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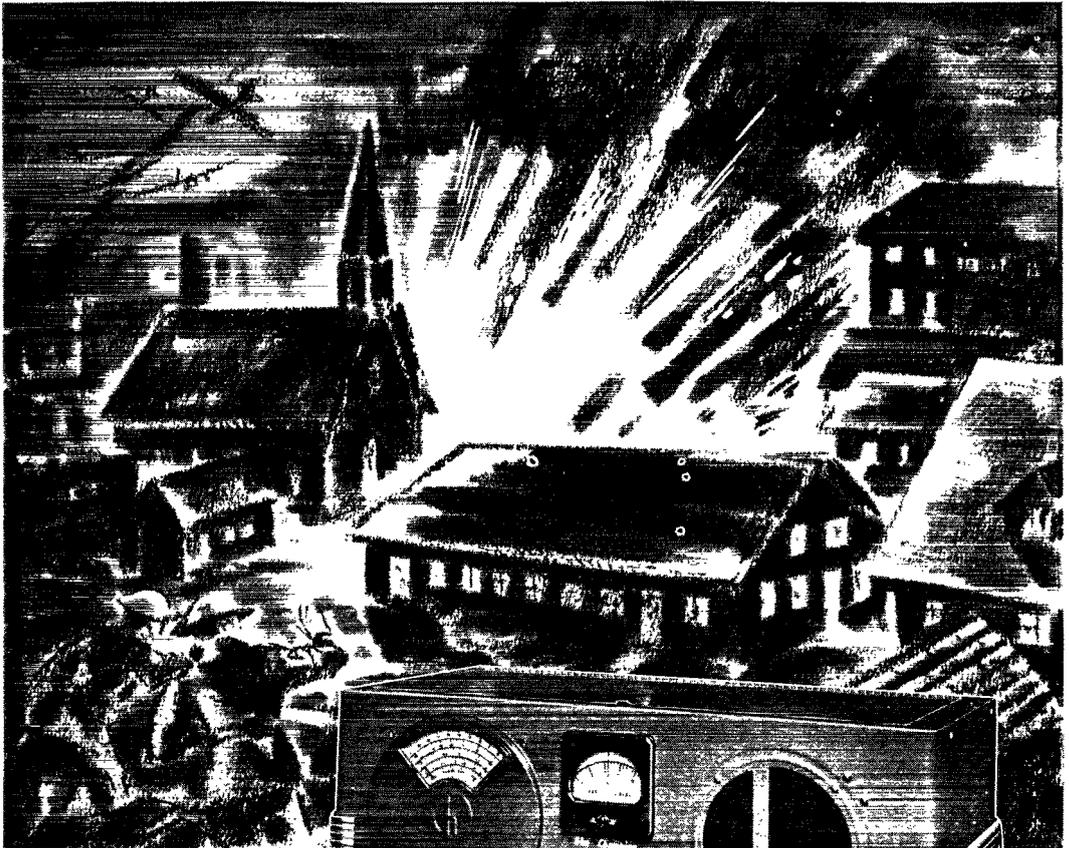
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QST

devoted entirely to

AMATEUR RADIO

PUBLISHED MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., AT WEST HARTFORD, CONN., U. S. A.:
OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION



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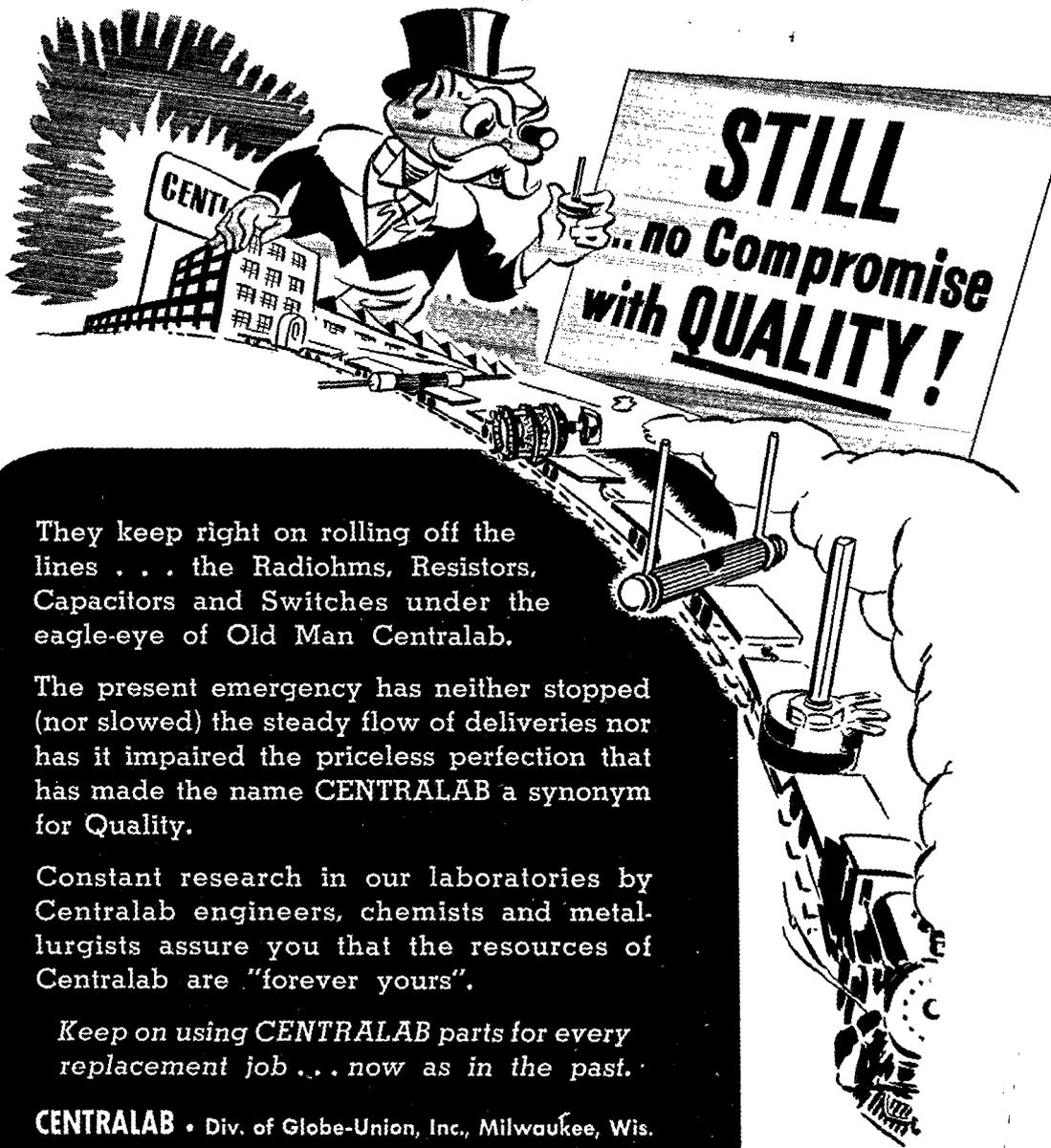
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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 nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

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



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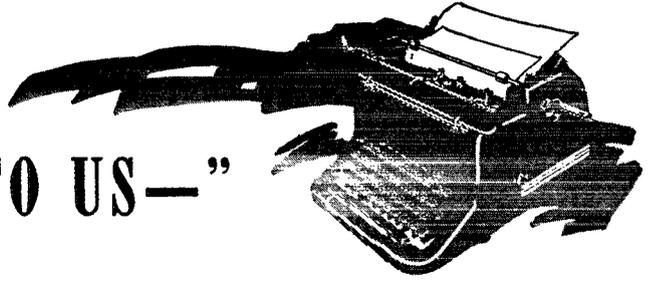
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“IT SEEMS TO US—”



THERE have been many times in the last two years that we wished *QST* were a daily newspaper so that we could send to you fellows the day-to-day news while it is hot. We have particularly wished this during the rapid developments of these past few weeks. There is quite a lot to tell you about, some brand new and some in recapitulation. Because things happen rapidly these days, you should supplement this information with the nightly messages from WIAW and the latest bulletins received by your director, SCM and Emergency Coordinator or by your radio store.

First off, we want to tell you that the League and *QST* are continuing. Not only that, but they are continuing in the manner to which you are accustomed. The League is maintaining every one of its traditional functions. That's one thing you won't have to verify from bulletins!

CIVILIAN DEFENSE

IN THE few weeks since the outbreak of war there has been much to grouse about and cuss, considerable in which to take pride. As we write, in early January, it is still too soon to know much about some things that are important to us all: reopening some of the u.h.f. for general amateur work, resumption of the issuing of new station licenses, and so on.

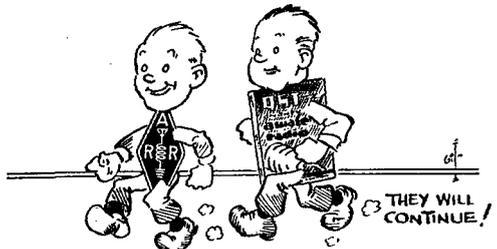
One thing that was immediately made manifest, though, was our part in civilian-protection communication. Already about 2000 of our stations have been “reactivated” to provide emergency communication for various defense councils, all over the nation, and some thousands more are in process. The way in which our gang has leaped into this job has been inspiring. The way in which the defense councils have embraced our abilities has shown their recognition of what the citizen amateur can do when his community is in a jam. A considerable number of statewide nets are functioning in intercity stand-by communication at the behest of governors or state councils, and an impressive number of local organizations have come into being.

This work has gone anything but smoothly. There has been rather vast confusion and in-

terminable delays, official doubts, lack of uniformity. There has been, so far, almost no operating of the sort that offers balm to the soul of the amateur. However, we don't see how things could reasonably be expected to be any better in the first few weeks following the entry into war of an unprepared democracy. A country that was comprehensively prepared in such respects probably would be no democracy. When the citizenry of a republic takes on such a job as this, there is bound to be confusion until the preparations are made, the plans worked out, the systems set up. If we should get nowhere in some months of trying, there might be room for discouragement. But there is none now, and we are confident that most of these things will iron themselves out in a very few weeks.

WHAT IS CIVILIAN DEFENSE?

LET'S get some perspective on CD work. In conflicts like this, where the whole citizenry is exposed to the effects of war, the Army and Navy are off in the theatre of operations doing their stuff, and the civilian communities have to fend pretty much for themselves, particularly in the matter of air raids and internal protection against sabotage. Modern war requires the marshaling of pretty nearly every human effort, civilian as well as military, and thus in the civilian world we find capital, labor, youth, transportation, the women—practically every category of activity—being organized to do its part. Many of these activities are directed by the Office of Civilian Defense. An important division of this organization is concerned with Air Raid Precautions.



It is this ARP work which most immediately interests us.

It is necessary for the states, cities and towns, and even the individual citizens, to prepare themselves as best they can to deal with the effects of air raids. It has been the lesson of the world that these are very real, and it seems to be in the cards that we'll experience some of them here. Preparedness is essential. Under OCD plans, each community enrolls volunteer citizens and trains them for a part in what are called the ARP services. The wardens' schools that you have read about, or possibly attended, are just one part of this. In addition to the wardens there is a large expansion in the volunteer fire-fighting establishment and the police services. Doctors and nurses are enrolled for first aid and emergency medical services. Rescue squads are organized, incident officers are trained, emergency feeding and shelter facilities planned, wardens' beats and stations located, crews organized to reopen streets and restore service on the utilities, and so on. It is a large and complex organization requiring the services of a great part of the citizenry of the community, and a gorgeous example of democracy at work.

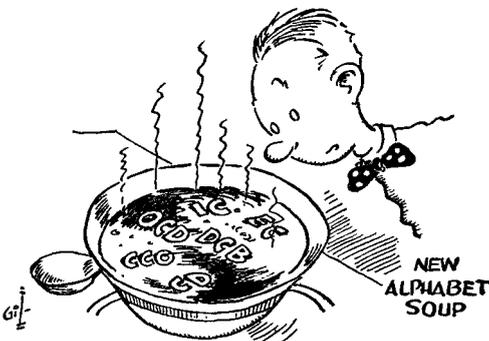
An essential to its success is communications. Radiating from the nerve center, the office of the local coördinator at the control center, there must be constant communication by some means with the many ARP services, to coördinate their work and to bring their special facilities into play at the spots where they are most needed. It is natural, of course, that the police and fire radio and signal systems should be employed to their utmost in this work, and that beyond that the ordinary wire telephone should be the major instrument of communication. That is why the public is asked not to use the telephone during alarms. But almost inevitably these facilities will be more or less seriously bombed out or overloaded, and therefore every community must also plan a secondary system of communication, based upon all the other facilities that are

available. And of these, the chief is amateur radio. That's where we come in.

Now if all of the communities knew just what they should do about communications and had been told about amateur radio by OCD, our task would be a simple one. If the war had been delayed until OCD organization was perfected, we would have found every community possessing a communications officer as an aide to the local coördinator, and that he had planned his primary and secondary systems, and that when amateurs stepped up to the volunteer enrollment desk and registered, the communications officer would know just where he wanted to spot them and their gear, and that he'd be fully prepared to give them their instructions and to drill them in their performance. Then when the alarm was given, the hardware store proprietor and his amateur clerk would put on their tin hats and armbands and lock up the place, the proprietor proceeding to his warden's post and the amateur repairing to his flea-power transmitter in the high school where he is assigned the first trick after the alarm sounds. It is a very nice system, but the trouble is that most of it was nonexistent when the war started. Our task is therefore the very difficult one of trying to do something vital in an organization that is only partly formed.

Black Sunday found ARP work well advanced on both seaboard and in a few cities in the central part of the country, but the necessary concentration on "first things first" meant that no instructions had been given on the organization of communications. So when we offered ourselves and our gear, in our states and in our communities, there was rarely anyone to receive us who understood us or who knew what was needed for communications. In a few places we have been rebuffed or laughed at; in most cases we have been received with more or less open arms and hurried attempts made to set up something that would bridge the gap if the awful moment arrived before sound organization was accomplished. And for our own part, too, we were not too well prepared. We are proud of the fact that we started off on our own in September and got the ball rolling, but December 7th took us as much by surprise as anyone else and we were far from ready. In this situation it is no wonder that the first few weeks have been confused.

Since the outbreak, OCD has worked furiously compiling its Control System manual, including the section on communications. As we write, this is now being printed and distributed. By about the time you read this, it should have been received and digested in your communities. The local CD organization will then know what to do about communications and where to fit amateur radio in its picture. To



What the OCD Communications Plan Will Say About Amateurs

The Office of Civilian Defense is issuing this month a special publication on the Control System for the Air Raid Precautions services, one section of which publication will deal with communications. It will call for the appointment in each community of a Chief Communications Officer, as an aide to the local coordinator of civilian defense, with the duty of setting up the local ARP communications system. This will be erected primarily on the wire telephone system and the local municipal signaling system. It will also be recommended that a secondary system be established, to come into operation when the wire system fails. The heart of this secondary system will be amateur radio. Here is what the plan says about amateur radio:

The performance record of amateur radio operators during peacetime disasters indicates that they are resourceful, adept at improvisation and possess a high sense of community service. Considering this, the Chief Communications Officer may consider it desirable to enlist the services of amateur operators within the community, most of whom, if not all, will provide their own radio equipment. The equipment for use within the Civilian Defense Communications System will be portable-mobile * u.h.f. radio telephone sets, thus providing for maximum flexibility of this important communications channel. Upon completion of the enlistment of such operators and their equipment, a survey should be made as to the best means of employing this service. All operation must conform with the rules and regulations of the Federal Communications Commission.

* The term is not here used in the FCC sense of meaning a mobile installation. OCD means movable self-powered apparatus of the type we have been building, useful for fixed, portable or mobile installations.

— Editor.

It must be thoroughly understood that all amateur radio stations are subject at all times to being ordered closed or to cease transmitting. This function is not within the jurisdiction of the Civilian Defense organizations. Orders to close a station (other than temporary silence) will emanate only from the Defense Communications Board. Orders to remain silent (for temporary periods) will emanate only from the Interceptor Command of the air defense region within which the community is located, or the Federal Communications Commission (or their representatives). Authority to reopen or resume operation will emanate from the same source which directed the closing or silencing.

In general, this service should be utilized to locally parallel the telephone installations connecting the most essential services, i.e., Control Centers, Incident Officers, Fire and Police service, etc. In addition, a pool, or group of pools, should be formed, located at strategic points from which one or more of the amateur operators could be dispatched with their equipment to bridge a gap, should any part of the telephone or Municipal Signal System be rendered temporarily inoperative by equipment failure or bombing.

In organizing this phase of the System, care should be taken to carefully select operator personnel on the basis of individual experience and the equipment in their possession or which they are prepared to provide.

In order to obtain maximum use of amateur radio, the Chief Communications Officer should appoint as a member of his staff the local Emergency Coordinator of the American Radio Relay League (a nationwide organization), or his equivalent in individual amateur groups, whichever may be available in the community.

help all concerned in this work, we quote on another page what OCD says about amateur radio — although this is far from giving any complete picture of its communications organization for the ARP services. At the same time, instructions have gone out to the volunteer enrollment centers in each town to establish a classification of personnel particularly for communications duties, and as soon as these arrangements are set up locally it will be possible for an amateur to enroll in the same formal manner that a warden does without danger of being assigned to a strong-arm squad instead of radio.

WHAT TO DO

THAT, then, is what the situation ought to be by late January. We may expect it on

both coasts. In the interior there may be further delay before communities become convinced that they had better organize. Let us examine what we should do, in terms likely to fit both kinds of cases.

If the hams in your community haven't organized and started work, there ought to be a general meeting of amateurs immediately for this purpose. If you have a good ARRL Emergency Coordinator in your community, he probably has had such a meeting a long time ago and started an organization which you can now join by enrolling. If there be no EC, you fellows should choose one of your number to serve temporarily in that capacity, petition your SCM to appoint him formally, and charge him with seeing the local civilian defense chief immediately to have your services



incorporated into the town plan. If the local Chief Communications Officer has been appointed, he is the man to see. If he hasn't yet been appointed, your man is the local coordinator or commander of the citizens' defense corps or chief warden or the mayor or the chief of police. You can't all go to see the town officials at once, but a spokesman for you can — the EC or someone subbing for him — and later the CD people can send representatives to your meetings to talk over what is needed.

If the CCO has planned his system, you should be able to proceed immediately on more or less of an engineering basis. If there isn't one, you can urge his immediate appointment (he ought to be primarily a wire man). But there is no time to be lost and, pending that, you can work out something with other CD people which will provide communication between the major points of the ARP system, as far as the ham facilities will extend. The control center, the fire and police stations, the district wardens' offices and the emergency medical services of course are most important. Some arrangement ought to be made for a pool of portable or mobile equipment that can be dispatched where it is most needed. Obviously there must be relief operators, three or four to a station — operators are much more needed than stations.

As soon as the communications plan has been laid out and you can see how many amateurs are available, what points of communication are necessary and how many operators there ought to be, the local CD authorities must make an application to the Defense Communications Board or the FCC at Washington for permission for you to resume operation as an exception to the closedown order, No. 87. This application must outline the communications plan and say why it is needed, and it must certify that it is necessary for a national-defense purpose. It must state the names, calls and addresses of every amateur whom it is desired be reactivated for service in this system. The application must come from, and be signed by, a ranking official of the protection work, such as the mayor, who is generally chairman of the local defense council, or the

local coordinator or other responsible administrator of such work. If the local CCO has been appointed, he of course is the one to arrange for such an application. If there be no CCO yet, you fellows had better assist.

If the application is approved by DCB, the result will be letters from FCC to the individual amateurs concerned, authorizing them to resume operation exclusively for national-defense purposes primarily associated with this particular enterprise; and under the condition that all transmitting cease on order of proper authority — on which we have much more to say later in this article. Unless you are temporarily blacked out by the military authorities, you are then ready to commence operating, but only to the extent specified by your CD agency. You will not be working then for the American Radio Relay League or for your local club or for your own glory, but as a cog in the defense of your home community and you will take your orders from your superior in the CD system. You will have to drill and report for practice as he says. Of course you ought to have some practice mobilizations. If a raid comes, you will report at your proper station for duty and you will handle the traffic that is given you. You will observe the discipline that is specified by your boss. Whether you handle any traffic or do any testing in the meanwhile depends upon your agency. If your agency wants you to assemble twice a week and test out the system for ten minutes to make certain that everything is working properly, your FCC letter authorizes that. But testing, not ragchewing. If your agency thinks it is sufficient just for you to be enrolled and doesn't want you to do any testing meanwhile, that goes — but there ought to be reasonable periodic testing.

In Red Cross disaster organization, where all local communication facilities join in a central committee, we have for years had the device of amateur representation through our Emergency Coordinator. Obviously, all amateurs can't belong to the committee. One selected spokesman sits on the committee, speaks for amateurs, receives the traffic assignment for the hams, and then parcels out the tasks amongst his gang. In OCD work we shall have much the same device. Note that the OCD plan calls for the appointment of the EC or similar local amateur leader as an adviser on ham matters to the CCO. The EC appointment now becomes one of great importance. We have ECs in most communities of size, and new appointments are being made rapidly. If your town doesn't have an EC, you should select one of your number to act temporarily and petition the SCM for his appointment, as suggested above. By the same token, if you have an EC who is not on the job or not doing

well, so that your local gang is dissatisfied with him and it is the common feeling that his derelictions are the cause of your lack of progress, you ought to petition your SCM for his replacement and name the man you want. This is strong medicine and must be used discreetly. It is not to invite two or three jealous punks to start a revolution to get a position of prestige for one of their number; keep amateur politics out of it and go to this length only when there is universal local feeling that your EC is failing on the job and that you just have to have a better man. But we must not fail!

If your local CD organization doesn't appreciate you and nobody will apply for your reactivation, you fellows should nonetheless do them the great service of planning an emergency set-up as best you can from the information you can collect. Thus prepared, you will simply have to QRX until your community wakes up, hoping it doesn't have to do so the violent way.

It seems to us that all this OCD work should be done on u.h.f. above 56 Mc. (and mostly on the 112 band) — if for no other reason, because of the regulatory requirements which bar portable and mobile work on the lower frequencies at the present time.

AVOID THESE PITFALLS:

Now why are we amateurs doing this? It is because we are interested citizens of our towns, willing to give of our time and skill in the community's need. It is not being done for play. It is something that has been specially authorized to us by Washington because of a bona-fide need, as an exception to the close-down believed necessary in the nation's interest at this time. It must be well handled. It must not be abused. If it is, you can practically depend upon it that the War Department will wash out the arrangement and put us all off the air entirely. Already in the first few weeks there have been some abuses, and some pitfalls are discernible. Headquarters asks you to note carefully our warnings on the following topics:

1) We're in this thing for a purpose and must stick to business. Ragchewing is strictly prohibited. There may be only defense communication and authorized businesslike testing. Amateur operation is the only uncensored communication and is necessarily viewed with misgivings. If we don't conscientiously confine ourselves to our war tasks, we'll be all washed up.

2) Only trustworthy amateurs willing to work should be accepted in such a plan. Our ECs and other participating officials must not simply accept every willing amateur and loosely arrange for his certification on general grounds. We hope that every amateur is willing to devote himself wholeheartedly to this

work, but applicants ought to be sifted, undesirables left out and those who won't play ball thrown out. The OCD work is *not* a mechanism that can be used to get all of amateur radio back on the air for the usual amateur chatter. In other words, pick your men carefully.

3) Let no amateur dare to come back on the air without proper reactivating authority. It is decidedly dangerous these days for any person to engage in the operation of an unauthorized radio station. ECs and others in charge of nets will know who is authorized in their vicinity and who isn't. If there be any gatecrashers, they must be stopped at once — by turning them in to FCC if necessary.

RADIO SILENCE

EVERY reactivated amateur must be prepared to go instantly silent during his otherwise-authorized work when so ordered by the Interceptor Command of the air defense region in which he is located. This is exceedingly important. The Air Defense people are responsible for our protection. Their plans necessarily contemplate closing down all radio transmission, including broadcasting, during an impending raid, to prevent radio bearings and leaks of any information whatever even at short ranges. Amateur authorizations are subject to temporary closings by this superior authority of the IC.

You can find out when you should be silent by listening to your local broadcast stations, and it is essential that every control station of a reactivated amateur net so monitor. When your local stations go off the air, you must too — it means that they have received the signal for radio silence. They get their dope from listening to a key broadcasting station in the region which briefly emits a special 1000-cycle signal by direct orders from the Interceptor Command. If you can learn what is the key broadcasting station in your region, you may monitor it direct and thus receive the signal instantly, but absolutely all amateur defense operation must be constantly prepared to cease operation when the IC signals that a raid is pending.

In seven western states on the Pacific slope, where conditions have remained critical for



some weeks because of nearby enemy operations, the IC has permitted no resumption of amateur operation, has caused frequent silencing of broadcasting and has even put severe curbs on police radio. Authorities have been both worried and annoyed by inability to control reactivated amateurs in those states who have not heard of the IC's "perpetual" close-down of amateurs, and it's been pretty embarrassing to amateur radio. FCC has wanted to continue reactivating, since the authority to go back on the air is always subject to temporary closdown by the IC; but, despite the widespread word on this, amateurs getting new authorizations have daily come back on the air, not realizing that the ICs were maintaining a semi-permanent amateur silence in the western regions: There is said to be a very good military reason for this. Let all western amateurs realize that they are under an operating blackout until the lid is lifted by the IC. They may plan their activities, get their authorizations, install their stations and be fully prepared to operate, but for the time being there must be no transmission whatever. If raids come and amateurs are needed, it may be expected that authority to operate will *then* be given, but in the meantime western hams can only prepare.

These are serious matters involving national security. There is question in the minds of authorities whether we are sufficiently disciplined, skillful and trustworthy to be permitted to operate by the hundreds, play our parts and keep out of trouble. Let us show that we have a reliable and well-oiled piece of machinery.

OTHER ACTIVITIES

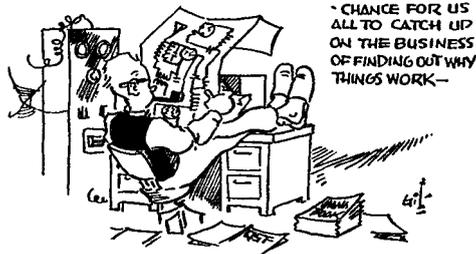
WE HAVE given much space above to ARP work because it is our most immediate responsibility. There is some other activity going on and still more in the wind. There are, for example, some intercity communications and some of practically statewide dimensions, because the states also have responsibilities and worries in their civilian protection, in a field greater than that of the municipalities and with the same need for auxiliary communications in the event of overload or losing

wires. Whenever officials need amateur nets for defense purposes, they can get them, and there are many of our state nets capable of going over intact into this work and doing a bang-up job.

An interesting possibility in the offing is the communications need of OCD's Civil Air Patrol, in which civilian pilots and other volunteers engage in patrolling, ferrying, transporting supplies and guarding airports to relieve the military as much as possible of these duties. Their communications needs have not yet been fully analyzed but it superficially appears that they need rather large-scale amateur assistance, and we expect some news on this before long. We are also keenly aware that our present confinement to national-defense work leaves the country wide open to communications emergencies in natural disasters with no arrangement for the customary relief that only we can afford. We may hope that the authorities will soon perceive this situation and establish arrangements for us to render our traditional service under appropriate controls. We are similarly hopeful that the League may soon be authorized to resume its transmissions of code instruction, enabling us to carry on with our proficiency program and the issuing of certificates. Even we have been surprised since the closedown to learn the immense extent to which these transmissions were being used for the training of operators, even in fields outside of amateur radio. At a time when the nation so badly needs operators it would seem wise national policy to permit the resumption of the program. We have some reason, too, to hope for the general reopening of some of our very-high-frequency bands. There couldn't be much military danger in amateur operation on 224 and 448 Mc., and there would be both technical advance and a lot of good sport in seeing what we could do on an exclusively super-u.h.f. basis.

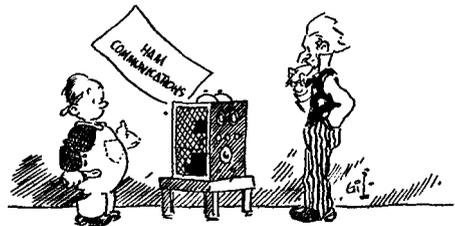
In fact, there is room for a tremendous amount of legitimate wartime ham activity, and we're getting charged up to a pretty high voltage over the possibilities of taking up now some things for which we never had time before. The fact that we can no longer engage in general communication does not seem such a tremendous disadvantage. We were fortunate in keeping our equipment intact and we can continue to engage in receiving and experimental work not involving the radiation of signals. At headquarters we are looking forward with considerable keenness to this opportunity to dig into fields for which we never before had the time and we're planning ahead for some issues of *QST* which we know you will find of immense interest.

We'll be getting into those things just as soon as we finish our program of emergency



equipment for local work. That's also your first duty, of course, preparing yourself with emergency equipment and emergency power supplies. We also must help in the national need for more operators, teaching local classes in code and theory. Beyond those duties, we have a lot of intriguing ideas under study and perhaps you'd like to hear something about them.

We're thinking, for example, of the possibilities of several alternative forms of communication in which much amateur gear could be used in local QSOs. There is "wired wireless," of course, and modulating light beams, and all the possibilities that may reside in FCC's magic formula for "low-power devices" that do not require a license. The alliance between under-water sound and radio excites curiosity about the possibility of communicating by low-frequency vibrations over the city water system. We shall have some dope very shortly on the use of audio systems made of amateur mikes and amplifiers as an aid in spotting approaching aircraft, etc. The whole field of Adcock antennas and direction-finding at high frequencies lies before us, one in which our talents are needed and one in which we could probably organize an extremely useful service. In fact, the possibilities of organizing an amateur intercept and recording unit need our attention as quickly as we can get around to it, and that will require further exploration of amateur technique in recording. We think many of us may be interested in learning something about cryptology, because it is so closely associated with our receiving activity. We have a chance to explore long-wave reception, a field we have long neglected. We need to bone up on modern blinker signaling. We shall have the first chance in most of our lives to learn something of the detailed uses of the cathode-ray tube. We had better take a look at the "radiator pipe" broadcasting system and learn something about the gear used in facsimile, panoramic reception, interoffice communication and that gadget with the funny name which reproduces handwriting at a distance.



LET US SHOW THAT WE HAVE A RELIABLE AND WELL-OILED MACHINE

A particularly important field for us will be experimental work, especially in the u.h.f. field below one meter. We need to acquaint ourselves with these frequencies and develop equipment on dummy antennas which can be used after the war is over. We may make no world-shaking discoveries but we will probably advance our super-u.h.f. technique several years ahead of normal progress because of this opportunity to do something interesting when ordinary activities are restricted. We shall have the opportunity to build up measuring equipment which will make our efforts more effective in the future, the kinds of things we have all wanted but which have never been a normal part of the ham laboratory. Everyone of us has wanted time to make a high-fidelity amplifier for the home phonograph but schedules and contests have always interfered until now.

We also rejoice in the reception already of numerous letters from amateurs indicating that now is the chance for us all to catch up on the business of finding out why things work. Amateur knowledge has always been badly behind amateur activity on this side of the water. Too many of us, with our authorized kilowatt, have just shoved in the power and let things drip, knowing that some of the watts would do their stuff. We'd all be better for a somewhat more serious and scientific approach, and there's reason to hope that we'll have the leisure now to learn many things that we have neglected in the past. And when we apply our

(Continued on page 46)

Flash!

NEW REACTIVATING REGULATIONS EXPECTED

At the request of DCB, FCC on Jan. 2nd temporarily discontinued the issuance of new reactivations for defense work, pending the drafting of more definite regulations to govern same. This action probably invalidates our recommendations herein on how to proceed to obtain reactivations. Civilian defense work is expected to continue but under new rules. QRX on applications until you have the new dope, expected about middle January, too late for this issue. Watch for this in broadcasts from WIAW and bulletins to League officials, then govern your applications accordingly.

Antennas for 112-Mc. Mobile Work

Suggestions for U.H.F. Automobile Antennas

BY BYRON GOODMAN,* WIJPE

The problem of where and how to install an antenna on one's car for participation in 112-Mc. mobile operation has of course been solved in many weird and wonderful ways, and it will continue so as long as amateur ingenuity exists. This article reviews a few of the more conventional solutions as a starting point for future work.

IT WOULD seem more or less obvious that an antenna on an automobile should be mounted as high as possible, to avoid absorptions and reflections from the car itself which would result in considerable distortion of the radiation pattern, but many mobile installations we have seen have not bothered to observe this rule. Naturally much of this is dictated by structural and aesthetic difficulties, but it would seem that more effective placement of the radiator could be had in many instances. That the advantage is not a minor one is confirmed by the experimental work of Mr. Sydney Warner, head of the Connecticut State Police radio system, and Professor D. E. Noble, then of Connecticut State College and now with Motorola, when the Connecticut State Police f.m. system was first being set up. They wanted to find out if a car-top antenna was really

mounted antenna. These tests were made around 40 Mc. with quarter-wavelength antennas, but the same general principles should apply on the higher frequencies, probably with even more marked differences. Apparently the antenna should be mounted so that the horizontal metal surfaces of the car will act as a good ground and help to maintain the theoretical pattern of the radiator.

The antenna system for a 112-Mc. mobile station in one's car can be either a temporary or a permanent affair, depending largely upon domestic factors and who has the final say. The disadvantage of the temporary antenna is that it may not be set up when it is needed most, and valuable time will be lost in getting it rigged up and connected.

It is important that the antenna be mounted as high as possible, to avoid screening effects of the car and to give maximum range. If the antenna cannot be mounted so that it is entirely above the top of the car, it can still be made to have a major portion of its length above the car roof. Roadsters and coupes have a convenient spot for mounting the antenna on the deck in back of the rear window, since the lead-in can be brought into the luggage compartment or the driver's seat, depending upon the location of the radio gear. Sedans lend themselves more readily to mounting the antenna along the side of the hood, or on the roof.

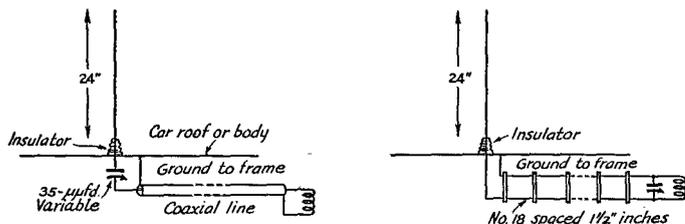


Fig. 1 — Two quarter-wave antenna systems for 112-Mc. mobile work.

worth while in comparison with the more common type mounted on the rear bumper, and field patterns were made for the two antenna positions on the automobile. It was found that with the antenna mounted on the rear bumper the signal was four times as strong in the forward direction as to the sides and rear. With the antenna mounted on the top of the car the radiation pattern was very nearly a circle, with the radiation in every direction as good as the best direction of the bumper-

If a quarter-wave antenna is to be mounted permanently on the car it should be located on the roof of the car, otherwise it is likely that the radiation pattern of the antenna will be quite irregular and the directional effects will be a help on some occasions but a definite hindrance on others. It can be fed by a tuned line or by a coaxial line, as shown in Fig. 1. The coaxial line feed can be checked by observing its detuning effect on the transmitter — a good match will have been obtained when the detuning is a minimum. The an-

* Assistant Technical Editor.

tenna length should be made about 22 to 24 inches, and this length and the capacity of the condenser should be varied until connecting the other end of the line to the transmitter shifts the frequency a minimum amount. Loading is controlled at the transmitter by adjusting the coupling coil, *not* by varying the condenser at the antenna. The coaxial line can be of the usual 70- or 100-ohm variety.

A half-wave antenna can be mounted on the side of the car if desired, because some of it will extend above the roof of the car and give better results than a quarter-wave antenna similarly placed. The half-wave antenna can be fed in any of the conventional ways, and the two methods shown in Fig. 2 are probably the most convenient. Both of these systems use tuned feed lines, however, and thus require a tuning system at the transmitter end.

Since a quarter-wave antenna is normally supported at a low-voltage point the insulation does not have to be the best, and hard rubber b.c. insulators are satisfactory. However, a half-wave antenna will usually be supported at a high-voltage point and thus requires good insulation for

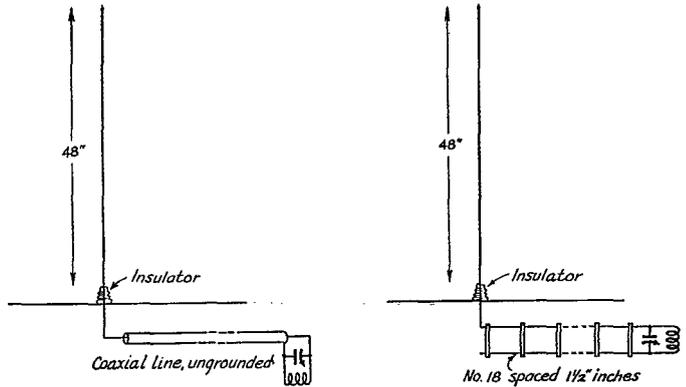
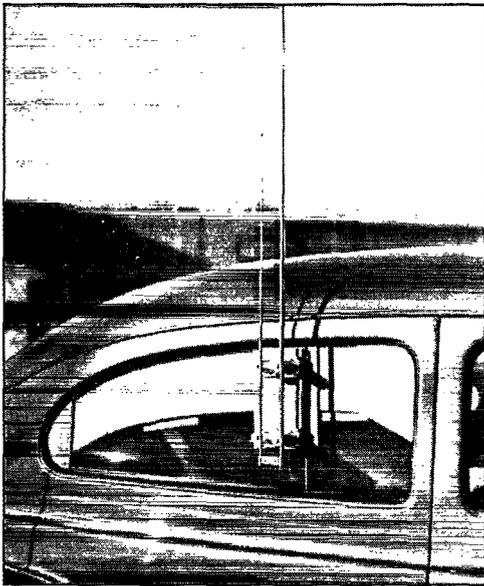


Fig. 2 — Two half-wave antenna systems for 112-Mc. mobile operation. If coaxial-line feed is used (left), the coaxial line must be a good one because of the standing waves present in this tuned system.

best efficiency. The ceramic insulators that are available in many shapes and sizes can usually be made to fit any case, and it is wise not to skimp on size because of the greater chance for eventual breakage with the smaller units. The feed-through types and the stand-off types with metal



An antenna for 112-Mc. mobile operation can be mounted easily in the window of a car, allowing the radiator proper to be placed above the roof of the car. This installation is a J-type antenna — the dimensions are given in Fig. 4.

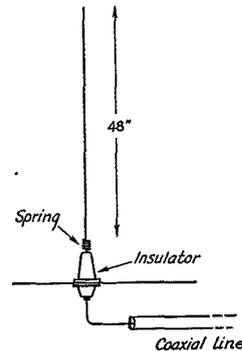


Fig. 3 — The car-top antenna at WIMPO is mounted on a spring which allows the antenna to be bent back by obstructions without breaking. The spring is taken from an old bicycle seat.

base rings are less likely to break than the type which has mounting holes in the ceramic.

Adwin Rusezek, WIMPO of Wallingford, Conn., mounts his half-wave 112-Mc. antenna on top of his car in a rather ingenious way. A Birnbach No. 4234J feed-through insulator was installed in the roof of the car, and the half-wave antenna is supported on the insulator through the spring from a bicycle seat (see Fig. 3). A flexible pigtail can be used to short-circuit the spring if desired. With an installation of this type, the antenna is less likely to be snapped off by hitting a low-hanging branch or other obstruction.

For the operator who doesn't wish to make his 112-Mc. antenna a permanent part of his automobile, the installation shown in the photograph

is suggested. It is held in place by running down a window of the car, setting in a panel of wood cut to the shape of the window and on which the antenna is mounted, and then running up the window until the panel is held firmly in place. The antenna itself is of the "J" type, with dimensions

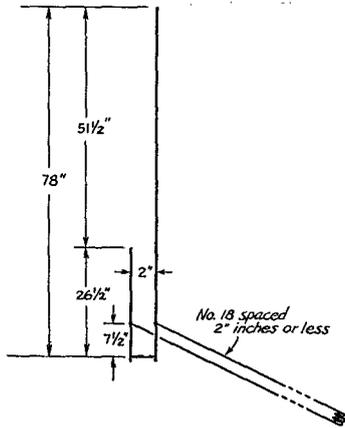


Fig. 4 — The dimensions of the window "J" antenna shown in the photograph.

as shown in Fig. 4. An antenna installed in this fashion follows the rules for the best placement of a car antenna because it places the radiator proper above the roof of the car, and it has the advantage that it can be readily removed from the car when not in use or when needed elsewhere.

The unit shown in the photograph is built up of $\frac{1}{4}$ -inch plywood, since the usual thickness of the window glass in cars is $\frac{1}{4}$ inch. The first job is to cut the major piece of plywood to the shape of the window glass, and this is most readily done from a cardboard pattern. Run down the window of the car about half way, or enough to leave at least a 6-inch opening, and make a pattern of cardboard using the top edge of the window glass for the guide. Trim the cardboard to this shape, and then push it up in the window and use the edge of the glass to mark the bottom edge of the pattern. From the pattern, mark the piece of plywood and

cut it with a scroll or band saw. The piece does not have to fit very closely except along the bottom edge, because if it is made too close to the exact size it will be impossible to get it in and out of place. Additional small pieces can be cut for each end to form stops in the corners, and they can be fastened to the main piece with glue and small nails. A piece of plywood about 6 by $8\frac{1}{2}$ inches should be fastened to the large piece at the point where the antenna is to be supported, using glue and small nails to secure it, and then the four stand-off insulators which support the antenna can be bolted to this piece. If the insulators are not long enough to allow the antenna to clear the side of the car by a sufficient amount (as happened in our case), they can be raised a bit by additional wood (1- by 2-inch strips) under them.

As described above, the major piece of wood has small blocks at each end and the antenna support in between, all mounted on the outside of the main piece. In addition, two small strips should be nailed along the inside so that they extend down below the edge a few inches and form, with the outside pieces, a yoke that keeps the assembly in the proper position on the window.

The feed line can be made of flexible rubber-covered wire, obtained by splitting a piece of lamp cord, separated by small plastic or dry wood spacers. The antenna ends of the line are soldered to the heads of the large bolts in the upper stand-off insulators, and the wire is run out through holes in the wood. If desired, a small piece of bakelite can be bolted on the plywood on the inside of the car and the feed line run through small holes. This will serve to keep the feed line away from the wood, but it is not a necessity unless the wood is likely to get soaking wet.

The antenna and matching-section rods are regular automobile antennas and they are supported on the stand-off insulators by small clamps made of copper or other metal. They will tighten up on the rods quite easily if square washers of heavy metal are cut to fit over them and press on a fraction of the curve portion of the clamp. The shorting bar is made along the same lines, with bars of heavy metal on either sides of the loops.

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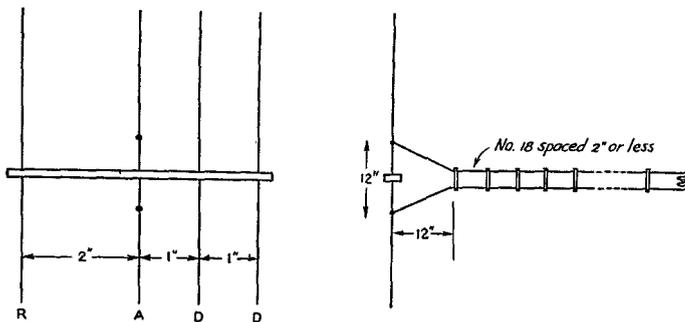


Fig. 5 — The dimensions of the 4-element "knockdown" beam used by W1QV and others. All of the elements are $\frac{1}{4}$ -inch copper tubing; for 112 Mc. the length of R is 51 inches, of A is 49 inches and of D is 47 inches. For operation around 116 Mc. these lengths should be decreased by 2 inches.

More Gear for Civilian Defense

Alternative Modulators and a Carry-all Operating Table

BY GEORGE GRAMMER,* WIDE

IN A previous article on 112-Mc. equipment for emergency defense communication,¹ a modulator of the Class-B type was recommended on the grounds that it gave maximum power output for least average plate current. High modulator plate efficiency is of course desirable, since with the available plate power limited to 300 volts at 100 ma. the smaller the d. c. power taken by the modulator the greater the proportion available for the modulated oscillator. However, suitable Class-B transformers are not too plentiful, and when they can't be obtained we must turn to other methods of modulation.

Of all the possible arrangements (of which there aren't too many) the simplest and also the cheapest is a 6L6 choke-coupled to the modulated oscillator. On theoretical grounds it is a pretty poor solution and one which wouldn't be given much consideration in normal times, first because the power output of a single 6L6 is not sufficient to give 100% modulation of a transmitter running with 15 to 18 watts input, and second because it is necessary to reduce the 6L6 plate current somewhat below the normal Class-A ratings to keep the total load on the power supply within the 100-ma. current rating. This increases distortion

Here are two simple modulators, using a minimum of parts, which fit into the 112-Mc. apparatus set-up outlined in December *QST*. There's also a suggestion for a transportable operating table on which the apparatus can be carried to any point which may need communication in a hurry.

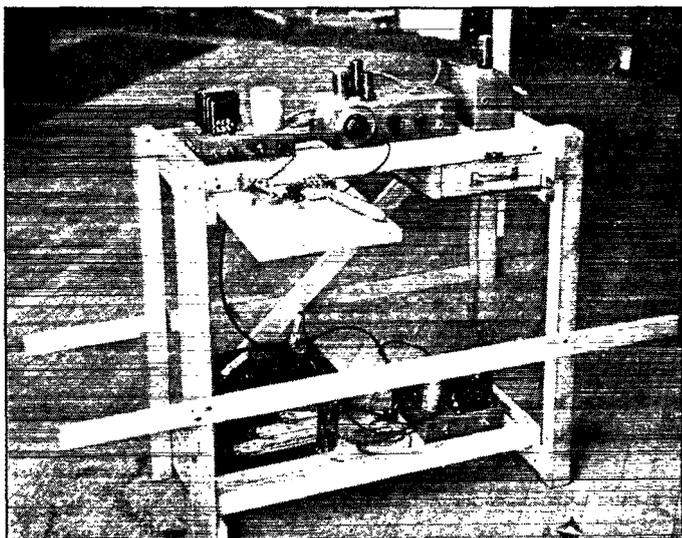
and very likely brings the optimum load resistance in a region which can't be matched by the plate circuit of the modulated oscillator. Nevertheless, we can tolerate defects now which we wouldn't normally accept — just so long as satisfactory communication can be secured.

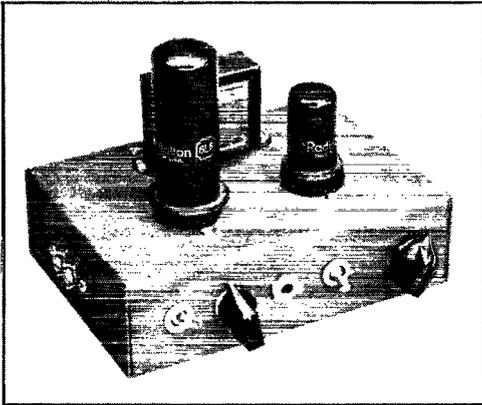
A modulator of this type will at least meet the requirement of providing satisfactory communication, even though the result may not be quite as pleasing to listen to as the Class-B job, especially at high modulation levels. Two slightly different arrangements are shown in the various photographs; the amplifier sections are practically identical in both, but the audio-oscillator circuits differ. The wiring diagrams are shown in Figs. 1 and 2. In both cases the speech amplifier stage is resistance-coupled to the 6L6 modulator, since resistance coupling eliminates an interstage trans-

* Technical Editor, *QST*.

¹ Grammer, "A 112-Mc. Emergency Transmitter," *QST*, December, 1941.

◆
An operating table on which an emergency station can be carried to points which cannot be reached by car or truck. The post in the rear right-hand corner is a folding antenna mast. A drawer is provided for carrying spare parts and tools, together with a board which pulls out for use as desk space in operating.
◆





A 6L6 choke-coupled modulator, using a minimum of transformers. Controls along the front are, left to right, send-receive switch, 'phone-c.w. switch, key jack, micro-

As in the previous unit, the volume control, R_1 , controls the feedback and hence the amplitude (and to a lesser extent the frequency) of oscillation. The tone also can be adjusted by means of the 6J5 cathode resistor, R_2 . Switching the cathode condenser, C_1 , out of circuit in the c.w. position is again a necessity for good keying.

Any filter choke capable of maintaining an inductance of 10 henrys or more with a direct current of 100 ma. through its winding will serve as a coupling choke for the modulator. The higher the inductance the better the low-frequency response, but since "quality" is not much of a consideration so long as completely understandable speech is transmitted it is unnecessary to make a special effort to obtain higher inductance than is found in the ordinary 100-ma. choke.

phone battery switch, gain control. Terminals for external microphone battery are on the left edge of the chassis. The microphone jack, not visible, is on the right edge of the chassis.

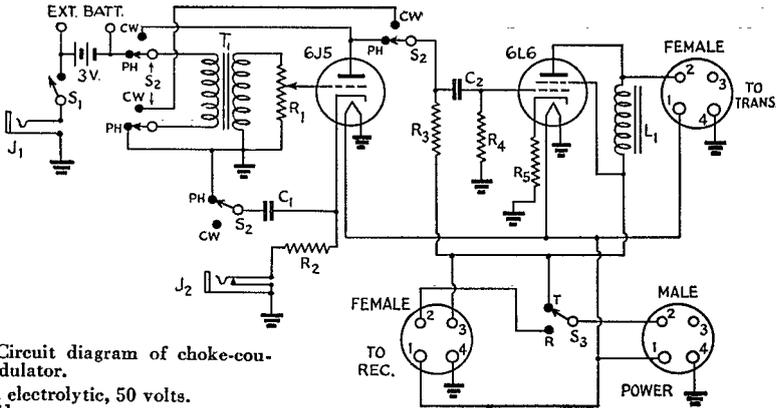


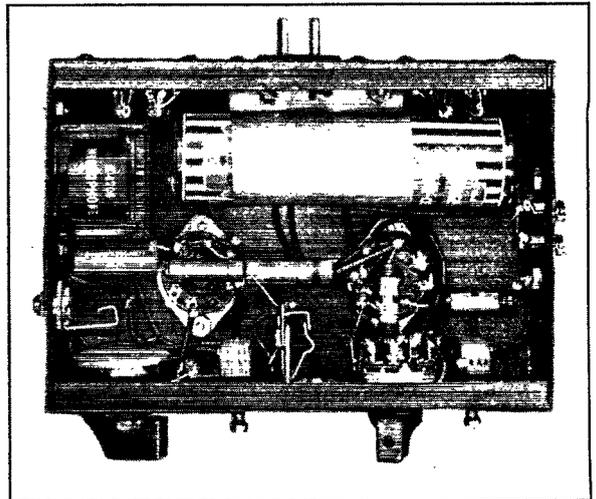
Fig. 1 — Circuit diagram of choke-coupled 6L6 modulator.

- C_1 — 10- μ d. electrolytic, 50 volts.
- C_2 — 0.01- μ d. paper.
- R_1 — 0.5-megohm volume control.
- R_2 — 1500 ohms, 1 watt.
- R_3 — 50,000 ohms, 1 watt.
- R_4 — 0.25 megohm, $\frac{1}{2}$ watt.
- R_5 — 500 ohms, 1 watt.
- L_1 — 10–15 henrys, 100 ma. (Stancor C-2303 or equivalent).
- J_1 — Open-circuit jack.
- J_2 — Closed-circuit jack.
- S_1 — S.p.s.t. toggle.
- S_2 — 4-pole double-throw rotary switch.
- S_3 — S.p.d.t. toggle.
- T_1 — Single-button microphone transformer (Stancor A-4706 or equivalent).

former and there is ample gain without the necessity for additional voltage step-up in a transformer.

Circuit Notes

The audio oscillator circuit in the unit whose diagram is given in Fig. 1 is practically identical with that used in the Class-B unit.¹ The four-pole double-throw switch, S_2 , makes the circuit changes necessary to shift the 6J5 from amplifier to oscillator service.



Underneath the 6J5-6L6 modulator unit. Parts may be placed where most convenient in wiring.

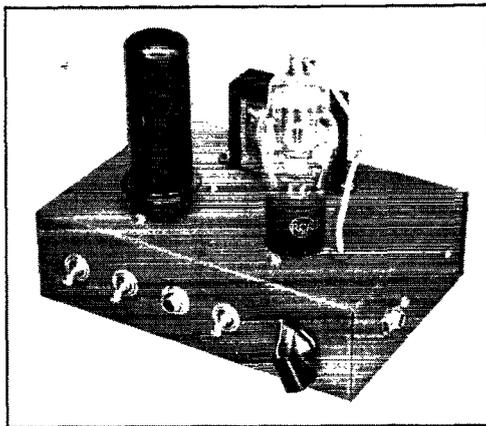
In experimenting with electrode voltages on the 6L6 in an effort to secure optimum operating conditions while keeping the total modulator plate current down to 40 or 45 milliamperes, it was found preferable to operate the screen at the full "B" voltage and to adjust the plate current by means of the cathode resistor, R_5 . Reducing the plate current by lowering the screen voltage markedly reduced the power output and increased distortion. The cathode resistor is un-bypassed to give some negative feedback, which helps reduce distortion and makes the value of load resistance less critical for optimum operation. The accompanying reduction in voltage gain is no disadvantage since the output of the 6J5 is more than enough to excite the 6L6.

The plate-voltage switching and the input and output socket and plug arrangement are identical with those in the amplifier already described.¹

An Alternative Oscillator Circuit

The circuit of Fig. 2 uses the same modulation system, but employs a double triode as the first tube so that the functions of speech amplification and audio oscillation can be separated. This gives greater independence between the tone frequency and the tone modulation level than is possible in the single-tube circuit, and also greatly simplifies the c.w.-'phone switching. One section of the 6C8G (this type is used because the triode sections have separate cathode connections) is a straight audio amplifier working out of the microphone transformer and resistance-coupled to the 6L6 modulator. The grid of the other triode section is permanently coupled to the secondary of the microphone transformer through C_2 and R_3 . Feedback is secured through C_3 , which is connected to the primary of T_1 , the other end of the primary being grounded. The plate of the oscillator section is parallel fed through the isolating resistor R_4 . The oscillator is keyed in the cathode circuit, the key being plugged into jack J_2 . As usual, it will be necessary to determine by trial which way the transformer primary terminals should be connected to give oscillation.

With this circuit no special switch is required to shift from 'phone to c.w., although the microphone battery switch, S_1 , should be opened when code is to be used. The key may be permanently plugged in J_2 and simply closed whenever tone is desired. However, an auxiliary switch S_2 is provided so that the tone can be switched on for any purpose when a key is not available. The modulation percentage is controlled by the volume control, R_1 . This control also affects the pitch of the tone to some extent since the input capacity of the triode section used as a speech amplifier is between the resistor arm and ground. The effect of this capacity on the oscillation frequency will vary with the setting of the control, but is considerably less than in the case of the oscillator circuit shown in Fig. 1. R_2 also affects the pitch, and



Another 6L6 modulator, using a double triode as speech amplifier and a.f. oscillator. Controls are the same as in the first unit.

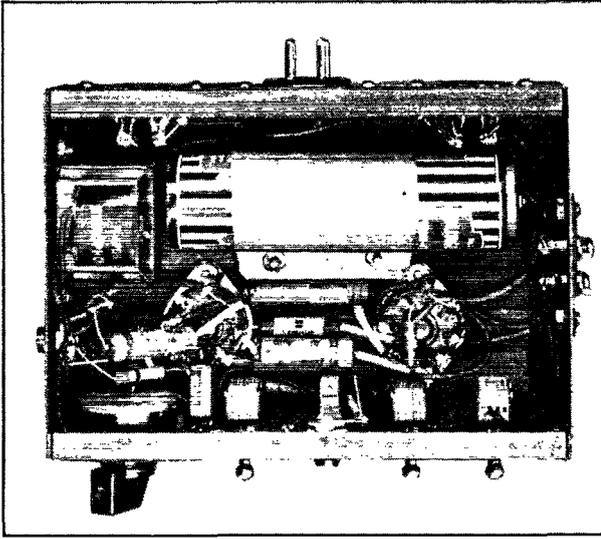
different values may be used to give a desirable tone for the setting of R_1 which gives a suitable modulation percentage.

The physical layout of the two units is shown in the various photographs. They are almost identical in parts arrangement. Controls and power supply outlets correspond in both units, and are arranged similarly to the controls on the Class-B modulator previously described.¹ The chassis also are the same size, 5 by 7 by 2 inches. There are no especially critical points involved in wiring, and practically any parts layout will be satisfactory. The two-cell microphone battery is held in place by a metal bracket fitting around the battery as shown, and fastened to the chassis by the machine screws which mount the modulation choke.

These two units will give satisfactory results on either voice or tone-modulated code, and can be built at just about minimum cost. Where better performance on voice is desired, and the transformers are available, the Class-B unit is to be preferred, as already stated. Considered purely from the standpoint of useful communication, all three units are about equally practicable. Incidentally, the double-triode speech amplifier-audio oscillator readily can be incorporated in a Class-B modulator unit in place of the circuit previously given, if desired.

Transportation

In actual use of a 112-Mc. station during an emergency it is quite likely that occasions will arise when it is necessary to transport the apparatus to points where it is impracticable for a car to go, and then set it up for operation. It is relatively easy to cope with this problem beforehand by providing a portable operating table such as the one shown in the photograph. Since such a table is inexpensive, it is no particular burden to build one so that the apparatus can be used on it



A below-chassis view of the 6C8G-6L6 modulator. Connections are soldered to the two cells of the microphone battery.

in its permanent location. Two men readily can carry the complete outfit, including storage battery, antenna, spare tubes and parts, wire and any other auxiliary apparatus that may be required. Such a table can be built in a variety of ways; the one illustrated incorporates a number of features which are desirable and are worth mentioning.

Since the table is to be portable, it should be no larger than necessary to accommodate the equipment without undue crowding. For the

equipment already described,^{1,2} a shelf space of 10 by 25 inches is about right, and the top and lower shelves in the table shown are 25-inch pieces of "1 by 10" white pine, which actually is about 9½ by ⅞ inches. Both shelves are rimmed by 1 by 2 strips to provide a barrier to prevent the equipment from sliding off when the table is carried. The top is intended to hold the oscillator, modulator and receiver, while the storage battery and power supply go on the lower shelf. The lower shelf is only a few inches off the floor so that the center of gravity will be low when the battery is in place, thus stabilizing the table. The upper shelf is at about normal table height (30 inches) for convenient operating. The four side posts or legs are 2 by 2 stock, each piece being 30 inches long.

Two pieces of 1 by 2, screwed to the legs about 12 inches from the bottom and projecting about 9 inches

outside the legs, serve as handles for carrying and also provide some bracing for the table. These handles should be fairly low so that the battery shelf will be above knee height when the table is carried.

A small drawer is included to give storage space for spare tubes, microphone, small tools, flashlight and other odds and ends that are likely

(Continued on page 80)

² Goodman, "Receivers for 112-Mc. Emergency Work," *QST*, January, 1942.

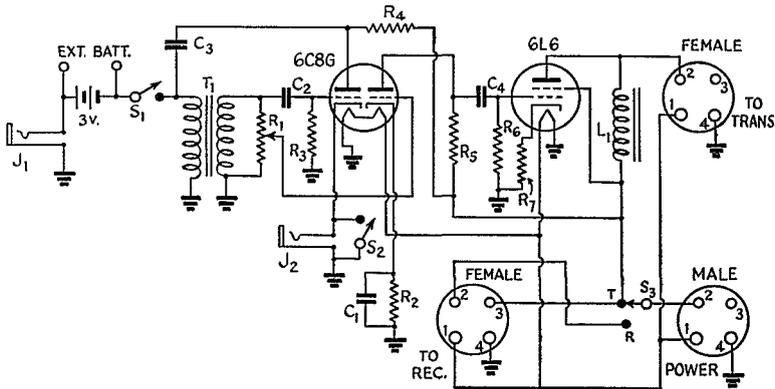


Fig. 2 — Choke-coupled 6L6 modulator using double-triode speech amplifier-audio oscillator.

- C₁ — 10- μ fd. electrolytic, 50 volts.
- C₂ — 0.002- μ fd. mica.
- C₃, C₄ — 0.01- μ fd. paper.
- R₁ — 0.5-megohm volume control.
- R₂ — 1500 ohms, 1 watt.
- R₃ — 0.5 megohm, ½ watt.
- R₄ — 0.1 megohm, 1 watt.
- R₅ — 50,000 ohms, 1 watt.

- R₆ — 0.25 megohm, ½ watt.
- R₇ — 600 ohms, 1 watt.
- L₁ — 10-15 henrys, 100 ma. (Stancor C-2303 or equivalent).
- J₁, J₂ — Open-circuit jack.
- S₁, S₂ — S.p.s.t. toggle.
- S₃ — S.p.d.t. toggle.
- T₁ — Single-button microphone transformer (Stancor A-4706 or equivalent).

Defense Network Control Station

112-Mc. Equipment in New Rochelle Net

BY WALTER STILES,* W2MBS

This article describes the operating setup and the transmitter used at the net control station of the Amateur Radio Division of the New Rochelle Defense Council, under the chairmanship of George Campbell, W2BBI, who, with Paul Cunningham, W2ADM, vice-chairman, collaborated with the author in the preparation of this article. The author is chief engineer of the group.

THE plan of operation of the Amateur Radio Division of the New Rochelle Defense Council is as follows: The master control station, a crystal controlled transmitter, is located in the "nerve-center" of the Defense Council and operates on a frequency of 116,000 kilocycles. The carrier is left on at all times, during actual emergency operation, and every two minutes a pulser applies 5 seconds of 400-cycle tone at 100% modulation.¹ The receiving equipment consists of a stand-by receiver, tuned to 115,950 kc., and a transceiver. All equipment is to be left running constantly throughout the emergency so that active operation can be undertaken immediately.

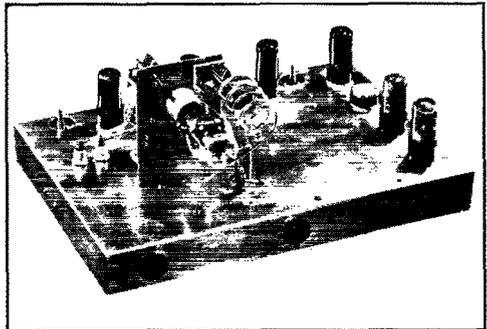
The field organization consists of 12 identical transceivers which are designed to have a transmitting frequency 50 kilocycles lower than their receiving frequency for a given setting of the tuning control.

The operating procedure is for the "field" station first to tune in the crystal-controlled master control station, listen for the 400-cycle pulse to make sure of the transceiver's calibration, and then to switch to the transmitting position and report into the net. Inasmuch as the master control station always has a receiver tuned to the transmitting frequency of the field stations the latter are sure of contact so long as their signals are receivable.

Intercommunication between field stations must be authorized by the master control station, and both field stations involved must report both out of and into the net. For example, should field station No. 1 desire to communicate directly with

field station No. 7 he would first call master control, state his request, and wait for authority. Master control would then call station No. 7 and inform him of the fact that station No. 1 desired to talk to him and then, after receiving an acknowledgment from station No. 7, would assign a frequency near the other end of the 112-mega-cycle band for the communication. Inasmuch as both stations have the exact frequency of the master control station as a calibration point for their transceivers, no trouble should be experienced in finding any assigned frequency. This method of shifting intercommunication between field stations from the immediate vicinity of the control station eliminates interference with normal net operations.

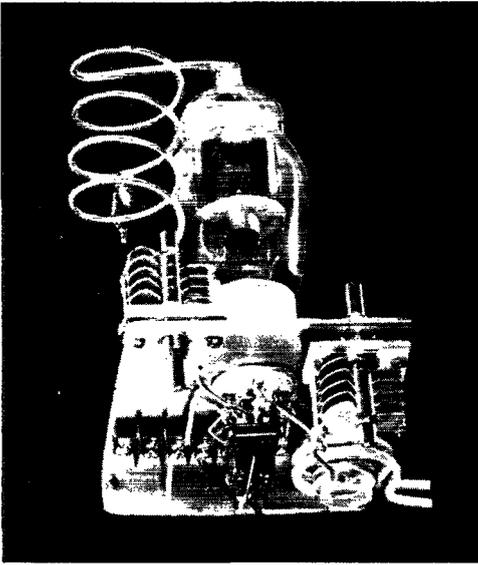
An automatic air-raid alarm system has been installed at the master control station which is actuated by the 30 seconds of 1000-cycle tone used by key broadcasting stations as a "close-down" signal. It consists of a tuned circuit on 880 kilocycles (WABC), a control tube (117L7), sharp cut-off 1000-cycle filter, and a plate relay. The contacts of the plate relay are used to operate a bell alarm. During normal periods of broadcast operation the plate relay seldom chatters but when given a sustained 1000-cycle tone, such as now used for air-raid warning, it closes to operate the bell alarm. The whole unit is a.c./d.c. operated because it will operate *before* we have an actual raid and consequently normal power facilities will be operating. However, as a second-



A view of the control station transmitter from the rear. The four 50L6 tubes are in line along the front edge of the chassis (rear edge in this photo). The two 50Y6 rectifiers are in line with the crystal. The sockets along the rear edge of the chassis are for supply voltage for the 807,[†] metering for the 50L6's, and voltages for the 50L6 and 50Y6 tubes.

* 59 Kingsbury Road, New Rochelle, N. Y.

¹ FCC regulations, which must be observed by amateurs operating in authorized defense communications networks, require that the station identify itself at intervals of not more than 10 minutes. Transmission of an unmodulated carrier is not permitted below 112 Mc. See Secs. 12.83 and 12.034 of the Amateur Regulations. — *Editor.*



Close-up view of the 807 stage. The plate tuning condenser should be insulated from the supporting panel and its rotor connected directly to the cathode prong on the tube socket; this lead is readily visible in the photograph. The coil is adjusted to use 7 μ fd. of tuning capacity to equal the plate-cathode capacity of the tube and thus provide a balanced tank circuit.

ary precaution an a.c./d.c. battery broadcast receiver is also available at all times. The latter will undoubtedly prove very helpful as an "all clear" indicator.

A crystal-controlled transmitter being an absolute necessity for the most satisfactory operation of our network our first step in the design of our equipment was to investigate all possible sources of emergency power sufficient for normal operation. Lt. Comm. A. H. Tenney, U.S.N.R., owner of the 75-foot cruiser *Showboat*, in charge of the Marine Division of our Radio Council, provided us with his boat including a 10-kilowatt 110-volt d.c. generator and a 350-watt d.c./a.c. converter. In addition, all 110-volt d.c. generator equipment available is being made ready as an additional source of secondary emergency power.

The original transmitter design consisted of five 50L6 tubes, starting with a 40-meter crystal and ending up with something over 1½ watts on 116,000 kilocycles. This rig was 100% modulated by push-pull 50L6 modulators and for a.c. operation had three separate power supplies each using 50Y6 rectifiers. However, since the 350 watts of a.c. was available from the converter it was decided that a higher-powered transmitter would still better serve our purpose. It should be noted in passing that for a strictly 110-volt d.c. power source the above-mentioned arrangement makes an excellent transmitter. Its operation, with only 1½ watts of output, seems superior to conventional 20- and 30-watt modulated oscillators using lines.

The present transmitter consists, as shown in Fig. 1, of a 50L6 40-meter crystal oscillator with successive doublers to 5 meters. The output of the 5-meter doubler is link-coupled to the 807 final, which is used as a doubler to 116,000 kc. Two

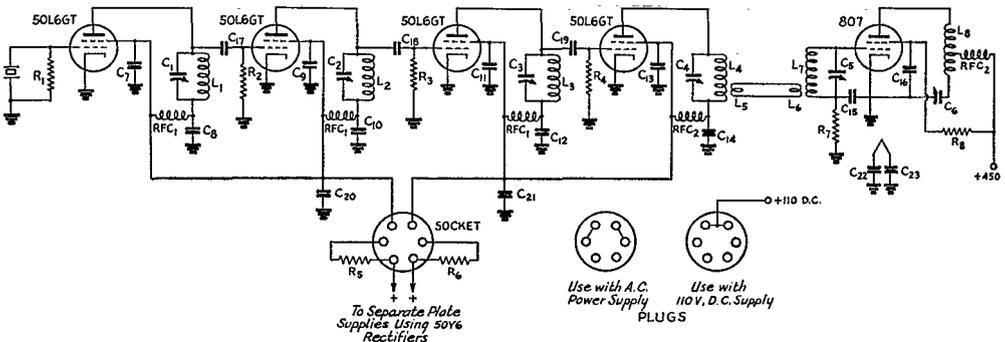
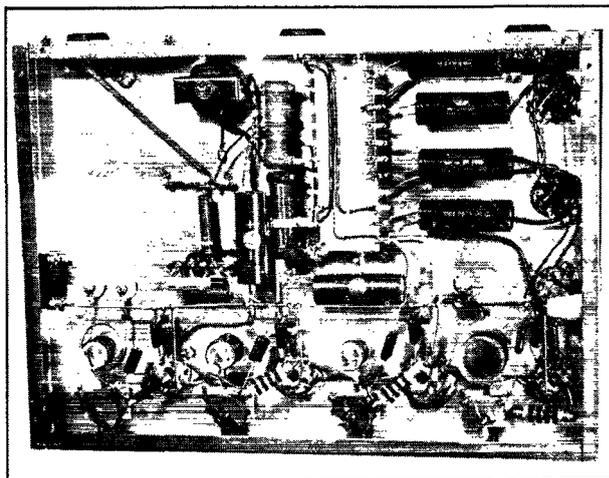


Fig. 1 — Circuit diagram of the control station transmitter.

- C₁ — 100- μ fd. variable.
- C₂ — 50- μ fd. variable.
- C₃ — 35- μ fd. variable.
- C₄ — 15- μ fd. variable, double-spaced.
- C₅, C₆ — 15- μ fd. variable (Cardwell ZT-15-AS).
- C₇-C₁₆, incl. — 0.001- μ fd. mica.
- C₁₇, C₁₈, C₁₉ — 150- μ fd. mica.
- C₂₀, C₂₁ — 16- μ fd. electrolytic, 450 volts.
- C₂₂, C₂₃ — 0.001- μ fd. mica.
- R₁, R₂, R₃, R₄ — 0.1 megohm, 1 watt.
- R₅ — 1000 ohms, 50 watts.
- R₆ — 300 ohms, 50 watts.
- R₇ — 40,000 ohms, 2 watts.
- R₈ — 50,000 ohms, 2 watts.

- L₁ — 25 turns No. 22 d.s.c. 1 inch long, 1-inch diameter.
- L₂ — 12 turns No. 22 d.s.c. 1 inch long, ¾-inch diameter.
- L_a — 6 turns No. 14 enamel, 1 inch long, ¼-inch diameter.
- L₄ — 5 turns No. 14 enamel, 1 inch long, ¼-inch diameter.
- L₅, L₆ — 2 turns No. 14, diameter 1½ inch.
- L₇ — 5 turns No. 14 enamel, 1 inch long, ¼-inch diameter.
- L₈ — 4 turns No. 14 enamel, 4 inches long, diameter 1½ inch.
- RFC₁ — 2.5-mh. r.f. choke.
- RFC₂ — U.h.f. choke (Ohmite Z-1).

Underneath the chassis. All grounds for the low-power stages are made to the bus shown. The bus is insulated at one end and grounded to the chassis through a 0.01- μ fd. condenser at the other. After the unit is in operation a screwdriver should be run along the bus, shorting it to the chassis, until a spot is found where the output of the 5-meter doubler is improved by cathode regeneration. A 0.002- μ fd. condenser should be soldered from bus to chassis at this point.



separate power supplies with 50Y6 rectifiers furnish plate power to all 50L6 stages. The plate voltage, after filtering, is approximately 200 volts on the 10- and 5-meter doublers and the power output is over 3 watts. This is far more drive than actually is required for the 807 final doubler stage.

The 807 output tank is tuned in the conventional manner although some schools of thought prefer to call it series tuning. Fig. 2 shows why it is, in reality, conventional parallel tuning. The stage handles much as though it were operating on 160 meters except for the dip in plate current, this dip being from 85 ma. off resonance to 60 ma. at resonance.

No difficulty was experienced with any stage of the equipment. If trouble is encountered in securing the proper plate current dip a little experimenting can be done with the 807 screen circuit. The screen by-pass condenser and the length of the lead running from the screen to the 50,000-ohm dropping resistor greatly affect the amount of dip realized.

A small coil and condenser, tuned to three times the excitation frequency to remove 3rd harmonic voltage, was tried in the grid circuit

and its use gave approximately 6 ma. additional plate-current dip. However, the circuit tuned so sharply that it was considered the small gain in power output was not worth the additional tuned circuit.

The audio and power supply equipment are conventional with 6L6 modulators, 5Z3 rectifier in the single power supply, and a 6L5 combined speech amplifier/audio oscillator as described in December *QST*.²

A panel is provided (it was removed for the photos), and the 807 grid and plate tuning controls are the only controls brought out to dials. The whole transmitter, r.f. unit, audio and power supply, is assembled in a two-panel enclosed relay rack. During periods of normal operation the filaments of the 50L6's are left running 24 hours a day to provide a semblance of crystal temperature control. It has been found that the inside cabinet temperature rises approximately 10 degrees above ambient during a period of 12 hours and is not especially sensitive to ambient variations of less than 10 degrees. The addition of plate voltage to all stages does not affect the inside cabinet temperature more than an additional degree or two.

For d.c. operation the 50L6 filaments are heated from d.c. and the 110 d.c. is sufficient plate voltage for the 50L6 stages, through the appropriate plug, to drive the 807 to full output. The filter resistors and input filter condensers are, of course, omitted for this type of operation. The 807 doubler, 6L6 modulators, and the power equipment for these stages are operated from the 350 watt d.c./a.c. converter.

Since the tubes used are commonly available only in limited numbers we have provided 400% spares of all types. Also available as spare equipment is a complete set of used, but serviceable, audio, power and r.f. components.

² Grammer, "A 112-Mc. Emergency Transmitter," *QST*, December, 1941.

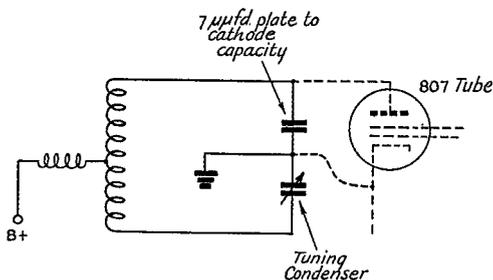


Fig. 2 — Using the 807 plate capacity as part of the tuned circuit, this drawing shows that the circuit actually is equivalent to an ordinary balanced tank, when the tuning capacity matches that of the tube.

★ WHAT THE LEAGUE IS DOING ★

ELECTION RESULTS

One new face appears on the ARRL Board of Directors as the result of the autumn elections, as Tom E. Davis, W9VVA, becomes the director from the Dakota Division. Mr. Davis won by 155 votes to 109 over his only competitor, Adolphus A. Emerson, W9ITQ, who has been acting director since the removal from the division of Director Fred W. Young.

The new alternate director is Donald M. Beaudine, W9RPJ, who was victor over Leonard W. Still, W9BMX, by 148 votes to 115.

Mr. Davis, an attorney in general practice, is president of the Min-Dak Radio Club, has ARRL appointments as PAM, OPS, OBS and AEC; and was control station for the 4-MC 'phone section of the Minnesota State Net. Mr. Beaudine, a printer, is our SCM for North Dakota, for the past two years was an assistant director of his division, and is the vice-president of the Min-Dak Radio Club as well as of the Red River Radio Amateurs.

The election in the Atlantic Division resulted in the return of Lieutenant Walter Bradley Martin, USNR, W3QV, as director, and Herbert M. Walleze, W8BQ, as alternate, for additional terms of two years. The balloting for director showed:

Mr. Martin	470 votes
Roy C. Corderman, W3ZD	293 "
Edward G. Raser, W3ZI	170 "
Frank E. Lyon, W3HAL	127 "

while the score for alternate was:

Mr. Walleze	569 votes
Charles G. Landis, W3UA	483 "

NOTE TO REACTIVATED STATIONS

STATIONS reactivated for defense communications should take note that the frequencies 3800-3900 are not available to them, the temporary loan of these frequencies to the War Department having taken effect on December 20th as originally ordered. If any stations are reactivated in the territories and possessions, they should note that the contemplated order opening A-3 in 7250-7300 kc. was *not* issued.

As to whether another order formally transferring the rest of 3650-3950 kc. to military uses will be issued, we just don't know.

WAIVER OF PROOF OF USE

FCC Order 77 waived until January 1st the proof of use of licenses usually required as a condition to their renewal. On December 3rd, FCC adopted its Order 77-A, extending this waiver until further notice, or until January 1, 1943. The questions relating to activity may be left blank when applying for renewal.

LICENSING AND EXAMINING

Yes, renewals and modifications of amateur operator and station licenses are being issued promptly, in precisely the normal fashion. Even if you've not yet been reactivated, you cannot tell when you may be desperately needed. **DO NOT LET YOUR LICENSE LAPSE!** If you change address, ask for modification promptly, the same as you would do if you were actively on the air. As the end of your license term approaches, get your application form from the inspector and file for renewal. Because renewals are thus available, ARRL continues to require licenses for the renewing of voting membership and the holding of certain offices. Maintain your status as a fully-licensed amateur!

Amateur examinations are still being given. While some delay may be expected in the actual issuance of new station licenses not specifically requested for a defense purpose, they will come along in due course. FCC announces amateur examinations during 1942 under the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained as the date approaches from the inspector in charge of the district. No examinations are given on national or state holidays. All examinations begin promptly at 9 A.M. local time, except New Orleans and Honolulu at 8:30 A.M.

Boston, 7th floor Customhouse: Daily except Thursday.
 New York City, 748 Federal Bldg., 641 Washington St.:
 Tuesdays, Thursdays, Saturdays.
 Schenectady, N. Y.: Some time in March, June, September and December.
 Philadelphia, 1200 Customhouse: Class A, daily; Class B, Wednesdays and Saturdays.
 Baltimore, Fort McHenry: Wednesdays and Saturdays.
 Norfolk, Va., 402 New P. O. Bldg.: Class A, daily; Class B, Fridays and Saturdays.
 Winston-Salem, N. C.: February 7th, May 2nd, Aug. 1st, Nov. 7th.
 Atlanta, 411 Federal Annex: Tuesdays, Fridays and Saturdays.
 Nashville: Feb. 20th, May 15th, August 21st, November 20th.

ARE YOU LICENSED?

When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

Miami, 314 Federal Bldg. (P. O. Box 150): Tuesdays and Saturdays.
 Jacksonville, Fla.: May 16th, November 21st.
 New Orleans, 308 Customhouse: Mondays; other days by appointment.
 Little Rock: April 14th, September 15th.
 Galveston, 404 Federal Bldg.: Wednesdays, Fridays and Saturdays.
 Dallas, 500 U. S. Terminal Annex Bldg. (P. O. Box 5373): Tuesdays and Saturdays.
 Oklahoma City: January 24th, April 25th, July 25th, October 24th.
 San Antonio: February 21st, May 23rd, August 22nd, November 21st.
 Albuquerque: March 21st, September 16th.
 Los Angeles, 539 U.S.P.O. & Courthouse Bldg.: Wednesdays and Saturdays.
 Phoenix, Ariz.: Two days in April, two days in October.
 San Francisco, 328 Customhouse: Class A, daily; Class B, Mondays and Saturdays.
 Portland, Oregon, 805 Terminal Sales Bldg.: Fridays and Saturdays.
 Boise, Idaho: Some time in April and in October.
 Seattle, 808 Federal Office Bldg.: Fridays.
 Billings, Mont.: Some time in May and in November.
 Butte, Mont.: Some time in May and in November.
 Spokane: Some time in May and November.
 Denver, 504 Customhouse: First and second Saturdays of each month.
 Salt Lake City: Some time in March and September.
 St. Paul, 208 Uptown P. O. and Federal Courts Bldg.: First and third Saturdays of each month.
 Bismark, N. D.: No announced dates; consult Inspector-in-Charge at St. Paul.
 Kansas City, 809 U. S. Courthouse: Saturdays; other days by appointment.

Des Moines: January 10th, April 11th, July 11th, October 10th.
 St. Louis: February 14th, May 9th, August 15th, November 14th.
 Chicago, 246 U. S. Courthouse: Saturdays.
 Detroit, 1025 New Federal Bldg.: Saturdays; other days by appointment.
 Cincinnati: Some time in February, May, August and November.
 Columbus, Ohio: Some time in March, June, September and December.
 Buffalo, 518 Federal Bldg.: First and third Saturdays of each month.
 Pittsburgh: Some time in January, April, July and October.
 Honolulu, Aloha Tower: Mondays and Saturdays.
 Other Hawaiian points: Hilo, Jan. 24th, Aug. 17th; Lihue, Feb. 13th, August 26th; Kaunakakai, Aug. 3rd; Lanai City, Aug. 4th; Wailuku, Aug. 5th. Verify from Inspector at Honolulu.
 San Juan, Puerto Rico, 322 Federal Bldg. (P. O. Box 2987): By appointment.
 Juneau, Alaska, 7 Shattuck Bldg. (P. O. Box 1421): By appointment.
 Washington, F.C.C. Headquarters: Thursdays; other days by appointment.
 Savannah, 208 P. O. Bldg. (P. O. Box 77): By appointment.
 Tampa, 203 P. O. Bldg.: By appointment.
 Beaumont, Texas, 329 P. O. Bldg. (P. O. Box 1527): First and third Thursdays of each month; other days by appointment.
 San Diego, 301 Customhouse & Courthouse Bldg.: By appointment.
 Cleveland, 541 Old P. O. Bldg.: First and third Saturdays of each month.

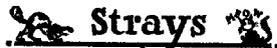


25 YEARS AGO THIS MONTH

THE February, 1917, issue announces the creation of the ARRL Department of Defense, under Edgar Felix. He says, "We have at least learned two things during the past three years. First, war *can* come in our day and age; second, it can come most unexpectedly. It is our duty to prepare in every line." Troops are at the Mexican border and Sergeant George T. Droste of the New York National Guard reports amateur work heard at the Mexican border. By order of the War Department, amateur licenses are temporarily not being issued or renewed south of Austin, Texas.

Traffic soars and big hops are being covered, but the first attempt at a transcontinental relay on January 4th was completely spoiled by QRN so heavy that nobody could hear anything. It was a freak night, however, and the editor says that if we keep up this progress there is no telling where we will go. Our apparatus is already much better than the commercials. He wonders if a general communicating system will develop whereby the private citizen will be able to communicate with other private citizens at long distances without it costing anything. He even wonders if some day we won't be able to talk to foreign amateurs.

In this issue appears the first instalment of a famous *QST* classic, "Amateur Number One," by Irving Vermilya, old VN, believed to be America's first amateur. (At that time manager of WCC, VN is still an active ham, W1ZE, at Mattapoisett, Mass.) The lead article is Harry Sadenwater's Radio Club of America paper on "Electro-Statically Coupled Receivers." H. E. Rawson describes the construction and erection of the two fir towers at his Idaho relay station, 165 and 205 feet high, the side members being of 4 x 4s. Dr. Radio completes his overhaul of transmitters by treating the components of the closed circuit, while an unsigned article on a new type of high-speed rotary gap shows the design for the first "Old Betsy" at TOM's station — and we think the authors are the same. Now if we can only find some solution for this QRM business!



Strays

OUR COVER

THIS shot was taken out in the fields just to prove that Little Joe can be transported. Front husky is W1QV (visiting Hq. for the day) with W1JEQ bringing up the rear.

George W. Bailey, W1KH, president of ARRL, has been appointed assistant to the chief of communications for the District of Columbia and metropolitan area, under OCD's Metropolitan Area Civilian Defense organization.

A Visit to America's Farthest North Ham

BY STANTON BENNETT,* K7BUB

FIVE HUNDRED AND FIFTY miles north of Fairbanks, just a crow's hop from the North Pole, lies the village of Barrow, Uncle Sam's most northern inhabited outpost and the QTH of amateur station K7ARG. Located on the very tip of Point Barrow, jutting out into the frozen Arctic Ocean and surrounded by miles of bleak, frozen tundra, Barrow is one of the most isolated spots in North America. Mail reaches this northland outpost twice a year by dog team, a long, cold and dangerous 400-mile trek from the village of Kotzebue. One supply ship a year wends its way in late summer through the Arctic ice pack to bring fresh supplies to the villagers.

It is Barrow, the heretofore insignificant dot on the map of Alaska regarded mostly as a last base for Arctic explorers, that is now a key point in Uncle Sam's new Weather Bureau program for the U. S. Army Air Corps—and hereby hangs this tale.

When a shortage of weather observation balloons developed at this top-of-the-world weather station, making it impossible to send up the u.h.f. transmitters that automatically radio back to earth the condition of the stratosphere, a plane loaded with the needed supplies was ordered from Fairbanks. Ace Alaskan pilot Harold Gillam, a veteran of Alaskan airways and one of the searchers for the Moscow-San Francisco Levenifsky plane lost in 1937, contracted to make the trip. It happened that Gillam was looking for a passenger to lend a hand in loading freight and refueling in sub-zero temperatures, and I was looking for a ride to Barrow.

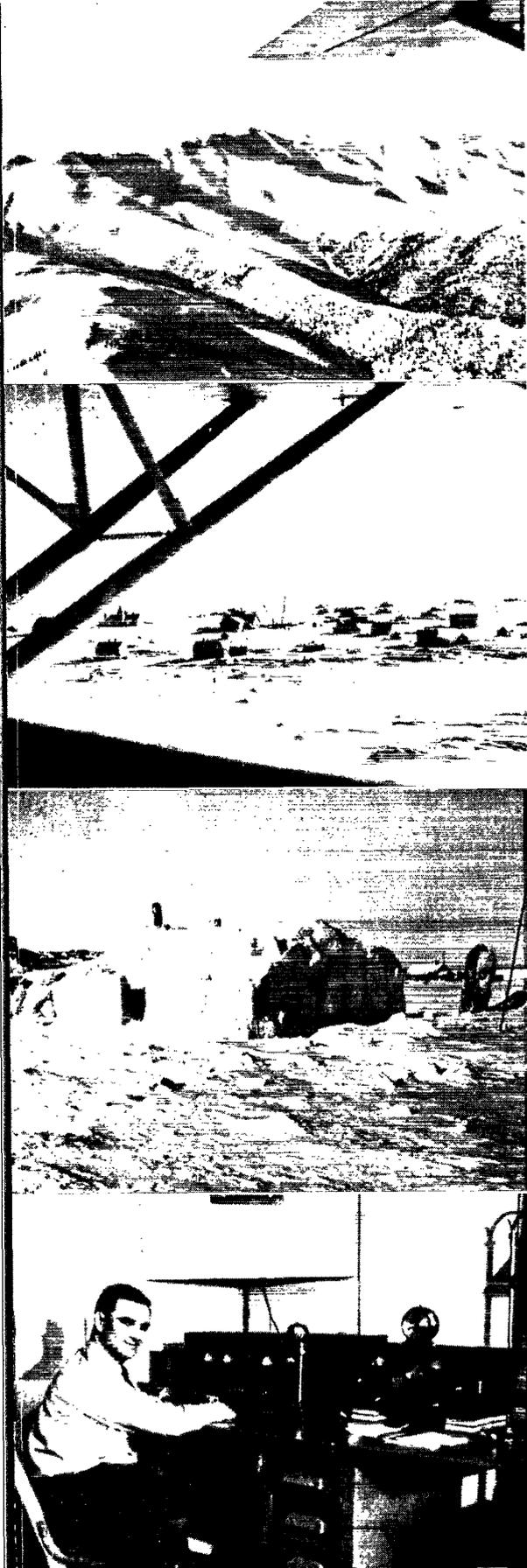
We took off on a cool morning in mid-March, the temperature a bit below zero as we taxied down the snow-covered Fairbanks Airport. The ten-passenger *Pilgrim* was loaded to the tail with weather-station supplies, fresh vegetables, lettuce, apples, oranges, a case of eggs and a sack of onions for the residents of Barrow who had not tasted fresh fruit or vegetables in many months.

Three hours later we were at the little river village of Bettles. The eighteen Indians and three whites living there met us when our plane landed

(Continued on page 60)

* Chief Engineer, KFAR, c/o Midnight Sun Broadcasting Co., Fairbanks, Alaska.

Top, left—“Although flying at 11,000 feet, the higher peaks often rose above the wing tips on each side as we nosed our way through river valleys and mountain passes.” Second from top—Barrow, Alaska, Uncle Sam's last outpost on the Arctic coast. Third from top—An Eskimo villager's home. The framework is of sod and skins, with an exterior coating of snow. Bottom—America's most northern ham station: K7ARG, Barrow, Alaska.



Amateur Radio at the Top of the World

Tales of Ham Deeds In the Far North

BY AUGUST HIEBERT,* K7CBF

Amid the woes of war it is refreshing to find a breath of orthodox hamdom to present on these pages. Orthodox, that is, in the absence of the clanging cymbals and beating drums of military deeds — but an unorthodox kind of ham radio just the same. You will enjoy the accounts of amateur activity up around the Arctic Circle on this and the adjoining page.

AT THE top of the world the Arctic Amateur Radio Club is celebrating a year of "firsts." The farthest north amateur club in the world observed its first anniversary on September 1st. On that date an XYL, Mrs. Mary Bramhall, K7IGG, the first woman to join the club, was elected president. And for the first time in the history of Fairbanks the AARC sponsored a radio and physics exhibit at the annual Tanana Valley Fair.

High point of the year's activities was the Fair. Club members set up fixed-portable K7CBF among exhibits of huge Alaska-grown cabbages, carrots and potatoes. The attention they claimed surpassed that shown to the customary displays of fur pelts, preserves, flowers, paints and handiwork most commonly identified with the Fair.

Scores of people gathered around the AARC booth to look at typical amateur equipment, to view an oscilloscope and photoelectric cell experiments, to try gravity-defying negative magnetism and to accept the invitation printed in large letters on the wall: "Personal Messages Sent Free to All Points in the United States."

Traffic was transmitted on 3.5 Mc. to K7BUB and K7GIN, who in turn relayed it on 7 Mc. via W7EBQ, W6RMM and through K7DIS of the

* Asst. Engineer, KFAR, c/o Midnight Sun Broadcasting Co., Fairbanks, Alaska.

Left — Mrs. Mary Bramhall, K7IGG, president of the Arctic Amateur Radio Club. Center — Stan Bennett, K7BUB, operating fixed-portable K7CBF at Tanana Valley Fair. Right — The Arctic Amateur Radio Club exhibit at the Tanana Valley Fair. Frank White, K7HAR, in charge of physics demonstrations, standing; Bill Pope, K7IUI, operating K7CBF, seated.

Alaskan AARS. The novelty of being able to send messages free to any city in the States was new to most residents, and the opportunity was snapped up by dozens of enthusiastic Fairbanksans. A total of 268 messages was handled during the three nights of the Fair.

Vital Roles Played By Radio

Of course it is never difficult to arouse public interest in amateur radio in Alaska. Because communication is so vital to existence in the Territory, Alaska no doubt has more amateur stations per capita than any other part of the world. Fairbanks and vicinity, with a population of 5658, has at least 45 licensed amateurs, most of whom have equipment in operation.

In more remote communities, hundreds of miles from food supplies, medical care or hospitalization facilities, amateur contact has many times been the only link through which necessary aid could be requested.

Numerous lives have been saved directly by amateur contacts — contacts which have meant the immediate departure of a plane with serum for some stricken community, or a doctor to perform an emergency operation on a desperately ailing prospector, or food to relieve a remote village whose supplies have been diminished by some unexpected circumstance.

Amateur radio has also been a boon to aviation.



A source of constant danger in Alaska has always been the uncertainty of weather conditions hundreds of miles from the flying bases that dot the vast interior. Hundreds of flights have been made with knowledge of nothing but local weather. Chances were taken, and either the pilots played a good hunch or they had no alternative but to turn back, time wasted, gasoline expended and their flights uncompleted. Where no other communications facilities exist, amateurs have relayed countless weather reports which proved invaluable to scores of pilots in the air-minded Territory.

Human Interest in Radio Anecdotes

All of these services have helped Alaskan amateur radio activities become part of the romance of Uncle Sam's last frontier. An account of each known outstanding deed performed by Interior Alaskan amateurs would fill a large portion of *QST*. A few typical stories, however, all rich in human interest, will serve to illustrate the scope of the emergency service Arctic hams have performed.

Lou Joy, K7FCH, likes to tell of an emergency contact with Tom Devane, K7FRD, at Ruby, a village 240 miles west of Fairbanks. Two partners were gathering driftwood on the outskirts of the village. One, angered by the fact that his efforts were far less successful than his companion's, started a quarrel. Hot words failed to satisfy him, and he seized a stout piece of wood and attacked his innocent mate. Tom Devane signalled news of the unfortunate incident to Fairbanks, where Lou Joy arranged for the chartering of a plane to

get the battered and unconscious man and return him to the Fairbanks hospital. In the Far North no motion is wasted, however, and the aviator was also told that Ruby could use a load of beer. The trip was made; the Fairbanks hospital received one unconscious miner, and Ruby received several cases of beer.

When an Alaskan combines ham radio as a hobby and flying as a vocation, interesting things can happen. Herman Lerdahl, K7HQZ, was flying for a Fairbanks air transportation company. On one occasion he was to have made a scheduled mail trip to Fort Yukon, 140 miles north, when a weather report indicated the conditions in that vicinity were "ceiling zero."

His flight cancelled, Herm went home with pleasant visions of 10-meter DX pouring from his loudspeaker as he tuned across the band. Instead, what he heard was a Montana ham contacting Ray Randall, K7EVM, at Fort Yukon. Ray and Herm couldn't hear each other on 10, but the Montana ham heard Herm when he broke in on the contact. It was learned from Montana that the Fort Yukon weather report had been in error; the true report was "ceiling and visibility unlimited," and Fort Yukoners were eagerly awaiting their mail. So Herm trudged back to his plane, still with visions of 10-meter DX pouring from the loudspeaker at home.

Combine Science With Domesticity

Dr. E. H. Bramhall, K7FJJ, found on one scientific trip that he could combine the necessity

(Continued on page 64)



The Arctic Amateur Radio Club

Back row, l. to r. — Ed Moore, K7FYI; Jacob Stampalia, W7EBZ; Harry Hart, Ray Rosasco, W6OAV; Ed Long, K7ENC; Frank White, K7HAR (vice-president); Joe Dunn and Pierre St. Amend, K7HMS.

Second row, l. to r. — Jerry Nerland, Ben Stewart, K7AZV, Allen King, K7FUO; Stan Brown, K7IGA; Mrs. Mary Bramhall, K7IGG (president); Dr. E. H. Bramhall, K7EJJ; Irving Reed, K7IEX; Stan Bennett, K7BUB; Augie Hiebert, K7CBF.

Front row, l. to r. — Herman Lerdahl, K7HQZ; Ed Kraiger, K7FDW; Harvey Carnett, Earl Grandison, Wilson Walton, K7BPD; George Saunders, K7FHD; Al Vaughn, K7GIN (secretary-treasurer).

Members not in picture: Clyde Cobb, K7EMS; Lou Joy, K7FCH; Wm. Buckmaster, K7HJR; Rodney Ohlson, K7HZT; John Cooley, K7IGW; Niilo Koski, W7LD; Bill Pope, K7TUI; Dick Hargraves, K7HNW; Stuart Seaton, ex-W3BWL-VK6MO-0A4U.

★ U. S. A. CALLING — AND HOW! ★

U.I.F. TRAINING IN THE NAVY

AN OUTSTANDING opportunity for amateurs to serve their country in Class V6 of the Naval Reserve and, at the same time, to receive training of great value in civilian life, is offered by the Navy's need for several thousand hams for one of its newest operation branches — the "radar" or radiolocator. Unquestionably the most fascinating branch of wartime radio, it is certain to have many later applications to commercial life — and amateur radio. Hams are especially sought for this service because of their native ingenuity.

To obtain men quickly, qualified applicants are being enlisted immediately as radiomen, second class, which is equal to four full promotions over the usual original enlistment as apprentice seaman. Those enlisting are immediately ordered to active duty, to receive special training lasting six to eight months at a Navy radio material school at either San Francisco or Bellevue, D. C. Upon graduation they may be recommended for promotion to radioman first class or chief radioman, depending upon qualifications. Radar men maintain and operate the nearly-perfected secret apparatus for radiolocation. Applicants must be high-school graduates and must hold or have held amateur Class A or B license; or, lacking the license qualification, they are eligible if experienced in service work or the design or operation of high-frequency radio gear. Code knowledge is not required. Age limit, 17 to 50, but high-school education essential.

The base pay of a radioman second class is \$72 a month, in addition to which all living expenses and medical care are furnished by the Navy. A complete outfit of uniforms is furnished upon enlistment. Radiomen first class get \$84 and chief radiomen \$99. These are for single men; if married or having dependents, an additional \$34.50 a month is paid. Part of the pay may be allocated to be sent home direct. After 12 months of active service, all ratings get an automatic increase of \$10 a month.

Particulars and applications at nearest Navy recruiting station.

AIRCRAFT RADIO LABORATORIANS

THE War Department Aircraft Radio Laboratory at Wright Field, Dayton, Ohio, has a shortage of qualified engineering and inspection personnel. While these are Civil Service positions, some amateurs who have not applied may be more definitely interested in the possibility of a Wright Field connection and are therefore in-

vised to submit applications direct to the laboratory.

See some particulars on the opportunities and requirements on page 28 of *QST* for November under the subhead "Engineer." The Civil Service standards for junior radio engineer, which position pays \$2000 a year, is merely a degree in electrical engineering from an accredited college. The next higher rating, assistant radio engineer, \$2600, has a requirement of two years of progressive professional experience plus substituted experience year for year for college education that is lacking. Note that for this \$2600 job a college degree, while very desirable, is not essential; a well-qualified engineer without degree is eligible for consideration. For associate radio engineer, \$3200, a man of course has to be pretty good. Simple enthusiasm and amateur experience cannot qualify a prospect, but in our ranks are many of the older and more experienced amateurs who do have the qualifications.

The requirements for positions in the inspection field are not nearly so exacting as for engineers. There are vacancies in pay grades from \$1620 to \$2000. Consideration will be given applications from persons with some experience as radio mechanics or some commercial experience of a mechanical nature or involving inspection tasks.

Address Director, Aircraft Radio Laboratory, Wright Field, Dayton, Ohio.

F.C.C. MONITORING OFFICERS

THE National Defense Operations Section of FCC offers an ideal place for certain kinds of amateurs to serve their country. The majority of the present NDO personnel are amateurs and so are the chief and his immediate assistants, and they are all giving a swell account of themselves.

These are Civil Service jobs and the general procedure outlined on page 28 of November *QST* applies. Radio monitoring officers are wanted at \$3200 a year and assistant ditto at \$2600. See CS Announcement No. 166, at any first- or second-class post office. No written examination.

Hams know that monitoring officers are assigned to monitoring and d.f. stations where they provide surveillance by listening and recording. They also investigate complaints of subversive activities and secure evidence for prosecution. They are required to travel a great deal and drive direction-finding cars. To qualify for the full-grade positions, applicants must have at least two years responsible supervisory experience in installation, testing, inspection, laboratory de-

velopment or responsible maintenance; and another three years of similar experience not necessarily supervisory, or appropriate technical study. Applicants for the assistant grade may qualify on appropriate study or experience such as that of studio engineer, supervising high-fidelity recordings. The announcement gives the particulars.

Men who qualify from studio experience will be placed on duty at stations which constantly record foreign propaganda. They are not required to meet any code requirements but must obtain a radio-telephone second class license within eight months. Those chosen for assignment at primary or secondary monitoring stations must obtain the radiotelegraph second within eight months, must demonstrate 15 w.p.m. at time of appointment and must qualify at 25 within eight months. Some officers familiar with FCC's radio services are assigned to the Interceptor Command centers, to carry out the orders of the center in silencing radio stations during impending air raids and reopening them when the all-clear is given. There are a number of vacancies in Puerto Rico and Alaska, always filled by appointment from the personnel from the primary monitoring stations; men having had that training are eligible to be sent on to their next duty at the expense of the government and are generally flown by commercial air lines to such distant posts.

You will find many ham buddies in this service. Most of the gang at the little four-men NDO stations are amateurs. The keen ears of DX hounds are digging out the stuff where no one else can. Most of the stations have transmitters too. Wander down to the post office and see the specs.

STUDENTS FOR MERCHANT MARINE OPERATORS

IF IT is brass-pounding you want, the Merchant Marine offers a good opportunity. You have seen the articles in *QST* about the beautiful Merchant Marine radio school operated by the Coast Guard at Gallups Island in Boston Harbor. The Federal Security Administrator has made a special plea for amateur operators to enlist in this part of the war effort, to man the merchant ships now sliding down the ways. Mr. McNutt praised the ability of hams and said, "Their knowledge can be turned to the service of our country whose growing Merchant Marine will need at least 1500 additional operators during the next two years. . . . Although possession of an amateur license is not a requirement for admission to the radio school, many of our best operators will undoubtedly come from those who have been so qualified."

This course offers magnificent free training to any man between 18 and 23 years of age with two years' high-school education, including a year in algebra. Moreover, there is pay of \$36 to \$60 a

month during the instruction period, with free clothing, food, quarters, books and medical and dental care, and free transportation to Boston from the point of signing up. Maritime radio operators' pay with wartime bonuses now runs to several hundred dollars a month. Selective service boards generally waive induction for men in the Merchant Marine.

Ask for further information at any State Employment Office or write direct to the United States Maritime Commission, Washington, D. C.

NAUTICAL INSTRUCTION

IF THERE be a radio amateur who doesn't want to serve in radio work but who wants to go to sea, let him be advised that the same Maritime Commission's offer described above extends to the enrollment of apprentice seamen, engine-room helpers and other seagoing jobs.

In this same connection, the American Nautical Academy, Atlas Building, Washington, D. C., announces its thirteenth annual offer of a course in nautical instruction by mail to boys and young men between the ages of 10 and 21. There is no tuition charge and no obligation for future service. The purpose is to instruct those who wish to know more about the sea and the possibility of devoting their lives to a naval career and those who, though not desirous of entering the service, still wish to obtain a general knowledge of life afloat.

Instruction deals with such subjects as the general characteristics of ships; daily routine and duties aboard ship, use of life buoys, first aid, signalling; the compass, log and lead; ground tackle, deck seamanship, the duties of lookout, the watch in port and at sea, cordage, etc. Examinations are held after each eight lessons. A student is required to write in for one lesson each week, and if he fails to request the lesson, none is sent. Thereby students may drop the course at any time they wish to do so. If you are interested, write to the Academy.

★ BOOK REVIEWS ★

Radio Troubleshooter's Handbook (Second Edition), by Alfred A. Ghirardi. Published by Radio & Technical Publishing Co., 45 Astor Place, New York City. 708 pages, including index. Price, \$3.50.

The first 386 pages of this ample volume are filled with "case histories" of several thousand broadcast-receiver models, itemizing the most common causes of failure in each case. The balance of the book contains an extensive collection of miscellaneous data of interest to the serviceman, most of which is available elsewhere but which is here conveniently assembled in one source. The classified directories of manufacturers, distributors, brand names, etc., constitute useful reference material.

— C. B. D

ARMY-AMATEUR RADIO SYSTEM ACTIVITIES

War Department, Office of the Chief Signal Officer, Washington, D. C.

MANY inquiries concerning the use of amateurs for defense purposes during the present national emergency have been received by the War Department from Army-Amateur members and other interested persons. The sincerity and initiative of these amateurs are greatly appreciated by the Chief Signal Officer. The matter of utilizing the services of amateurs was partially clarified by the following ZCVA Message No. 49, transmitted by Army-Amateur NCS, WLM, on December 8th:

ALL AMATEUR RADIO OPERATIONS INCLUDING THE ARMY AMATEUR RADIO SYSTEM ARE SUSPENDED FOR THE PRESENT STOP CIVILIAN DEFENSE AGENCIES REQUIRING USE OF AMATEUR RADIO FACILITIES SHOULD MAKE SUCH REQUESTS TO DEFENSE COMMUNICATIONS BOARD FOR CONSIDERATION STOP THE WAR DEPARTMENT TODAY ISSUED AN APPEAL FOR RADIO OPERATORS STOP MEMBERS OF THE ARMY AMATEUR RADIO SYSTEM AND OTHER AMATEUR RADIO OPERATORS WHO ARE ELIGIBLE FOR MILITARY SERVICE ARE NEEDED AT ONCE FOR THE SIGNAL CORPS STOP AMATEUR RADIO OPERATORS WHO ARE BETWEEN THE AGES OF 18 AND 35 UNMARRIED AND IN GOOD PHYSICAL CONDITION ARE URGED TO VOLUNTEER THEIR SERVICES AT ONCE DURING THIS NATIONAL EMERGENCY STOP RADIO AMATEURS QUALIFIED FOR ACTIVE SERVICE SHOULD APPLY AT ONCE TO THE NEAREST ARMY RECRUITING STATION OR TO THE SIGNAL OFFICER AT THE HEADQUARTERS OF THE RESPECTIVE CORPS AREAS FOR FURTHER INFORMATION AND ENLISTMENT STOP AMATEUR RADIO OPERATORS WHO, BECAUSE OF MARITAL STATUS, AGE, SLIGHT PHYSICAL DEFECTS OR OTHER REASONS

MAKING THEM INELIGIBLE FOR ACTIVE MILITARY SERVICE ALSO ARE NEEDED BY THE WAR DEPARTMENT TO SERVE IN A CIVILIAN CAPACITY IN ARMY RADIO STATIONS AT CORPS AREA AND OTHER HEADQUARTERS STOP THESE CIVILIAN RADIO OPERATORS WOULD RELEASE THE PRESENT ENLISTED MEN FOR MILITARY DUTIES STOP INTERESTED MEN SHOULD APPLY BY MAIL OR IN PERSON DIRECTLY TO THE CORPS AREA SIGNAL OFFICER AT THE HEADQUARTERS OF THEIR RESPECTIVE CORPS AREA FOR FURTHER DETAILS IN THIS CONNECTION

Since transmission of this message, many inquiries have been received from amateurs concerning the location of their respective corps area headquarters. The following is a list of the corps areas and the states they cover.

<i>Corps Area Hq.</i>	<i>States</i>
Signal Officer, First Corps Area, Army Base, Boston, Mass.	Maine, New Hampshire, Vermont, Mass., Conn., Rhode Island.
Signal Officer, Second Corps Area, Governors Island, N. Y.	New York, New Jersey, Delaware.
Signal Officer, Third Corps Area, Post Office Building, Baltimore, Md.	Pennsylvania, Maryland, Virginia, D. C.
Signal Officer, Fourth Corps Area, Post Office Building Atlanta, Ga.	Tenn., N. Carolina, S. Carolina, Georgia, Alabama, Mississippi, Florida, La.
Signal Officer, Fifth Corps Area, Fort Hayes, Columbus, Ohio.	Indiana, Ohio, Kentucky, W. Va.
Signal Officer, Sixth Corps Area, U. S. Post Office Building, Chicago, Illinois.	Michigan, Wisconsin, Illinois.
Signal Officer, Seventh Corps Area, Federal Office Building, Omaha, Nebraska.	Minn., N. Dak., S. Dak., Wyoming, Nebraska, Iowa, Kansas, Missouri, Arkansas.
Signal Officer, Eighth Corps Area, Fort Sam Houston, Texas.	Oklahoma, Texas, New Mexico, Arizona, Colorado.
Signal Officer, Ninth Corps Area, Presidio of San Francisco, California.	Washington, Idaho, Montana, Oregon, California, Nevada, Utah.



"This Is Your Army" program on NBC's Red Network, 7 P.M. Nov. 15th. At the War Department Message Center in Washington: Sgt. N. C. Richardson at WLM/W3USA key; at the mike, ARRL President George W. Bailey, WIKH, NBC Announcer Bill Crago, and Major David Talley, W2PF, LO AARS.

In the past, during disasters such as floods, hurricanes and earthquakes, amateurs have made an enviable record as public servants and we feel confident that again they will make an enviable record now that they are being called upon for their services during this national emergency.

The Defense Communications Board was created by Executive Order of the President on September 24, 1940. The duties of this board in part consist of the coordinated planning for the

(Continued on page 66)

Wireless Cape Cod

All That Now Remains—Memories and Foundations

BY IRVING VERMILYA,* WIZE

Picturesque Cape Cod has been the scene of a number of firsts in international communications, involving both cable and wireless. Not the least is famous old WCC — Marconi's historic station. On a recent pilgrimage to the Cape, Charlie Wiley, WIBUC, snapped a few photos of the old WCC site. Milt. Mix, WIPL, showed them at Hq, and in the rush of nostalgic memories we wrote Irving Vermilya, famous then and now as IZE, for a word or two about the old station in the lusty style that was so notable a feature of *QST* when radio was young. (It was Vermilya, you recall, who earned undying fame as "Amateur No. One," over a couple of decades ago, writing about the "good ol' days" around the turn of the century.) Here is his response. To quote 'ZE, "Those were the days!"

Good old WCC — yes — the memories of old "Cape Cod" are still with me, in fact, so much so, that my own call is always given as "WIZE Cape Cod," and never with the name of my town, Mattapoisett. All good sailors always look forward to their last days to be spent in peace and contentment "on the Beach," so here I am — after many years as a commercial wireless operator at sea — safely tucked away "on the beach." All through it all, however, once a ham always a ham. I have seen literally thousands of new hams spring up only to drop from sight after a very few years of activity, in fact, some hams only last for months. I have often wondered why. They were so enthusiastic, so "white hot" while they were active. Could it be that they actually burned themselves out? I'm going to be awfully disappointed if I don't have a QSO in the land to come.

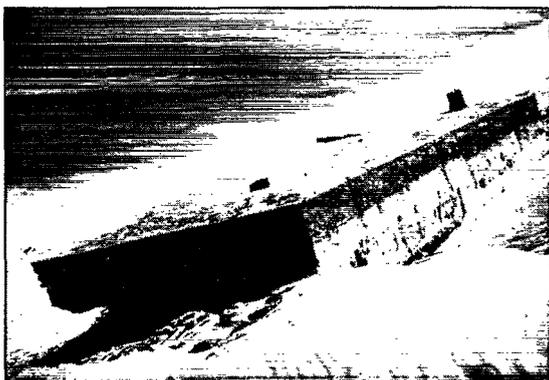
When I first came to old WCC, at South Wellfleet, Cape Cod, it was indeed a majestic station, and was a sight to behold, there on the high sand dunes, with its four wooden towers rising 210 feet into the air. The antenna was a tremendous fan-shaped affair, containing some 50 wires. A big sprawling counterpoise system was used because of the poor ground conditions in the sand. The old non-synchronous rotary spark gap was a huge affair that was propelled by a big a.c. motor duly

protected from surges that were all over the place. We made our own juice by a large kerosene engine. This was truly a self-propelled unit. There was no commercial juice within twenty-five miles of the place.

We ran about 30 kilowatts on that old spark, and the noise from the old gap was terrific. The flashes from the spark were blinding. We always worked in a sound-proof room. The flash from the spark could be heard and seen a mile or more from the building, with the window opened. The radiation from "that baby" was 50 amperes in the antenna. Everything that was loose was throbbing with the code. Indeed, I often lighted my pipe on an old hunk of wire, and a piece of paper held against a metal window sill. Is it any wonder, then, that amidst such romantic settings that my story "Amateur Number One" should have been born? Is it any wonder that I went in for high power? Is it any wonder that even to-day, at 51, I am still at it — still a ham? Boy — truly those were the days. It is just simply something

that can never be taken from you — yet which words seem unable to describe.

Many times before I was assigned to old WCC as manager, I had sailed past the station on various ships as radio operator. Little did I ever dream that I would some day be stationed there, and be responsible for its full operation. Years and years before even becoming a



This concrete slab is all that remains of power house and was once $\frac{1}{4}$ mile from the water. Little else is to be seen and another year may find this under water.

*Vermilya Ave., Mattapoisett, Mass.

shipboard commercial operator, I had copied the WCC weather and press from my ham station in Mount Vernon, N. Y. Indeed, even then, there was something about the old WCC spark signal in the dead of the night that made the chills and thrill of it all shiver up and down your back. It was a wonderful station, and it had a beautiful signal — so easy to read. I'd like to really know how many old time hams learned their code from WCC's old familiar drone. All of the transmitting was done by automatic paper tape at a speed of about 15 to 17 words per minute — wonderful stuff to learn by. Many was the time, however, when we used to have a break-down, and I sat there imitating the old machine. I doubt if anyone ever knew the difference — I had heard it so many times that it came second nature to imitate it. In fact, so vivid is the text of the nightly preamble that I can still quote it word for word, after all these years — "V-V-V- To all ships equipped with Marconi or Debeg apparatus and subscribing to the Marconi Press Service."

We used to receive the press and messages for the ships over telegraph wires that were connected directly through from South Wellfleet to the *New York Times* office in New York City. And believe me, I can still remember that that *Times* operator used to bat that stuff in to me a mile a minute in American Morse Code. I then put the messages and press on a paper tape with a machine that resembled a typewriter. This tape was then taken down to the station, which was about 1000 feet from "our home." There, at 10 P.M. sharp, we started the big transmitter and sent the stuff out. We repeated the transmission three times, and it was usually around 1 A.M. or so before we were clear. This high-powered station worked up around 1500 meters, and was used to broadcast to the ships. The majority of ships that copied WCC, were days and days out of range of an ordinary shore station. I always "scouted around" the ocean, however, before we went on the air, and with the regular 600-meter set. I usually found some ship well within the range of my ship transmitter, and it was his job to contact all the ships I had broadcast a message to and get their O.K. — if not direct — by relay through another ship. Then, in between the rounds, I would contact my man, and if I got an O.K., I might take as many as a dozen messages off the tape for the next round. The more I took off, the sooner I got to bed. Some nights, we even got O.K.'s from ships that were one night out of London.

There was one thing that always interested me, and it still does to this day. We keyed that station in the secondary or high-voltage end of a 50-kw. transformer. The key was a great big double-barrel affair and the contacts were large. There was a strong air blast on both sides of it to blow the arc out. The primary was closed all the time. Probably that is one reason why



Anchor posts and pieces of guy wire of one of the masts can still be seen.

the station never went faster than a gallop.

I always make a yearly visit to the old site, and it is therefore, no surprise to me to know that after all these years, the old cement foundations are now sliding into the ocean. These foundations were at least a quarter mile back from the ocean when I first came there. I've seen the wind blow 80 miles an hour down there many times during the winter. Old Wellfleet is rich in traditions, and I could go on here indefinitely. You should meet the old timers that used to live around there, and get to go hunting and fishing with them, and playing poker on Saturday nights — boy, the tales they told me would simply slay you.

This is ONE Z-E-signing off — Good Night.

Additional Press Schedules

The schedules below are additions to those sent us by F. E. Charlton, RM2c, U. S. Naval Air Station, Seattle, Wash., and published on page 70 of January *QST*. The transmissions of press are excellent for code practice, but we again remind you that information contained therein may not be divulged except to the addressee.

Time (GCT)	Call	Freq (kc.)	Place	Speed
0000	DLE	10,130	Germany	20
0000	DON	10,128	Germany	20
0000	GIC	8640	England	20
0000	GID	13,555	England	20
0000	GIH	10,650	England	20
0030	WPN	6410	New York	—
0040	WPI	11,640	New York	50
0100	WCB/WBG2	15,550/7615	New York	22
0200	KUP	6440	San Francisco	—
0200	XDP	4800	Mexico	—
0200	XDD	13,043	—	—
0500	VAE	8330	Vancouver	—
0545	WCX/WHL	7355	New York	25
0600	KWJ	15,000	San Francisco	—
1000	WPI	14,635	New York	50
0830	WBS/KCI2	7355/10,340	New York/Los Ang.	—
1000	VIS	—	Australia	—
1930	IAC	12,865	—	40
2030	IAC	12,865	—	40
2100	GIC	8640	England	20
2100	GID	13,555	England	20
2100	GIH	10,650	England	20
2200	DLE	10,130	Germany	20
2230	WBE/WJP	19,850/8810	New York	22
1230	DON	10,128	Germany	20
2300	LOL	8690	Argentina	—
2300	PPR	8310	Brazil	—
MISCELLANEOUS				
1200	WBS	7355	New York	35-7
1800	WCX	15,700	New York	35
0830	WBS/KCI2	7355/10,340	New York/Los Ang.	—



Another highly portable 2½-meter rig — a home-built acorn-tube transceiver with built-in speaker doubling also as microphone. It has its own antenna mounted on the case. Batteries are in the old camera case slung over the operator's shoulder. This unit is of too low power for other than short-range operations but is ideal for "walkie-talkie" service, as when the operator might find it necessary to get, with minimum encumbrances, right into the scene of a disaster.

THIS was to be an article on the preparations which have been going on for some months among a group of hams in Westchester County, New York; preparations and planning so that this group would be ready for voluntary local service if and when the need should arise. Before the story could be put on paper, however, the Pearl Harbor incident occurred. Local defense activities were no longer a rehearsal for a remotely possible time of need. The emergency had arrived. We were at war! Now, more than before, this history of the activities of this local gang should be of interest.

The Westchester Amateur Radio Association was organized in 1935 to provide personal contact among the hams of the county, talks on technical subjects, and in general to promote ham interests. It carried on continuously through the intervening years and in May, 1941, undertook to investigate the possibilities of ham radio as an aid in local civilian defense. There was no formal announcement to outsiders of the proposed investigation, no hurrahs and no fuss.

The first consideration was that of the frequency range to be utilized. For convenience and flexibility, the ultra-high frequencies were indicated. If the 5-meter band were selected, crystal control or equivalent frequency stability would be necessary. This meant more tubes, higher current drain and rather large antennas if reasonably good efficiency were to be obtained. The

* 2505 Aqueduct Ave., New York City.

Westchester County's Hams Are Prepared

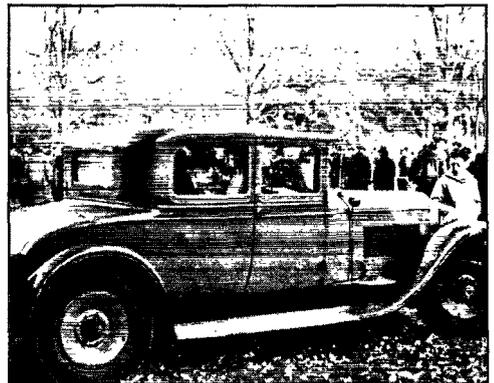
BY S. GORDON TAYLOR,* W2JCR

2½-meter band, with modulated oscillators and superregenerative receivers (or transceivers) would permit the use of a minimum number of tubes with proportionately low battery drain, and antenna dimensions would be cut in half. Going to 1¼ meters would provide these latter advantages also but there was the drawback that few of the members had equipment for this band. Further, definite technical and apparatus problems were involved at this frequency.

All things considered, it was the consensus that the 2½-meter band provided the greatest possibilities, not only for reasons mentioned above but also because commercial equipment for this range was not only available but relatively inexpensive. Moreover many were already equipped with suitable portable rigs. In fact, it was found possible right at the start to muster something like 20 of the gang, completely equipped.

Radio Survey

The first activities consisted of an intensive operating survey of 2½-meter conditions in the various parts of the county. With its approximately 500 square miles of rolling country this was no mean job. Groups were sent out, fanned out as far as possible without losing contact with one another, and every square mile of the county was investigated during these tests, which occu-



One of the mobile amateur radio units "on location" at the scene of a defense demonstration staged in one Westchester town. Orders transmitted over the network from this car brought out the fire department, police, etc., and directed their movements, even when on the road, through the media of other 2½-meter mobile communication units which accompanied them.

pied several weeks. The data were recorded on a master map with the result that transmission and reception conditions in every nook and corner of the area were a matter of record. Should an emergency arise necessitating the establishment of communication facilities within any portion of the county the required set-up could be planned from reference to this master map, without any necessity for preliminary tests at a time when even minutes might be precious. At least this was the thought behind the survey and the map.

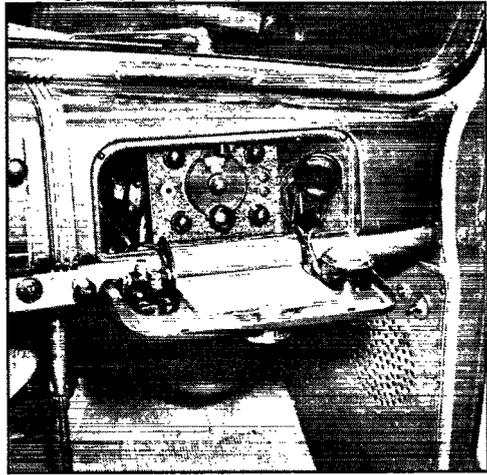
The effectiveness of the plan was tested during subsequent drills, which consisted of paper planning of mock disasters and the actual provision of communications set-ups to meet the assumed requirements. Several such drills were held, each with a different town or area as the focal point. The number of rigs participating in the individual drills varied from 15 to 28. At no one time was it possible to muster the full strength of the net, largely because many of these tests took place during the summer vacation season, and also because with a group of this size it is seldom possible to find any one time when some are not working, others out of town, etc.

By this time, word of the activities and their success had gotten around. As one result the services of the net were in demand by both the Red Cross and the Westchester Defense Council. In fact, for a short time the net constituted the official emergency communication system for both organizations. It later was found that by serving the broader requirements of the Defense Council it also met the needs of the Red Cross and the direct official affiliation with the Red Cross was therefore dropped. Needless to say the service was still available to this latter organization, through coöperation of the Defense Council chairman.

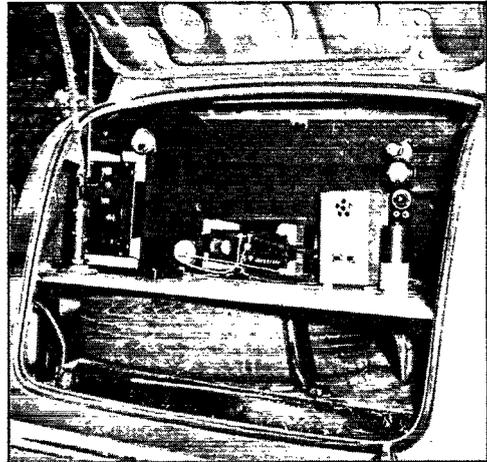
As a result of this affiliation, the WARA unit was called upon to provide the emergency communication facilities in defense demonstrations and tests not only on a county-wide scale, but also in conjunction with the defense organizations of individual cities, towns and villages within the county. In this way additional experience was accumulating, not only insofar as practical coverage problems were concerned, but also as to equipment, antennas, operating procedure, etc.

Operator Training Program

The service rendered to the defense organization did not stop here. Steps were taken to organize classes in various parts of the county to train men to qualify for amateur licenses and thus increase the number of licensed operators available. The WARA arranged to provide instructors for both theory and code from among its membership and to render every other possible assistance to communities desiring to organize such classes. Eventually the demands on the time of these volunteer instructors bid fair to become



The operating position of one home-built mobile unit. Shown is the 2½-meter glove-compartment receiver, the panel of which also accommodates the changeover control switch for the transmitter. A meter mounted on the drop door provides a constant check on transmitter operation. The receiving antenna is conveniently located on the nearby door-hinge. The transmitter, supplementary battery charging equipment and vibrator supply are in the car trunk as shown in the lower photo. The transmitting antenna projects through the trunk roof and is directly connected to the transmitter, thus eliminating all feeder problems.



excessive. As a result, plans are now under discussion to concentrate all training activities at one central point, with the privilege extended to all county communities to send enrollees there for training.

Another voluntary contribution to defense activities has been the provision by the club of member-lecturers to address meetings of local defense groups, explaining the functioning of the radio communications net and helping these groups to fit its services into their local defense set-ups.

All of these activities were proceeding prior to the events of Sunday, December 7th. Since that date the past activities are continuing but now that a state of war exists the name "Westchester Amateur Radio Association" has been suspended "for the duration." Out of its membership has emerged a new organization known as the "Westchester Defense Volunteers, Radio Communication Unit." No longer is this group functioning as an official affiliate of the Defense Council — it is a definite and important part of the Council itself. As such its voluntary efforts have been intensified.

Emergency Organization

Within 72 hours after war was declared the licenses of 37 of its ham members had been extended by the FCC at the request of the chairman of the Defense Council. Within ten days additional members of the ex-WARA had obtained or built 2½-meter equipment with the result that the communications unit then included 49 members equipped and ready to go almost at a moment's notice, and authorized by the FCC to continue on the air for defense purposes.

Provisions have been made to get these men together in the shortest possible time, should an emergency arise. Radio contact, broadcasting and amateur, will be used for the call-in if feasible under the emergency circumstances. Set-ups for contacting every member by telephone, à la the chain letter idea, have been established, one for daytime and another for night. With such a set-up no member will be out of range of the call if he has either radio or telephone available. Where

neither is available various other arrangements have been made to take care of each individual case.

Many of the members are employed in the neighboring city of New York and require perhaps an hour or more to reach their homes and equipment. Because of this, arrangements have been made to have immediate assignments accompany the telephoned emergency calls to those employed within the county. Those arriving from New York report with equipment at a central point and are there given their individual assignments either by someone who will be there to meet them or by contacting the "preliminary control" station over the air.

The effort has been made to provide for every conceivable contingency that may arise. Special car license plates have been ordered by the Defense Council and arrangements made for cars bearing these plates to be given every consideration on the highways during an emergency, not only by county and state police and defense officers, but by the local police and defense organizations of New York City and other surrounding areas.

Equipment

All of the equipment employed is privately owned by the individual hams. Not one cent for equipment or time has come out of the county or defense treasuries. When it is considered that several thousand dollars worth of apparatus is involved, much of it purchased for this purpose alone, the financial contribution made by these hams is impressive. There is no detailed list of the equipment available but it is known that at least five members are equipped with gas-driven generators capable of operating high-power home rigs should the power lines fail. Plans are now either completed or under consideration for utilizing these as key stations and for coordinating the emergency activities within Westchester with those of surrounding counties, should the need arise.

All portable and mobile equipment is powered by dry batteries (usually self-contained), by vibrator supplies and car batteries, or both. Perhaps half of all the rigs are commercial types and the balance homemade. A goodly percentage operate from car batteries and employ oscillator inputs of around 12 to 20 watts. Most of this type use antennas mounted on the cars. Indeed, many of the dry-battery powered rigs also utilize antennas permanently installed on cars to take advantage of the improved efficiency offered by the larger antenna systems thus made possible. Not a few of the rigs designed for operation from a car battery can also be operated from a.c. power supplies and are therefore useful for fixed point operation — as at the home shack, for instance, where the advantage of a higher antenna may

(Continued on page 70)



A typical shot of a 2½-meter field unit during network drill. The equipment on top of the car is an Abbott DK-3 transceiver, a type of equipment which, powered by self-contained batteries and with its own rod antenna supported directly by the antenna coupling terminals, is in extensive use by the Westchester net members.



IN THE SERVICES

DECEMBER arrivals at the Gallups Island Radio School include Abeyta, 5KGF; Albers, 9OEE; Anderson, 5HWD; Dalbey, 5ESU; Dodds, 5HKA; Etheredge, 5KKQ; Fagot, 5IBD; Fitz, 9YKW; Foley, 7HAM; Hankins, 5KQB; Hansen, 9VLV; Holzenthal, 5KQA; Issokson, 1MML; Joslyn, 9UUG; Jovanovich, 9MMW; Justus, 9LAA; Kohler, 9CCF; Lodato, 5HIA; Misorski, 1NUS; Newbold, 1MMG; Pennell, 5KCG; Rauscher, 9RYN; Sagan, 1NRY; Statham, 5KQP; St. Peter, 8WRP; Troy, 2NWR; Vartanian, 6UIL; Westley, 9YEW; Wiley, 5DYH; Gleich; Graner; Morlock; Schriock; and Thomas.

Another Scott Field instructor is Lynn Breece, 9HFB, and new students there include Pvts. Roberge, 9LVW, and Krusniak, 9ZBK. In the Air Corps we also find Pvts. Kohn, 9GUD, 4th Air Base Sqdn., Selfridge Field, Mich.; Hibbert, 9ENJ, 113th Obsn., Key Field, Miss.; McClellan, 4IAO, 91st School Sqdn., Maxwell Field, Ala.; Capt. Snyder, 9QNU, France Field, C. Z.; Major Schindler, 8OVC, Chanute Field, Ill.; Davis, 9OBI, 12th Obsn., Ft. Knox, Ky.; Novak, 9PGI, 110th Obsn., Adams Field, Ark.; Reid, 4FVI, Jefferson Barracks, Mo.; and Instructor Rippel, 8NCH, Avon Park, Fla.

In the 7th Sig. Co. at Ft. Ord, Cal., are Staff Sgt. Hathaway, 9WYS, and Pvt. Noyes (operator only). Pvt. Washburn, 1CLE, operates with the 3rd Sig. Svc. Co., Ft. Ethan Allen, Vt. Capt. Fairchild, 9FVN, supervises the 855th Sig. Svc. Co. at Chanute Field. Cpl. Zvolanek, 9WIO, is radioelectrician with the 6th Sig. Svc. Co., Savannah, Ill., Ordnance Depot. In Alaska we find Pratt, 6NZE, with the 14th Sig. Svc. Co. at Ft. Richardson; and Gilliam, 6SHE, with the 18th Sig. Platoon at Elmendorf Field. Lt. Gulland, 4HZV, is stationed at Ft. Buchanan, P. R.; Lt. Col. Chadwick, 6SGJ, with the 25th Division at Schofield Bks., Hawaii. Capt. Janes, 9KS, is now liaison officer to the Chief Signal Officer, on special duty at the Massachusetts Institute of Technology. At Ft. Monmouth Lt. Edwards, 5AKD, is taking electronics training, and Pvt. Borges, 4DUA, the regular radio course. Someone apparently "bootlegged" 6QCC's call on the list of Clinton, Ont., radio school students published in December, since OM Arnold is still in South Pasadena.

Camp Barkeley, Texas, boasts the following among its amateurs on active military duty: Cpl. Depue, 5JCP, and Staff Sgt. Meyer, 5JCG, of the 179th Inf.; Pvt. Ferguson, 5IES, 7th Sig. Svc. Co.; Staff Sgt. Martin, 5EXZ, 158th F. A.;

Tech. Sgt. Leasure, 9ZCX, 157th Inf.; Capt. Pinkerton, 5FQB, finance officer; and Capt. Daly, 5GVP, 120th Med. Regt. Staff Sgt. Hogan, 6HQO, is chief of radio for the 75th F. A. Hq. Bn., and Pvt. Victor, 6FDD, op for the 32nd Inf., both at Ft. Ord, Cal.

In the 57th Sign. Bn., Ft. Bragg, N. C., are Pvts. Davenport, 1LJD; Merchant, 1MQK; Grossman, 2KIK; Bent, 1JPK; and Adams. Pvt. Barc, 5KAB, is in the 202nd C. A., Ft. Bliss, Texas. Pfc. Conley, 8CZR, finds AARS training helpful in his work with the 74th Inf. Hq. Co., Camp Shelby, Miss. Also there is Pvt. Ziegler, 3BTP, 166th F. A. Lt. Page, 5AQV, is chief of ordnance, ammunition division, Washington. W8IXJ, UUO and QQK were operating 8PVK and later 9CZU from Ft. Leonard Wood, Mo. Lt. Col. Oliver, 6FPF, is stationed at Ft. Davis, C. Z., and Capt. Cook, 3IQS, at Arlington Village, Va. Col. Hinemon, Ft. Monmouth, is 2CNG; General Henry, Chevy Chase, Md., is 3JCA; Capt. Howland, 2BQH, is at Ft. Jackson, S. C.; Capt. Mack, 5KOX, at Ellington Field, Texas; and Lt. Schmidt, 8OD, at Phoebus, Va. Sgt. Bedat, 4HRO, is one of the "regulars" in the 2nd Armored Div., Ft. Benning, Ga.

CRM Davis, 6UJO, is assigned to the *Dobbin*; Welling, 6TRF, to the *Argonne*; RM2c Armstrong, 9UQP, to the *Paducah*; Dragulich, 9RXT, to the *Catbird*; Pomeroy, 9DQL, and Holcomb, 9IMB, to the *Crosby*; RM1c Hiers, 4HJR, to the *Tallapoosa*. Lt. (jg) Taylor, 9ALD, is watch officer at the Navy Yard in Cavite, P. I. Ev. McCoppin, 8SO, is working in the radio labs at Wright Field, Dayton, Ohio, and Schultz, 9ZUX, at the Naval labs in Anacostia, D. C. Lt. Ferrier, 6BHV, is in the office of Comdr. Myers in Washington. Ens. Hanson, 8UNP, is another student at Bowdoin College. At the Naval Air Station in Norfolk are RM3c Bednartz, 1LQK; Hughes, 8UIL; and Fonopulos, 5IVX. Lt. Olney, 4FNN, teaches at the Naval Academy in Annapolis. S1c Marrow, 4GSE, is going to radio school in Jacksonville, Fla., and Donnelly, 1NMV, in San Diego. RM2c Culmone, 8RKX, and RM3c Mickey, 7IYY, are now handling matériel at the N.A.S., with the Coast Guard at St. Thomas, V. I.

We regret to report the loss of Ensigns Thomas McClelland, 9HFC, and Ralph Hollis, 4AFC, killed in action at Pearl Harbor during the first Japanese attack. Ens. McClelland was formerly chief engineer of KLZ, Denver. Ens. Hollis will always be remembered for his heroic amateur

(Continued on page 74)



ON THE ULTRA HIGHS



CONDUCTED BY E. P. TILTON,* W1HDQ

THOUGH this is certainly a time for looking ahead rather than backward, we take time out from the problems of the present and future for a brief look over our shoulders at the 1941 U.H.F. Marathon — so abruptly terminated, eight days ahead of schedule, on December 7th. From the final summary of our second Marathon one fact is immediately apparent: u.h.f. activity made great strides during 1941, not only in the number of stations active but in their geographical distribution.

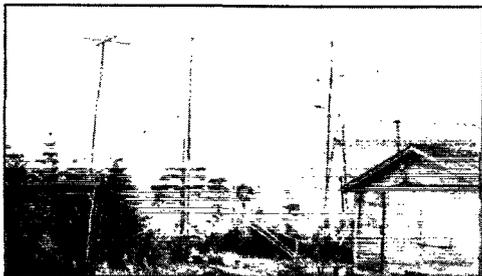
Most pronounced is the increase in our 112-Mc. population and in the distances over which we were able to work on this band as compared to former years. W1MBS in the Boston area, and W2DZA, W2LXO and W3HOH, with access to Greater New York, were able to work from two to four times as many stations as during 1940; and sizeable reports of 112-Mc. activity came from the Middle West (W9PNV was able to work 133 different stations) and from Arizona, for the first time.

In 1940 only two stations, W5AJG and W9ZJB, were able to work more than half of our 48 states on Five. In 1941 eight were able to work 25 or more states, with W2BYM carrying off top honors with 30.

Highest score, for the year, on 56 Mc. was 2394 points, turned in by W8CIR, Aliquippa, Pa., with W2BYM, Lakehurst, N. J., running a close second with 2145. An uncanny ability to be on deck whenever DX of any sort was brewing was a big factor in the high scores of these two, with W8CIR getting the better break in scoring on those 250-500 mile contacts made during the aurora DX sessions with W's, 2's and 3's.

The 112-Mc. race was a nip-and-tuck affair from the very start. W3BZJ, Glenside, Pa., for-

* 329 Central St., Springfield, Mass.



Retouching job by Mother Nature — The antennas at W1MEP, Glastenbury Mountain, Vermont, laden with ice in early November, include a 3-element horizontal and an extended double-Zepp for 56 Mc., a 112-Mc. "H", and a Vee beam.

sook the five-meter band for the entire year with the avowed purpose of coming up with the 112-Mc. award; W1MBS, nosed out for first place last year by W6RVL, was in there again in earnest (328 stations contacted with never more than 12 watts!); W2DZA, another of last year's leaders, worked 407 stations; and W1KLJ made a splendid record with his 200-watt f.m. job; but it was W3HOH, Bernardsville, N. J., who lead the pack at the finish. Ken, in a fortunate position about 30 miles from New York City, found 425 different stations on 2½ during the year!

Not all the good work was done by these high scorers, however. From an ordinary city location, with moderate power (175 watts on 56 Mc. and 25 on 112 Mc.) W1LLL, Hartford, worked 163 stations in 25 states on Five and 127 on 2½, to slide into the select circle of scores over 2000 points. W2OEN, off to a late start and running only 9 watts, worked 195 stations on 2½. His contact with W1MEP, Glastenbury Mountain, Vt., on Dec. 3rd, should be some kind of record — 9 watts at W2OEN, 3 watts at W1MEP — distance 180 miles *in midwinter!* W6ANN, San Pedro, Cal., showed the West-Coast boys that it is possible to work out on Five. Bill worked plenty of skip DX and found time to contact 265 stations on 2½ as well. W8KKD, Royal Oak, Mich., succeeded to the throne in the Detroit area, ruled over last year by W8QDU. Two stations in Morgantown, W8TDJ and W8KWL, kept West Virginia on the map. And the W9's were out in force, with honors almost equally divided between W9's BDL, ARN, and YKX. W5JGV became the first New Mexico station to work out on Five, and the accomplishments of W6OVK and W6QLZ were, as always, outstanding.

And now just a bit about u.h.f. conditions preceding the Dec. 7th blackout. The last ten days of "normalcy" were filled with operating thrills. On the evening of November 28th Five was wide open for the Arizona W6's. W6QLZ at Phoenix worked W5HTZ, Cromwell, Okla., and W5EHM, Dallas. Commercial harmonics came through as high as 79 Mc. Harmonics from Hawaiian commercials were heard on 50 and 54 Mc. Ten-meter harmonics were coming through strongly on Five from the California coast and from the W9's, and double-hop signals were in evidence on Ten. All the evidence pointed to a bang-up opening for Five but apparently there were not many stations active in the areas affected. W6OVK, Tucson, worked W5HTZ and W5DNN at Austin, Tex., and heard many harmonics throughout the band, including WVB (Ft. Sam Houston) coming

through on 57.3 with an S-9 plus signal for more than an hour. The f.m. band was wide open, with San Francisco, Baton Rouge, and Nashville all pounding in at Tucson. Signs of DX were in evidence from 6 to 9 p.m.

On November 30th W6QLZ took his 112-Mc. portable (p.p. HY-615's with concentric antenna) up to Camp Wood, and from a 6000-foot elevation there worked W6OVK and W6SLO in Tucson, a distance of more than 200 miles. A number of stations around Phoenix, about 100 miles, were also contacted. During the QLZ-OVK contact both stations were heard by W9KBM/5 at Silver City, New Mexico. The exact distance on this one is hard to figure, from the maps we have at hand, but it is certainly well over 300 miles, and is very likely long enough to have been a new world's record if it could have been made two-way! Both before and after his contact with W6QLZ/6, W6OVK heard a weak fading signal calling QLZ. This was heard by W6SLO also, but neither could identify the station because of fading, though both are positive that it was W9KBM/5. Needless to say, this gang is going to be hot after a new 112-Mc. record and the first Arizona-New Mexico u.h.f. contact the minute the bars are down!

Unseasonably warm weather during the first week of December brought an almost continuous temperature inversion to the Atlantic Seaboard, and many contacts were made which rivaled the best that the summer had to offer. Dec. 3rd was good enough for a six-way QSO between W3CGV, Wilmington, W3OR, Essington, Pa., W3GQS, Feasterville, Pa., W3AXU, Trenton, W2BYM, Lakehurst, and your conductor at Wilbraham, Mass. It will interest W9ZHB to learn that all the stations in this 4-state 250-mile round table QSO were using horizontal polarization. A feature of this workout was the performance of the soup-can beam at W3GQS. Charlie has a 3-element array up in the attic with the elements composed of soup-cans soldered end-on-end!

While this QSO was going on, W1MEP, Glastenbury Mountain, Vt., was having a time for himself on 2½. With three watts to his HY-114 and vertical "H" array, Chet worked W2OEN, Middletown, N. J., 180 miles, and W1JFF, Newport, R. I., 145 miles. These are the first and only QSOs between Vermont and Rhode Island and New Jersey on 112 Mc. The following calls were heard by W1MEP: W1's DEP, KOE, GJZ, MKZ, BJE, and KSA. A very definite temperature inversion was in evidence on Glastenbury Mountain during all of the first week of December. At one time on the 3rd the temperature at the top of the Mountain was 50 degrees, while at Chet's home in Bennington, more than 3000 feet below, the mercury stood at 34. Under normal weather conditions temperatures at the summit run about 20 degrees lower than in the town below!

The contact between W1JFF and W1MEP



Ed Doherr, W8CIR, Aliquippa, Pa., made National High for 56 Mc. in the U.H.F. Marathon of 1941.

was also a record in that it provided W1JFF with the distinction of having worked *nine states* on 112 Mc. He is co-holder, with W2MPY/1, of the recognized DX record of 335 miles, and has worked all other New England states and New York, New Jersey, and Pennsylvania as well. Not bad for 15 watts!

W3BZJ, Glenside, Pa., makes some interesting observations as a result of his solid year of intensive effort on 112 Mc. He notes that inversion-bent signals have been very much stronger on 2½ than they ever were on 5, though they don't seem to come through from the points beyond 200 miles so well. When conditions were right, Bob was able to work transceivers right in the heart of New York City, and mobile stations in Southern Connecticut, which never was possible on 56 Mc. On the other hand, W8CIR used to be worked frequently with signals up to S-9 on 5, and stations as far away as Boston have been worked, whereas the best 112-Mc. DX is 235 miles and the average distance for loudest signals is 75-150 miles. Bob feels certain that there has been no skip DX thus far on 2½ and that it is unlikely that there will be any until the next sunspot peak a few years hence. He has no positive evidence of aurora DX, though he has listened carefully when this phenomenon has been in evidence on 56 Mc. Incidentally, W3BZJ, W2BYM, W8PK and your conductor had a "gentlemen's agreement" to spend the next aurora session on 2½, with c.w. transmissions and b.f.o. reception! But Dec. 7th changed all that, so we stow away our log of nearly ten years of happy days on the Ultra-Highs and turn to the urgencies of the tremendous job at hand.

What has been done up to now? What should we do? What are the prospects for the future of the Ultra-Highs? Up to Dec. 20th, about 700 stations had been put back into circulation by the FCC. This number includes the Connecticut State Police nets, a Westchester Country (New York) Club group with a considerable list of sta-

U.H.F. MARATHON OF 1941

FINAL SUMMARY

Call	Contacts for year				Cumulative Score	States in 1941	
	86	112	224	400		86	112
*W1AEP					1008	23	
W1AVV	112	34			847	18	3
W1BCT		108			566		4
W1CGY	56				427	14	
W1DJ	131	116			1163	12	2
W1DLY	78				626	17	
W1EHT	67				535	6	
W1EKT	127				1002	16	
†W1HDQ	257	148	4		3009	30	8
W1IJ	87	38			722	10	4
*W1KJ	196	166			2972	26	7
W1LFI	30	172			900	2	7
W1LLL	163	127			2052	25	3
W1LMU		122			509		6
*W1LSN	95	2			946	14	1
*W1MBS		326			1330		3
*W1MFP	52	38			757	10	5
*W2ADW		173			1273		6
W2AMJ	191				1680	22	
*W2BYM	224	56			2329	30	7
W2COT	123	83			896	6	2
W2DZA		407	5		1685		6
W2FCQ	58	72			314	13	5
W2LAL	103	6			724	9	2
W2LXO		327			1377		5
W2MGU		210			876		4
W2MIV	56	263			1057	9	5
W2MQF		124			508		2
W2OEN		195			1033		7
W3ABS	59	1			232	5	1
W3ACC	103	26			890	15	3
W3AXC	32	6			167	6	1
W3AXU	144	20			1214	21	6
*W3BZ		287			1704	16	4
*W3CGV	99	12			846	16	1
W3GJU	67	5			339	10	1
*W3HOH	95	425			2311	13	7
W3IIS	68				736	16	
*W4FBH	67	5			721	17	1
W4KFN	34	12			322	12	
*W5AJG	152	2			1723	25	1
W5FSC	40				416	16	
*W5VY	64				690	15	
*W6ANN	63	265	1	2	1974	14	1
W6IGJ	16	34			313	1	1
W6NCP		12			846		1
*W6OVK	78	14			1968	23	1
W6QG	49				578	10	
W6QKM	4	91	1		366	1	1
W6QLZ	56	23			1148	16	1
W6RVL		180			632		1
W6SLO	60				846	17	1
*W8CIR	131	10			2416	26	2
*W8KKD	113	59			1676	21	1
W8KWL	33				502	15	
W8MHM	3	29			243	1	1
W8QCS	68				848	19	
W8RUE	62	25			769	13	1
*W8TDJ	41	2			599	13	1
W8UUY	10				150		1
W8AB	25				194	7	
W8ANH	39				590	11	
W8ARN	91				1341	24	
*W9BDL	90				1403	23	
W9FHS	3	27	1		97	1	2
W9LLM	94	58	1		1165	16	1
W9PK	106	1			1052	25	1
W9PNV		133			810		2
*W9YKX	93				1333	26	
*W9ZHL	74				1052	19	

The above list includes only those stations sending in five or more reports. Four or less were received from the following: W1's ELP JAX JJR LCC MGT *NBU INCQ, W2's MBS MEU MFA *NSD, W3's BYF EJ FSM HDJ *RL, W5's DNN *JGV, *W6BPT, W7's *CIL ERA *RT, *W8PKJ, W9's ECQ RGH RLA VHQ UNS *ZJB.

* High scorer in ARRL Section — Certificate Winner.

MONTHLY CERTIFICATE WINNERS

1 — WIMBS, 194; 2 — W8CIR, 271; 3 — W8CIR, 404; 4 — W6ANN, 470; 5 — W6SLO, 616; 6 — W2BYM, 676; 7 — W1KJ, 461; 8 — W3HOH, 351; 9 — W1KJ, 590; 10 — W3HOH, 174; 11 — W3HOH, 142.

MEDALION AWARD WINNERS

National High Score, 56 Mc.: W8CIR, 2394 points.
National High Score, 112 Mc.: W3HOH, 2050 points.
National High Score, 224 Mc.: W2DZA, 50 points.
National High Score, 400 Mc.: W6IOJ, 75 points.
States Worked in 1941, 56 Mc.: W2BYM, 30.
States Worked in 1941, 112 Mc.: W1KJ, W1LFI, W2BYM, W2OEN, W3HOH, tied with 7 each.
States Worked in 1941, 224 Mc.: W2DZA, 2.

† Not eligible for award.

DUD LITTLE MEMORIAL AWARD TO BE MADE MARCH 14TH

W9FEN, secretary of the U.H.F. Club of Chicago, announces that nominations for the first Dud Little Memorial Award must be in by January 31st. Presentation will be made on March 14th, anniversary of the death of Dud Little, W9VHG. Rules governing the Award appear in *QST* for September, 1941. Nominations should be sent to Edward C. Hamel, W9EWE, c/o Columbia Broadcasting System, 410 North Michigan Ave., Chicago.

tions on 2½ and 5, a Florida defense net, and a 80-160 State Guard net with local 2½-meter tie-ins in California.

There still seems to be some confusion as to the means by which stations are authorized to return to active status. Authorization for any local plan which fills a definite defense need and does not conflict with plans for national security will be granted by the FCC upon receipt of application from an authorized public official. Applications cannot be filed by amateurs themselves nor by amateur organizations. Operation must be confined to actual traffic work, or to such testing as may be authorized by responsible local officials. All work is subject to immediate temporary close-down by the Interceptor Command.

And the future? The present stringent regulations are not necessarily permanent. If things go well there is a good possibility that we may get the Ultra-Highs back on a more or less unrestricted basis. In the meantime there are many things to be done which do not involve the use of our transmitters. It goes without saying that those of us who do not already possess u.h.f. gear should get going on some without delay. We who have been working the u.h.f. bands all along should see to it that our equipment is all set for operation from emergency power supply when the need arises. Improvements in gear (that rotating mechanism we've been going to rig up; that r.f. stage on the rush-box to make life easier for the other fellows who work 2½ locally; that concentric-line preselector to hop up the weak ones) will be made more easily and quickly now that there is no temptation to have a few QSOs before starting in on the job.

More important now than ever before is the reporting of your accomplishments to headquarters. With random operation out of the picture we must depend entirely upon correspondence for the material to be presented each month. So let's have the news, fellows. Who is back on in your neighborhood? What is the local u.h.f. program? Who of our u.h.f. gang have gone into the country's armed forces? Letter writing, nearly a lost art among amateurs, must now be revived if we are to know what goes on the country over!

W1AYY, New Britain, Conn., a town which is

(Continued on page 76)

Wrinkle Your Rig for a Buck

Kitchen Methods for Home Crackling

BY W. N. FELLOWS,* W9ZJC/G

IN THESE rush production times the ordinary radio parts store finds it difficult to obtain delivery on relay racks, panels and chassis of that much-in-demand material, steel. The poor amateur consequently is forced to use his old ones or to resort to the manufacture of the desired products from the raw stock.

As this is a paint story no details will be given of the construction of our new rack and panel units. In general, No. 14 gauge sheet iron was used for the panels and chassis and 1½ by 3 inch channel iron used for the rack. The completed units were sprayed with black lacquer and work begun on the installation of the radio components. However, part way through this phase of the work it was decided that a coat of wrinkle finish paint would have to grace the unit in order to conform to "modern design." The status of construction at this point was something like this: One unit completed on a cadmium plated chassis and a black iron panel, one black chassis and panel drilled but no parts assembled and the remainder of the panels and chassis merely painted black.

A survey of the various brands of wrinkle paints on the market revealed that a quart of Sherwin-Williams Art Metal Finish only cost \$1.06, tax additional, and was available in sixteen colors plus three types of black! The salesman was rather doubtful about securing a good wrinkle by home workshop methods but a can of platinum gray was purchased anyway. At least we would have the satisfaction of proving that it wouldn't wrinkle by our methods!

Contrary to the professional advice, preliminary experiments indicated that the paint would respond to about any type of heat for the production of a well-wrinkled surface. Paint for the first panel was brushed on, but results showed that unless it was applied rapidly with a large brush the paint "set" too fast to give a smooth application (before wrinkling).

* 233 So. Holliston Ave., Pasadena, Calif.

Want to dress up the old rig in modern colors? Or get the new one under way even though deliveries are slow on finished chassis and panels? Here's dope on how to put on a wrinkle finish, using methods which can be applied by practically any amateur.

The spray gun attachment of the domestic vacuum cleaner was then tried and, although the paint is rather thick, the coverage was very satisfactory. It was found that a light coat sprayed over the entire panel or chassis first and then immediately covered with a second coat took less paint and yielded a surface which covered the black lacquer better than did one heavier coat. This same procedure worked equally well when covering raw metal.

Directions on the paint can suggested that an air drying period of from fifteen minutes to five hours be allowed prior to baking. In view of this wide latitude no mad scramble was necessary to rush the units from the spray gun to the oven, as with other types of wrinkle paint. However, the minimum fifteen minute period was not found necessary as immediate baking yielded the same quality of wrinkle as on units standing for three hours after spraying.

The kitchen oven was heated to 240 degrees F. in preparation for the baking, but imagine the dismay when it was found that the oven door could not be closed with a 17-inch chassis inside! But in spite of this slight irregularity in the planned procedure a sprayed chassis and panel were placed inside the oven on the sliding shelves and the door propped as far shut as possible without touching the wet units. After twenty-five minutes of baking (the directions say thirty minutes at this temperature) the panel was gently slid out of the oven and behold, a wonderful wrinkled surface — on the half of the panel which was toward the rear of the oven! There was still a smooth surface on the front half, so the panel was turned around and replaced in the oven with the unwrinkled half toward the rear. Inspection of the chassis revealed the same situation but in addition the paint had turned rather yellow which, to our guess, indicated too much heat as the chassis was placed on the shelf below the panel and our oven is probably hotter on the bottom than on top. The chassis was reversed anyway and the baking completed.

The next chassis and panel were carefully placed in the oven and, you may be sure, watched more carefully this time. After ten minutes the rear half was nicely wrinkled as before and ten minutes more of baking with the units reversed completed the job on these two pieces. This time the yellow color was not present so our guess as to too much heat was correct.

At this point it was found that great care must be taken not to touch the hot surfaces as the paint remains quite soft and mars easily until the units are cool. Rest assured, however, that once cool the surface is plenty hard. Upon attempting to remove the paint from the first yellowed chassis with a putty knife it was found to be so hard that only a slight impression could be made on the wrinkled surface. This problem was side-stepped by merely respraying a light coat over the yellow one and rebaking. The desired gray color was thus restored and the surface was as good as new. The remainder of the panels, chassis and support brackets were then baked, giving ten minute intervals to each half in accordance with the above experience.

The problem of baking the panel of the completely assembled power supply appeared to be next on this program. As it looked like too much of a job to remove all the parts from the panel it was decided to spray it "as was" and wrinkle it by a method other than oven baking. All parts that could not be removed, such as switch knobs and indicator lights, were covered with masking tape. The panel was then sprayed as with the previously prepared units. This time, however, the panel was vertical instead of lying flat on the saw-horses but no special precautions were found necessary and no "running" of the paint was experienced. All that remained to finish this part of the problem was to wrinkle it. An old 1000-watt radiant heater was pulled down off the shelf and beamed on the panel with about three or four inches between the paint surface and the element. After twenty minutes the surface was nicely wrinkled — directly in front of the element. So, the heater was moved over and left for another twenty minutes. Six different adjustments of the heater were required to process the entire surface but the final result was a panel wrinkled as nicely as were those baked in the oven. Putting the unit on the floor allowed the heater to be rested on blocks in front of the panel so that we didn't have to stand and hold it during the twenty minute periods.

Now all that remained was the black channel-iron relay rack. Although it wouldn't go into the oven we decided that a gray rack would match the gray panels much better so it was sprayed all over, inside and out. Then, before cleaning up the spray gun about two dozen 6/32 screws were pushed into a piece of corrugated board until just their heads showed and these were sprayed and baked. They were to be used in holding the chassis to the panels and to support other parts mounting on the front of the rack and panels.

As all pieces had now been sprayed a five cent pint of benzine was used to clean up the spray gun but it was found not to be of much use in cleaning the brush or thinning the paint. Kem Reducer No. 75 is recommended by the manufacturer for this operation; however, no thinning

of the paint was found necessary, and the brush was an old one anyway. It was later learned that plain soap and warm water would clean up the brushes satisfactorily.

The unwrinkled rack still continued to haunt us but the twenty minute periods with the radiant heater were rather discouraging for application to this problem because of the much greater amount of metal to be heated to the "wrinkling point." Then the thought of a gasoline blowtorch occurred. We reasoned that if the torch was applied to the inside part of the channel members the resulting burned paint (inside) wouldn't show and the outside surface might wrinkle. If we didn't like the burned paint it could be resprayed anyway. So the torch was applied down near the bottom of one of the uprights for a test, and after two or three minutes of playing the flame over a length of about a foot of channel the outside paint started to wrinkle. As soon as this wrinkling appeared the torch was moved up to another one foot length and soon the wrinkling followed the heat up. About this time one little spot of the outside paint started to bubble and boil which indicated that we had gotten the metal too hot. A longer portion of the channel was taken next time and as soon as the slightest wrinkle appeared the torch was moved on. Even after the torch was removed the paint continued to wrinkle up until it was just right and matched that obtained on the panels. Now that we had the procedure it was a simple matter to complete the remainder of the rack, including the thinner metal leg supports and cross members. And to top off the good fortune of having a wrinkled outer surface it was found that the paint on the inside of the rack had not been damaged at all even though the nose of the torch had been held about an inch away from it with the flame turned up full. The inner surface didn't wrinkle very well but did show a slight tendency toward it. One word of caution: In duplicating this heating procedure, be sure that the torch is good and hot before applying it to the paint surface and that the flame is pure and blue, as any yellow in it will deposit black soot on the cold surface.

(Continued on page 78)





HINTS AND KINKS FOR THE EXPERIMENTER



KINKS FOR THE DK-3 TRANSCEIVER

HERE are a few ideas which hams with DK-3 transceivers may find useful in making the unit more adaptable to both emergency and stand-by use.

The circuit diagram of the DK-3 is shown in Fig. 1. Provision for i.c.w. operation was made by connecting the plate of the modulator tube back through the audio transformer through C_7 , R_7 and S_2 , permitting the circuit to operate as an audio oscillator.

The audio oscillator is keyed by plugging the key in the microphone jack. In 'phone work, I have found that it is much easier for the receiving station to tune in the signal accurately with tone modulation. After a few seconds of tone signal, it is just necessary to throw S_2 to the right and start talking, since the microphone seems to have little effect upon the operation of the tone signal.

To save unnecessary battery expense, I have made provision for operating the unit from a.c. supply except for portable and emergency service. To eliminate the necessity for the microphone battery with a.c. operation, d.c. voltage is taken from the drop across a variable resistance substituted for the cathode resistance in the audio stage. The changes required in the original circuit are shown in the heavy lines of Fig. 1. The only additional components required are a

10-watt, 500-ohm adjustable resistor (R_4), a 0.1- μ fd. paper condenser (C_7), a 5000-ohm, $\frac{1}{2}$ -watt resistor (R_7) and an s.p.d.t. toggle switch (S_2).

For a.c. operation in the house, I use a 6.3-volt filament transformer and a "B" eliminator, although almost any low-voltage receiver pack may be used. The transceiver is fitted with a cable and 4-prong plug for connecting to the a.c. supply. This plug is also used to plug into the vibrator supply in my car for portable-mobile work. Since I found the output voltage of the vibrator pack a little too high for receiving, I have provided a 12,000-ohm series resistor in the plus B line which may be cut out with a toggle switch when transmitting. This gives me about 135 volts when receiving and 155 volts when transmitting which works out very well. It is a good idea also to install a switch for cutting off the car receiver when using the transceiver to prevent overload of the vibrator pack.

If the use of larger batteries is desired for economy, they may be placed in a box fitted with handles as a separate unit in which case the cable and plug may also be of use.

— Gordon J. N. Wiley, W1AUN.

CHEAP CABINETS FOR SMALL GEAR

I FIND that the steel filing-card cabinets sold in the five-and-dime stores make ideal cabinets for various pieces of ham radio gear. They

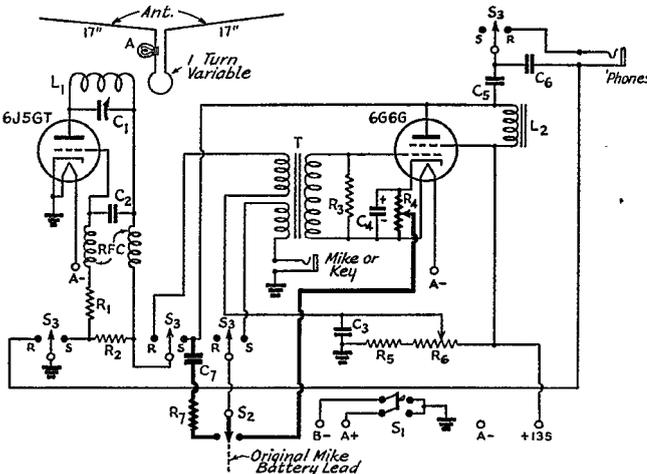


Fig. 1 — Revised circuit diagram of Abbott DK-3 transceiver. Changes from the original are shown in heavy lines.

- C_1 — 2-plate midget variable.
- C_2 — 100 μ fd., mica.
- C_3 — 0.25 μ fd., paper.
- C_4 — 10 μ fd., 35-volt electrolytic.
- C_5 — 0.25 μ fd., paper.
- C_6 — 0.01 μ fd., paper.
- C_7 — 0.1 μ fd., paper.
- L_1 — 3 turns No. 14, $\frac{5}{8}$ in. diameter.
- L_2 — Audio choke, 7-hy.
- R_1 — 2000 ohms.
- R_2 — 1 megohm.
- R_3 — 0.25 megohm.
- R_4 — 500-ohm, 10-watt adjustable.
- R_5 — 0.1 megohm.
- R_6 — 0.1-meg. potentiometer.
- R_7 — 5000 ohms.
- RFC — 2 $\frac{1}{2}$ -meter r.f. choke.
- S_1 — D.p.d.t. switch on back of R_6 .
- S_2 — S.p.d.t. toggle switch.
- S_3 — Sections of 4-pole d.t. switch.
- A — Flashlight or dial lamp.

come in an attractive olive-green finish and in two sizes, 3 inches by 3½ inches, by 5¼ inches and 4 inches, by 4½ inches, by 6½ inches, selling for fifteen and twenty-five cents respectively. I have built audio oscillators, monitors and ultra-high-frequency receivers in the smaller ones and ultra-high-frequency transceivers and portable high-frequency receivers in the larger ones. They are very strong and yet made of sufficiently thin stock to be very easily worked with the ordinary ham tools. They are available in almost any five-and-ten-cent store in the average-sized community. — *Edwin W. Hill, W4HMS.*

— . . . —

ANCHORING THE BUG

FOR once the brasspounder gets a lift from the bee-keeper. To those who are fed up on chasing a bug all over a slippery table top, and who do not wish to disfigure the table, simply go to a bee-keepers' supply house and purchase a sheet of what is known as "brood foundation." This is a thin, waffle-like sheet of beeswax, used by the bees to build their comb upon. If the wandering bug is placed upon a sheet of this material, just laid upon the table, I defy a blow from a twelve-pound sledge to move it in any direction.

Why did I have to suffer for twenty years before discovering this?

— *H. Seymour Jones, W6AX.*

— . . . —

IMPROVING THE PIERCE CRYSTAL OSCILLATOR

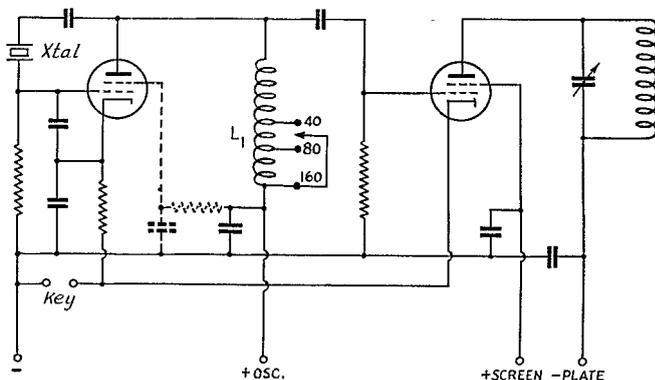
IN COMMON with a great many amateurs, the writer has a "portable-emergency" transmitter employing the popular 6C5 untuned Pierce oscillator driving a 6L6 amplifier. After extended periods of transmission, it was noticed that the crystal holder became very hot. When a 150-ma. pilot bulb was placed in series with the crystal, it was lighted to more than full brilliance. Reducing the plate voltage to a point where the

crystal r.f. current was brought down to a more reasonable value caused a great reduction in output. Just as I had decided to abandon the idea of the Pierce oscillator, I ran across a solution to my problem in the *RCA Guide for Transmitting Tubes*. It is a very simple solution, since it necessitates only the substitution of a resonant coil, L_1 , for the usual plate r.f. choke (see Fig. 2). This coil is resonant at a frequency somewhat lower than the crystal frequency. Where crystals on several bands are used, the coil is wound for the lowest-frequency band and portions shorted out for the higher-frequency bands. Since different amateurs may not use the same circuit lay-out, coil-form size or wire size, it would be difficult to specify a certain coil for all occasions. However, the adjustment of the coil is simplicity itself. If it is too large, the crystal current will be high; if too small, the circuit will not oscillate. The best procedure is to place a 60-ma. pilot bulb in series with the crystal and use a plate voltage not greater than 150 volts. Start with a coil of 200 turns or so for 160 meters, or about 125 turns for 80 meters. One coil which worked satisfactorily in my transmitter consisted of 85 turns No. 24 enameled wire, close-wound on a 1-inch diameter form. Turns should then be removed, a few at a time, until the pilot bulb barely ceases to glow. If the coil is to be tapped for operation on more than one band, the tap will be located at a point which gives reliable operation with the lowest crystal current.

In addition to the reduction of crystal r.f. current, it will be found that the circuit has greater output for a given plate voltage. The circuit will key smoother with "cranky" crystals and the value of the feedback condenser will not be at all critical. It is recommended that the article in the *RCA Guide for Transmitting Tubes* be read for further information.

With this circuit properly adjusted, it has been found possible to operate a 6L6G with 600 volts on the plate with less than 60 ma. crystal r.f. current! — *Ed Preston, W8CSE.*

Fig. 2 — W8CSE replaces the usual plate-circuit r.f. choke in his Pierce crystal oscillator to obtain reduction in crystal r.f. current. Other values are usual for this type of circuit.



NOISE FROM TRANSMITTER

I HAVE just finished clearing up a source of noise which might be of interest to others. I had first thought the mercury-vapor rectifiers to be responsible, but a check showed that the source of noise was somewhere else. I purchased two new filter condensers on the assumption that they might be leaking. These condensers were installed and the supply turned on without being connected to the transmitter. No noise appeared in either the communications receiver or the broadcast receiver. However, on connecting the supply to the transmitter, this machine-gunning again started, this time at a more rapid speed and much louder than before.

I started with the tubes and removed parts from the final amplifier. After removing tank coil, grid coil, r.f. choke and by-pass condenser, I removed the leads from the final-amplifier plate meter. At this time the noise stopped. I removed the meter from the panel and opened the case. I found that the shunt consisted of a short length of about No. 20 resistance wire, the only irregularity being that two turns of the wire were touching. The insulation on this wire is single cotton and was burned brown. I moved the turns of wire apart and reinstalled the meter. The interference is now completely gone.

It appears that there may have been some leakage across this point, but this leakage was not sufficient to cause any variation in the plate current reading of the meter. This might possibly be a good suggestion to others who are experiencing like trouble. It shows that the mercury-vapor tubes are not always to blame.

— J. P. Gilliam, W9SVH.

A THREE-DIRECTION DOUBLE-PITCHFORK ANTENNA

THE fine article by W2DKJ in the issue of *QST* for August, 1940, on the double-pitchfork antenna reminded me of the arrangement shown in Fig. 3, which I have used successfully.

The simple pitchfork antenna consists of two vertical half-wave elements spaced one-eighth wave-length. The elements are fed in opposite phase so that the combination is directive in the plane of the elements (direction A, for example). In the arrangement described in W2DKJ, a third half-wave element was added so that by switching feed from one pair of elements to the other, a second direction (B) was made available.

In the system shown in Fig. 3, a third direction (C) is made available simply by arranging the elements so that they are equidistant. There is a slight change in characteristic due to the fanning of the line at the antenna when switched over to the third direction but there is little change compared to the other two directions.

There is nothing new about this arrangement, or original, but I wanted to verify the fine re-

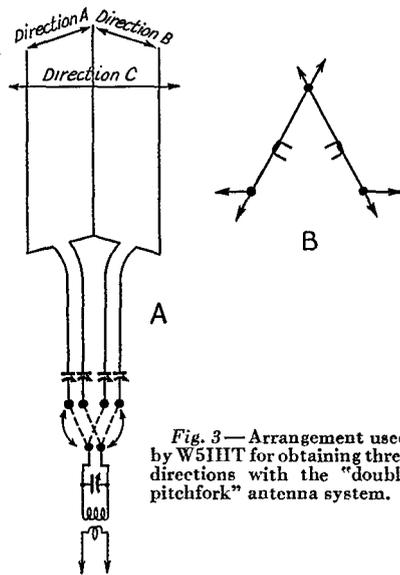


Fig. 3—Arrangement used by W5IHT for obtaining three directions with the "double pitchfork" antenna system.

sults of this type vertical antenna and to give you this arrangement used at my home station, for whatever interest it may be to you and antenna enthusiasts. — George Nelson, W5IHT.

It Seems to Us

(Continued from page 13)

new armchair knowledge to the rebuilding of our gear, we'll be ready to do a world-beating job when we are loose again.

WE NEED EACH OTHER

IN THE period now stretching ahead of us, we have got to hang together as amateurs whether we are serving in the armed forces, operating u.h.f. puddle-jumpers in civilian defense, or experimenting at home. The inspiring progress of the Radio Society of Great Britain during the last two years of war is an example of what can be done by amateurs in a country at war. Now is the time for clubs to build up their membership; the opportunity for meetings and social affairs is greater than ever. As we lose our contact on the air, we must make other arrangements to maintain it. The central one, of course, is our League. We must keep the League going through thick and thin — to continue to represent us, to get the information that affects us, to direct our efforts intelligently in the amateurs' contribution to winning the war, and so that we may have the organization to get back our full operating privileges when victory comes. Your League has a great deal to do and a great deal to offer you. *QST* is going to be more interesting and helpful than ever before and we need each other more than ever before. Let's stick together!

K. B. W.



CORRESPONDENCE FROM MEMBERS

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

THIS IS IT!

Wilmetta, Illinois

Editor, *QST*:

Well, fellows, this is it!

When the United States declared war, every one of us graduated!

Our care-free "college days" are over. Now we are going to find out what Amateur Radio really means.

These years of rag-chewing, tinkering, adjusting, experimenting, exchanging ideas and dope — these have been our school days. Already, looking back upon them, they seem to have that glow of happy memories; of close associations, sincere friendships, and intriguing momentary contacts with those in distant places. . . .

Rag-chewing? Sure, that was amateur radio. That was what kept it alive. We had to have those contacts to make it worth while to tinker and experiment; to pore over the pages of the *Handbook* in search of the needed dope; to get up in the middle of the night with a sudden inspiration and work for hours, sometimes until dawn, changing connections, testing, trying this, trying that, until we found the thing that spelled perfection in our rig. Sure, rag-chewing was a part of amateur radio; a necessary part, a beautiful, memorable part. We can never forget those swell QSO's wherein we just talked of this and that.

But now there is to be a different kind of amateur radio. It is something big; something glorious. Who knows, now, where it will lead? Before this is over, some of those hams you chewed the rag with will have become heroes. Amateur radio may have become an indispensable institution. We hope that it will. We must make it so.

Just now the amateur bands are silent. No QRM there now! But that is only an incident in the evolution of things. Gradually, they will again come to life, but this time it will be serious business. We are going to play a part in this colossal and intense project. We are going to be able to demonstrate that these rigs we have built are something more than toys to play with; that we have been preparing, through all these years, for the emergency — and that we are ready! . . .

— Harry A. Fanckboner, W9BPS

either 40, 20 or 10 meters. The only station in the amateur category which was heard was the ARRL headquarters station which kept up steady operation, giving all of us the last-minute FCC orders. . . .

I feel that the entire world should know that when it comes to an expression of proof of our united peoples, one need only turn to the American amateur radio operator. His thorough adhesion to last-second orders and regulations, his steady alertness and quick-mindedness to act at a moment's notice, provide proof enough. With this type of united front, we cannot possibly fail to achieve our final goal — Victory!

— Carl Beyil, W9ORQ/W2

Granite, Oklahoma

Editor, *QST*:

In our line of business [banking] we readily and wholeheartedly support our banking associations, national and state, in the positive knowledge that without these clearing houses of information and concerted action we would soon disintegrate into an unorganized mass of individual institutions working at random and with no objective toward better banking. It seems to me that the League should mean as much to each individual amateur as any business organization. It *does* mean as much, and it is up to us collectively to realize this and to support the League now as never before. Even though we may be temporarily off the air, and even though we be called upon to surrender *all* our privileges for a time, we as a body of Americans, must not begrudge or bemoan this sacrifice. It is a small one to what we may be called upon to make later. We may well consider that this time off the air is an investment to secure the privilege of some day getting back the privileges enjoyed by no other amateurs in the world.

Let's all support the League now and in the trying times to come. Let's keep the organization more alive than before, and when the trouble is all over we will be in a position to return to the air in a bigger and better way than ever.

Enclosed is my check for dues, and I hope that many more of the gang will respond in the same way.

— O. H. Ford, W6HXII

235 So. Lexington Ave., White Plains, N. Y.

Editor, *QST*:

Being a radio amateur and a news correspondent vitally concerned with the international developments which have so greatly affected our American "hamdom," I feel I am in position to commend my fellow hams.

First, however, it must be said that my job [W9ORQ/W2 works for Transradio Press. — Ed.] incorporates endless short-wave spectrum intercepting and general c.w. and radio-telephone listening. . . .

I wish to commend the American Radio Relay League, its staff and fellow members, for the perfectly splendid sense of coordination so wholeheartedly displayed when the FCC order was published. The ARRL's *QST* transmissions were "precision clock-work plus." But, aside from this, it was our duty to grasp this situation, which was new to most of us, and immediately do the right thing. I can find no words in the English language which will justly express the fine, all-out cooperative and patriotic "wave" which overhung the amateur radio bands on the historic night of December 8th, 1941.

Here at my listening post, where I had five receivers in steady 24-hour service, I could not hear a single ham on

c/o Naval Research Labs., Washington, D. C.

Editor, *QST*:

For the second time in our history we have been silenced. Order No. 87 is no longer a possibility but a reality! And what are the amateurs going to do about it? Are we going to forget amateur radio and pick up some new hobby, then cry our heads off to high heaven that our rights were not looked after? I say we should not. . . .

I think everyone should stand by the League, now more than ever, for it is going to be upon the shoulders of the League officials that the burden of getting us restored to the air will fall.

The League officials will soon, I am sure, adopt some policy for continuing our work during the coming months and it is up to us to aid this program as far as possible. . . .

Let all members stand by the League. Renew that membership now and keep it renewed. Stand by wherever possible and render service wherever possible. It is what the amateurs do *now* that will help determine their future status after this is all over. Let us serve our country now, so it will be here to serve us later.

— Lester Harlow, W6CVO/3

(Continued on page 84)



F. E. HANDY, WIBDI, Communicating Manager

J. A. MOSKEY, WJMY, Asst. to the Coms. Mgr.

"We are now in this war. We are all in it, all the way . . . a partner in the most tremendous undertaking. . . . We are fighting to maintain our right to live among our world neighbors in freedom and decency. . . . It must be remembered that our free and rapid communication must be carefully restricted in war time. . . . On the road ahead there lies hard work, gruelling work . . . sacrifice for all of us. It is not a sacrifice to do without things to which we are accustomed if defense calls for it. . . . Rather it is a privilege. . . . The future of this nation depends upon the manner in which each and every one of us fulfills his obligation to our country."

— Franklin D. Roosevelt.

The Immediate Job. The civilian defense problem is the one immediately before our institution of Amateur Radio. War means the imposition of additional controls in every field of civilian life as well as the suspension of the rag-chewing type of amateur radio and conversion of amateur frequencies to national defense uses. Amateur operators may assist the war effort in numerous ways. Production requires a score of workers for each individual in uniform. This is a war of technical skills and specialists. Numerous members are already in the services as specialists. Even more are needed! Many are in defense production jobs. The home front is most important and there are many ways in which amateur radio ability and technical skill can count on that front. A job of first importance for many civilian amateurs may be that of disciplined participation in the civilian defense communications plans-for-radio formulated to meet the approval of local defense authorities.

With the formal declaration of a state of war with Japan, Germany and Italy by the United States, the war is no longer far from our shores. It may come to you or me to-morrow, or even to-day. Selfish use must go out the window . . . must give way to defense-radio. Our amateur abilities must be rededicated to this task of home protection, and to the training of skilled specialists. In our radio clubs there should be continued and unremitting efforts (1) on code instruction, (2) radio theory technical classes, (3) on u.h.f. building and support of local civilian defense measures. Each individual radio amateur must find his place to serve in a responsible manner in this emergency so that our institution of amateur radio may contribute its utmost to the national effort.

Civilian Defense our Big Opportunity. As you learned immediately from WIAW bulletins

on all amateur frequencies (these transmissions continue daily, see schedule elsewhere in these pages), FCC's close-down order, December 8th, made it plain that certain amateur stations would be reauthorized by the DCB-FCC, but of course only for essential defense operations. The DCB policy of reactivating amateur stations certified by duly authorized federal, state, or local officials, raises to new prominence the public interest, convenience and necessity clause behind issuance of all amateur licenses. All non-essential non-useful activities of citizens that use up rubber, steel, or radio frequencies must be restricted in order to harness facilities to the utmost for our all-out war effort. As far back as the announcement of a new ARRL program (Aug. 1940 *QST*) we predicted that casual efforts must give way to the productive in referring to the challenge of the times. This civilian defense opportunity looks to us like the "big challenge," particularly for those amateurs in substantial centers on our two seacoasts.

At this writing scores of organized amateur groups have been certified. The flood of telegrams and letters to ARRL contain offers of assistance, and convey a significant new spirit. "How can I help win?" is the keynote! Amateurs offer transmitters free of transportation charges if we will place them in the all-out war to defeat our enemies. Letters end with "V" and "Remember Pearl Harbor." The spirit of unity and proper restraint (we hope) predominates. The acceptance of responsibility and self-discipline must be the spirit for defense-amateur-radio. Toil and sacrifice of time and facilities for the good of the community and the nation bring their own reward. The part of the amateur, as surely as any other part, can contribute to the success of the nation in its hour of common peril. In the months that may elapse before we become fully strong will come the maximum danger of air attack on the home front. Observers back from Britain have brought the story of the effect of bombings on wire communications. The need and use of radio as supplementary to wire and messenger service was indicated — to save lives, extinguish fires quickly, reduce property damage and assure maximum community protection for vital services. You will read (with this month's editorial) what the OCD communications plan will say about amateurs. The official government agency centralizing civilian defense problems has re-

ceived numerous visits from your ARRL officers; its recommendations have been passed upon by the DCB; now it rushes its information on communications in ARP services to the nation's communities indicating how amateur radio, and ARRL organized groups may fit into local situations.

Why is it possible to report to many municipal groups of amateurs already certified? How can one proceed where no local ARRL coördinator has been appointed? For many years, and especially in recent months the major emphasis in ARRL field organization has been on building up the Emergency Corps and appointment of additional Emergency Coördinators. Constant progress has been reported. The ability of our institution to serve in either a natural disaster emergency or wartime civilian defense has been emphasized. The readiness of those 4000 amateurs previously registered in the ARRL Emergency Corps, many with Emergency Coördinator group leaders already in touch with community officials is responsible for the swift completion of plans at many points during December with FCC reauthorization of stations for warning and report centers, fire and police service, etc. But a great deal remains to be done. Bulletins sent to its SCMs and Coördinators by ARRL in December have outlined the immediate steps. Where local amateurs have not had a meeting to get organized and assay what amateur radio has to offer in equipment and operators there should be such a meeting right away. It is not enough to keep antennas up and not dismantle, so your set may be made known to your Air Raid Warden and the City Hall as there for an ultimate need. There must be cooperative organization with every amateur licensee possible participating. If there is no coördinator, choose one of your qualified ARRL members in your group to recommend to your Section Manager (address on page 4 of QST) for appointment. This is the first piece of business before your meeting. The local newspaper will be glad to collaborate with amateur leaders in calling groups together to study defense problems. Many Coördinators have had meetings. If there have been none, find out why. All communities with two or more rigs available to be offered for defense use, should make the most of plans for emergency-radio links by organized planning in a local Amateur Defense Meeting.

Get ARRL Emergency Corps (Form 7) blanks¹ for civilian defense registering. See the steps under "what to do" (editorial). Get a leader if one isn't functioning. (1) Have a meeting — and repeat meetings as needed. (2) Register all amateurs. (All FCC operator licenses are good for work

¹ The ARRL Emergency Corps (Form 7) registration blanks may be obtained gratis by sending a stamped self-addressed envelope to ARRL Hq., or similarly from the nearest SCM or Emergency Coördinator, or at your local Western Union Telegraph office. Every radio amateur licensee is requested to register availability by completing such blanks at this time.

at reactivated stations providing they also have been individually reactivated. Each station may need five or six qualified operators to handle one equipment over a continuous period in real all-out local emergency. As many portables and self-powered equipments must be lined up as possible.) (3) Build u.h.f., adding to what you start with. It is not only a greater amateur service to provide gear, but the situation calls for planned disposition of what may be mobilized without more purchasing than essential. This conserves supplies and avoids delay. (4) Establish training so more near-licensed men may take their exams and be available to replace any lost to the uniformed service. (5) Organize, after local officials explain their needs to the meeting or to your leader. (6) Plan *one facility* to serve all local agencies as well as possible, with regard for priority as public interest requires at the time. Fire, police, protection, rescue, medical, demolition, warning, etc. services for the whole community, not devotion to one agency alone, but pooling of facilities by all, for all, is essential. Neither equipment or operators are plentiful enough to afford us the luxury of separate conflicting local organizations. Be sure to aim for a generous pool of operators and equipment to cover unexpected major gaps that pop up. (7) Sift your questionnaire information or registrations carefully before reporting same to the Chief Communications Officer or OCD aide in charge of ARP communications control for the mayor, municipal defense council, etc. You must get authorization from FCC-DCB on application of state, county or municipal authorities to be served before any tests may be made. Only patriotic, responsible, efficient operators who will operate in useful disciplined fashion should be certified and recommended and used in defense nets!

SCMs QRX all but ECs and AECs; ECs to Send Station-Activities Defense-Items. Every ARRL Section Manager has been requested to expedite appointments of Emergency Coördinator leaders for different communities in his Section. Emergency Coördinators received full instructions under date of December 12th, and they aim at nothing short of 100% registrations of every amateur licensee in the ARRL Emergency Corps. Each Coördinator is the spokesman and representative of the amateur (to civilian defense authorities) for his community. In order that the full force of all of our efforts may be turned into the desired channel, all ORS-OPS-OO-OBS-RM-PAM appointments in the field organization of the League are considered to be suspended-for-the-duration. Certain bulletins on the current situation will be issued to all groups, pointing especially to the ARRL programs, defense needs, and opportunities, but these will not necessarily follow a quarterly or weekly schedule. By relieving SCMs of the necessity of making any reports, except for Emergency

Coördinators, of endorsements or cancellations (and freezing the list, except ECs, as of this date), they may put the full force of their efforts into development of the Emergency Corps whose reactivated personnel will provide all the Operating News of the present.

All appointees and leaders whose functions are suspended thus as a secondary effect of FCC-DCB action are urged to step forward where SCMs are looking for Emergency Coördinator leadership or handling of local meetings. 100% registration of appointees in the Emergency Corps itself may of course be almost taken for granted.

Station Activities reported by SCMs this month contains a wealth of information about the response of amateurs in all the ARRL Sections to the call of defense officials for their services. We have asked all SCMs to make this department a medium for reporting the progress and procedure and group-plans so all amateur radio may profit in the exchange of experience. Different local necessities and determinations govern particular civilian defense setups. Concise, cogent, paragraphs for each community setup of the many different regions will help newcomers and existing groups to adjust perspective and adduce answers for special problems. We can exchange data of the practical kind needed, barring anything of military value, of course. Every amateur operator and station in this defense-station-activity will be represented in his group-report if information is sent the SCM each month without fail. *Each Emergency Coördinator is requested and urged to submit a report to the SCM each month on progress and plans and meetings, all activities covering the 16th of one month to the 15th of the following month inclusive. Local amateurs should each report to and through the Coördinator. A new form will be available to coördinators to facilitate regular reporting. All amateurs can share some pride in the generally patriotic organizing-for-defense picture already taking form behind this months reports.*

Operating Precautions and Discipline Necessary. Reactivated amateur stations with new FCC authorizations giving the name of the local sponsoring authority are the *only* stations that may engage in *any* operations. Those currently reauthorized must be responsive to orders from the highest authority, those issued by the War Department's Interceptor Command. "Radio silence" means just that! In the western theater of operations such a continuous radio blackout has been required of amateurs in California, Oregon, Washington, Montana, Idaho, Nevada, and Arizona for security purposes. This does not stop reauthorizations and probably, if needed after an air raid, the precaution might be relaxed. In other sectors, until and unless qualified orders are issued excepting certain groups

using certain frequencies, all amateurs activated, or the NCS of directed nets may test if and when permitted by their sponsor, but must monitor local or key broadcast stations for the radio silence signal as shown by absence of the carrier or the special signal and announcement (preceeding silence) in the case of the key area station. When received instant silence is indicated required.

Unnecessary conversation between operators, rag-chewing, idle chatter, contacts not essential to perfecting or use of the sponsors radio facility, operation in any period when radio silence is indicated, excessive testing, undisciplined work or any violation of FCC amateur service regulations may result in cancellation of an individual reauthorization. Near-by local Coördinators must arrange by meetings or telephone which frequencies or u.h.f. band portions will be assigned for adjacent communities, to avoid jamming and interference in emergency — not engage in radio discussions of such matters. Net controllers must keep strict discipline. Those with NCR or AARS or ORS Net experience will know what is meant. A local meeting devoted to illustrating network procedure, how stations ask permission to transmit, etc., should be profitable. Individual operators must regard their FCC-DCB authority as tentative, the future depending on how they individually make use of it. It is something not to be abused. Individually or for the groups it is subject to revocation unless good judgement is continuously observed and operation limited specifically to that (1) permitted by the Interceptor Command, (2) approved by the official sponsor locally.

ARRL EC's must bear in mind that FCC monitoring stations get lists of those authorized and watch and report all that goes forward. If individuals abuse their reauthorization, the sponsor should give proper warning and even request FCC-DCB revocations for the troublesome individuals unable to contribute properly. Let no one muff our One Big Chance! To build an effective facility some tests at proper intervals are necessary. Local transmission conditions between fixed points must be determined perhaps. Caution and restraint, too little rather than too much testing is to be preferred at this stage of affairs. It's a time for efficiency, not headlines. The air sounds strange these days, but organizers should be practical, not melodramatic. (We heard a test Msg. called an "official communique"!) Remind your group to study operating procedures as set forth in the "network organizing" section of Operating an Amateur Radio Station.² Tell each to operate as though he knew his transmission was being copied by an FCC monitoring car across the street from his station. This defense

² This booklet is sent gratis to ARRL members who request it, or supplied to any amateur who sends 10¢ to ARRL Hq. requesting the booklet *Operating an Amateur Radio Station*.

job is one that takes skill. It must be done right.

In Conclusion. We're sorry that our remarks on this page last month on the Code Proficiency Program and a certain "160" Band-Warming Party turned out to be out of line with the possibilities. You can blame those who planned the Pearl Harbor atrocity for that. Every ARRL officer is working for and hoping for authorization for the Code Proficiency Program. Copies of one or two petitions spontaneously got up by clubs to be sent to the FCC, and letters from those in the services who had been using the program, now deploring its absence make us more wishful about the Program daily . . . and we hope the national standard and training incentive of that Code Program can be restored shortly.

The Emergency Corps re-registration is being temporarily postponed as the pressure of current correspondence places an unusually heavy burden on SCMs and ECs in the field as well as Hq. without this routine. First things must come first. The local meetings and organization for wartime civilian-defense duty answer every desirable purpose — and current registrations will double our Emergency Corps shortly. So we're not going to re-examine or reregister until the current period of new-building-u.h.f. makes national reappraisal a more finished and conclusive possibility.

Staff changes again hit the Communications Department. Hal Bubb, W1JTD and top operator at W1AW for some seven years, leaves us for a defense job closely allied to radio. The test stuff he puts together will help keep 'em flying. We're mighty sorry to lose the valued services of "Hal." Similar regrets when a month ago we had to bid goodbye to Jim Buckler, W9NFL-W1NKC, who was off to the dark continent to meet adventure, and serve the cause of democracy through radio operating for Pan American Airways Africa, Ltd.! Good luck, to both, and we know every ARRL member wishes them the same. The new fist that you hear from W1AW is that of a new CD staff member. Recently elected as SCM of Missouri, Robert C. Morwood (Bob) of W9QMD, barely completed his second report before entraining for West Hartford. He needs no introduction to friends in the Midwest and he'll keep the wheels turning to the best of his ability so you get the latest from W1AW as the news develops. George Hart (Geo), W1NJM, becomes chief operator at W1AW.

— F. E. H.

BRIEFS

In case you've been wondering what FD station sported that nifty location pictured in the heading of the writeup on the Ninth ARRL Field Day published in last month's QST, it was W7RT/7 operated single-handed by John Gruble.

Brass Pounders' League

(November 15-December 7)

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
W4PL	14	35	1260	28	1337
K7HZM	0	0	1224	0	1224
W3BWT	42	115	799	110	1066
W8DAQ	17	32	608	23	680
W9ILH	22	53	556	17	648
W5MN	33	74	444	61	612
W9NSU	8	11	582	11	612
W6RBU	16	144	298	144	602
W1BDU	9	98	400	91	598
W6IOX	9	47	507	9	572
W9UQT	5	6	538	4	553
W1BXC	34	2	432	45	513
W9IHN	11	35	431	26	503

These stations "make" the B.P.L. with total of 500 or over. One hundred deliveries + Ex. Del. Credits also rate B.P.L. standing. The following one-operator stations make the B.P.L. on deliveries. Deliveries count.

W8TMA, 204	W4AOB, 130	W2LZR, 119
W8TZD, 149	W9BRD, 127	W3UF, 112*
W2KI, 143	W3AOC, 123	
A.A.R.S.		

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
WLMH (W6CDA)	13	12	698	6	729
WLMH (W6CDA)*	5	9	485	8	507

A total of 500 or more or 100 deliveries + Ex. D. Cr. will put you in line for a place in the B.P.L.

* Oct.-Nov.

W1AW Schedules

For Transmission of Messages to All Radio Amateurs.

W1AW SENDS its informative DCB-FCC, etc., information and interpretations of current communications orders concerning all amateurs at speeds to suit different listener tastes and abilities. Information is repeated on c.w. several times each evening. Note the starting times given below. Messages are tape sent simultaneously on the following frequencies: 1906, 3575, 7150, 14,254, 28,510 and 58,980 kcs.

C.W. starts at

2:30 P.M. EST, 25 wpm
4:00 P.M. EST, 15 wpm
6:00 P.M. EST, 25 wpm
*7:30 P.M. EST, 15 wpm
*9:30 P.M. EST, 20 wpm
*11:00 P.M. EST, 15 wpm
1:00 A.M. EST, 20 wpm

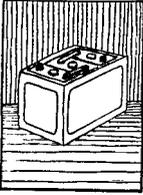
Radiotelephone transmission follows code transmissions, as announced by operator, and sent consecutively on 1906, 3950 and 14,237 kcs.

Ten-meter transmissions on 'phone are added (daylight) only (extra) as conditions warrant. 56-Mc. 'phone will be used simultaneously with each 1906-Kc. 'phone transmission. When operating, the station constantly monitors the key area station, to be ready for radio silence or blackout precautions as required. Also, in accord with DCB requirements, visiting access to W1AW has to be restricted to that in connection with the business of station operations.

1.75-Mc. C.W. "Calls Heard"

From time to time we hear amateurs say that there just isn't any c.w. activity on 1.75 Mc. For the benefit of these and others who are interested in that band we here list calls heard by two Headquarters operators, WITS and Hal

* (Daily, except Sat & Sun when station on 6 hr. shift transmits as per (*).)



FOR THE COMING MONTHS, it is more than ever important that amateurs be prepared for emergency operation. Since emergency work frequently requires being independent of the power mains, many amateurs will have to use existing receivers operating from batteries.

Such being the case, we are going to give a few pointers on operating National receivers from battery power. We are not going to say much about the power supply itself, because vibrapacks, genemotors and B-batteries have been well covered in recent issues of *QST* and in the Handbook.

If necessary, it is quite practical to operate National Communication Receivers such as the HRO and NC-200 from B-batteries. Using headphones with the output tubes removed, the current drain is low. Plate voltages as low as 90 volts will give good performance, so that many hours of service can be obtained from a 135 volt battery. The B-supply switch disconnects all voltage dividers as well as plate and screen circuits, so there is no current drain during stand-by periods. Of course, the transmitter is likely to require more power, and if you have a vibrapack or genemotor it should be used for the receiver as well. Just the same it is well to remember that B-batteries will do the job.

The NC-200 presents no problem when operating from batteries, because it is provided with a battery plug for this very purpose. Similarly, the HRO can be readily connected to emergency power through its regular power cable. The same thing is true of the One-Ten and the NHU.

Receivers of the NC-100 series having a built-in power supply require a circuit change because the 6.3 volt winding of the power transformer would short circuit any D.C. voltage connected to the heater circuit. The simplest arrangement is to connect the storage battery in series with one of the heater leads, allowing the DC current to pass through the transformer winding. For convenience, the leads to the storage battery can be brought out to a plug at the back of the receiver. In this case, a jumper can be plugged in to complete the circuit for AC operation, thus making the receiver universal.

The table below gives current drain with the RF gain full on for the HRO and NC-200 for different plate voltages. The current drain for the NC-100 is similar to that of the NC-200 with output tubes removed; with all tubes operating the NC-100 uses slightly less current.

DANA BAGON

HRO RECEIVER			NC-200 RECEIVER		
Plate Voltage	Output tubes in	Output tubes out	Plate Voltage	Output tubes in	Output tubes out
230	65 Ma	45 Ma	285	100 Ma	40 Ma
180	60	40	180	60	25
135	45	30	135	45	20
90	30	20	90	30	10





As-is? Heck-No!

When conditions are normal, it is easy for manufacturers to go along on an "as-is" basis. But now, owing to the vital wartime production program, conditions are abnormal. Some raw materials are no longer available. Others are to be had only in limited quantities. Established specifications speedily become obsolete. Changes in production-routine and material substitutions (with their attendant design-changes) present a challenge . . . if quality is to be maintained.

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of WIAW between last November 25th and 30th in proof of the fact that there is (Was! — Ed.) activity on 1.75-Mc. c.w.

WITS

WIAEF, 1AW, 1AYG, 1BWJ, 1IFS, 1JDP, 1JQD, 1JTB, 1KQX, 1LGE/3, 1LKP, 1LPM, 1MJU, 1NMF, 1NPA, 1ZAC, 1ZK, 2BLF, 2BQT, 2DFW, 2DLR, 2ESO, 2KYF, 2LPV, 2MVB, 2NLE, 2NMZ, 2NYZ, 2OAH, 2WH, 3AJX, 3AQN, 3BJU, 3DDX, 3DR/4, 3GHR, 3GQT, 3GUT, 3HHC, 3HKE, 3HUM, 3HVD, 3JNH, 3JNZ, 3QW, 3AII, 4AJT, 4AUP, 4EOL, 4EDE, 4ED, 5PFS, 5FHS, 6GCG, 6GCU, 5HEQ, 5HT, 5IZ, 5JIC, 5JIP, 5JSU, 5KXP, 5LC, 6JLY, 7GUX, 8AC, 8ASJ, 8BAL, 8BJB, 8BOF, 8CNY, 8CXT, 8DLI, 8EED, 8EFF, 8HFR, 8HMH, 8IEZ, 8IOH, 8JYK, 8KYI, 8LCY, 8MTZ, 8MYK, 8NMJ, 8NZH, 8OKU, 8PCB, 8PLA, 8PQT, 8RGH, 8RKM, 8RPS, 8ROS, 8RTD, 8RYZ, 8SKH, 8SL, 8SMH, 8SQF, 8TEX, 8IGX, 8TQA, 8TWC, 8UDD, 8UPH, 8UOK, 8URM, 8VDA, 8VRE, 8VWJ, 8WGD, 8WDO, 8WFA, 8WNG, 8WVG, 8AB, 8AEY, 8AHJ, 8ALS, 8AND, 8BOB, 8BIK, 8BIL, 8BTE, 8BZL, 8CHI, 8CMZ, 8DKA, 8DKH, 8DIZ, 8DQ, 8DRT, 8DSJ, 8EHO, 8EJL, 8ENN, 8EUJ, 8EYH, 8EZF, 8FCX, 8GCG, 8GEN, 8HCH, 8HUV, 8IHQ, 8IQH, 8JOC, 8JCE, 8JSS, 8KPA, 8KUM, 8KZY, 8LFR, 8LWE, 8MPC, 8MC, 8MQB, 8NQT, 8NYI, 8OKH, 8PIR, 8PQC, 8QRL, 8QMJ, 8QUV, 8REH, 8RQM, 8RAN, 8SUC, 8TCH, 8TZL, 8UCT, 8UYD, 8UMU, 8UXR, 8VGD, 8WBI, 8WNZ, 8WQB, 8WQH, 8YBY, 8YJL, 8YZS.

WIAW

WIEMG, ANC/2, JQD, LPM, LGE/3, EPE, AEF, W2DFW, WS, W3DDX, HVD, HKE, W4AII, W4AUP, W5LJJ, JSU, W8CSE, AQ, VLK, TEX, PLA, RYZ, RPS, VWT, OKU, VDA, URM, PFK, WDL, W9IHQ, VGD, ABZ, MUX, DB, QUV, KZY, DBA, BOB, GOM, NLS.

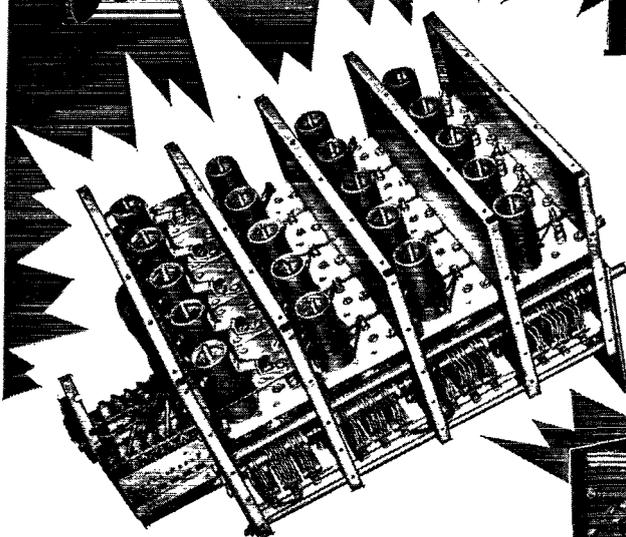
High 1941 "SS" Scores

Last November 8th-9th and 15th-16th will long remain in the memory of many contest hounds as the week ends during which was held one of the keenest amateur radio operating competitions of all time. Two busy week ends they were with practically every kilocycle of the commonly used 'phone and c.w. bands jammed to capacity (and then some!). Each year we wonder if and to what extent the seemingly peak performances of the previous SS will be bettered. We thought the top had been just about reached in 1940 when the leading station made 703 QSOs. Imagine our amazement when this time a log was received showing 128 contacts more than that figure! W9FS is the feller who turned in this astounding performance; he worked 351 stations in 63 sections for the staggering total of 130, 882 points. No less worthy of mention are the other six scores over 100,000. Tops in the 'phone contest is W9RBI with 53,680 points and W9YQN, 51,179. The listings following show score, stations worked and sections worked, in that order. All these figures are, of course, only claimed scores and subject to further checking. Complete official results are scheduled for April QST.

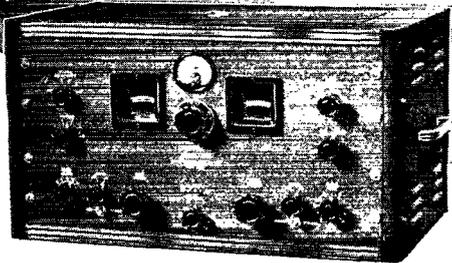
'Phone	W5IGS	18792-163-58
W9RBI	W9OD	18240-190-48
W9YQN	W6GSB	18020-172-53
W9NDA	W2DMJ	17850-179-50
W1HKK	W1HRI	17160-142-47
W6AM	W8NDN	16544-176-48
W9YXO	W8NCV	15275-166-47
W9NVW	W5FJP	14700-150-49
W8FMF	W8EMP	14612-143-52
W8NMF	W9TFP	14270-147-43
W4FLS	W9ENI	13800-138-50
W8QDU	W8QAD	13596-134-47
W6CHV	W8GYR	13500-150-45
W9KQX	W7QP	13362-142-51
W5FH	W3EZR	13160-140-47
W3HDJ	W9ZYL	12584-144-44
W9ZIX	W9ARE	11960-115-52
W9OMG	W9DZE	11960-133-46
W9SZB/9	W6CPT	11914-163-37
W9GWL	W3BET	11352-133-43
W5HNW	W1LOA	10967-108-41
W8PXP	W3EQK	10332-126-41
W5PFD	W9LVZ	10306-124-43
W6ULG	C.W.	
W6DTB	W9FS	130882-831-63
W5IRO	W3BES	115165-744-62
W9ADJ	W2JAE	108885-714-61
W2JKH	W2IOP	106445-718-61
W8MXL	W9RQM	106330-638-62
W9HVW	W9DIR	104440-696-60
W9NGG	W8JIN	102690-653-63
W1IIM	WITS	99583-653-61
W6SPQ	W8OFN	98349-649-61
W1KAN	W9GFF	95635-618-62

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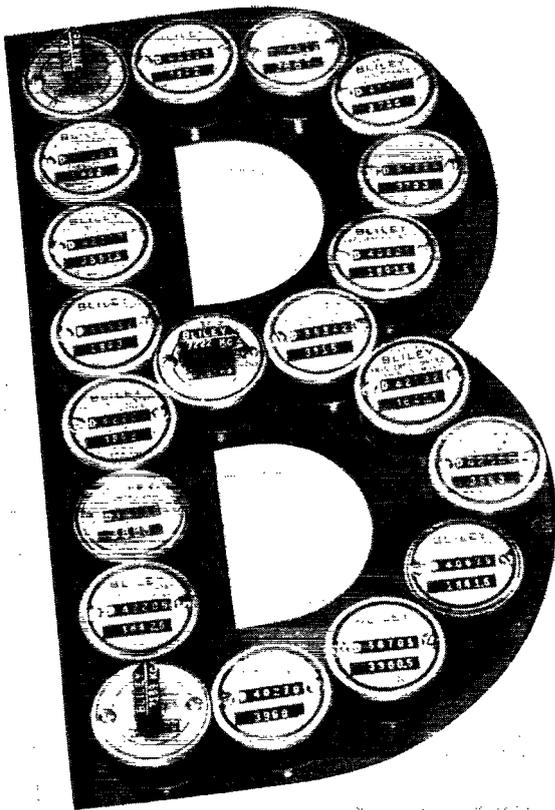
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W8HGW	95524-607-63	W5JTO	64852-529-62
W9YFV	94450-620-61	W3IWM	64310-437-59
W9BRD	90051-591-61	W3HXA	64170-414-62
W3GAU	83700-548-62	W9IHN	63510-440-58
W9VDY	83570-550-61	W8FGX	63278-435-59
W8OKC	83550-563-60	W6YX	63135-414-61
W3HFD	83275-537-62	W1RX	63125-415-61
W9YWQ	82800-552-60	W1LHK	63071-564-61
W3ITR	81000-540-60	W9ZRP	63000-420-60
W9ZAR	80978-532-61	W3CRW	62415-438-57
W4WE	80445-510-62	W6NIK	61120-406-61
W9VKF	78895-510-62	W9ZWR	60950-460-53
W8RSP	78300-540-58	W4AKH	60662-411-59
W3FRY	77500-500-62	W3DVC	60619-399-61
W1KQY	76950-513-60	W6VB	60480-507-60
W3HYT	76026-518-59	W3DMQ	59537-412-58
W3IKW	75330-486-62	W8UKB	58912-507-58
W9FOI	72720-607-60	W1BIH	58575-427-55
W8UWV	72375-485-60	W8SSC	58199-412-57
W9JRI	71765-463-62	W2JUJ	58000-400-58
W8ROX	71025-480-60	W3CHH	57288-412-58
W3BXE	69750-450-62	W8SDN	57230-388-59
W8EUY	69030-468-59	W2LJY	57143-402-57
W7VY	68948-548-63	W9ZTO	57035-393-58
W3BTQ	68735-476-59	W3GHM	56788-388-59
W8NCJ	68600-490-56	W8IFT	55460-504-59
W3FLH	68150-470-58	W2AYJ	54625-390-55
W8SLH	67629-462-59	W2LTP	53900-415-54
W8KWI	67374-473-57	W9LDH	53100-361-59
W2MBS	66817-453-59	W6MVQ	52860-453-60
W3GJY	66450-443-60	W6BVM	51832-419-62
W6IOJ	65844-535-62	W8SMC	51410-402-53
W9UIT	65540-452-58	W3FSP	51371-361-57
W8RCN	65450-476-55	W5FFW	51020-426-60
W3JBC	65250-435-60	W9KBL	50243-347-58
W8OYT	65048-441-59	W6BBR	50085-319-63

ARTICLE CONTEST

The article by Mr. James H. Green, Jr., W8MYW, wins the CD article contest prize this month. We invite entries for this monthly contest. Regarding subject matter, we suggest that you tell about what activity you find most interesting in amateur radio. Here you will find an almost limitless variety of subjects. Perhaps you would like to write on working for code proficiency, Emergency Corps planning, traffic work, working in Section Nets, Phone and Telegraph operating procedures, holding a League appointment, working on radio club committees, organizing or running a radio club, the most interesting band or type of ham activity, or some other subject near to your heart.

Each month we will print the most interesting and valuable article received. Please mark your contribution "for the CD contest." Prize winners may select a bound *Handbook*, *QST* Binder and League Emblem, six logs, eight pads radiogram blanks, DX Map and three pads, or any other combination of ARRL supplies of equivalent value. Try your luck!

Service

BY JAMES H. GREEN, JR.,
W8MYW *

IN THE first few pages of the *Radio Amateur's Handbook* the following paragraph appears:

"Amateur Radio is one of the finest of hobbies, but this fact alone would hardly merit such whole-hearted support as was given it by the United States government at recent international conferences. There must be other reasons to justify such backing. One of these is a thorough appreciation by the Army and Navy of the value of the amateur as a source of skilled radio personnel in time of war. The other is best described as 'public service.'"

The time has come for the amateur to show that this confidence in him is not misplaced.

* Department of Physics, University of Rochester, Rochester, N. Y.

Active ————||—————

Rugged ————||—————

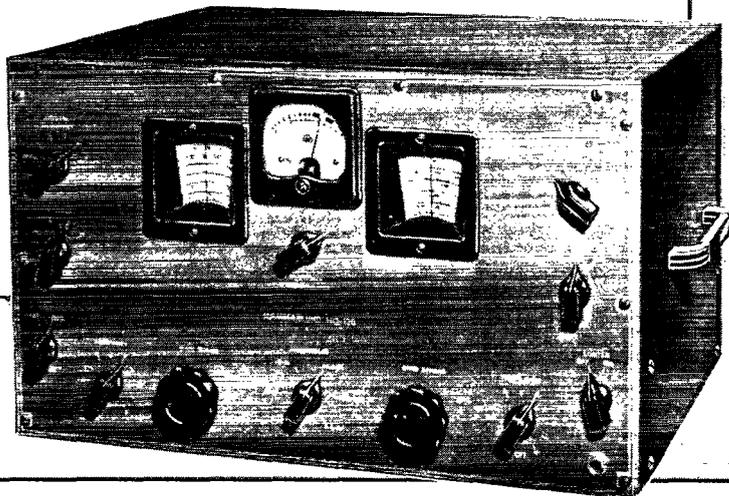
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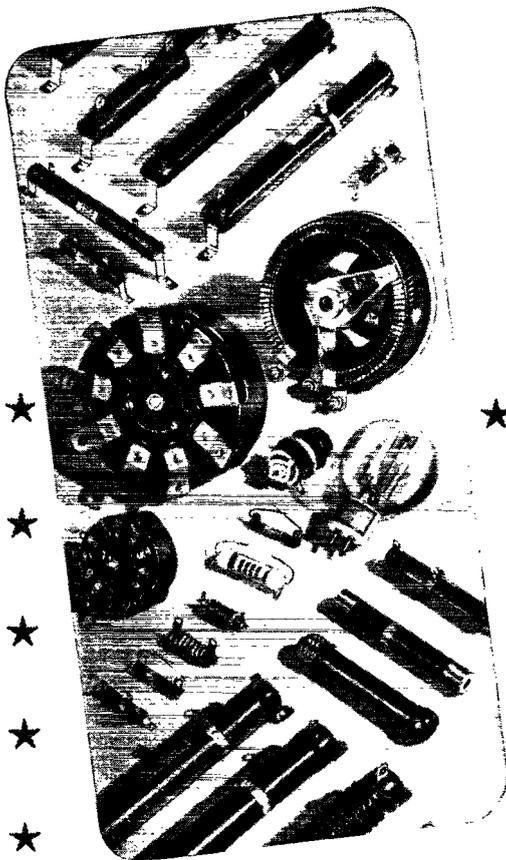
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In this grave period in our national history every man must do his utmost to aid in the war effort. This means more than biding your time until drafted and then proudly announcing, "I want to be in the Signal Corps. I'm an amateur."

It behooves each and every one of us to improve his operating ability. To this end our radio clubs can organize classes in code proficiency** and operating technique. These skills can always be put to good use whether it be in the armed forces or in home guard units.

We are obliged as well to expand our technical knowledge. Many universities are offering tuition-free defense courses in radio. Where these facilities are not available the problem becomes more difficult but by no means insurmountable. Many good books are available which are well within the scope of the average amateur and which may be studied at home without the aid of an instructor. Terman's "Radio Engineering" and Everett's "Communications Engineering" are two excellent books in this category. A more comprehensive bibliography is contained in the *Handbook* which itself contains a wealth of information scarcely touched by the average amateur. The time has come for all of us to make a concerted effort to be better amateurs.

Our responsibility does not end however with our determination to improve our technique and expand our knowledge. All this will be of no avail if we do not put these talents to immediate and effective use.

By no means all amateurs should be in our armed forces. The course of action for those in that category is obvious. Many are outside the age limits specified by our Army and Navy; still others are needed in our defense industries. To this latter group comes the opportunity to do just a little more than we are actually called on to do, a "little something extra" which it would be almost reasonable to neglect.

Airplane-spotting organizations, home-guard units and similar organizations are desperately in need of men trained in communications engineering. Make your abilities known. Remember Pearl Harbor!

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 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 West Hartford on or before noon of the dates specified.

Due to a resignation in the San Joaquin 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, Monday, February 2, 1942.

Section	Closing Date	Present SCM	Present Term of Office Ends
Philippines	Feb. 2, 1942	George L. Rickard	Oct. 15, 1938
Kentucky	Feb. 2, 1942	Darrell A. Downard	Apr. 15, 1940
San Joaquin Valley	Feb. 2, 1942	Edwin A. Andress (resigned)
Hawaii	Feb. 2, 1942	Francis T. Blatt	Feb. 28, 1941
New Mexico	Feb. 2, 1942	Dr. Hilton W. Gillett	Apr. 15, 1941
Sacramento Valley	Feb. 2, 1942	Vincent N. Feldhausen	June 15, 1941
Western New York	Feb. 2, 1942	Fred Chichester	Dec. 6, 1941
Nevada	Feb. 16, 1942	Edward W. Heim	Nov. 1, 1941
Oklahoma	Feb. 16, 1942	R. W. Battern	Nov. 1, 1941
Eastern New York	Feb. 16, 1942	Robert E. Haight	Nov. 1, 1941
Southern Texas	Feb. 16, 1942	Horace E. Bidley	Dec. 23, 1941
Eastern Mass.	Mar. 2, 1942	Frank L. Baker, Jr.	Mar. 11, 1942
Montana	Apr. 1, 1942	R. Rex Roberts	Apr. 15, 1942
Indiana	Apr. 1, 1942	Harry B. Miller	Apr. 15, 1942
San Diego	Apr. 1, 1942	Louis A. Cartwright	Apr. 15, 1942
South Dakota	May 1, 1942	E. C. Mohler	May 18, 1942
Alabama	May 15, 1942	James F. Thompson	May 22, 1942
Virginia	May 15, 1942	Frank S. Anderson	May 27, 1942

** Code Proficiency Club Award Certificates are available and will be furnished gratis by A.R.R.L. to bona fide radio clubs (1) that undertake to conduct code classes and qualifying tests, (2) that schedule local competitions between large or small groups of amateur operators to stimulate interest in code proficiency. The certificates are so designed that they may be awarded to individuals for either sending proficiency or receiving proficiency. Clubs are invited to write A.R.R.L. Headquarters for a supply of awards sufficient to meet the needs of their particular programs.

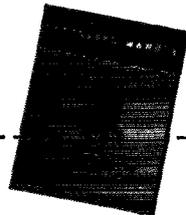
**HEY SPIKE, HE USES GL-807's
JUST LIKE THE COPS!**



IF Spike and Joe make a habit of stopping at hams' homes, they will find a lot of amateurs using GL-807's "just like the cops." For your sake, we hope they don't start collecting them instead of silver.

The GL-807 will give you record-breaking performance as a grid- or plate-modulated r-f amplifier, crystal oscillator, doubler, quadrupler, modulator, or buffer. It's being used extensively in FM broadcast transmitters and police communication systems. You can't buy a more versatile performer for \$3.50. Less than half a watt drives a pair; ICAS cw output: 100 watts!

Ask your dealer to show you the GL-807. And for your other tube needs, too, try G-E's—measure the difference yourself.



**FREE!
DATA BOOK ON RECEIVING TUBES**

It's different: 24 pgs., 8½ x 11. Includes tube dimensions, base connection diagrams, and interchangeability chart. It lies flat; the type is easy to read; technical information is in easy-to-get tabular form.

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- GEA-3315C on G-E Transmitting Tubes
- GEA-2021C on G-E Pyranol Capacitors

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Little in size, but BIG in performance, the HY75, HY114B, and HY615 are automatically associated in the mind of the amateur with top efficiency on the now vitally-important ultra-highs.

It is a pleasure to assure the amateur that there is no need to use second-best substitutes for the unsurpassed Hytron U.H.F. tubes he needs so urgently for Civilian Defense.

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There will be no nerve-wracking, anxious moments for you, if you use Hytron tubes, even at their full continuous-duty ratings. Conservation of equipment, especially of tubes, is vitally important today. Read in December QST, K. B. Warner's moving editorial plea for careful, reasonable operation of tubes. Give yourself that safe, secure feeling; be ready with Hytron tubes for any Defense emergency.



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Manufacturers of Radio Tubes Since 1921

A DIVISION OF
HYTRON CORP.

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 the By-Laws.

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 in alphabetical sequence 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 dates 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:

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. Each candidate must have been a licensed amateur operator for at least two years and similarly, a member of the League for at least one continuous year, immediately prior to his nomination or the petition will likewise be invalidated. 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 to the number of petitions that may be filed, but no member shall sign more than one.

4. Members are urged to take initiative immediately, filing petitions for the officials of 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, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Northern Texas	George W. Smith, Jr., W5HIP	Oct. 1, 1941
Md.-Del.-D. C.	Hermann E. Hobbs, W3CIZ	Dec. 1, 1941
Connecticut	Edmund R. Fraser, W1KQY	Dec. 13, 1941
Louisiana	W. J. Wilkinson, Jr., W5DWW	Jan. 2, 1942

BRIEFS

WIHDQ, QST's u.h.f. contributing editor, sends us this story. Shortly before Thanksgiving, K6M VV's son, W9GEQ, Golden, Colo., fell and sustained a liver injury. An emergency operation of considerable seriousness was required. Through the medium of W9YQW, Denver and the station of W9GEQ, information on the son's condition has been constantly available to the anxious father. W9GEQ is now on the road to recovery, apparently, and he was connected up at the hospital by telephone and radio to his father in Waiialua, Hawaii, regularly. He was, in fact, in contact with his father almost as soon as he was able to talk at all.

During this trying period, when there was considerable question of saving the son's life, you can imagine what these skeds meant to Ken Bryan. Accustomed to battling the QRM on both 28 and 14 Mc. (and it is terrific out there in K6), it has been a revelation to Ken to see the boys on both bands provide him with a clear channel when it was needed. He is deeply grateful, and dictated the following statement to WIHDQ on 28 Mc.:

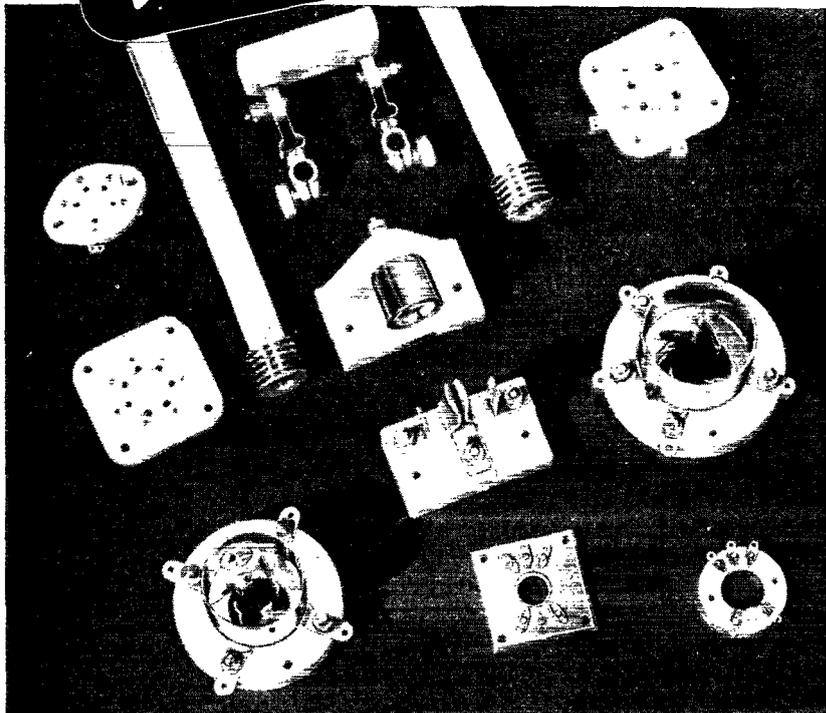
"To the many amateurs who have cooperated with K6M VV, W9YQW, and W9GEQ, on skeds during the week of Thanksgiving, I wish to express my very sincere thanks. This has been a rather unusual emergency, and we have had remarkable cooperation from all. It is impossible to mention calls as many of those who have cooperated are unknown to me. Aloha and 83. — Ken C. Bryan, K6M VV."

P.O.W.

It is reported that the following amateurs are being held as prisoners of war:
Gunner P. Sneath, G4FI, B.P.O.W.,
11417, Stalag, IIID, Germany.
Sgt. William Spink, G5SP, B.P.O.W.,
21132, Stalag, VIIIB, Germany.

JOHNSON

for tube sockets



SOCKET	FOR
209	5 watt
210	5 watt
211	50 watt
212	RCA 833
213	152TL
214	1500TH
215	250 watt
216	204A
217	7 prong
224	4 prong
225	5 prong
226	6 prong
227	7 prong
228	8 prong
235	Acorn
237	RCA 813
245	Acorn
247	RCA 829

If it's a tube socket, the chances are that Johnson makes it. Listed above are some of the more common types manufactured regularly in large quantities, and available from your Jobber. Others are supplied on special order or to the customer's specifications.

In the illustration will be noticed some of the old familiar stand-bys. Also illustrated is the 212 for RCA 833 and the 245 with built in by-pass condensers for the Acorn tube. When you buy a tube socket be sure to look for the name Johnson. It's your guarantee of quality.



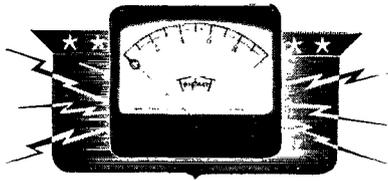
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For TRIPLETT Customers Only

LONG BEFORE the state of emergency was proclaimed, the Triplett Company was getting ready to do its part in building our national security. We knew that we must meet important new responsibilities. At the same time, we felt keenly our continuing obligations to our customers—old friends with whom we have had happy business relations through many years.

We doubled—then tripled—our output to fill the needs of our old accounts. We added to our production facilities . . . hired many more men . . . are working extra shifts at time-and-a-half.

All this has not been enough. We have been called on to produce more and more for national defense. We are proud of the job we are doing to help meet the emergency, but it is difficult not to be able to serve our old friends equally as well. In the face of these conditions, the Triplett Company has adopted these policies "for the duration":

FIRST: We will continue to serve you by our service to our mutual responsibility—the national emergency.

SECOND: We will continue to do everything we can to fill orders from our regular customers, even though some deliveries may be temporarily delayed. No business from new accounts has been nor will be accepted until after our old friends have been served, except where priorities make it impossible to do so.

THIRD: Our engineering and research departments will continue to work on the development of superior equipment and improved methods to serve you still better when we can resume normal operations.

The present emergency is incidental and as we work towards the future, we will do our best to continue to merit your confidence and loyalty.

President
The Triplett Electrical
Instrument Company

Manufacturers of Precision Electrical Instruments

Farthest North Ham

(Continued from page 26)

on the frozen Koyukuk River. After a bit of dickering with the traders for a few cases of gasoline at a fancy price, we refueled the emergency tanks—just in case.

The next hour was spent crossing the rugged, majestically beautiful Endicott Mountains. Although flying at 11,000 feet, the higher peaks



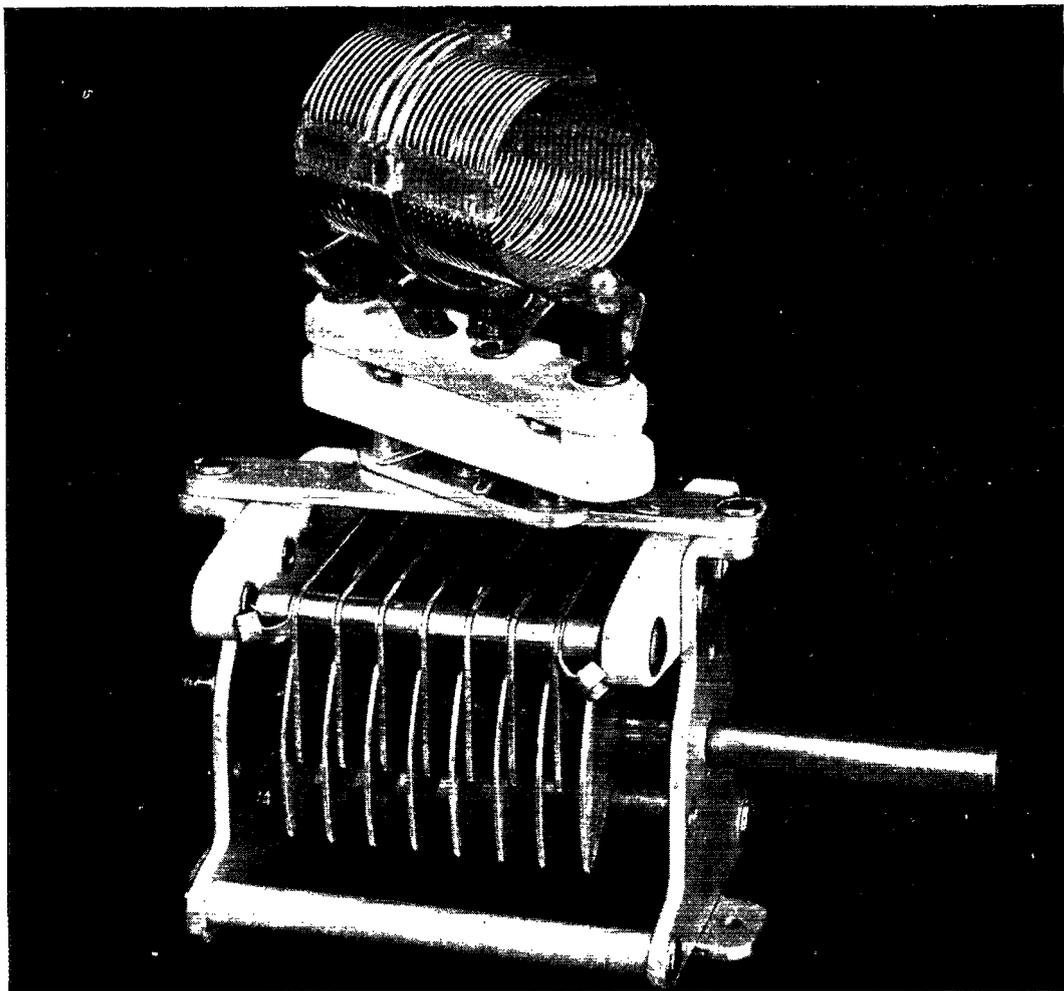
Howard Burkher, K7ARG, and XYL Pauline, K7CDY, in summer costumes.

often rose above the wing tips on each side as we nosed our way through river valleys and mountain passes.

Our first glimpse of the Arctic Ocean revealed that Pilot Gillam had done an excellent job of navigation across the trackless tundra of ice and snow. We turned up the coast to Barrow just above the small rock monument marking the terminus of the ill-fated Will Rogers and Wiley Post flight back in 1935.

Barrow was indeed a surprise. Expecting to find a few snow-covered shacks, a radio antenna and a half-dozen inhabitants, instead we were greeted by most of the 500 Eskimos and the entire white population of the village, 18 in all.

Our arrival resulted in a happy holiday in Barrow, rivalling Christmas and New Year's Day combined. School was dismissed and dozens of Eskimo boys and girls, little and big alike, swarmed to meet us. Ours was the first plane with fresh supplies from Fairbanks in well over a year, and the missionary's wife said we were "practically an angel from heaven." At the big dinner that night at the Mission, the dessert was neither ice cream nor cake but a fresh vegetable salad with tomatoes, lettuce, celery and cucumbers! I know I could have enjoyed my share a bit more if I had not known the freight alone on the ingredients cost just \$1.00 a pound.



ISOLANTITE CONTRIBUTES TO EFFICIENCY OF NATIONAL'S NEW TMK CONDENSER

PROGRESSIVE engineering characterizes the design of the new Type TMK condenser built by National Company, Inc., for exciters and low power transmitters. The standard model is suitable for panel or chassis mounting, stand-off insulators being used for insulated rotor circuits. A swivel plug-in mount is provided to permit easy mounting of series coils to complete a tuned circuit.

In keeping with its up-to-the-minute design, the TMK condenser uses Isolantite* insulation to assure high efficiency in condenser operation—and National uses Isolantite also in the Type AR-16 coil shown mounted on the condenser.

These applications are typical of the many ways in which leading manufacturers of sets and component parts use Isolantite—because of its electrical efficiency at high frequencies, mechanical strength, dimensional precision, and non-absorption of moisture.

With the properties that have contributed to Isolantite's popularity assuming still greater importance for war-time production, Isolantite has initiated a comprehensive program of plant expansion and improvement, in order to render more efficient service to the users of its products. Current production at Isolantite is five times the levels of a year ago—and completion of the new facilities will permit *doubling* of present output.

*Registered Trade-name for the products of Isolantite Inc.

ISOLANTITE INC.

C E R A M I C I N S U L A T O R S

Plant: Belleville, New Jersey • Office: 233 Broadway, New York, N. Y.

BANDWAGONS are not all they seem

Having been on the DEFENSE "BANDWAGON" before the universal scramble to get aboard, we know.

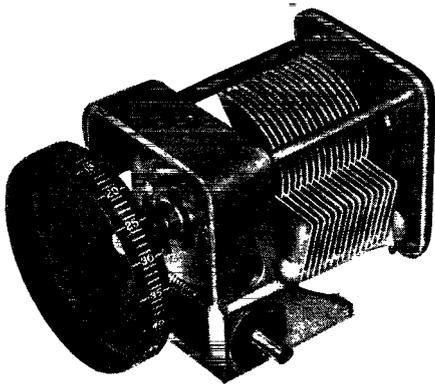
Huge war orders are no "joy ride" for the manufacturer.

It's been toil and sweat . . . headache and heartache. . . . It's been a story of more, more, more; faster, faster, faster. . . . Our men and machines have been harnessed to this ever increasing, "all-out" tempo.

From time to time, we've looked back to our old friends and customers and have been forced to say, "Excuse us please if, at times, deliveries are slow." And later, "Sorry, we cannot supply your needs."

Please understand. Our military services need our services.

We'll be with you again as soon as our country finishes the job.



THE ALLEN D. CARDWELL
MANUFACTURING CORPORATION
83 PROSPECT STREET • BROOKLYN NEW YORK

It was not our first meeting with Howard Burkner, K7ARG, and his charming young wife, Pauline, K7CDY, both teachers in the Eskimo school for the Bureau of Indian Affairs, as they both had passed through Fairbanks several years before en route to the States. Of course we were invited over to the "shack" — one corner of their very comfortable and modern living room, adjacent to the school. There we kept a brief schedule with K7CBF at KFAR back in Fairbanks, just to let it be known we had made all three-point landings.

The rig at K7ARG is a Hallicrafters 75-watt HT-9 powered by a gasoline-driven Kohler plant. Barrow is no ideal location for DX reception, as not less than half a dozen gasoline-driven electric plants are in operation during the evening hours. However, the receiver, a Hallicrafters SX-16, does a good job. Operating is done mostly on schedule, using 80-meter 'phone and 75-meter c.w. The rig will work on 20 as well, and a new crystal recently forwarded from Fairbanks should put K7ARG on 14,166-ke. 'phone.

Ham radio to K7ARG and XYL K7CDY is more than a hobby. It is often their only means of communication with the outside world. Such was the case at Kivalina, an isolated Eskimo school and village 275 miles northeast of Nome, where both were stationed before their present post at Barrow. Here amateur-band communication was the only contact with civilization.

At Barrow there is also the station of the U. S. Army Signal Corps, but ham radio is the only voice communication with friends throughout the territory, and the Burkners are the sponsors of many a pleasant evening for residents of Barrow when friends or relatives of the villagers are behind the microphone back home.

A story of radio in Barrow is not complete without mention of Sgt. Stanley Morgan, Chief Operator of the U. S. Signal Corps' WXB for the past 13 years and the hero of more Arctic rescues than he will ever admit. Morgan has steered many a plane through the Arctic to a safe landing at Barrow. He was, by the way, the first white man on the scene of the Will Rogers and Wiley Post crash a few miles down the coast. Although not now an amateur, Morgan has held several ham tickets. Mrs. Morgan, also a licensed telegraph operator, takes the weather schedules when her husband is busy with his variety of other duties.

The day following our arrival the weather was mild, or so my hosts informed me. It was 20° below zero, with only a 20- or 30-mile an hour wind! Aside from frosting my fingers a few times while attempting to take pictures, the cold was not unbearable. Children and adults alike bundle up in fur-lined parkas both summer and winter. Old timers say it is a rare summer indeed when the temperature rises above freezing.

Regretfully we left Barrow after being the recipients of hospitality that could only be found in the isolated north. Our consoling thought was that ham radio would make it possible to say again our thanks for a most interesting visit to the top of the world.

CHANCES ARE...

**... YOU HAVE ALSIMAG^{*}
INSULATION IN YOUR HAND
WHEN YOU PICK UP YOUR
ELECTRIC SOLDERING IRON**

PHOTOGRAPH COURTESY OF NU-TONE LABORATORIES, CHICAGO, ILLINOIS

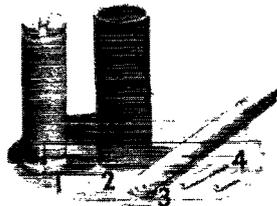
NO DOUBT, the coil form, condenser or insulating bushing in your rig is giving you visible proof of ALSIMAG ceramic insulation's excellent qualities at high frequencies.

But little may you suspect that ALSIMAG insulators are hidden in the soldering iron in your hand and do their part toward the proper functioning of your iron.

Manufacturers of high quality soldering irons have chosen ALSIMAG insulators for three main reasons:

- (1) At high temperature they remain good electrical insulators and protect you against electrical shock.
- (2) They are mechanically strong, do not crack under heat and stand considerable abuse in service.

This advertisement is one of a series designed to give you a better understanding of the advantages of ALSIMAG insulation. It is not a solicitation of business. Custom made ALSIMAG is sold direct to the manufacturers.



CERAMIC PARTS IN SOLDERING IRON

1. ALSIMAG ceramic heating element core.
2. ALSIMAG ceramic protection tube.
3. ALSIMAG ceramic twin hole lead insulator.
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(3) Their heat conductivity is high and causes your iron to heat up rapidly.

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*REG. U. S. PAT. OFF.

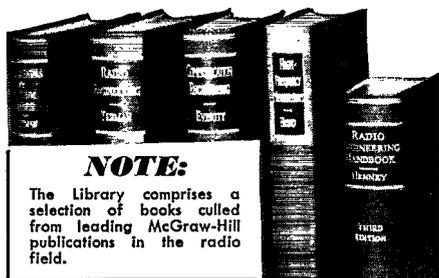
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Amateur Radio at Top of World

(Continued from page 28)

of obtaining information from Fairbanks with the pleasure of talking to his wife.

In June, 1940, Dr. Bramhall, then professor of physics at the University of Alaska, established a magnetic station to detect variation in the earth's magnetic field at Lake Minchumina, 150 miles from Fairbanks. He accompanied Gerald Fitzgerald of the U. S. Geological Survey, who established a ground control marker for aerial



The late Judge Fred C. Driffield, K7QS, ex-K7EP, U. S. Commissioner at Unga for over thirty years, was "a good friend of countless hams on the Pacific Coast and Alaska," according to K7AIF, who supplied this picture of "the Judge."

mapping of the surrounding terrain. Schedules were kept with Stan Bennett, K7BUB, and the writer, K7CBF, to obtain Weather Bureau reports on barometric pressure. Keeping a constant check on Doc's diet and date of return, Mrs. Bramhall took to the 75-meter 'phone band and passed along instructions on what to do with the fish the men had caught and when a plane would be dispatched to return them home.

Not all Alaskan amateur communal service is associated with emergency contacts or weather reports, or as an aid to scientific research. While Mrs. George Fleischmann, wife of a Tanacross school teacher, lay in the Fairbanks hospital awaiting the arrival of an Arctic stork, Herschel Frickey, K7HUM, soothed the anxious floor-pacing at Tanacross by relaying developments as reported from K7BUB, 170 miles away in Fairbanks. Eventually all turned out well, and K7BUB was named godfather of the baby Fleischmann!

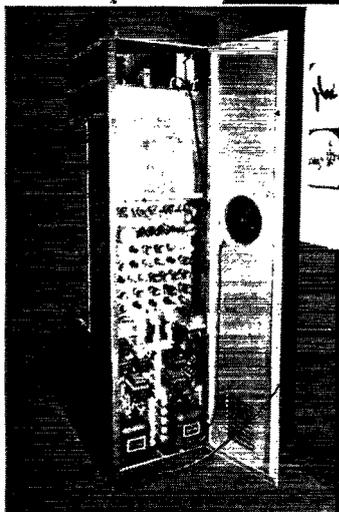
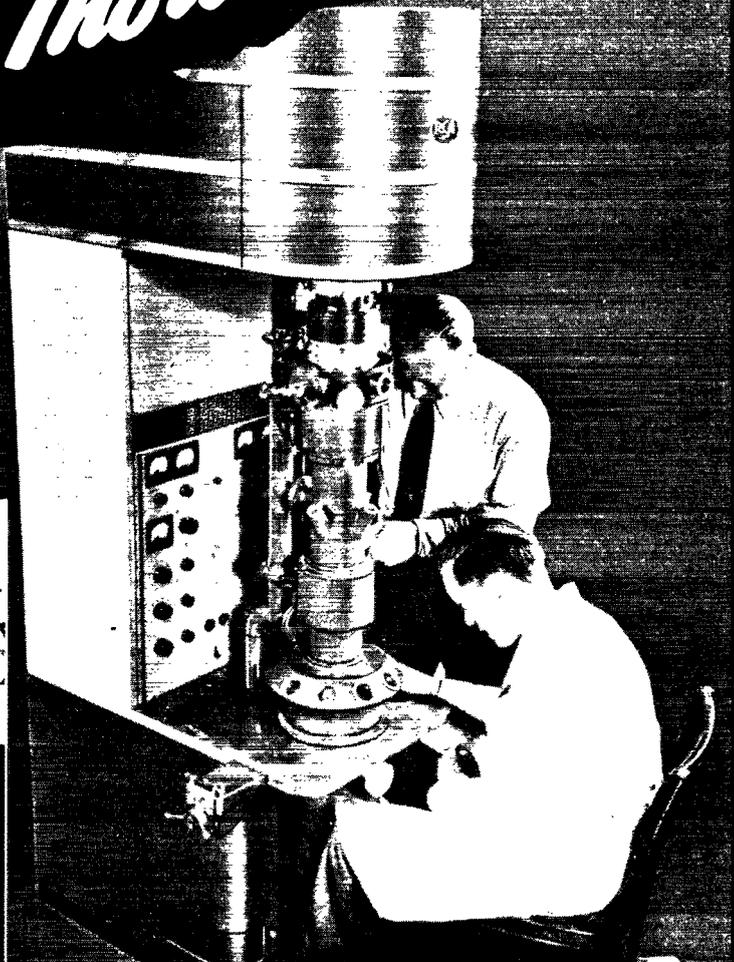
These accounts are but typical of the fascinating deeds and valuable accomplishments performed by Alaska's hams every year. And every day, at the top of the world, these same hams would be glad for a QSO with you.

Powered by Thordarson!

(Right) Front view of RCA Electron Microscope with Dr. V. K. Zworykin (standing), head of the RCA Electronic Research Laboratory, and James Hillier, who played an important role in the instrument's development.

(Below) Rear view of microscope with panels removed showing Power Supply Units.

(Photographs Courtesy Proceedings of the I.R.E.)



One of the greatest achievements of modern science is the new RCA Electron Microscope. This electron microscope affords magnifications as great as 450,000 times, or nearly half a million, whereas the best optical microscopes cannot usually give magnifications beyond 2,000 times. Thordarson transformers were used in the completely self-contained and extremely compact power supply system. Thordarson is proud of the essential part Thordarson transformers played in the development of this delicate and highly scientific piece of equipment.

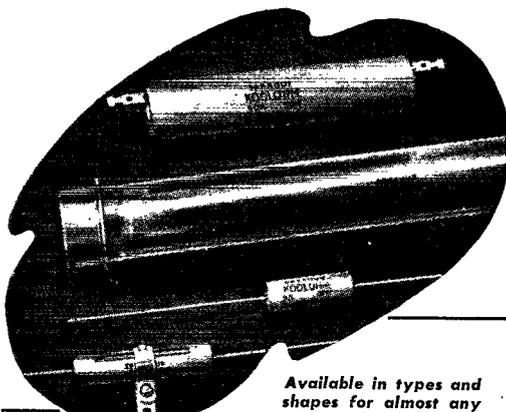
For 46 years Thordarson transformers have been designed and manufactured to the highest quality standards, resulting in the selection of Thordarson transformers where precision and dependability are vital.

THORDARSON

ELECTRIC MFG. CO.

500 WEST HURON STREET, CHICAGO, ILLINOIS

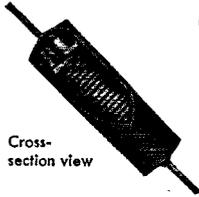
TRANSFORMER SPECIALISTS SINCE 1895



Available in types and shapes for almost any wire wound need.

REAL RESISTOR IMPROVEMENT

CALLED FOR THIS TOTALLY DIFFERENT TYPE OF CONSTRUCTION



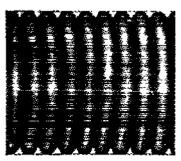
Cross-section view

Wire insulated before winding with high voltage ceramic insulation that is moisture-proof and heat tested at 1000° C.

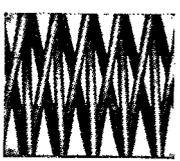
ALL other wire wound resistors are space wound with bare wire . . . Sprague Koolohms are wound with wire that is insulated before winding. This insulation consists of a special ceramic material—so flexible it can be wound on small diameter forms, so moisture-proof

it excels in any moisture test, so heat-proof that the insulation is actually applied to the wire at 1000° C., and so good as an insulator that it has an insulation strength of 400 volts per mil. at 350° F.

This permits layer windings that mean higher resistance in less space; faster heat dissipation; no danger of shorted windings; closer accuracy; greater protection; truly non-inductive units, even at 50 to 100 Mc. and many other outstanding advantages. Koolohms cost no more than ordinary resistors and will out-perform and out-last them as proved by actual test.



Koolohm layer winding permits greater overall efficiency including smaller physical sizes, larger wire sizes, and rapid heat dissipation.



Interleaved windings with ceramic-insulated wires result in resistors that are truly non-inductive, even at 50 to 100 Mc.

SPRAGUE KOOLOHMS
 SPRAGUE SPECIALTIES COMPANY
 RESISTOR DIVISION • NORTH ADAMS, MASS.

A. A. R. S.

(Continued from page 31)

most efficient control and use of radio, wire and cable communication facilities under jurisdiction of the United States in time of national emergency.

In time of stress, accompanied by accelerated general activity, there may be a tendency to "short out" or disregard certain vital instructions, thereby inducing inevitable ill results. Amateurs are well represented on the DCB committee on amateur radio, and it is urged that all await specific instructions, and under no circumstances go on the air without proper authorization.

It is now possible to directly join the Signal Corps of the U. S. Army, as per the following radiogram sent by the Adjutant General to the Commanding General of each corps area on Dec. 10th:

RECRUITING PERIOD YOU ARE AUTHORIZED TO ENLIST AN UNLIMITED NUMBER OF MEN SPECIFICATION SERIAL NUMBER 176 RADIO OPERATORS AMATEUR AND 177 RADIO OPERATORS COMMERCIAL FOR SIGNAL CORPS ARMY OF UNITED STATES PERIOD A RECOGNIZED LICENSE WILL BE ACCEPTED IN LIEU OF A TEST FOR PROFICIENCY PERIOD PERSONNEL SO ENLISTED WILL BE SENT TO NEAREST RECEPTION CENTER FOR TRANSFER TO A SIGNAL CORPS REPLACEMENT TRAINING CENTER PERIOD TRANSMIT THIS INFORMATION TO ALL RECRUITING STATIONS WITHOUT DELAY AS RADIO BROADCASTS ON THIS SUBJECT WILL BE MADE DECEMBER ELEVENTH.

This change in policy was affected so that communication personnel, particularly radio operators, will be given maximum training in the shortest time possible, thereby being of almost immediate use to the Signal Corps. In applying to a recruiting station, be sure you have your amateur license with you.

The annual AARS Code Speed Competition which was scheduled for January 5th has been cancelled.

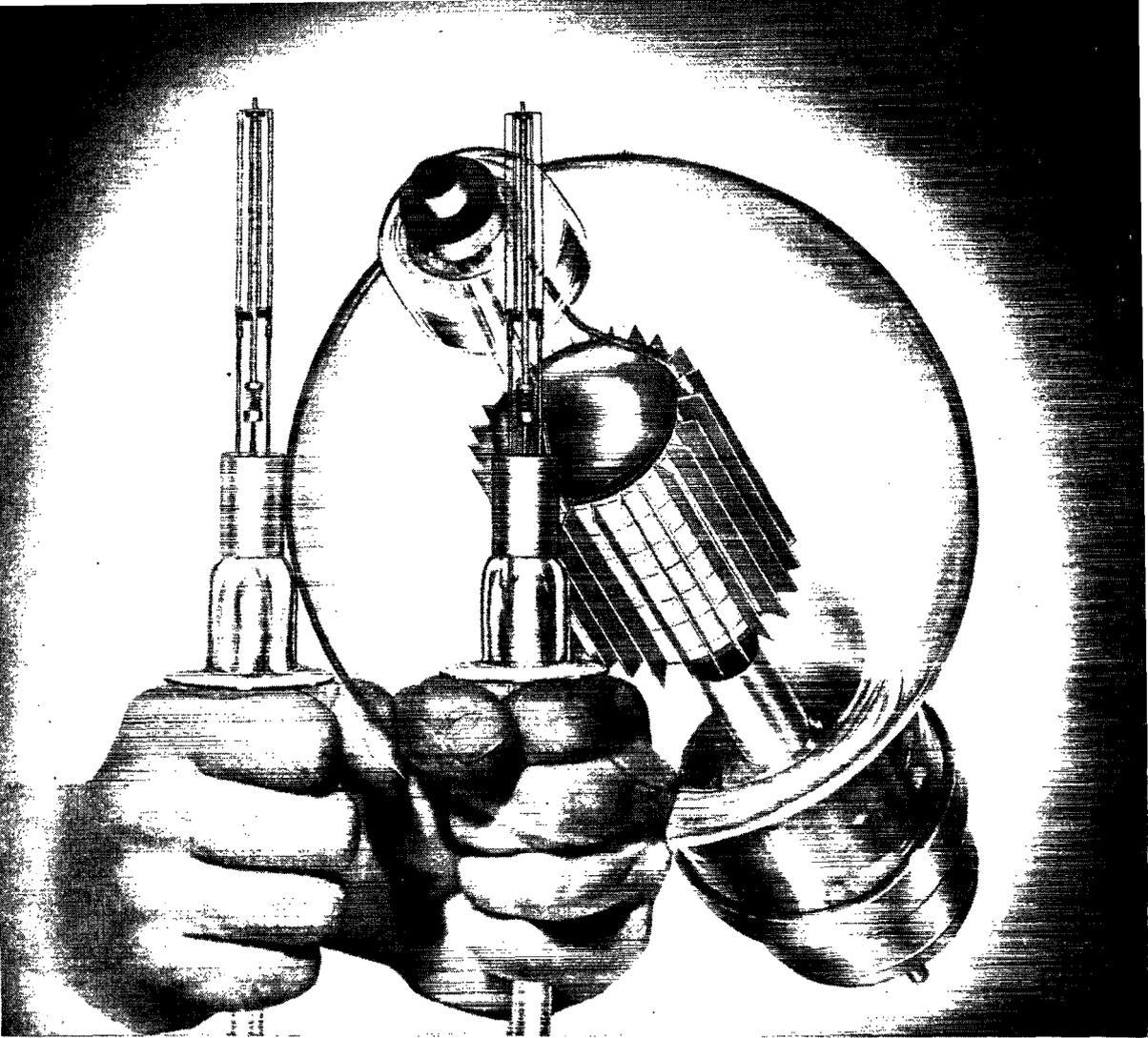
RESULTS OF 1941 ARMISTICE DAY MESSAGE CONTEST

THE 13th Annual Armistice Day Message Contest was won by the Fifth Corps this year. A total of 1339 Army Amateurs participated, while five non-members submitted reports. Following are Corps Area results based on percentage participating.

C.A.	No. Active Members	No. Reports Submitted	1941 Percentage	1940 Percentage
V	171	147	86.0%	61.6%
VI	258	202	78.2%	74.2%
VII	204	142	70.0%	24.6%
III	136	94	69.1%	52.0%
IX	401	269	67.0%	82.7%
II	279	155	55.5%	28.4%
I	190	103	54.2%	21.8%
VIII	154	81	53.0%	36.6%
IV	366	146	40.0%	71.8%
Totals	2159	1339	62.1%	52.3%
Mis. Reports		5		

1344

It is interesting to note that only two corps areas failed to record a percentage gain over the same contest last year.



How Important is a Filament?

It's a well known fact that the vacuum tube is the heart of radio communications, but it is important to remember that the filament is the heart of the vacuum tube! Thus, the efficiency with which these tiny strands of tungsten wire perform may mean the difference between success and failure of the tube itself...victory and defeat for tanks or battleships... life and death for millions of people.

You can't always tell by appearance whether a filament is efficient or not. The two assemblies shown above look exactly alike but when put to the test one may not do its job. Into the production of filament for Eimac tubes has gone much research and experimentation. Among the many special instruments designed and perfected by Eimac to insure perfect filaments, none is more interesting than the electron microscope which virtually gives a moving picture of how a filament works under actual operating conditions.

Behind every Eimac tube is the assurance that its

filament will function at top efficiency. Contributing factors to this efficiency are: Tantalum plates and grids and the super-vacuum which removes all contaminating gas particles. All these factors and more are what make it possible for Eimac tubes to carry the unconditional guarantee against emission failure caused by gas released internally.

Eimac's unusual performance capabilities are receiving enthusiastic acceptance in all branches of the service... ARMY, NAVY and the AIR CORPS

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Station Activities



NEW ENGLAND DIVISION

CONNECTICUT — SCM, E. R. Fraser, W1KQY — With the declaration of War came a great rush of organization for emergency communication. Registration blanks for the AEC were in great demand as all amateur radio operators rushed in to do their part in civilian defense communication. At this meeting complete details from all over the section had not been received but several additional Emergency Coördinators are hard at work planning local defense nets. In southern Fairfield County, the following are acting as coördinators in the newly formed Southern Fairfield County Emergency Communication Net: Norwalk, W1NRU; Westport, W1MRP; Stamford, W1FSX; Darien, W1KGE; New Canaan, W1BCG; Greenwich, W1AJO. This net was formed by the desire of Major Pierson, Civilian Defense Head of the district, to have efficient amateur emergency communication. KTF is general chairman. W3AOH/1 heads the technical committee. Plans have been drawn up for a system that includes a radio alarm in case of power failure, town-to-town communication on 56 Mc. local Headquarters to cars on 112 Mc. and car-to-car on 112 Mc. Each town must have a main or Headquarters station equipped with emergency power and 56, 112 Mc. and i.f. rigs. Organization of the net, forming of the plan and design of an emergency u.h.f. transmitter-receiver was finished and the final results presented to Major Pierson in 8 days. Full cooperation was given by all services and the 68 amateurs affected. Many remarks were heard on the excellent progress and spirit of unity as the organization work took place. We are bound to hear more of this net in the near future. JXP is organizing Old Lyme, Lyme, Essex and Saybrook. TD is in charge for West Haven. JFN has taken over for West Hartford, JQK for Hamden and BW Branford. BHM is hard at work in New Haven and is a member of the CD communications committee. The State Police net opened up on 1.75, 28, 56 and 112 Mc. BIH reports his local defense council will purchase 112-Mc. outfits. To get more operators, KKB is running code and theory classes with about 25 attending. APA is working on plans for a 112-Mc. authorized net in Bridgeport. MBN completed emergency power setup for his fixed station. The SX-24 operates from batteries and the transmitter from a vibrator. KVV completed a 112-Mc. emergency rig in one day and is all set for port-mobile work. All Connecticut amateurs: If you have not done so by now, contact your local leaders in amateur radio and get going on emergency communication work. Work out plans, ways and means, form a solid organization and build u.h.f. equipment. This is amateur radio's big chance to prove its worth. We must show the public that we are on the job with efficient two-way communication whenever it is needed. Well thought out plans will include amateur communications for fire and police departments, Red Cross, Air Raid Wardens and other public services, all under control and direction of one central authority. It will be a big job, one worthy of our efforts and a job that we can all be proud of when the U. S. A. wins this war.

Traffic: W1TD 95 EAO 74 MBN 38 BIH 19 CTI 2.

MAINE — SCM, Ames R. Millett, W1BAV — New EC for Bangor district is DTS and for Millinocket, KEZ. Applications for the AEC are flocking into this office which goes to show that the boys are certainly willing to get down and put their shoulders to the wheel when the need becomes apparent. The PAWA in Portland, under the able guidance of FBJ, the EC, is already in contact with local authorities who are very interested in the operation of an u.h.f. net to be used in conjunction with the local civilian defense unit. The abundance of u.h.f. gear already available is a revelation and it appears that this is the case throughout the State. DHH has a jr. op. NGV built a new 9-tube super and a pre-selector that does an FB job. I wish to commend all the nets that were in operation here in the State of Maine at the closing of business. They were all doing a wonderful job and all members, both c.w. and 'phone, were operators of the finest calibre. KKZ called on NHI and discussed local civilian defense plans as NHI had been approached by local authorities about defense operations. Every effort in this ham game should be concentrated on the building of 112-Mc.

equipment and it is of vital importance that the procedure of unit type construction as outlined by ARRL be followed in order to standardize the equipment so that anyone who might have to supply a piece of gear can do so and it will fit right into the picture alongside the other fellows' without any changes being necessary. I have received word that for the present, at least, the Interceptor Command does not require any station in the State of Maine. Therefore, the u.h.f. setup to be used in connection with your local authority is the goal to shoot for and the best of luck to every one of you.

Traffic: WINGV 49 KKZ 30 DHH 7 AUC 18 IIE 45 LKP 34 BAV 30.

EASTERN MASS. — SCM, Frank L. Baker, Jr., W1ALP — War and the cease operation order. Those were tough words for all of us to hear, but we all have a bigger job to do now, Defense! Defense for our country, city and town. Do you know who your Emergency Coördinator is for your city? If not, write me. If there is no Emergency Coördinator, either offer your services or suggest some other ham in your city or call a meeting of all local hams and nominate someone. Let's all forget our childish peevs against the other fellow and let's all pull together. Back up ARRL by joining up. It is the only organization that is working for the hams. Join the radio clubs, the only place we can meet our brother hams now. New ECs: HBR, Revere; GDY, Boston; GYZ, Quincy; BB, Winthrop; NVB, Salem; JCS, Scituate; MON, Holbrook. South Shore Club voted to buy some Defense Bonds. Twenty Quincy hams held a meeting to talk over defense net for emergency work. Eastern Mass. Club had a fine meeting, with remarks from various ECs and other hams who have helped out to get hams in their cities back on the air for a defense job. Belmont hams were authorized to get back on the air. ZK in Brockton is also authorized. NEZ, our EC for Westford also reports that he has been authorized to get back on air. LNE is now a deputy fire chief. EVJ and LRO have applied for authority to get back on. Newton Amateur Radio Assn. is newly organized for defense work. HPC is pres. and MRK treas. NPA is call being used. I urge you all to assist the EC for your city. Here is a list of ECs in this Section: KBQ, Haverhill; JGQ, Lynn; HUP, Weston; MBE, Barnstable County; CRN, Fall River; MPP, Watertown; IGO, Methuen; LYH, Everett; JSM, Arlington; JKR, Norfolk County; BMO, Andover; HUV, Winchester; LSW, Woburn; EHT, Regional EC; KCT, Dedham; LVN, Falmouth; MME, Hull; JOX, Newton; JDG, Medford; EAU, Weymouth; LRO, Provincetown; EVJ, Nantucket County; BAP, Wrentham; DFM, Wenham; MQV, Chelmsford; CTR, Framingham; CCL, Cohasset; AGR, Norwood; RP, Westwood; FWS, Milton; JMJ, Dukes County; MTV, Needham; BHW, Chelsea; IXI, Walpole; MQO, Middlesex County; WI, Lexington; ARE, Bedford; LXL, Suffolk County; AWA, No. Reading; ATQ, Malden; MDN, Amesbury; KRR, Mansfield; ISA, No. Attleboro; IYU, Braintree; AR, Belmont; EKT, Wakefield; LTC, Middleboro; HUZ, Wareham; NFQ, Foxboro; JLK, Easton; AFQ, Harwich; KQN, Canton; MBG, Bridgewater; LXQ, Newburyport; FSK, Melrose; BWJ, Natick; LTP, Marblehead; LOS, Sharon; MMM, New Bedford; KYX, Somerville; MAL, Wayland; LSD, Waltham; JIS, Rockland; PZ, Lynnfield; ZK, Brockton; AXA, Swampscott; GAG, Stoneham; MBQ, Vineyard Haven; KON, Danvers; IBF, Essex County; NEZ, Westford; CBY, Lawrence; ATD, Brookline; UU, Beverly; COX, Lowell; AAL, Attleboro; KTG, Cambridge; LBY, Marshfield; MNK, Manchester; RD, Saugus; HBG, Peabody; FDN, Reading. All ECs are urged to send in a monthly report for this column which might be of some assistance to other ECs.

Traffic: W1BDU 598 BXC 513 JCK 157 AKS 122 HWE 48 NAV 35 MQT 22 NF 6 ALP 2 NF 14 (Oct.-Nov. LBY 36).

NEW HAMPSHIRE — SCM, Dorothy W. Evans, W1FTJ — W1AVJ in Concord is working with the State Defense Council and trying to get the N. H. Emergency Net back on the air for defense work. Here is our opportunity to put to use the plans of the past few years which built up the Emergency Net, although it will probably be used for a little different purpose than was originally in view when it was started up back in 1936. The situation changes rapidly, so keep tuned to W1AW for the latest news. AVJ will keep you informed as to the progress on NHEN. CNX has started cooperation with the local defense board in Concord, and it is understood that the Manchester Radio Club has started activity in the same direction in Manchester. We

hope that by the time next month rolls around we will have more definite news for you concerning the defense setup and amateur radio in this section. Remember, it is up to us to take the initiative, so let's go gang.

Traffic: W1AOQ 28 JKH 26.

RHODE ISLAND — SCM, Clayton C. Gordon, W1HRC — Your SCM has been very busy with meetings in the Defense effort. JEZ has been equally busy lining up AEC registration, appointing new ECs, etc. AFO, JND, BEH and many others have been right out straight in the same effort, and nobody has time to bother with glory or publicity. DQ is ECing the Warren-Bristol outfit. BVI got the Newport gang lined up to take care of the "warning-center" staff there. Dave Payne has got the Westerly gang moved over to new headquarters in the old town hall and work is progressing on a station there for defense. The following met at the Toll Gate House on Dec. 18th to coordinate the effort in the Valley and surrounding towns: JND, JUN, KOF, KFL, EAR, MBU, IQF, NCX, BFB, CJH, GJZ, BEH, KCH, BFQ, KFD, HRC and Clark Vaughn who has taken his exam and awaits license. BEH is the first to come to my attention who has received his "authorization" from DCB. BBA is organizing the hams for Mayor Roberts of Providence. Wesley Hayward has eight boy scouts in Cranston with code speed of 13 w.p.m. NDI is teaching ham radio as part of the recognized curriculum at Cranston High School. MDW and NES are first mother and son combination in the State; they are located at East Greenwich. The ham gang at WEAN have volunteered to install and maintain the 1.75/3.5 Mc. job at the State Warning Center in Providence. Enthusiasm among all the hams is high. Reasonable patience with necessary delay is predominant, and a sense of their responsibility is evident among all of us. Time is precious and we must make the most of it, so 73 and bear up if I've overlooked anybody.

Traffic: W1MEK 25.

VERMONT — SCM, Clifton G. Parker, W1KJG — W1CUN is at Camp Blanding and expects to return to Vermont for a furlough shortly. Steve recently received a promotion to grade of sergeant. LWN and GAN have been testing portable equipment (prior to that last order!). Al Philips secured a new license with his old call, IQG. All members of the Burlington Amateur Radio Club are actively participating in the civilian defense program on the ultra-highs. IJL moved to Barre from Acton, Mass. CGV is busy building a new home. MMU moved to Randolph for the winter. JRU and XYL were recent visitors at MLJ. GQJ is completing gasoline-powered emergency apparatus. NLO has been appointed on the Communications Committee of the CD work at Burlington. AD has a m.o.p.a. rig on 112 Mc. and has revamped his big rig to work final on gasoline-powered supply, with other stages working from vibrapack supplies and is working with his local defense board. SPECIAL! Your SCM has been swamped with inquiries from amateurs throughout the Section as to what, when, where, etc., on the defense program, particularly since the last FCC order. Fortunately, the survey of stations available in the Section was completed on Dec. 5th. Since that time, your SCM has conferred with the State Defense Board at Montpelier and with various members of the Board identified with the general problem of emergency communications. This has resulted in the development of several nice problems due to the scattered facilities of all types in this Section. I expect by the first of the month, and probably before you read this, to receive a memorandum plan from the State Board setting forth in particular: (a) The immediate situation which they deem most necessary to cover at once with such amateur facilities as are available. (b) The plan they anticipate to have fully established on a more permanent basis for the duration of the emergency. (c) Such special communications problems as appear in the light of their arrangements to date. It is then expected to promptly contact the amateurs throughout the State, personally, by letter, and in group assemblies in some instances, and take up with them the needs as to their particular area. The spirit of cooperation and willingness to actually do something on the part of the amateurs throughout the Section is evident. Also, it is now felt, though not definitely decided upon by anyone, that the better way to effectuate such setup insofar as petition and certification to the FCC/DCB is concerned is to submit for such approval the entire list of stations participating through the State Defense authorities. There is plenty of actual work cut out for all of us in Vermont. We have all too few amateurs if every licensee participates and just as

soon as the mass of detail involved in this matter can be straightened out, contact will be made through your SCM and/or some authority representing the State Board with each licensee. Keep your antennas up, and keep after those portable units. Be sure to convert that big rig so you can use at least the low-powered stages from the emergency supply you are working on! Do ascertain the facts as to all operations! Don't act on rumor! 73 — Park.

Traffic: W1JDP 75 KJG 67.

HUDSON DIVISION

NEW YORK CITY AND LONG ISLAND — SCM, E. L. Baunach, W2AZV — The Section reports from now on and for the duration will be slightly different. The gang, however, are advised to keep sending in reports on activities. Although we are all not on the air we should keep ourselves ready to go on if called. From month to month I will keep all informed as to defense activities and Emergency Coördinator appointments and changes. The present EC setup is as follows: DBQ, Section Coördinator; DOG, EC for Suffolk County; CET, Nassau County; GDF, Queens County; DW, Kings County; NNC, N. Y. County; BGV, Bronx County; and BGO, Regional Coördinator for the five counties of N. Y. C. All amateurs are requested to join the AEC and get in touch with their respective county EC for information and work that is being done in their locality. There is a job for everyone and it is up to you to get in touch with us. Due to the present conditions changes occur from day to day, therefore it is advisable to keep posted. If in doubt, call on your SCM. The gang in Suffolk County have been authorized to operate under the guidance of W2DOG. At present the 3710-kc. net frequency is being used every night at 7:30 p.m. CET is having meetings in the police auditorium in Mineola; both 112 and 28 Mc. are expected to be authorized for use in Nassau County. 112 Mc. is expected to play an important part in N. Y. C. Due to the large population and buildings, the task of helping the many services that require communication is a big job and all of the gang are asked to give their fullest cooperation to the EC of their respective counties. Here are some reports from the boys before Dec. 7th: EC reports that the AP Trunk Line handled traffic up to the last day of operation. JBL expects to join the Signal Corps. BCS got already to operate e.c.o. on 7 Mc. LZR's last QSO with 4NG was, "QTC 50 (can you take them?)" AHE is at the Naval Air Station at Jacksonville. AZV was all set for 7 Mc. 'phone.

Traffic: W2LZR 227 BGV 165 KI 159 EC 55 AOF 32 AZV 31 DBQ 20 BCS-DOG 4.

NORTHERN NEW JERSEY — SCM, Edward Gursky, Jr., W2LMN — PAM: W2LXI. RMs: W2CGG, HCO, IOQ. New EC appointments: NAP (Livingston); IIN (Elizabeth); W2LSH (Kearny). Many amateur clubs and defense groups were sufficiently prepared to apply to DCB for special authorization to resume operations in connection with defense work. At this writing, authorization has been received by amateurs in Belleville, East Orange, Elizabeth and Verona. Several other communities have applied and will probably resume operations soon. At a recent meeting of Essex County amateurs, the following tentative plan was adopted to promote section-wide emergency communication: All local communication within a community will continue under present plans using 112-Mc. portable stations under the direction of a "community control station." The community control stations will also be equipped with 1.75-Mc. gear and would be able to check into a network of stations throughout the county in which they were located. These would be under the direction of a "county control station," who in turn would be under the direction of a section or state control station. In neighboring communities where population and/or territory is not great enough to require independent operation such communities can operate under a joint control station, thereby keeping community control stations to as few as possible for maximum operating efficiency. In this way, all communication and operation will be kept as local as possible. Another point discussed was the availability of operators during all hours of the day. In most cases, amateurs were registered in their home towns. The possibility of an emergency occurring while an operator was at work and unable to reach his assigned post might leave some communities much undermanned and provide a surplus of operators in other communities. To overcome this it is suggested that amateurs register, giving town of business as well as his home town and the hours of night or day normally spent in each 19-

(Continued on page 72)

Westchester Hams

(Continued from page 36)

prove useful. Such service may not be dependable, however, because of the not remote possibility that power line service may be interrupted during emergencies.

Among the car-supply rigs the new Abbott TR-4 combination transmitter-receiver is finding favor. As a matter of fact this particular rig incorporates practical features suggested by the Westchester gang and based on their experience — suggestions offered in a voluntary effort to make available an outfit as nearly ideally suited to defense requirements as possible.

Antennas employed by the Westchester net vary all the way from the simple quarter-wave vertical to multi-element arrays. Some are permanently mounted on cars, others directly on the transmitter case (especially the lower-power rigs with self-contained batteries). Some very effective types for fixed-mobile use are mounted on long poles which are lashed under the car while riding and supported against the car or a convenient building when operating. "J's," Q's and "extended Zepps" lend themselves to this type of mounting which provides the advantage of getting the radiator up off the ground, usually with appreciable increase in operating range.

Many of the ideas incorporated in the above described activities and organization of the Westchester defense net are applicable to others and should be particularly helpful where such nets are just being organized and are without the benefit of extensive previous experience. All of this development may not be applicable in every detail in all localities, but it should certainly prove suggestive. Moreover the general plan of (1) deciding on the frequency range or ranges; (2) test-surveying the entire area to determine the transmitting conditions; (3) arriving at a final plan best suited to the terrain, the extent of the area, the distribution of population and the number of hams available for service, represents a pattern which is applicable in all localities. By no means the least important of the activities in Westchester is that which undertakes the training of new hams. Not only will this result in additional operators being made available, but it will help to fill ranks that are bound to be depleted to perhaps a serious extent by voluntary enlistment of some of its members in the armed services, and by the operation of the selective service.

(NOTE: In this story and the accompanying illustrations no names of individuals are mentioned, by express request of the officers and members of this organization. They feel that their unit is a team, out to do a job, and that no member, whether officer or otherwise, should be selected for special mention either by virtue of his accomplishments or equipment. Moreover, it is the feeling that the work being carried on could not possibly profit from mention of individuals, and might conceivably be harmed through possible subversive action aimed at interfering with the functioning of the unit. Whether this latter point is justified may be debatable, but there is no debating the self-effacing spirit and patriotic impulse behind the attitude of this gang.)

RADIO TRAINING



FOUNDED IN 1909

PORT ARTHUR COLLEGE, a non-profit-making educational institution, offers a practical radio operator's course at the lowest tuition price in its history. Each radio graduate receives two months' actual operating experience at the college's commercial broadcasting station KPAC. This station is equipped with the latest type 1000 watt high fidelity RCA transmitter — 1250 kc. — directional antenna system. KPAC operates in new modern studios located on the campus.

The college has never advertised jobs or positions in lieu of education. Today it is well known there is a shortage of radio operators in every branch of radio; particularly flight and ground operators for airlines in America and South America — marine operators for ships traveling coastwise and foreign — geodetic-geographic research — broadcast stations — the Army and Navy — other positions in many departments of the United States Government. Therefore, we believe it is good common sense to mention that Port Arthur College is the sole radio school in America which owns a commercial broadcasting station with commercial advertising representatives in New York, Chicago, San Francisco, and many of America's leading cities, with active membership in the National Association of Broadcasters, and Broadcast Music Incorporated. Through these contacts the college receives from the broadcast industry alone more calls for radio operators than it is possible to supply.

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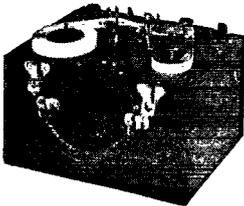
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THE YANKEE NETWORK

STATION WEAN
CROWN HOTEL
PROVIDENCE, R. I.

November 27, 1941

Abbott Instrument Co. Inc.,
8 West 18th Street,
New York, N.Y.

Gentlemen:

In co-operation with the National and Civilian Defense Programs WEAN has purchased 2 Abbott TR-4, 2 $\frac{1}{2}$ meter, Transmitter-Receiver units. One is being used as a portable and the other as a portable-mobile unit. They are being operated by men holding amateur licenses and will form a link of the Emergency Communications System in Rhode Island.

These units perform excellently - are compact - and the separate Transmitter-Receiver feature makes them most satisfactory.

Sincerely yours,
Harry A. Tilley
Harry A. Tilley,
Chief Engineer WEAN.

HHT/af

● FREQUENCY: 112 to 116 MC. ● RANGE: Varying from 5 to 75 miles, depending upon terrain. Contacts up to 150 miles have been completed in field tests. ● TUBES USED: One each of Hytron HY-615, Hytron HY-75, 7F7, 6V6 or 6L6. ● MICROPHONE: Any good single button microphone.

ABBOTT TR-4 TRANSMITTER - RECEIVER for 2 $\frac{1}{2}$ METERS

A compact, efficient unit, designed for either fixed station or mobile operation. Transmitter and receiver sections are completely separated. The 5 inch PM speaker is self-contained. Single inter-connected switch permits use of a common antenna for both transmitter and receiver. The TR-4 requires a 6 volt battery or 110 volt, 60 cycle AC power supply. Receiver radiation is necessarily reduced to a minimum.

TR-4 Overall size 9" x 8" x 4 $\frac{1}{2}$ ", less tubes and power supply, list price **\$65.00**

ABBOTT INSTRUMENT, INC.

8 WEST 18 STREET • NEW YORK, N. Y.

(Continued from page 69)

cality. In this way, amateurs who are unable to reach their home towns can be used to good advantage in places they can reach. Each and every amateur in the section is urged to register with the AEC. Blanks for this purpose can be obtained from the SCM or direct from ARRL. The outcome of this discussion was the formation of "Amateur Radio Communications," an organization of Essex County amateurs, designed primarily for amateur defense communication throughout the County and with the hope of inspiring formation of similar organizations throughout the State. Present at the meeting were: W2AIE, AMF, BWN, COT, DCP, EDM, EOC, EWL, FDL, FKF, FOP, GFG, HWY, ICA, IKS, IQQ, IZV, JIB, JN, JST, JTM, KRO, LCD, LMN, LQN, LZW, MND, NAP and OIJ. Officers elected were: Pres., JST; vice-pres., COT; secy., OIJ; treas., EDM. In a recent election, the North Newark Amateur Radio Club elected the following officers: Pres., JSF; secy.-treas., PY. The L/C Radio Club of Jersey City kept a 28-Mc. emergency net in operation nightly until amateur operations stopped. The East Orange Emergency Club has been issued the station call W2OMW. The Somerset Hills Radio Club elected the following officers: Pres., 2BCC; treas., 3GIZ; secy., 3HPX; trustees, 3MI, 2COT and 3GNY. 2BZM and BNU have both moved to East Paterson. IGN was appointed asst. EC for Woodbridge. MNT suggests that W. U. and PX stations furnish good material for improving code speed. ESO and his XYL, OLB, were called to Toledo, Ohio, but expect to return shortly. Until the end of the present emergency, this column will be devoted primarily to reports of defense activities throughout the Section. Therefore, all clubs, defense groups and individual amateurs in the Section are urged to keep the SCM informed of what they are doing so that the entire Section can pull together as a whole and do its utmost for the national effort.

Traffic: W2HXI 369 MLW 265 (WLNC 41) LFR 115 MNT 112 (WLNW 39) NCY 105 LMN 42 NJE 22 IGN-HFN 16 BNU 11 ESO 8. (Oct.-Nov.: W2MNT 240 (WLNW 19).

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Jerry Mathis, W3BES — The last message handled by W3JAK was from K6USO, dated December 6th. W8UQM reports progress on the u.h.f.'s and is registering as many stations and operators as possible in his location. 3JNQ was rebuilding when order to QRT came along. 3BIL is constructing u.h.f. equipment for the use of the Chester Radio Club. GYU is building a new transmitter at the commercial. New ORS in the Section are W3HUS, JNQ, JUC, JEX, JSU, 8HDJ/3 and 3AIZ. BXE has gone to Long Island to take over an important defense job. In his place as Asst. SCM is DVC. The Allentown Police Dept. is sponsoring the erection of a continuously-operated low-frequency amateur station with low-frequency connection. The U. S. Weather Bureau has likewise endorsed the Susquehanna Net to DCB. GPM appears to be heading the defense effort in Lower Merion Twp. LN is lining up Chester County in a satisfactory manner. GYV wrote from Camp Forrest, Tenn., to offer his equipment, which he had left behind, for National Defense use as we saw fit. For the benefit of those amateurs who wish to do their part in National Defense the following is a list of Emergency Coördinators and leaders active to date in the various counties: Luzerne and Columbia, W8RKZ, Frank Meehan, 88 N. Thomas Ave., Kingston; York and Adams, W3AQN, Paul Stumpf, 713 S. Pine St., York. Lycoming, Sullivan and Tioga, W8HHO, Harold Reitz, 508 Montour St., Montoursville; Snyder, Northumberland and Union, W8QJP, Wm. Miller, 875 S. 2nd St., Sunbury; Lancaster, Richard Wenger, 232 N. Mary St., Lancaster; York Road and Huntington Valley section of Red Cross, W3HFE, Brad Algeo, 29 Weldy, Oreland; Susquehanna Net, W3UA, C. G. Landis, 949 S. Edgar St., York; Phila. County, W3BYS, Ernest Black, 325 Green Lane, Alternate, W3IU, Sam Thackery, Bustleton; Delaware, W3DGM, Melvin Wardell, 1427 Esrey, Chester; Chester, W3LNL, Robert Nick, 122 Webster Ave., Dowingtown; Montgomery, W3FHU, E. J. Kerns, Skippack; Bucks, W3GFG, Elmer J. Middleton, 227 Osborne, Morrisville; Berks, W3CKD, James C. Muhn, 210 N. Church St., Mohnton; Lebanon, W3CDY, Lloyd Sherman, 501 N. 10th St., Lebanon; Schuylkill, W8ATF, J. N. Weaver, 115 N. 14th, Ashland; Northampton, Lehigh, Carbon and Monroe, 3FJU, Don Wilbur, 406 N. 17th St., Allentown; Wyoming, Pike, Susquehanna, Wayne, Bradford

and Lackawanna, W8DXT, John McGoldrick, 1055 Blair Ave., Scranton; Montour, W8TIZ, S. Clifton Kindt, 435 Mill St., Danville; Cumberland, Dauphin, Perry, Juniata, no coördinator at present but being handled by W3UA until one can be selected; Asst. SCM in charge of Emergency Co-ordination, W3DVC, Bill Tunnell, 7064 Ruskin Lane, Upper Darby. New QTH of SCM — Jerry Mathis, W3BES, 6208 Master St., Phila. Register in AEC Build u.h.f. as per QST. Train new operators. Keep in touch with your local leaders. Copy W1AW. Also keep 'em rolling and flying, and remember Pearl Harbor.

Traffic: W3AOC 338 3GKO 277 3DRO 20 8UQM 13 3JUC 21 3JNQ 5 8OKC 145 3HUS 13 3BES 6 3JAK 81.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Hermann E. Hobbs, W3CIZ — Eppa W. Darne, Chief RM., Roy Corderman, Regional Coördinator. 3FAM and 3HNT are in the Maryland State Guard Net. JOI, the Baltimore Amateur Radio Assn., and a gang of the local boys have applied for authorization to operate in one of the defense nets on u.h.f. PV suggests that application be made for permission to continue the code practice runs by WLAW for training purposes toward more and better operators. A u.h.f. net is organized in the Wilmington area for defense use.

Traffic: W3BWT 1066 CIZ 431 HUM 348 PV 99. (Oct.-Nov.: W3UF 212.)

SOUTHERN NEW JERSEY — SCM, Lester H. Allen, W3CCO — Asst. SCM, W3ZI. Regional Coördinator in charge of Emergency Coördination, W3BAQ. With the writing of this report we find amateur activities curtailed. However, we do have some reports of activity and traffic totals from the 16th of last month to the time we were closed down. I would like to ask each and everyone who reads the column to keep in touch with me as to activity, etc. If you have not registered in the AEC group, write for application blanks. Your station may be needed for emergency purposes. The Delaware Valley Radio Association of Trenton held its 10th Anniversary Banquet, with over 100 persons in attendance. Clinton De Soto of ARRL Headquarters was guest speaker. W3ASQ was presented with a gavel in recognition of his past presidency of the organization. W3ZI was general chairman. The South Jersey Radio Assn. has incorporated a new idea at their club since the curtailment of ham activities. Besides holding business meetings the members report each meeting on emergency achievements and use the club as a clearing house with the Red Cross, American Legion and all branches of Civilian Defense. This idea should be incorporated with all clubs at once. HDJ again leads the 'phones of the Section in the Sweepstakes contest, with AQ placing second. W8IKA was a recent visitor of 3ITU. BWF completed his vertical beam for 28 Mc. ZI added a new stage to his speech amplifier. W3JUZ is the latest member of the Supporting Division AEC. ABS was appointed RM for the 56-Mc. 'Phone Net, and has ten stations all set to go. AVJ's traffic total is 73 this month! CUD and HDJ had the first two-way 224-Mc. contact in the Station last month. Both were using 100 watts and superregen. receivers. The distance was about 20 miles, and reports S 9 both ways. Congratulations to GEF on his recent marriage. IZT's emergency equipment is all set to go in case of an emergency. IDY completed 100-watt crystal-controlled rig for 112 Mc. FTU likewise is putting the finishing touches on his 112-Mc. rig. BAQ and CCO are making plans for the emergency setup for the State of New Jersey, and are about all set to go. JXX completed a new 50-watt modulator. EED is being heard a lot on 112 Mc. Until next month 73.

Traffic: W3BZX 213 ZI 155 GNY 146 EWK 101 HAZ 95 AVJ 73 AQ 65 BAQ 64 CCO 56 GMY 56 HPX 48 IDZ 42 ITU 41 BWF 40 GZS 34 JXX 28 ABS-GHR 24 HDW-OQ 20 IPM 17 JOL-IHO 16 IZT-EED 14 BEI 13 INF-ACC-WV 12 JOL-ARN 10 IMY 6 TL-EUH 5 JNO 3 HDJ 2 W8MOT/3 28.

WESTERN NEW YORK — SCM, Fred Chichester, W8PLA — The RARA gang had an FB exhibit at the Rochester Hobby Show, including a complete "Ham Shack" set up by W8JIC, frames of QSLs by ACY and an old kw. rotary spark transmitter by TC. WTJ is a new ham in this area. With the advent of the suspension of activities order, most of the boys are turning their attention to the u.h.f., and the already large Monroe County AEC ranks are swelling rapidly. The County and City Defense Coördinators have advised W8MC, the AEC Coördinator for Monroe County, that the local hams are definitely "in" the local plans for a defense setup, and it looks like all this area gang

The Month in Canada

QUEBEC—VE2

From Lin Morris, 2CO:

2HW is trying his hand at building a hi-fi gramophone amplifier. 2GM has a commission in the RCAF. 2DA is still teaching code. Condolences to 2BO on the passing of his mother. 2BK is overseas. 2GE has his commission in the reserve army. 2CO acquired an FBX with ham coils only, one week before the W's went of the air!

Seen but not heard: 2ID, ex-2AG, 2EM, 5TD, 2BE, 3AKO, 2CJ, 2HI, 2DU, 2IC, 2AL, 2HO, 2GE, 2HW, 2EW, 2IE, 2FK, 2FQ was ill in hospital in Montreal but is now back on the job at the flying school at St. Jean.

ONTARIO—VE3

From Len Mitchell, 3AZ:

The following news from Oshawa comes via 3AZG and we wish to thank Doug for taking the trouble to forward it to us.

3JV has built himself a new home just on the city limits where he has a swell location. 3SZ is a commercial operator and is now flying with the RAF ferry command. 3AKB is also with the RAF ferry command, having recently left TCA. 3AZE, Oshawa's newest commercial operator, is at Long Point radio beacon, way up in the wilderness of Northern Ontario. 3ARI has moved out to the suburbs and is telling everyone about the swell shack he's going to have up in the attic. 3QN is just waiting quietly and working hard. 3AGT when last heard from was at a coast station near Sarnia, but he hasn't been heard from lately. 3AZG must have something to build and rebuild, so is working on receivers. He had a trip to the hospital recently and came out minus an appendix. He states this column is OK as it is the only way to keep track of the old gang, and wishes more power to QST and the ARRL.

As it is impossible for the editor of this column to know personally all the amateurs in Ontario and their activities, the column can only be kept going if the amateurs themselves, particularly those outside Toronto, will send in news of interest. Address them to Len Mitchell, VE3AZ, 78 Raglan Avenue, Toronto, Ont.

ALBERTA—VE4

From W. W. Butchart, 4LQ:

4BP plays an instrument in the Edmonton Fusiliers Band C.A. (R). 4CL paid a visit to Edmonton on one of his Western trips. Pery is with the CBC at Ottawa now.

4HM is producing some very fine portrait work these days. 4XE has his hands full running a Regimental Signal School. We saw Pat (4XF) wending his way along Jasper Avenue one day last week. 4AHY is now in Ottawa with RCCS, and is instructing members of the Women's Service Corps in wireless. Nice job! Harvey now has his third stripe.

The ops of 4YX have opened up their own radio service store. Wonder where Pere' McGrane, 4AES, is these days? It's been a long time since we heard of him. 4PH has left his job piloting for CAT, Ltd., and has gone into the more adventurous task of ferrying bombers to Britain. Good luck, MacVic! 4AGZ, mentioned in this column a month or two ago as joining up in the wireless end of the RCAF, now has a commission. Nice going, Don. 4ANH of the RCAF, previously reported as being at the Wireless School in Calgary was, when last heard from, in Trenton instructing.

Can any readers pass along some dope as regards the whereabouts of any hams in the active forces overseas? Drop the writer a line, as any news item, however small, will prove of interest to the gang if it's about the boys overseas.

4AH gave an actuality broadcast from CFRN's new transmitter on the occasion of its inaugural ceremonies. 4EA's photo appeared in Edmonton newspapers, showing Roy seated at the studio control console of CFRN's new studios. We see by the papers that 4QX is returning to Edmonton about Xmas time, and will be married while here. Fred should be able to give us a good line-up on his present activities. 4EA is QRL parades with "E" Troop Cavalry SIGS. on doctor's orders. Nothing serious, we hope.

Received a swell letter from 4AFR, formerly with C. N. Telegraphs in Edmonton, now radio attendant for C. N. at Jasper. He says that OM and OW Sparks (4AKB) and himself comprise the hams up there. 4AFR figures that Canadian hams should interest the Dominion Government in u.h.f. work to be used in defense work. Thanks for the letter, OM.

who can serve will receive reactivation orders. MC has HK24s on 112 Mc. VLN is using 813s final. The Batavia Radio Operators Club, which consists of eleven licensed operators, two of whom are also Morse operators, have offered their services to the County Defense Council. Most of these stations are emergency-powered. RVM has 112-Mc. gear ready to go with emergency power. RTU and SBV both have two complete 112-Mc. rigs. Quite a number of the gang in this Section are tied in with the "Aircraft Warning System." SFD is testing transmitters for G.E. at Schenectady. With the FCC order for a shut-down in effect, your SCM, more than ever before, must rely on news mailed in by individual hams, clubs, coordinators, etc., for items to fill this column. So, fellows, please send in whatever news you have, and mail it not later than the 15th of each month. Headquarters suggests that these news items include as much on state-wide and municipal Amateur-Radio-in-Defense as possible. Mention meetings and defense organization plans, and the stations in them, and the agency served or certifying them. Without your help this column is going to be pretty slim, so how about a little help, gang?

WESTERN PENNSYLVANIA—SCM, E. A. Krall, W8CKO—Aest. SCM in charge of Emergency Coördination, W8AVY. Most of our ORS and OPS have failed to send in a monthly report. It is important that they do so, incorporating any information regarding defense nets and action taken in cooperation with local authorities for communication. The defense coördinator named by Governor James for the nine southwestern counties of Pennsylvania, is Mayor Scully of Pittsburgh. His jurisdiction includes the following counties: Armstrong, Beaver, Butler, Fayette, Greene, Lawrence, Washington, Westmoreland and Allegheny. The appointments made by Mayor Scully are E. C. Stone, vice coördinator of the Metropolitan District; Ross L. Leffler and Park Martin, chairman and secretary respectively, for the Allegheny Council of Defense. These men are also responsible for the other eight counties. An original committee of amateurs, namely, W8AVY, BWP, CKO, DJE, GWU, ONE, PX, QGH, RBJ and RMS met for discussion of the defense communications situation. No definite program was agreed upon but it was deemed necessary to call a mass meeting of all amateurs of the district three days later. Over three hundred attended, all nine counties being represented. Due to the many versions of the topics discussed, it was evident that nothing could be done regarding organization. It was imperative that some existing group or committee should handle the situation. Mr. Leffler, to whom we are responsible, gave us a talk, and said he was expected to show action himself and wanted it from us. FTY made a motion that The Pittsburgh Area Radio Club Council be named as the governing body. PARCC represents all worth while amateur radio clubs in W. Pa. and is an ARRL affiliate. After being put to vote it was found that 285 voted for and only 12 against the motion. A meeting was called for December 20th. Fifty-seven were in attendance at the PARCC meeting. Lt. Wickenhiser, W8KWA/WLQL, submitted his resignation as chairman of PARCC due to his CDC duties. PX then became chairman and DNO was elected vice chairman. Here are a few items of interest which were adopted at the meeting: Counties are to be divided into zones. Amateur zone coordinators will have areas under their jurisdiction and will appoint assistant ZCs to aid in establishing and maintaining nets. The following ZCs should be contacted by amateurs in their vicinity for appointment: NKI, DAB, OJW, HLM, AIG, BK, TUY, OLY, QGH, DNO, PDU, MKP, OC, CKO, UHB, BWP, CPE, ONW, BSO, AZG, OKU and PX. Some are still to be named. Most of the above data is applicable to Allegheny County only, but if acceptable to Mr. Leffler, other counties will follow the same procedure. The committee to represent the PARCC to the defense council will be PX, AVY, CKO, BWP, OC, RUE and WJK. Amateurs in other counties of W. Pa. should contact the SCM and inform him what they are doing so that proper credit can be given. Mr. Public wants action and the best way the amateur can get recognition is to be on his toes and show what can be done. Our ORS and OPS are urged to tie in with their local defense group. Recommend ECS, join the AEC and report progress monthly to the SCM. Tell about meetings, defense organization and active participating stations. New ECS: VTQ for Washington County; VRZ for Beaver County and RUE in Allegheny to assist WJK in u.h.f. work. Keep 'em flying!

Traffic: W8NCJ 391 CKO 231 PX 25 CMP 21.



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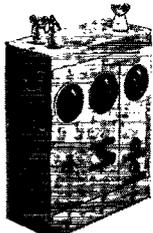
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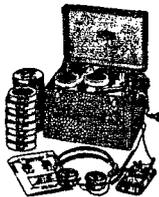
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In The Services

(Continued from page 37)

If you are an amateur in the services and not yet so registered with us, we'd like to add your name to our rapidly-growing list. Drop us a postcard, won't you, telling us your name and home call, your rank and radio duties, name and location of outfit to which assigned, and whether selectee, reservist or volunteer?

communications work in the 1928 Florida hurricane. We must also record the loss of Charles Singer, 2FJK, aboard ship en route to Britain for CTC work.

Lt. (jg) Henderson, 2N1Y, is aboard the *Vincennes*. Lt. (jg) Calhoun, 6FCO, is stationed at Pearl Harbor. Lt. (jg) Callahan, 6KO, is with the Pacific fleet. Lts. (jg) Heiser, 8DME, and Coss, are stationed in the East. RM3c Hoyt, 6QFG, operates at Port Blakely, Wash., and CRM Crie, 1AWR, on the *St. Augustine*. RM3c Stewart, 9IYH, sends us the following list of hams in the services: CRM Rost, 7GNT; RM3c Rogers, 7IHF; RM3c Miller, 7GMH; RM3c Lenny, 7IBC; RM3c Andrews, 8UGV; S2c Rudolph, 8RBE; and CRM Wade, 7DYH; and himself, are all assigned to the Naval Air Station in Seattle, Wash.; RM1c Rose, 7GMC, to the *Northampton*; RM3c Marvin, 7IIA, to the *Harris*; and his brother, 7GVC, operates in a National Guard company at Camp Murray, Wash. S2c Simpson, 6TET, banged up a leg and is now in the Naval Hospital at San Diego.

★ New Receiving Tubes ★

THE types 3LF4 and 14S7 are two new tubes announced recently by Sylvania.

The 3LF4 is a beam power amplifier, similar in characteristics to the 3Q5GT/G, fitted with a loktal base. Pin connections are as follows: Pin 1 plus filament, pin 2 plate, pin 3 screen, pin 6 grid, pin 7 filament center tap and beam-forming plates, pin 8 minus filament.

The type 14S7 is a loktal-base converter tube consisting of a triode unit and heptode unit. It is similar to the type 7J7 except for a considerably higher conversion conductance. The grid of the triode section is connected to the injector grid of the mixer section which results in true electron coupling. The cathode is common to both units. The frequency stability is said to be excellent and "flutter" filters required by other converters not necessary. Base connections are as follows: Pin 1 heater, pin 2 mixer plate, pin 3 triode plate, pin 4 triode control grid and mixer injection grid, pin 5 mixer screen, pin 6 mixer control grid, pin 7 cathode and mixer suppressor, pin 8 heater. The heater ratings are 14 volts, 160 ma.

★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS

BUY DEFENSE BONDS ★ BUY DEFENSE BONDS

★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS ★ BUY DEFENSE BONDS

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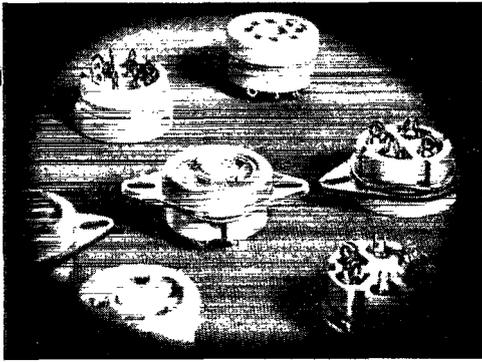
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On the Ultra Highs

(Continued from page 40)

full of defense industry, reports W1's BTG, MAB, EKY, and AYY working in cooperation with the local police to provide auxiliary communication on 112 Mc. All have attended air-raider warden school to familiarize themselves with the working of the ARP system.

W1EKT reports that he has been on the job practically every night making plans for 112-Mc. coverage of the town of Wakefield, Mass. Town appropriations have been made to cover the installation of eight emergency stations, and numerous mobile units are under construction. Whit hopes that all the five-meter gang along the Atlantic Seaboard will keep their stations in order and get the necessary authorizations for emergency inter-city work. The effectiveness of Five for this sort of work is well known.

W5AJG and W5VU of the municipal radio system of Dallas are at work on an amateur auxiliary system in conjunction with police radio. W6OVK, working with W6TJH as EC, has a request for authorizations for 32 Tucson amateurs for 112-Mc. work awaiting action. W8KPH reports that 112-Mc. activity was making rapid strides in Toledo just before the close-down. In July W8's KPH and RQI started keeping regular schedules and were soon joined by others until a total of 22 stations were active in the Toledo area, with the Lucas County Emergency Radio Council and the Toledo Amateur Radio Association sponsoring a drill each Sunday at 11 A.M. W9FZF lists W9's EWH, OVM, UKH, MTW, and FZF as the nucleus of a 112-Mc. emergency net now forming in Moline, Ill.

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THE HY1269 is a new transmitting beam tetrode recently announced by Hytron. In power rating, it falls somewhat above that of the 807 and HY61 class. With a maximum plate dissipation rating of 40 watts, power-output ratings are given as 63 watts, 52.5 watts and 30 watts respectively for c.w., plate-modulated and doubler service. An audio power output rating of 120 watts is given for a pair of tubes in Class AB₂ operation. The HY1269 operates at a maximum plate voltage of 750 and maximum screen voltage of 300. Under typical operating conditions, the plate current should be limited to 120 ma. for c.w. operation or 100 ma. for plate-modulated and doubler service. In doubler operation, plate voltage should be limited to 600. The HY1269 is a filament-type tube. The filament is center-tapped so that it may be operated at either 12 volts, 1.75 amp., or 6 volts, 3.5 amp. Maximum ratings may be used at frequencies up to 60 Mc.

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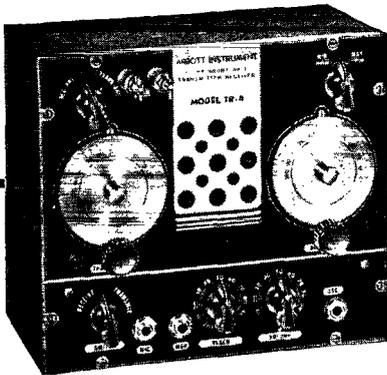
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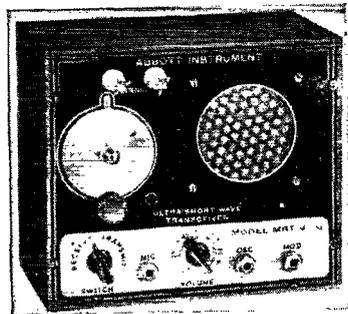
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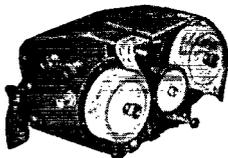
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Wrinkle Your Rig

(Continued from page 42)

Thus an afternoon of fun resulted in the production of a fully professional looking wrinkle paint job on our 73 inch relay rack, eight panels and six chassis, and there remained a good half pint of paint to wrinkle those other odd little pieces which will turn up in the future. And all for the cost of a dollar and six cents for a quart of paint and five cents for a pint of benzine.

P. S. The paint doesn't even make much of a smell in the kitchen while it is baking!

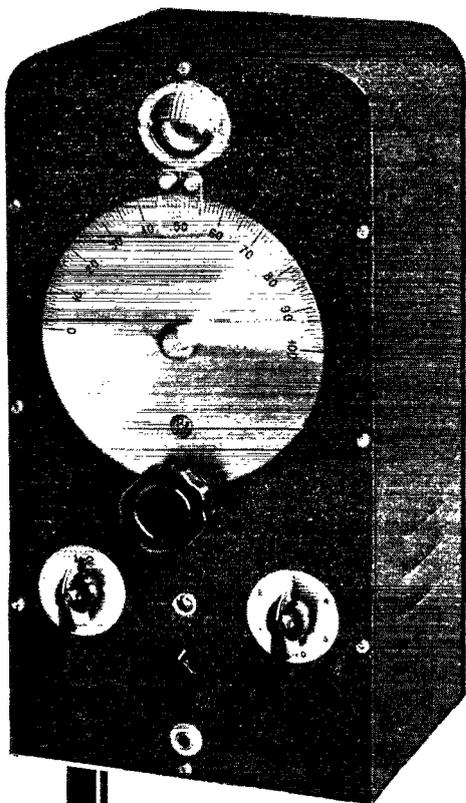
Antennas for 112-Mc. Mobile Work

(Continued from page 16)

The unit can be finished off by giving the wood a coat of shellac and then a coat of colored lacquer. If one wishes to be real fancy, a strip of weatherstripping can be glued along the bottom edge of the wood, to make up for any minor errors in carpentry.

The antenna will probably not need to be adjusted, but anyone interested in tuning it more precisely can do so by connecting his superregenerative receiver to the feed line. It should load the receiver fairly well (as indicated by the setting of the regeneration control necessary for the receiver to oscillate), and all points along the feed line should be equally "hot." This latter condition can be tested for by touching the feed line with the finger at various points and noting if the same degree of detuning is obtained. The shorting bar at the bottom of the antenna should be "cold." If the system does not act as described above, slight changes can be made in the dimensions until the thing behaves as it should. It is not too critical, however, and no one should have any trouble obtaining a reasonable match just by following the dimensions given.

Still another type of antenna that is handy to have in the car, although it is not directly applicable to mobile work, is the "knockdown" 4-element beam used by Bob Chapman, W1QV, and others in the vicinity of New London, Conn., and shown in Fig. 5. It is a 4-element beam that can be taken apart very easily and stowed away when not in use. W1QV uses a piece of 1- by 2-inch wood 52 inches long for the support of the elements. This length was arrived at by the simple process of noting what length of stick could conveniently be placed in the car. The elements are made of 1/4-inch copper tubing, and holes are drilled in the 1 by 2 strip for the elements to pass through. When the antenna is to be set up, the elements are run through the holes in the supporting strip, and a match or other sliver of wood is wedged in each hole to hold the elements in place. The beam can be supported in a number of different ways, ranging from a rope sling fastened to a tree to the top of a fence post acting as a center support. The beam can be turned quickly in any direction, and either vertical or horizontal polarization can be used. The beam shows a worthwhile gain and excellent directivity, and this latter



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characteristic is often helpful in reducing QRM from nearby receivers. An antenna with gain is a useful adjunct to any mobile station that may be called upon to do some fixed work from a distant point.

More Gear for Civilian Defense

(Continued from page 20)

to be needed. In this particular table the drawer slides in a tongue-and-groove arrangement, the tongue being formed by allowing the bottom of the drawer, which is quarter-inch thick Masonite, to project a half inch or so on either side. The grooves are simply gaps between the side supports, wood strips in the case of the side toward the legs, and a combination of wood and built-up strips of Masonite on the other side. The drawer height (inside) should be at least 2½ inches so that the larger sizes of receiving-tube cartons will fit inside, and can be as deep as the table top. A simple rotating window catch keeps the drawer from falling out while the table is being carried.

For code work and to provide a writing space for messages, log keeping and other necessary paper work, a sliding board is fitted in the end opposite the drawer. The telegraph key is permanently mounted on this board, and when not in use the board is simply slid into its grooves with the key on the bottom.

Provision is made for mounting an antenna on one of the corner posts, a pair of U-shaped metal brackets being fastened to the post so that a piece of 1 by 2 used as an antenna mast can be slid into place to fit snugly against the upright. The mast is made in two sections, the upper one slightly over 4 feet long to support a half-wave antenna or folded doublet and the lower one any convenient length which will bring the lower end of the antenna about 6 feet above the floor or ground so that it will clear the head of an in-

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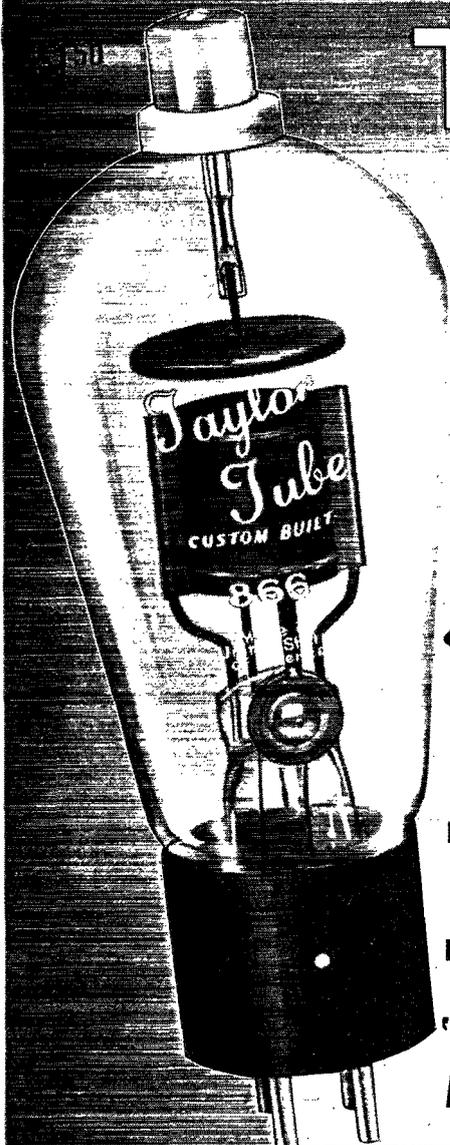
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dividual or ordinary height. The two pieces, both 1 by 2, are fastened together by bolts fitted with wing nuts for easy assembly and disassembly; one bolt can be left in so that the two pieces can be folded scissors fashion and placed on the lower shelf when the table is to be carried. A double-pole double-throw knife switch mounted on the side of the upper shelf is used for switching the feeders to either transmitter or receiver; a separate receiving antenna can of course be used if preferred.

It would be a good idea to carry, along with the other equipment, a fairly long 115-volt extension cord so that a.c. can be used whenever it is within reach, and possibly also some additional rolled-up lengths of feeder for the antenna in case a better antenna location can be found at greater height than that provided by the mast.

As a final piece of equipment, a waterproof canvas or rubber sheet to cover the apparatus in rainy weather would be a practical necessity, since emergencies don't always pick days when the sun is shining brightly!

Strays

By addressing a request to Research Division, American Lava Corporation, Chattanooga, Tenn., anyone interested may obtain, free of charge, reprints of an article, "The Electrical Properties of High Frequency Ceramics," by Dr. Ing. E. Rosenthal of London.

The article deals with characteristics, properties and comparisons of various types of ceramic insulators. The data, many of which have hitherto been unpublished, are summed up in a series of curves and charts.

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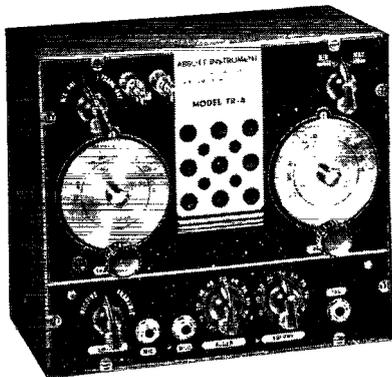
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Correspondence

(Continued from page 46)

17 Inrie Road, Allston, Mass.

Editor, QST:

This evening, while gazing rather sadly at my collection of DX cards — the testimony of many a night spent copying 7 and 14 Mc. c.w. — and wondering just what would be available now to fill the gap, I turned on my receiver and listlessly tuned through the amateur bands. Imagine my surprise to find a station sending c.w. on 1.9 Mc. Close listening disclosed that I was copying none other than good ol' 1AW. The message was in regard to the amateur's part in the present national defense effort; and I certainly felt proud to learn that W1AW was still carrying the standard of amateur radio.

The purpose of this letter, gentlemen, is simply to express to the American Radio Relay League my sincere appreciation of the outstanding service that the League renders at all times. Also I wish you to know that I felt extremely gratified at being able to copy W1AW, and to know that neither wars nor other worldly ills can stop the signals of W1AW from sending a message of hope and comfort to all radio amateurs in this period of extreme world anguish.

— Charles T. Florentine (SWL)

422 Goshen Ave., Elkhart, Indiana

Editor, QST:

As is probably true of all good Americans, I was shocked by the news that our country has been invaded by a Nazi-dominated government.

... What I really wanted to mention is the matter of loyalty to the ARRL during the coming months or years. I sincerely hope that the hams will get behind their ARRL and give it their full support. I, for one, want to make my stand very clear, and will repeat it wherever there is a gathering of hams. I WISH TO MAINTAIN MY MEMBERSHIP IN FULL, WHETHER WE ARE PERMITTED TO OPERATE OR NOT. I realize that the ARRL is the only means we have of expressing our views, and that it is also the only hope of resuming operation after the flame has died down and we are again at peace. . . .

— J. P. Gilliam, W9SVH

TUBE CONSERVATION

2137 32nd Ave., San Francisco, Calif.

Editor, QST:

Your editorial of December regarding the conservation of apparatus is misleading in part since you do not qualify your statement: "Avoid frequent cooling and reheating of filaments; if you're going to use the transmitter again within two hours it will be cheaper in the long run to leave the filaments on."

Thoriated-tungsten filament tubes do not come under this type of operation, since the tube life is greatly shortened by letting the filaments run for long periods without plate voltage applied. Frequently the grid becomes coated, secondary emission results, and the tube must be sent to the manufacturer to be "burned off" or the tube thrown away.

The "Eimac twins," Bill Eitel and Jack McCullough, told me that I could increase my tube life by killing the filaments during stand-by periods. The proof that they are right is that my final P.P. 35T's have well over a thousand hours on them and no sign of trouble. By means of a progressive contact switch filament voltage is applied before plate voltage. Even if both voltages are applied simultaneously less harm will be done to the tubes than if let run for long periods with only filament voltage applied. . . .

— Rex A. Reinhardt, W6PGB

EQUIPMENT SHARING FOR DEFENSE NEEDS

Stockton Theatre, Stockton, Illinois

Editor, QST:

... First, due to defense requirements, there is going to be a shortage of equipment available to hams. Second, there are lots of hams who would like to build emergency equipment but cannot afford to step out and purchase the neces-

(Continued on page 88)

HANG TOGETHER OR ELSE

Swift course of changing world conditions make it vital that we all gear ourselves toward one objective . . . **VICTORY** . . . as quickly as possible. Kenyon is proud of the privilege to be a small part of the road toward that objective—and come what may we pledge ourselves . . . and our company . . . to hang together—that there may be no "**OR ELSE**"



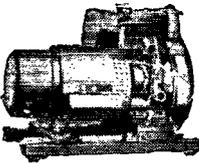
KENYON TRANSFORMER CO., Inc.

840 BARRY STREET

NEW YORK, N. Y.

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Cleveland	3292 Cedarbrook Rd.	Seattle	2605 Second Ave.	New Orleans	618 Girod St.
Chicago	21 E. Van Buren St.	Los Angeles	2112 7th St., W.	Lutz	Florida
Kansas City, Mo.	2004 Grand Ave.	Dallas	P. O. Box 4116, Sta. A	Richmond, Va.	3106 Edgewood Ave.



110-VOLTS A.C.
Anytime! Anywhere! With
KATOLIGHT PLANTS

Have special plant for operating portable radio receivers and transmitters. Close voltage regulation. *Filtered and Shielded.* 350 watt A.C., Amateur's price, \$76.50
Other sizes up to 15,000 watts. Also converters, AG and DO generators, and frequency changers.

"Ask your jobber"

KATOLIGHT, 2 Elm St., Mankato, Minn.

Hams, Defense School Students and Gov't Men



are learning the code the right way, quickly and easily with the all electric Ayers machine. Built by Code Champion McElroy for our future champions. Largest selection of tapes in World available with each machine. Low monthly rental. Tapes for MacAutos, recording slip and special inks for sale.

Ayers Automatic Code Machines
Dept. Q-2, 711 Boylston Street, Boston, Mass.

HARVEY RADIO LAB'S, Inc.
Manufacturers of
Radio Transmitters

ELECTRONIC APPARATUS

447 CONCORD AVENUE, CAMBRIDGE, MASS.

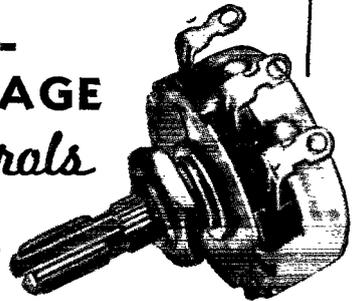
CRYSTALS by HIPOWER

The Hipower Crystal Company, one of America's oldest and largest manufacturers of precision crystal units, is able to offer the amateur and manufacturer attractive prices because of their large production and the exclusive Hipower grinding process. Whatever your crystal need may be, Hipower can supply it. Write today for full information.

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Sales Division—205 W. Wacker Drive, Chicago
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**HIGH-
OHMAGE
Controls**



- ★ For the application calling for high ohmage adjustable resistance, just count on a Clarostat composition-element control. Remember, here's two decades of specialized experience boiled down to the finest control available today. And there's precisely what you need — 1000 ohms to 5 megohms; choice of tapers and taps; choice of shafts (serrated type shown above). A trial will convince you!
- ★ Order from your local Clarostat jobber. Ask for latest catalog. Or write direct to Clarostat Mfg. Co., Inc., 285-7 N. 6th St., Brooklyn, N. Y.



The NEW MINILOG

*Especially Designed for
Emergency-Defense Use*

🇺🇸 To make it easier for amateurs engaged in civilian-defense communication to comply with FCC regulations, the ARRL has designed a special new pocket-size Log Book.

Detailed observance of the regulations is required of every one of the thousands of amateur stations now being reactivated by the Defense Communications Board. Many of these will be portable or portable-mobile stations; most will be operated under conditions making record-keeping a problem. All will find the Minilog the convenient answer to an important need.

Taking maximum advantage of all shortcuts permitted by the regulations, the new 4 x 6-inch Minilog answers the special needs for compactness and convenience in portable/mobile amateur operation, and still meets all requirements of the FCC. Its 60 pages contain space for recording contacts. With a strong leatherette-paper cover for protection and spiral binding (opens and folds flat) for convenience, it is designed throughout for maximum usefulness. You will find the Minilog a useful part of emergency preparation.

PRICE 25 CENTS
(NO STAMPS, PLEASE)

*Available from your local dealer
or direct from*

**THE AMERICAN
RADIO RELAY LEAGUE**
WEST HARTFORD, CONNECTICUT

WWV Schedules

THE standard frequency service of the National Bureau of Standards station WWV has been extended to include another carrier frequency (15 megacycles). Temporary equipment is still in use while a new transmitting station is being built. The broadcast is continuous at all times day and night from 1-kilowatt transmitters, and carries the standard musical pitch and other features. The radio frequencies are:

5 megacycles (= 5000 kilocycles = 5,000,000 cycles) per second
15 megacycles (= 15,000 kilocycles = 15,000,000 cycles) per second.

The standard musical pitch carried by the broadcasts is the frequency 440 cycles per second, corresponding to A above middle C. In addition there is a pulse every second, heard as a faint tick each second when listening to the 440 cycles. The pulse lasts 0.005 second, and provides an accurate time interval for purposes of physical measurements.

The 440-cycle tone is interrupted every five minutes for one minute in order to give the station announcement and to provide an interval for the checking of radio measurements based on the standard radio frequency. The announcement is the station call letters (WWV) in telegraphic code (dots and dashes).

The accuracy of the 5- and 15-megacycle frequencies, and of the 440-cycle standard pitch as transmitted, is better than a part in 10,000,000. Transmission effects in the medium (Doppler effect, etc.) may result in slight fluctuations in the 440-cycle frequency as received at a particular place; the average frequency received is, however, as accurate as that transmitted. The time interval marked by the pulse every second is accurate to 0.000 01 second. The 1-minute, 4-minute, and 5-minute intervals, synchronized with the seconds pulses and marked by the beginning and ending of the announcement periods, are accurate to a part in 10,000,000. The beginnings of the announcement periods are so synchronized with the basic time service of the U. S. Naval Observatory that they mark accurately the hour and the successive 5-minute periods; this adjustment does not have the extreme accuracy of the time intervals, but is within a small fraction of a second.

The service from the temporary transmitters will continue for some months. It will be continuous except for such breakdowns as may possibly occur because of the use of temporary apparatus. As rapidly as possible the Bureau is establishing a new station to provide more fully than in the past standard frequencies reliably receivable at all times throughout the country and adjacent areas.

Where to buy it

A directory of suppliers who carry in stock the products of these dependable manufacturers.



ALBANY, N. Y. Uncle Dave's Radio Shack 356 Broadway
ATLANTA, GEORGIA 265 Peachtree Street
 Radio Wire Television Inc.
BOMBAY, INDIA Eastern Electric & Engineering Company
BOSTON, MASS. Radio Shack 167 Washington Street
BOSTON, MASS. 110 Federal Street
 Radio Wire Television Inc.
BRIDGEPORT, CONN. 177 Cannon Street
 Hatry & Young, Inc.
BRONX, N. Y. 542 East Fordham Rd.
 Radio Wire Television Inc.
BUFFALO, N. Y. 1531 Main Street
 Dymac, Inc.
BUTLER, MISSOURI 211-215 N. Main Street
 Henry Radio Shop
CHICAGO, ILL. 833 W. Jackson Blvd.
 Allied Radio Corp.
CHICAGO, ILL. 901-911 W. Jackson Blvd.
 Radio Wire Television Inc.
CINCINNATI, OHIO 1103 Vine Street
 United Radio, Inc.
DETROIT, MICH. 325 E. Jefferson Ave.
 Radio Specialties Co.
DETROIT, MICHIGAN 11800 Woodward Ave.
 Radio Specialties Co.
HARTFORD, CONN. 227 Asylum Street
 Radio Inspection Service Company
HOUSTON, TEXAS 1021 Caroline Street
 R. C. & L. F. Hall
INDIANAPOLIS, INDIANA 34 West Ohio Street
 Van Sickle Radio Supply Co.
KANSAS CITY, MO. 1012 McGee Street
 Burstein-Applebee Company
NEW HAVEN, CONN. 1172 Chapel Street
 Hatry & Young, Inc.
NEW YORK, N. Y. Harrison Radio Co. 12 West Broadway
NEW YORK, N. Y. 100 Sixth Ave.
 Radio Wire Television Inc.
NEWARK, N. J. 24 Central Ave.
 Radio Wire Television Inc.
READING, PENN. 404 Walnut Street
 George D. Barbey Company
SCRANTON, PENN. 519-21 Mulberry Street
 Scranton Radio & Television Supply Co.
WASHINGTON, D. C. 938 F Street, N. W.
 Sun Radio & Service Supply Co.
WATERBURY, CONN. 199 South Main Street
 Hatry & Young, Inc.



ALBANY, N. Y. Uncle Dave's Radio Shack 356 Broadway
ATLANTA, GEORGIA 265 Peachtree Street
 Radio Wire Television Inc.
BOSTON, MASS. Radio Shack 167 Washington Street
BOSTON, MASS. 110 Federal Street
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BRIDGEPORT, CONN. 177 Cannon Street
 Hatry & Young, Inc.
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 Radio Wire Television Inc.
BUFFALO, N. Y. 1531 Main Street
 Dymac, Inc.
BUTLER, MISSOURI 211-215 N. Main Street
 Henry Radio Shop
CHICAGO, ILLINOIS 833 W. Jackson Blvd.
 Allied Radio Corp.
CHICAGO, ILL. 901-911 W. Jackson Blvd
 Radio Wire Television Inc.
CINCINNATI, OHIO 1103 Vine Street
 United Radio, Inc.
HARTFORD, CONN. 203 Ann Street
 Hatry & Young, Inc.
MINNEAPOLIS, MINNESOTA 1211 LaSalle Avenue
 Lew Bonn Company
NEW HAVEN, CONN. 1172 Chapel Street
 Hatry & Young, Inc.
NEW YORK, N. Y. 100 Sixth Avenue
 Radio Wire Television Inc.
NEWARK, N. J. 24 Central Ave.
 Radio Wire Television Inc.
READING, PENN. 404 Walnut Street
 George D. Barbey Company
WASHINGTON, D. C. 938 F Street, N. W
 Sun Radio & Service Supply Co.

Listings on this page do not necessarily imply endorsement by QST of the dealers or of other equipment sold by them.

Correspondence

(Continued from page 84)

sary gear. Now I believe that there must be a tremendous amount of equipment in the junk boxes or surplus equipment collections which most of us maintain that could be put to very good use at the present time.

My suggestion is that those hams who have such surplus equipment loan it to other reliable hams who need it for construction of defense-emergency u.h.f. stations, for the duration of the present emergency. Possibly this exchange or loan of parts could be handled by ARRL headquarters, a record of ownership and of user being maintained by the League. Hams needing such material could be required to make requisition through local civilian defense officials, who would pass on the reliability and responsibility of the ham requesting material for use in defense efforts.

I personally have some equipment which I would be willing to loan to a responsible ham, and also I would welcome having made available for my use certain parts which I do not have. In this connection, I will forward a list of available material which I would be willing to loan, if this idea has any value under present conditions.

— H. Williams, W9BEN

Strays

The other day, I worked W9FQB in Omaha on 40 c.w. Later the same day I visited W9MPJ. Our first contact was W9FQB, this time on 160 'phone.

— — — — —

My landlord is a ham — W9ARN.
My mailman is a ham — W9KEC.
My milkman is a ham — W9QPQ.
Yes, I'm a ham, too. — W9FKO.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

Harvey G. Bennett, W8PHD, Pittsburgh, Penna.

Lt. (jg) Aaron Bush, W4FB, Birmingham, Ala.

Dr. Frank Conrad, ex-8XK, Pittsburgh, Penna.

Ensign Ralph Hollis, W4AFC, West Palm Beach, Fla.

Sigurd E. Knudsen, W2BAS, Brooklyn, N. Y.

Thomas A. McClelland, W9HFC, Englewood, Colo.

Leonard Nash, G4DA, England

O. W. Parker, W8DUT, New Kensington, Penna.

Sherley R. Sampson, W9WQD, Crookston, Minn.

Erwin Shaeffer, W8AGU, Penfield, N. Y.
William Shepard Wilson, W6RCF, Elsinore, Calif.

Charles Singer, W2FJK, Jamaica, N. Y.

Sterling A. Speirn, W8URO, Detroit, Mich.

Arthur K. Woodman, W4GFN, W. Palm Beach, Fla.

Ensign Marvin J. Zimmerman, W9NZW, Kelley, Iowa.

WE'RE DOING OUR PART, TOO IN AN ALL-OUT EFFORT TO PROVIDE IMMEDIATE DELIVERY OF NATIONAL DEFENSE REQUIREMENTS

★
**NOW — the GREATEST STOCK
EVER IN OUR HISTORY!**

**RADIO PARTS and SUPPLIES OF ALL TYPES
—AVAILABLE FOR PROMPT SHIPMENT!**

AEROVOX • AMPHENOL • ASTATIC • AUDAK
B&W • BUD • BLILEY • BRUSH • BURGESS
CORNELL-DUBILIER • EBY • EIMAC
GAMMATRON • G.E. • GUARDIAN • HICKOK
HAMMARLUND • HYTRON • I.R.C. • JACKSON
JENSEN • JOHNSON • JONES • KENYON
MALLORY • MEISSNER • MILLEN • MILLER
NATIONAL • OHMITE • PAR-METAL • R.C.A.
SHURE • SPEED-X • STANCOR • SUPREME
TAYLOR • THORDARSON • TRIPLETT • WESTON
and many, many others!

Write for complete descriptive catalogs

WE CARRY ALL RECEIVERS IN STOCK, Too!

HALLICRAFTERS
S19R \$32.50 S20R \$54.50
S22R 74.50 SX24 74.50
SX25 94.50 SX28 179.50
S29 69.50 SX32 149.50

HAMMARLUND
HQ120-X..\$168.00 "SUPER-PRO"..\$318.00

NATIONAL
NC-200....\$159.50 HRO\$197.70

ECHOPHONE
EC-1..\$24.50 EC-2..\$42.50 EC-3..\$59.50

Send for free illustrated booklets

—MAIL ORDERS FILLED—

ABBOTT 2½ METER TRANSMITTER-RECEIVERS

AVAILABLE FROM STOCK

FOR ALL EMERGENCIES

Model TR-4—Less power supply and
tubes\$38.22

Model DK-3—Less accessories 18.82

Model MRT-3—Less power supply and
tubes\$28.81

Complete descriptive literature available on request



NEW YORK'S OLDEST "HAM" HOUSE
"SUPPLIERS TO MANY U. S. GOVT. AGENCIES"
Telephone BR4day 7-1840

SUN RADIO CO.
212 Fulton Street, Dept. GH New York
Cable Address: SUNRADIO NEW YORK



The Paul Revere of 1942 THE AMERICAN RADIO AMATEUR

1775-1942

One if By Land
Two if By Sea
2½ if By Air

2½ METER DEFENSE COMMUNICATION NETWORKS BEING ORGANIZED BY AMATEURS

The essence of air raid defense lies in quick and direct unailing communication. Only radio is faster than aircraft; only radio can operate when power lines are out; only radio can be completely portable with mobility so necessary.

Many cities and towns have investigated, purchased and installed 2½ meter radio equipment. In this field the best known and the most used is the Abbott TR-4 2½ meter (receiver transmitter) unit in one case. Inexpensive in cost and operation; portability and dependability assured. The 2½ meter equipment chosen should be small and adaptable for fixed station use or operation in an automobile. It is recommended that immediate action in setting up your network be taken.

HALLICRAFTERS • NATIONAL and HAMMARLUND RECEIVERS

	Down Payment	4 Months	6 Months	8 Months
HALLICRAFTERS	\$44.87			\$17.84
Model SX-28		53.50		21.27
Model SX-28 with R-12 Speaker		23.62		9.39
Model SX-25, Super Defiant, Less speaker		27.38		10.88
Model SX-25, Super Defiant with speaker		18.63	\$9.87	
Model SX-24, Defiant, Less speaker		22.38		8.90
Model SX-24, Defiant, With speaker		13.63	7.22	
Model S-20R, Sky Champion		17.38	9.21	
Model S-29, Sky Traveler		8.13	\$6.46	
Model S-19R, Sky Buddy		43.63		17.34
NATIONAL		14.38		7.62
NC-200 TG				31.60
NC-85 AC-DC				16.69
HAMMARLUND		79.50		
SP-210-SX		42.00		
HQ-120-X		10.63	8.45	7.89
ECHOPHONE				
EC-2		14.88		
EC-3		24.50		
EC-1, Net Price				



ABBOTT TR-4

Model TR-4, Net price	\$38.22
Universal Handset	5.88
AC Power Supply	19.20
Vibrapak 300V—100 mills	14.70
Tube Kit (for TR-4 and power supply)	8.40

IMMEDIATE DELIVERY

The RADIO SHACK

167 WASHINGTON ST., BOSTON, MASS., U.S.A.

**HE BOUGHT AN
ECHOPHONE EC-1!**



Echophone Model EC-1. 6 tubes, 3 bands.
Tunes from 550 kc. to 30 mc. Self-contained speaker. Elec-
trical bandspread on all bands. AC/DC. 115-125 volts.

\$24⁵⁰

ADVERTISEMENT

HAM-ADS

(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 15¢ 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 7¢ 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 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 15¢ rate. Provisions of paragraphs (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

Having made no investigation of the advertisers in the classified columns, the publishers of *QST* are unable to vouch for their integrity or for the grade or character of the products advertised

Gear is short. You can sell your old and extra gear through Ham-Ads.

QUARTZ — direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSL'S, Cartoons. Free samples. Theodore Porcher, 7708 Navajo, Philadelphia, Pa.

CALLBOOKS — Winter edition now on sale containing complete up-to-date list of radio hams throughout entire world. Single copies \$1.25. Canada and foreign \$1.35. Radio Amateur Call Book, 610 S. Dearborn, Chicago.

COMMERCIAL radio operators examination questions and answers. One dollar per element. G. C. Waller, W5ATV, 6540 Washington Blvd., Tulsa, Okla.

TELEPLEXES, Instructographs bought, sold. Ryan's, Hannibal, Mo.

OLD QSTs, Bought — sold — traded. 1915/41. W6SN.

WANTED — Teleplex, Instructograph, meters, midget transmitter, etc. W8KQZ.

SWAP brand new 2½-meter Abbott transceiver complete and 5-meter transceiver (less batteries) for movie equipment or what have you. W9BNC, 6915 N. 31st Ave., Omaha, Nebr.

SELL — slightly used DB-20 \$30; used RK-20 \$6. W3HME.

SWAP Howard 450-X for Stancor 60-P or similar phone-CW all band commercial transmitter. W9DPU.

FOR sale: 1000 volt 300 ma. Esco motor-generator \$60; 500 volt 300 ma. Esco motor-generator \$35; 1000 volt 1000 ma. Esco generator \$40; 1½ h.p. Westinghouse motor, coupled to generator \$50; National AGSX receiver complete general coverage coils also 20, 40; 80 bands \$100. W5SP, Abilene, Texas.

WANTED: Proceedings IRE January, 1936, January, 1937. W5CLP, 1724 Pauline, New Orleans.

ARE you up-in-the-air about U.H.F. gear for your defense plans? Well, come on down long enough to study the Ultra High Frequency Chapters of the 1942 Handbook.

SWAP new Tokofone recorder for Stancor twenty or forty P or what have you. Jack Watt, Ontonagon, Mich.

RADIO engineers wanted for development and design of radio transmitter components and directional antenna equipment. Transmitter experience desirable although not necessary. Permanent positions. Describe education, experience, aptitudes and state salary desired. Recent photo requested. E. F. Johnson Company, Waseca, Minn.

CASH for your transmitter, receiver, test equipment, etc. Must be modern and very reasonable. Give full information, photographs, detailed parts list, etc. Radio, 12 W. Broadway, N. Y.

FOR sale — 125 watt standard relay rack transmitter, remote control, automatic time delay; separate modulator is 55 watt Lafayette amplifier, four inputs, 2 bass reflex cases with 12 inch speakers; Universal velocity microphone with floor stand; Hallcrafters receiver; Johnson Q ant; Vibroplex. Ready to go on air. For details and photo write J. S. Grishin, W2KWC, 192-13th St., Brooklyn, N. Y.

WANTED: National NC-200 receiver. E. Turner, 188 Lovell Rd., Watertown, Mass.

WANTED: used receiver. Must be in good condition and bargain. No junk. W9ZHY, Neosho, Mo.

COME what may, we will continue to serve you with the world's most complete stock of shortwave receivers and radio supplies of all sorts. Amateurs, government, police, broadcast, schools, NYA, and all other services get whatever radio equipment you need from us promptly. You get lowest prices, best terms (financed by us), quickest delivery, best trade-in. We have everything: radio: 2½ meter and emergency equipment, vibrapacks, Signal Shifters, hundreds of communications receivers. SX-32s, NC-200s, HQ120Xs, SX-28s, SX-25s, S-29s, etc., positively in stock. Write, telephone, telegraph us 24 hours a day, 7 days a week for anything in radio. Bob Henry, Butler, Mo., or Ted Henry, 2335 Westwood Blvd., W. Los Angeles, Calif.

WE pay cash for used communications receivers. Also give best trade-ins. Bob Henry, Butler, Mo., or Ted Henry, 2335 Westwood Blvd., W. Los Angeles, Calif.

RECONDITIONED, guaranteed communications receivers and transmitters. All makes and models cheap. Free trial. Terms. List free. Code machines rented. Bob Henry, Butler, Mo., or Ted Henry, 2335 Westwood Blvd., W. Los Angeles, Calif.

ICONOSCOPE tube wanted, new or used. Will swap new General Electric Television set, or cash. William B. Still, W2GJR, 107-51 Merrick Rd., Jamaica, N. Y.

WANTED — 1 or 2 Mercury Arc Rectifier tubes, preferably Cooper-Hewitt 30 amp capacity. State price. Instructograph Co., 4701 Sheridan Rd., Chicago, Ill.

EIDSON crystals, in behalf of its dealers, extends its most cordial thanks to the hams for their loyalty and patronage. We gratefully acknowledge your assistance in helping us do a better job. Our attention must now be turned to a more serious undertaking, one in which you too will play a most important part. In all sincerity, fellows, it's been swell knowing you, we will be seeing you again — and soon we hope. Eidson's, Temple, Texas.

EIDSON low drift commercial crystals meet FCC requirements and complete satisfaction is guaranteed. Police, aircraft, marine, defense, etc. — write or wire your needs or send for folder. Eidson's, Temple, Texas.

SELL — HQ-120X in excellent condition \$135 including speaker. Fred Johnstone, W5LS, Roanoke, Va.

WANT to buy used Lingaphone code records or rent Teleplex. Leonard Poole, Herndon, Va.

WANTED Sargent Marine or LW receiver. W4OF, Atlanta, Ga.

WANT July, 1916, QST. W9EFC.

HAM printing: letterheads, envelopes — 250, \$2.40; 500, \$3.75; 1000, \$5.50. W8DED, Holland, Mich.

WANTED: a used Meissner signal shifter. Will pay cash. W8QJF.

WANTED — National HRO or NC-100 receiver in perfect condition. Write stating serial number and cash price. F. W. Perkins, 1037 Farmington Ave., W. Hartford, Conn.

THE MINILOG

*A Streamlined Log Book
"stripped for action" in
Amateur Defense Work*

ASK YOUR DEALER TO SHOW YOU

THE MINILOG

THE 1942

RADIO AMATEUR'S HANDBOOK

MORE CONSTRUCTIONAL MATERIAL THAN EVER BEFORE

IN BUILDING THE 1942 EDITION the ARRL Headquarters staff designed a new, non-mathematical, simple yet thorough treatment of fundamentals to make the **HANDBOOK** even more useful in its growing role as a textbook for defense classes. Stripped to essentials, the new theory and design sections cover every subject encountered in practical radio communication, sectionalized by topics with abundant cross-referencing and fully indexed. The new **HANDBOOK** is an ideal reference work as well as a logically-arranged study course.

All this was achieved without sacrificing any of the constructional information on tested and proved gear which has always been the outstanding feature of the **HANDBOOK**. In fact, the constructional chapters are given more space and contain more new designs in this edition than ever before.

★ The new **HANDBOOK** is divided into two parts. The first section starts the reader with the basic electrical fundamentals, takes him through the principles of vacuum tubes and their operation, explains the methods of generating r.f. power, keying, modulation, radio reception, principles of wave propagation and antenna systems. The subject matter is keyed in such a way as to make ready reference possible throughout the book.

★ The second section is devoted to the building of practical amateur equipment. Constructional details are given for receivers from 1 to 7 tubes, including new ultra-simple receivers designed especially for the beginner. The greatly enlarged transmitter chapter now coordinates power supply and r.f. equipment, ten complete transmitters from 70 watts

to a kilowatt being described. The fifteen individual exciters and amplifiers range from the simplest oscillator to a push-pull kilowatt amplifier. The u.h.f. chapters, also enlarged, place special emphasis on equipment for portable-mobile work. They include converters, superregenerative receivers using the newest tubes, crystal- and self-excited transmitters in several power ranges and a battery transmitter, as well as FM transmitting and receiving equipment. Other chapters contain an expanded treatment of measurements and measuring equipment, material on emergency and portable gear, workshop practice, operating procedure, F.C.C. regulations and miscellaneous tables and data. The vacuum-tube tables remain the most complete published anywhere, with over 50 new types added.

THEORY—CONSTRUCTION—OPERATING. More than ever before, the new 1942 **RADIO AMATEUR'S HANDBOOK** is "the all-purpose volume on radio." Text, data book, operating manual—it is all these and more. As a text it is probably more used in radio schools and colleges than any other single volume. As a practical constructional handbook, it stands in a class alone. As an operating manual, it provides information available from no comparable source.

Buckram Bound
\$2.50

\$1.00
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\$1.50 Outside
Continental U. S. A.

AMERICAN RADIO RELAY LEAGUE, INC., West Hartford, Connecticut

Your Nearby Dealer Is Your Best Friend

Your nearby dealer is entitled to your patronage. He is equipped with a knowledge and understanding of amateur radio. He is your logical source of advice and counsel on what equipment you should buy. His stock is complete. He can supply your needs without delay. His prices are fair and consistent with the high quality of the goods he carries. He is responsible to you and interested in you.

One of these dealers is probably in your city—Patronize him!

ATLANTA, GEORGIA

Radio Wire Television Inc.
265 Peachtree Street
"The World's Largest Radio Supply House"

HOUSTON, TEXAS

R. C. & L. F. Hall
1021 Caroline Street (C 0721)
"Specialists in Amateur Supplies"

BALTIMORE, MARYLAND

Radio Electric Service Co.
3 N. Howard St.
Everything for the Amateur

NEWARK, N. J.

Radio Wire Television Inc.
24 Central Avenue
"The World's Largest Radio Supply House"

BOSTON, MASS.

Radio Wire Television Inc.
110 Federal Street
"The World's Largest Radio Supply House"

NEW YORK, N. Y.

Radio Wire Television Inc.
100 Sixth Avenue
"The World's Largest Radio Supply House"

BUFFALO, NEW YORK

Radio Equipment Corp.
326 Elm Street
W8PMC and W8NEL — Ham service and sound equipment

NEW YORK, N. Y.

Harrison Radio Company
12 West Broadway
Harrison Has It! Phone WOrth 2-6276 for information or rush service

BUFFALO, NEW YORK

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1531 Main Street — Cor. Ferry — GA. 0252
One of the Largest Ham Supply Houses in Western New York

PHILADELPHIA, PENNSYLVANIA

Eugene G. Wile
10 S. Tenth Street
Complete Stock of Quality Merchandise

HARTFORD, CONNECTICUT

Radio Inspection Service Company
227 Asylum Street
What do you want? We have it. Radio exclusively

PROVIDENCE, RHODE ISLAND

W. H. Edwards Company
85 Broadway
National, Hammarlund, Hallicrafter, Thordarson, Taylor, RCA

HARTFORD, CONNECTICUT

Hatry & Young, Inc.
203 Ann Street
Stores also in Bridgeport and New Haven

SCRANTON, PENNSYLVANIA

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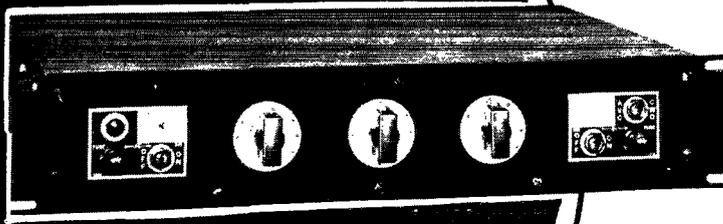
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SCR-2 RECEIVER

Superb Single-Channel Performance

Crystal Controlled

2 RF stages

2 IF stages

Noise Limiter

Nine Tubes

Self-contained

Power Supply

— all on a

3½" Panel

The SCR-2 is an extremely compact crystal controlled receiver for single channel reception mounted on a 3½" relay rack panel. It has two stages of tuned RF amplification, a dual purpose converter with crystal controlled oscillator, two stages of IF amplification, a detector and one audio stage. Auxiliary circuits are AVC, CW oscillator and noise limiter. Nine tubes are used, and the power supply is self-contained.

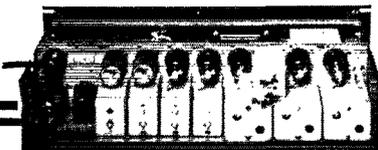
The SCR-2 is definitely a high performance receiver. Signal-to-noise ratio averages 10 db for an input of 2.5 microvolts. The AVC is flat within 4 db for inputs from 1 microvolt to well over 1 volt. Being crystal controlled, the frequency stability is excellent. The IF channel has a band-pass characteristic to allow for slight transmitter drift, etc.

As the SCR-2 receiver is intended for communication work, the audio channel has been deliberately made flat only from 100 to 1500 cycles, with increasing attenuation of higher frequencies, thus providing good intelligibility with maximum reduction of unwanted signals and noise.

SCR-2 receivers are available for use at fixed frequencies between 100 kcs and 18 mcs. A free booklet describing this receiver will be mailed on request.

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80 Million Metal Radio Tubes



... and RCA is now producing metal tubes at fastest pace in history!

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If you have found difficulty or delay in obtaining RCA Metal

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12 REASONS WHY METAL Tubes are BETTER Tubes!

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- Greater Flexibility in Design
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- Lower Interelectrode Capacitance
- No Envelope Emission Troubles
- Freedom of Placement on Chassis
- Higher Getter Efficiency
- Simple, Efficient Grounding
- Single-ended Construction
- Large Pin-Contact Area
- Lower Socket Costs
- More Rugged Construction



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