a costly mistake. In the last contest the 14,000-kc. band proved ideal for daylight DX to remote points — good for evening work until 9 p.m. or later, too.

Stations using 14 mc. for the first time are cautioned to use care to keep in the band — slight tuning capacity changes, antenna changes, etc., can change frequency over very wide limits — interference with A.T. and T's 14,440-kc. channel (GBW) from off-frequency amateur operation will be *decidedly* out of order . . . and we don't *want* to be obliged to make disqualifications again on these grounds this year!

Also W/VE hams are being heard across the water *regularly* on 3500 kc. this season. QSA5 reports from D, F, G, ZL and VK are being forwarded through Hq.

Both public opinion and government regulations have

ruled against "prehistoric" signals, "ac" and unduly broad notes, so we hope there will be "none such." "1933-type" stations with *good* notes and stable frequencies should make *your* work in this contest more successful and enjoyable. A.R.R.L. Official Observers are requested to put in all time possible notifying amateur stations observed off-frequency or with improper-type signals, operating during the contest period . . . and Observers' reports for this period should be sent in through S.C.M.s at the conclusion of the contest.

Results in previous Relay Competitions indicate that the majority of stations worked were raised, not by sending CQ, or testing on a half-dozen frequencies — but by *first* listening and locating foreign amateur stations, then going after them. No excuse for ten minute CQ's. The stations in remote localities, *not* W/VE stations, are the ones using CQ most effectively in previous international-DX affairs. The planning of best use of frequencies and operating hours for most effective participation and *real operating skill* are necessary to successful DX-work.

Regenerative Detectors

(*Continued from page 30*)

lator. The regeneration control can be maintained right at the critical point with the resultant high amplification, since there is little danger of the detector breaking into oscillation with the supply fluctuations. If this occurs it cannot be noticed (unless the regeneration control is very greatly advanced) since the separate heterodyne oscillator holds the detector oscillations in synchronism. The heterodyne oscillator can be calibrated, if carefully constructed, and employed as a frequency meter as well.[4]

It is hoped that this information may prove helpful to amateur experimenters and further stimulate amateur receiver development.

An Amplifier for the Beginners' Crystal Transmitter

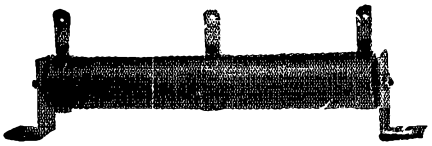
(*Continued from page 22*)

A FINAL HINT

The output of the amplifier depends a good deal upon the size of the grid leak resistor, R_7. The higher the resistance, the lower the output. Maximum output will be secured with no resistance at all in the circuit, the key being connected directly between the end of the grid choke and the filament center-tap or minus "B" lead. It is better to have about 1000 ohms in the circuit, however, especially when the preliminary adjustments are being made, since the bias developed by grid current flowing through the resistor will hold down the plate current to the amplifier tubes. After the set is lined up, however, R_7 may be shorted out.

The power supply described in the November issue will give approximately the voltages indicated in Fig. 2 when handling the complete transmitter. If a different power supply is used it should be kept in mind that these voltages should not be exceeded if the tubes are to behave properly and have reasonably long life.

[4] "Electron-Coupled Oscillators as Frequency Meters," *QST*, July, 1932.



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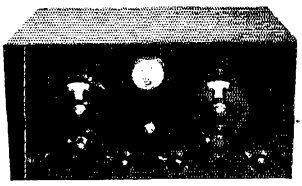

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(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
(3) The Ham-Ad rate is 15c per word, except as noted in paragraph (6) below.
(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.
(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.
(6) A special rate of 7c per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15c rate. Provisions of paragraph (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

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ONLY $2.00! Model "Y" Experimenters' super-sensitive, midget single-botton microphone. Unquestioned Universal quality performance. 200 ohms. Pure Gold Spot Center Diaphragm. Price includes general catalog with diagrams. Universal Microphone Co., Ltd., Inglewood, Calif.

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TRADE power crystals and holders — highest quality — for meters, tubes and transmitting parts. Have anything you need at right price. W9DOQ, Route One, Duluth, Minn.

WANTED — dud tubes. 270A and 849. W6RW.

QSL cards — new and different. Samples free. Write W1DOR, 15 Aubudon Rd., Boston, Mass.

CRYSTALS. Now Hipower oscillators. For that New super — IF filter 525 or 460Kc. Broadcast size. Complete with plug-in air-gap holder with mountings $4.75. 1700 and 3500Kc. Bands 1" square $1.35. Found less strain more power $1.60. 7000Kc. Band $4.50. All crystal ground to 1% or better of your specified frequency. 1" blanks 65¢. Plug-in dust-proof holder with mountings $1.00. Hipower Crystal Co., 3607 N. Luna Ave., Chicago, Ill.

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QSL cards, message blanks, stationery, snappy service. Samples free. Write today. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

CRYSTALS: 80 or 160 meter band. Inch square, $2.50. Blanks: Oscillating $1.75. Reference side finished, $1.50. Rough cut, $1.75. Satisfaction guaranteed. White Radio Lab., Peru, Ill.

SELL: Receiver, monitor, Crosley auto radio. Xtal controlled transmitter, power supplies, tubes, meters — piecemeal. Best offer takes any part. W9GBT.

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QSL cards, two colors, free samples. W8DTY, 257 Parker Ave., Buffalo, N. Y.

QSLs, 90¢ a 100. Two colors, W9DGH, 1816 5th Ave., N., Minneapolis, Minn.

CRYSTALS, Brazilian quartz, c.o.d. 15000 crystals at these low prices, ⅞" to 1", 1750 to 4000, x or y, three for $5.90. Within 2 kc. of your frequency. 7000 to 7300 within 5 kc. of your frequency, $4.50 each. Crystals calibrated to your specified frequency 1", x or y, 1750 to 4000, $3.50 — 7000 to 7300, $5.50. Blanks, 1" x or y, 1750 to 7300, oscillating $1.50, unfinished, $1. Single signal low frequency crystals and blanks. Prices upon receipt of specifications. Practical instructions on grinding and calibrating crystals, including circuits and thickness chart, 75¢. W8FN, William Threm, 68 E. McMicken Ave., Cincinnati, Ohio.

QSLs, W6DOU, 1562 B St., Hayward, Calif.

SHIELDED xtal stage, 3 band xtal, 247 tube, $6. Power supply complete 600 volt p.d.c. $11. W7AUS.

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QSLs. Get our samples before ordering elsewhere. Maleco, 1512 Eastern Parkway, Brooklyn, N. Y.

STEWART-Warner superhet converters, $5.95, complete with tubes, cabinet. Rectifier Engineering Service.

CRYSTALS: your approximate frequency, 80 or 160 meters $1.35 prepaid. Guaranteed excellent oscillators. 1" blanks selected highest grade Brazilian Quartz 65¢. Irregular shapes 25¢. Standard dust-proof plug-in Holders 75¢. Fisher Laboratory, 1200 E. Nevada, El Paso, Texas.

REL receiver, $9. Two Cardwells xmitting, $2. each. 10 volt xformer, nice case, $2.50. W4ADD.

POSTPAID: — Two New Perfect DeF-510's $3.45 each. Used Perfect Thordarson No. T2230 7½ VCT $3.45. 50 Hy 125 Ma Heising Choke $1.25. W9GDB, Milford, Nebr.

CALLBOOKS W9FO; Handbooks. Buy from W8DED.

QSL's! SWL's! Absolutely world's finest! Handful samples free. W8DED, Holland, Mich.

QSLs — 100 one color 50¢, two colors, 80¢. Samples, 2143 Indiana Ave., Columbus, Ohio.

QSLs, $1 for 200, 24 hour service. Samples. Foster Press, Appleton, Wisc.

BRASS corner pieces ¼" square. Drilled, tapped 6-32, 16 holes per foot. With flat or roundhead screws. 3 and 4 foot lengths. 25¢ foot. Lengths to order 28¢ foot. Cash. Postpaid. R. H. Lynch, 970 Camulos St., Los Angeles, Calif.

RELAY racks — all sizes. Low prices. Write Harvey Robey, East Lansing, Mich.

203As brand new, late model, Westinghouse or GE $12.00. Class B transformers, pair 210-$7.00; for 203As-$10.00. Cardwell 166Bs, like new, $22.50. 10,000V heavy duty 866s-$3.00. New RCA UX250s-$1.75. Weston type 301 milliammeters $3.75 (some new, all new condition, most all ranges) 204As-$20.00. 212Ds-$20.00. Hammarlund Comet & SW3. List. E. Ewing, Jr., 1057 Pratt Blvd., Chicago.

FREE Plugin, dustproof holder with each crystal purchased. Crystals: X cut, 1" square ground to maximum output at your approximate specified frequency. More power, better frequency control with our crystals. 0.05% calibration. 1750 and 3500 kc. bands — $4.50. 7000 kc. — $5.50. Other frequencies and ovens quoted on. 4 years in business. Precision Piezo Service, 427 Asia St., Baton Rouge, La.

QSLs. T. Vachovetz, Elmsford, N. Y.

DOLLAR buys 150 two color QSLs, 100 75¢. Postpaid, samples. D. Maxham, W9GOF, Mishawaka, Ind.

TECHNICAL articles now! Policies, politics, too. Subscription, $1.00, sample 15¢ (Canada, $1.75, 20¢). "R/9", Box 666, Hollywood.

DELLENBAUGH on Filter Chokes, February "R/9".

SUPERHETERODYNES — "A" to "Z". Starts, February "R/9".

DISTINCTIVE QSL's in modern trend; cost more — worth more. Samples for stamp or see February "R/9". Box 666, Hollywood.

GENERAL Electric 24/1500 volt 350 watt Dynamotors $37.50. 24/750 volt 150 watt with filter condenser $25. For external drive $3.00 additional. Westinghouse 27½/350 volt .08 amperes $10. Mounted twins $15. 500 cycle watt aircraft generators Special $7.50. 900 cycle 200 watts $12.50. Henry Kienzle, 501 East 84th Street, New York.

FOR sale — National SW5, d.c. seven sets coils, including 20-40 bandspread and R.C.A. B eliminator, $25. W2BHI, Queens Village, L. I.

QSLs of distinction. Samples, prices on request. W2AEY, 338 Elmora, Elizabeth, N. J.

NEW Vibroplexes, $12. Rebuilts. $6 to $10. Guaranteed. Lydeard, 28 Circuit, Roxbury, Mass.

SELL — 15 watt push-pull xmitter, $5. Two tube receiver, $4. W8FUJ, Utica, Mich.

TRANSMITTING and receiving equipment manufactured to order. Holmes C. Miller, Radio Engineer, Box 105, Palo Alto, California.

QSLs — W8AKY, 2857 Ambler, Cleveland, Ohio.

FOR sale — Western Electric and Crosley speakers, $1.25, Carter Hipot 500,000 ohm potentiometers, 20¢. All postpaid. Cash with order. Henry Bailey, Coldwater, Mich.

GRINDEX scientifically correct crystal grinding compounds. GRINDEX packed in small tins, is sold in three grades: Medium, Fine and Superfine, all three being essential for fast grinding, semi-finishing and final conditioning of perfect crystals. Price: 65¢ per tin, postpaid anywhere in U.S.A. It takes a total of only $1.95 to start you on the road to successful crystal grinding. Send that order today. Hams disgusted with hours of wasted labor and disappointing results will find crystal making with GRINDEX compounds easy and completely sucessful. GRINDEX is sponsored by Ene Laboratories, Inc. (Research Chemists), 1424 Pulitzer Building, New York.

300 watt transmitter complete a.c. receiver, class B fone. Best offer. W9KQO, Topeka, Kans.

GUARANTEED crystals, $1.35, large plug-in holders, $1.10. Blanks, 65¢. Prepaid. Hlavaty, Box 407, W. Lafayette, Ind.

CONDENSER microphones. Flat response 40 — 8500 cycles. Drops 1 db. from 8500 — 10000. Scientifically damped and built. Double diaphragm. Moisture-proof. Extremely high output. $12. Hercules Special Mfg. Co., Models, Metal Stampings, Experimental Work, Cincinnati, O.

PHONE MEN — High class, two stage, bomb type condenser microphone, assembled $27.75, in kit form $18.75 complete. Send 3¢ stamp for descriptive bulletin. Sound Recording Studios, 147 Cooper Avenue, Peoria, Illinois.

RECEIVERS — AC and DC using latest screen grid and pentodes. Bandspread, full vision tuning. Noiseless, humless, in beautiful crackle finish, hinged cover, metal cabinet. Two, Three and Four tube jobs, from $7.95 up, with coils. Also Kits. Beam Supply, 547 E. 180 St., N.Y.C.

AC and DC receivers of outstanding quality using latest tubes and finest parts thruout. Three and Four tube models, in fine crackled metal cabinet. A real EDBERN job. Prices from $13.50. Edbern Radio, 1340 Merriam Avenue, N.Y.C.

FIFTY watt sockets — 100% contact with tube prongs — $1. postpaid, 500 milliampere RF chokes, bakelite form, pie wound, easily mounted, 50¢ postpaid. Cino Radio Shop, 1115 Murray Rd., Cincinnati, Ohio.

CARTOON QSLs. Discriminating hams everywhere choose Gil Cartoon QSLs. Write Box 119, West Hartford, Connecticut.

TRANSFORMERS — 46s class B, $4.50 pair. 203As, class B, $9.95 pair. Plate, filament, and audio transformers and chokes. Write for circular. Earl Anderson, W8UD, Douglas, Mich.

SELL — Six x cut 80 and 160 meter crystals, $2.10 each. Four new TL866s with filament transformer for bridge rectifier, $11.50. Include postage. List. W9UW, 5508 Fulton St., Chicago.

——Immediate shipment: Comet Pros on trial $79.38; SW3s $20.88, SW58s $40.88, AGS $161.70: REL278s $25.65, REL296s $15.38, REL297s $20.81; Vibroplexs $15.30; Rectobulbs R3 $6.75, R81 $2.75. Lowest prices National, Hammarlund, REL, Thordarson, Cardwell, Weston-Jewell, Morrill, Bliley, Littelfuse. Omnigraphs, Teleplexs rented $1 a week, $15 deposit. List. Write. Henry's Radio Shop, Butler, Mo.

SELL, trade: WE276As, WE212Ds; RCA852s, 204-A, 851s, 861s; WE387W, WE394W mikes; receivers, meters, MGs, dynamotors, other apparatus. W9ARA, Butler, Mo.

VOLOVOX dynamic microphones give " broadcast quality ". $7.75 postpaid in U.S. Specify field resistance. Baker Engineering Laboratories, Fort Wayne, Indiana.

TRANSFORMERS, reactors made to order. Accurate, dependable. Prompt shipments. Write for quotations. Baker Engineering Laboratories, Fort Wayne, Indiana.

SENSITIVE but sturdy. Single button mikes mounted in black, nickel trimmed, stands. Dress up your phone station. Well known make. Best value ever. $1.00 each postpaid while they last. Two way telephone kits, quality parts. Good, " shack " to house etc. $1.69. Keen relays, filter condensers, wire, other salvage equipment. Bargain bulletin, stamp. Engineering Service Company, 1718A South 14th Street, Lincoln, Nebr.

WANTED '52 p.p. linear amp. and power supply, class B mod. transformers for '11 tubes, Super-het. receiver. Cash for bargains or trade 32 h.p. Johnson Seahorse. W4BPF, 205 N. Madison St., Albany, Georgia.

TRANSFORMERS rewound or built to your order, Speaker field coils. Pembleton Laboratories, 921 Parkview, Fort Wayne, Indiana.

FINISHED x or y cut crystal blanks, guaranteed, $1.50 postpaid. Prices on finished crystals upon request. Complete 100 watt CW transmitter or any part. Write for list. Bellefonte Radio Eng. Lab., Bellefonte, Pa.

YOUR radio question answered quickly. Send problem and ask for price or request rate card. Robert S. Kruse, R.F.D. No. 2, North Guilford, Conn.

QUARTZ — Direct Importers from Brazil of best quality pure Quartz suitable for making piezoelectric Crystals. Diamond Drill Carbon Co., 719 World Building, New York.

HAMMARLUND PRO $75. SW3 $22. Condenser mikes $6.50 3500v working, puncture proof 2.8 mfd condensers $15. Faradon 1500v .04 mfd $1.75 WE 261A & 276A 100 watters $7.50 DeForest 552 $9.50 560 $14.75. Used National & Cardwell condensers, meters. Midget BC receivers $9.75. Guaranteed xtals $3. QSL's 250 $1.50 500 $2. Klassen & Ross, 823 Garfield, Kans. City., Kans.

WANTED — one 861 or two 852s. State age and price. Will be purchased c.o.d. subject to test in my set. Also wanted mg or power pact for plate supply on 861 or two 852s. L. M. Fessenden, Equitable Life, Room 1022, 100 Milk St., Boston, Mass.

SELL trade mercury arc rectifier with selonoid. Perfect shape. Commercially built. Want 212D or two 845s. W8DBQ.

WE212D tubes used but guaranteed, $15. cash. First come first served. W1BIC, Hamden, Conn.

RCA course, 12 lessons, $12. Teleplex, $12. W4KP.

TRADE xtals, transformers for meters, tubes. W4KP.

Q R A SECTION

50c. straight with copy in following address form only:

W4EM — Wm. Wright Mitchell, 1455 Peabody Ave., Memphis, Tenn.

W6GXS — Edward D. Seeley, 1409 W. Blvd., Los Angeles, Calif.

W1MK, A.R.R.L. Headquarters

R. B. Parmenter, Chief Op " rp "

The following calls and personal sines belong to members of the A.R.R.L. Headquarters gang:

W1AKW-W1KP Clyde J. Houldson "ch."
W1BAW R. T. Beaudin "rb."
W1BDI F. E. Handy "fh."
W1CBD-W9ZZF Clinton B. DeSoto "dc."
W1AL J. J. Lamb "jlm."
W1DF Geo. Grammer "hg."
W1EH K. B. Warner "ken."
W1ES A. A. Hebert "ah."
W1GS F. Cheyney Beekley "beek."
W1RP R. B. Parmenter "rp."
W1SZ-W1BIZ C. C. Rodimon "rod."
W1UE E. L. Battey "ev."

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

YOU *should* become a member of the League! That you are interested in amateur radio is shown by your reading of *QST*. From it 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 the page opposite the editorial page 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 *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
West Hartford, Conn., U. S. A.

I hereby apply for membership in the American Radio Relay League, and enclose $2.50 ($3.00 outside of the United States and its Possessions, and Canada) in payment of one year's dues, $1.25 of which is for a subscription to *QST* for the same period. Please begin my subscription with the.....issue. Mail my Certificate of Membership and send *QST* to the following name and address.

.....

.....

.....

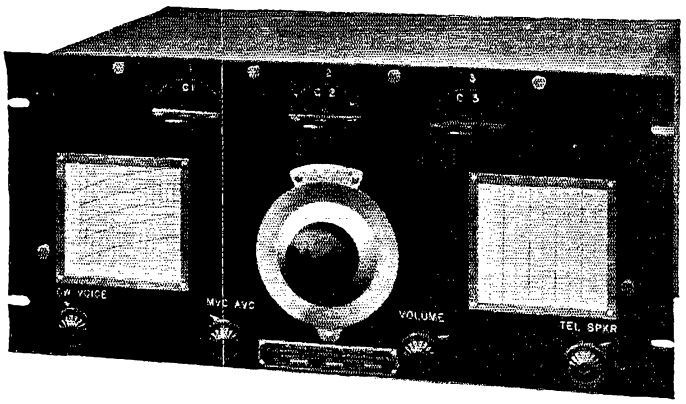
Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of *QST*?

.....

Thanks

For Your Convenience

QST'S INDEX OF ADVERTISERS IN THIS ISSUE



NATIONAL "AGS"

COMMUNICATION TYPE RECEIVER

NATIONAL'S LATEST AND FINEST

The amateur who is particular about his receiver, who knows and appreciates the little touches of refinement in design that give TOP QUALITY to radio equipment, will welcome the NATIONAL "AGS" Communication Type Receiver.

The "AGS" has been developed in cooperation with the Airways Division of the U. S. Dept. of Commerce to meet the exceedingly strict requirements of aviation ground station service. Every latest development has been included to make the "AGS" the very best possible in performance and every-day reliability.

NOW AVAILABLE WITH BAND-SPREAD COILS

The "AGS" has band spread coils for the 20, 40, 80 and 160-meter ham bands either in place of the standard 15 to 200 meter coils or as additional equipment.

ELECTRON-COUPLED OSCILLATOR

Made with electron-coupled oscillator, the "AGS" has maximum stability.

OUTLINE SPECIFICATIONS

1. CW or Voice, by shift of one control.
2. Optional manual or automatic volume-control, by throw of switch.
3. Coil Change from front of panel.
4. Tuned RF ahead of front detector. Very high signal-to-noise ratio, and high weak signal response.
5. Suppressed image.
6. Single control S.F.L. tuning by 270° precision Velvet-Vernier-Dial with German silver scale and vernier reading to 1/10 division.
7. Calibration curves and tuning log on front of panel.
8. Phone or speaker output.
9. Relay rack mounting, extremely rigid construction — front panel 8¾" x 19".
10. Frequency range 1500 to 20,000 kc. Band-spread coils available.

OPERATED ON AC OR BATTERIES

NATIONAL Power Units are available for AC operation of the "AGS" RCA Licensed.

NATIONAL SW-3

The Leading Amateur Receiver

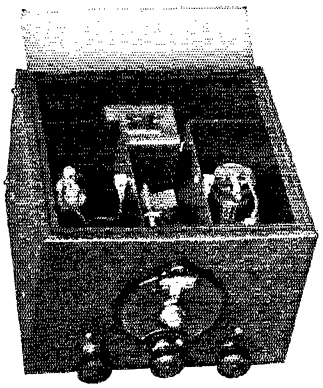
Because it is designed especially for amateurs, with many features not to be found elsewhere,—because of its outstanding and consistent performance, the National SW-3 has become the leading amateur receiver, used by amateurs the world over.

HIGHEST SIGNAL-TO-NOISE RATIO

The SW-3 has the highest signal-to-noise ratio of any commercially available receiver, except the National "AGS."

EASE OF HANDLING

Once the trimmer is set to supply proper "padding," for the antenna and transformer, all tuning can be done on the dial. NATIONAL Short-Wave Condensers in new dual unit with isolated rotors completely eliminate the tendency to interlock, as with ordinary condensers.



EXTRA SENSITIVITY WITHOUT CRITICAL CONTROL

Utilizing hitherto unused characteristics of the 58 tube, the set may be worked up to maximum sensitivity without the critical setting usually found at that point. This is because in the SW-3 the "spill-point" is not approached on a curve that becomes more vertical as it rises. In the SW-3 the curve becomes more and more horizontal, as sensitivity increases.

BUILT-IN AUDIBILITY-METER

In the SW-3, the volume control serves also as an audibility meter, an exclusive feature. The "R-rating" of signals can be read at sight from the position of the volume control and this is mounted so that it can be operated with the same hand as the tuning dial.

BAND-SPREAD COILS

Are standard equipment for the 14, 7 and 3.5 mc. amateur bands. Bands can be accurately located to place each one over the major portion of the 270° dial scale.

THE PRICE IS RIGHT

Adapted for full AC or for part or all battery operation.

***Send in Coupon* TODAY!**

NATIONAL

"AGS" & SW-3 H. F. RECEIVERS

Made by the Makers of Velvet Vernier Dials

NATIONAL COMPANY, INC. Q-2-33
61 Sherman St., Malden, Mass.

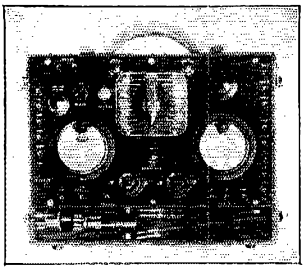
Gentlemen: Please send me
- ☐ Full information on the "AGS"
- ☐ Latest description and prices of the SW-3

Name.....

Address.....

Never Before—Never Again

Weston 566 Set ANALYZERS

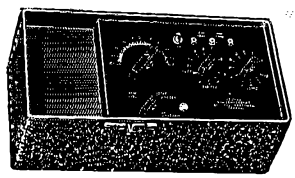


Brand new, original cartons, up to the minute; factory guarantee. Complete with 6 and 7 prong adapters. Now you can secure these analyzers at better than the distributor's price, only **$55.95**

For those who prefer it, we also have a few of the JEWELL 444 analyzers. Same condition, same guarantee and the same unbelievable low price..... **$55.95**

Both listed at $115 each

JEWELL 536 Tube Tester. List $150. Special..... **$39.50**
JEWELL 538 Tube Tester. List $150. Special..... **39.50**



**This is the same as No. 563, except without a cover*

SERVICE MEN AND DEALERS

Here are two real bargain numbers. Only a few of each so order quickly. **JEWELL 562*** Test Oscillator. A self modulated calibrated oscillator covering 550–1500 kc. — 125–185 kc.—175–450 kc. Complete with 230 tube and batteries. List price $47.50. Special only.. **$19.50**

JEWELL 533 Counter tube seller, complete with adapters, to test all 4-5-6 and 7-prong tubes. List price $93.00. Special..... **$31.50**

JEWELL 214 Tube Tester. List $125. Special..... **$37.50**
JEWELL 534 Tube Tester. List $164. Special..... **55.00**

NATIONAL S.W 3 A.C. or D.C. **$20.88**
S W 34 less coils **38.52**
S W 58 less coils **40.88**

The famous A G S super heterodyne in stock. This receiver is now available with band spread amateur coils.

Power supplies and coils at lowest wholesale prices. National 3580 B eliminator, 180 v. at 35 mils, with variable taps at 22½ — 45 — 67 and 90 v. Designed for use with short wave receivers. Uses 280 rectifier. Limited quantity only. They are going fast at **$8.50.** Order quickly.

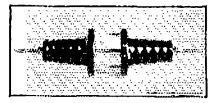
If you didn't understand the "Q S T English" last month we repeat; Grammer's low powered crystal transmitter is proving popular with hams that want a foundation transmitter that is basically correct. Why shouldn't it with the Xmitter kit at..... **$12.75**
Power supply kit at..... **5.75**
Complete set wired and tested..... **24.50**

LYNCH "No Stat" antenna systems are doing a great job for the B C L troubled with man made static. As described last month; with 50 foot lead-in...**$2.95**; with 100 foot lead-in **$3.75**

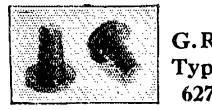
Remember there is a Kenyon transformer for every amateur need. The prices on this high grade line are well within every amateur's pocketbook.

We carry a complete line of Hammarlund parts and receivers at lowest wholesale prices. Quotations furnished by return mail.

Y cut Crystals 160–80 M. bands .1 of 1% accuracy **$4.25**
X cut Crystals 160–80 M. bands .1 of 1% accuracy **4.75**
Extra special 3500–3650 I 5 kc special frequency.. **3.50**
The finest Y cut. Finished Y cut 80 meter blanks **2.00**
X cut 40 meter Crystals, random frequency..... **6.50**
LEEDS dustproof holder..... **1.45**
De Luxe model..... **1.89**
General Radio Xtal holder..... **2.25**



G.R. Type 629



G.R. Type 627

GENERAL RADIO — type 629 Lead-in Assembly, consisting of 2 high grade porcelain insulators app. 2½" long; 2¼" base; brass nickel plated 15" lead, complete with brass washers and nuts....**90c**
Type 627 Jack Top stand-off insulator — 2½" x 2¼" high grade porcelain; complete with heavy duty type 674 jack.....**60c**
Type 628 plain top stand-off insulator, same as 627, but without jack.....**30c**

SPECIAL

We will have an interesting announcement to make on the single Signal receiver next month. We have not been asleep on this close approach to the ultimate in short wave receivers. **Watch for this Important Announcement.**

We are pleased to announce that the new **GENERAL RADIO RELAY RACK** is now in stock, in addition to the other new items illustrated last month. With standard 19" width, 45" high, it is readily adapted to table or floor mounting. Only.....**$15.00**

No. 398 Gold Bug Automatic Transmitting Key

$12.50 List. Simple in construction, correct mechanically, and electrically rugged and durable 3/32" contacts, complete with cord and plug. Brand new in original cartons. While they last..... **$4.45**

No. 10202 Extra heavy 3/16" contact..... **$5.45**

LEEDS SUPREME TRANSMITTING KEY

Ideal for beginner's practice set. List $1.75. Special Now..... **55c**

Our 5 meter 3 tube super regenerative receiver is still the standard of comparison. Uses 6 volt tubes, battery or A.C. operation; only **$12.45**

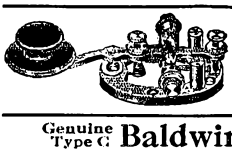
LEEDS Band Spread MONITOR

furnished complete—DeForest 430 tube, A and B batteries and 20–40–80 coils. 50 divisions spread on 20 meters — 35 divisions on 40 meters and 70 divisions on 80 meters. Unconditionally guaranteed.

$9.95

KELLOGG SINGLE-BUTTON HAND MIKE

Ideal for portable transmitter. Extra Special **$1.95**

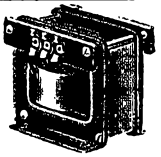


NAVY TYPE TELEGRAPH KEY

List $3.60. Navy knob — ¼" Tungsten contacts. While they last... **$1.25**

Genuine Type C Baldwin Phones

$12.00 List — Mica diaphragm. Limited quantity — only 2 pair to a customer. Special..... **$3.75**
Imported 4000 ohm featherweight phones. Special **$1.35**
Acme 2000 ohm featherweight phones.....**$1.15**
Acme 4000 ohm featherweight phones.....**$1.45**



Leeds 866 transformer — 2½ v. 10 amp. Center tapped, 10,000 v. insulation. **$2.75**

Leeds mounted fil. trans. 7½ v. 5 amp. Center tapped..**$2.95**

Leeds mounted filament trans. 2–7½ v. 3 amp. Center tapped windings...**$3.95**
Leeds mounted 10 v. 7 amp. fil. trans. with 3 primary line taps to insure correct voltage.....**$3.95**
Leeds mounted fil. trans. 2½ v. 10 amp. 1000 v. insulation for receiver or 888 fil. in low voltage power supplies **$1.15**
Leeds single button Mike trans. **$1.25**
Leeds double button Mike trans. **$1.45**

We do not publish a catalog. Lowest current prices, quoted by return mail on all short wave apparatus. Hundreds of other items at Big Special Prices.

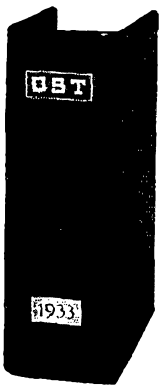
LEEDS
The Home of RADIO
45 Vesey Street, New York City
New York Headquarters for Transmitting Apparatus

MAIL ORDERS FILLED SAME DAY
C. O. D. Orders Must Be Accompanied by 10% Deposit

Sanokaa että näitte sen *QST*-ssä. Se on teidän tuntomerkkinne ja se auttaa *QST*.

RUMFORD PRESS
CONCORD, N. H.

QST BINDERS



KEEP THEM SAFE

For seventeen years, QST has published the current history of Amateur Radio. A file of QSTs is the world's most complete record of the development of short-wave radio communication. QSTs of several years ago are fascinating reading today. QSTs of today will be fascinating reading in years to come. Don't let your files get scattered. As time goes on they will acquire more and more sentimental and intrinsic value. It is easy to keep your current files of QST complete — to replace lost copies in the future may be impossible. Many old issues of QST bring high prices today. This will be just as true of today's issues in future years. In order that devotees to the art may keep their QSTs — protect them against loss or damage — the League buys special binders. They are offered to readers of QST at a modest cost. Each binder accommodates twelve issues of QST and the index. The binders are sturdy, cloth covered, deep maroon in color, excellent in appearance and cleverly designed to take each issue as it is received and hold it firmly without mutilation. Don't delay. Order today a binder for your 1933 copies — and enough binders to accommodate the file of QSTs which you have already accumulated.

$1.50 Each—Postpaid Anywhere

The American Radio Relay League, Inc.

WEST HARTFORD, CONNECTICUT

Dependable Burgess Batteries Save *the Flying Family*

When the Flying Family "cracked up" in Greenland on their attempted Trans-Atlantic flight, dependable Burgess Batteries played an important role in the rescue.

Here are excerpts of the story in Mr. Hutchinson's own words:

"It is history now that we sent out an S O S over our radio which resulted in our rescue, but few people know that we tore down our sending apparatus and made a receiving set out of it, so that we could hear the rescue work going on about us.

"The performance of your batteries in connection with this makeshift set certainly kept up our spirits . . . it was interesting to find in the radio station at Hopedale, Labrador, your familiar black and white striped batteries and the operator spoke very highly of them.

"Besides the Burgess airplane radio batteries that we naturally carried . . . we also carried three of your large flashlights and a red ship light . . .

". . . the flashlights were invaluable in helping us stand watch . . . but the most important part they played was in signalling the Lord Talbot in code when they were finally attracted by our flares."

No matter if you are buying a battery for your "Ham" station, your flashlight, or a trans-oceanic flight, you will be wise to insist upon the dependability that is always found inside the black and white striped Burgess Batteries.

BURGESS BATTERY COMPANY

Engineers and Manufacturers of Acoustic and Electric Products

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