THE RADIO EXPERIMENTER'S MAGAZINE

SHORT WAVE CRAFT

HUGO GERNSBACK
Editor

"The Y. L. Stands Him Up"

May 935

WORLD'S LARGEST SHORT WAVE CIRCULATION

Vol. 6, No. 1

SHORT WAVE CRAFT

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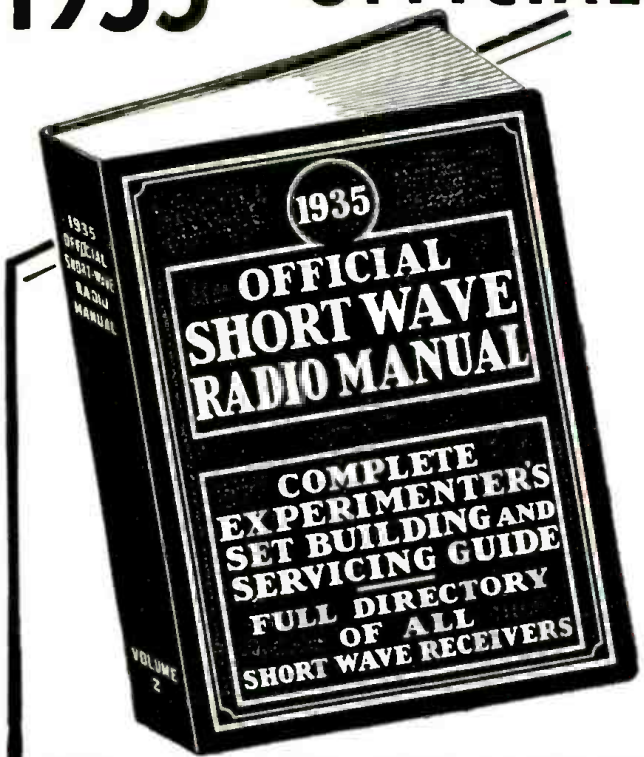
Here's the new-Big

1935 OFFICIAL SHORT WAVE RADIO MANUAL



When we brought out our 1934 OFFICIAL SHORT WAVE RADIO MANUAL, of which many thousands of copies were bought by short wave enthusiasts, we promised you that a new volume would be published every year.

In keeping with this promise, we now take great pleasure in announcing the 1935 OFFICIAL SHORT WAVE RADIO MANUAL.

There has been tremendous progress and a great boom in short waves in the past year, and the art has made such rapid progress that no single book, up to now, has been able to keep up with this progress. The 1935 OFFICIAL SHORT WAVE RADIO MANUAL fills this need, and it fills it completely. All the progress made in short waves, whether it is in set building, whether it is in radio servicing, whether it is in new models, whether it is in new short wave discoveries, all are faithfully reported and chronicled in this great 1935 volume.

Like its predecessor, it is a BIG book, in which you will find literally EVERYTHING in short waves—nothing has been left out.

Not only is it a complete manual, but it is a great encyclopedia of short wave facts, information, hookups, photographs, tables, maps, etc., etc. The wealth of material is so great that it would take several pages to list all the valuable data that has been included in this volume.

Similar to last year's volume, the new book has been edited by Hugo Gernsback, Editor of SHORT WAVE CRAFT and H. W. Secor, Managing Editor, and if you are and have been a reader of SHORT WAVE CRAFT, and particularly if you have seen the 1934 Manual, you will know just what you can expect from this, the greatest short wave manual ever put out by Mr. Gernsback.

Here are the star features of the book:

29 ★ Features:

★ 1—**Short-Wave Beginners' Section**—Dozens of new simplified circuits for 1-2 and 3 tube receivers, including famous "Doerle" and "Oscillodyne," etc.

★ 2—**Short-Wave Receivers**—All types discussed with diagrams and pictures—The best types only, which have "stood the test" of actual operating service. Full details for constructing them, etc., "Band-Spreading" the Doerle, 5-tube T.R.F. Receivers, etc.

★ 3—**Battery Short-Wave Receivers**—1-2, & 3 tube sets—all the way up to special 5-tube superheterodyne, designed especially for battery operation.

★ 4—**"5-Meter" Department**—All the latest "dope"—including newest transmitters, "Long Line" oscillators, improved "high sensitivity" receivers. How to arrange best aerial to get greatest distance, 5-meter transceivers, hook-ups, etc.

★ 5—**Short-Wave "Artificial Fever" Apparatus**—also newest therapeutic and other allied applications of ultra short waves.

★ 6—**Short-Wave Experimenter's Section**—filled with Short-Wave Kinks, Short-cuts, etc., of interest to every experimenter.

★ 7—**Ultra Short Waves**—Newest circuits, apparatus, and results obtained in this field.

★ 8—**Commercial "Short-Wave" and "All-Wave" Receivers**—Full Servicing Data for "Set-Owners" and "Service-men."

★ 9—**How to build "Power Supply" Units for Short-Wave Receivers.**

★ 10—**Latest Short-Wave Converters**—With servicing data on Commercial Models.

★ 11—**The Short-Wave Antenna**—Including latest "Noise-Reduction" types, Transposed Lead-In systems, shielded cable, Double-Doublet, etc.

★ 12—**Short-Wave Superheterodynes**—From 3 to 11 tubes—Latest descriptions and diagrams including commercial all-wave superhets.

★ 13—**Phone Transmitters for Amateur Stations**—How to build them.

★ 14—**"Skip" Distance**—Heaviside layer, etc.—explained; physics of Short Waves.

★ 15—**Super-Regenerative Short-Wave Receivers**—latest circuits, etc.

★ 16—**Recording "Foreign" and "Domestic" Short-Wave programs.** All systems in use.

★ 17—**"High Fidelity"**—How to obtain it in Short-Wave Receivers.

★ 18—**The best Short-Wave Questions and answers of the year.**

★ 19—**The best Short-Wave "Kinks" of the year.**

★ 20—**Foreign Short-Wave Review**—Novel circuits, apparatus, etc.

★ 21—**Tubes for Short-Wave purposes**—Including tables of latest tubes for Short-Wave transmitters and Receivers.

★ 22—**Short-Wave Transmitters**—All about the new "Long Lines" Oscillators as well as other "simplified" high-efficiency transmitters, Rack and Panel jobs, Crystal Control, etc.

★ 23—**Multi-Purpose Tubes**—How to use them on Short Waves—Sets in which 2 tubes=4; 3 tubes=6; etc.

★ 24—**"Audio Amplifiers" for Short-Wave Receivers, Circuits, etc.**

★ 25—**"Band-Spread"**—How to spread the stations over the dial for easier tuning.

★ 26—**Plug-less "Mono-Coil" Receivers**—How to build efficient switch-type coils to eliminate plug-in coils; "Clip-Coil" Receivers, etc.

★ 27—**Boosters, Pre-amplifiers and Beat Oscillators**—How they work, with constructional data, diagrams, etc.

★ 28—**Portable Short-Wave Receivers and Transmitters**—Transmitter Power supply from Ford Coils, etc.

AND FOR SERVICE MEN

★ 29—Every short-wave diagram, every short-wave set, whether it is a battery set, whether it is an all-ware set, EVERYTHING, in other words, that has been manufactured in the commercial set line, will be found in this special enlarged section. Hundreds of valuable diagrams, with tube layouts, resistor values, color codes of wiring cables, etc., and the purpose of each tube in each set clearly indicated on the diagram, wherever this information can possibly be obtained.

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WHAT'S NEW IN RADIO

OLD-TIME SERVICEMEN LOSING OUT WITH THEIR HIT-AND-MISS METHODS

RAPID DEVELOPMENT IN RADIO—new and improved circuits—special purpose tubes—Radio's expansion into many allied fields—have created an increasing demand for Radio servicemen. BUT—only the trained servicemen—the men who have secured a firm grounding in the fundamentals of Radio, in modern service technique, and who have kept up with all the modern developments of Radio are in a position to take advantage of this.

TODAY'S RADIO SERVICEMAN is a different person from the serviceman of five years ago. Today, the successful serviceman must really be a trained service engineer—capable, quick, ingenious, to solve the many problems he meets with when servicing the many types of Radios and other apparatus developed along Radio principles—which he is called on to repair, sell and service. The old-timer who simply changes tubes, pulls wires, holds his breath and hopes, can't get along today. On every side he sees efficient, trained men step into his shoes—go ahead faster—and make more money.

ALL-WAVE RADIOS, with their exact adjustments have brought forth many new service problems. This kind of service work requires a man with special knowledge and training. Not the old-time, hit-and-miss fellow. He may try—but he can't succeed. It's the well trained serviceman who cashes in. That's why we see many ambitious men everywhere getting into Radio service work—with sound training such as any man can get from the National Radio Institute. And that's why many servicemen with years of practical experience are also training themselves in the modern ways of servicing.

MODERN SERVICING METHODS are helping servicemen increase their earnings by greatly reducing the amount of time required to do a job. This enables them to handle a greater volume of work per day, and have more time to build up their businesses.

AUTO RADIOS BRING SPECIAL SERVICE PROBLEMS. The increasing volume of sales of Auto Radios is bringing with it an increased demand for trained servicemen who are capable of servicing Auto Radios quickly and thoroughly. Many new problems—such as ignition noises, complicated and compact design, the ability to tell whether the car chassis or the receiver is to blame, vibrator defects—are being solved by modern, well-trained servicemen who are finding Auto Radio a means of increasing their incomes. Modern Radio schools—such as the National Radio Institute—are including thorough training in Auto Radio in their courses.

NEW BOOK TELLS ABOUT RADIO'S DEVELOPMENTS. Mr. J. E. Smith, President of the National Radio Institute, Washington, D. C., the oldest and largest Institute for training men for Radio through home study, has prepared a book telling all about the need for thorough training in Radio, for either "old" servicemen who want to prepare themselves for modern Radio servicing—or for the beginner who wishes to enter Radio either as a spare time or full time expert. Read the National Radio Institute's advertisement on the right—then mail the coupon for a FREE copy of Mr. Smith's book.

IN THIS ISSUE: PROMINENT SHORT-WAVE AUTHORS

Kepperling • Shuart • McEntee • Palmer • Worcester • Kahlert

SHORT WAVE CRAFT

HUGO GERNSBACK
Editor

H. WINFIELD SECOR
Managing Editor

GEORGE W. SHUART, W2AMN
Associate Editor

Contents for May, 1935

Features in the June Issue

A New "Magnifying Dial" Makes S-W Tuning Easy.

A 6-Tube Superhet of Proven Efficiency, by Stanley Olsson.

Beginners' 2-Tube Receiver—Battery Type.

Low-Power Transmitter Using 802's, by George W. Shuart, W2AMN.

How to Eliminate Radio Interference, by Wilhelm E. Schrage.

A First-Class Short-Wave Converter of Improved Design

Certified Circuits

● SHORT WAVE CRAFT goes to a large expense in verifying new circuits. When you see this seal it is your guarantee that such sets have been tested in our laboratories, as well as privately, in different parts of the country. Only "Constructional-Experimental" circuits are certified by us.

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SHORT WAVE CRAFT is the only magazine that certifies circuits and sets.

OUR COVER

● Our cover this month shows a young lady "Ham" operator who has become so engrossed in maintaining a schedule with some of her fellow radio amateurs, that she has completely forgotten the fact that she had a theatre date with her "boy friend." See "YL" Photo Prize Offer, page 9.

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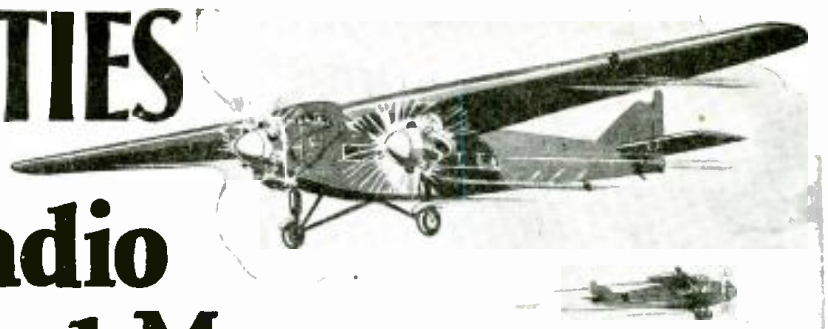

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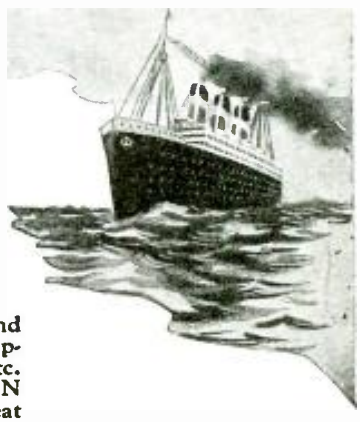

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HUGO GERNSBACK, EDITOR H. WINFIELD SECOR, MANAGING EDITOR

Specialize In Short Waves!

A Talk to Young Men

An Editorial By HUGO GERNSBACK

● I AM continuously in receipt of letters from young men who wish to know what opportunities there are in short waves. Many of them wish to know if they should specialize in short waves, and if there is enough of a future in this field alone for them.

The answer to these questions is that from my own observations and feelings in the matter there is a tremendous future ahead in short-wave *specialization.* It is, in fact, the greatest field of endeavor in radio today, and, I believe, during the next 20 years short waves in one form or another will prove to be also a most lucrative field.

Of course, when I talk of short waves and the specialization thereof, I want it understood that before you can embark in this field, the young man must have a good general electrical and radio foundation, and particularly the theory and practice of alternating currents. Much of this knowledge can be had from books, but practical knowledge is essential. This can be had by working with the different instruments, apparatus, etc., or taking a position in some factory which specializes in short-wave instruments or appliances.

The field of short waves itself is pretty large and each different branch of short waves is getting bigger each day, and, as a matter of fact, it will pay to specialize in each distinct branch of the short-wave art.

To enumerate briefly, without any attempt to cover the whole short-wave field, I only wish to mention the following important branches:

We have, first of all, the short-wave *communication* field. As in broadcasting, the short waves have their commercial *code transmission*, the *facsimile* photograph transmission and the yet undeveloped *television* branch. Then, we have the branch of radio reception in receiver *design* and *manufacture*, which, particularly in its *all-wave* field today, is tremendous. An entirely new branch, which is coming rapidly to the fore, is the *therapeutic* branch of short waves, which is, as yet, in its infancy and of which not too much is known. Already, many physicians and a number of dentists also, and many hospitals, are experimenting with short-wave fever therapy, and this branch in the future will probably assume large proportions. It is also, at the present time, a most lucrative endeavor.

Coupled with this, we have such new ideas as baking by means of short waves, where crustless bread, fully baked, is now being turned out, and an offspring of this branch, which has to do with the preservation of foodstuffs of all kinds. by killing certain bacteria by means of short waves.

Coupled to this, we have another commercial branch of short waves whereby insect larvae of various grains are treated by means of short waves, as well as other products, such as cereals, and even cigars, to rid them of insect pests. I have stated editorially, in some of my other magazines, that the insect danger, particularly in the United States will assume huge proportions in the years to come. This is mainly due to our transportation methods whereby insects are carried from city to city and from state to state. The short wave method of treating insects and their larvae will, in due time, assume tremendous importance, particularly in this country. and the more experts we have in this particular branch, the better it will be for the short-wave art.

Then, there are many special fields where it will pay to specialize in the future. Light portable sets for special functions are always in great demand. Policemen of the future will be equipped with secret radio equipment and the lighter such equipment can be made the better. A great deal of research work remains to be done, and those who are able to turn out a real good product at the right price will be enabled to cash in on their work. It should be noted that it isn't always the large radio factory or institution which develops important radio equipment. Very frequently, this is privately developed by ingenious outsiders, and very often these individuals reap a harvest from such endeavors.

To cite a case in point, it might be well to mention the special branch of short-wave radio termed *geo-radio*, that branch which is devoted to explore the soil for mineral riches. There are a number of such systems in use, developed with a small amount of capital by a group of short-wave engineers. Such equipment as a rule is not for sale but is used by the various organizations who specialize in this form of short-wave mining exploration.

Many similar cases could be cited and there is no question that in the next generation we will see a tremendous upswing of special applications of short waves undreamed of today throughout the world.

My advice to the young man who knows what he is about, and who is really interested in short waves, is to pick out *that* branch of short waves which particularly appeals to him and then stick to it. He should learn as much as it is possible to know on the subject; he should experiment with it, until he becomes letter perfect, in other words, until he is an expert at it. This country, more than anything else, requires experts in all lines, and short-wave radio is not an exception to this rule. *Specialize*—and your outlay in time and money will not have been in vain.

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How Soon SHALL WE

● What is delaying the development and application of television in America? Various factors, including the question of finance—failure of the Government to permit sponsored programs—lack of experimental image transmission—and other factors which are here discussed.

By H. WINFIELD SECOR

● TELEVISION for the public has recently received considerable impetus, so far as the daily newspaper reports are concerned at least, and most of us have undoubtedly read the recent opinion expressed by Senatore Marconi that he hoped to see practical television established between Europe and America by means of micro-waves. This means that he places great faith in the possibilities of long-distance transmission by micro-waves, having such an extremely short length as 60 centimeters or 24 inches.

Dr. Alfred N. Goldsmith, well-known radio expert and consulting engineer to the Radio Corporation of America, said that the possibility of using radio waves of very short length to carry television across the ocean had both a bright and dark side. On the dark side, is the interference which such waves would cause to the radio systems of other countries. This would mean that the micro-waves spectrum would have to be considered on an international basis and allocated so that one nation's transmission would not interfere with others. If the micro-wave radio spectrum proves to be, upon development, the form in which television signals can cross the Atlantic, it is likely to be the only medium we can use for the purpose.

British to Launch Big Television Service

One of the new and interesting reports on *television for the public* comes from England where the engineers of the British Broadcasting Corporation are said to have planned swift action on the government authorization of a public television service. Working in cooperation with the Marconi and Baird television companies, they are about to decide on a site for a high television transmitting tower, which will be of sufficient altitude to provide an uninterrupted path for the ultra-short waves between the television transmitter and receiver over the 30 mile radius it is primarily intended to serve. It is possible that the Crystal Palace tower rising 280 feet above the level of the Thames, will be used for the first television broadcast. Demonstrations of the Baird experts at a distance of 25 miles from Crystal Palace have shown vision and sound to be satisfactory. Recently a demonstration by two Baird home television receivers operating on Crystal Palace transmitting signals gave brilliant black and white images. One model, which cost $250, gave an image 6x8 inches and the second larger machine, valued at $450, produced a brilliant image 9x12 inches, sufficiently large to be enjoyed by the whole family.

Another demonstration by the Baird engineers in England the other day, and which shows how far behind we have fallen in America, consisted of a demonstration cr transmission of outdoor scenes. These scenes, due to the difficulty of being picked up well by the average televisor, were photographed on a motion picture "talkie" film and, with a delay of but 30 seconds for the development and drying of the film, it was sent through the television transmitter and the image picked up on short waves!

It is unfortunate that our short-wave experimenters cannot today enjoy the reception of television programs, the transmitting stations being partly subsidized by the Government, if necessary—all of which would serve to greatly spur the development of television in this country.

What Is Delaying Television in America?

If you talk to some of the business and technical experts connected with our large American radio corporations, you will find several similar arguments they will give you as to why television has apparently been "put to sleep" for the past several years, and also why we can hardly hope to have practical television for the enjoyment of the vast radio public in this country for several years to come.

One of the first arguments is that it did not pay to keep on broadcasting television images, because the Federal Communications Commission would not issue licenses to the operating companies for "sponsored" television programs, owing apparently to the fact that sufficiently clear images were not produced.

This is part of a vicious circle as it were, and another argument is and has been the lack of any great amount of capital for developing television during the past few years, and, added to this, a pronounced lack of interest on the part of the radio public.

There are several answers to some of these questions, a few of which may be catalogued in the following manner: If television broadcasting by first-class stations, such as that operated by the Columbia Broadcasting System up to about two and one-half years ago, had been maintained and experiments continually conducted which were aimed to improve the clarity of the image, we would be two and one-half years nearer our goal of practical and satisfactory television for the public. The writer's contact with that section of the radio public who at one time or other had occasion to see some of the television images demonstrated both on "home-type" machines, as well as public exhibition screens as large as 6 to 8 feet square, shows that undoubtedly a pretty bad impression resulted as the images would frequently fade and become "fuzzy," etc. It is the writer's contention, however, that if some of the radio broadcasting companies, such as CBS, NBC, and others as well as private plants of the large radio concerns like those operating station WLW, had "followed through," as they did in the early days of American sound broadcasting, we would have had a very different state of television affairs today than we have at present.

Only a Few Stations Transmitting

At present, there are twenty-eight American television broadcasting stations licensed by the Federal Communications Commission—half a dozen of these are actively broad-

"The British are to be commended for their enterprise. . . . What they plan exactly parallels tests made in New York and other cities several years ago. England's problem is comparatively simple. . . . As the area of the United States is 38 times as large as the British Isles, our television problem is more than 38 times as large as theirs."

DR. ALFRED N. GOLDSMITH,
Prominent American Radio Engineer.

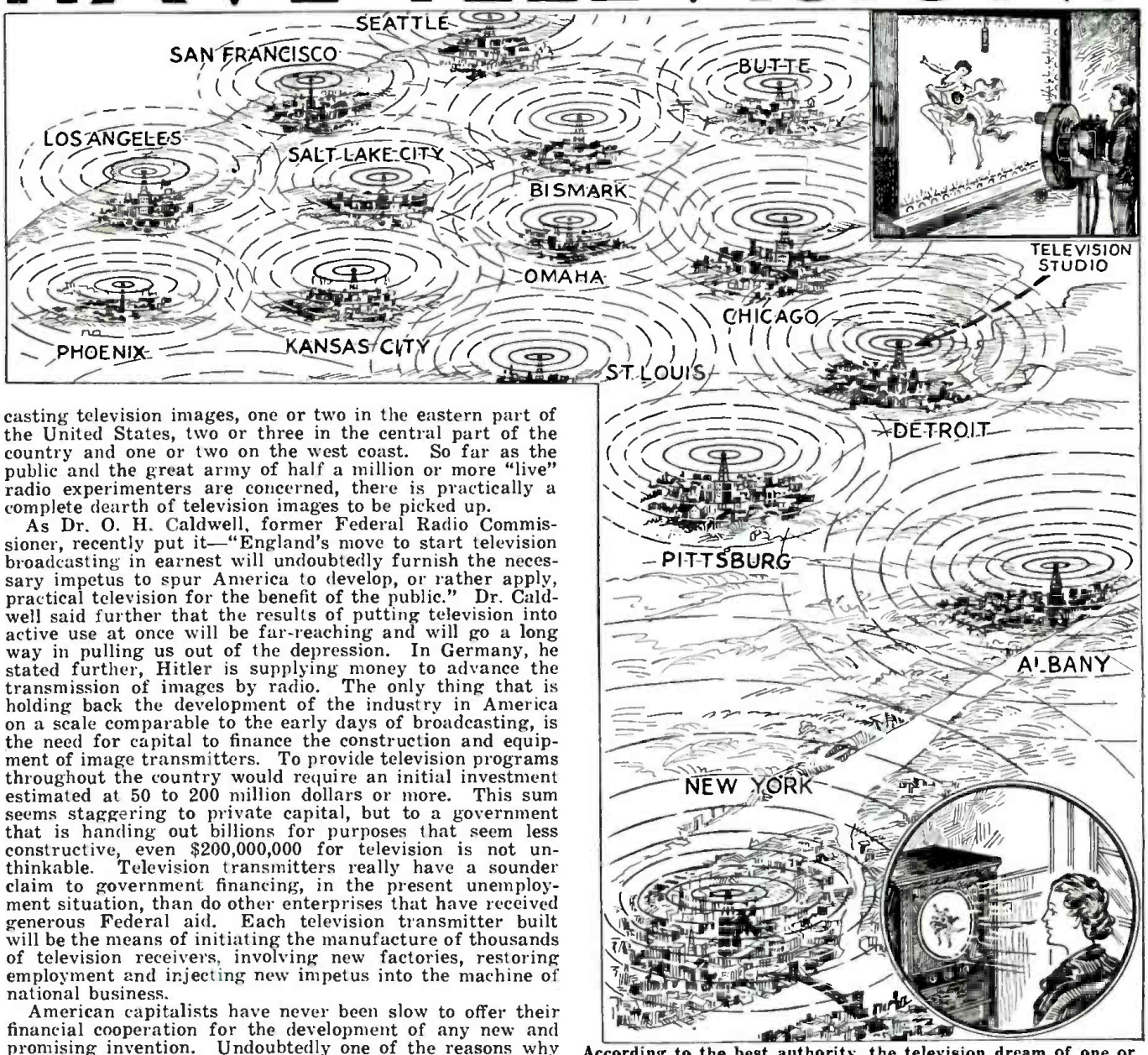
"We will follow England's experiment with keen interest. Experiments two years ago with television transmission gave us a sympathetic understanding of the difficulties to be encountered to sustain public interest in images possessing limited detail. . . . A conservative policy of watchful investigation will best serve our interest."

EDWIN K. COHAN,
Director of General Engineering, Columbia Broadcasting System.

"Television will go a long way in pulling us out of the depression. . . . The only thing that is holding back the development of this new industry is capital to finance the construction and equipment of image transmitters. To provide television programs here would require an initial investment of from $50,000,000 to $200,000,000 or more."

DR. O. H. CALDWELL,
Formerly Federal Radio Commissioner.

HAVE TELEVISION?



According to the best authority, the television dream of one or two of the large American radio corporations is illustrated in this picture. Must we wait 3 to 5 years more until this grand television scheme can be placed into operation, before we can enjoy television in our homes?

casting television images, one or two in the eastern part of the United States, two or three in the central part of the country and one or two on the west coast. So far as the public and the great army of half a million or more "live" radio experimenters are concerned, there is practically a complete dearth of television images to be picked up.

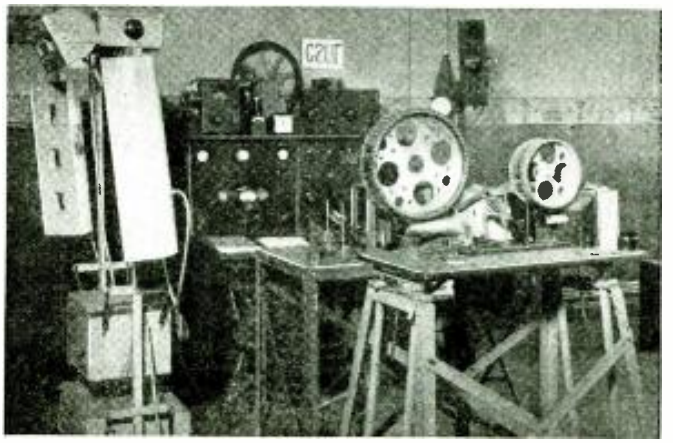
As Dr. O. H. Caldwell, former Federal Radio Commissioner, recently put it—"England's move to start television broadcasting in earnest will undoubtedly furnish the necessary impetus to spur America to develop, or rather apply, practical television for the benefit of the public." Dr. Caldwell said further that the results of putting television into active use at once will be far-reaching and will go a long way in pulling us out of the depression. In Germany, he stated further, Hitler is supplying money to advance the transmission of images by radio. The only thing that is holding back the development of the industry in America on a scale comparable to the early days of broadcasting, is the need for capital to finance the construction and equipment of image transmitters. To provide television programs throughout the country would require an initial investment estimated at 50 to 200 million dollars or more. This sum seems staggering to private capital, but to a government that is handing out billions for purposes that seem less constructive, even $200,000,000 for television is not unthinkable. Television transmitters really have a sounder claim to government financing, in the present unemployment situation, than do other enterprises that have received generous Federal aid. Each television transmitter built will be the means of initiating the manufacture of thousands of television receivers, involving new factories, restoring employment and injecting new impetus into the machine of national business.

American capitalists have never been slow to offer their financial cooperation for the development of any new and promising invention. Undoubtedly one of the reasons why some of the ambitious television inventors in this country have found it difficult to find capital to carry on and develop practical television to the stage it should have reached by this time, is due to another link in the vicious circle already mentioned, namely, the rather poor images obtained a few years ago; and for one reason and another, the failure of those radio broadcasting companies, who could have easily kept on broadcasting images, to carry on, and thus keep the television engineers continually on the job, which would have certainly resulted in a much finer image today than we were used to seeing say 3 years ago. It is certainly to be regretted that there has been nothing, practically, during the past three years to sustain experimental interest in television, such as would have been the case had a number of stations been broadcasting images regularly.

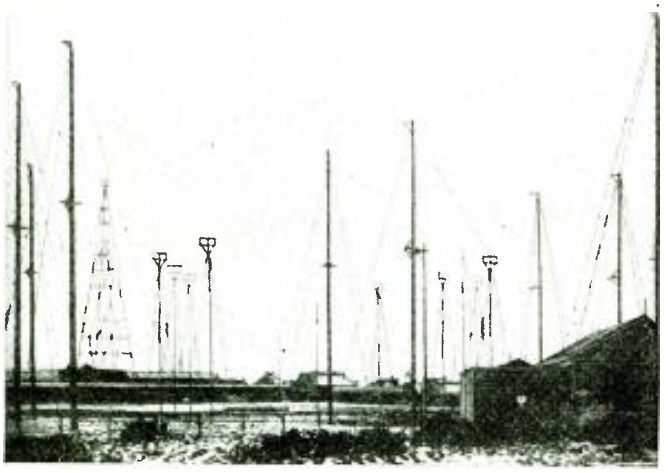
(Continued on page 43)

SHORT-WAVE Camera SHOTS

● Above—One of the telephoto pictures transmitted by short waves from Australia to England, a distance approximately halfway around the world. By combining a series of such views, each one slightly different, a "movie" was made up showing the arrival of the British airmen, C. W. A. Scott and Campbell Black. The British newsreel showing the arrival of Scott and Black in Australia was on view in movie theaters within a few days after the arrival of the pictures. Each picture is built up of a series of dots.



● The photo above shows an interesting view of the Television Transmitter at station G2UF in Manchester, England. Light-sensitive photo-cells, which pick up the image of a person whose likeness is to be transmitted by television, are shown at the left of the picture. The mirror scanning drums, extensively used in the English apparatus, are shown at the right; while the short-wave tuning instruments appear in the background.



← ● Left—Some of the numerous aerial arrays used at the world-famous experimental station PCJ in Eindhoven, Holland. This station is one of the oldest of the short-wave stations on the air. It first went on the air in 1927. At the present time the operators are conducting experiments at this station with the view of improving their producton service to the Dutch East Indies.

$500.00 PRIZE CONTEST

For the "Best Title" Describing March Cover

● THE illustration on our March cover showed a very irritating situation between "Hubby" and "Wifey" at about 3 a.m. in the morning, with "Hubby" listening in to his favorite DX station by means of a pair of headphones. "Friend Wife" is sitting up in bed and shaking her finger at her spouse in a very angry fashion and aside from the fact that a small boudoir lamp is illuminated between the twin beds, the editors, after having the cover painted, were at a loss to figure out quite what should have caused "Wifey" to become all "steamed up." Instead of selecting a title for the cover, the editors are asking the readers of SHORT WAVE CRAFT to name this cover, and a total of 50 prizes will be awarded for the best title suggested for the March cover. The rules governing this cover title contest are given herewith, as well as a partial list of the prizes, which will total 50 in all. All entries must be in the editor's hands by midnight of April 30, 1935.

The first prize will be one of the new Pilot 11-tube Super-Dragon receivers valued at $99.50. This is one of the very latest *all-wave* receivers, and one which we are sure every short-wave fan in the country will be wild to own. This set covers all waves between 13 and 555 meters.

Partial List of 50 Prizes

Alden Products Company, Brockton, Mass.

1—No. C-140, 140 mmf. Na-Ald Victron "AA" Variable Condenser
1—No. C-15, 15 mmf. Na-Ald Victron "AA" Variable Condenser
1—No. 702RV. 2½ mh. 150 m.a. Na-Ald Victron R.F. Choke
1—No. 75V, 5 meter Na-Ald Victron R.F. Choke
1—LV2, Na-Ald Victron Coil Dope and No. 700, Na-Ald Coil Selector Unit
1—No. 4955V Acorn Tube Socket of Victron

Anker Labs., New York, N.Y.

1—"Frigate" Twin Regeneration 6-Tube Receiver Kit
1—3-Tube A.C.-D.C. "Cruiser" Kit
1—Buccaneer S.W. Receiver Kit
1—Buccaneer Junior Receiver Kit

Blan, The Radio Man, New York, N.Y.

1—Pair Buddy Test Prods
1—6"x5½"x6" Shield Box
5—Individual prizes of aluminum panels each to the winner's specifications not exceeding 150 sq. inches each
10—Individual prizes of ½ lb. packages of aluminum strips that make very handy bracket-shelf support handles, etc., in radio construction for homemade sets.

Burgess Battery Company, Freeport, Ill.

1—Burgess No. B76F Ribbon Battery

Eilen Radio Laboratories, New York.

1—All-Electric All-Wave set, wired, complete with B.C. Coils, Tubes, Cabinet and Phones

Electrad, Inc., New York, N.Y.

1—Electrad Universal Service Kit containing six Standard Replacement Controls

Hammarlund Mfg. Co., New York.

1—Set short-wave plug-in coils and coil forms

Insuline Corporation of America, New York, N.Y.

1—No. 2651 Insulex Trans. Coil Form
1—No. 957 Insulex Trans. Socket
1—No. 965 Insulex 6-prong S.W. Coils

Arthur H. Lynch, Inc.

1—Hi-Fi, Marconi type, high fidelity receiver antenna kit

National Company, Malden, Mass.

1—Type CPO, Code Practice Audio Oscillator

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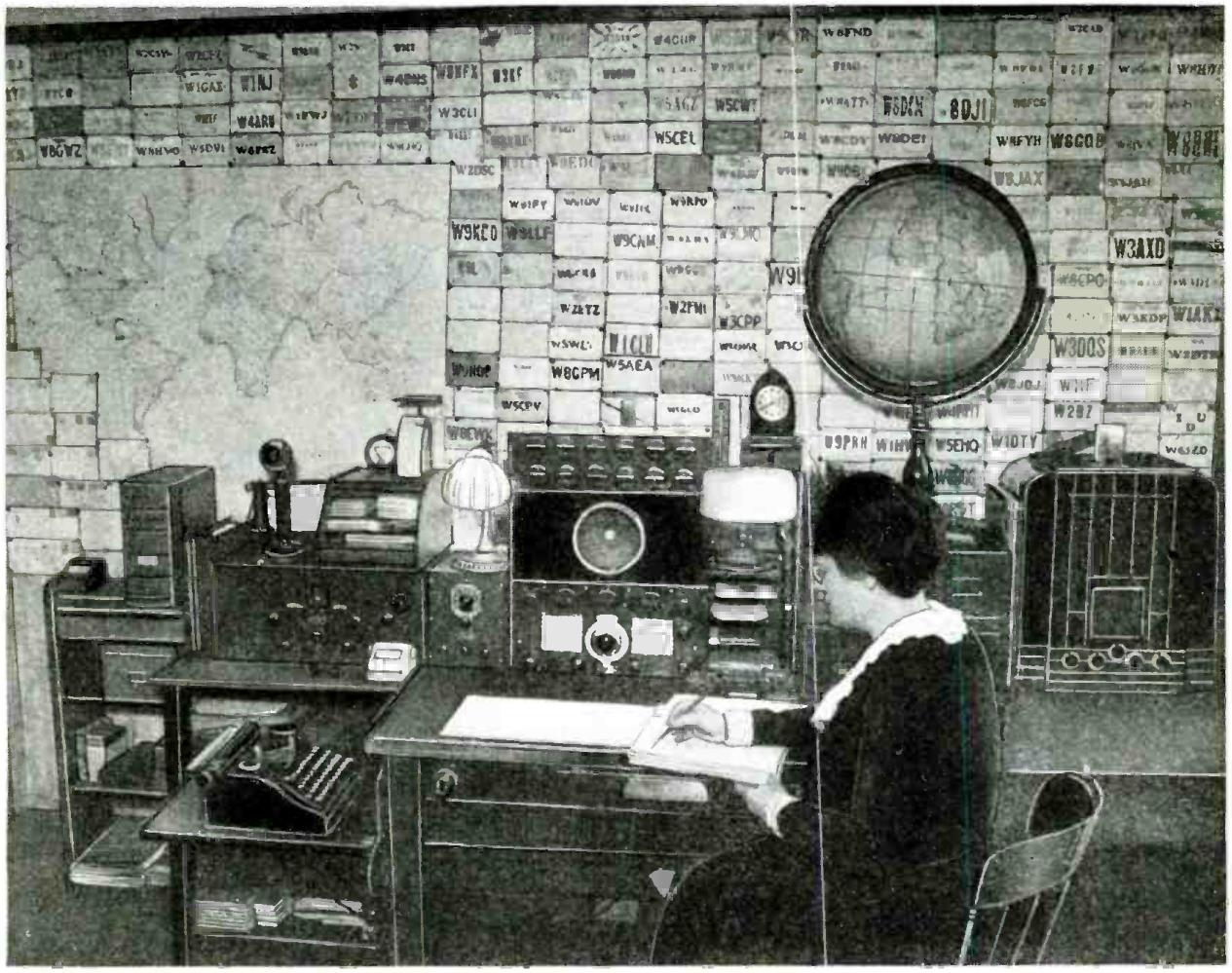


Hats off to Mrs. Alice R. Bourke, owner of this remarkable short-wave transmitting and receiving station, which she operates under Uncle Sam's license call—W9DXX. Several well-known makes of short-wave receivers are to be seen in the photo.

$5.00 for Best "YL" Photos

● Alice R. Bourke, W9DXX, photo of whose station appears above, has what appears to be possibly the finest "XYL" station in the country. The transmitter used at W9DXX is not shown in the above photo, but for the benefit of our Ham friends, we may say that it is crystal-controlled, uses a 47 oscillator, 801 doublet, 203-A buffer, and a pair of 203 A's, push-pull in the final amplifier, with an input of 450 watts on 40 meters. Signals from this station have been heard in Poland and Russia.

The operator of station W9DXX handles regular message "traffic" and likes to hear from other amateur short-wave station operators. Mrs. Bourke is a member of the A.R.R.L., the Anglo-American Radio and Television Society, Réseau Belge, and other radio societies, besides being the only XYL member of the Society of Wireless Pioneers.

The owner of W9DXX has been connected with the Chicago newspaper world for a number of years and she has had some very interesting and exciting experiences as a police reporter for the *Chicago Tribune*.

RULES FOR ENTERING PHOTOS

● **THERE are many fine amateur short-wave transmitting stations operated by "YL" (young lady) operators; married women add one more initial and are known to the short-wave fraternity as "XYL's."**

The editors are offering a $5.00 prize for the best photo of the licensed lady amateur operator and her station and the opinion of the judges will be final. The deadline for photo entries for the next issue will be April 20.

In the event of a tie, equal prizes will be given to both. Send entries to "YL" Photo Editor, W2AMN, % Short Wave Craft, 99-101 Hudson St., N. Y. City.

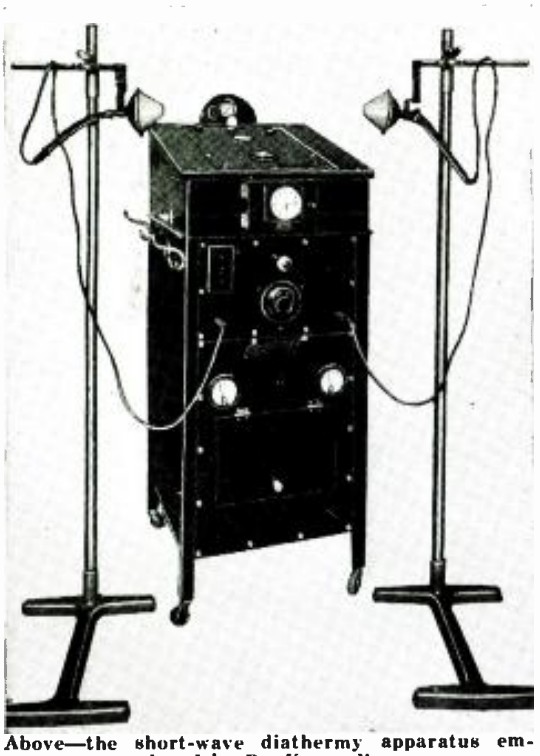
We are sure that this excellent photo of Mrs. Bourke and her station will inspire other YLs both in this country and abroad to send in to the editors a good photo of themselves and particularly of their station. Please keep in mind that the photos must be as clear and sharp as possible, and at least 4 by 5 inches, but preferably 5 by 7 inches or larger. We can use separate photos of the operators where they do not appear with the station apparatus.

In any event, be sure that the photo is good and clear and as large as possible, and send this along with a short description of three hundred to five hundred words, preferably typewritten, describing briefly the apparatus used and also schedules maintained and what countries the operator has had contact with. YLs and XYLs are all eligible in this contest for the best photo and the editors will be axiously awaiting for the coming mail to see what our lady "Ham" operators have been doing. Let's go!

Short Waves Help GLAND AILMENTS

By DR. IRA L. KEPPERLING, M.D.

● Short waves have found a new rôle besides that of communicating intelligence over vast distances—they are now being used by a number of medical investigators for the treatment of various human ailments. Dr. Kepperling has obtained very good results in treating abnormal glands.



Above—the short-wave diathermy apparatus employed by Dr. Kepperling.

● NO MORE promising field of experimentation and research exists anywhere for the physician, than is found in the study of Endocrinology (ductless glands). It is upon the delicate balancing of these ductless glands and their internal secretions that life itself depends. We are today just what our glands made us. Physicians abreast of things medical give due attention to the endocrine phase in diagnostics.

Doctors depend principally upon surgery and glandular products taken from animals in therapy aimed at correcting pathology of these glands. The benefit accruing to thousands in this important branch of medicine, makes anything new on the subject of interest to all who keep apace with scientific medicine.

Dr. Steinach's use of the X-ray, in reactivation of the gonads (sex glands) with its apparent benefit to the whole endocrine chain, was, to a great extent responsible for my research into what action other wavelengths than the X-ray played in the endocrine game of life.

A practice devoted to *physiotherapy* enabled me to try out each new wavelength as scientific discovery unfolded their usefulness, and high-frequency laboratories supplied us with proper machines. Many of the modalities discovered and now part of the physiotherapy equipment of our hospitals, as well as the private medical offices, have given us additional power over disease. It is for this reason the writer seized upon the short and ultra-short-wave band, as likely to possess the solution in many hormone problems.

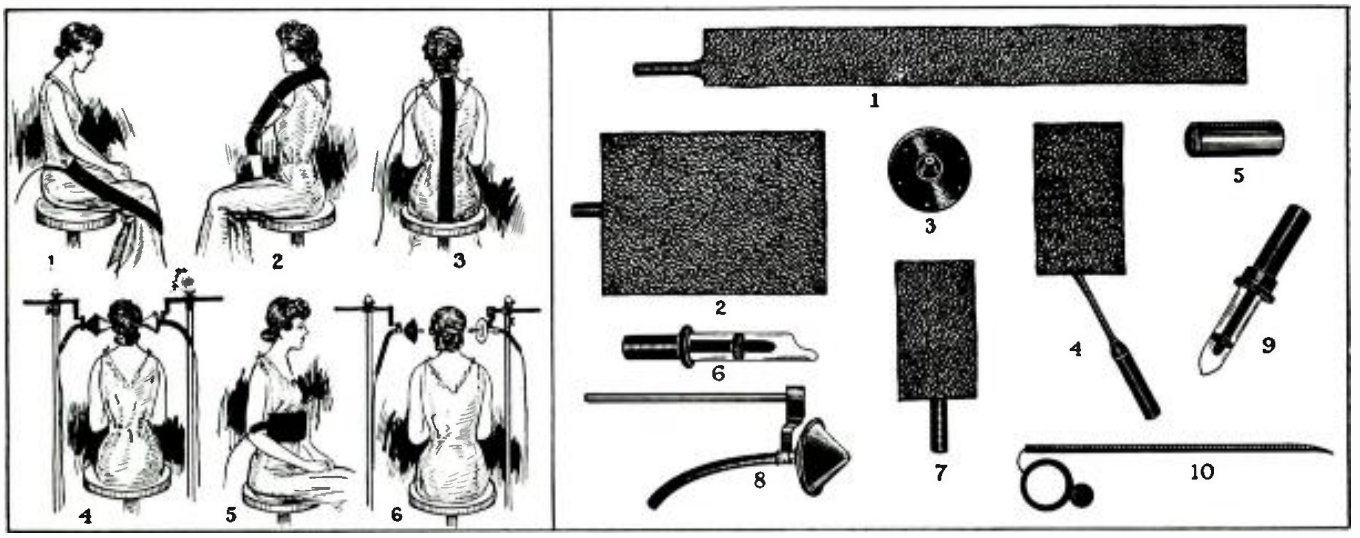
A trial convinced me that short waves (waves above 10 meters) did not give the answer. With an idea of the apparatus and electrodes needed, I took my problem to Mr. William Reid of Philadelphia, with the result that the outfit here described was brought into being. Its use in various glandular dysfunctions has been highly encouraging, to say the least.

It is the starting point in a great field, one that I have reason to believe, offers a bountiful harvest to physicians who have the right apparatus, proper qualifications for the work and who dare to go ahead along an almost uncharted path of research into this ultra-short-wave field of energy as applied to human ills.

The technic employed is not difficult. When a complete diagnosis of an endocrine dysfunction is made, the treatment is comparatively easy. In functional derangements what we must first determine is what glands are *overactive* and need *sedation* and what glands need *stimulation*.

Knowing what gland or glands are *overactive* the treatments are given to cause a let-down in their activity. For this purpose a wavelength between 3 and 6 meters is selected, and the proper electrode so placed that the desired area comes between the two terminals. Energy output of from 1

(Continued on page 49)



The illustration above shows the various applications of short-wave diathermy electrodes, different types of which appear at the right of the picture. One—No. 1 electrode in position for treating the thigh; Two—No. 1 electrode used for treating brachial neuritis; Three—No. 1 used to cover the spine and sacrum; Four—No. 8, focused for treating pituitary gland; Five—No. 4 in position for treatment of liver area; Six—No. 8 electrodes in use with rubber cones removed. Description of different electrodes is given in the text. Excellent results were obtained in treating glandular ailments with high-frequency currents.

Regenerative BOOSTER

Peps Up Weak "Sigs."

By GEORGE W. SHUART, W2AMN

If you are interested in obtaining greater DX or distance range and want to pep up those weak signals, then you will find this regenerative preamplifier Hot Stuff!

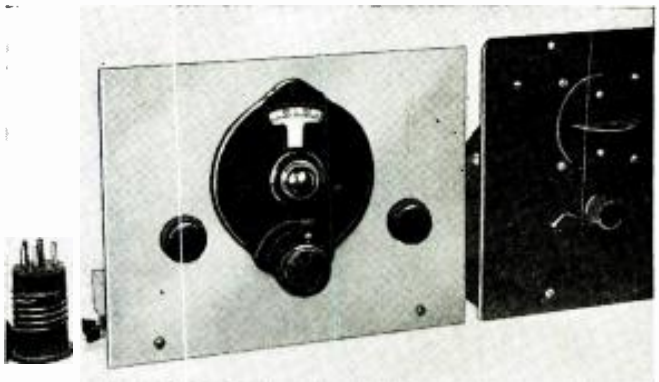
Rear view of the Regenerative Booster or R.F. amplifier.

● SENSITIVITY is the prime requisite of any short-wave receiver. Regeneration, or *feedback*, as it is sometimes called, is a very satisfactory method by which to obtain sensitivity. Selectivity is also greatly improved simultaneously when using regeneration. Back in the first part of 1933 the writer proved this in some experiments with superheterodyne *first detectors*. A super-het having a regenerative first detector was later described in the August issue of that year. This same arrangement and receiver has been used right up to the present time. And we have yet to see it fail on a "weak" station.

Proven Practical

After two years of use it has been proved that the principle is very practical. So we decided to incorporate it in an RF (Radio frequency) booster. The booster or *preamplifier* as some prefer to call it needs to have two very important features—first *sensitivity* and second *selectivity*. Both cannot be obtaind ordinarily without regeneration, even if we used two or three stages, which complicates matters considerably. With *regeneration*, however, it is possible and thoroughly practical to obtain more sensitivity and selectivity in a *singe* tube, than can be had with two or three ordinary R.F. stages. Boosters or preamplifiers have usually been associated with superheterodynes, although they can be used to an advantage on even a 1-tube regenerative receiver.

The booster shown in the photographs was made as simple as possible. It could be put into a neat cabinet with its own power supply and a coil-switching arrangement, though it would not work a bit better. We leave



Here we see the Regenerative Booster, or preamplifier, hooked up to a short-wave receiver. The Booster is actually an R.F. amplifier.

the constructional design up to the reader and present the circuit and an explanation of its use and benefits.

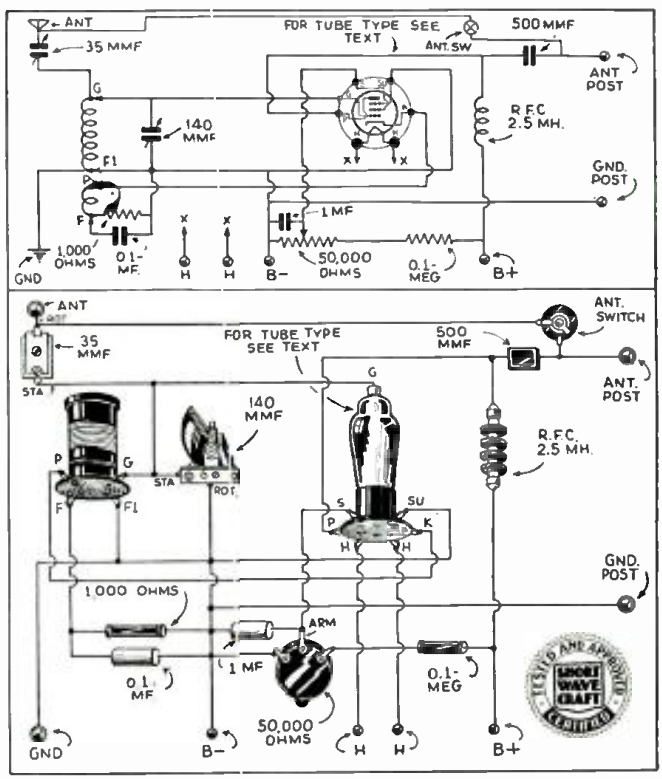
Tubes to Use

The choice of the tube used will depend upon the type of set in conjunction with which it is going to be used and whether or not it is to have its own separate power supply.

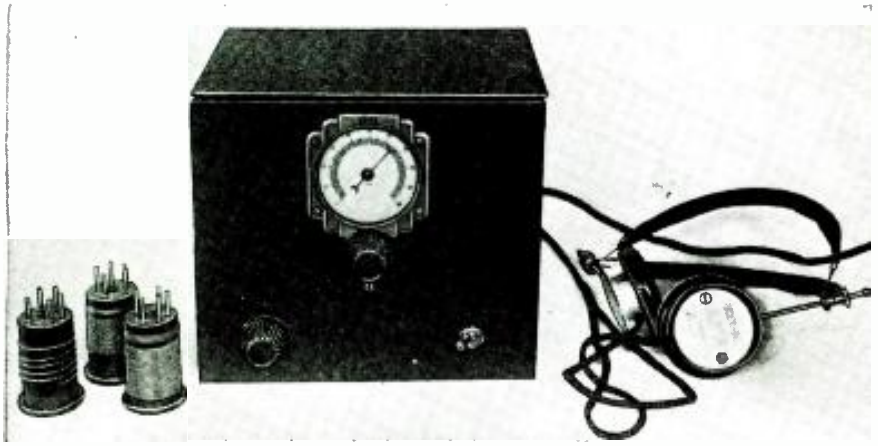
We see no reason, though, why it should not receive its power from the receiver with which it is used. Most receivers are built with power supplies that will furnish enough power to run at least *one* more tube. If we have a receiver that uses 6.3 volt heater-type tubes then we should use a similar tube in the booster. If the set uses 2.5 volt A.C tubes then the same type will be used here also. For sets using the 2-volt battery-type tubes or if the reader wishes for some reason to operate the booster on batteries, then the type 15, 2-volt heater tube like that used in the *"Economy Two"* and *"Three"* sets described in past issues of SHORT WAVE CRAFT, should be used and the 15 is well suited for the purpose.

The type 57 and 6C6 tubes are recommended for 2.5 and 6.3 volts respectively. These tubes seemed to work much smoother in the original unit.

(Continued on page 47)



Wiring diagrams for the Booster, which amplifies those weak signals like nobody's business!



Front view of the 2-tube UDAR receiver which works on 110 volts A.C. or D.C. A dandy head-phone job.

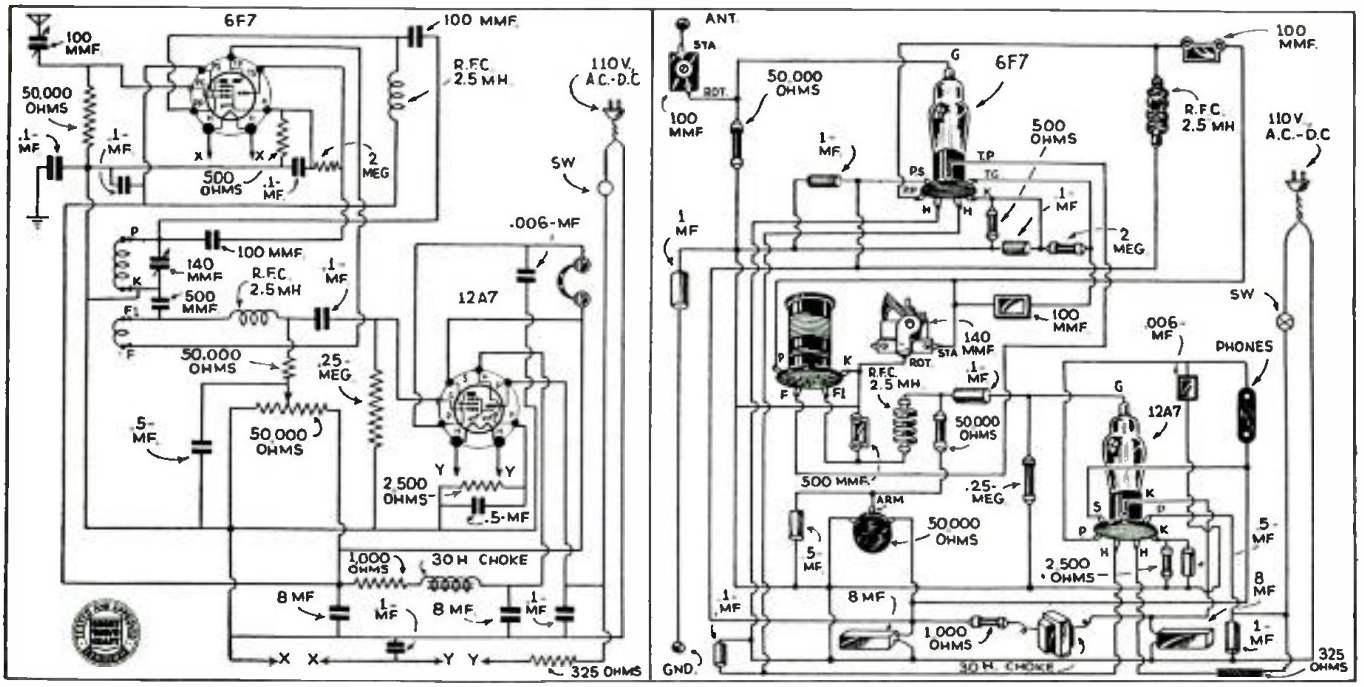
The name "UDAR" was formed from the first letters of the words denoting the four purposes which the two tubes of this set fulfill—U for untuned R.F. stage, D for detector of regenerative type, A for audio amplifier stage, and R for rectifier. It is the quietest A.C.-D.C. receiver we have listened to. All the usual "foreign" stations were received with excellent earphone volume.

The 2-Tube UDAR A.C. D.C.

● TWO of the most valuable *dual-purpose* tubes on the market today are the 6F7 and the 12A7. The 6F7 has been described in this magazine in various types of short-wave receivers, while the 12A7 has not received so much attention. This last-mentioned tube has many valuable uses. It is designed to function as a pentode audio amplifier and a half-wave rectifier in the well-known A.C.-D.C. circuits. The 6F7 is designed to be used in any circuit where an R.F. pentode and a triode are required and thus fits in very well with our present design for a 2-tube receiver.

Two Tubes Equal Four

In this receiver we use both of these tubes to make what amounts to a "4-tube" receiver because of each tube performing two distinctly separate functions. The 6F7 is used as an untuned R.F. stage and the regenerative detector. The benefit of an untuned R.F. stage is that it eliminates "deadspots" caused by absorption effects of the antenna at points of resonance. It therefore eliminates the necessity of continually adjusting the antenna coupling condenser. These are enough to warrant its use; then also the tuning dial can be calibrated and stations will always come in at the *same setting* of the dial. The untuned R.F. stage overcoming the "deadspots" in the tuning range of the detector, also of course makes the regeneration control much *smoother* and very little adjustment is necessary when tuning from one station to another. If one wishes to go to the extra trouble and expense the R.F. stage can be tuned. All that is necessary is the use of another plug-in coil and a tuning condenser similar to those used in the detector circuit. This will give a great increase in signal strength,



Schematic and picture wiring diagrams which will enable any one after reading the article to easily build this very quiet and smooth-tuning 2-tube headphone receiver.

¶ This set works on 110 volts A.C. or D.C.

¶ Makes an especially fine "personal" receiver to take on trips.

¶ Specially designed for "headphone" reception.

¶ Brings in "Europeans" and other distant short-wave "phone" stations like a charm!

Designed By
ART GREGOR

Receiver

Rear view of the 2-tube 110 volt A.C.-D.C. receiver.

especially on the weaker stations. The volume control that will then be necessary will have to be put in the antenna circuit, because if it were put in the cathode circuit as is customary it would affect the tuning of the detector too greatly. Ample shielding will also have to be incorporated if the R.F. stage is tuned.

Detector Circuit

The output of the regenerative detector is *resistance-coupled* to the pentode *audio stage* for simplicity alone, although transformer coupling could be used. The 50,000-ohm potentiometer in the plate circuit controls the regeneration by varying the plate voltage of the detector. This is connected directly across the high voltage supply. If transformer coupling is used there should be connected between the potentiometer and the "B" plus a 25,000-ohm, one-watt resistor in order to reduce the voltage and make the regeneration control less critical. With resistance coupling this is unnecessary.

6F7 Connections Critical

Returning to the 6F7 again we find that the bias for the pentode section is obtained through the use of a 500-ohm resistor connected in series with the cathode. Due to the use of a common cathode in this tube, care should be taken that the connections are made as shown. If the detector grid-leak were to be connected to the "B" negative or across the grid condenser as is usually the case, we would have a bias on the detector as well as the pentode and it would not work properly. The detector grid-leak must be connected from the grid to the cathode directly and the biasing resistor by-passed with a .1 mf. condenser. The output of the pentode is capacity-coupled to the grid of the detector through a .0001 mf. mica condenser. This makes necessary the use of the R.F. choke in series with the high voltage lead. The detector uses "two-winding" coils and the sockets are wired for 5-prong coils, so that *band-spread* coils can be used without any changes. The tickler is in the plate circuit, and the large winding in the grid circuit. The tuning condenser is of the regular 140 mmf. variety.

Bias for the 12A7 is effected by the 1000-ohm resistor in the cathode lead. This should be by-passed with a large electrolytic condenser of from 10 to 20 mf. capacity at least. The grid of the pentode comes out the top of the tube. So that this rather long grid lead will not pick up A.C. hum it is shielded its entire length. Use ordinary shielded lead-in wire or other similar material. The heaters of both tubes are connected in series and receive their power from the line voltage dropping resistor, which is incorporated right in the line cord. One heater connection of the 6F7 is by-passed with fairly large condensers right at the socket terminals, in order to eliminate as much hum as possible. This is a considerable aid in reducing "tunable" hum and it should be used in all short-wave A.C.-D.C. sets.

The filter used in this set consists of a single 30 henry midget choke and a 1,000-ohm resistor with two 8 mf. electrolytic condensers. These condensers are contained in a single cardboard container and have a working voltage of 175 volts. This filter, while not the most elaborate that could be used, gives a very low *hum level*. If the reader wishes to increase the effectiveness of the filter, another choke and an additional 8 mf. condenser should be used. However this requires greater space and the size of the chassis used in this set was not large enough to accommodate the extra parts.

Chassis and Cabinet

The chassis and cabinet used in the construction of this set can be obtained from most mail-order houses or radio-parts dealers. The size of this one is 6"x8"x2" for the chassis and 8"x7" for the panel; the cabinet of course is made to fit the chassis. All connections that go to the "B" minus side of the circuit are soldered directly to the chassis. This means that no *direct ground* connection can be made to the chassis; except through a .1 mf. condenser, otherwise the house fuses are liable to be blown.

The best arrangement would be a large condenser, around .1 mf. capacity in series with the ground wire right where it is connected to the water pipe, or whatever you happen to use to form the ground. This would eliminate the danger of the fuses being blown should the ground wire come in contact with the chassis while attempting to make the connection to the ground post on the receiver.

The antenna used should be at least 75 feet long and as *high up in the air* as possible! The adjustment of the receiver is the same as any other set. The regeneration control should be adjusted until the tube is just oscillating, then proceed to tune for a station. When one has been located, backoff the regeneration control until the whistle disappears and the station comes in clearly.

The antenna trimming condenser needs little adjustment on the shorter wave coils; however when the 100 to 200 meter coil is used the trimmer will have to be *(Continued on page 45)*

Here we have the Midget Transceiver in operation.

Tiny Transceiver

By Howard G.

Undoubtedly one of the most popular pieces of ultra short-wave apparatus is the Transceiver. These little instruments consist of a combined transmitter and receiver wherein it is only necessary to flip a switch in order to transmit or receive. Mr. McEntee (W2FHP) here describes one of the Smallest Transceivers we have had the pleasure of operating.

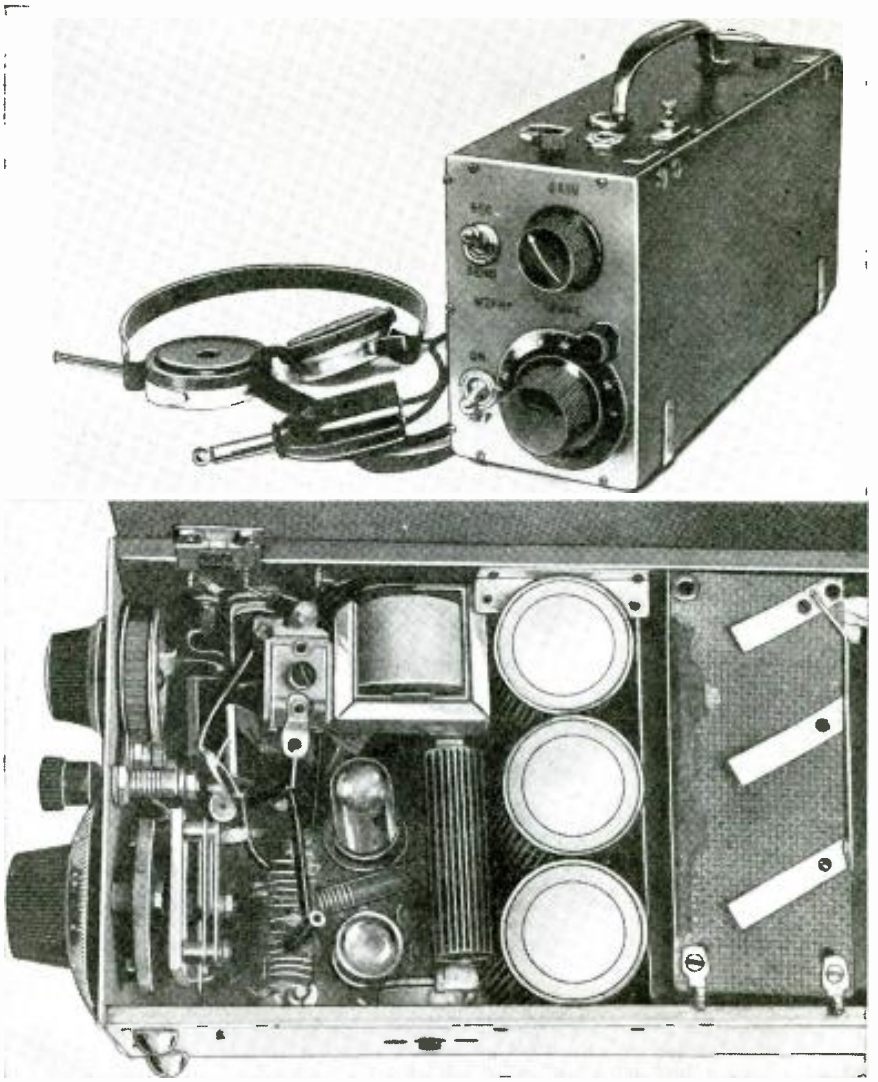
● WITH the advent of great popularity on the 5-meter band, interest in transceivers is mounting rapidly. The writer is very much opposed to the use of a transceiver as a fixed station because of the bad interference which is set up when on the "receive" position, and believes that the man breaking into the 5-meter band should build a separate transmitter and receiver, since the results obtained are infinitely better. Duplex work can then be indulged in and the receiver used with a minimum of interference, this being accomplished preferably by use of an R.F. stage ahead of the detector. Such an R.F. stage, however, is not desirable in a real portable set, since the extra battery consumption cannot be tolerated.

Total Weight But 4 Pounds

We shall now describe a transceiver which is portable in every sense of the word. It weighs but 4 pounds *with* batteries and the accessories weigh only several ounces. The power input on transmit position is about six-hundredths of a watt! Yet, with this flea power, R9 phone signals were worked over a distance of *3 miles*, the other

List of Necessary Parts

C1—15 mmf. midget, Hammarlund (Star type).
C2—30 mmf. Hammarlund postage stamp type (National).
C3—.01 mf. paper—Sprague.
C4—.01 mf. paper—Sprague (Capacity may need changing).
C5—.01 mf. paper—Sprague.
C6—.1 mf. paper tubular—Aerovox.
C7—.0002 mica—Aerovox.
R.F.C.—See text.
Choke—See text.
T1—3-1 midget audio transformer with extra winding to be put on.
R1—50,000 ohms, 1/5 watt. Ohmite. (Aerovox.)
R2—500,000 ohms, variable carbon. Electrad.
R3—3 ohms rheostat. Ohmite.
SW1—DPDT toggle switch.
SW2—SPST toggle switch.
2—215A W.E. tubes (peanut tubes; or nearest equivalent. Blan.)
2—sockets for same. Blan.
1—2 in. dial.
2—Single contact short jacks.
Box and panel material.
3—Large size Burgess flashlight cells.
1—Smallest Burgess flashlight cells.
2—Small 45 volt battery. Burgess.
1—0 to 5 milliammeter.
1—"Hand-set" or separate phones and "mike" (Universal hand-set, etc.).
Antenna rod. Blan.



Close-up views of the Midget Transceiver: Note the very neat workmanship. The cover is removed from the "A" batteries in order to get a clearer view. The three "shorting" bars on this cover can be clearly seen. These bars are used to connect the three "A" batteries together.

Talks 3 Miles!

McEntee, W2FHP

This instrument uses only two tubes, which can be the small "peanut" tubes, which Mr. McEntee used, or the larger type 30 tubes. The total weight of this Transceiver is 4 pounds and it has a power input of six-hundredths of a watt. Distances up to 3 miles have been covered with this excellent Transceiver and we are pleased to present complete details in the accompanying article.

This is a midget transmitter and receiver also built by Mr. McEntee. Complete details of this instrument will be given in the June issue.

station being a transceiver of only slightly greater power. With a good antenna and receiver at the other end, it would undoubtedly be possible to work up to *6 miles or more* in "open" country. As a *receiver*, it is very sensitive, and being so small and light can be carried on hikes and set up on a moment's notice by throwing a piece of fine wire over a tree branch. In a high spot the results are exceptional, stations *50 miles* away being received with fine *volume!*

Case Made of Pressedwood

The case is made of "tempered pressedwood," a wood pulp material. It is fastened together with Duco cement, small screws being used to hold the pieces together until the glue dries, and then left in for added strength. The screws are brass flat heads, No. 2 by ⅜ in. long. The holes for the screws *must* be drilled out and tapped, using one of the screws for the tap and a small clamp on each side of the hole to prevent splitting. This applies also to holes in the edges of the material.

The panel is of electralloy or aluminum 1/16 in. thick. When the box is finished it is sanded down smooth, and the screw holes filled up. Then several coats of clear lacquer are applied, allowing each to dry and then sanding down. The finish is ordinary car wax well rubbed in.

Assembly Simple

We are now ready to assemble the parts. The panel may be drilled and the controls installed on it. The switches are one SPST for on and off, and one DPDT for send-receive. They are the smallest type toggle switches with as short necks as can be obtained. The volume control is in the form of a variable gridleak and is, of course, a carbon type resistor. The vernier adjustment is made out of a phone tip jack and a small knob. A rubber washer bears on the edge of the 2 in. dial for fine tuning.

The condenser is of the midget variety and should be mounted about ½ in. back of the panel to reduce capacity effects. For the same reason, a ¼ in. bakelite shaft should be used if possible, otherwise, hand capacity is quite bad.

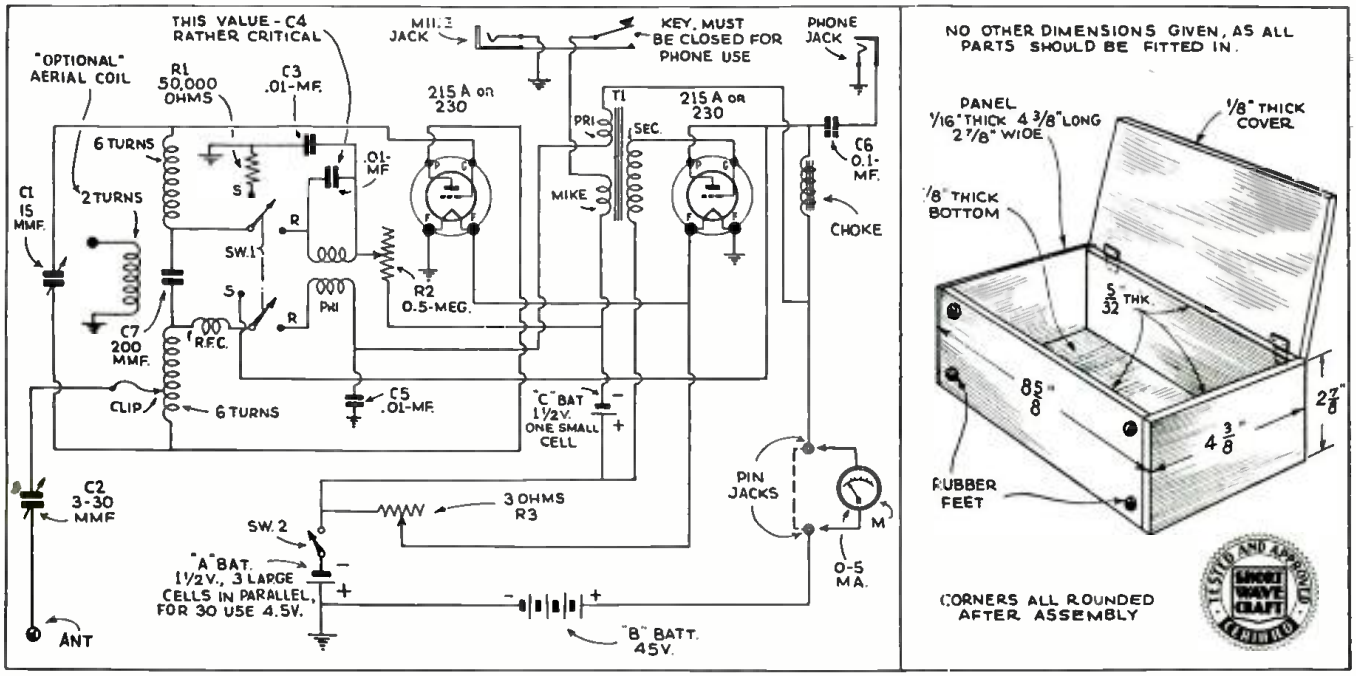
When the panel is all drilled and the parts satisfactorily fitted, it may be disassembled, and rubbed with fine sandpaper. The lettering is then put on with small rubber type and some rather thick ink such as ordinary indelible ink, which is protected by a coat of clear lacquer over the panel.

Holes for the various fittings on the box may now be drilled, as well as those for the transformer, sockets, jacks, and so on.

Checking Layout of Parts

Before any of the parts are installed and in fact before the holes are drilled, they should be set in place temporarily

(Continued on page 51)



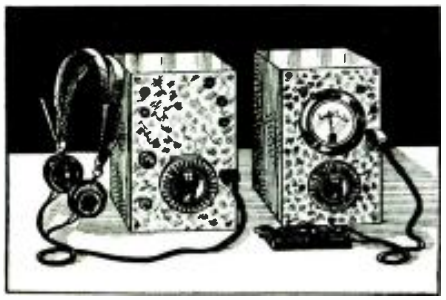
Complete circuit diagram of the 2-tube Transceiver, together with dimension drawing of the "pressedwood" case.

WORLD-WIDE SHORT-

An Italian Portable Short-Wave Station

● THE development of short-wave equipment for wavelengths below 10 meters has opened up a need for portable transmitters and receivers because of the advantages to be found on these wavelengths. The fact that these waves are limited in their travel because they are not reflected by the "Kennelly-Heaviside" and "Appleton" layers but are absorbed, makes them particularly useful for short-range work of all sorts.

This need for portable apparatus is not limited to this country, where amateurs are particularly interested in ultra-short waves, but is also found in Europe. A recent article in *Radio-Lux*, an Italian magazine, described the construction of small battery-operated transmitter and



Italian "miniature" station.

receiver for use on a wavelength of about 8 to 10 meters.

The receiver is a standard regenerative detector unit using a battery type tube of the screen-grid variety. Because of the wide variation in aerials which are likely to be used with such a receiver, a very small series aerial condenser is employed. To get the required small value, the designer connected two of the usual condensers in series.

The values of the condensers and resistors used in this receiver are on the diagram. The coils are standard inductances available in Italy, and no constants are available for them.

The transmitter is also very simple in design, having but a single coil and condenser for frequency adjustment. However, a quartz crystal is included, in the grid circuit, to keep the frequency constant. This coil is made similar to the grid coil of the receiver, and may, in fact, be one of the same type, provided with a variable tap for the aerial connection.

The quartz crystal is chosen to suit the frequency at which the transmitter is to operate. It may be cut to oscillate either at the frequency of transmission, or a harmonic of this frequency.

The transmitter and receiver are mounted in small boxes, about the size of box cameras, including the small-size batteries which actuate the tubes.

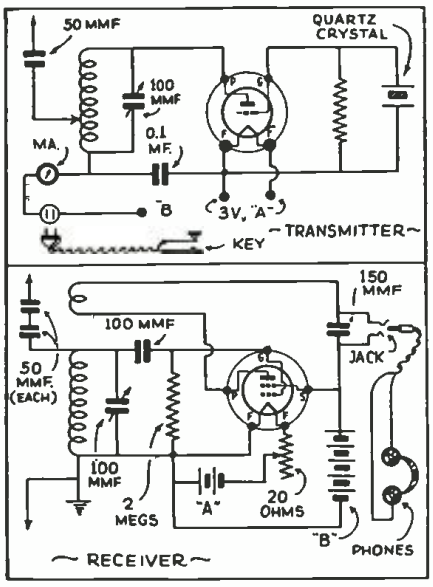
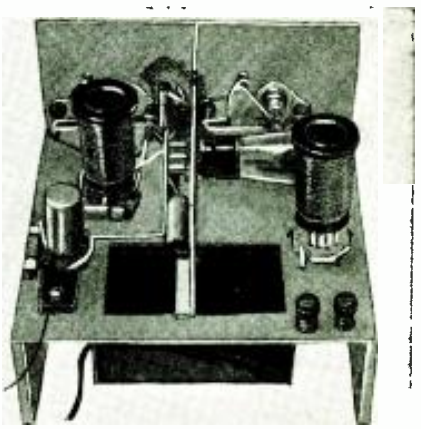


Diagram for portable station.

The Editors have endeavored to review the more important foreign magazines covering short-wave developments, for the benefit of the thousands of readers of this magazine who do not have the opportunity of seeing these magazines first-hand. The circuits shown are for the most part self-explanatory to the radio student, and wherever possible the constants or values of various condensers, coils, etc., are given. Please do not write to us asking for further data, picture-diagrams or lists of parts for these foreign circuits, as we do not have any further specific information other than that given. If the reader will remember that wherever a tuned circuit is shown, for instance, he may use any short-wave coil and the appropriate corresponding tuning condenser, data for which are given dozens of times in each issue of this magazine, he will have no difficulty in reconstructing these foreign circuits to try them out.



English converter.

A Tuning Dial Idea from France

● A NEW French radio receiver illustrated in *Toute La Radio* is constructed around a novel dial which should be of interest to short-wave fans, because of its adaptability to direct logging—an extremely useful kink in finding those stations again when they are once located.

The dial, as shown, consists of a drum, about 4 inches in diameter and divided into a number of segments. These individual discs can be used to log the stations for each band, by making the dial drum of celluloid, or arranging it in such a way that paper slips can be secured around the actual drum.

The condenser is coupled to the dial by a flexible cable, much as the drum dials used a year or two ago in this country were operated. In this particular dial, however, a "crank" is provided on the end of the dial shaft for fast tuning and vernier action is obtained with the regular knob on the front panel.

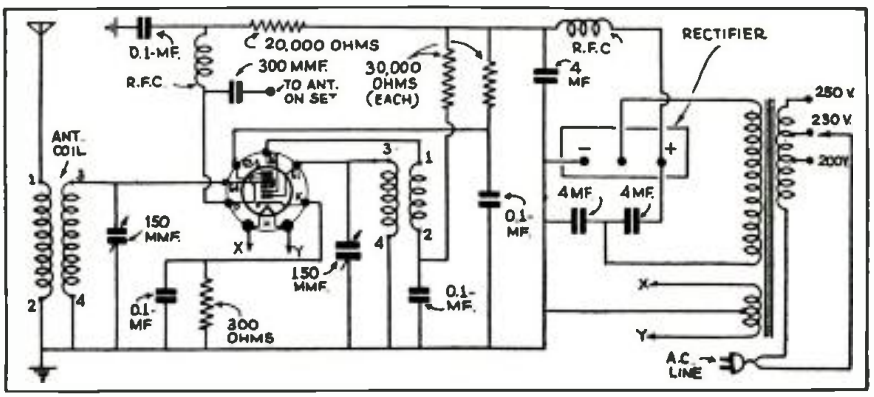


Diagram of English short-wave converter.

An English Short-Wave Converter

● A MODERN short-wave converter has just been described in several issues of *Popular Wireless*—using a penta-grid-converter tube as first detector and oscillator and feeding into the input of any broadcast receiver.

This converter supplies its own plate and filament power by the use of a small power transformer and a high voltage "dry" rectifier of the copper oxide type. The circuit of the unit is shown here for the interest of those American fans who have an interest in converter units.

This set uses two sets of plug-in coils one for the aerial tuning and the other for the oscillator and in order to get the greatest possible output and sensitivity separate controls are used for the aerial and oscillator condensers. The values of the parts used in the unit are listed on the schematic circuit. For any fans who wish to try it, suitable coils can be obtained from several coil manufacturers and the metal rectifier can easily be replaced with an 80 tube by using a power transformer having a separate 5 volt winding for the filament of the 80.

Novel French tuning dial.

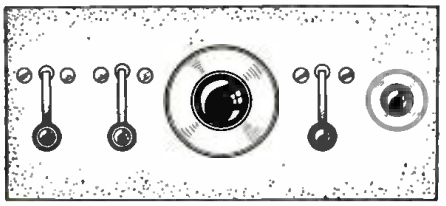
WAVE REVIEW..

Edited by C. W. PALMER

A French All-Wave Tuner

● AN interesting comparison between American and European methods of tackling the wave changing problem encountered in all-wave receivers, can be made by comparing the circuit and panel here with some of the new all-wave receivers described in this and other issues of SHORT-WAVE CRAFT.

It will be noticed that the French unit which was described in *Le Radio-Monteur*, has three individual switches for changing from one band to another—no attempt has been made to gang these controls. While this method has some advantage in the flexibility of control, it is doubtful if there is any need for individual switching and the panel is certainly far from being as neat as existing commercial sets in this country.



French all-wave tuner.

The circuit consists of three sets of coils of the regenerative type, covering two short-wave bands and the broadcast wavelengths. The first tube is a regenerative detector which feeds into a pentode-type audio stage.

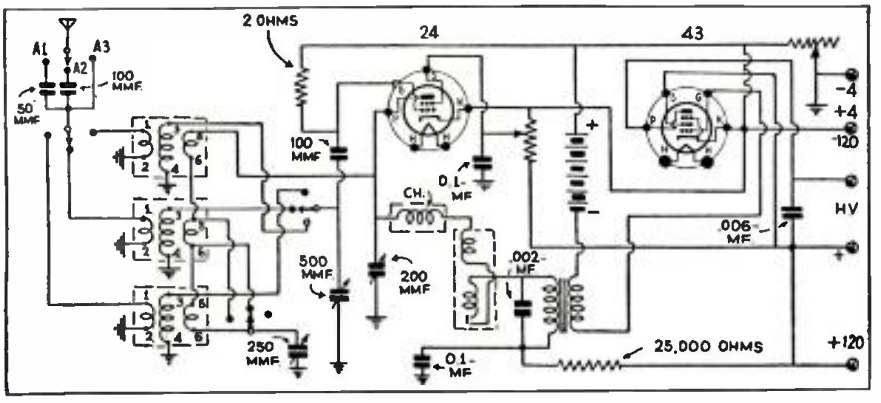
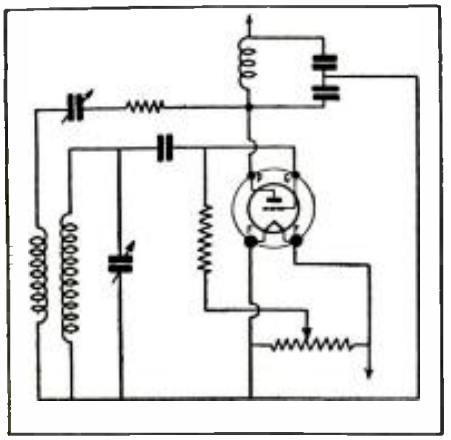


Diagram of an all-wave tuner used in France.

Smooth Regeneration in S-W Sets



Smoothing up regeneration.

● ONE of the most difficult tasks in making short-wave receivers of the regenerative type function properly is to have a smooth control of regeneration.

A recent issue of *World-Radio* contained some helpful facts on this subject which should be of use to short-wave fans everywhere.

Concerning the "plop" with which many sets go into oscillation the article mentions: "There are many possible cures for these unwanted effects, but one should be sure before trying them that the R.F. choke is a good one and is not responsible for the trouble, or part of it. A plate by-pass condenser should be connected between the plate of the detector tube and ground, and it is often an advantage to connect an additional by-pass condenser between the output of the R.F. choke and ground. A suitable value for both these condensers is .0002 mf.

"Parasitic oscillation in the detector which is a cause of unstable regeneration may be reduced or cured by the addition of a resistance in series with the regeneration condenser. Different values should be tried for this resistance until one is found which is effective over the range of wave lengths it is desired to receive. The value will probably lie between 250 and 600 ohms, depending on the type of receiver and the values of by-pass and regeneration condensers.

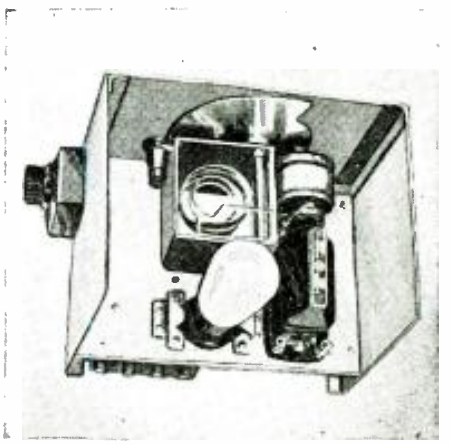
"Reduction of the B voltage on the detector tube may help to smooth the regeneration, and a higher value of decoupling resistance may be tried. Different values of gridleak and grid condenser should also be tried. The substitution of a condenser of .00015 or .0002 mf. for a condenser of lower capacity may effect an immediate cure. The connection of the gridleak return to the negative instead of the positive side of the filament frequently helps, but results in a loss of volume. A much better idea is to connect the gridleak to the slider of a potentiometer (200 ohms) connected across the filament supply. By varying the position of the slider a position may be found which is a compromise between smooth operation and maximum volume." (The latter method is useful only for battery sets.)

A German Ultra-Short-Wave Set

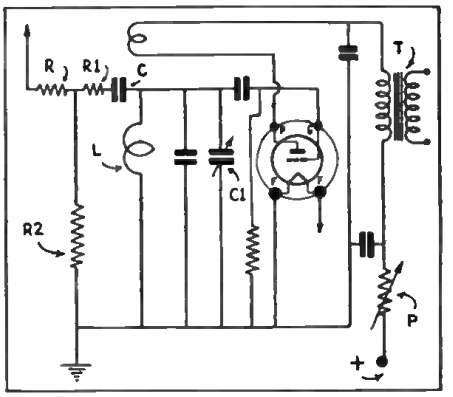
● IN a recent issue of the *Radio Bildfunk Fernsehen Fuer Alle*, a German publication, a circuit and picture of a new ultra-short-wave receiver of the regenerative type made by Telefunken, appeared. The circuit is shown here, and it will be noticed that it is fundamentally a straight regenerative set using a triode tube.

Because of the difficulty of making such an arrangement oscillate with ordinary aerials, due to the loading of the aerial on the oscillations of the tube, a special network is included in the aerial circuit. This consists of three resistances R, R1, and R2, in series with a condenser C, which produces a phase shift.

The tube used in this set is a special one having an extremely low internal capacity and the remainder of the set is made in such a way that the losses and capacitive effects are kept at a minimum. The tuning is accomplished with a single plate condenser (C) which consists of a plate of metal adjacent to the metal cabinet of the receiver. This variable unit is shunted across a fixed capacity—in the usual band-spread manner. Regeneration is controlled by a variable resistor in series with the plate supply lead.



Ultra short-wave receiver.



Circuit diagram for ultra short-wave receiver.

The Counterpoise

● FOR one reason or another it is sometimes far from easy to arrange a satisfactory ground connection for the wireless set. If the set is of the all electric type it is sometimes possible to dispense with the earth connection altogether, but often it pays to move the set to a different part of the room or even into another room in order to obtain a good ground contact with a reasonably short lead.

With battery sets, however, a substitute for the ground connection can sometimes be used with advantage. This is the *counterpoise*. The ordinary aerial and ground system is, in effect, a condenser of large size but small capacity, the aerial wire forming one "plate" and the ground itself the other. When a counterpoise is used the second "plate" of the collector system is formed, not by the ground, but by a length of insulated wire.—*World Radio*.

Short Wave SCOUT NEWS

E. M. Heiser, Brecksville, Ohio, Reports

● DURING the past week, I have rewired the "Tetradyne" to use the 50 series of tubes and these new tubes surely give the set more sensitivity.

There were many stations heard which could not be identified; although their carriers were very strong, the voice could hardly be heard.

Conditions have remained more or less freakish, as there are still many harmonics of regular broadcast band stations heard on the short-wave bands. On one occasion a harmonic of one of the "local" *broadcast* band stations was picked up on every two degrees of the dial.

DJC has disappeared again for some time. There are a few new South American stations working on this wavelength. One of them is listed in the appended log. The rest have not been identified as yet, although one announces as being in Bogota, Colombia.

The variable weather we have been having seems to have made reception just as variable.

I am enclosing a log for this period.—Edward M. Heiser, Route 2, Box 124, Brecksville, Ohio.

BRECKSVILLE, OHIO, OLP-SHORT-WAVE LOG—TIME IS EASTERN STANDARD

Date	Time	Call	W.L.	Location	Remarks
Jan.	p. m.				
26	7:20	HIH	44.02	Dominican Rep.	Very Good. Signed off at 7:45 p. m.
27	7:20	HC2RL	45.00	Guayaquil, Ecud.	Very Loud, but Choppy
28	3:45	GSD	25.53	Daventry, Eng.	Very Loud
28	7:10	HIH	44.02	Dominican. Rep.	Very Loud
29	a. m. 9:30	DJE	16.89	Zeesen, Ger.	Faded Fast
29	9:55	HJB	20.07	Bogota, Col.	Very Loud. Working WNC
29	p. m. 8:15	HJ4ABB	42.02	Manizales, Col.	Very Good
Feb. 3	.....	.....	.....	.....	All Bands Very Poor." Excessive Atmospherics
4	12:20	GSD	25.53	Daventry, Eng.	Fair, but Noisy
4	7:10	I2RO	49.20 abt.	Rome, Italy	Very Loud and Clear.
4	7:25	YV5RC	49.82	.....	Fair
4	7:40	YV5RMO	51.28	Maracaibo, Ven.	Very Loud and Clear
4	8:25	HJ3ABD	40.54	Bogota, Col.	Very Good
12	a. m. 9:45	DJE	16.89	Zeesen, Ger.	Fair, at 10:30 a. m. Very Good
12	9:55	WNC	19.92	Hialeah, Fla.	Working HPF
12	10:30	HVJ	19.83	Vatican City, It.	Just Understandable. English
12	10:50	ZFB	28.98	Hamilton, Ber.	Local Tests. Very Loud.
12	11:00	COH	31.80	Havana, Cuba.	Steady, but Weak
12	p. m. 7:10	EAQ	30.40	Madrid, Spain	Very, Very Loud
12	7:20	GSA	49.59	Daventry, Eng.	Very Loud and Clear with Vol. Control Off.
13	7:20	HJ3ABD	40.54	Bogota, Col.	Very Good and Steady
13	8:30	FYA	25.6	Paris, France	Just Understandable
14	1:25	KKP	18.25	Kohuku, Hawaii	Very Loud. Working KWO
15	a. m. 10:30	HVJ	19.83	Vatican City, It.	Very Good. Italian
15	p. m. 6:50	EAQ	30.40	Madrid, Spain	Very Weak
15	7:00	GSA	49.59	Daventry, Eng.	Very Loud
15	8:05	GSC	31.30	Daventry, Eng.	Very Loud
17	7:15	GSA	49.59	Daventry, Eng.	Very Loud, but Noisy
17	7:30	HC2RL	45.00	Guayaquil, Ecuad.	Loud, but Noisy
18	a. m. 11:30	COH	31.80	Havana, Cuba	Loud, but Distorted
18	p. m. 7:30	HJ1ABB	46.53	Bar'nquilla, Col.	Very Loud and Clear
18	7:40	YV3RC	48.7	Caracas, Ven.	Very Loud
18	7:50	HIH	44.02	Dominican. Rep.	Very Good. Signed off at 8 p. m.
18	8:00	HP5B	49.75	Panama City, Pan.	Very Loud. *Announced
18	8:30	YV2RC	49.08	Caracas, Ven.	Very Loud
18	8:35	TIEP	44.75	San Jose, C. Rica.	Very Loud
18	8:45	COH	31.8	Havana, Cuba	Very Loud and Clear,
19	a. m. 5:45	VK3LR	31.32	Melbourne, Aust.	Very Loud and Clear
19	8:15	FYA	19.68	Paris, France	Just Understandable
19	8:20	GSF	19.82	Daventry, Eng.	Fair
19	8:45	DJE	16.89	Zeesen, Ger.	Fair
19	10:20	COH	31.8	Havana, Cuba	Very Loud and Clear
19	10:30	HVJ	19.34	Vatican City, It.	Very Good English. *Announced
20	9:45	DJE	16.89 abt.	Zeesen, Ger.	Fair. Faded
20	10:50	CJA	25.00	Drummondville, Ont.	Testing with VK3ME and VAY
20	11:10	ZFB	29.84	Hamilton, Ber.	Very Loud

Reception Report for Feb. from Herman Borchers, Greenfield, Mass.

● DURING the month of February the reception on the short waves was very good here on all wave bands. The South American station, generally poor, came in much better than last month.

An outstanding station this month was CT1AA, Lisbon, Portugal. This station was received daily on a R8-9 signal strength; this station has only 2 kw. power.

CQN—49.8 meters, Macao, China, is on a new schedule according to a letter received. They broadcast every Monday and Friday from 8:00 G.M.T. to 10:00 G.M.T.

Bernard Kinzel, thirteenth trophy winner, appreciates the handsome silver SHORT WAVE SCOUT trophy immensely. Have you started your list of "S-W stations heard" yet? Who can tell—maybe you will be the next winner of the Trophy.

which is 3 to 5 a.m., E.S.T., on a wavelength of 49.8 meters and 500 watts power. Announcements are in Portuguese and English. This is the address: Direction Superieure des Postes de la Colonie de Macao, Macao, China.

DGU—31 meters, DJB—19.73, Germany was broadcasting a special program to United States on Washington's Birthday, from 2 to 2:20 p.m. Reception was very good R9.

The Australians didn't come in good. The 19-meter band was also good. FYA—19.68 meters, Paris, PCJ—19.75 meters, Holland, GSF—19.82, England, all were received well.

Other stations received were:

2RO—30.67 Rome, Italy, reception good, R8.

2RO—49.2 Rome, Italy, strong signal, R9.

CT1AA—31.25 Lisbon, Portugal, came in like a local, R9.

VE9DN—49.96 Drummondville, Can., were testing Saturday, Feb. 16, 10:45 a.m., E.S.T.

YV5RMO—51.28 Maracaibo, Venezuela, strong signal, R8.

COC—49.92 meters Havana, Cuba, excellent, R8.

DJC—49.83 Germany, heard night after night, R8-9.

Latest "Hot" Tips for Short-Wave Listeners from our "OFFICIAL LISTENING POSTS"

GSA—49.59 London, fair, R6-7.

VE9GW—49.2 Bowmanville, Can., extra strong, R9-5.

CJRO—48.78 Canada, strong signal, R8.

YV3RC—48.7 Caracas, Venezuela, S.A., fair, R6.

HJ1ABB—46.53 Col. S.A., fair, R6.

PRADO—45.30 Ecuador, R7.

HC2RL—48 Ecuador, R7, fair signal.

COH—31.8 Cuba, good reception, but change their frequencies very often.

PRF5—31.58 Brazil, very good R8.

HBL—31.27—HBP—38.47 Geneva, Switzerland, heard regular at R7 strength.—Herman Borchers, 240 Federal St., Greenfield, Mass.

Stations Heard and Logged by John Sorensen, New York City

● DJE - DJB - DJD - DJN - DJA-DJC-GSG-GSF-GSE-GSD-GSC-GSB-GSA-FYA—19 meters, FYA—25 meters, GAS—24 meters, PHI—25 meters, PCJ—19 meters, HBP-HBL-ORK-EAQ-JVT—44 meters, 2RO—30 meters and 49 meters, LKJ1—31 meters, OXY—49 meters, VK3ME-VK2ME-VK3LR—31 meters, HAT—55.56 meters, RW15—70.6 meters, YDA—49 meters, CT1GO—48.4 meters and on 24.2 meters. OAX4D-XEBT-HCK-TIGPH-TIEP-YV2RC-YV3RC-YV4RC-YV6RV-YNLF-YV5RMO-HIX-HIH-HI4D - COC - COH - PRF5 - HP5B - HI1A-HJ1ABB - HJ2ABC - HJ4ABE - HJ5ABD-HJ4ABB-HJ3ABD-HC2RL-PRADO-CT1AA-GCB-CGA4-CJRO-CJRX - VE9DN - KEE-KFZ - KEN - VE9GW - WWDI - WWDW-WWHJ-WWEC—on 89 meters.

These must be Departments of Commerce Stations. Some airplane or ship was in distress: W1XAZ—31 meters, W1XAL—49 meters, W8XK—19, 25, 49 meters, W2XE—19, 25, 49 meters, W3XL-W3XAL—16 meters, W9XAA - W8XAL - W9XF-W3XAU—31, 49 meters.

Number of unidentified stations heard.

Veris received this month: PRF5-CT1GO—48.4 meters, I2RO—49 meters, YV2RC—Apartad—290—Caracas, Ve., S.A.

HAT—55.56 meters, Budapest. It is on the air every Sunday 8 to 9 p.m., E.S.T. I have heard this every Sunday this month—lady announcing. Station Budapest—KEN—68.45 kc.

Code and harmonics continue to mar reception here; 49 meters has been the best here this month. YV6RV—has been heard on 46 meters. YNLF—on 49 meters, testing. EA4AO—an amateur in Madrid, Spain, has been heard asking for reports to P. O. Box 745, Madrid.—John Sorensen, Bronx, New York City.

Official Listening Post of Geo. D. Sallade, Sinking Spring, Pa.

● RECEPTION at this post has been very inconsistent during the entire month of February. For example, on Feb. 6, GSA was heard at R9 strength, while the next evening their signal was obliterated by heavy static and consistent fading. On the other hand, the 31-meter band is much better. GSB, PRF5, DJA, DJN and CT1AA are heard with local volume. CT1AA is especially strong at present. As many listeners know, this station is testing on 5980 kc., aside from their regular Tuesday, Thursday and Saturday broadcasts. The 25-meter band has shown much improvement and stations such as GSD, DJD and Radio Coloniale are really worth hearing, from noon to 4:00 p.m., E.S.T., Radio Coloniale was by far the best signal heard on this band. YV5RMO was heard several times on this band, using a frequency of approximately 11800 kc. The 19-meter band was only fair. RKI, DJB, and GSF were heard with much fading. HAS3, whose sched-

(*Continued on page* 53)

SHORT WAVE SCOUTS

No Trophy Awards This Month:

Only Entries Received Were Disqualified for Not Conforming to Rules.

● Would you like to win one of these magnificent large silver trophies, which the editors have been awarding each month for over a year to the SHORT WAVE CRAFT listener who submitted the longest list of Short Wave Stations heard, in accordance with the simple rules given herewith?

There is nothing difficult involved in the compiling of the list of stations heard, and the only change in the rules is that at least one half of the stations heard and verified, must be located *outside* of the country in which you reside. So, get busy and rush your list of stations to us by May 1, the closing date for the July number.

Perhaps some of you short-wave listeners have gotten the idea in your heads that if you had only a short list of stations, possibly 20, 30 or 40, that you did not stand much of a chance by submitting it, and therefore failed to send it in. Please remember that you never can tell when you have a good chance to win one of these magnificent large silver trophies, because if you had submitted an even smaller number of verified stations, half of which were foreign to the country in which you reside, and all of the stations being verified in accordance with the new rules, you would have won one of these beautiful trophies. This is so for the simple reason that the post-office rules require in any such contest as this, that every entry must be considered by the judges and as long as the list of stations submitted to the judges conformed to the rules of the contest, and if the list had only contained a dozen stations, the judges would then have awarded this month's trophy to him.

So do not be afraid to step right up and mail in that list of verified stations, whether it is 20, 30, 40, or more! Read the accompanying rules carefully and after you have written in ink or preferably typewritten your list of stations, go before your local notary and for the usual fee of 25c simply take an oath that you have listened to each of these stations on the list submitted on your own receiver, and rush the list and the oath along to the Editor.

IMPORTANT: Do not fail to remember that all the entries must now be entered according to the new rules which are herewith reprinted for the benefit of those who intend submitting lists of stations. Read the new rules carefully!

Presented to the

"Trophy-Winning"
SHORT WAVE SCOUT
JOHN DOE

For his contribution toward the advancement of the art of Radio

by

SHORT WAVE CRAFT

Magazine

● ON this page is illustrated the handsome trophy which was designed by one of New York's leading silversmiths. It is made of metal throughout, except the base, which is made of handsome black Bakelite. The metal itself is quadruple silver-plated, in the usual manner of all trophies today.

It is a most imposing piece of work, and stands from tip to base 22½". The diameter of the base is 7¾". The diameter of the globe is 5¼". The work throughout is first-class, and no money has been spared in its execution. It will enhance any home, and will be admired by everyone who sees it.

The trophy will be awarded every month, and the winner will be announced in the following issue of SHORT WAVE CRAFT. The winner's name will be hand engraved on the trophy.

The purpose of this contest is to advance the art of radio by logging as many short-wave commercial phone stations, in a period not exceeding 30 days, as possible by any one contestant. The trophy will be awarded to that SHORT WAVE SCOUT who has logged the greatest number of short-wave stations during any 30-day period.

Briefly they are: The Trophy will go to the person submitting the "greatest number of verifications!" No unverified stations are required! Also, at least 50 percent of the verifications submitted must be for stations located OUTSIDE of the country in which the entrant resides. Only letters or cards specifically verifying reception of a given station will be considered.

Trophy Contest Entry Rules

● NOTE that we have amended our rules and you will find that the rules now read:

In order to protect everyone, the rules have been amended that a sworn statement before a Notary Public which only costs a few cents to get, must be sent in at the same time.

For the complete article of the Purpose of the SHORT WAVE SCOUTS, we refer to page 393 of the November, 1933, issue.

Here are the rules amended:

You wish to know how you can win this valuable trophy, and here are the simple rules. *Be sure to read them carefully. Do not jump at conclusions.*

1.—A monthly trophy will be awarded to one SHORT WAVE SCOUT only.

2.—The purpose of this contest is to advance the art of radio by "logging" as many short-wave commercial phone stations, in a period not exceeding 30 days, as possible by any one contestant.

3.—The trophy will be awarded to that SHORT WAVE SCOUT who has logged the greatest number of short-wave stations during one month.

4.—In the event of a tie between two or more contestants, each logging the same number of stations, the judges will award a similar trophy to each contestant so tying.

5.—Verifications are necessary; these must be sent in with each entry. All cards or verification letters must be sent in at the same time, with a statement by the SHORT WAVE SCOUTS, giving the list of stations in typed or written form, with the station calls, wavelengths, and other able information. (See below.) The verification letters and cards will be returned to the SHORT WAVE SCOUT at the end of each monthly contest. (See Jan., 1933, editorial how to obtain verifications.)

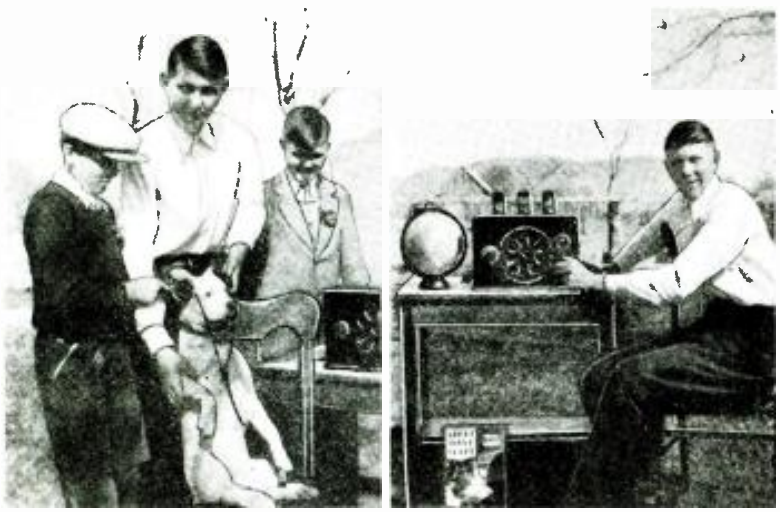
Note! All Stations Sent In Must Now Be Verified!

6.—The winner each month will be the person sending in the greatest number of *verifications*. *Unverified* stations should *not* be sent in, as they will not count in the selection of the winner. At least 50 percent of the verifications sent in by each listener must be for stations located *outside* of the country in which he resides! In other words, if the contestant lives in the United States, at least 50 per cent of his

(Continued on page 55)

SHORT WAVES and

EVEN FIDO ENJOYS THE SHORT WAVES



Even the dog seems to be enjoying the short-wave music picked up on Julius Dalley's receiving set.

Editor SHORT WAVE CRAFT:

I learn a great deal from SHORT WAVE CRAFT, and read all the articles in the magazine. The *Short Wave Scout News* is of great interest to me. I can hardly wait until the next issue comes out, the time drags when I am waiting for SHORT WAVE CRAFT to come.

I am sending a couple of snapshots. "Getting an Earful" and "Tuning In." The receiver is a "Baird." I haven't broken any records with this receiver but it does fairly good work.

I am a 100 percent supporter of the SHORT WAVE CRAFT and the fine work you are doing to further the short-wave art.

JULIUS W. DALLEY,
Kanab, Utah

(Thanks for sending us the novel photo of the dog listening in to the short waves, Julius, and we hope that many more readers will send in photos of a similar nature as "variety is the spice of life." And after all, even the editors do get "fog-eyed" looking at the same old type of photo, most of which do not even show the "operator" on the job. Let's see what you can do with your camera to help make these pages more interesting.—Editor.)

ORCHIDS FOR "2-TUBE CHAMP"

Editor, SHORT WAVE CRAFT:

I have been reading your magazine for about a year and it sure is F.B. I'm one of those fellows who likes to build 'em, test 'em, and knock 'em down to make room for the next one, so SHORT WAVE CRAFT is "right down my alley"! I haven't seen any "raves" published for the "Champ" 6F7, 37 rig yet, so I'm putting my vote in right now. She sure pulls in the European "locals" with plenty of "sock." Enough to operate a speaker, and on only 90 volts, too! Orchids also for the Oscillodyne, Globe-Trotter, Scout, and a host of others too numerous to mention.

I believe you would do well to print more technical data, such as short-wave antennas, Band-Spread Methods. We, who want to become "Hams," would welcome a series of theoretical articles, and "Hams" themselves would take to them in a big way. Other than this one weakness, SHORT WAVE CRAFT is one fine "mag." More power to you!

WILLIAM TOWNSEND,
c/o F. R. Howe,
Bayville, N.Y.

(Thanks for the orchids, William, and we are glad indeed to know that you have found the OSCILLODYNE, GLOBE-TROTTER, SCOUT, *and especially the* 2-TUBE CHAMP *to be "tip-top" short-wave receivers. Mighty fine results and all on the loud-speaker, too! We endeavor to publish material right along which will be of value to embryo "Hams."—Editor)*

AUSTRALIA FIRST COUNTRY HEARD ON HIS SET

Editor, SHORT WAVE CRAFT:

The purpose of this letter is to give you an idea of the remarkable results that I have obtained with the "Argonaut" short-wave receiver described in the August, 1933, edition of SHORT WAVE CRAFT. With the aid of my father, who has been an ardent radio fan for years, construction was started on the set early in November. On Thanksgiving Day the set was first put into operation and "Believe-It-Or-Not" the first station tuned in was VK2ME on 31.2 meters—Sydney, Anstralia! Besides about 30 different police stations and all the principal short-wave stations in the United States and Canada, I have received the following:

GSA—Daventry, Eng.
GSB—Daventry, Eng.
GSC—Daventry, Eng.
GSD—Daventry, Eng.
GSE—Daventry, Eng.
GSF—Daventry, Eng.
GSG—Daventry, Eng.
G6RX—Rugby, England
GBB—Rugby, England
DJC—Berlin, Germany
DJD—Berlin, Germany
DJB—Berlin, Germany
FYA—Paris, France
FYA—Paris, France
EAQ—Madrid, Spain
I2RO—Rome, Italy
HVJ—Vatican City
PHI—Huizen, Holland
PSK—Rio de Janiero
YV3BC—Caracas, Ven.
YV1BC—Caracas, Ven.
HKC—Bogota, Colo'bia
HKD—Barranquilla, Colombia
VE9HX—Halifax, N. S.
VE9GW—Bowmanville, Ontario
VE9DN—Montreal, Que.
CMCI—Havana, Cuba

I think that this is very good reception for a battery-operated set. The aerial is a single wire, about 50 feet long, with a single lead-in wire of about 20 feet. Since building it there has been added a small variable condenser in the antenna which makes quite an improvement. Please thank Mr. Denton for me for all the "thrills" his set has given to me.

ROBERT F. KAISER.
96 Ontario St.,
Albany, N. Y.

(Well you beat the editor's record, Robert, for he confesses that he did not have the marvelous luck to hear VK2ME when he first tuned in, but thanks to the greatly improved circuits and apparatus available today, it is really possible to accomplish some very remarkable "long distance" short-wave reception as proven in your case.—Editor)

HIS RECEIVER IS ON WHEELS

Editor SHORT WAVE CRAFT,

Here is a picture of my short-wave receiving set. It is a Binnewig 2-tube (227's) DX receiver as described in your *"Ten Most Popular Short-Wave Receivers."* I call it my "indoor portable" because the "orange-crate" cabinet is mounted on rollers and I can thus easily move the set to any room in my home. When the indoor noise gets too great in the living room, all I have to do is roll the set to the bedroom, connect to an aerial and ground, plug in the transformer, and I am all set to continue my listening.

A Crosley Bandbox power-pack supplies the 2½ volts for the filaments and two blocks of 45 volt dry cells furnish the "B" current. The front of the cabinet is a hinged door. Shelves inside hold the transformer, "B" batteries, magazines and tools.

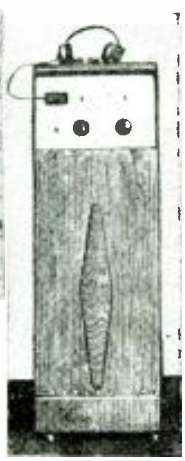
The panel of the set is aluminum as is also the chassis. The tuning dial is on the extreme right. Next, to the left, is the regeneration control, and the "B" battery toggle switch is on the extreme left. A small bakelite panel, upper left, holds the phone tip jacks, and the two holes above the dials are peepholes.

I have gotten very good results from this receiver, having heard the usual short-wave broadcasting stations—EAQ, GSB, DJA, etc., and once VK2ME.

I thoroughly enjoy "SHORT WAVE CRAFT" and obtain my copy from the newsstand *5 minutes after they receive it!* My ambition now is to own one of your *"Short Wave Radio Manuals"* and I intend to procure my copy very soon.

J. VERNON SACHER
10 Zane St.
Wheeling, W. Va.

(A capital idea, J.V.S., and we have been so smitten with your idea of the "Indoor Portable" that we have a good mind to build up one of these jobs for our own personal use.—Editor.)



Mr. Sacher has a novel idea which he has carried out in his "Indoor Portable" receiver, which is built up on an orange-crate cabinet, mounted on rollers.

LONG RAVES . . . OUR READERS' FORUM

Albert M. Wentworth's Ham Station a Pippin!

Prize-Winning Station Photo Awarded One Year's Subscription to SHORT WAVE CRAFT

Editor, SHORT WAVE CRAFT

I get the SHORT WAVE CRAFT each month and Boy, I sure do enjoy every page between its covers! I have watched some of the photos of the Amateur Stations and I think I would like to try to win a free subscription to SHORT WAVE CRAFT. Anyway I'm sending you a picture of W1BSX in Roslindale. Here is a full description of the station:

On the desk is a National SW 45 Receiver. Double button microphone and a Horace-Martin Vibroplex key. On the front right-hand corner of the desk is a neon lamp.

Transmitter sets appear just to the right of the desk. The window at the bottom of the transmitter is the 866 rect. for the final amplifier power supply. The meter above the 866s is 0 to 2,100 voltmeter. To the right of the meter is a switching arrangement for the final amplifier power supply. The voltage can be changed from 850, 1350 or 1500 volts. Directly above the switching arrangement are two phone jacks. These are to plug in the 0 to 300 milliammeter to read the buffer and amplifier. The panel switches above are the main means of controlling the entire transmitter. The switches are: (from left to right) first is the ruby to tell when the rectifier and crystal oven-heaters are on. Next is the rectifier and crystal oven switch, then the oscillator. Then the buffer and last is the final amplifier.

The knobs above the panel switches are on the "Tri-Tet" oscillator. The meter at the left of the oscillator is the 0 to 300 mill. The row of knobs above the milliammeter are: (left to right) Antenna, Amp. Tank. Buffer and the coupling condenser between the oscillator and buffer. The meter in the center of transmitter at top is the 0 to 2.5 amp. antenna meter. And last is the name-plate which says: W1BSX Radio Station, Roslindale.

The antenna of the Trans. is connected to GR insulators just back of the model boat. Stations' licenses are on the walls in background. That completes the layout.

Now the story on the transmitter circuit is: Starting with a Tri-Tet oscillator a 210 buffer and a RCA211 in the final amp. That is for 20, 40, and 80 CW. Now on phone. Tri-Tet oscillator 210 Buff. and the RCA211 with two 203A as the modulators. Speech amp. is 2-227 feeding a 245 to a 250 and then to the modulators. The Tri-Tet oscillator is equipped with a crystal and crystal oven (home-made).

There are switches on the back to change from Phone to CW. The speech equipment is on this side of the desk (not in picture).

This station has worked all U.S. districts, three Canadian districts, Cuba, South America, England and Spain. That is on CW.

On Phone, W1, 2, 8. Ve2, 3.

W1BSX is a member of the *Amateur Army Radio System*.

All calls heard will be gladly answered by W1BSX on 20, 40, 80 or 160.

(*Continued on page* 58)

Albert Wentworth certainly has a crackerjack Ham station and we are glad indeed to award the prize this month to Mr. Wentworth.

PRAISES FROM AN ENGLISH "FAN"!

Editor, SHORT WAVE CRAFT:

Quite recently I received from a "pal" of mine in San Francisco, a copy of SHORT WAVE CRAFT and as I had not read any of your American wireless magazines before, I was naturally interested in receiving a recent issue of your periodical from my friend who happens to be an S.W. "Fan" over in your country.

Now that I have read it thoroughly from cover to cover, I feel really grateful to my "pal" for having introduced me to the *finest* and most *comprehensive* magazine dealing with short-wave radio I have yet seen. As we sometimes say over here, when we like something extra well, "It's undoubtedly the Bee's-Knees" which I believe when translated into American is "hotcha-cha" or thereabouts.

I came to hear of SHORT WAVE CRAFT when my pal in "Frisco" was over here this summer, enjoying a vacation after his first ten years in U.S.A. and after giving me a glowing account of it, he promised to send one along when he got back and I must say it fully warrants all his praise.

It is only about six months ago since I took up the idea of constructing a S.W. receiver, as up to then I had been rather skeptical about the wonderful results which I had heard some "Fans" obtained.

However, after constructing a little one tube receiver on a piece of plyboard for purposes of experiment, I pulled in W2XAD, KDKA, and some "chappie" with an amateur station "over in Texas"—and suddenly I developed S.Wave-itis and have still got the "fever"!

I now possess quite a decent all-wave receiver, consisting of a screen-grid high frequency (R.F.) stage (with untuned aerial circuit) followed by a detector which is coupled to the S.G. tube by means of an A.F. transformer tuned with secondary winding. The detector is then followed by an R.C. coupled "Class B" driven tube with the usual driver transformer of course between the driver and the "Class B" output tube (1½ watts output, or 2½ watts with bigger tube).

As I expect you may be aware, the system of "Class B" amplification is rather popular over here with "battery users," on account of the considerable economy obtained in plate current, together with all-round improvement in *quality* of reproduction. Although the Quiescent-Push-Push or (Q.P.P.) system seems also very popular for the same reasons.

I was very much interested in the article on *Short Wave Antennas* and the methods used for overcoming electrical interference. In this connection might mention that I obtain very good results indeed with an aerial not described in your paper, but one with which no doubt you are familiar, namely the "vertical wire" type. As a matter of fact I receive W3XAL best of all on this aerial, with the length of wire equal to *one-half* the station wavelength viz. 16.86 meters; also Pittsburgh on 13.93 meters, a station which does not come in too good as a rule on this wave.

Incidentally I also use another aerial which I find works very well on wavelengths above 20 meters, and this is a tilted (slanting) wire 45 feet long, sloping at an angle of about 50 degrees to the ground.

I might mention also a point of interest, that when listening to W3XAL or any stations below 20 meters on the *vertical* aerial that I get greater signal strength by using the sloping wire as an "earth" than the actual ground "earth" used on other wavelengths. Perhaps some of your readers might be interested to try out a few experiments on these lines.

Wishing your paper every success.

CHARLES G. HAYES,
209 Nutgrove Road,
Nutgrove,
St. Helens, Lancs., England.

(We hope to hear from many more of our friends across the "Big Pond," Charles, and it gives us great pleasure to know that you have found SHORT WAVE CRAFT *so interesting, and also that we measured up to your friend's description of us, at least to some degree. Why not send us a good clear photo or two of your station, together with one of yourself, if you do not already appear in the photo of the apparatus?—Editor.)*

One Year's Subscription to
SHORT WAVE CRAFT
FREE
for the "Best" Station Photo

Closing date for each contest—60 days preceding date of issue: May 1 for July issue, etc. The editors will act as judges and their opinions will be final. In the event of a tie a subscription will be given to each contestant so tying.

All-Wave ADAPTER FOR YOUR S-W Receiver

By J. A. WORCESTER, JR.

The remarkable range of 15 to 1000 meters can be covered by a single rotation of the tuning condenser when the all-wave adapter, here described by Mr. Worcester, is connected to an ordinary short-wave receiver, which may be of the one or two-tube regenerative type.

Note the extremely simple construction and small number of parts used in this all-wave adapter which permits tuning in waves from 15 up to 1000 meters with a single rotation of the tuning condenser.

● THE device described in this article makes it possible to extend the range of the ordinary short-wave regenerative receiver to include the wavelength range above 200 meters, and at the same time eliminates the necessity of employing plug-in coils or a tapped coil construction, by covering the entire *all-wave* frequency range (15-1000 meters) with a single rotation of the tuning condenser. It may appear to the casual reader that the coverage of such a wide-frequency range with a single dial rotation would result in hopeless station congestion. When it is realized, however, that the frequency range covered is slightly less than twice that covered when employing the smallest coil in the usual regenerative receiver, it is readily apparent that such is not the case. As a matter of fact it is possible, by employing one of the new "two-pointer" dials, to obtain a mechanical band-spread entirely sufficient for accurate logging of stations and much easier tuning than is possible with the usual tuning systems, especially at the higher frequencies.

This device is constructed so that it can be used in conjunction with an ordinary one or two-tube regenerative receiver and can also be used with receivers employing tuned or untuned R.F. amplification. The manner in which circuit connections are made in each instance will be discussed in detail in a later paragraph.

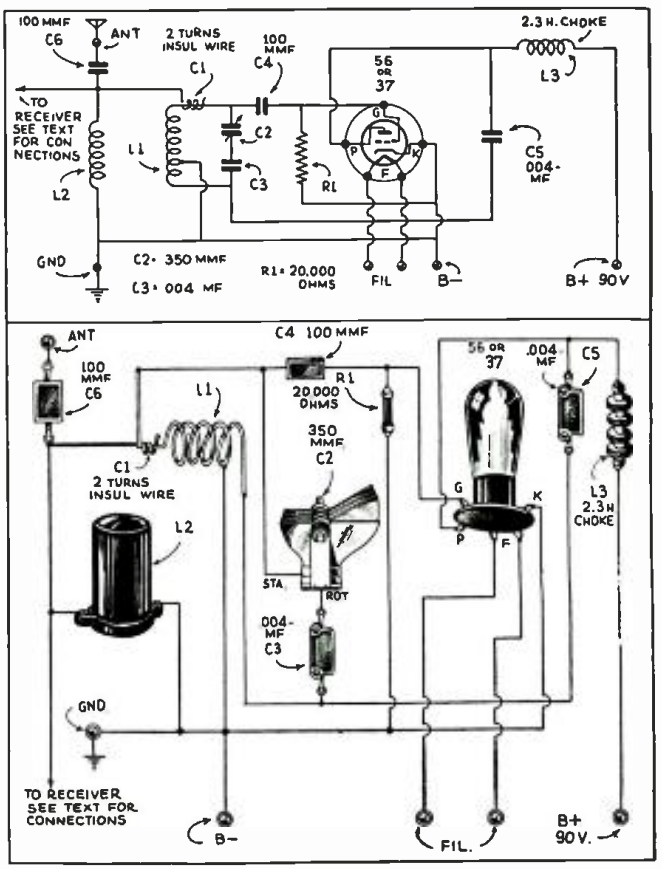
Theory of Operation

Before proceeding further it may be advisable to discuss briefly the theory of operation of this device. The circuit diagram is shown in Figure 1 and it will be noted that it is essentially an R.F. oscillator. This oscillator generates frequencies from 10 to 30 mc. (30 to 10 meters) by rotating the tuning condenser, C2. This frequency range is chosen so that difference between the maximum and minimum frequencies covered is equal to the frequency difference it is desired to receive . Since the useful frequncy range extends from .3 to 20 mc., the frequency difference is approximately 20 mc.; and since a 3-to-1 frequency ratio is possible with a 365 mmf. variable condenser, it is necessary to produce a frequency range extending from 10 to 30 mc., in order to obtain the desired 20 mc. differential.

The choke, L2, is employed as a universal input across which any signal to be received will produce an appreciable voltage. It will be noted that the signal voltage developed across the above choke is applied to the available short-wave receiver, as is also the voltage produced by the local oscillator through the coupling condenser, C1. Now if we tune the receiver to about 10 mc. (30 meters) it is evident that if the local oscillator is tuned to say 11 mc., a 1 mc. broadcast station will beat to the receiver frequency of 10 mc. Likewise, a 15 mc. oscillator frequency will beat a 5 mc. signal to the receiver frequency and a 30 mc. oscillator frequency will beat a 20 mc. signal to the 10 mc. receiver frequency. It is thus evident that with this device it is possible to cover the entire "all-wave" frequency spectrum with a *single* rotation of the tuning control. In this set a gear-driven, airplane-type dial was used and gave entirely satisfactory results. The choice of the receiver frequency need only approximate the 10 mc. value assumed above. In practice, a frequency is selected in the neighborhood of this value which is on a cleared channel.

Construction Details

The actual con- (*Continued on page* 56)



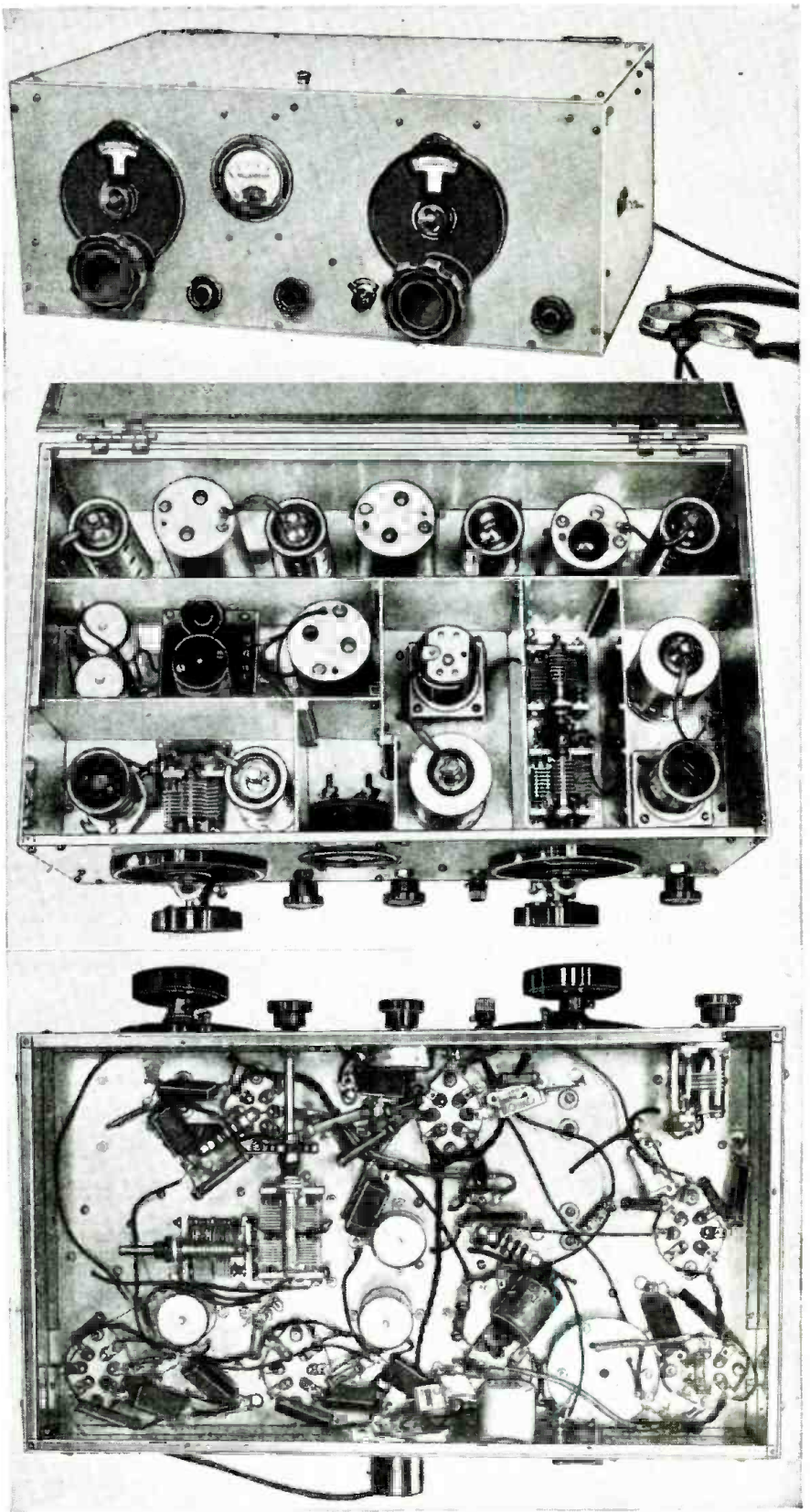
It is a simple matter to build this all-wave adapter as here described by Mr. Worcester by following the simple diagrams shown above.

A 7-TUBE SUPERHET for the "HAM"

By Ernest Kahlert

Here's a real receiver for the "ham"—it features "single signal" reception 'n' everything. This set incorporates band-spread, beat oscillator, one T.R.F. stage ahead of first detector, "output" meter, etc. It operates from 110 volts A.C., through separate power supply. This set gives razor-sharp selectivity.

● THIS superhet was built because of the increasing QRM resulting from an ever widening use of the amateur bands. People are gradually learning that one can experience real thrills from short waves and especially the amateur frequencies. Of course a set of this type is not primarily for a beginner, though upon analysis it becomes several small "sets" not greatly complicated. However, it would be much better for beginners to leave this type of set alone till they have gotten more experience with the many excellent and simple sets described in this magazine. The cost of a set of this type is rather high, also, and it behooves one to take great care in construction. With a little skill and patience, mostly *patience*, it is possible to make a set equal to the best of them for about half the price of the better superhet. Naturally one cannot expect very high selectivity from a TRF job and a super is the only alternative. A plain super, though, surprising as it may sound, is not such a whole lot more selective than the regenerative sets but it is free from *blocking* along with greater *gain* and ease of handling. But a crystal-filter superhet! Well—they do justify the extra cost. Panegyrics are unnecessary. Results CQ for themselves.



The three photos at the right show respectively front, top, and bottom views of the 7-Tube Superhet especially designed and built by Mr. Kahlert for "ham" station operators. In one night the author, located in New York City, "logged" nine Australian stations!

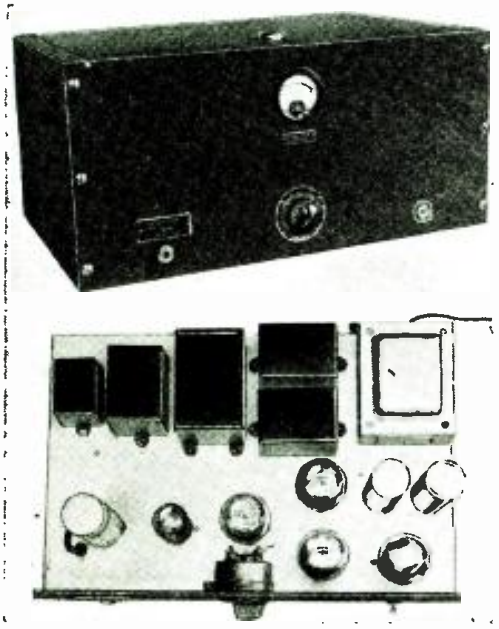
2 R.F. Stages Not Needed

Two R.F.'s and auto gain control are not used, as in the latest commercial models. Two R.F.'s would necessitate mechanical work beyond any ordinary home workshop, even if a "poor" job was contemplated; besides two R.F. stages are not necessary. One stage amply fills the bill down to 28 M.C. Carefully tuned and of good design

(Continued on page 38)

WHAT'S NEW In Short-Wave Apparatus

The short-wave apparatus here shown has been carefully selected for description by the editors after a rigid investigation of its merits



Front and top views of modulator. No. 273.

Efficient Modulator Unit for 30-Watt Transmitter

By FRANK LESTER*

● THE Lafayette Model P-46 30-watt transmitter, using the 2B6 exciter circuit and inexpensive parallel 46's in the output stage, as described in the April issue, has already achieved popularity among amateurs because of its reliable electrical design and its simple, compact construction. Readers will recall that the circuit uses a 2B6 double-triode as crystal oscillator and buffer or doubler, and parallel 46's in the final. The entire outfit, including power supply, is built into an attractive steel "table-style" cabinet measuring 19 by 12 by 8¾ inches, an unusually small space.

With the appearance of this transmitter came an immediate demand for a modulator unit for use on the 20-, 75- and 160-meter phone bands. Accordingly, the same cabinet was used and several experimental circuits laid out for trial. The final layout, selected after a thorough test in the laboratory and actual trial on the air, is shown in the accompanying diagram.

Five tubes plus rectifier are used altogether. The first is a 57 used as a high-gain pentode, resistance-capacity coupled to a 56. The potentiometer-grid leak R3, in the grid circuit of the latter, functions as gain or volume control. The 56 is transformer coupled to a 46 used as a triode, with the No. 2 grid tied to the plate. Note that the plate of the 56 is shunt-fed through the resistor R7. The blocking condenser C5 keeps the D.C. out of the primary winding of the transformer T1, at the same time permitting the audio frequency component of the plate current (representing the amplified microphone current) to pass to the primary for further amplification.

The two 46's in the output stage function as class B amplifiers, the two grids being connected together in each tube. The secondary of the output transformer T3 connects merely to the two posts marked "MOD" in the transmitter; that is, directly

(Continued on page 48)

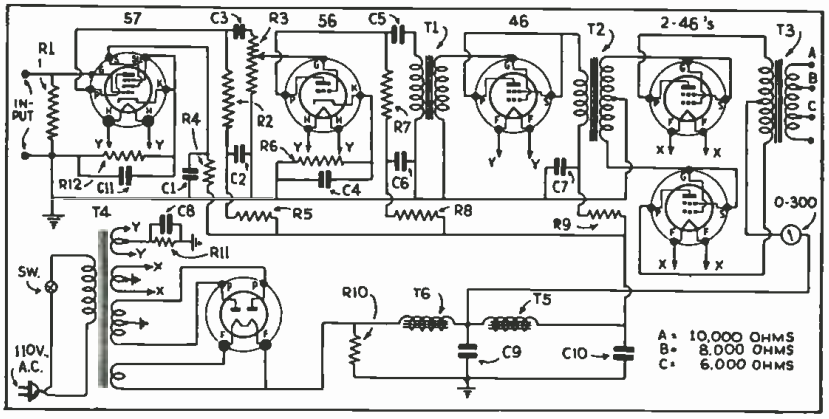
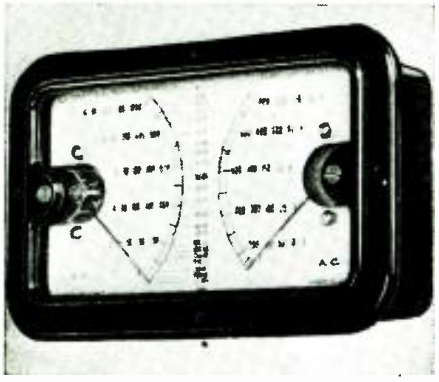


Diagram of complete modulator unit.

*Engineer, Wholesale Radio Service Co., Inc.

New Volt-Ohm-Milliammeter



New Triplett meter. No. 274

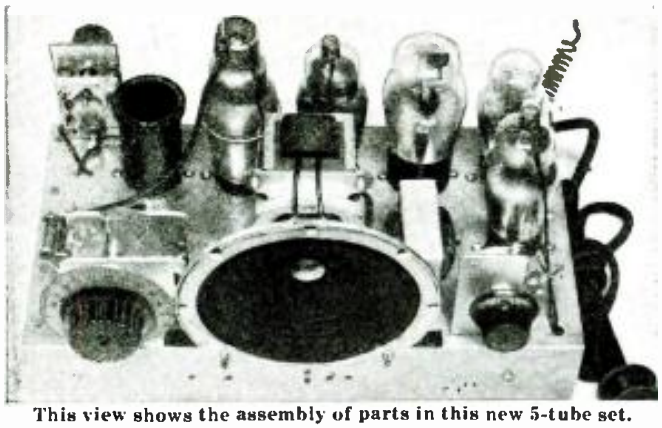
● RECENTLY a new addition to the Triplett line of meters was announced. Their popular No. 1200 Volt-Ohm-Milliammeter is now available in "kit" form and is designed for use with built-in shop equipment. This announcement will be of interest to Service Men who desire to build their own instruments, or who want instruments to meet special space and installation requirements. The 1200 volt-ohm-milliammeter in "kit" form is identically the same as the master model, except that it does not have the panel, the adjustable feature on the meter, the batteries or case—but does have index marking. It is furnished complete with all shunts, resistors, condensers, coils, drilling template, blueprints and instructions.

Junior Velocity "Mike"

● ABOUT the size of a match-box, with an output equal to a large velocity, and an output that is constant with any position of the head, the new 7-point Junior by Amperite will be welcome for the unusual job. By letting it hang like a monocle, the speaker is always at the right distance from the microphone. The en-

(Continued on page 63)

Names and addresses of manufacturers of sets described on this and following pages furnished upon receipt of 3 cent stamp; mention No. of article.



This view shows the assembly of parts in this new 5-tube set.

New 5-Tube Set Works Speaker

By H. G. Cisin, M.E.*

● THE new *Space Explorer* model has been designed and constructed to conform to a number of basic principles found to be most efficient for long-distance short-wave reception and embodied in the earliest "Air Scout" models. Among these might be mentioned elimination of unnecessary tuned stages; the use of tubes best adapted for each portion of the circuit; simplification of the circuit and the use of plug-in coils rather than a switching arrangement.

Taking up these features in the order mentioned above, the reduction of the number of tuned circuits has been carried to its ultimate conclusion in the Space Explorer for this circuit employs an untuned R.F. stage and a tuned regenerative detector. As a logical result, losses are reduced to a minimum due to shortening of grid connections and especially due to the elimination of double and triple coil sets.

*Chief Engineer, Allied Engineering Institute.

In the *Space Explorer* only one plug-in coil is used at a time.

The many thousands of users of these sets will testify to the high efficiency of the 6C6 tube when properly used as a regenerative detector. After trying out many different types of tubes, the 6C6 tube was also found best adapted for use in the untuned R.F. stage. In the first audio stage, the 6C6 is employed as a triode with the screen grid tied directly to the plate. Used in this way, greatest gain has been attained. The output stage employs the very excellent 43 tube which has an output of 2 watts when used most efficiently and which delivers up to 1 watt when operating with 100 volts on plate and screen. Through the proper design of the filter circuit, it is possible to increase the

(*Continued on page* 46)

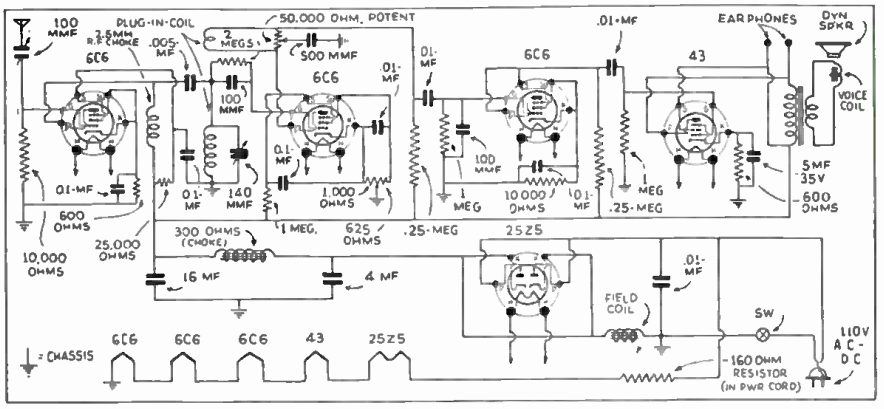


Diagram for the new Space Explorer.

Simple 1-Tube All-Wave All-Electric Set

By W. Green*

● HERE is a 1-tube all electric A.C.-D.C. receiver designed especially for the short-wave beginner. It makes use of the new type 12A7 tube which is really two tubes in one envelope. It consists of a pentode and a half-wave-rectifier each having its own cathode with a common heater for the two tubes. The pentode section is used as a regenerative detector with regeneration being controlled by variation of the voltage applied to the screen grid.

The filter system consists of a 40,000-ohm resistor and a dual 4 mf. 200 volt condenser. It uses standard plug-in coils having a tickler and grid winding. The grid winding is tuned with a 140 mmf. tuning condenser. The grid circuit is so wired that the B negative side of the circuit is isolated from the metal chassis, allowing a ground to be connected directly to the chassis.

The rotor of the variable tuning condenser is also connected to the chassis and ground. This is accomplished by inserting a .1 mf. by-pass condenser between the chassis and B negative. All traces of hand-capacity are eliminated in this manner. A 350-ohm line-cord resistor drops the line voltage to the necessary 12.6 volts for the heater.

There is nothing complicated about the construction of this set. While at first glance it might seem quite complicated, actually there is nothing to it. Just build the instrument piece by piece, and watch how easily and quickly it goes together.

To operate: Plug in the coil covering the wave band selected. For beginners we recommend strongly that the broadcast coil be used first, since tuning is much easier than for short waves. Connect aerial, phones and then plug into any house outlet (A.C. or D.C.). Turn up the right-hand knob slowly until a rushing noise is heard in the phones. This is the most sensitive point and makes a whale of a difference in the volume of signals. But it is best to back off a little to the left to clarify music and speech. Parts list follows:

*Chief Engineer, Harrison Radio Co.

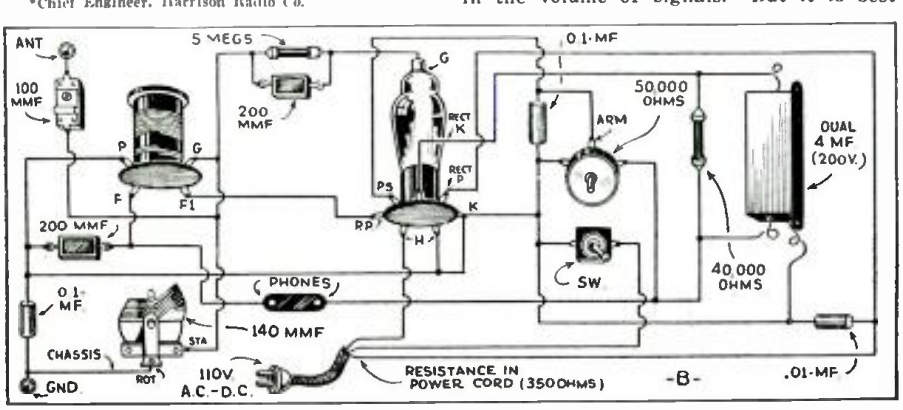
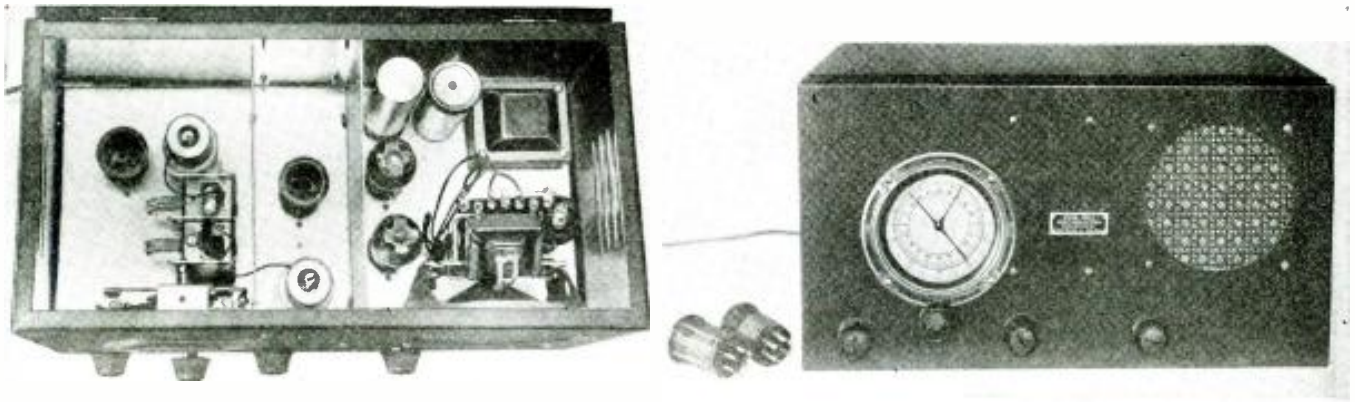


Diagram for the 1-tube A.C.-D.C. receiver.

General appearance of this 1-tube "All-Electric" set.

1—Harrison Duett chassis. 1—Cabinet.
1—7-prong socket.
1—4-prong socket.
1—Electrolytic condenser. Double 4mf.
1—50,000-ohm potentiometer with switch.
1—dial.
1—140-mmf. condenser.
1—350-ohm line-cord.
2—200-mmf. condensers.
1—5-meg. resistor. 1—40,000-ohm resistor.
2—.01-mf. condensers.
1—.1-mf. condenser.
1—100-mmf. antenna coupling condenser.

Names and addresses of manufacturers of sets described on this and following pages furnished upon receipt of 3-cent stamp: mention No. of article.



Left—Inside view showing neat arrangement of parts in the new Doerle. Right—Front view of the new 5-tube band-spread Doerle.

DOERLE Becomes a Five-Tuber

Here is the latest 5-tube Doerle which has just about every feature that any short-wave fan could desire.

● THIS 5-tube TRF receiver has just about everything that it is possible to incorporate in a receiver of its type. Some of these features are: constant band-spread tuning, ear-phone operation with provisions for shutting off the dynamic speaker, doublet antenna connections, etc. The set is completely contained in a neat crackle-finished metal cabinet; even the loudspeaker is mounted inside the cabinet. The circuit diagram which is shown in the drawing incorporates the latest circuit improvements together with the most popular of the newer type tubes.

The R.F. stage uses a 6D6 with a separate winding on the plug-in coil for trimming. The R.F. volume control is accomplished by varying the bias on the 6D6. This R.F. stage is inductively coupled to the detector, which is the pentode section of a 6F7. The triode section of the 6F7 is the first stage of audio and this is resistance-coupled to the 37, which functions as the intermediate audio amplifier. A 41 power pentode is used to drive the dynamic speaker. These three stages of audio amplification allow *full speaker volume* on nearly every station which comes within the range of the receiver. The audio amplifier is especially designed to give full speaker volume on relatively weak signals; loud signals, of course, have to be tuned down with the R.F. volume control.

It can be seen from the diagram that the circuit contains a great many by-pass condensers and isolating resistors. This is done for the sole purpose of making the receiver *quiet* in operation and really sensitive to the desired signal. Regeneration in the detector stage is controlled by variation of the screen-grid voltage. This control is rendered absolutely quiet and perfectly smooth with an unusually large by-pass condenser. The bandspread dial has a tuning ratio of approximately 100 to 1!

On tests the 49 meter band was spread over 90 degrees of the dial making it ideally suited to the short-wave fan who desires extremely easy tuning. The 40 meter amateur band, believe it or not, is spread over 360 degrees of the dial. Imagine the tuning ease when working in a congested band such as the 40 meter amateur band.

Short-wave hams and fans should find this receiver eminently satisfactory in their respective fields of endeavor.

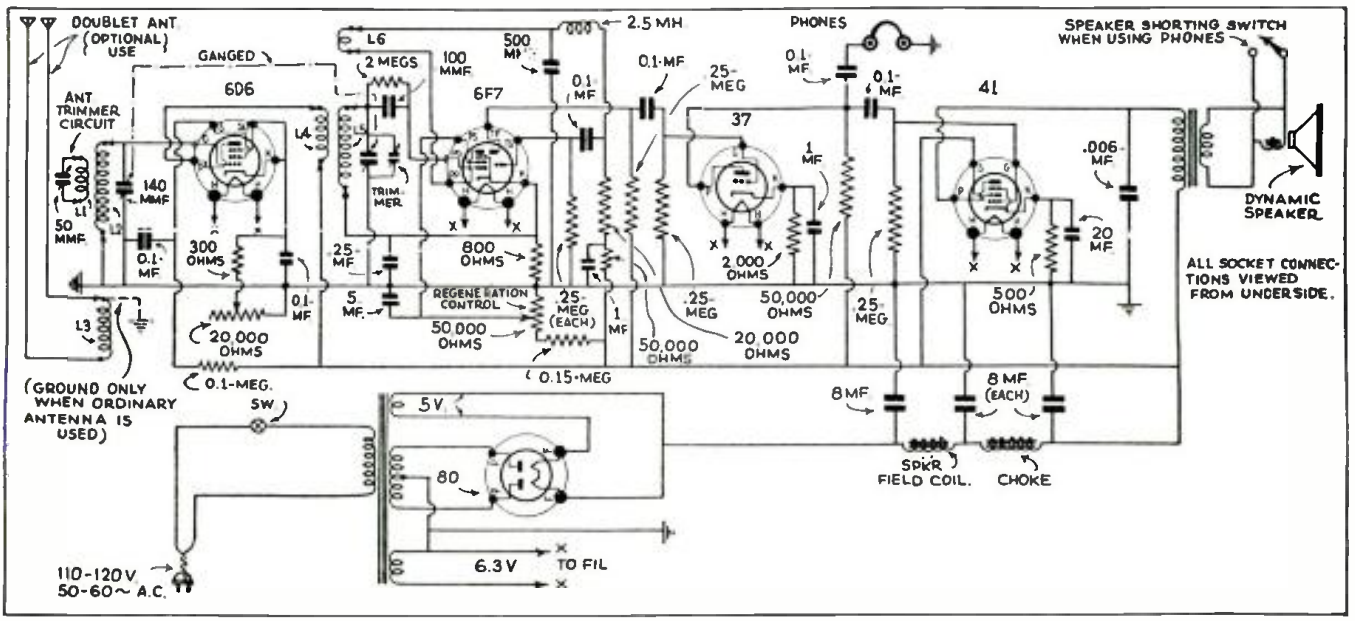
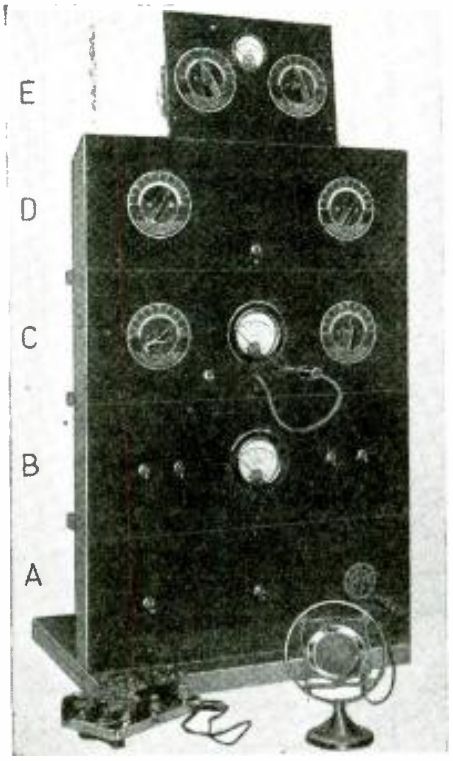


Diagram of the 5-tube Doerle, where 5 tubes actually do the work of 6. No. 276.

Names and addresses of manufacturers of sets described on this and following pages furnished upon receipt of 3 cent stamp; mention No. of article.

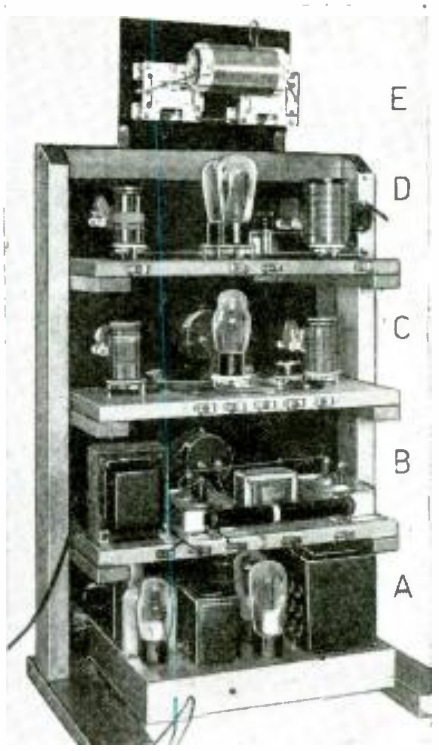


Front view of the complete low-power Xtal transmitter.

A Low-Power Rack-and-Panel Xmitter

By George W. Shuart, W2AMN

This is the final installment of the transmitter series. This transmitter provides an ideal low-power phone or CW outfit of which any Ham should be proud. It has an output of approximately 40 watts for CW work and 20 watts for phone. This installment describes the complete transmitter, including modulator and power supplies.



Rear view, showing how each unit slides into the frame.

● THIS is the third installment of the transmitter series. The past two articles described the oscillator unit using the "Lestet" circuit and the final amplifier using two 46's in parallel. This month we will describe the remainder of the complete "low-power phone" and CW transmitter. The photographs clearly show the layout of the various parts and little need be said of the layout.

The complete transmitter as can be seen is mounted on a wood rack or frame. The lower panel "A" is the modulator and its power supply. The next to the bottom is "B" the power supply for the radio-frequency portion of the transmitter and the third panel "C" the oscillator using the "Lestet" circuit. The fourth "D" the final amplifier with its 46's and above this is the antenna tuning network or "impedance network" as it is sometimes called. All panels are fastened to wood baseboards 16 x 7¾ inches and these slide into the place made for them in the wood frame. The modulator however has an aluminum chassis 11" wide, 16" long and 2" high. Complete details for building the wood frame can be obtained from the photograph. After the rack has been constructed as shown, it should be given a coat or two of orange shellac to improve its appearance and preserve the wood.

All joints are doweled and glued and the finished rack is very strong and will stand plenty of wear and tear. All saw-cuts should be made with a miter-box so that the finished rack will be straight. Otherwise it will look like the leaning tower of Pisa!

Current Consumption

The total current drawn by the radio-frequency part of the set is around 150 milliamperes. Therefore the parts of the power supply should be chosen accordingly. The high voltage transformer should deliver at least 600 volts at 150 or 175 mills (ma.) and with fairly good regulation. This transformer has two filament windings, one for the 83V, which requires 5

(Continued on page 44)

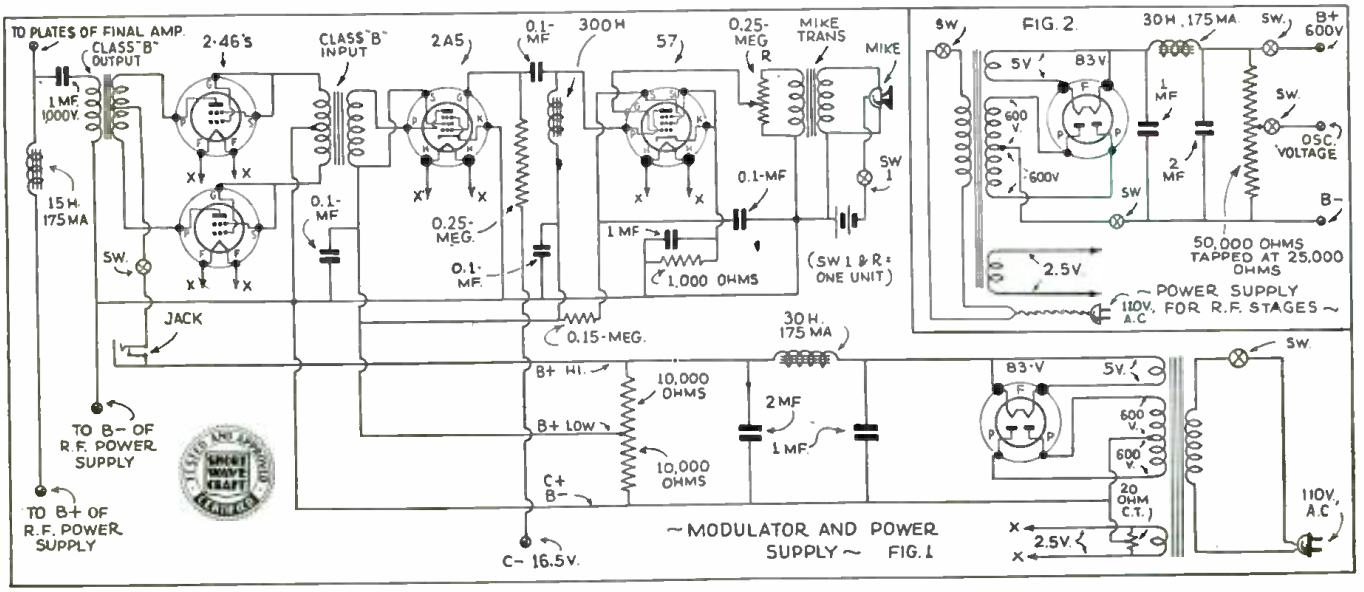


Diagram of power supplies and modulator for the low-power phone and CW transmitter.

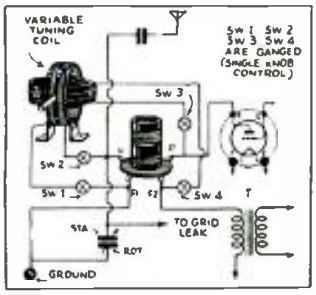
$5.00 FOR BEST SHORT-WAVE KINK

The Editor will award a five dollar prize each month for the best short-wave kink submitted by our readers. All other kinks accepted and published will be awarded eight months' subscription to SHORT WAVE CRAFT. Look over these "kinks" and they will give you some idea of what the editors are looking for. Send a typewritten or ink description, with sketch, of your favorite short-wave kink to the "Kink" Editor, SHORT WAVE CRAFT.

$5.00 Prize Winner Tuner for BC Band

Here is a description of the broadcast adapter which will permit the reception of stations operating on the regular broadcast band using a short-wave receiver.

To operate this instrument, remove the

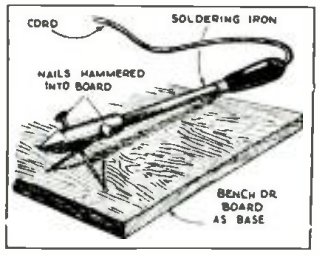


plug-in coil and connect the new long wave tuner. This can be done either with a 4-gang switch or the leads from the tuner can be connected to a tube base which will plug into the plug socket.—Alfred Kiszan.

▼ ▼ ▼

Handy Iron Stand

During a repair job I needed something to rest my hot iron on and hit upon the

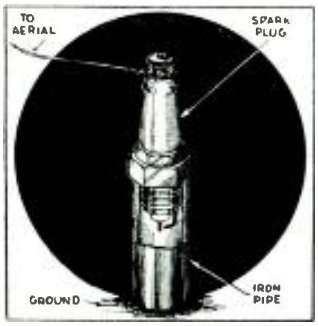


idea depicted above. It consists merely of two large nails driven in a board as shown in the drawing.—Edward Brown.

▼ ▼ ▼

Novel Lightning Arrester

Here is just one more use for discarded spark plugs. Procure an old spark plug, one whose insulation is not damaged, and clean it thoroughly by removing all carbon. Then obtain a length of iron pipe which can be either threaded or which has an in

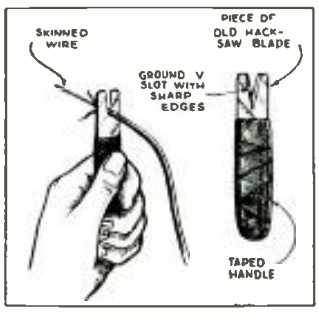


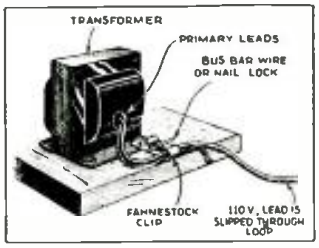
side diameter large enough to permit the insertion of a plug with sufficient tension to hold it firmly. The entire instrument should be driven into the ground as far as possible.—Burgess Brownson.

▼ ▼ ▼

Simple Wire Cleaner

Here is a simple kink which can be made from an old hacksaw blade or a steel knife. File a V-slot in one end with a three-cornered file, and tape the entire instrument all but the cutting end.—Chas. Wilde.





Cord Clip

During the course of experimenting I made a simple fastener which can be used to hold a line-cord securely and eliminate the danger of pulling it loose from its connections to the transformer. The drawing clearly shows how a Fahnestock clip can be used for this purpose. Screw down in the ordinary manner and use a small length of heavy wire or bus bar to prevent it from opening.—Henry Shry.

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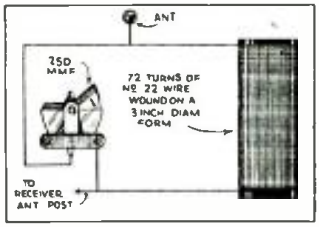

Wave Trap

Many short-wave fans who are experiencing trouble due to interference caused by local broadcast stations can use this simple method to overcome the difficulty.

This wave trap can be made from parts which usually can be found in the junk box. The coil consists of 72 turns of No. 22 insulated wire wound on a coil from 2 to 3 inches in diameter. The condenser should have a capacity of .00025 mf. The wave-trap should be connected in series with the aerial as shown in the diagram; then proceed to adjust the tuning condenser until the interference from the local station disappears.—George Forest.

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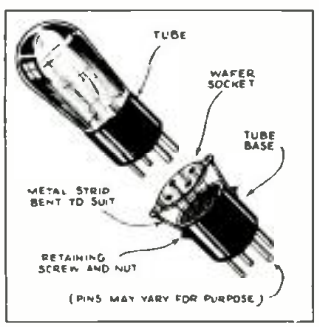


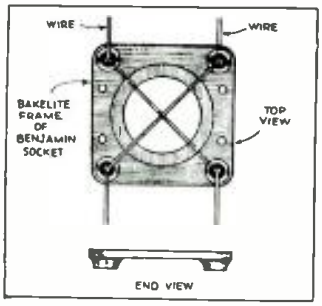
Adapter Plug

When building a short-wave adapter I was in need of an "adapter plug" and quickly constructed one from parts found around the "shack." The drawing clearly shows that a wafer socket is fastened to an old tube base and the necessary connections made between the terminals of the two units. Small metal brackets are used to hold the wafer firmly in place.

Try this kink when you are in need of an adapter.—J. H. Acevedo.

Transposition Block

This is my idea of a cheap, still effective transposition block. Many experimenters have a great assortment of old bakelite sockets and by removing the shell from the base a very effective transposition block can be made. Many of the older type sockets can be used in this manner and we should have no difficulty in finding them in the nearest junk box.—Frank Tapner.



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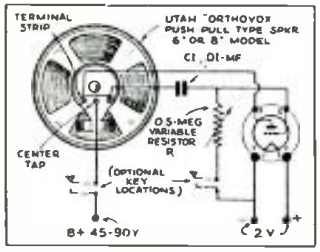
Loudspeaker Code Set

When in need of a loudspeaker code practice audio oscillator, I hit upon the following idea. The input transformer to the speaker being center-tapped provided the necessary center-tapped for the Hartley circuit. The .01 mf. tubular condenser was found to be the most effective and gave the most pleasing tones. Various pitches can be obtained by varying the resistor.—R. W. Bullers.



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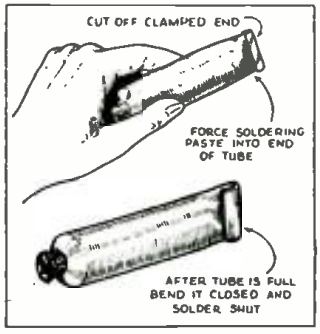
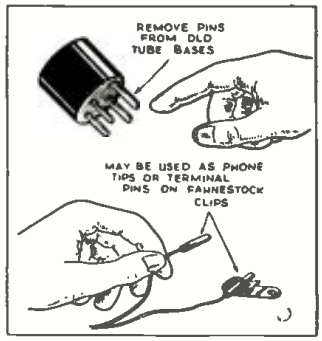
Flux Holder

In answer to your call for kinks I am sending you the following: A few years ago I hit upon the idea of using an old tooth-paste tube as a soldering flux container. Cut the hard rim off the bottom as shown in the drawing and clean the container thoroughly. Open it and fill with soldering flux.

After it has been filled, solder the bottom together again and the job is finished.—Francis Kemec.





Wire Tips from Old Tube Socket

I have been reading your "Kinks" in SHORT WAVE CRAFT for some time, and think them very useful. So I thought that I would send one of my own in to you.

I have been using this kink for some time and it has proved very useful. The prongs on old discarded tubes can be used when soldered to antenna, ground, and battery leads, to make a very handy and efficient mean of connecting to Fahnestock clips.

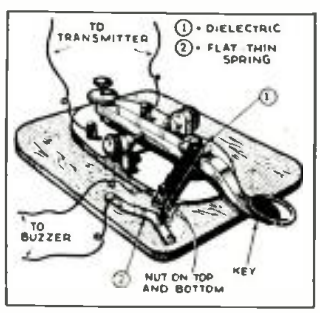
They can easily be removed by breaking the entire tube base. Once you get the knack of it, it will prove very successful in making a low resistance connection.—Louis Hartman.

▼ ▼ ▼

Nifty Keying System

If one desires to hear his own keying other than through monitor, while transmitting, the sketch illustrates how it may be done without any cost providing one has a buzzer and a couple of standard dry cells.

No. 1 is a small piece of any good dielectric about 2 inches long, ⅜ inch wide and ⅛ inch thick, drilled at both ends with holes of suitable size to fit the screw on the key lever which adjusts the spring



tension, and the screw one happens to have, for making contact to the spring.

No. 2 a small strip of spring steel bent as shown and fastened down at both ends. The bend permits of fine adjustment as the contact screw by swinging the dielectric strip backward or forward. Nuts should be placed above and below the dielectric strip on the contact bolt to hold it firmly in place. When the contact bolt or screw has been adjusted and the nuts tightened any further adjustment required may be made by simply moving the strip backward or forward.

This extremely simple kink works perfectly.—Harry Porter.

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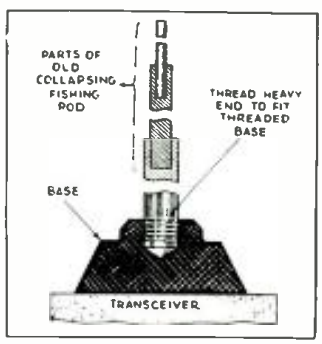


Fish-rod Antenna

Being in need of a collapsible and compact aerial for my portable set, I obtained an old fishing rod, one of those very small collapsing kind. Then I removed the paint, the ferrules, and the handle; then I had the large end threaded to fit a base which I mounted on my set. This made a very good aerial for my small "transceiver."

The diagram will explain more fully.—R. Tweedle.

Short Wave Stations of the World

Complete List of Broadcast, Police and Television Stations

We present herewith a revised list of the short-wave broadcasting, experimental and commercial radiophone stations of the world. This is arranged by frequency, but the wavelength figures are also given for the benefit of readers who are more accustomed to working with "meters."

All the stations in this list use telephone transmission of one kind or another and can therefore be identified by the average listener.

Herewith is also presented a very fine list of police as well as television stations. Note: Stations marked with a star ★ are the most active and easily heard stations and transmit at fairly regular times.

Please write to us about any new stations or other important data that you learn through announcements over the air or correspondence with the stations themselves. A post card will be sufficient. We will safely return to you any verifications that you send in to us. Communications of this kind are a big help.

Stations are classified as follows: C—Commercial phone. B—Broadcast service. X—Experimental transmissions.

Around-the-Clock Listening Guide

Although short wave reception is notorious for its irregularity and seeming inconsistency (wherein lies its greatest appeal to the sporting listener), it is a good idea to follow a general schedule as far as wavelength in relation to the time of the day is concerned. The observance of a few simple rules will save the short wave fan a lot of otherwise wasted time.

From daybreak till 4 p. m. and particularly during bright daylight, listen between 13 and 19 meters (21540 to 15800 kc.).

To the east of the listener, from about 2 p. m.-10 p. m., the 25-35 meter will be found very productive. To the west of the listener this same band is best from about 7 p.m. until shortly after daybreak. (After dark, results above 35 meters are usually much better than during daylight.) These general rules hold for any location.

Short-Wave Broadcasting, Experimental and Commercial Radiophone Stations

21540 kc. W8XK
-B- 13.93 meters
WESTINGHOUSE ELECTRIC
PITTSBURGH, PA.
7 a. m.-2 p. m.; relays KDKA

21420 kc. WKK
-C- 14.01 meters
A. T. & T. CO.
LAWRENCEVILLE, N. J.
Calls Argentina, Brazil and Peru, daytime

21060 kc. WKA
-C- 14.25 meters
LAWRENCEVILLE, N. J.
Calls England
noon

21020 kc. LSN6
-C- 14.27 meters
HURLINGHAM, ARG.
Calls N. Y. C.
8 a. m.-5 p. m.

20700 kc. LSY
-C- 14.49 meters
MONTE GRANDE
ARGENTINA
Tests irregularly

20380 kc. GAA
-C- 14.72 meters
RUGBY, ENGLAND
Calls Argentina, Brazil, mornings

19900 kc. LSG
-C- 15.08 meters
MONTE GRANDE,
ARGENTINA
Tests irregularly, daytime

19820 kc. WKN
-C- 15.14 meters
LAWRENCEVILLE, N. J.
Calls England, daytime

19650 kc. LSN5
-C- 15.27 meters
HURLINGHAM, ARGENTINA
Calls Europe, daytime

19600 kc. LSF
-C- 15.31 meters
MONTE GRANDE,
ARGENTINA
Tests irregularly, daytime

19380 kc. WOP
-C- 15.48 meters
OCEAN GATE, N. J.
Calls Peru, daytime

19355 kc. FTM
-C- 15.50 meters
ST. ASSISE, FRANCE
Calls Argentine, mornings

19220 kc. WKF
-C- 15.60 meters
LAWRENCEVILLE, N. J.
Calls England, daytime

19160 kc. GAP
-C- 15.66 meters
RUGBY, ENGLAND
Calls Australia, early a. m.

18970 kc. GAQ
-C- 15.81 meters
RUGBY, ENGLAND
Calls S. Africa, mornings

18830 kc. PLE
-C- 15.93 meters
BANDOENG, JAVA
Calls Holland, early a. m.

18620 kc. GAU
-C- 16.11 meters
RUGBY, ENGLAND
Calls N. Y., daytime

18345 kc. FZS
-C- 16.35 meters
SAIGON, INDO-CHINA
Phones Paris, early morning

18340 kc. WLA
-C- 16.36 meters
LAWRENCEVILLE, N. J.
Calls England, daytime

18310 kc. GAS
-C- 16.38 meters
RUGBY, ENGLAND
Calls N. Y., daytime

18250 kc. FTO
-C- 16.43 meters
ST. ASSISE, FRANCE
Calls S. America, daytime

18200 kc. GAW
-C- 16.48 meters
RUGBY, ENGLAND
Calls N. Y., daytime

18135 kc. PMC
-C- 16.54 meters
BANDOENG, JAVA
Phones Holland, early a. m.

18115 kc. LSY3
-C- 16.56 meters
MONTE GRANDE,
ARGENTINA
Tests irregularly

18040 kc. GAB
-C- 16.63 meters
RUGBY, ENGLAND
Calls Canada,
morn. & early aftn.

17810 kc. PCV
-C- 16.84 meters
KOOTWIJK, HOLLAND
Calls Java, 6-9 a. m.

17790 kc. GSG
-B- 16.86 meters
BRITISH BROAD. CORP.
DAVENTRY, ENGLAND
See
"When to Listen In" Column

17780 kc ★W3XAL
-B- 16.87 meters
NATIONAL BROAD. CO.
BOUND BROOK, N. J.
Relays WJZ, Daily exc. Sun.
9-10 a.m. Tues., Thurs., Sat.
3-4 p.m.

17760 kc. DJE
-B- 16.89 meters
BROADCASTING HOUSE
BERLIN, GERMANY
Irregular 8 a. m.-2 p. m.

17760 kc. IAC
-C- 16.89 meters
PIZA, ITALY
Calls ships, 6:30-7:30 a. m.

17310 kc. W3XL
-X- 17.33 meters
NATIONAL BROAD. CO.
BOUND BROOK, N. J.
Tests Irregularly

17120 kc. WOO
-C- 17.52 meters
A. T. & T. CO.,
OCEAN GATE, N. J.
Calls ships

17080 kc. GBC
-C- 17.56 meters
RUGBY, ENGLAND
Calls Ships

16270 kc. WLK
-C- 18.44 meters
LAWRENCEVILLE, N. J.
Phones
Arg., Braz., Peru, daytime

16270 kc. WOG
-C- 18.44 meters
OCEAN GATE, N. J.
Calls England,
morning and early afternoon

16233 kc. FZR3
-C- 18.48 meters
SAIGON, INDO-CHINA
Calls Paris and Pacific Isles

15880 kc. FTK
-C- 18.90 meters
ST. ASSISE, FRANCE
Phones Saigon, morning

15810 kc. LSL
-C- 18.98 meters
HURLINGHAM, ARGENTINA
Calls
Brazil and Europe, daytime

15760 kc. JYT
-X- 19.04 meters
KEMIKWA-CHO, CHIBA-KEN, JAPAN
Irregular in late afternoon and early morning

15660 kc. JVE
-C- 19.16 meters
NAZAKI, JAPAN
Phones Java 3-5 a.m.

15620 kc. JVF
-C- 19.2 meters
NAZAKI, JAPAN
Phones U.S., 5 a.m. & 8 p.m.

15415 kc. KWO
-C- 19.46 meters
DIXON, CAL.
Phones Hawaii 2-7 p.m.

15370 kc. HAS3
-X- 19.52 meters
BUDAPEST, HUNGARY
Broadcasts Sundays, 8-9 a.m.

15355 kc. KWU
-C- 19.53 meters
DIXON, CAL.
Phones Pacific Isles and Japan

15340 kc. DJR
-X- 19.56 meters
BROADCASTING HOUSE
BERLIN, GERMANY
Testing Irregularly

15330kc. ★W2XAD
-B- 19.56 meters
GENERAL ELECTRIC CO.
SCHENECTADY, N. Y.
Relays
WGY daily, 2:30-3:30 p. m.

15280 kc. DJQ
-B- 19.63 meters
BROADCASTING HOUSE
BERLIN, GERMANY
12:30-2 a. m.

15270 kc. ★W2XE
-B- 19.65 meters
ATLANTIC BROADCASTING CORP.
485 Madison Av., N.Y.C.
Relays
WABC daily, 11 a. m.-1 p. m.

15250 kc. W1XAL
-B- 19.67 meters
BOSTON, MASS.
Irregular, in morning

15243 kc. ★FYA
-B- 19.68 meters
"RADIO COLONIAL"
PARIS, FRANCE
Service de la Radiodiffusion
103 Rue de Grenelle, Paris
7:00-11 a.m.

15220 kc. ★PCJ
-X- 19.71 meters
N.V. PHILIPS' RADIO
EINDHOVEN, HOLLAND
Broadcasts relaying PHI
Sat. and Sun.

15210 kc. ★W8XK
-B- 19.72 meters
WESTINGHOUSE ELECTRIC & MFG. CO.
PITTSBURGH, PA.
7 a.m.-4:15 p.m.
Relays KDKA

15200 kc. DJB
-B- 19.73 meters
BROADCASTING HOUSE
BERLIN, GERMANY
12:30-2, 3:45-7:15 a.m.

15140 kc. ★GSF
-B- 19.82 meters
BRITISH BROAD. CORP.
DAVENTRY, ENGLAND
See
"When to Listen In" Column

15120 kc. HVJ
-B- 19.83 meters
VATICAN CITY
ROME, ITALY
5:00 to 5:15 a. m., except Sunday. Also Sat. 10-10:30 a. m.

15090 kc. RKI
-C- 19.88 meters
MOSCOW, U.S.S.R.
Phones Tashkent near 7 a.m. and relays RNE on Sundays
Irregularly

15055 kc. WNC
-C- 19.92 meters
HIALEAH, FLORIDA
Calls Central America, daytime

(All Schedules Eastern Standard Time)

14980 kc. KAY
-C- 20.03 meters
MANILA, P. I.
Phones Pacific Isles

14950 kc. HJB
-C- 20.07 meters
BOGOTA, COL.
Calls WNC, daytime

14590 kc. WMN
-C- 20.56 meters
LAWRENCEVILLE, N. J.
Phones England
morning and afternoon

14535 kc. HBJ
-B- 20.64 meters
RADIO NATIONS,
GENEVA, SWITZERLAND
Broadcasts irregularly

14500 kc. LSM2
-C- 20.69 meters
HURLINGHAM, ARGENTINA
Calls U. S., evening

14485 kc. TIR
-C- 20.71 meters
CARTAGO, COSTA RICA
Phones Cen. Amer. & U.S.A.
Daytime

14485 kc. HPF
-C- 20.71 meters
PANAMA CITY, PAN.
Phones WNC daytime

14485 kc. TGF
-C- 20.71 meters
GUATEMALA CITY, GUAT.
Phones WNC daytime

14485 kc. YNA
-C- 20.71 meters
MANAGUA, NICARAGUA
Phones WNC daytime

14470 kc. WMF
-C- 20.73 meters
LAWRENCEVILLE, N. J.
Phones England
morning and afternoon

14440 kc. GBW
-C- 20.78 meters
RUGBY, ENGLAND
Calls U.S.A., afternoon

13990 kc. GBA
-C- 21.44 meters
RUGBY, ENGLAND
Calls
Buenos Aires, late afternoon

13610 kc. JYK
-C- 22.04 meters
KEMIKAWA-CHO, CHIBA-KEN, JAPAN
Phones California till 11 p. m.

13585 kc. GBB
-C- 22.08 meters
RUGBY, ENGLAND
Calls
Egypt & Canada, afternoons

13420 kc. TIEP
-B- 22.35 meters
LA VOZ del TROPICO
APARTADO 257
SAN JOSE, COSTA RICA
Sun. 1-4 p.m.

13415 kc. GCJ
-C- 22.36 meters
RUGBY, ENGLAND
Calls Japan & China early morning

13390 kc. WMA
-C- 22.40 meters
LAWRENCEVILLE, N. J.
Phones England
morning and afternoon

13075 kc. VP1A
-X- 22.94 meters
SUVA, FIJI ISLANDS
Daily exc. Sat. and Sun.
12:30-1:30 a.m.

12840 kc. WOO
-C- 23.36 meters
OCEAN GATE, N. J.
Calls ships

12825 kc. CNR
-B, C- 23.39 meters
DIRECTOR GENERAL
Telegraph and Telephone Stations, Rabat, Morocco
Broadcasts, Sunday, 7:30-9 a. m.

12800 kc. IAC
-C- 23.45 meters
PIZA, ITALY
Calls Italian ships, mornings

12780 kc. GBC
-C- 23.47 meters
RUGBY, ENGLAND
Calls ships

12396 kc. CT1GO
-B- 24.2 meters
PAREDE, PORTUGAL
Sun. 10-11:30 a.m., Tues., Thur., Fri. 1:00-2:15 p.m.

12290 kc. GBU
-C- 24.41 meters
RUGBY, ENGLAND
Calls N.Y.C., afternoon

12150 kc. GBS
-C- 24.69 meters
RUGBY, ENGLAND
Calls N.Y.C., afternoon

12000 kc. ★RNE
-B- 25 meters
MOSCOW, U. S. S. R.
Sat. 10-11 p. m.
Sun. at 5, 8 and 10 a. m.
Also at 3 p.m.

11991 kc. FZS2
-C- 25.02 meters
SAIGON, INDO-CHINA
Phones Paris, morning

11950 kc. KKQ
-X- 25.10 meters
BOLINAS, CALIF.
Tests, irregularly, evenings

11940 kc. FTA
-C- 25.13 meters
STE. ASSISE, FRANCE
Phones CNR morning,
Hurlingham, Arge., nights

11875 kc. ★FYA
-B- 25.25 meters
"RADIO COLONIAL"
PARIS, FRANCE
11:15 a. m.-2:15 p. m., 3-6 p. m.

11870 kc. ★W8XK
-B- 25.26 meters
WESTINGHOUSE ELECTRIC & MFG. CO.
PITTSBURGH, PA.
4:20-11 p.m.
Fri. till 1 a.m. (Sat.)
Relays KDKA

11860 kc. ★GSE
-B- 25.29 meters
BRITISH BROAD. CORP.
DAVENTRY, ENGLAND
See
"When to Listen In" Column

11855 kc. DJP
-X- 25.31 meters
BROADCASTING HOUSE
BERLIN, GERMANY
Tests irregularly

11830 kc. ★W2XE
-B- 25.36 meters
ATLANTIC BROADCASTING CORP.
485 MADISON AVE., N. Y. C.
3-5 p. m. Relays WABC

11811 kc. I2RO
-B- 25.4 meters
E.I.A.R.
Via Montello 5
ROME, ITALY

11795 kc. DJO
-X- 25.43 meters
BROADCASTING HOUSE
BERLIN, GERMANY
Tests irregularly

11790 kc. W1XAL
-B- 25.45 meters
BOSTON, MASS.
Irregularly in the afternoon

11770 kc. DJD
-B- 25.49 meters
BROADCASTING HOUSE,
BERLIN, GERMANY
12-4:30 p.m.

11750 kc. ★GSD
-B- 25.53 meters
BRITISH BROAD. CORP.
DAVENTRY, ENGLAND
See
"When to Listen In" Column

11730 kc. ★PHI
-B- 25.57 meters
HUIZEN, HOLLAND
Daily ex. Tue. & Wed. 8:30-10 a.m.; Sat. till 11:30; Sun. till 11 a. m.

11720 kc. ★CJRX
-B- 25.6 meters
WINNIPEG, CANADA
Daily, 8 p. m.-12 m.
Sunday, 3-10:30 p. m.

11720 kc. FYA
-B- 25.6 meters
"RADIO COLONIAL"
PARIS, FRANCE
7-10 p. m.
11 p. m.-1 a. m.

11680 kc. KIO
-X- 25.68 meters
KAHUKU, HAWAII
Tests in the evening

10770 kc. GBP
-C- 27.85 meters
RUGBY, ENGLAND
Calls
Sydney, Austral. early a. m.

10740 kc. JVM
-C- 27.93 meters
NAZAKI, JAPAN
Phones California evenings

10675 kc. WNB
-C- 28.1 meters
LAWRENCEVILLE, N. J.
Calls Bermuda, daytime

10660 kc. JVN
-X- 28.14 meters
NAZAKI, JAPAN
Broadcasts
irregularly 2-7:45 a.m.

10550 kc. WOK
-C- 28.44 meters
LAWRENCEVILLE, N. J.
Phones
Arge., Braz., Peru, nights

10520 kc. VLK
-C- 28.51 meters
SYDNEY, AUSTRALIA
Calls Rugby, early a.m.

10430 kc. YBG
-C- 28.76 meters
MEDAN, SUMATRA
5:30-6:30 a. m., 7:30-8:30 p. m.

10420 kc. XGW
-C- 28.79 meters
SHANGHAI, CHINA
Calls Manila and England, 6-9 a. m. and California late evening

10410 kc. PDK
-C- 28.80 meters
KOOTWIJK, HOLLAND
Calls Java 7:30-9:40 a. m.

10410 kc. KES
-X- 28.80 meters
BOLINAS, CALIF.
Tests evenings

10350 kc. ★LSX
-C- 28.98 meters
MONTE GRANDE, ARGENTINA
Tests irregularly 8 p.m.-12 midnight.

10330 kc. ORK
-C- 29.04 meters
RUYSSELEDE, BELGIUM
Broadcasts 1:30-3 p.m.

10300 kc. LSL2
-C- 29.13 meters
HURLINGHAM, ARGENTINA
Calls Europe, evenings

10290 kc. DIQ
-X- 29.16 meters
KONIGSWUSTERHAUSEN, GERMANY
Broadcasts irregularly

10260 kc. PMN
-C- 29.24 meters
BANDOENG, JAVA
Calls Australia 5 a. m.

10250 kv. LSK3
-C- 29.27 meters
HURLINGHAM, ARGENTINA
Calls Europe and U. S., afternoon and evening

10220 kc. PSH
-C- 29.35 meters
RIO DE JANEIRO, BRAZIL

10055 kc. ZFB
-C- 29.84 meters
HAMILTON, BERMUDA
Phones N. Y. C. daytime

9950 kc. GCU
-C- 30.15 meters
RUGBY, ENGLAND
Calls N.Y.C. evening

9890 kc. LSN
-C- 30.33 meters
HURLINGHAM, ARGENTINA
Calls New York, evenings

9870 kc. WON
-C- 30.4 meters
LAWRENCEVILLE, N. J.
Phones England, evening

9860 kc. ★EAQ
-B- 30.43 meters
P. O. Box 951
MADRID, SPAIN
Daily except Saturday, 5:15-7 p. m.; Saturday, 1-3 p. m., 5:15-7:30 p. m.; Tues., Thurs. and Sun. 5:15-7:30 p. m.

9840 kc. JYS
-X- 30.49 meters
KEMIKAWA-CHO, CHIBA-KEN, JAPAN
Irregular, 4-7 a. m.

9800 kc. LSE
-C- 30.61 meters
MONTE GRANDE, ARGENTINA
Tests irregularly

9790 kc. GCW
-C- 30.64 meters
RUGBY, ENGLAND
Calls N.Y.C., evening

9780 kc. ★I2RO
-B- 30.67 meters
E.I.A.R.
ROME, ITALY
Daily 2:30-5 or 6 p.m.
M., W., F. 7:45-9:15 p. m.

9760 kc. VLJ-VLZ2
-C- 30.74 meters
AMALGAMATED WIRELESS OF AUSTRALIA
SYDNEY, AUSTRALIA
Phones Java and N. Zealand early a.m.

9750 kc. WOF
-C- 30.77 meters
LAWRENCEVILLE, N. J.
Phones England, evening

9710 kc. GCA
-C- 30.89 meters
RUGBY, ENGLAND
Calls Arge. & Brazil, evenings

9600 kc. ★CT1AA
-B- 31.25 meters
LISBON, PORTUGAL
Tues., Thurs., Sat. 4:30-7 p.m.

9595 kc. ★HBL
-B- 31.27 meters
LEAGUE OF NATIONS
GENEVA, SWITZERLAND
Saturdays, 5:30-6:15 p. m.

9590 kc. ★VK2ME
-B- 31.28 meters
AMALGAMATED WIRELESS, LTD., 47 YORK ST.
SYDNEY, AUSTRALIA
Sundays 1-3, 5-11 a. m.

9590 kc. HP5J
-B- 31.28 meters
J Street,
PANAMA CITY, PANAMA
Reported on daily 7:30-10 p.m.

9590 kc. W3XAU
-B- 31.28 meters
NEWTOWN SQUARE, PA.
Relays WCAU
12 noon-7:50 p.m.

9580 kc. ★ GSC
-B- 31.32 meters
BRITISH BROAD. CORP.
DAVENTRY, ENGLAND
See
"When to Listen In" Column

9580 kc. ★VK3LR
-B- 31.32 meters
Research Section,
Postmaster Gen'ls. Dept.,
61 Little Collins St.,
MELBOURNE, AUSTRALIA
3:15-7:30 a.m. except Sun.

9570 kc. ★W1XAZ
-B- 31.35 meters
WESTINGHOUSE ELECTRIC & MFG. CO.
SPRINGFIELD, MASS.
Relays WBZ, 7 a. m.-1 a. m.

9565 kc. VUB
-B- 31.36 meters
BOMBAY, INDIA
11 a. m.-12:30 p. m., Wed., Sat. and irregularly 7-9 a.m.

9560 kc. DJA
-B- 31.38 meters
BROADCASTING HOUSE,
BERLIN
8-11:30 a. m., 5:15-9:15 p. m.

9540 kc. DJN
-B- 31.45 meters
BROADCASTING HOUSE
BERLIN, GERMANY
3:45-7:15 a.m., 8-11:30 a.m., 5:15-10:45 p.m.

9540 kc. LKJ1
-B- 31.45 meters
JELOY, NORWAY
Relays Oslo 5-8 a. m.

9530 kc. ★W2XAF
-B- 31.48 meters
GENERAL ELECTRIC CO.
SCHENECTADY, N. Y.
Relays WGY 6:25-11 p.m.
Sundays, 6:25 p.m.-12:30 a.m.

9510 kc. ★GSB
-B- 31.55 meters
BRITISH BROAD. CORP.
DAVENTRY, ENGLAND
See
"When to Listen In" Column

9510 kc. ★VK3ME
-B- 31.55 meters
AMALGAMATED WIRELESS, Ltd.
G. P. O. Box 1272L,
MELBOURNE, AUSTRALIA
Wed., 5-6:30 a. m.; Saturday, 5:00-7:00 a. m.

9500 kc. ★PRF5
-B- 31.58 meters
RIO DE JANEIRO, BRAZIL
Daily
except Sun. 5:30-6:15 p. m.

9428 kc. ★COH
-B- 31.8 meters
2 B ST., VEDADO,
HAVANA, CUBA
10-11 a.m., 5-8, 8-9 p.m.
also 11 a.m.-12 N. Thurs.

9415 kc. PLV
-C- 31.87 meters
BANDOENG, JAVA
Phones Holland, 7:40-9:40 a. m.

9330 kc. CJA2
-C- 32.15 meters
DRUMMONDVILLE, CANADA
Phones England irregularly

9280 kc. GCB
-C- 32.33 meters
RUGBY, ENGLAND
Calls Can. & Egypt, evenings

9170 kc. WNA
-C- 32.72 meters
LAWRENCEVILLE, N. J.
Phones England, evening

9020 kc. GCS
-C- 33.26 meters
RUGBY, ENGLAND
Calls N.Y.C., evenings

8775 kc. PNI
-C- 34.19 meters
MAKASSER, CELEBES, D. E. I.
Phones Java around 4 a. m.

8760 kc. GCQ
-C- 34.25 meters
RUGBY, ENGLAND
Calls S. Africa, afternoon

8730 kc. GCI
-C- 34.36 meters
RUGBY, ENGLAND
Calls India, 8 a. m.

(All Schedules Eastern Standard Time)

8680 kc. GBC
-C- 34.56 meters
RUGBY, ENGLAND
Calls ships

8560 kc. WOO
-C- 35.05 meters
OCEAN GATE, N. J.
Calls ships irregular

8380 kc. IAC
-C- 35.8 meters
PIZA, ITALY

8185 kc. PSK
-C- 36.65 meters
RIO DE JANEIRO, BRAZIL
Irregularly

8036 kc. CNR
-B- 37.33 meters
RABAT, MOROCCO
Sunday, 2:30-5 p. m.

7901 kc. LSL
-C- 37.97 meters
HURLINGHAM, ARGENTINA
Calls Brazil, night

7880 kc. JYR
-B- 38.07 meters
KEMIKAWA-CHO, CHIBA-KEN, JAPAN
4-7:40 a. m.

7799 kc. ★HBP
-B- 38.47 meters
LEAGUE OF NATIONS, GENEVA, SWITZERLAND
5:30-6:15 p. m., Saturday

7400 kc. HJ3ABD
-B- 40.54 meters
P. O. Box 509
BOGOTA, COLOMBIA
Daily 12-2 p. m.; 7-11 p. m.
Sunday, 5-9 p. m.

7220 kc. HKE
-B- 41.55 meters
BOGOTA, COL., S. A.
Tue. and Sat. 8-9 p. m.; Mon. & Thurs. 6:30-7 p. m.

7140 kc. HJ4ABB
-B- 42.02 meters
MANIZALES, COL., S. A.
P. O. Box 175
Mon. to Fri. 12:15-1 p. m.; Tues. & Fri. 7:30-10 p. m.; Sun. 2:30-5 p. m.

6905 kc. GDS
-C- 43.45 meters
RUGBY, ENGLAND
Calls N.Y.C. evening

6860 kc. KEL
-X- 43.70 meters
BOLINAS, CALIF.
Tests irregularly

6800 kc. HIH
-B- 44.12 meters
SAN PEDRO de MACORIS
DOMINICAN REP.
4-7:30 p.m.

6755 kc. WOA
-C- 44.41 meters
LAWRENCEVILLE, N. J.
Phones England, evening

6750 kc. ★JVT
-X- 44.44 meters
NAZAKI, JAPAN
KOKUSAI-DENWA KAISHA, LTD., TOKIO
Broadcasts 2-7:45 a.m.

6666 kc. ★HC2RL
-B- 45.00 meters
P. O. BOX 759, GUAYAQUIL, ECUADOR, S. A.
Sunday, 5:45-7:45 p. m.
Tues., 9:15-11:15 p. m.

6660 kc. ★TIEP
-B- 45.05 meters
LA VOZ DEL TROPICO
SAN JOSE, COSTA RICA
APARTADO 257, Daily 7-10 p.m.

6650 kc. IAC
-C- 45.1 meters
PIZA, ITALY
Calls ships, evenings

6620 kc. ★PRADO
-B- 45.30 meters
RIOBAMBA, ECUADOR
Thur. 9-11:30 p. m.

6611 kc. RW72
-B- 45.38 meters
MOSCOW, U. S. S. R.
1-8 p. m.

6500 kc. HI4D
-B- 46.15 meters
SANTO DOMINGO, DOMINICAN REPUBLIC
Except Sun. 11:55 a.m.-1:40 p.m.; 4:40-7:40 p.m.

6490 kc. HJ5ABD
-B- 46.22 meters
MANIZALES, COL.
12-1:30 p. m., 7-10 p. m.

6447 kc. HJ1ABB
-B- 46.53 meters
BARRANQUILLA, COL., S. A.
P. O. BOX 715.
11:30 a. m.-1 p. m.; 5-10 p. m.

6425 kc. W3XL
-X- 46.70 meters
NATIONAL BROADCASTING CO.
BOUND BROOK, N. J.
Tests irregularly

6375 kc. YV4RC
-B- 47.06 meters
CARACAS VENEZUELA
4:30-10:30 p.m.

6316 kc. HIZ
-B- 47.5 meters
SANTO DOMINGO
DOMINICAN REPUBLIC
Daily except Sat. and Sun. 4:40-5:40 p. m.; Sat., 9:40-11:40 p. m.; Sun., 11:40 a. m.-1:40 p. m.

6272 kc. HI1A
-B- 47.84 meters
P. O. BOX 423, SANTIAGO, DOMINICAN REP.
11:40 a. m.-1:40 p. m.
7:40-9:40 p. m.

6250 kc. OAX4B
-B- 48 meters
Apartado 1242
LIMA, PERU
Wed. & Sun. 7-9 p.m.

6198 kc. CT1GO
-B- 48.4 meters
Portuguese Radio Club.
PAREDE, PORTUGAL
Sun. 11:30 a.m.-1 p.m.
Daily exc. Tues. 7:20-8:30 p.m.

6175 kc. HJ2ABA
-B- 48.58 meters
TUNJA, COLOMBIA
1-2; 7:30-9:30 p.m.

6160 kc. ★YV3RC
-B- 48.7 meters
CARACAS, VENEZUELA
Generally 4:00-10:00 p. m.

6150 kc. ★CJRO
-B- 48.78 meters
WINNIPEG, MAN., CANADA
8 p. m.-12 m.
Sun. 3-10:30 p. m.

6140 kc. ★W8XK
-B- 48.86 meters
WESTINGHOUSE ELECTRIC & MFG. CO.
PITTSBURGH, PA.
Relays KDKA
4:30 p. m.-1 a. m.

6130 kc. ZGE
-B- 48.92 meters
KUALA LUMPUR, FED. MALAY STATES
Sun., Tue., and Fri., 6:40-8:40 a. m.

6128 kc. LKJ1
-B- 48.94 meters
JELOY, NORWAY
Relays Oslo. 10 a.m.-6 p.m.

6122 kc. JB
-B- 49 meters
JOHANNESBURG, SOUTH AFRICA
Daily except Sat. and Sun., 11:45 p. m.-12:30 a. m.. 4-7 a. m., 9 a. m.-3:30 p. m.
Sat., only, 4-7 a. m., 9 a. m.-4:45 p. m.
Sun., only, 11:45 p. m.-12:30 a. m., 8-10:30 a. m., and 12:30-3 p. m.

6120 kc. ★YDA
-B- 49.02 meters
N.I.R.O.M.
BANDOENG, JAVA
10:40 p.m.-1:40 a.m., 5-9:40 a.m.

6120 kc. ★W2XE
-B- 49.02 meters
ATLANTIC BROADCASTING CORP.
485 MADISON AVE., N. Y. C.
Relays WABC, 6-11 p. m.

6115 kc. HJ1ABE
-B- 49.05 meters
CARTAGENA, COL.
P. O. Box 31
Daily 11:15 a. m.-1 p. m.; Sun. 9-11 a. m.; Mon. at 10 p. m. Wed. 8-10 p. m.

6112 kc. YV2RC
-B- 49.08 meters
CARACAS, VENEZUELA
Sun. 1:30-10:30 p. m., Daily except Sun. 11 a. m.-1:30 p. m.; Mon., Thurs., Sat. 4:45-10 p.m.; Tues., Wed., Fri. 4:45-9:30 p.m.

6110 kc. ★GSL
-B- 49.10 meters
British Broadcasting Corp.
Daventry, England
See "When To Listen In"

6110 kc. VUC
-B- 49.1 meters
CALCUTTA, INDIA
Daily except Sat., 3-5:30 a. m., 9:30 a. m.-noon; Sat., 11:45 a. m.-3 p. m.

6100 kc. HJ1ABD
-B- 49.18 meters
CARTAGENA, COL.
Sun. 11:30 a.m.-1 p.m.; Daily 7:30-9 p.m.

6100 kc. ★W3XAL
-B- 49.18 meters
NATIONAL BROADCASTING CO.
BOUND BROOK, N. J.
Relays WJZ
Monday, Wednesday, Saturday, 5-6 p.m. Sat. also 12 m.-1 a.m. (Sun.)

6100 kc. ★W9XF
-B- 49.18 meters
DOWNERS GROVE, ILL.
Relays WENR, Chicago
Daily except Mon, Wed. & Sat., 2:30 p. m.-2 a. m.
Mon., Wed. 2:30-5, 6 p.m.-2 a.m. Sat. 2:30-5, 6 p.m.-12 m.

6090 kc. ★VE9GW
-B- 49.28 meters
BOWMANVILLE, ONTARIO, CANADA
Sun. 1-9 p. m.
Mon.-Wed., 3 p. m.-12 m.
Thurs.-Sat., 7 a. m.-12 m.

6090 kc. VE9BJ
-B- 49.26 meters
SAINT JOHN, N. B., CAN.
7-8:30 p. m.

6085 kc. ★I2RO
-B- 49.3 meters
E.I.A.R.
Via Montello 5.
ROME, ITALY
Mon., Wed., Fri., 6-7:30 p. m.

6080 kc. CP5
-B- 49.34 meters
LAPAZ, BOLIVIA
7-10:30 p. m.

6080 kc. W9XAA
-B- 49.34 meters
CHICAGO FEDERATION OF LABOR
CHICAGO, ILL.
Relays WCFL
Sunday 11:30 a. m.-9 p. m. and Tues., Thurs., Sat., 4 p. m.-12 m.

6079 kc. DJM
-X- 49.35 meters
BROADCASTING HOUSE
BERLIN, GERMANY
Tests irregularly

6072 kc. OER2
-B- 49.41 meters
VIENNA, AUSTRIA
9 a. m.-5 p. m. daily

6070 kc. VE9CS
-B- 49.42 meters
VANCOUVER, B. C., CANADA
Sun. 1:45-9 p. m., 10:30 p. m.-1 a. m.; Tues. 6-7:30 p. m., 11:30 p. m.-1:30 a. m. Daily 6-7:30 p. m.

6060 kc. OXY
-B- 49.50 meters
SKAMLEBOAEK, DENMARK
1-6:30 p. m.; also 11 a. m.-12 n. Sunday

6060 kc. ★W8XAL
-B- 49.50 meters
CROSLEY RADIO CORP.
CINCINNATI, OHIO
7:30 a. m.-8 p. m.; 11 p. m.-1 a. m.
Relays WLW

6060 kc. VQ7LO
-B- 49.50 meters
NAIROBI, KENYA, AFRICA
Mon., Wed., Fri., 5:45-8:15 a. m., 11 a. m.-2 p. m.
Tues., 3-4 a. m., 11 a. m.-2 p. m., Thurs., 8-9 a. m., 11 a. m.-2 p. m., Sat., 11 a. m.-3 p. m., Sun., 10:50 a. m.-2 p. m.

6060 kc. W3XAU
-B- 49.50 meters
NEWTOWN SQUARE, PA.
Relays WCAU, Philadelphia
8 p. m.-11 p. m.

6050 kc. ★GSA
-B- 49.59 meters
BRITISH BROADCAST. CORP.
DAVENTRY, ENGLAND
See "When To Listen In" Col.

6040 kc. ★W1XAL
-B- 49.67 meters
BOSTON, MASS.
Tues., Thurs. 7:30-9 p.m.
Sun. 5-7 p.m.

6030 kc. ★HP5B
-B- 49.75 meters
P. O. BOX 910
PANAMA CITY, PAN.
12 N.-1 p.m., 8-10:30 p.m.

6030 kc. ★YV6RV
-B- 49.75 meters
VALENCIA, VENEZUELA
Heard every night 6-8 p.m.

6020 kc. ★DJC
-B- 49.83 meters
BROADCASTING HOUSE, BERLIN
12 N.-4:30 p.m., 5:30-10:30 p. m.

6012 kc. ZHI
-B- 49.9 meters
RADIO SERVICE CO., 20 ORCHARD RD., SINGAPORE, MALAYA
Mon., Wed., Thurs., 5:40-8:10 a. m.; Sat., 12:10-1:10 a. m., 10:40 p. m.-1:10 a. m. (Sunday)

6010 kc. ★COC
-B- 49.92 meters
P.O. BOX 98
HAVANA, CUBA
Daily 9:30-11 a.m., 4-7 p.m.
Sat. also at 11:30 p.m.

6005 kc. ★ VE9DN
-B- 49.96 meters
MONTREAL, CAN.,
Saturday 11:30 p.m.-12:30 a.m.

6000 kc. RW59
-B- 50 meters
MOSCOW, U. S. S. R.
Daily 3-6 p.m.

5980 kc. HIX
-B- 50.17 meters
SANTO DOMINGO, DOMINICAN REP.
Tues. and Fri. at 8:10 p.m.

5968 kc. HVJ
-B- 50.27 meters
VATICAN CITY (ROME)
2-2:15 p. m., daily. Sun., 5-5:30 a. m.

5965 kc. ★XEBT
-B- 50.29 meters
MEXICO CITY, MEX.
P. O. Box 79-44
7 p. m.-1 a. m.

5940 kc. TGX
-B- 50.5 meters
SR. M. NOVALES.
GUATEMALA CITY, GUAT.
Daily except Sun., 6-10 a.m., 1-2:30 p.m., 8 p.m.-12m.

5930 kc. HJ4ABE
-B- 50.6 meters
MEDELLIN, COLOMBIA
Mon., 7-11 p. m.; Tues., Thurs., Sat., 6:30-8:00 p. m.; Wed. and Fri., 7:30-11:00 p. m.

5890 kc. HJ2ABC
-B- 50.97 meters
CUCUTA, COL.
11 a. m.-12 n.; 6-9 p. m.

5853 kc. WOB
-C- 51.26 meters
LAWRENCEVILLE, N. J.
Calls Bermuda, nights

5850 kc. ★YV5RMO
-B- 51.28 meters
MARACAIBO, VENEZUELA
5:15-9 p. m.

5790 kc. JVU
-X- 51.81 meters
NAZAKI, JAPAN
Broadcasts 2-7:45 a.m.

5780 kc. OAX4D
-B- 51.9 meters
P.O. Box 853
LIMA, PERU
Mon., Wed. & Sat. 9-11:30 p.m.

5714 kc. HCK
-B- 52.5 meters
QUITO, ECUADOR, S. A.

5660 kc. HJ5ABC
-B- 53 meters
CALI, COLOMBIA
11 a. m.-12 N.
Tues. and Thurs. 8-10 p. m.
Sun. 12 N.-1 p. m.

5400 kc. HAT
-X- 55.56 meters
Royal Hungarian Post, Gyali,ut 22.
BUDAPEST, HUNGARY
Broadcasts Sun. 8-9 p.m.

5077 kc. WCN
-C- 59.08 meters
LAWRENCEVILLE, N. J.
Phones England irregularly

5025 kc. ZFA
-C- 59.7 meters
HAMILTON, BERMUDA
Calls U.S.A., nights

4975 kc. GBC
-C- 60.30 meters
RUGBY, ENGLAND
Calls Ships, late at night

4820 kc. GDW
-C- 62.24 meters
RUGBY, ENGLAND
Calls N.Y.C., late at night

4752 kc. WOO
-C- 63.1 meters
OCEAN GATE, N. J.
Calls ships irregularly

4600 kc. HC2ET
-B- 65.22 meters
Apartado 249
GUAYAQUIL, ECUADOR
Reported Wed., Sat. 9-11:30 p.m.

4320 kc. GDB
-C- 69.44 meters
RUGBY, ENGLAND
Tests, 8-11 p. m.

4273 kc. RW15
-B- 70.20 meters
KHABAROVSK, SIBERIA, U. S. S. R.
Daily, 3-9 a. m.

4272 kc. WOO
-C- 70.22 meters
OCEAN GATE, N. J.
Calls ships irregularly

4107 kc. HCJB
-B- 73 meters
QUITO, ECUADOR
7:14-10:15 p. m., except Monday

4098 kc. WND
-C- 73.21 meters
HIALEAH, FLORIDA
Calls Bahama Isles

3600 kc. CT2AJ
-B- 83.5 meters
PONTA DELGADA, SAO MIGUEL, AZORES
Wed. and Sat. 5-7 p. m.

3543 kc. CR7AA
-B- 84.67 meters
P. O. BOX 594
LOURENCO MARQUES, MOZAMBIQUE, E. AFRICA
1:30-3:30 p.m., Mon., Thurs., and Sat.

3490 kc. PK1WK
-B- 85.96 meters
BANDOENG, JAVA
Daily except Fri., 4:30-5:30 a. m.

(All Schedules Eastern Standard Time)

Television Stations

2000-2100 kc.

W2XDR—Long Island City, N.Y.
W8XAN—Jackson, Mich.
W9XK—Iowa City, Ia.
W9XAK—Manhattan, Kansas.
W9XAO—Chicago, Ill.
W6XAH—Bakersfield, Calif.

2750-2850 kc.

W3XAK—Portable
W9XAP—Chicago, Ill.
W2XBS—Bellmore, N.Y.
W9XAL—Kansas City, Mo.
W9XG—W. Lafayette, Ind.
W2XAB—New York, N.Y.

42000-56000, 60000-86000 kc.

W2XAX—New York, N.Y.
W6XAO—Los Angeles. Calif.
W9XD—Milwauke, Wis.
W2XBT—Portable
W2XF—New York. N.Y.
W3XE—Philadelphia, Pa.
W3XAD—Camden, N. J.
W10XX—Portable & Mobile (Vicinity of Camden)
W2XDR—Long Island City, N.Y.
W8XAN—Jackson, Mich.
W9XAT—Portable
W2XD—New York, N.Y.
W2XAG—Portable
W1XG—Boston, Mass.
W9XK—Iowa City, Ia.

Police Radio Alarm Stations

CGZ	Vancouver, B.C.	2452 kc.
CJW	St. Johns, N.B.	2416 kc.
CJZ	Verdeen, Que.	2452 kc.
KGHG	Las Vegas, Nev.	2474 kc.
KGHK	Palo Alto, Cal.	1674 kc.
KGHM	Reno, Nev.	2474 kc.
KGHO	Des Moines, Iowa	1682 kc.
KGHX	Santa Ana, Cal.	2430 kc.
KGHY	Whittier, Cal.	1712 kc.
KGHZ	Little Rock, Ark.	2406 kc.
KGJX	Pasadena, Cal.	1712 kc.
KGLX	Albuquerque, N.M.	2414 kc.
KGOZ	Cedar Rapids, Iowa	2466 kc.
KGPA	Seattle, Wash.	2414 kc.
KGPC	St. Louis, Mo.	1706 kc.
KGPD	San Francisco, Cal.	2466 kc.
KGPE	Kansas City, Mo.	2422 kc.
KGPG	Vallejo, Cal.	2422 kc.
KGPH	Oklahoma City, Okla.	2450 kc.
KGPI	Omaha, Neb.	2466 kc.
KGPJ	Beaumont, Tex.	1712 kc.
KGPK	Sioux City, Iowa	2466 kc.
KGPL	Los Angeles, Cal.	1712 kc.
KGPM	San Jose, Cal.	2466 kc.
KGPN	Davenport, Iowa	2466 kc.
KGPO	Tulsa, Okla.	2450 kc.
KGPP	Portland, Ore.	2442 kc.
KGPQ	Honolulu, T.H.	2450 kc.
KGPR	Minneapolis, Minn.	2430 kc.
KGPS	Bakersfield, Cal.	2414 kc.
KGPW	Salt Lake City, Utah	2406 kc.
KGPX	Denver, Colo.	2442 kc.
KGPY	Baton Rouge, La.	1574 kc.
KGPZ	Wichita, Kans.	2450 kc.
KGZA	Fresno, Calif.	2414 kc.
KGZB	Houston, Tex.	1712 kc.
KGZC	Topeka, Kans.	2422 kc.
KGZD	San Diego, Cal.	2490 kc.
KGZE	San Antonio, Tex.	2482 kc.
KGZF	Chanute Kans.	2450 kc.
KGZG	Des Moines, Iowa	2466 kc.
KGZH	Klamath Falls, Ore.	2382 kc.
KGZI	Wichita Falls, Tex.	2458 kc.
KGZJ	Phoenix, Ariz.	2430 kc.
KGZL	Shreveport, La.	1712 kc.
KGZM	El Paso, Tex.	2414 kc.
KGZN	Tacoma, Wash.	2414 kc.
KGZO	Santa Barbara, Cal.	2414 kc.
KGZP	Coffeyville, Kans.	2450 kc.
KGZQ	Waco, Tex.	1712 kc.
KGZR	Salem, Ore.	2442 kc.
KGZS	McAlester, Okla.	2458 kc.
KGZT	Santa Cruz, Cal.	1674 kc.
KGZU	Lincoln, Neb.	2490 kc.
KGZW	Lubbock, Tex.	2458 kc.
KGZX	Albuquerque. N.Mex.	2414 kc.
KGZY	San Bernardino, Cal.	1712 kc.
KMFE	Duluth, Minn.	2382 kc.
KNFO	Storm Lake, Ia.	1682 kc.
KNSM	Compton, Cal.	2466 kc.
KSNE	Duluth, Minn.	2382 kc.
KSW	Berkeley, Cal.	1658 kc.
KVP	Dallas, Tex.	1712 kc.
VYR	Montreal, Can.	1712 kc.
VYW	Winnipeg, Man.	2452 kc.
WCK	Belle Island, Mich.	2414 kc.
WEY	Boston, Mass.	1558 kc.
WKDT	Detroit, Mich.	1558 kc.
WKDU	Cincinnati, Ohio	1706 kc.
WMDZ	Indianapolis, Ind.	2442 kc.
WMFP	Niagara Falls, N. Y.	2422 kc.
WMJ	Buffalo, N.Y.	2422 kc.
WMO	Highland Park, Mich.	2414 kc.
WMP	Framingham, Mass.	1666 kc.
WPDA	Tulare, Cal.	2414 kc.
WPDB	Chicago, Ill.	1712 kc.
WPDC	Chicago, Ill.	1712 kc.
WPDD	Chicago, Ill.	1712 kc.
WPDE	Louisville, Ky.	2442 kc.
WPDF	Flint, Mich.	2466 kc.
WPDG	Youngstown, Ohio	2458 kc.
WPDH	Richmond, Ind.	2442 kc.
WPDI	Columbus. Ohio	2430 kc.
WPDK	Milwaukee, Wis.	2450 kc.
WPDL	Lansing, Mich.	2442 kc.
WPDM	Dayton, Ohio	2430 kc.
WPDN	Auburn, N.Y.	2382 kc.
WPDO	Akron, Ohio	2458 kc.
WPDP	Philadelphia, Pa.	2474 kc.
WPDR	Rochester, N.Y.	2382 kc.
WPDS	St. Paul, Minn.	2430 kc.
WPDT	Kokomo, Ind.	2490 kc.
WPDU	Pittsburgh, Pa.	1712 kc.
WPDV	Charlotte, N.C.	2458 kc.
WPDW	Washington, D.C.	2422 kc.
WPDX	Detroit, Mich.	2414 kc.
WPDY	Atlanta, Ga.	2414 kc.
WPDZ	Fort Wayne Ind.	2490 kc.
WPEA	Syracuse, N.Y.	2382 kc.
WPEB	Grand Rapids, Mich.	2442 kc.
WPEC	Memphis, Tenn.	2466 kc.
WPED	Arlington, Mass.	1712 kc.
WPEE	New York, N.Y.	2450 kc.
WPEF	New York, N.Y.	2450 kc.
WPEG	New York, N.Y.	2450 kc.
WPEH	Somerville, Mass.	1712 kc.
WPEI	E. Providence, R.I.	1712 kc.
WPEK	New Orleans, La.	2430 kc.
WPEL	W. Bridgewater, Mass.	1666 kc.
WPEM	Woonsocket. R.I.	2466 kc.
WPEP	Kenosha, Wis.	2450 kc.
WPES	Saginaw, Mich.	2442 kc.
WPET	Lexington, Ky.	1706 kc.
WPEW	Northampton, Mass.	1666 kc.
WPFA	Newton, Mass.	1712 kc.
WPFC	Muskegon, Mich.	2442 kc.
WPFE	Reading, Pa.	2442 kc.
WPFG	Jacksonville, Fla.	2442 kc.
WPFH	Baltimore, Md.	2414 kc.
WPFI	Columbus, Ga.	2414 kc.
WPFJ	Hammond, Ind.	1712 kc.
WPFK	Hackensack, N.J.	2430 kc.
WPFL	Gary, Ind.	2470 kc.
WPFM	Birmingham, Ala.	2382 kc.
WPFN	Fairhaven, Mass.	1712 kc.
WPFO	Knoxville, Ten.	2474 kc.
WPFP	Clarksburg, W. Va.	2490 kc.
WPFQ	Swathmore, Pa.	2474 kc.
WPFR	Johnson City, Tenn.	2470 kc.
WPFS	Asheville, N.C.	2474 kc.
WPFU	Portland, Me.	2422 kc.
WPFV	Pawtucket, R.I.	2466 kc.
WPFW	Bridgeport, Conn.	2474 kc.
WPFX	Palm Beach, Fla.	2442 kc.
WPFY	Yonkers, N. Y.	2442 kc.
WPFZ	Miami, Fla.	2442 kc.
WPGA	Bay City, Mich.	2466 kc.
WPGB	Port Huron, Mich.	2466 kc.
WPGC	S. Schenectady, N.Y.	1658 kc.
WPGD	Rockford, Ill.	2458 kc.
WPGF	Providence, R.I.	1712 kc.
WPGG	Findlay, Ohio	1596 kc.
WPGH	Albany, N.Y.	2414 kc.
WPGI	Portsmouth, Ohio	2430 kc.
WPGJ	Utica, N.Y.	2414 kc.
WPGK	Cranston. R.I.	2466 kc.
WPGL	Binghamton, N.Y.	2442 kc.
WPGN	South Bend, Ind.	2490 kc.
WPGO	Huntington, N.Y.	2490 kc.
WPGQ	Columbus, Ohio	1596 kc.
WPGS	Mineola, N.Y.	2490 kc.
WPGT	New Castle, Pa.	2470 kc.
WPGU	Boston, Mass.	1712 kc.
WPGW	Mobile, Ala.	2382 kc.
WPGX	Worcester, Mass.	2466 kc.
WPHC	Massillon, O.	1682 kc.
WPHD	Steubenville, O.	2458 kc.
WPHF	Richmond, Va.	2450 kc.
WPHI	Charleston, W. Va.	2490 kc.
WPHK	Wilmington, O.	1596 kc.
WRBH	Cleveland, Ohio	2458 kc.
WRDQ	Toledo, Ohio	2474 kc.
WRDR	GrossePt.Village, Mich.	2414 kc.
WRDS	E. Lansing, Mich.	1666 kc.

When to Listen In

By M. Harvey Gernsback

Daventry

● THIS station has been testing with an additional transmission during the past month. It is known as transmission 6. It is intended especially for listeners in the Pacific coast area and especially Western Canada. The time of transmission has been from 9:30-10:30 p.m., several days a week. However, it is likely that the transmission will be placed on a daily basis and extended to 2 hours or possibly combined with transmission 5. Transmission took place on GSL, 6110 kc. and GSC, 9580 kc. GSL may be replaced by one of the 25-meter waves, either GSD or GSE. The other transmissions for April follow: Trans. 1, 1:15-3:15 a.m. till Apr. 14 (12:15-2:15 a.m. after Apr. 14) on GSB and GSD. * * Trans. 2, 6-9 a.m. (Sun. 7:30-9 a.m.) on GSF and GSE. GSG will probably replace GSE for the first hour and a half or for the whole period some time in April. * * Trans. 3, 9:15-10:45 a.m. on GSE and either GSB or GSF; 10:45 a.m.-12:45 p.m. on GSE and GSB. * * Trans. 4, 1-4 p.m. on GSD and GSB; 4-5:45 p.m. on GSB and either GSC or GSD. * * Trans. 5, 6-7 p.m., on GSD and GSC; 7-8 p.m. on GSC and either GSD or GSA. On Apr. 21, Daylight Saving Time goes into effect in England and several other European countries. The Daventry schedules will probably undergo some alteration at that time.

Rome

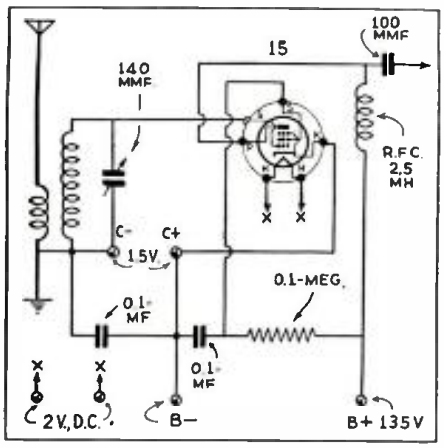
2RO, or I2RO as it is properly called, although it announces itself as "2RO," still broadcasts the American hour on Mondays, Wednesdays, and Fridays from 6-7:30 p.m. It has been taking place on 6085 kc. but will probably be shifted to the 31-meter band in April. 9780 kc. (the frequency used in the daily broadcasts from 2:30-5 or 6 p.m.) will probably be employed for the American hour when the change is made. A program in Spanish for South America is broadcast on 9780 kc. on Mondays, Wednesdays, and Fridays from 7:45-9:15 p.m.

W9XF

W9XF in Chicago on 6100 kc. now announces in about six different languages

(*Continued on page* 63)

• • • Short Wave



Type 15 as T.R.F. Stage

T.R.F. STAGE

Raymond H. Johnson, Dixon, Nebr.

(Q) I would like to see printed in the QUESTION BOX a hook-up for type 15 tubes in a tuned R.F. stage using 4-prong coils. This is to be used with a regenerative receiver.

(A) We are printing your diagram of a type 15 as a tuned R.F. amplifier which can be added to any short-wave receiver. This particular tube is excellently suited for the purpose.

operation, and eliminate the drain of the potentiometer across the first 22½ volt section. This switch is part of the regeneration control, being the standard potentiometer and switch combination. These switches are usually used to break 110 volt lines to A.C. receivers.

3-TUBE A.C.-D.C. RECEIVER

Walter Joyce, Albuquerque, N. Mex.

(Q) Would greatly appreciate it if you would publish a diagram of a 2- or 3-tube receiver using a 6F7, a 76 and a 25Z5. I want to use the set with a 300 ohm line-cord resistor.

(A) We take pleasure in printing your diagram, Walter, although you will have to use a 250 ohm line-cord voltage dropping resistor, if your line voltage is in the vicinity of 110 volts. The 6F7 is used as a regenerative screen-grid detector and triode audio amplifier. Regeneration is controlled by varying the screen-grid voltage of the pentode section. When using the 6F7 in this manner, the grid return of the pentode section is connected directly to the cathode; while the grid return of the triode section is returned to the B negative side of the 800 ohms biasing resistor. A 76 is used as a resistance-coupled audio amplifier; having two stages of audio will yield considerable increase in signal strength and the addition of the 76 is recommended. The 25Z5, of course, furnishes the necessary rectified plate voltage for the tubes.

EDITED BY GEORGE

● **Because the amount of work involved in the drawing of diagrams and the compilation of data, we are forced to charge 25c each for letters that are answered directly through the mail. This fee includes only hand-drawn schematic drawings. We cannot furnish "picture-layouts" or "full-sized" working drawings. Letters not accompanied by 25c will be answered in turn on this page. The 25c remit-**

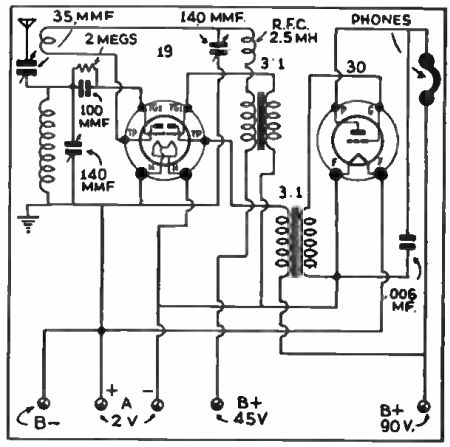
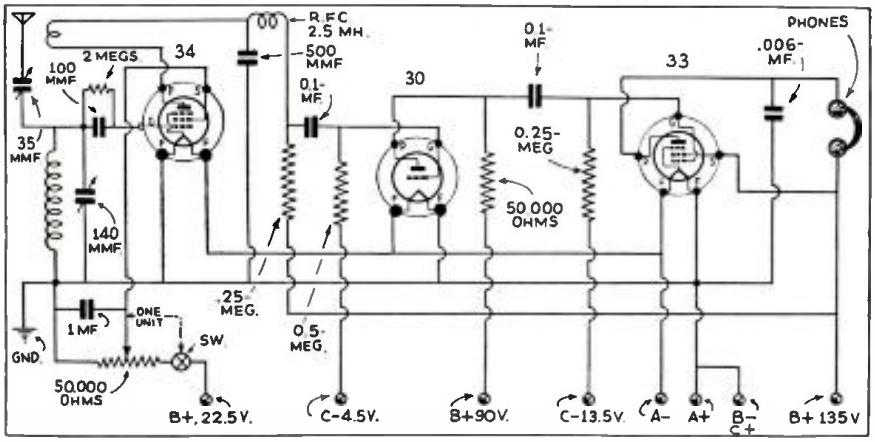


Diagram of 2-tube Battery Set Using One 19 and One 30



3-Tube Battery Receiver with Pentode Output

ECONOMICAL BATTERY RECEIVER

J. A. Daigle, Bangor, Me.

(Q) Would like to have you publish a circuit diagram of a set using two 19's or one 19 and one 30.

(A) A circuit diagram using a 19 and a 30 is shown above. The 19 performs the functions of regenerative detector and one stage of transformer-coupled audio amplification. The 30 is recommended rather than another 19, giving two stages of audio rather than three, as would be the case if two 19's are used. Three stages of audio usually results in considerable trouble and unless the output tube is a power tube, the three stages are unwarranted.

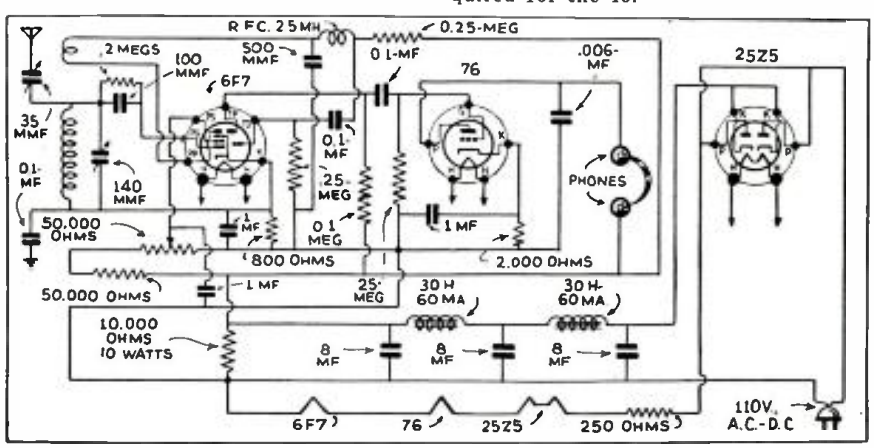
While the 19 functions as two separate tubes, we believe better results could be obtained with a type 15 screen-grid detector. Few of our readers realize that the 15 actually requires less heater or filament current than the 19; .26 ampere are required for the 19 while .22 ampere is required for the 15.

3-TUBE BATTERY SET

William Craft, Sibbald, Alta, Can.

(Q) I would like to have you publish a diagram for a 3-tube short-wave receiver using a type 32 or 34 screen-grid detector, a type 30 first audio amplifier, and a 33 output amplifier. I would like to have the entire audio amplifier *resistance-coupled*. Will this set work all right on 110 volts of B?

(A) A 3-tube battery receiver using a 34 screen-grid detector, a 30 resistance-coupled audio, and a 33 resistance-coupled output pentode should undoubtedly make a very fine receiver, and there is no doubt that it would work very satisfactorily on 110 volts D.C. even though the tubes are supposed to have 135 volts on the plates as shown in the diagram. The detector uses 4-prong plug-in coils, the data for which was printed in the April 1935 QUESTION BOX. Regeneration is controlled by varying the screen grid voltage of the 34 detector. A switch is connected in series with the 22½ volt lead going to the potentiometer, so that when batteries are used this switch can be opened, when the set is not in



3 Tubes Are Used in This Receiver Although a 4-tube Performance is Obtained

QUESTION BOX

W. SHUART, W2AMN

tance may be made in the form of stamps or coin.

Special problems involving considerable research will be quoted upon request. We cannot offer opinions as to the relative merits of commercial instruments.

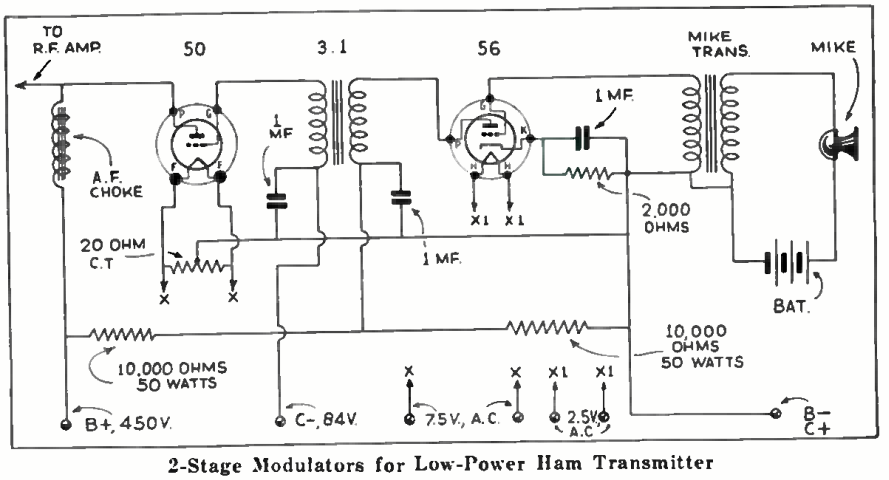
Correspondents are requested to write or print their names and addresses clearly. Hundreds of letters remain unanswered because of incomplete or illegible addresses.

3-TUBE A.C. DOERLE

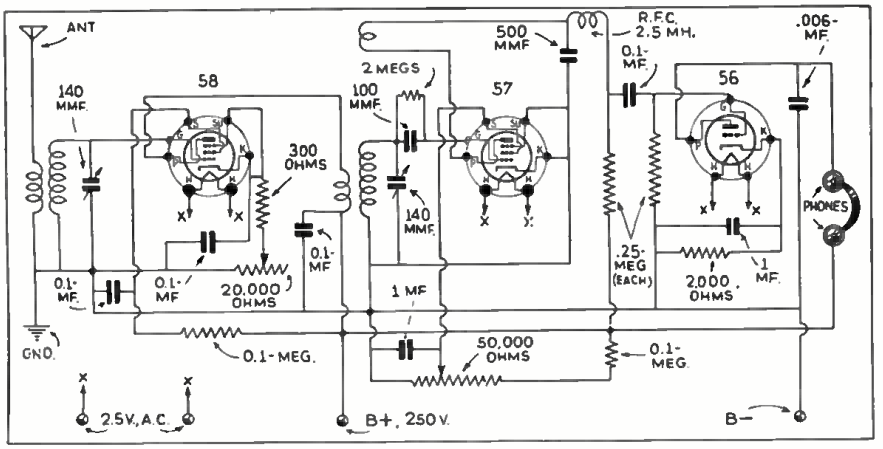
(Q) Would you be kind enough to publish a diagram of a 3-tube electrified Doerle receiver, using a 58 tuned R.F. radio frequency amplifier, a 57 regenerative detector, and a 56 resistance-coupled audio amplifier?

(A) The 3-tube electrified Doerle diagram is shown herevith. Regeneration is controlled in the screen-grid circuit of the 57 detector. However, if you wish to control regeneration by use of a throttle condenser, the 500 mmf. condenser shown on the tickler side of the R.F. choke should be changed to a 140 mmf. variable condenser.

We advise leaving the screen-grid potentiometer in the circuit inasmuch as it allows the optimum value of screen-grid voltage. If the two 140 mmf. tuning condensers are ganged, a 35 mmf. padding condenser should be connected across the R.F. tuning condenser.



2-Stage Modulators for Low-Power Ham Transmitter



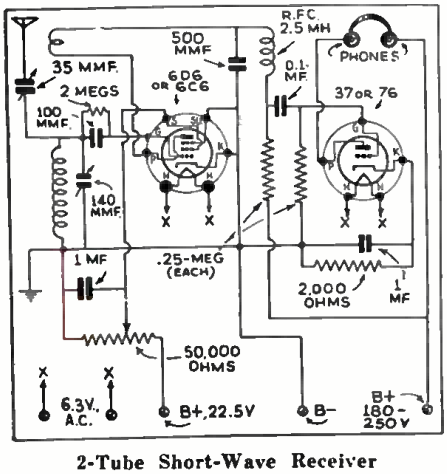
3-Tube Electrified Doerle Diagram

2-TUBE RECEIVER

Milton Berlin, Passaic, N.J.

(Q) Will you please publish in your QUESTION BOX a diagram of a short-wave receiver using 6.3 volt heater type tubes? I would like to have it use a 6C6 detector and a 37 audio amplifier.

(A) The 6.3 volt heater-type tubes are becoming quite popular in present day radio receivers and we take pleasure in presenting your diagram. Either the 6D6 or 6C6 can be used as the detector and a 37 or 76 in the audio circuit with no change in the values which are given in the diagram. This receiver can be run with a regular power supply or in conjunction with a storage battery and B batteries.



2-Tube Short-Wave Receiver

BATTERY-OPERATED S.-W. CONVERTER

F. H. Helme, Lacadena, Sask., Can.

(Q) I would like to build a battery-operated short-wave converter and ask that you print a suitable circuit using a 34 detector and a 30 oscillator.

(A) We are printing a diagram of a converter which should give very fine results if used in conjunction with a *sensitive* broadcast receiver. Standard 4-prong plug-in coils are used and two coils will be necessary for each short-wave band you wish to cover. The output of the converter should be connected to the antenna and ground posts of the broadcast receiver. These are labeled, "Ant. Post," and "Gnd. Post." The coupling between the detector and oscillator is accomplished by the use of a 6 mmf by-pass condenser. This small coupling can also be effected by running insulated wire from the oscillator to the grid lead of the detector. Wrap the insulated wire around the grid lead about three or four times. We suggest you experiment with the number of turns used in order to obtain best results. The diagram shown is one where separate controls are used. If you intend to gang the 140 mmf. condensers, insert a .001 mf. mica condenser in series with the oscillator condenser and connect a 35 mmf. condenser in parallel with the detector-tuning condenser for trimming.

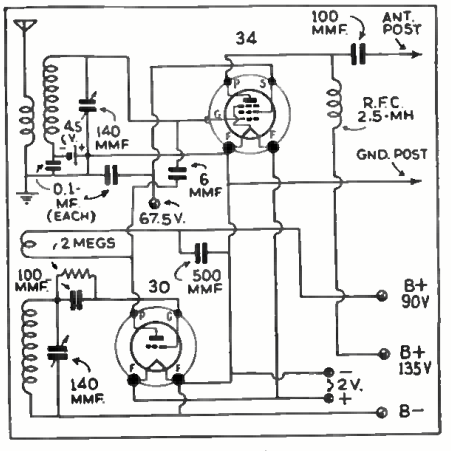
2-TUBE MODULATOR

Thomas Jones, Philadelphia, Pa.

(Q) I would like to have you print a diagram of a modulator using a 56 speech amplifier transformer coupled to a 250 power amplifier or modulator tube. I would like to use just one "B" supply for the modulator and R.F. amplifier.

(A) For low-power phone transmitters the modulator system diagrammed above is undoubtedly the most used among the amateurs. The power supply furnishing the 450 volts should be capable of supplying the plate current for the 250 together with that of the R.F. amplifier. The audio frequency choke, or modulating choke as it is sometimes called, should also be capable of handling the total current. Fixed battery bias is used on the modulator inasmuch as this provides greater output; Automatic bias is used on the 56 for convenience. This modulator will only work with a single-button microphone; another stage of amplification will be necessary for a double-button or crystal microphone.

When using this modulator make certain that you do not over modulate your radio frequency amplifier. We say "radio frequency amplifier" because we trust that no one is using a *modulated oscillator.*



2-Tube Battery Converter

SHORT WAVE LEAGUE

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Baron Manfred von Ardenne
Hugo Gernsback

Executive Secretary

Pro and Con on the 5-Meter "No Code" Test

A Boost for "No Code" 5-Meter License

Editor SHORT WAVE CRAFT:

I have been watching the arguments for and against having a code test for 5 meters for some time. It is surely a "good scrap" and I can't resist getting my foot in it, so here goes:

Because I hold a government license I suppose everybody expects me to uphold the code test, but to tell the truth, I'm against it. Here are some of the facts that helped me reach that decision:

The average low-power 5 meter transmitters and transceivers have a range of around 10 miles. With some 3,088,520 square miles of land in the United States, it would therefore be possible to have over 8,000 stations working on the same frequency and not cause interference with each other.

This number of stations multiplied by the number of channels in the 5 meter band shows that several hundred thousand stations could be operated, provided of course they used up-to-date equipment and not apparatus which is frequency modulated.

Not only that, but the fellows around here that hold government licenses have been complaining because they have tried 5 meters and found that the band is "dead" most of the time. In fact, they have even been campaigning the amateurs for miles around to get 5-meter rigs and go "on" so there will be somebody to talk to!

Now I say that 5 meters should be thrown open, even the "stiff" exams done away with as those that start building receivers and transmitters will meet up with some hard problems that will require some real research work, and before they get on the air they will know plenty about radio.

O. KLOER, W9SZB,
223 Prospect Ave.,
Lake Bluff, Ill.

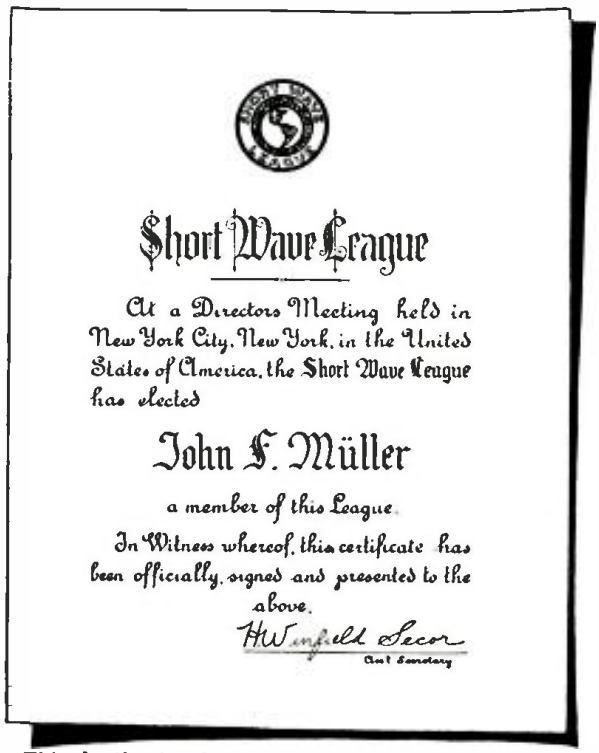
(Many of these arguments prove that a great number of stations can be placed in the 5 meter band, provided the type of transmitters and receivers can be improved. Those who do not wish to change their equipment in order to accommodate the great number of amateurs who would like to get on the 5 meter band, can go down to 2½ and 1¼ meters now that that territory is "wide open."—Editor.)

Hooray for "No Code" Test!

Editor, SHORT WAVE CRAFT:

I have been reading many arguments on the *No Code Test below 6 Meters* and the two most sensible arguments are J. A. Worcester's and Paul Lomaster's. I'm not saying that most Hams are selfish, but if they have read Mr. Worcester's and Paul Lomaster's letters and still stick to the code test, they are either selfish or stubborn. I had a friend who, no matter what you said, still stuck up for the code test. I then told him to read both these letters. After he read them all, I now hear him giving reason after reason why "codeless" licenses should be given! I am not a license holder, but don't think I am writing this letter so as to make it easier for me to get a license. The reason I am writing it is only to help abolish the "code test" below 6 meters. There are plenty of radio engineers who would do much for the development of radio, if they had licenses, and the only thing that is stopping them is the *code!* That is my only reason for abolishing the code test. I am greatly interested in the development of radio. I know it will benefit everyone. Before I close my letter I want to impress on the reader's mind what Paul Lomaster writes—"it will take 20,000 years, at the present rate of issuing licenses to get 40,000,000 stations operating in the 5-meter band, with no more congestion than we now have on 80 meters!" All Hams should read and study J. A. Worcester's letter published in the April issue of SHORT WAVE CRAFT.

STANLEY BAIKOWSKI,
12 Marble Terrace,
Hastings-on-Hudson, N.Y.



This is the handsome certificate that is presented FREE to all members of the SHORT WAVE LEAGUE. The full size is 7¼" x 9½".

See page 62 how to obtain certificate.

Get Your Button

The illustration herewith shows the beautiful design of the "Official" Short Wave League button, which is available to everyone who becomes a member of the Short Wave League.

The requirements for joining the League are explained in a booklet, copies of which will be mailed upon request. The button measures ⅝ inch in diameter and is inlaid in enamel—3 colors—red, white, and blue.

Please note that you can order your button AT ONCE—SHORT WAVE LEAGUE supplies it at cost, the price, including the mailing, being 35 cents. A solid gold button is furnished for $2.00 prepaid. Address all communications to SHORT WAVE LEAGUE, 99-101 Hudson St., New York.

Good Argument for "Code Test"

Editor, SHORT WAVE CRAFT:

Being a reader of your fine magazine since its inception, back in the days when it was on the newsstands *every other month,* I am taking the liberty of dropping you a line in regard to your very interesting discussion of a "code-less" ticket for operation in the fifty-six megacycle band.

First of all, I would like to correct the impression of many short-wave experimenters that the Amateur or Ham is selfish. I am not going to go into any great detail in extolling the praise of the licensed amateur, as his record of achievement and self-denial in advancing and bettering this most wonderful of all "hobbies" is an open book. Suffice it to say that personal contact with any one of the forty thousand odd transmitting amateurs will soon remove this silly prejudice.

Secondly, whatever I or anyone else may think in regard to a *code-less exam.* for five meter operation, the fact remains that the

(*Continued on page* 59)

Hams Who Have Made Good

FRANK LESTER, W2AMJ

● FRANK LESTER grew up literally eating, drinking and living *amateur radio*. He obtained his "ticket" in 1920, when he was only 13 years old, and he was soon agitating the ether in the neighborhood of 851 Tinton Avenue, Bronx, N.Y., with a 1-inch spark coil outfit. For receiving he had one of those famous Gernsback E.I. Co. loose couplers and a galena detector. Spark eventually gave way to C.W., and the crystal receiver to a 3-tube honeycomb coil job. Name any kind of a receiving or transmitting circuit—Frank can tell you of his own personal experience with it.

About 10 years ago, when P.A. (public address) amplifiers were practically unheard of, Lester made up a unit that permitted a mother to hear her baby crying in its crib, several rooms away. Frank simply hung a microphone over the crib and rigged up the amplifier and loudspeaker in the sun parlor, and the stunt worked fine. It was a national sensation at the time, the stunt being written up far and wide.

In 1926, when he lived on Washington Heights, New York, W2AMJ attracted further notice from the press, because of his regular contacts via the short waves with the George M. Dyott expedition up the "River of Doubt," in Brazil. On several important occasions he was the only contact the expedition had with civilization, and the messages he received from the explorers were featured on the front pages of various New York newspapers.

For the past six years Frank has been connected with Wholesale Radio Service Co. Inc., of New York. He is now in charge of the amateur division and is applying his long experience in the "ham" game to the design of highly efficient transmitting apparatus. The 100-watt rack-and-panel outfit described in the January issue is a sample of his handiwork.

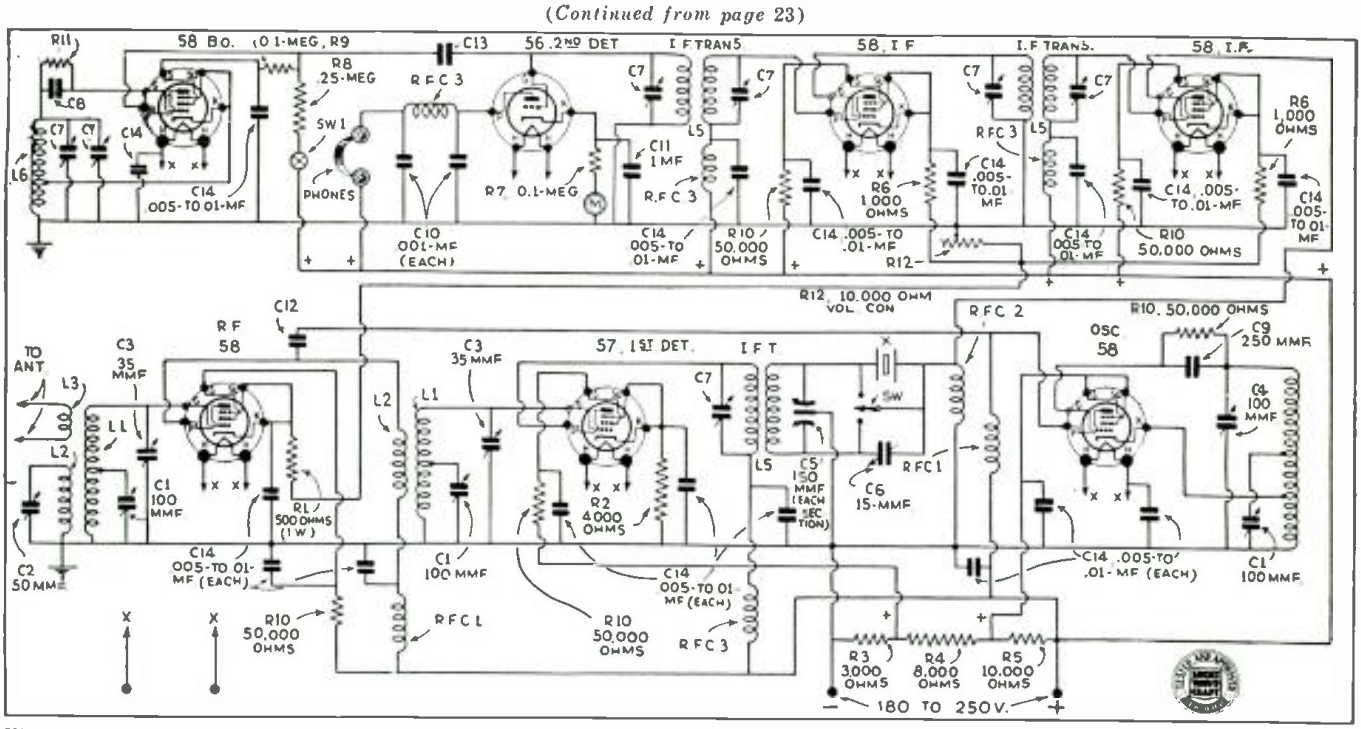
Frank recently moved to Bergenfield, N.J. While his wife fixed up the house, he went scouting around in the woods and with the aid of some local "hams" came back dragging a 40-foot tree. Trimmed down, this now decorates the back yard and supports a different antenna every week. W2AMJ is active on all the amateur bands, from 5 meters up. He's always glad to QSO.

Frank Lester, W2AMJ. is well-known to the "Ham" fraternity.

Let's know the names and addresses of any "Hams" who you think should be cited in our Hall of Fame—labeled "Hams Who Have Made Good."—Ed.

A 7-Tube Superhet for the "Ham"

(*Continued from page 23*)



Wiring diagram is given above for the 7-tube superhet "ham" receiver designed, built, and tested by Mr. Kahlert, as well as by the editors.

there is negligible "image"; one or two stations do come through though on this set on 14 MC. rather weakly.

Most likely the use of two R.F. stages in commercial models is demanded by the greedy diode detector and the other diode which rectifies precious R.F. to d.c. to bias the I.F. tubes. As the use of more than two I.F. stages using "high-gain" I.F. transformers is impracticable and should be confined to million dollar laboratories, the only other part of the circuit where the gain can be multiplied is the "front end" and this is done by tacking on another R.F. stage.

Stages Incorporated in This Set

The set consists of 58 tuned R.F., 57 detector or frequency changer, 58 oscillator, crystal filter, two 58 I.F. stages, 56 rectifier and 58 beat oscillator—seven tubes in all. As stated before, two I.F. stages are the maximum that can be employed; more than two means trouble and plenty of it. It will be noted that 58's are used for the oscillators. This is because a lot of trouble was experienced from 57's in this rôle. Many weird noises and unearthly sounds resulted with their use and cleared up immediately when 58's were used, much to our relief as several other headaches at the same time were greatly bothersome. No audio found its way into the original conception, as a separate amplifier and speaker across the room from the set table fills the bill for all the sets used. The 56 therefore in this case is the natural termination of the set and it carries a heavy load. No audio is used before the phones.

Looking at the front, left to right, is the oscillator dial, selectivity control, output meter, volume control, beat oscillator switch, R.F. detector tuning dial, and the R.F. aligning condenser. From the top we perceive, front left, the oscillator compartment with the coil and the self-contained padding condenser to the left, the tuning condenser in the middle with the grid condenser and grid leak behind it with the tube to the right. To the right of this is the meter, a O-1 mil. small size, bakelite cased instrument projecting through the panel. To the right of this is the detector coil and tube compartment, the detector and R.F. stage tuning condensers, the detector tuning condenser in the back and the R.F. tuning condenser in front opposite the coils of those stages and to the right of the condenser compartment is the R.F. stage coil and tube. Behind the oscillator and meter compartments is the *crystal-filter* compartment with the remodelled I.F. transformer to the right, the crystal which is a Bliley 465 kc. plate, the switch and the phasing condenser grouped in the middle on an upraised piece of bakelite and the output chokes in series on an upraised piece of aluminum are at the left. Both the piece of aluminum and the piece of hard rubber (or bakelite) are supported by pieces of drilled and tapped brass rod. At the back is the I.F. amplifier with the first and second I.F. tubes and transformers to the left and the indented *beat-oscillator* transformer and tube to the right. On the right side are the two "GR" jacks connecting to the ungrounded antenna winding of the R.F. coils. With this method the signals travel through the R.F. stage and not around it through the set wiring which might be the result if the antenna leads were brought in via some other channel. At the back is the 4-prong power plug and the phone jack. Looking at the bottom on the front panel, from left to right, are the R.F. stage padding-condenser, the beat-oscillator switch, volume control and the selectivity control shaft, the selectivity control double section condenser which is mounted directly under the I.F. transformer and coupled to the panel knob with a flexible coupling and the shaft and bearing of a defunct Hammarlund midget condenser. To the right of the selectivity control is another midget split and in parallel with the selectivity control, as the capacity of the selectivity control is not quite great enough alone to give full range of selectivity to both sides of resonance with the crystal-filter in the "series" position. The three chokes mounted in the same direction are plate chokes for the I.F. and first detector, and the other choke is the plate choke of the second detector.

The beat oscillator is at the rear left and proceeding along the back to the right, are the second detector, the second I.F. and the first I.F. At the left side in the center can be seen the R.F. stage tube socket, in the center of the set at the front can be seen the first detector tube socket and to the right of this is the oscillator tube socket. The condensers and resistors are for the most part grouped about their respective tube sockets.

Chassis Construction

The set is constructed of 1/16 inch or No. 14 gauge Alclad. This is the trade name for aluminum with a thin layer of dural on each side. It adds nothing to the cost and greatly increases the rigidity. It cannot be bent like aluminum though, as it is quite brittle. However, this becomes an added benefit as it drills quite cleanly, like brass, and doesn't gum the drill and burr out the way aluminum does. It reacts unfavorably to silvering with lye, resulting in a dull leaden finish, but this is unimportant. To start with aluminum may just as well be used if Alclad is not available. Enclosing the whole set in a box was deemed desirable on account of the xtal filter and for the sake of rigidity the "works" were built in, rather than constructed on a chassis and then slid into a cabinet. The layout used seems the only one commensurate with short leads between stages with the R.F. and detector stages adjacent to the front panel and with a single deck. If the R.F. stage was in back of the detector, we would have an extremely long tuning shaft, with several flexible couplings and with those arrangements requiring long shafts and flexible couplings it seems that it takes about 5 minutes of dial turning to "wind up the slack" in the shaft before the condensers start to move. The arrangement shown provides a rather symmetrical panel layout and adequate space between the stages. The R.F. and detector tuning is comparatively free from *backlash* and there is no direct coupling between the rotors of the condensers, which was shown a few years back to be a probable cause of instability when R.F. stages were first introduced on a large scale for our regenerative detectors. In this case, too, there is air space between the R.F. coil shield and the detector coil shield, so that the induced currents of the two coils don't flow in the same piece of shielding which is the greatest cause of instability in R.F. receivers. Having a common partition between stages

is as bad as coupling the coils of the two stages magnetically!

The aluminum is best cut on the power shears where it is bought, as cutting the amount necessary would be a Herculean task with a hacksaw and one could not then be so sure of the squareness of the pieces, which greatly affects the finished appearance. The dimensions are as follows, all dimensions in inches: Top and bottom pieces are 18x10, the sides 9⅞x7, and the front and back pieces are 18x7. The outside dimensions of the resulting box are therefore 18x10x7⅛. The space in the various compartments is as follows (these figures do not include the thickness of the aluminum partitions, but are the air spaces alone):

Space in osc. compartment 6 7/16 x 3 7/16.

Space in meter compartment: front, 2 5/16, back 2, depth 3 7/16.

Space in det. compartment: front, 3⅛, back 3 7/16, depth 6 7/16.

Space in condenser compartment: width 2 7/16, depth 6 7/16.

Space in R.F. compartment: width 3 5/16, depth, 6 7/16.

Space in xtal filter compartment is 8½x 2 15/16.

Space in I.F. compartment is 17⅞ x 3⅜.

Bottom plate is 2 5/16" up from the bottom, leaving a space of 4 11/16" minus the thickness of the Alclad base plate which is 4⅝". The internal shield pieces are 4½" high, leaving an air space.

The front condenser on the R.F. stage is a special one from National, with a bit of shaft extending through the rear, enough for the flexible coupling to bite on (procurable through any National dealer). Also the condensers right out of the boxes are too long to fit in the available space, so the rotors were taken out and approximately a quarter of an inch was sawed off the front bearing sleeve. This was done and the two flexible couplings pushed almost right up to the sixteenth of an inch of sleeve. Care should be taken, in sawing, that the bearings of the condensers don't get clogged with brass dust, and in reassembling so there is no lateral strain on the isolantite insulating bars.

The beat-oscillator transformer is mounted on a circle of aluminum supported about an inch down by brass spacers, so the knob of the transformer doesn't stick up beyond the cover plane. Incidentally this helps in confining beat oscillator R.F., as the eddy currents the coil introduces into the shielding stay in the transformer shield, and don't get out and cause unwanted coupling by contact of the transformer shield with the other shielding. The cover can now be put on; the hinges holding it are "draw-pin" brass and available at any large hardware "emporium." They are mounted reverse to ordinary fashion to save work. Be careful to keep the brass rod that lines the cover in far enough so it doesn't scrape the sides. The "pull" on top so one can open the cover, is the top from a defunct metal binding post of the past era. Without this, one has to scratch around at the cover for a few seconds to get a lifting grip.

These coils are wound with the length of the coil equal to the diameter which is the best shape for coils as the "Q" is highest with this shape, also by making the coil partitions of reasonable size we can keep the resistance of the coil down which helps to boost the Q. The oscillator coils are home made with self-contained padding condensers which are the new small Hammarlunds which are mounted on discs of hard rubber (or bakelite) and easily fit into the 5-prong National R-39 forms.

It is best to make up a "haywire" oscillator coil, using an old 5-prong form and not bothering about band-spread on the oscillator till everything else is done. We then connect the tuning condenser across the whole coil in the place that the small Hammarlund APC condenser will eventually fill. The coil can be wound with any old wire or that specified, following the same number of turns in the coil as specified, and the same number of

turns in the cathode tap. When all else is finished we can devote time to the oscillator band-spread coils. Frankly this *band-spread* oscillator coil business is the hardest job of all.

Coil dimensions are given at the end of the article.

The I.F. transformer in the xtal filter has to have one of the tuning condensers removed as shown in the circuit diagram and this is very easily done in the National I.F. transformers, without any trouble whatsoever. The grid leads of the I.F. tubes and the second detector should be shielded as well as the oscillator's plate and cathode lead. The condensers coupling the two oscillators to the two detectors are made of twisted hook-up wire; the one coupling the high frequency oscillator to the first detector is four inches of this twisted wire condenser and the other is about one-quarter of an inch, or rather one turn of the beat oscillator plate lead about the second detector grid post, enough to raise the plate current of the second detector 0.025 mils. which is adequate for all signals.

Use Parts of High Quality

The best quality parts that could be obtained were used, as it was desired to make a good job. The National tuning condensers are notably free from noise as they have *constant-impedance* pigtails. The National I.F. transformers were chosen primarily because *they are tuned from the top.* The dials are also National. If dials of higher ratio are available however, it would be wise to use them as the tuning with the xtal filter is rather sharp and "holding" a signal is quite a job, even with the ten to one ratio and a band-spread of 75 degrees. The fixed by-pass condensers are .01 m.f. mica, but a good grade of paper condenser is O.K. There is practically no difference at I.F. frequencies between the two varieties, but it is advisable to use the mica units in the high frequency section.

Before wiring the set all the parts should be inspected and the fixed condensers especially should be tested.

After the set has been wired, a several hours job, and the wiring checked, hook up the power, put in the set of 7 mc. coils. Assuming we get a sound in the phones turn the volume control *full on* to get the loudest *rush* possible. This with the xtal in the filter *shorted out.* Then take the tuning wrench and turn the I.F. transformer tuning condensers all as far clockwise as they will go, then back them off slightly and tune each separately for the maximum rush. Now put on the antenna, if not done previously, and tune the padding condenser in the oscillator coil to slightly less than maximum capacity. Now tune the R.F. padding condenser for maximum rush. The background should be very high as the gain of the set is enormous. Don't forget that the selectivity control on the panel tunes the secondary of one of the I.F. transformers. Signals should be searched for; if all one gets is *commercials* and no *ham* stations and the R.F. and detector don't seem to peak, the I.F. frequency should be shifted until we *do* hear *amateurs.* The tuning condensers on top of the transformers should each be turned slightly clockwise or counter clockwise, and then all of them *peaked* for "maximum rush" the same as previously and the padding condenser in the oscillator coil form again varied, looking for the amateur band. The process should be repeated until the band is found.

Lining Up Detector and R.F.

We can now proceed to line up the detector and R.F. more correctly. Take out the R.F. coil and loosely couple the antenna to the detector. This is done by looping the antenna lead around the detector grid lead. As this gives very loose coupling from the antenna to the detector the volume control should necessarily be set at *maximum gain.* This is what we

want as we don't want to load up the detector with antenna capacity and inductance which would throw the tuning off. With the antenna lead looped around the grid lead of the detector loosely and signals coming through weakly, incidentally it is a good idea to have the oscillator and R.F. det. dials set at about fifty, so we can return easily to the correct settings when coils are changed, take a screwdriver and tune the detector padding condenser in the detector coil form for maximum response. Now replace the R.F. coil form and without touching anything but the R.F. padding condenser tune for *maximum response*. The set is now all aligned; as stated above, before starting *aligning*, it is a good idea to set both dials at fifty so that the band can be fully covered on the R.F. and det. dial and when changing bands the dials are always set at a number easily remembered and the oscillator and the detector will then always be in line, so all we have to do is vary the R.F. padding condenser each time coils are changed and the dials set at fifty instead of going through the whole process each time. Any antenna will suffice with this set to bring signals in, but of course a good idea is to have a fair antenna at least. Antenna power is *cheap!* A single long wire hooked to one side of the antenna coil on the coil forms will suffice and it usually works better on one side than the other; so try changing the leads around. A doublet will work fine on this set also.

The question may be asked why is the oscillator run at the next lower frequency than the fundamental. This is because the oscillator on the fundamental was affected by the tuning of the detector below 3.5 mc. Using the second harmonic of the oscillator eliminated this trouble and gives satisfactory heterodyning.

After the super is working O.K. "straight" we can switch in the crystal and get *single signal* reception.

To start out we have the split tank circuit, which when tuned to resonance, has an impedance of approximately 100,000 ohms. This impedance is reduced to one-fourth in the crystal series circuit by connecting only one side of the variable selectivity control in the crystal circuit.

By tuning with the selectivity control we can vary the impedance across the coil and across the section of the selectivity control condenser in the series crystal circuit. As the selectivity is directly dependent on the resistance in the circuit we can then vary the selectivity. At resonance therefore we have a maximum of resistance introduced and minimum selectivity and by detuning either side of resonance we can cut down the resistance of the tuned circuit as the resistance of a resonant circuit is cut down by detuning and therefore the selectivity increases.

With the filter switch at "off" and the set operating as a straight superhet, take out the unused crystal and hook it up in a convenional TRIODE crystal oscillator with about 90 to 135 volts on the plate. This is sufficient power. Connect a long lead to the plate and, with the oscillator working, loop this lead loosely around the grid lead of the second I.F. tube and line up the one I.F. transformer. Then loop the wire around the grid lead of the first I.F. tube and line up the next I.F. transformer, the one between the first and second I.F. tubes. Then loop the output wire around the grid lead of the first detector and line up the transformer between the first detector and the first I.F. tube. The volume control and the coupling between the oscillator and the grid leads should be adjusted so the plate current of the second detector doesn't go above .6 of a mil. Make sure the volume control is full off when starting the lining up to the crystal as the meter is liable to be blown. With the I.F.'s lined up, place the crystal in the socket and open the switch to series position. We can now search for signals. It is most likely that the crystal I.F. fre-

Notes For the "Veri" Card Collector

By J. A. Worcester, Jr.

● THERE is increasing evidence of late that many short-wave fans are taking up the interesting hobby of collecting short-wave broadcast station verification cards. Anyone seriously taking up this hobby is immediately impressed with the numerous types and varieties of cards issued by each station. As yet, however, the writer has not noticed any attempt to publish any information on this subject and the following miscellaneous notes are presented with the hope that they will prove of some value to those interested and that they will invite further notes from collectors who are in possession of such information. Any corrections, additions, or further information on any material presented will be greatly appreciated and may be sent to the writer, % SHORT WAVE CRAFT.

EAQ

EAQ—Madrid, Spain—There are two varieties of the current card in green. Those issued during the first four or five months of the year have the address "Peligros, 2" while later cards have "Alcala, 43." The latter card is also done in a darker shade of green.

VE9GW

VE9GW—Bowmanville, Ont., Can.—There are also two varieties of this well-known card issued during the first half of this year. During the first few months the card contained the correct printed frequency of 6,095 kc. Subsequent cards show a printed value of 11,810 kc., which has been crossed out and the correct value inked in. The fact that these latter cards have been pressed into service may be an indication that the stock is running low and we may be justified in prophesying a new design from this station in the near future.

COC

COC—Havana, Cuba—Collectors who have the early verification from this station typewritten on a governmental postal may not know that later verifications contain practically the same information but are printed on a white card.

GSA

GSA—Daventry, England—The Daventry cards can hardly be called verifications, but are nevertheless of interest to the collector. The writer has two types of this card issued during the first of the year. One is a three line acknowledgment without date and the other has four lines with a typewritten date.

HVJ

HVJ—Vatican City, Papal State—The writer has a verification from this station showing a post-card view of the station's motor-generator sets and has seen a verification showing an external view of the station. Any information regarding additional views employed for verification purposes would be appreciated.

YV3RC

YV3RC—Caracas, Venezuela—The verification card of this station is the same as the last card of YV3BC with the exception of an additional red line note at the bottom of the card stating that the call letters have been changed.

VK2ME

VK2ME—Sydney, Australia—This station offers several interesting varieties. The last card from this station is in light buff on a thin card. A card used a year ago last summer is on a much thicker card and is done in dark buff. A card employed in the spring of 1933 is without the red frame line at the top and is also minus the red arrow pointing to Sydney. A still earlier card is done in bistre, has a fine red line at top, employs larger letters in the slogan, and shows a power of 12 k.w. instead of 20 k.w. as in later cards.

quency is not the same as the previous I.F. frequency used for trying out the set and naturally this will throw out the tuning of the high frequency oscillator somewhat. The band will then have to be relocated on the oscillator dial and the I.F. and detector circuits realigned. With the filter working and the band found, tune in a loud signal the station oscillator or whatnot and adjust the elimination control to cut out the "image" or rather the unwanted beat note of the pair, according to preference either the higher or the lower in frequency. If one tunes from the low frequency end of the band it is best to cut out the high frequency beat note, or vice versa.

Do not expect to get wonderful results the first try. One must make himself familiar with a new set before maximum results can be obtained.

All in all, this set is a "honey." It brings in the dx "fb" and some of the "BIG" W6's here in the east on 14 mc. come through so loud that the "health" of the meter is feared for.

PARTS LIST FOR KAHLERT SUPERHET

(3) C1—100 mmf. tuning condensers (National)
(1) C2—50 mmf. R.F. padding condenser (National)
(2) C3—35 mmf. pad. condenser in the top of the coil form of the detector.
(1) C4—100 mmf. midget padding condenser in oscillator coil (Hammarlund) APC-100.
(1) C5—150 mmf. each section National plus parallel split 100 mmf. midget which when split is about 40 mmf. or slightly less per section. Therefore total effective capacity across coil is about 90 mmf. or so.
(1) C6—15 mmf. Trim-air midget.
C7—I.F. transformer tuning condenser in National I.F. transformers.
C8—In National beat osc. transformer.
(1) C9—.00025 mf. small mica with mounting holes for supporting to chassis.
(2) C10—.001 mf. postage stamp mica with wire leads.
(1) C11—1 mf. with wire leads. Large paper cartridge type.
C12—Hook-up wire condenser. Two pieces of hook-up wire about 4½ inches twisted together.
C13—Piece of hook-up looped about grid post of detector or equivalent to raise plate current about .025 mfl.
(17) C14—.005 to .01 mf. paper or mica by-pass.
(1) R1—500 ohms, 1 watt (all resistors 1 watt except R3, 4, 5, which are 2 watt).
(1) R2—4000 ohms, Lynch.
(1) R3d—3000 ohms, Lynch.
(1) R4—8000 ohms, Lynch.
(1) R5—10,000 ohms, Lynch.
(2) R6—1000 ohms, Lynch.
(1) R7—100,000 ohms, Lynch.
(1) R8—250,000 ohms, Lynch.
(1) R9—100,000 ohms, Lynch.
(4) R10—50,000 ohms, Lynch.
R11—In beat oscillator transformer.
(1) R12—10,000 ohm volume control.
(2) RFC1—National No. 100 choke.
(1) RFC2—2 Hammarlund CH-10-S in series.
(3) RFC3 Hammarlund ch-10-S.
(1) SW—midget switch.
(1) SW1—jack-type switch.
(1) M—small size 0-1 mil. meter.
(1) X—Bliley 465 kc. Crystal.

COIL DATA

Winding	14 mc.	7 mc.	3.5 mc.	wire size
L1	10 t.	21 t.	35 t.	No. 22 Enam.
Tap from bottom	2¼ t.	5¾ t.	16¾ t.	
L2	8 t.	16 t.	22 t.	No. 34 dsc.
L3	3 t.	4 t.	4 t.	No. 34 dsc.

The tickler on the detector coils is disregarded. These coils plug into the special National square coil sockets. Oscillator coils wound with No. 22 dsc wire on 5-prong National form and plug into regular 5-prong socket raised from base plate on brass spacers high enough to clear the contacts.

	14 mc.	7 mc.	3.5 mc.
Turns	9¾ t.	21½ t.	21 t.
Tuning cond. taps	3 t.	7¼ t.	15 t.
Cathode tap	1¾ t.	1¾ t.	1¾ t.

FREE CODE INSTRUCTION

The First National Television, Inc., announces the inauguration of their early evening "code class" broadcast which is given every Monday, Wednesday and Friday evening from 5:30 until 5:45 p.m., Central Time. The broadcast is known as the DOT AND DASH CLUB.

W9XBY on 1530 kilocycles reaches most of the midwestern states at this time of the evening and can be tuned in by short wave listeners all over the Mississippi Valley.

How Soon Shall We Have Television?

(Continued from page 7)

Perfect "Laboratory" Images Reported —But Not for Public

On the brighter side of American television developments, we have had the secret reports which leak out now and then from the laboratories of such great operating companies as the R.C.A., that first-class television images have been obtained in their laboratory tests—images in fact *equivalent in quality to those projected by home movie machines!* The writer has been told by people who have seen some of these images that such is the fact, and this being the case, it is indeed unfortunate that apparently the public, as well as a great section of the army of the unemployed, as Dr. Goldsmith has pointed out, cannot benefit by the immediate or at least early application of this television service.

Unofficially, from bits of information gathered from various sources, the "grand" television scheme for we Americans seems to be all tied up, due to patents, lack of finances by the smaller radio and television concerns, etc., in a plan whereby one or two of the largest American radio companies are planning to erect a series of ultra-short-wave television transmitting stations in all the larger cities across the country. In other words, these images are to be transmitted on waves of 5 to 6 meters or less, which, of course, with their extremely high frequency, lend themselves ideally to the practically perfect transmission of a first-class clear image, one of good size on a "home televisor" and having possibly 300 to 400 scanning lines. At least two large laboratories have been busy the past few years on the development of *cathode-ray* televisors, and according to reports given by those who have seen the images produced by this type of televisor, the results are well worth waiting for.

This is but one angle of the situation, however, and it does seem too bad that during the past few years we could not have had a number of stations broadcasting television images in this country, even though *mechanical scanning* had to be used. John V. L. Hogan, well-known American radio engineer, who, let it be said to his credit, has kept on broadcasting television images for the benefit of the experimenters during the past few years, told the writer there is no reason why we cannot obtain good clear television images of sufficiently fine detail by *mechanical scanning.* In other words, it is not an immutable law that we have got to have *cathode-ray tube* televisors to give us satisfactory images at the receiver. Another point in this same direction, and one which will be vouched for by thousands of people who saw daily demonstrations some years ago by the Bell Telephone Laboratories and the New York Telephone Company, is the fact that very good likenesses of people's faces were televised over a distance of several miles by wire—all by *mechanical scanning.*

About 5 years ago, the Bell Telephone Laboratories' television experts, headed by Dr. H. E. Ives, gave several remarkable demonstrations to editors and others in which not only outdoor scenes picked up *directly* by one of their televisors and projected over a circuit to a receiver in another part of the laboratory, but television images *in colors* were transmitted and received with wonderful fidelity and one of the onlookers remarked that one of the strawberries "looked so real" that it seemed that one of them could be picked out of the image!

One of the writer's main contentions is that with all this really remarkable television development, which was in actual operation 5 and 6 years ago, we, in this country, should be miles ahead of the point at which we now find ourselves. But in fact—insofar as the radio public is concerned—*we have no television!*

(Continued on page 45)

A Low-Power Rack-and-Panel Xmitter

(*Continued from page* 27)

volts at 3 amperes and one 2.5 volt winding, capable of supplying the 2B6 and the two 46's. The filter is an ordinary "brute force" affair using a 30 henry choke and two 1000-volt oil condensers, (one 1 mf. and one 2 mf.). With this power supply the transmitter gives a very "clean" note and all reports have been T9X. A 50,000-ohm voltage divider and bleeder is used and this is tapped in the center at 25,000 ohms. The low voltage tap feeds the plate of the small triode in the 2B6, which is the crystal oscillator. This *power supply* delivers 600 volts under full load of 150 milliamperes. Four toggle switches are used in the power supply and break the high voltage, the low voltage, the B minus which cuts off all D.C. and one in the primary for cutting off the entire power unit. These are all mounted on the panel, together with the 0-200 ma. scale milliammeter. The meter reads the current of the final amplifier or the modulator, depending upon where the plug is inserted.

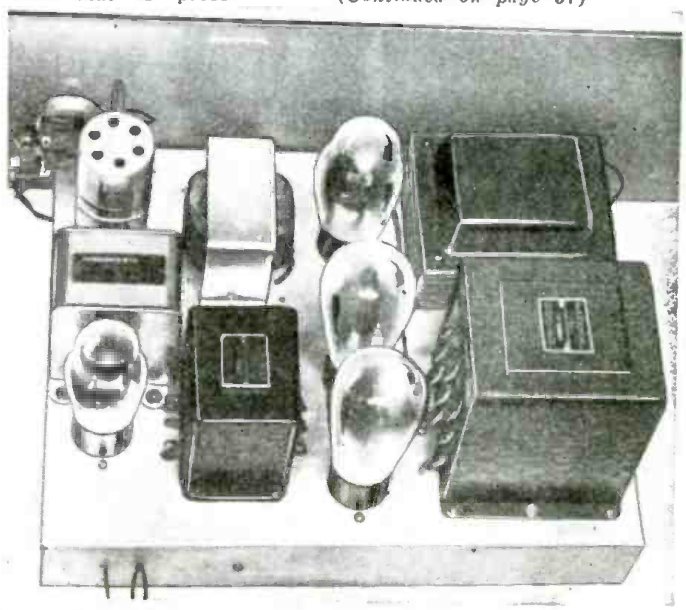
The modulator which is entirely adequate to modulate this transmitter 100 per cent for phone use, employs a pair of 46's in class "B." Starting from the microphone we have a 57 *speech-amplifier* which in turn drives the 2A5, which is the driver stage for the two 46's.

Microphone

Connections are shown for a double-button carbon mike. The crystal mike gives excellent quality minus the carbon hiss which is present in all carbon microphones and its use is recommended wherever possible. The single 57 feeding the 2A5 will give just enough amplification for the crystal mike, if one talks within 6 inches of it. For greater pickup it is advisable to use a 56 resistance coupled between the 2A5 and the 57. For the carbon mike the 57 alone will suffice. The 300 henry audio choke in the 57 plate circuit provides better gain over the usual resistor. The 2A5 was used because of its high output with relatively low input. The pentode usually renowned for distortion does not prove harmful at voice frequencies; after all, Hams don't broadcast music! All reports on phone were "excellent quality" and that is proof enough. Separate battery bias is used for the 2A5 and this helps the quality as well as increasing the output somewhat. While the two 46's in class "B" have slightly higher plate voltage on them than the tube manufacturers recommend, a single pair have been run this way for the past 6 months and exhibit no signs of weakening. This high plate voltage produces considerably more audio output than if they were run with the usual 400 volts. A switch is incorporated in the "B" plus lead of the 46's, to cut them off when standing by for the other station. Choke and condenser coupling is used between the modulator and the class "C" amplifier, so that the final amplifier plate current does not flow through the secondary of the class "B" transformer.

Previous articles have described the "tuning up" for code transmission, we will now

(*Continued on page* 57)



The complete modulator including its power supply.

How Soon Shall We Have Television?

(*Continued from page* 43)

A "New Deal" for American Television

The question of how soon shall we have television for the American public is, therefore, practically unanswerable at the present time. It has been reported several times in the past 2 years, that one of the large radio companies would put their perfected cathode-ray television receivers on the market, and "start the ball rolling"—but so far as any definite word from any of the American radio business leaders is concerned, they will say nothing definite.

One of the best hopes for an early break in television for the public seems to lie in a Government subsidy, which could be later paid back to the Government, and as already pointed out, some immediate action in the development and application of television would help to start factories going and help us to catch up with the television activities of our British and German friends. What the writer and many others who have been in close touch with American television would like to see, would be a rebirth of the activity shown a few years ago on the part of the smaller television and radio companies, who started doing a very creditable job with *mechanical scanning* systems. Furthermore, there is nothing to stop these companies from procuring the services of competent engineers who could devise for them new systems of cathode-ray scanning or its electro-mechanical equivalent, for it is foolishness to believe that all of the real genius in television engineering is encompassed within the brains of possibly half a dozen engineers in the employ of two or three large radio concerns.

The 2-Tube UDAR A.C.-D.C. Receiver

(*Continued from page* 13)

loosened because the interference from local broadcast stations usually causes the set to be useless where the first stage is untuned. If the condenser is adjusted to minimum capacity there should be no trouble.

Alden Plug-in Coil Data

Meters Wave-length	Grid coil turns	Tickler turns	Distance between 2 coils
200-80	52 T. No. 28 En. Wound 32 T. per inch.	19 T. No. 30 En. Close wound (CW)	⅛"
80-40	23 T. No. 28 En. Wound 16 T. per inch.	11 T. No. 30 En. C. W.	⅛"
40-20	11 T. No. 28 En. 3-32" between turns	9 T. No. 30 En. C. W.	⅛"
20-10	5 T. No. 28 En. 3-16" between turns	7 T. No. 30 En. C. W.	⅛"

Coilform—2⅛" long by 1¼" dia. 4-pin base.

PARTS LIST FOR UDAR SET

1—50,000-ohm ½ watt resistor, Lynch.
1—500-ohm ½ watt resistor, Lynch.
1—2 meg. ½ watt resistor, Lynch.
1—50,000-ohm ½ watt resistor, Lynch.
1—250,000-ohm ½ watt resistor, Lynch.
1—2500-ohm 1 watt resistor, Lynch.
1—1000-ohm wire-wound 20 watt resistor, Aerovox.
1—50,000-ohm potentiometer, Electrad.
5—1/10 mf. by-pass condensers, Sprague.
2—.0001 mf. mica condensers, Aerovox.
1—.0005 mf. mica condenser, Aerovox.
1—.006 mf. mica condenser, Aerovox.
2—.5 mf. by-pass condenser, Sprague.
1—100 mf. variable ("postage stamp") condenser, ICA.
1—.00014 mf. variable condenser, Hammarlund.
2—8 mf. electrolytic "filter" condenser.
1—30 henry 40 ma. filter choke.
1—toggle switch, ICA.
1—set of plug-in coils, Na.Ald, (Hammarlund).
2—2.5 mh. R.F. choke, Hammarlund.
1—325 ohm A.C.-D.C. line-cord, 2—7-prong wafer sockets, Na.Ald.
1—6 F 7 RCA Radiotron Tube.
1—12 A 7, Sylvania Tube.
1—Crowe "airplane-type" dial.
1—Drilled and sprayed metal chassis and cabinet; Supertone.
1—Antenna ground terminal strip; 1—phone terminal strip, ICA.

Correction Notice

On page 756, April issue 2-35 mmf. Midget Variable condensers were listed. This should have read "350 mmf."

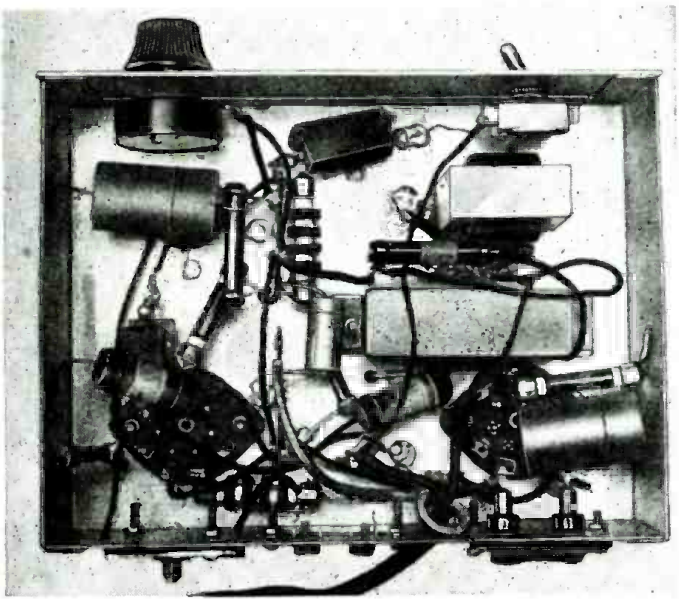
He Calls for Help

To those who have written me regarding a circuit of the Triplex-2:

So many requests have come to me for this circuit, about 175 in fact, that I found it impossible to draw diagrams by hand fast enough.

I have had mimeographed copies made so that I can fill all requests, but the outlay of cash on my part runs so high that if any of you desire copies bad enough I simply must ask you to send me 10c to cover my costs and postage.

RICHARD B. DUGDALE,
c-o Box 66, Anaheim, California.
Member, S-W League.



Cut at left shows bottom view of UDAR A.C.-D.C. receiver. It works on 110 volts and has its own power supply and rectifier. It can be built at a very nominal cost and will prove especially satisfactory, as extensive tests have demonstrated.

New 5-Tube Set Works Speaker

(*Continued from page* 25)

voltage on alternating current to a considerable extent and thus to obtain close to maximum output from the tube. Hence, it can readily be seen that although many radio receivers employ the 43 tube as an output tube, there will be considerable variation in the results shown, depending on just how well the circuit has been designed. As a rectifier the Space Explorer uses a 25Z5 tube in the conventioned arrangement.

The Space Explorer employs the Cisin A.C.-D.C. circuit which permits universal operation from any alternating source of supply, regardless of frequency and from any direct current source.

Filtering is accomplished by means of a 30-ohm filter choke, together with the field of the dynamic speaker, with high capacity electrolytic condensers connected across both the chokes. Reduction of voltage to the proper value for filament supply is obtained by means of the resistance in the line cord. This method is preferable to the use of a resistor in the set since it keeps the heated resistor away from delicate parts such as electrolytic condensers which might be affected by the heat.

The five plug-in coils are designed to cover the band from 9½ to 550 meters. The use of the plug-in coil has been found by the writer to be far preferable to the use of switches, since there is a complete elimination of lengthy wires with consequent reduction of losses. Stated even more bluntly, this means that the set which uses plug-in coils can reach out and bring in many distant stations which are utterly unobtainable on a set using a switching arrangement which is so commonly found in high-priced models.

The Space Explorer is provided with a long wave assembly unit arranged in the form of two special mica condensers and a flexible lead. To bring in long-wave stations, a special coil is provided which is plugged into the space of the regular coils. When the flexible lead is connected to one of the fixed condensers, the set will tune from 500 to 850 meters; when it is connected to both condensers at the same time, the set tunes up to 2,000 meters. Hence, it is possible to cover the complete range from 9½ meters to 2,000 meters with a single variable tuning condenser.

While the Space Explorer has been designed primarily for highest efficiency in bringing foreign stations, it is an excellent broadcast set and when used in this connection it is so sensitive that in many localities a wire less than a foot in length is sufficient for an antenna. The quality of the reproduction is very good and there is a complete absence of hum. Where conditions are favorable for distant reception, the background noise is very much lower than that commonly found in sets which use ten and sixteen tubes and this is a further advantage as regards circuit simplification.

The Space Explorer uses a regenerative circuit because this is more sensitive than a nonregenerative one. In other words, nothing has been disregarded in the effort to obtain maximum distance-getting ability.

The controls are three in number: there are the station selector, the combined regeneration control and switch, and the antenna control. This latter is used not only for the purpose of separating strong local stations, but also for getting an additional tuning adjustment in the case of distant stations.

The Space Explorer is available in kit form for the set constructor and also as a laboratory tested instrument for those who are more interested in listening-in than in set construction. An attractive two-tone cabinet can be obtained for this receiver.

Regenerative Booster Peps Up Weak "Sigs."

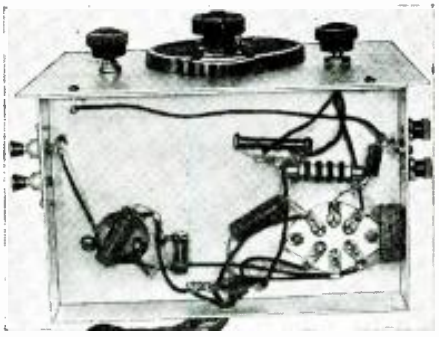
(*Continued from page* 11)

The Circuit

The circuit used is of the so-called *electron-coupled* variety and was used for the sole purpose of convenience, inasmuch as the plate was left free to provide the output to the receiver. It will be seen by referring to the diagram that a separate coil is used for the cathode circuit, rather than tap the grid coil. This was done in order that the biasing resistor and its associated by-pass condenser could be placed in the low potential side of the circuit where, if a tap was used, the resistor and condenser would be in the cathode side of the circuit. Of course a grid condenser and gridleak could have been used in the conventional manner but we prefer the method shown in the diagram. Aside from the above-mentioned facts the circuit resembles a regenerative detector with parallel voltage feed and minus the plate by-pass condenser which removes the R.F. from the plate circuit. We want the R.F. to be present in the plate circuit, that is why we use no by-pass condenser. This R.F. is to be fed into the input circuit of the receiver.

Regeneration Control

Regeneration is controlled in the usual manner by varying the screen-grid voltage. This is about the only workable method left to use, because we have dispensed with the plate by-pass condenser which is usually the alternative method of controlling regeneration. The number of tickler or cathode turns should be kept as low as possible, consistent with smooth operation. If we have too many turns in this coil the screen-grid voltage will be too low



Bottom View of "Booster"

with the tube in a *non-oscillating* condition and result in lack of sensitivity. (Incidentally, readers experiencing *weak* signals on their regenerative receivers take note.) Doublet antennas cannot be successfully used with a 1-tube regenerative booster; a nonregenerative stage ahead of it would be necessary. It seems foolish to put the most insensitive tube *first*, although this is being done every day in all types of receivers. Like putting the cart before the horse—or are we wrong?

The construction of this booster is not at all difficult and even the most inexperienced S.-W. fan should be able to obtain results. Wire it as shown in the diagram and make sure that all connections are correctly made and soldered thoroughly.

How It Is Used

Make all leads as *short* as possible; long leads never did a piece of radio apparatus any good. An antenna "change-over" switch is incorporated in this booster, so that it can be shut off and the set used without it. In many cases the booster is unnecessary. For instance, there is no reason for having the booster running when tuning in a short-wave station, or when the operator is searching for stations or tuning across the band. The booster is just another control and should be left off until a station is located, or until the receiver is tuned to the approximate frequency of the desired station. After the station has been located, the booster can be brought into play and a decided increase in signal strength will be immediately noticed. The reason we advise leaving the booster off until it is really needed, is because any station that can be tuned in with the booster will be heard loud enough to locate at least. In other words, the booster won't bring in stations that are absolutely inaudible without it. It does however "bring up" those stations which are heard, but which are too weak to be easily understood.

The regeneration control of the booster should be advanced till it is very near the point where the tube will break into oscillation. The setting of the regeneration control will depend upon the weakness of the received station. Do not operate it with the regeneration control so far advanced that the tube frequency breaks into oscillation with static crashes or other disturbing noises. The background noise is amplified terrifically when the tube is just on the point of oscillation. This regeneration control can also serve as a volume control to a certain extent.

Background Noise?

Does the booster reduce background noise? Well, that is dependent upon what we really mean by that question. The booster actually increases the background noise but the ratio between the signal and the background noise is in favor of the wanted signal. Therefore we can say that the booster is a decided advantage, inasmuch as we can bring the wanted station up to a level that our set will efficiently cope with.

This booster is very selective and tunes rather critically, especially when we operate it close to the point of oscillation. The closer to the oscillating point it is adjusted, the sharper it becomes! So tune as carefully as you can and set the regeneration control at a point that gives best results. This adjustment will depend on the strength of the station you want to receive and the level or degree of the background noise.

Parts List for Booster

1—140 mmf. tuning condenser, National.
1—35 mmf. Isolantite trimmer, Hammarlund.
1—.1 mf. by-pass condenser, Sprague.
1—1 mf. by-pass condenser, Sprague.
1—.0005 mf. mica condenser, Aerovox.
1—2.5 M.H. R.F. choke, National.
1—set of 4- or 5-prong plug-in coils, Na-Ald (5-prong for band-spread).
1—50,000 ohm potentiometer, Electrad.
1—100,000 ohm resistor, Lynch.
1—1000 ohm resistor, Lynch.
1—6-prong Isolantite socket, National.
1—4- or 5-prong Isolantite coil socket, National.
1—antenna switch SPST.
2—antenna ground binding post strips.
1—tube shield, Hammarlund.
1—National dial, type B.
1—metal chassis and panel, Blan. (Korrol.)
1—4 wire power cable.
1—R.C.A. Radiotron tube, for type see text.

Na-Ald Plug-in Coil Data

Meters Wave-length	Grid coil turns	Tickler turns	Distance between 2 coils
200-80	52 T. No. 28 En. Wound 32 T. per inch.	19 T. No. 30 En. Close wound (CW)	⅛"
80-40	23 T. No. 28 En. Wound 16 T. per inch.	11 T. No. 30 En. C. W.	⅛"
40-20	11 T. No. 28 En. 3-32" between turns	9 T. No. 30 En. C. W.	⅛"
20-10	5 T. No. 28 En. 3-16" between turns	7 T. No. 30 En. C. W.	⅛"

Coilform—2¼" long by 1¼" dia. 4-pin base.

Cash for Your Ideas!

We are looking for "New S-W Receiver Designs! Tell it to the Editor!

Efficient Modulator Unit for 30-Watt Transmitter

(*Continued from page* 24)

in the plate circuit of the final amplifier. A 0-300 ma. milliammeter acts as a visual modulation indicator.

The power supply consists of the transformer T4, and 83 mercury-vapor rectifier, the chokes T5 and T6, the filter condenser C9 and C10 and the bleeder resistor R10. Filament current for the tubes is provided by two low voltage windings on T4. The 83 rectifier, with its low voltage drop of only 15 volts, gives the power pack the good regulation necessary for class B service, with its widely varying current requirements.

The 57, the 56, and the first 46 receive their plate voltage through individual series dropping resistors, R5, R8 and R9 respectively. These also function as decoupling resistors and completely prevent coupling effects through the common power supply. The by-pass condensers C1, C2, C6, and C7 chase the A.F. plate current components back to cathode or filament. These simple precautions give the entire amplifier a rock-bound stability that is reflected in its beautifully clean operation.

Because crystal microphones are now relatively inexpensive, and their quality and convenience make them ideal for amateur purposes, this Lafayette modulator unit was designed for them. The mike is simply hooked across the input posts and that's all there's to it; no messing with preamplifiers or anything else.

The over-all gain of this modulator unit is 110 db., with a hum level of minus 50 db. The frequency response, as determined by test with an RCA beat frequency oscillator, is uniform to plus or minus 1½ db. from 60 to 17,000 cycles. While this is an excess of amateur requirements, it assures the user of absolutely perfect modulation in the voice frequency range. "Broadcast quality," the goal of every phone Ham, is easily achieved with this outfit.

The mechanical construction of the modulator unit is made clear in the accompanying photographs. The heavy audio units, transformers and chokes, are lined up along the back of the chassis, with the tubes in front. Note that the 57 is fitted with a shield to cut down external noise pickup, which can be serious with a high-gain amplifier.

In the center of the front panel are the plate milliammeter and the gain control. On the left, the microphone jack; on the right, the line switch.

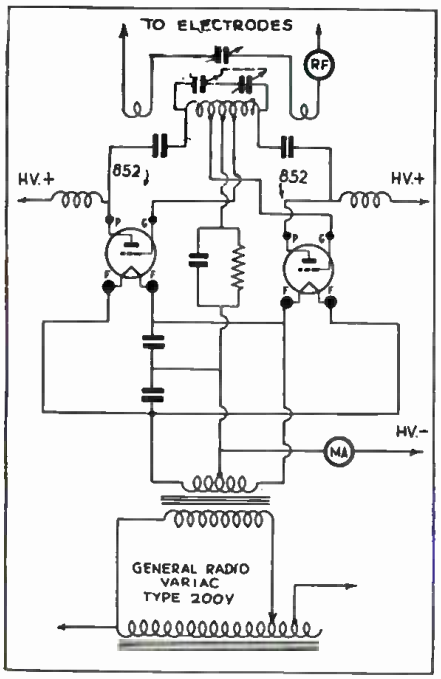
The electrical values of all parts are given in the accompanying table.

Modulator Unit Parts List

R1—5 megohms, ½ watt
R2—¼ megohm, ½ watt
R3—1 megohm potentiometer
R4—2 megohms, ½ watt
R5—200,000 ohms, ½ watt
R6—5000 ohms, ½ watt
R7—100,000 ohms, 1 watt
R8—50,000 ohms, 1 watt
R9—5000 ohms, 20 watts
R10—30,000 ohms, 50 watts
R11—1500 ohms, 1 watt
R12—5000 ohms, ½ watt
C1—½ mf., 500 volts
C2—1 mf., 500 volts
C3—.1 mf., 600 volts
C4—5 mf., 50 volts
C5—½ mf., 600 volts
C6—1 mf., 500 volts
C7—1 mf., 500 volts
C8—5 mf., 50 volts
C9—8 mf., 600 volts
C10—8 mf., 600 volts
C11—5 mf., 50 volts
T1—Interstage A.F. trans.
T2—Class B input trans.
T3—Class B output trans.
T4—Power transformers.
T5—15 henry filter chokes
T6—15 henry filter chokes.

Short Waves Help Glands

(*Continued from page* 10)



Hook-up of S-W Diathermy Apparatus of the type used by Dr. Kepperling.

to 3 amperes, for from 1 to 15 minutes duration, in any one day constitutes the technic. Dose and length of the treatment as given is arrived at according to the indications in each separate case. This method I have named the *U.S.W. sedative technic.* The 3-meter wave appears to be the most satisfactory in a large percentage of the above class of patients, and 3 to 5 minutes the average time.

Stimulation, or what I like better, *activation,* is indicated and used for such glands as do not secrete sufficiently to maintain the proper reciprocal relationship with the chain of hormones. Where this state of affairs exists, commonly spoken of as a *hypocrinism,* such glands are treated to a wavelength of from 6 to 10 meters, the output of energy varying according to each case, and from 1 ampere to 2 amperes for from 5 to 15 minutes, the average being about 8 meters for 10 minutes. No more than one such radiation to such gland is given during any one day.

While as yet no rigid rule can be intelligently laid down as to the frequency of the treatments, I am convinced that wavelengths of 6 meters or less are *accumulative,* and should be used with the same care, and with as full appreciation of this very active form of energy, as we have learned by bitter experience, to be careful and exacting in our dosage of the X-rays.

Indeed, when we better understand this U.S.W. therapy, it will not be the least surprising to me if we should then look back on the above dosage with much the same horror of the ignorance displayed as we today view the early hazards in the use of the X-ray.

In more than 200 cases I have used the U.S.W. therapy, without a single burn or other observable injury to any patient. But one noticeable disturbance of any nature has been witnessed; in that case a temporary fainting spell occurred in a high-strung neurotic, lasting however but a few moments. No further fainting was seen in more than ten succeeding treatments given the pituitary gland. Her recovery was rapid and she has since remained in fair health.

This article deals entirely with my own experience with these waves; reports from abroad record unfavorable findings that I believe due to three main causes, to wit: using apparatus unsuited to medical use; second, too heavy dosage for too great a length of time, and too frequent treatments and improper wavelength, and perhaps cases where U.S.W. was contra-indicated.

This article devoted to U.S.W. therapy in endocrinology is not intended to convey the idea that I find no other use for these waves, for in most cases whether I am dealing with a hypercrinism, a hypocrinism, or a mixed condition, I also apply them to other parts, or organs; using electrodes such as illustrated.

This more general form of treatment helps to overcome congestion, pain, etc. Equally important, is that due attention should be given to the patient's diet, exercise, habits and such factors as make for a well-balanced life.

There should be a proper evaluation of the mental side. These things ignored may spell the difference between success and failure. Again have I found that a "mental clean-up" must be made before recovery is possible. In other words, while this field of energy promises to yield results far beyond our fondest expectation, it is not to be looked upon as a possible cure-all, or as a modality that will supplant everything else. Indeed, only in the hands of well-qualified physicians, trained in the use of Nature's finer forces, can it be expected to be productive of the greatest good with the least amount of danger.

Electrodes

No. 1 is a spinal electrode 3x18 inches; No. 2 is 10x12 inches, used for chest or abdomen; No. 3 is a circular electrode made of hard rubber and copper used on bladder or breast treatments; No. 5 is a 5x2 inch roller-shaped electrode for such locations as the armpit, prostate area, etc.; No. 6 a vaginal electrode; No. 7 is a 4x5 inch used on smaller areas; No. 8 an electrode for radiating the ductless glands; No. 9 is a rectal electrode; No. 10 is a cutting or coagulating electrode.

Construction Details of Electrodes

Electrodes Nos. 1, 2, 4 and 5 consist of double thickness 60-mesh copper screening, covered with one layer of one-fourth inch felt, with cable connection and a loose, changeable cover.

No. 7 uses a 5x4 inch sheet of aluminum, one-sixteenth of an inch thick, also covered with felt and a changeable cover.

No. 6 is made of a 5-inch rod of aluminum with a hard rubber ring over its center to keep it equally distant from the glass tube through which it passes, and which allows for spacing between electrode proper and the tissues.

No. 9 is constructed in the same manner as No. 6, except that the glass cover is pointed at the distal end.

No. 8 is the ductless gland electrode, also shown on the adjustable stands beside the apparatus. The electrode proper consists of one circular plate of aluminum of a circumference of 15 inches, one-sixteenth inch thick; centrally is superimposed one-half inch plates with rod terminating five-sixteenths of an inch from the opening of the cone. The hard rubber cone acts as means of gauging the gland area to be treated and protects patient from accidental contact with the metal. It is so mounted that it can be moved or adjusted to any position quickly and maintained in that position while treatment is given.

No. 10—Cutting electrode—is made from three-sixteenth inch diameter silver wire covered by hard rubber.

Cables connecting machine with any electrodes are heavy flexible cord, covered with heavy pure rubber. All cords have at cord ends a telephone plug, and all electrodes have a suitable receptive jack covered with heavy flexible rubber tubing. This makes for simple connections and changing.

The circuit used in the apparatus is shown in diagram. Two type 52 tubes are used, giving a maximum measured output at 6 meters of 250 watts without ex-

ceeding the plate dissipation ratings of the tubes. The output circuit is a floating series resonant circuit, inductively coupled to the plate tank inductance. This arrangement gives an unusual freedom from useless standing waves on the electrode feed wires and a concentration of field between electrodes rather than between each electrode and ground. The wavelength range of this particular apparatus is 3 to 10 meters without changing coils. At 3 meters it is essential that the length of the electrode feed wires be not over 2½ ft., otherwise it will be found impossible to resonate the output circuit at this wavelength.

$500.00 Prize Contest

(*Continued from page 8*)

Pilot Radio Corp., Long Island City, N.Y.

1—11-tube Pilot Super-Dragon All-Wave Receiver

World Trotter Radio Labs., New York City.

1—Prof. Band-Spread, Model DX-5 Receiver, in metal cabinet with dynamic speaker

Short Wave Craft, New York.

25—1-year subscriptions to SHORT WAVE CRAFT
12—Short-wave Manuals
25—50c Short-wave Books

Rules Pertaining to This Contest

1.—A suitable title is wanted for the front cover of the March issue.

2.—The title should be self-explanatory and should have in it some reference to radio, short waves, or both. It should be humorous, if possible.

3.—You may submit as many titles as you wish. There is no limit.

4.—Titles must be submitted on slips of paper size of a postal card, 3½x5½ inches, or you can send your title on a 1-cent postal card if you prefer to do so. Only one title must go on one sheet of paper. Use only one side of the paper. If the paper or postal card is larger than that size the entry will be thrown out automatically.

5.—Write in ink of typewrite the title; no penciled matter considered.

6.—Name and address must be given on each title, no matter how many you send in.

7.—This contest is open to everyone whether you are a newsstand reader of subscriber.

8.—From the contest are excluded employes of SHORT WAVE CRAFT and their families.

9.—The contest closes on Apr. 30, 1935, at which time all entries must have been received.

10.—The editors of SHORT WAVE CRAFT will be the judges of this contest, and their findings will be final.

11.—No correspondence can be engaged in on this contest, nor letters answered, nor the entries returned.

12.—In the event of ties the prizes tied for will be awarded to the contestants so tying.

Address all entries to TITLE CONTEST EDITOR, SHORT WAVE CRAFT, 99 Hudson Street, New York City.

The prizes will be sent from the radio manufacturers and radio firms to the winners at the end of the contest, and the results giving the winners' names will be published in our July issue.

YOU Can Easily

WIN

A S-W SCOUT TROPHY!

Have You Read the Simple Rules on page 19?

In Next Issue More "Ham" Articles—Don't Miss 'Em!!

Tiny Transceiver Talks 3 Miles!

(*Continued from page* 15)

with all batteries and tubes to make sure everything will go in and the cover close. This is especially necessary if other parts than those specified are used, as the quarters are close and one overlarge part will displace most of the others. Begin by putting in the "B" battery and the three flashlight cells and glue a strip to the case bottom to hold the "A" battery cells in place. This may be a strip of pressed-wood ½ in. high. Then place the two tube sockets and next the low frequency coils and the transformer.

The other parts such as jacks, filament rheostat and C.W. key can then be put in. The rheostat is on the bottom of the case, as there is no room for it elsewhere. It is of 3 to 6 ohms and if one cannot be obtained that is small enough, it may be omitted entirely; in fact, this is probably advisable.

Interruption Frequency Transformer

The interruption or low frequency transformer may be made of three 1⅛ in. squares of 1/16 in. fiber, bakelite, or even cardboard, on a bolt, with ½ in. diameter washers between so that the winding space is about ⅜ in. for the secondary and ¼ in. for the primary. The wire is No. 36 single silk-covered and 1400 turns are used on the secondary with 900 on the primary. The mounting bolt may be put in a hand drill held in a vise and the whole winding can be done in 15 minutes. When connecting into the circuit, the outside of the secondary goes to the switch contact, while on the primary, the inside end goes to the switch. This is very important in order to insure low frequency oscillation. Be sure both windings are in the same direction. The whole assembly should be dipped in melted wax or airplane dope and allowed to soak for ½ hour, then laid aside to dry thoroughly. This I.F. coil is mounted directly under the audio transformer and cannot be seen in the photographs.

Modulation Transformer

The audio transformer is a midget 3 to 1 type and may be a push-pull input if the straight 3 to 1 cannot be obtained. In this case the center tap of the secondary is disregarded.

A "mike" winding of 75 to 200 turns of the No. 34 single silk wire is needed on the transformer. This is put on by disassembling the core. The transformers usually have a protective layer of paper or thread over the winding and some of this may be removed if necessary to get enough room. Put on as many turns up to 200 as possible.

The output choke is made from the winding of an old Baldwin speaker unit. The winding is removed and strips from an audio transformer core are inserted and bent over, top and bottom, to form a closed core. A strip of tape is wrapped around to hold the core tight. This is not a very efficient choke but it suffices in this case since the current through it is only about 2 milliamperes.

R.F. Choke and H.F. Coils

The R.F. choke is made by winding a ¼ in. bakelite rod for a space of 1 in. with No. 30 D.S.C. wire. The wiring is started on the sockets and the I.F. coil and each part put in as it is wired. The original set was completely wired with No. 18 bare tinned copper wire, over each piece of which was slipped the smallest diameter spaghetti obtainable. This assures a neat job with good insulation in crowded quarters.

The H.F. (high frequency) coils are wound with No. 18 bare wire and are *self-supporting*. The diameter is ⅜ in. inside and each coil has six turns. They must be spaced to cover the 5-meter band. The coupling coil in the center has two turns, one end of which is grounded. A clip on the lead from the antenna condenser can

be fastened on either the coupling coil or the plate tank allowing a variety of antennas to be used.

In putting the set into operation, the most difficult point is to get the detector to "super" or hiss over the entire band. The transmitting section is foolproof, if hooked up correctly. The condenser across the secondary of the I.F. coil is the only critical value and may need considerable cut and try. It is best to start with 90 volts plate voltage and when the detector is operating well, cut it to 45. The setting of the variable gridleak has considerable bearing on the proper operation and must be frequently changed. If the set refuses to super-regenerate and a low-pitched buzz is heard, more capacity is necessary across the I.F. coil secondary.

A very sensitive single button "mike" (microphone) is needed for transmission. The one on the hand set shown is very satisfactory. Two separate plugs may be built into one for use with the hand set, thereby making possible the use of headphones for noisy locations. Also for code, separate phones are needed as the "mike" must be held up to one phone to get the audio howl which is keyed for C.W. work.

An antenna consisting of a section of telescoping aluminum tubing about 5 feet long when extended is quite efficient and handy, and when used the coupling coil is connected to the circuit. A low reading milliammeter such as 0 to 5 is plugged into the tip jacks and the set tuned till the plate current rises, indicating resonance. For receiving, almost any piece of wire will suffice.

New Tubular Condensers

● Newly designed paper dielectric tubular condensers have just been made available by the Tobe Deutschmann Corp. Features of this new series of condensers are:

1. Metal end discs are soldered to the condenser terminals to provide a path for quick radiation of solder iron heat. (A very important detail, as this prevents "Opens" and "Intermittent" condenser operation.)

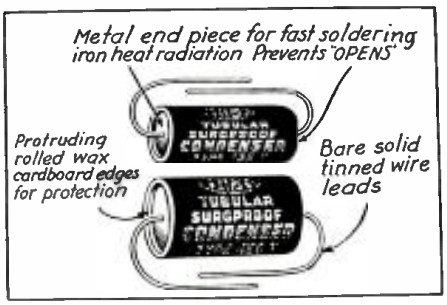
2. Dual impregnation of the entire condenser assembly to prevent moisture absorption.

3. Extra heavy double-tinned wire lead terminals.

4. The outside foil terminal is plainly marked. (It is important in short-wave use that this terminal be at ground potential.)

5. Extremely compact physical sizes.

It is claimed by the manufacturer that the new condensers are priced extremely low, consistent with high quality of materials used, true voltage ratings, and the extreme care taken in manufacture.



New condensers of extra sturdy construction. No. 277.

Next Month
SEE
Article on
Beginner's
S-W Receiver.
2 Tubes Do the Work of 3!

Short Wave Scout News

(*Continued from page 18*)

ule is on Sundays from 8-9 a.m. was heard regularly but with poor volume. HVJ is very good on their Saturday 10-10:30 a.m. broadcast. Their broadcasts start with the bells from St. Peter's Cathedral, followed by "Stazione Radio-citta del Vaticano, HVJ." The studio clock can be heard ticking throughout the entire program.

I am indebted to my very good friend, Mr. Chas. Lamm, of Philadelphia, Pa., for the following note: "In his recent verification from YDA, NIROM states, that they are at present transmitting on a wavelength of 98.68 meters, using 10,000 watts. This is in conjunction with YDA on 6120 kc. They are particularly interested in receiving reports on the 98-meter station."

Two new stations heard at this post were HC2JSB, located in Guayaquil, Ecuador, and XECW located in Mexico City. The HC2JSB transmitter used a frequency on 7700 kc. XECW was heard on approximately 5990 kc. The former is heard with poor modulation and weak signal strength. This station is a "30-watter."

When the short waves have little to offer, we all tend to stray to the broadcast band. Just how feasible medium waves are for long distance reception was vividly proved to me. While tuning the B.C. band I accidentally tuned to where KOA is usually heard. To my surprise, there was LR5, "Radio Excelsior," coming in with R8-9 signal strength. This transmission was on Feb. 12 from 2-3 a.m. The broadcast was arranged by the *Newark Radio Club*.

How many listeners are hearing the 11 p.m. transmissions of HJ4ABL? The station is heard with wonderful volume and clarity. The owner of the station is Dr. Alberto Estiaba. The address is P. O. Box 50, Manizales, Col. The chief announcer, Mario Jaramillo, gives nightly descriptions of Colombian points of interest. Senor Jaramillo speaks English very fluently. Listen for him.—Geo. D. Sallade, Sinking Springs, Pa.

Report from Oliver Amlie, Philadelphia, Pa.

● I BELIEVE I am the "happiest man" in the world, for I still have been able to hold my record of completing my fifth month's test on VK2ME-3LR-3ME, ending February 1935. I thought these stations were "goners" for the month of February, as this month was the hardest month on Australian reception. Have heard amateurs in N.Z., Santo Domingo, Poland, and 48 States of the U. S.

VQ7LO, 49.50 meters, heard on Monday-Wednesday, from 12:30-2:00 a.m., also ZHI on 49.09 meters heard same days from 1-2:00 a.m.

KEG, 32 meters, Bolinas, Calif., is not a new station; this station has been on the air for months, and sends programs to KGMB of Honolulu, Hawaii, daily from 7:30-9:30 p.m., heard first on Saturday from 7:30-8:30 p.m.

VE9AS, 46.07 meters, or 6425 kc. heard on Feb. 6, sending programs from 4-5 p.m., also on Thursday 7:30-9:00 p.m., irregular as yet; address University of New Brunswick, Frederickson, N.B., Canada, input of power 100 watts.

OAX4D, 51.09 meters, Lima, Peru, is on the air Monday-Wednesday-Saturday from 9:00-11.30 p.m., have heard them for weeks at these hours.

HAS3, 19.52 meters, Budapest, Hungary, is still on the air Sunday 8-9 a.m.; this station reads news reports at 8:45 to 9:00 p.m. in English.

VK3LR, 31.32 meters, is on the air as follows: week days except Sunday and Monday from 3:15 to 7:30 a.m., Wednesday from 4:00 to 6:00 p.m., and week days from 9:00-12 midnight. The announcer of VK3LR took me "off my feet" when he announced they would be on the air at 7:00 a.m. Thursday, which still would be 4:00 p.m. here Wednesday.

VK3ME has been closing down of late on Saturday at 7:00 a.m.

Australian test from October to February. Here are the reports of reception when Australian stations were at their peak of reception on this 1-year test. October-November-December best heard 6:15-8:45 a.m.; January, 7:15-8:30 a.m.; February, 7:15-8:15 a.m. These are the actually best hours Australian stations have been heard by this post on VK2ME-3LR-3ME; signals are heard 15 to 25 minutes before reception is available for logging. (E.S. time.)—Oliver Amlie, 56th City Line Ave., Overbrook, Philadelphia, Pa.

Official Listening Post Report of Heinie Johnson, Big Spring, Tex.

● ON Feb. 9, HJ1ABG furnished an hour of real entertainment while broadcasting special programs to Chicago Radio Club. They are at Barranquilla, Colombia, and come in on your dial between GSA and VE9GW. Seem to have plenty of power.

On this same night, HP5B at Panama City also broadcast a program to Chicago Radio Club. They signed off at 9:27 C.S.T. This station is worth listing among your good ones as they are certainly original in their manner of announcing, etc.

Either we have a new station coming on the air in Mexico City or XEW, with its short-wave transmitter XEBT, is playing a joke on the world. It sounds a mighty lot like XEBT's announcer to us, but they announce as XECW.

Have heard a new one by call-name of YNQA but can't tell you where they come from. Also one on 51 meters which sounds like he was saying H1DJ; not a very strong signal and it apparently has to travel over a long stretch of mineral deposits before reaching this post. Things like that often affect quality of a signal.

In that respect, here is an example worth noting. A friend of mine here who has a small 2-tube set has heard VK2ZX testing on three different occasions. He lives about two miles from this post, down in a valley while we are located on a hill. Looks like we ought to hear whatever he can and yet we cannot hear this signal in the least, using sensitive sets and several different antenna systems.

We find old man "Noise" creeping back on the 49-meter band as February draws to a close. Signal strengths are still good but the noise is beginning to hurt quality.

The 31-meter band is just average with a pretty high "noise level" here in West Texas. EAQ on 30 meters is good, as is also LSX on 28 meters. Some signals on 25 M. band come through well, while others are very disappointing. The 19-meter band is not very interesting at present if you listen from 8 to 9 a.m. C.S.T., and again at 5:30 to 6:30 p.m., C.S.T. Perhaps there are other hours worth while on this band, but we haven't found anything but W8XK and W2XAD at the above hours. DJB and FYA as well as GSF and HVJ formerly were heard during early morning hours. In fact, these were "swell" between 8 and 9 a.m.

We had our ears to the phones of Mr. J. A. Worcester, Jr.'s 3-tube DX-er described in January issue of SHORT WAVE CRAFT, when the West Coast Hams began sending out the news of the Navy dirigible dropping in the brine. Seems nothing very serious can happen anywhere in this world of ours but what the news flashes over the *short waves* right away. April will afford good 31- and 25-meter reception this year for Central States' listeners. The 14-meter band also is best during April at this Post.

Frank Hogler of Brooklyn, N. Y., Reports

● RECEPTION on the short waves for the past month was excellent.

HB9B—42.14 M. Was heard Feb. 13 from 5 to 6 p.m. having a special program in English, they are also scheduled on Thursdays 4 to 4:30 p.m., E.S.T. The address of this station is Radio Club of Basel, Box 1, Basel, Switzerland.

FZS—25.02 M. Was heard often 7:15 a.m., E.S.T., calling Paris.

CT1AA—50.17 M. Was heard testing on this wave Feb. 6, 5 p.m. on, they asked for reports as to how this frequency was received, they were heard better than on the regular 31.25 meter wave.

RKI—19.94 M. Is heard often on Sundays 9 to 9:30 a.m., E.S.T., Feb. 10. This station was broadcasting a special program for the U.S.A., and was announced by a lady in English.

KKH—39.89 M. Hawaii was heard 11:30 p.m., E.S.T., Feb. 14. Talking to KNRA. They also relay KNRA on Tuesdays.

ZFB—29.83 M. Heard Feb. 2, 10:45 a.m. Talking to WNC.

SEE PAGE 43 FOR SPECIAL SUBSCRIPTION OFFER ON SHORT WAVE CRAFT

OXY—49.50 M. Are sending out a test program 8:15 to 8:45 p.m., E.S.T., every Sunday. the signals consist of letters of the alphabet, sent in code, at intervals of about 1 minute.
YV6RV—49.75 M. Heard often 5 to 7 p.m., E.S.T. They announce as the "La Vos de Carabobo. Valencia, Ven.
HAS3—19.52 M. Heard Sundays 8 to 9 a.m, signal, a little low.
HAT—55.56 M. Also heard Sundays 8 to 9 p.m. Classical music with singing and announcements in English and Hungarian by lady—quite well received.
KEE—38.89 M. Heard regular 11 p.m., E.S.T. on.
JVM—27.93 M. Heard Jan. 25, 4:15 p.m. talking to KWU, California.
YNLF—50.30 M. Heard talking Feb. 3, 7 p.m. on. They announce as the "La Vos de Nicaragua."
The following stations were well received and regular: YDA—49.02 M, 3 to 6:30 a.m., E.S.T. JVT—44.44 M., 5 to 7:30 a.m., E.S.T. VK2ME, VK3ME, VK3LR—5 to 7 a.m., E.S.T.

O. L. P. Report from Angelo Centanino, Freeport, Pa.

● HJ4ABA are the call letters of the new Colombia station on 50.15 meters. The 25-meter band has been very good lately up until 4:30 p.m., E.S.T.

I2RO Rome is back on their old wave of 25.4 meters and are heard up until 10 a.m. Also 2RO's broadcast on 30.67 meters Mondays, Wednesdays and Fridays from 7:45 to 9:15 p.m., E. S. T., for South America is coming in much better.

CT1AA did quite a bit of testing this month one evening around 5:30 p.m. They tested on 50.17 meters and one morning around 10:30 a.m. on 24.99 meters.

HIH, 44.12 meters, has been a R-7 to 8 this month when they were on.

YV6RV and HP5B both on 49.75 meters are a regular mix-up when they are both operating around 8 p.m.

HJ4ABM on 49.15 meters, which has been testing since January is now on a regular schedule 6 to 7:30 p.m. They had a very novel way of getting call letters; they held a contest for the best call letters and the winner was awarded a camera.

Edward G. Schmeichel's Report from Illinois

● THIS month has been exceptionally good. Stations that have never been heard before have been rolling in with unbelievable volume. The stations in Asia and South America have been coming in like a "ton of bricks" at all times! Here are some tips:

HVJ—Vatican City, Italy, has now changed their schedule; they are on the air now every day at 10-10:30 a.m., E.S.T. Each day a different language is used. They are heard with a bang and they send a "sweet veri." They are on 19.84 meters or 15.11 megs. Tune for them.
FZS—Saigon, French Indo-China, Asia, on 25.02 meters has been heard phoning France on Saturday between 12:30 p.m. and 2:00 p.m., E.S.T. They are almost on top of RNE—so you cannot miss them.
ORK—Ruysseleyde, Belgium, must have changed their schedule. They are now on the air 1:30 to 3:00 p.m., E. S. T. on 29.04 meters.
ZFD—Hamilton, Bermuda, was heard twice broadcasting music. They were heard on Feb. 12. They sure have a strong "wallop" in their signal. They are on the same wave as ORK.
I2RO—Rome, Italy. This station is on the air on Mondays, Wednesdays and Fridays, beginning at 6:00 p.m. on several different wavelengths. They broadcast music and announce frequently in English. They send a very beautiful "veri," as I have received one from them about Feb. 23.
VWY—Poona, India. This station has been phoning England quite frequently on a wavelength of 17.10 meters or 17.54 megs. They have been heard at this post with an R6-7 signal. They are on from 3:00 to 8:00 a.m., E.S.T.

On Feb. 10, this "Listening Post" had the supreme thrill of hearing VUB—Bombay, India. The time was 6:45, C.S.T. They had an R7 signal. Their quality was very good. I held them for about a solid hour after which time they closed down. They are on the same wavelength as W1XAZ. I sent them a report and am awaiting verification.

The South Americans on the 46-51 meter band have still been pouring in "night after night!" Boy, Oh! Boy! you can identify them every night! They seem to "pop up" from nowhere. Some of them have very enjoyable programs, while others are simply ruined due to bad interference from the powerful Americans. A very selective band-spread receiver must be used to separate these, and then a tough job will still be experienced. Verifications received this month have been from stations:

HJ1ABB—They send a new card. Call letters in red with white background.

HVJ—Showing the radio towers in the Vatican. The card is oil-painted.

YV5RMO-TI4AC-I2RO-DJC, were others received.

Short Wave Scouts

(*Continued from page 19*)

"veris" must be for stations *outside* of the United States. Letters or cards which do not specifically verify reception, such as those sent by the Daventry stations and, also by commercial telephone stations, will not be accepted as verifications. *Only letters or cards which "specifically" verify reception of a "given station," on a given wave length and on a given day,* will be accepted! In other words it is *useless* to send in cards from commercial telephone stations or the Daventry stations, which state that *specific* verifications will *not* be given. Therefore do not put such stations on your list for entry in the trophy contest!

7.—This is an *international* contest in which any reader, no matter where located, can join. It is allowable for SHORT WAVE SCOUTS to list stations in their own countries, if they desire to do so.

8.—SHORT WAVE SCOUTS are allowed the use of any receiving set, from a one-tuber up to one of sixteen tubes, or upwards, if they so desire.

9.—When sending in entries, note the following few simple instructions: Type your list, or write in ink, *pencilled matter is not allowed.* Send verification cards, letters and the list all in one package, either by mail or by express prepaid; *do not split up the package.* Verification cards and letters will be returned, at the end of the contest, to their owners; the expense to be borne by SHORT WAVE CRAFT magazine.

10.—In order to have uniformity of the entries, when writing or typing your list, observe the following routine: USE A SINGLE LINE FOR EACH STATION; type or write the entries IN THE FOLLOWING ORDER: Station call letters; frequency station transmits at; schedule of transmission, if known (all time should be reduced to Eastern Standard which is five hours behind Greenwich Meridian Time); name of station, city, country; identification signal if any. Sign your name at the bottom of the list and *furthermore state the type of set used by you to receive these stations.*

11.—Don't list amateur transmitters or code stations in this contest.

12.—This contest will close every month for the next twelve months on the first day of the month, by which time all entries must have been received in New York. Entries received after this date will be held over for the next month's contest.

13.—The next contest will close in New York, May 1.

14.—The judges of the contest will be the editors of SHORT WAVE CRAFT, and their findings will be final.

15.—Trophy awards will be made every month at which time the trophy will be sent to the winner. Names of the contesting SCOUTS not winning a trophy will be listed in Honorable Mention each month.

16.—From this contest are excluded all employes and their families of SHORT WAVE CRAFT magazine.

17.—Address all entries to SHORT WAVE SCOUT AWARD, 99-101 Hudson St., New York City.

FREE BATTERIES TO TROPHY WINNER!

● **The manufacturers of the well-known Burgess batteries have offered to furnish FREE one year's supply of batteries—all the batteries that the "trophy" winning set will need for a year—and providing it happens to be a Burgess Battery-powered set. A very fine offer indeed, and the editors are glad to pass on the good word to all of their embryo trophy contestants.**

All-Wave Adapter for Your S-W Receiver

(*Continued from page 22*)

struction of the adapter can be noted from the photograph, while the proper connecting procedure is at once noted from the schematic and picture-wiring diagrams. It is essential that the *oscillator* construction be adhered to rigidly, especially as regards the grouping of the parts. This construction is clearly shown in the photograph. It will be noted that the entire assembly exclusive of the input choke and antenna condenser is constructed as a detachable unit. The tube socket is mounted to the frame of the variable condenser and the remaining parts are wired directly by their terminals. When proceeding to build this set this *oscillator unit* should be constructed first.

The *oscillator coil* consists of 8¾ turns No. 14 bus-bar or enamelled copper wire wound to an outside diameter of ¾". The coil is self-supporting and is stretched to a length of 1½". The coil is tapped 3 turns from the *plate end* in order to provide a conventional Hartley hook-up. The mounting of the coil and its relation to the other parts in the oscillator unit needs no detailed comment as this information is clearly shown in the photograph.

The oscillator unit, when completed is mounted on a 9"x5" wood baseboard. The unsupported end of the tube socket can also be mounted on a bushing to facilitate the insertion and removal of the tube. It will be noted that the unit is mounted sufficiently back to eliminate "hand capacity" effects. Connection to the airplane tuning dial is made by employing an insulated shaft and flexible bushing. The antenna condenser, input choke and battery cable can now be mounted and the remaining connections made.

It is intended that a type 56 tube be used in this device, although the equivalent 6.3 volt tube, the 37, can be substituted if desired. If this device is to be used in conjunction with a simple regenerative receiver without R.F. amplification, the cathode connection of the detector tube which is normally *grounded* is disconnected and attached to the converter output, at the point indicated in the schematic diagram. If the receiver employs R.F. amplification, the converter is connected to the grid of the R.F. tube and the present grid connection removed. In addition, the cathode biasing resistor should be increased to 5,000 ohms; although in some instances this latter change is not necessary. The above assumes that the same power supply is used for the receiver and converter. If this is not the case, the B— terminals of the two supplies should be connected together.

To put the combination in operation, the receiver should be set to approximately 10 mc. as discussed above and the regeneration control advanced until the detector is just oscillating. The dial on the adapter is then turned until the condenser plates are nearly all-in at which point the carriers of broadcast stations should be heard. The regeneration control on the receiver is then "backed down" in customary fashion to clear up reception. If broadcast stations are not heard the receiver is tuned to too low a frequency, while if they come in before the oscillator condenser approaches its maximum value the receiver frequency should be decreased until this condition occurs.

Parts Required for All-Wave Adapter

L1—8¾ turns No. 14 bus-bar or equivalent, self-supporting, ¾" outside diameter, 1½" long. Tap at 3.
1 2—Hammarlund 85 mh. choke.
C1—2 turns insulated hook-up wire wound around grid end of L1.
C2—Hammarlund 350 mmf. (.00035 mf.) variable condenser, ML-23.
C3, C5—.004 mf. mica condensers, Aerovox.
C4, C6—.0001 mf. mica condenser, Aerovox.
L3—Hammarlund 2.3 mh. midget R.F. choke.
R1—20,000 ohm resistor, ½ watt.
1—Crowe Type 120 airplane-type dial.
1—9"x5" baseboard.
1—Hammarlund insulated shaft coupling.
1—1¾" bakelite extension shaft. I.C.A.
1—R.C.A. type 56 tube.
1—3 ft. length 4-conductor cable.

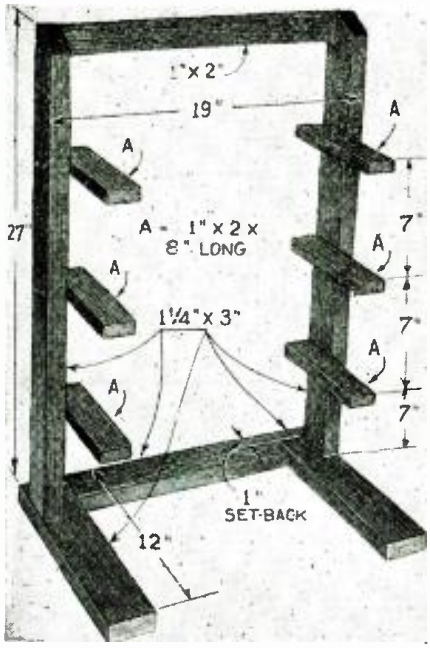
Low-Power Rack-and-Panel Xmitter

(*Continued from page 44*)

consider the tuning adjustments for phone transmission. Granting that the proper crystal is used which will permit operation in one of the phone bands, we proceed as though we were going to use code. The oscillator is adjusted for a *dip* in plate current and the amplifier portion of the exciter is neutralized. That is, if we are operating on the crystal frequency; then adjust the amplifier section to resonance with oscillator. Next plug the meter in the grid circuit of the final amplifier. The plate voltage of the amplifier should be kept off during these adjustments. Adjust the grid condenser of the amplifier until the grid current is highest. Now swing the plate tuning condenser and note whether or not there is a change in grid current; if there is, the neutralizing condenser should be adjusted until there is no change in the grid current. The amplifier is now neutralized.

The plate voltage can now be applied to the amplifier and the plate condenser adjusted until the plate current is at a minimum. The plate condenser should not be touched again. All adjustments will now be done with the antenna condensers in the "impedance matching" network.

Attach the antenna clip from the network to the second or third turn from the top of the plate coil; the plate voltage has been cut off of course. Now, set C2 to maximum



The above photograph clearly shows the construction of the wood frame together with the necessary dimensions.

capacity and as the plate voltage is applied to the amplifier, turn condenser C1 until a *dip* is noticed in the meter reading. Always set C1 so that the plate current is at minimum. Adjust C2 again until the current rises and readjust C1 for minimum reading on the meter again and repeat this procedure until the plate current is 100 milliamperes. The meter in series with the antenna will show that R.F. is going into the antenna; the amount of current indicated will depend upon the length of the antenna and should not be judged as indicating the power output. The modulator should now be turned on and as we speak into the mike there will be an increase in the reading of the antenna meter. This increase indicates the percentage of modulation.

When we hum a steady tone into the mike the *gain-control* of the speech amplifier should be adjusted until the increase in antenna current is only around 22 or 23 per cent more than the reading when no sound is made before the mike. It is very important—this increase in antenna current—because if it were to increase over the percentage mentioned above, there will not only be the danger of spoiling the quality of your speech, but it will cause undue interference with other amateurs. When adjusted properly, a phone transmitter should never be allowed to modulate over 100 per cent when a strong sound is made before the mike. Then while talking normally the average percentage of modulation will be around 80 per cent; that is, if one talks in an *even tone of voice*, with no undue rises in the level of the voice, when certain words are spoken. Be careful of your modulation and you will command the respect of your fellow Hams.

And just one more thing, don't whistle into the mike every time you turn it on. The antenna meter will show more modulation on a whistle than on voice, and besides being of no value for adjusting the transmitter—as we don't whistle at each other—it sounds horrible!

PARTS LIST FOR TRANSMITTER

RF. Power Supply

1—transformer with 600-0-600 Volts at 175 ma., 5 volts—3 amp., 2½ volts—6 amp., Kenyon.
1—30 henry 175 ma. filter choke, Kenyon.
1—2mf. 1000 volt condenser, Aerovox.
1—1mf. 1000 volt condenser, Aerovox.
2—25,000-ohm, 75-watt resistors, Aerovox.
1—4-prong socket, Na-Ald.
4—toggle switches, ICA.
1—0-200 ma. meter, Triplett.
1—7x19x¾ inch bakelite panel, ICA.
1—type 83V RCA Radiotron.

MODULATOR POWER SUPPLY

1—transformer with 600-0-600 Volts at 175 ma., 5 volts—3 amp., 2½ volts—6 amp., Kenyon.
1—30 henry 175 ma. choke, Kenyon.
1—2 mf. 1000 volt condenser, Aerovox.
1—mf. 1000 volt condenser, Aerovox.
2—10,000-ohm, 75-watt resistors, Aerovox.
1—4-prong socket, Na-Ald.
1—toggle switch, ICA.
1—0-200 ma. meter, Triplett.
1—7x19x¾ inch bakelite panel, ICA.
1—type 83V RCA Radiotron.
1—20-ohm ct. resistor, Aerovox.

PARTS FOR MODULATOR

1—aluminum base, see text, Blan. (Steel-Korrol).
1—microphone transformer (if carbon mike is used; none needed for crystal mike).
1—300 henry impedance, Kenyon.
1—class "B" input transformer, National.
1—class "B" output transformer, National.
1—15 henry 175 ma. choke, Kenyon.
1—250,000-ohm pot. with switch Electrad.
1—1000-ohm, 1-watt resistor, Lynch.
1—150,000-ohm, 1-watt resistor, Lynch.
4—.1 mf. condensers, Sprague.
1—1mf. 1000 volt condenser, Aerovox.
2—6-prong wafer sockets, Na-Ald.
2—5 prong wafer sockets, Na-Ald.
1—toggle switch, ICA.
1—single closed-circuit jack, ICA.
1—7x19x¾ inch bakelite panel. ICA.
1—22½ volt Burgess "C" battery.
1—A static crystal microphone (optional).
1—double-button carbon microphone (optional).
1—type 57 RCA Radiotron.
1—type 2A5 RCA Radiotron.
2—type 46 RCA Radiotrons.

We Want GOOD ARTICLES on 1-, 2- and 3-tube sets. Send us sketch or diagram of your set for approval. If it seems new, the Editors will at once advise you so you can send set in and write article. Let's hear from you!!

Ham Station a Pippin!

(*Continued from page 21*)

The frequency on 80 is 3,565 kc. 20 and 40 are worked from harmonics.
And 160 is 1,830 kc.
On CW430 watts input.
On Phone 165 watts input.

I hope I win a subscription to SHORT WAVE CRAFT. And I might say that there are four of us that "fight" for the first copy on the newsstand.

Wishing you all 73s and best luck for DX, From W1BSX of Roslindale, Mass.

ALBERT M. WENTWORTH
W1BSX.
W1DBR.
29 Cohasset St., Roslindale, Mass.

(Congratulations, Albert, on your very fine Ham station. We were very highly impressed with the extremely neat arrangement of your station and the businesslike appearance of the whole set-up. Let's hear from you again whenever you have new equipment which you think would be of interest to the readers of SHORT WAVE CRAFT.*—Editor.)*

"DUO-AMPLIDYNE" SWELL!

Editor, SHORT WAVE CRAFT:

Here's a line of praise for your *Duo-Amplidyne.* I think it is a swell little set and I am sending you a list of some of the stations I have received on the dandy one-tube "Wizard." The stations are: W8XK, HBL, WIXAZ. CJRX-CJRO, W2XAF, VE9GW, W8XAL, PRF5, W9XF, GSD, W2XE, GSB, DJB, DJD, DJA, DJC, EAQ.

I think that others who have built this set are as pleased as I am with it.

Many thanks for the benefits derived from SHORT WAVE CRAFT.

DAVIS H. CORKRAN,
2nd Ave. & B. St.
Glen Burnie, Md.

(The Duo-Amplidyne has made thousands of friends for SHORT WAVE CRAFT *and we are glad to hear that you too, Davis, have found it a very satisfactory little receiver. We hope to publish many more small "set specifications" in the coming issues of* SHORT WAVE CRAFT *which will even "outperform the Duo-Amplidyne.—Editor.)*

If you hear a new S-W Station and get its call letter, location, etc., tell the Editor about it!

Electrical and Radio School Celebrates 35th Anniversary

● One of the best known electrical and radio schools in the country is now celebrating the 35th anniversary of its entry into the field of specialized training for the electrical and radio industries.

H. C. Lewis, President of the Coyne Electrical and Radio School of Chicago, announced in connection with the celebration, that a complete course in Electric Refrigeration and Air-Conditioning has been added to the regular courses of training given by this nationally known school and that the new courses have attracted widespread interest from all over the United States and Canada.

Mr. Lewis said: "The air-conditioning course which we have added in connection with electric refrigeration has created a great amount of interest because of the crying need throughout this fast-growing industry for men with practical training as well as a thorough knowledge of the principles of air-conditioning. The Coyne School has expended many thousands of dollars in new equipment and a great number of students, convinced that air-conditioning is a business with a real future, are taking it up." The Coyne Electrical and Radio School now occupies a large building at Paulina and Congress Streets in Chicago which is devoted exclusively to their training shops and general offices. As an indication of the growing interest in specialized training to meet new conditions, Mr. Lewis reports an increase of 61 per cent in student registrations since the first of the year over the same period of a year ago.

Short Wave League Members

IDENTIFY THEMSELVES WITH THE ORGANIZATION

In order that fellow members of the LEAGUE may be able to recognize each other when they meet, we have designed this button, which is sold only to members and which will give you a professional appearance.

If you are a member of the LEAGUE, you cannot afford to be without this insignia of your membership. It is sold only to those belonging to the LEAGUE and when you see it on another, you can be certain that he is a member.

See page 62

Lapel Button, made in bronze, gold filled, not plated. prepaid..... 35c
Lapel Button, like one described above, but in solid gold. prepaid.....$2.00

Short Wave League

(Continued from page 36)

Federal Radio Commission demands a *code test* and is not going to change that particular regulation in any great hurry. Thus it seems to me that all this time spent in arguing and writing letters to your good magazine might be spent to good advantage in learning to copy "ten per."

I have been wondering whether it has ever occurred to this group of *no-code* men that one of the essential features of knowing the code is in order that the international distress signal might be recognized. It is hardly likely that an SOS would be sent on five meters, but a five-meter transmitter might be in a position to *interfere* with any important work that might be carried on, and an operator not knowing the code might continue to operate his station and by so doing cause considerable interference and possibly make any rescue work impossible.

Finally, after operating on five meters myself, I find that there are numerous stations on the air who are using ICW and lack of knowledge of the code would prevent contact with such stations, and in addition to causing a good deal of embarrassment, would deprive the operator of a good deal of pleasure that he otherwise would derive.

Hoping that your magazine keeps up its wonderful work, and thanking you for many of the interesting articles that I have read, I am, Very truly yours,

SOL SMITH,
Amateur Radio Station W1HNN,
70 Chester Street, Allston, Mass.

A "Hot" Argument Against "Code-less Ticket"

Editor, SHORT WAVE CRAFT:

Our club, the *Pikes Peak Amateur Radio Association*, wishes to register an emphatic protest against your plan of prevailing on the Federal Radio Commission to allow partially-reformed broadcast-hounds to operate on frequencies above 56 mc. without passing an examination in the International Morse Code.

Once 'phone-hounds are allowed to operate on one band without an International Morse Code examination, they will renew their blatant squallings to operate thusly on all bands. Soon all the punks and lids who are too feeble-minded to learn International would be on radiophone. Then they would outnumber the amateurs and could probably coerce the Federal Radio Commission to open *all* of every band to radiophones. That would mean the end of amateur radio; the amateurs *could not* operate through the 'phone interference, and the broadcast-hounds are not interested in *radio*—they merely want a plaything like their blankety-blank broadcast receivers; they want to *talk* to someone. What the heck do they think the A. T. & T. is for, anyway?

And why start these pseudo-amateurs out on 56 mc? That is the band that requires the most technical skill. If a sub-amateur class *must* be created, why not give them the 1.9 mc. band? That is most like the broadcast band they have formerly played with. If they were allowed to operate there, and were given a special type of call—say one with two numerals in it—to distinguish them from amateurs, then there would not be so much harm done. But no one wants such lids—apes who are admittedly too lacking in intelligence and initiative to learn so simple a thing as the International Morse Code, which even five-year-old children have readily mastered—turned loose to ruin radio for the real amateurs, the men who have painstakingly built up amateur radio to what it is today . . . the world's most entrancing hobby.

It may be argued that knowledge of the International Morse Code is not necessary for 56 mc operation. Perhaps no 56 mc pseudo-amateur would ever hear a distress message. But there will be plenty of I.C.W. stations on that band, and perhaps the "lids" would like to communicate with them, or to be able to understand their QRT when (and if) they had some QRR traffic. All colleges and high schools have certain required subjects and there are always some dunces who whine because they are compelled to take these. Nevertheless, educators agree that if the standards of education are to be upheld, the required subjects must be retained. Similarly, if the standards of amateur radio are to be maintained at their present high level, the code test, with its "weeding out" of the mentally unfit, must be retained. The mental rating of the persons upholding your plan is evinced by their use of "Best 73's" at the end of their letters. Any kindergarten child knows better than to say "best best regardses." Any person too mentally deficient to learn the proper use of "73" is surely too lacking in intelligence to be allowed to play with radio transmitters, for then his idiocies would cause interference to hundreds of persons.

73,

The Pikes Peak Amateur Radio Association,
CARL C. DRUMELLER, W9EHC-KWJ,
Secretary-Treasurer,
411 North Cedar Street,
Colorado Springs, Colo.

P. S. The majority of the members of our club do not hold an operator's license, yet the resolution authorizing this letter was passed without a dissenting vote. That shows what men who are not yet licensed amateurs think of your plan; they resent the implication that they are not just as capable as the 35,000 or 40,000 men who at present hold operator's licenses.

The League Welcomes the "Dawn Patrol" from Boston

Boston, Massachusetts,

SHORT WAVE LEAGUE,
99 Hudson St.,
New York, N. Y.

Mr. Hugo Gernsback, Executive Secretary.
Dear Sir:

Received your letter today and am very pleased to find that the League has accepted the Patrol as a member. I assure you that we shall be at the service of the league at all times and shall be very pleased if you will call upon us at any time for duty.

You ask in your letter for details for publication purposes. I believe the following is what you wish.

The Patrol is a life saving unit chartered by the American National Red Cross and operating from the A.R.C. base at the Boston Metropolitan Chapter. The Patrols' headquarters are at 108 Blake Street, Mattapan, Mass. The mailing address is Mattapan Station, Mass. The Patrol is made up of two crews: Junior and Senior. It operates on the waters of Massachusetts Bay and its immediate vicinity. It also does land duty in emergency cases. We operate from Midnight to Noon of each day, three receivers at three points. One at H.Q's., one at Dorchester, Mass., and one aboard ship. The ship at present is called the S.S.S. *Annapolis*. This name is to be changed to the *Dawn Patrol!*

We have also two transmitters, one at H.Q's. and one aboard ship. As yet call letters have not been assigned. I shall forward same to you as soon as received. Both receivers are R.C.A.'s and the transmitters are constructed from Atwater Kent equipment.

During the other 12 hours at various times, possibly every three hours, the sets are also operated. We cover the following bands—Amateur bands from 60 meters up, Police band, Commercial Airways band, and Naval Emergency bands.

The Senior crew consists of 26 men, and the Junior crew of 11 men. The Patrol is uniformed and is equipped for emergency of any type. Note—Practically all the members of the Patrol operate receivers for short waves and would be interested in any data that would pertain to amateur radio.

Thanking you once again for your decision in accepting the Patrol.

I am respectfully yours,
CAPT. LIONEL K. BERIG,
Dawn Patrol L. S. C.

Swappers . . .

The names here listed are those of readers who would like to hear from other short-wave "fans." There is no charge for this listing—just sign your name and address on a post-card and address it to "SWAPPERS" in care of this magazine.

L. H. ALLEN, Jr.
Rt. 1, Weiser, Idaho

VINCENT ANYZESKI
WIFWN, 19 Pardee St., New Haven, Conn.

CARL ASHWORTH
Altamont Hotel, Fayetteville, W. Va.

V. BABINTZEFF
c/o J. J. Tschurin Co., New Town, Harbin, Manchoutikuo

JOHN J. BARCH
92 Pine St., Natrona, Pa.

DAVID BENTON
3 Pequossette Rd., Belmont, Mass.

JOSEPH R. BLACKWOOD
1467 E. McLemore Ave., Memphis, Tenn.

RICHARD BOHN
204 Western Ave., Chillicothe, Ohio

MAX BOLTON
322 E. Fulton st., Farmington, Ill.

THOMAS BOWLER
110 Allyn St., Holyoke, Mass.

RUTH BRENTON (160 Phone)
4110 N. Mason Ave., Chicago, Ill.

BRADLEY BURKHALTER
709 North St., Rome, Georgia

HARRY G. BUTLER, W9OVF
P. O. B. 32, South Whitley, Indiana

ERNEST CHESLOW
2134 58th St., Brooklyn, N. Y.

ALVA H. CLARK
Port Arthur College, Port Arthur, Tex.

RICHARD P. COHEN
275 28th Ave., San Francisco, Cal.

W. J. COVEYDUCK, JR.
33 Hamilton St., St. John's, Newfoundland

GLENN DANIELS
4047 39th Ave., Oakland, Calif.

VIRGIL DARNELL
Emerson, Ga.

HERMAN DEGE
Herron, Mich.

SETH DEMPSEY
Fayetteville, W. Va.

GEORGE DIMTROFF
445 W. Hopocan Ave., Barberton, Ohio

VINCENT A. DOLVA
Hawley, Minnesota

JAMES DORAN
Doran's Drug Store, Nixa, Mo.

ROY EADS
R. 1, Box 150, Harougate, Tenn.

STEVEN G. ELLIS
R. F. D. 2, Monroeville, N. J.

VERNON ESGAR
R. F. D. No. 3, Box 558, Independence, Mo.

GARRY FELLOWS
422 State St., Charleston, W. Va.

R. DE WITT FRASER
46 Cedar St., So. Norwalk, Conn.

FRANK GENOA
312 Spearman Ave., Farrell, Pa.

RICHARD GERBERDING
R. R. 2, Vida, Mont.

JOSEPH F. GIGLIOTTI
311 Main St., Boonton, New Jersey

CLARENCE GILLEY
1739 N. Sycamore, Hollywood, Calif.

CHARLES H. GIRT, JR., W8KYK
620 Slack St., Steubenville, Ohio

PAUL GOFF
511½ Market St., Parkersburg, W. Va.

GERALD E. GONDERINGER
Box 446, Atkinson, Nebr.

DAVID GRIFFITH
R. R. 1, Box 206, Moline, Ill.

ROMAN GRYGIEL
90 So. Bend St., Pawtucket, R. I.

MARTIN HABADA
5817 W. 16th St., Cicero, Ill.

ERNEST HACK
Perkins St., Route 3, Box 42, Bristol, Conn.

RICHARD E. HALEY
1715 Rutland Ave., Springfield, Ohio

CHARLES EMERSON HALL
Box 183, Hernando, Miss.

WILFORD HATTON
R. R. No. 1, Alexandria, Ind.

ROBERT HAWLEY
607 S. Stough St., Hinsdale, Ill.

HECKLER RADIO LAB.
522 Wymore Ave., Route 3, Iron Mountain, Mich.

LESTER D. HERITAGE
R. F. D., No. 1, Box No. 148, Swedesboro, N. J.

HOWARD L. HILL
600 Spring Ave., Steubenville, Ohio

K. L. HOERCHER, W9KQY
Elroy, Wisconsin

JOHN W. HOLZWARTH, W8LKS
165 West Main, Alliance, Ohio

RALPH HOUCK
134 Amanda St., Clyde, Ohio

ROBERT D. HOYT
Wakeman, Ohio

PAUL M. HUMMER
720 Wright Ave., Alliance, Ohio

GORDON HYMANN
Remsen, Ia.

ANDREW A. JANIGA, JR., W9HPQ
4002 Fir St., East Chicago, Ind.

JACK JEWETT
94 County Rd., Barrington, R. I.

ALBERT JOHNSON
Bon Secour Route, Foley, Ala.

WALLACE ALLEN JOHNSON
P. O. B. 247, Coldthwaite, Tex.

D. JONES
44 Randwick Cres., Lower Hutt, Wellington, New Zealand

R. L. JONES
1558 Westwood Ave. S. W., Atlanta, Ga.

R. KAULFUSS, JR.
32 Gardner St., Glasgow, W. I., Scotland

W. M. KEEL
510 Locust St., Abilene, Tex.

KENNETH KEGG
C/O Valley Radio Service, 32 Venture St., Pittsburgh, Pa.

VIVIAN D. KINARD
Big Spring, Texas

STANLEY M. LADAGE, W3BYK
923 N. 27th St., Camden, N. J.

JOE LANDMESSER
c/o January & Wood Co., Maysville, Kentucky

RICHARD H. LEONARD
15901 Elderwood Ave., E. Cleveland, Ohio

JORMA LESKINEN
1655 Catalpa Ave., Chicago, Ill.

STANLEY LEWIS
2408 So. 3rd St., Philadelphia, Pa.

TED LILJESTRAND
11 Farrington St., W. Caldwell, N. J.

LOUIS G. LIND
802 E. Main Cross St., Edinburg, Ind.

HAROLD MacDONALD
85 Richmond St., Rochester, N. Y.

WESLEY McCANN
678 S. Clarkson, Denver, Col.

DAVID McCLELLAND
P. O. Box 949, Masontown, Pa.

BRUCE T. McCOUN
39 West 84th St., New York City, N. Y.

BILL McCUNE
10 Linderman Ave., Kingston, N. Y.

JAMES T. MACKAY
4939 Denny, N. Hollywood, Calif.

ELMER T. MAGOWAN
16 Ambler Rd., Merchantille, N. J.

JAMES MANDAKIS
340 W. 49th St., New York City

JOHN E. MANION
204 East 6th St., Maysville, Ky.

MYRON MARTIN
Route 1, Apple Creek, Ohio

GEORGE MESKINIS
873 N. 26th St., Philadelphia, Pa.

EDWIN C. MILLER
138 Cliff St., Naugatuck, Conn.

JACK R. MILLER
1826 S.E. 54th Ave., Portland, Ore.

NORMAN H. MILLER
35 Linden Park, Buffalo, N. Y.

JOHN MOUAWOD, JR.
138 Congress St., Newark, N. J.

JOHN MULDOON
128 Arlington Ave., Jersey City, N. J.

AUGUST A. NICKEL
837 Van Duber St., Stapleton, Staten Island, N. Y.

EUGENE OBIDZINSKI
438 18th St., Niagara Falls, N. Y.
STEVE T. OGDEN, VE3VI
100 Essa Rd., Allandale, Ontario, Canad
EDWARD J. ORESSEY
1119 Blair Ave., Scranton, Pa.
LOUIS PAPP
185 Orland St., Bridgeport, Conn.
A. C. PARSONS
Box 312, Route 1, Salem, Va.
CHESTER D. PAWELCZAK
3117 LaGrange St., Toledo, Ohio
MATTHEW PAWLAK
1529 Montana St., Chicago, Ill.
GEORGE ALLEN PERL
2712 W. Master St., Phila., Pa.
OSCAR R. PETERS
1393 Fairview Ave., North Bergen, N. J.
ALONZO B. PHILLIPS
Glover, Vermont
RAY H. POWELL
Route 2, Buffalo, Mo.
EARL R. RAPP
Box 85, Gregg, Pa.
WALTER RAY, JR.
185 13th Ave., Newark, N. J.
BEN REIDKO
50 Russell St., Brooklyn, N. Y.
GERALD E. REMLEY
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ALFREO G. ROACH
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RUSSELL ROBINSON, W8LPZ
701 Boyce St., Urbana, Ohio
IRA E. RODINSKY
356 Orillis St., Providence, R. I.
CARL A. ROGERS
Route 3, Sycamore, Ohio
FRANK ROGOWIN, W8HOW
415 Brownell Ave., Lorain, Ohio
STANLEY ROGOWSKI
2539 E. Ontario St., Philadelphia, Pa.
ALBERT SACHS
57 Porges St., Randfontein, Transvaal, South Africa
TED SCARROW
644 Second Ave. W., Owen Sound, Ont., Canada
JOHN H. SCHULKEN
25 Warren St., Charleston, S. Car.
MURL C. SCHUMACHER
1210 Washington St., Eldora, Iowa
EUGENE SCIORA
1437 Lincoln Place, Brooklyn, N. Y.
EVERETT SHIRLEY
R. F. D. 2, Tarentum, Penna.
ALVIN C. SIEGLER
73 Ellwood St., New York City
GEORGE SISLER
500 W. 11th St., Bristow, Okla.
HOWARD J. SMITH
Box 110, Good Hope, Ill.
ROBERT T. SMITH
R. F. D., No. 2, Sac City, Iowa
JOHN SOCOLICH
9 Weber's Walk, Coney Island, Brooklyn, N. Y.
EDWARD SOMMERFELD
4358 W. 48th St., Cleveland, Ohio
DELLNER O. SOPHER
Steger, Ill.
JOHN SORENSEN
3301 Waterbury Ave., Bronx, N. Y.
CHARLES SOVATSKY
169 W. Ridge St., Nanticoke, Pa.
DREW STEFAN, JR., W8GEI
Brier Hill, Pa.
JAMES A. SUTTON
306 Keefer St., Willard, Ohio
LAWRENCE SWENSON
Box 265, Eden, dia.
KENDALL E. THOMPSON
11 Willow St., Holyoke, Mass.
L. E. THOMPSON
314 E. Vance St., Tyler, Tex.
PETER THORPE
4 Beech Tree Lane, Bronxville, N. Y.
HARRY D. TITCOMB
Route 1, Box 20, Chelmsford, Mass.
JOHN TURVINE
518 Albany St., Dayton, Ohio
GABRIEL J. ULJON, W8IFY
523 Curry Ave., St. Mary's, Pa.
CARROLL UTERMAHLEN
114-15 141st St., Jamaica, N. Y.
RUDOLPH J. VRANICH
409 N. Holland Ave., Rankin, Pa.
SAMMY WATKINS
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CLIFTON WEBBER
1323 Stewart Ave., S. E., Roanoke, Va.
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Route 3, Westport, Conn.
MARTIN WEINBERG
526 Pearl St., Camden, N. J.
D. W. WEIR
P. O. B. 322, Huntington Park, Calif.
BILL F. WEST
133 Whitfield St., Dorchester, Mass.
W. H. WHITE
Box 74, Harrison County, Tippecanoe, Ohio
R. L. WHITTINGTON
Route No. 1, Elbert, Colo.
CARR WICKERT
3343 Beech Ave., Baltimore, Md.
DANIEL WILMER
1522 Willow St., Norristown, Pa.
DICKSON WITMAN
41 Peters Pl., Red Bank, N. J.
HAROLD FREDERIC WOLFE
116 Jay St., Lock Haven, Pa.
ED. WRIGHT
53 Silver St., Patchogue, L. I., N. Y.
THOMAS W. YORK
204 W. Raymond Rd., W. Hartford, Conn.
LESLIE ZEISS
2818 Tenn. St., Paducah, Ky.
HELEN ZWIGAITIS
2236 Indiana Ave., Philadelphia, Pa.

CLASSIFIED

Advertisements are inserted at 5c per word to strictly amateurs, or 10c a word to manufacturers or dealers. Each word in a name and address is counted. Cash should accompany all orders. Copy for the June issue should reach us not later than April 5th

ELECTRICAL SUPPLIES

INSULATION, WIRE, VARnishes, supplies, etc. Send 3c stamp for bulletin. Auto Power, 414 S. Hoyne Ave., Chicago.

GENERATORS

TWENTY PRACTICAL AND LOW cost changes converting Ford, Dodge, or Chevrolet generators into new generators and motors 100-500 watt capacity, direct or alternating current, with six to 400 volts for radio operation, power, light, or welding. Also instructions for rewinding armatures; 350 definitions of electrical terms, etc. All in new, revised book with simplified instructions and illustrations. Endorsed by thousands—Only $1.00 postpaid. Auto Power—414 S. Hoyne Ave., Chicago.

SLIGHTLY USED ALTERNATING and Direct Current Motors and Generators at half price. Motor & Generator Supply Co., 4516 Clifton Ave., Chicago, Ill.

"HAM" OFFERS & WANTS

SELLING STATION—AC, TRF, Receiver Black crackle cabinet.—210 transmitter, with XPDC power supply, complete in neat rack. Both $40.—W3EKS, Linwood Ave., Ardmore, Pa.

SWAP: 5300 DIFFERENT FOREign stamps. Catalog $235.00. 520 United States. Catalog $5.00 for A.C. Short Wave Set. Description please. C. H. Allen, 328 Greenwood Ave., Decatur, Ga.

FOUR TUBE ALL ELECTRIC Doerle short wave receiver. Wired, tested to receive Broadcast, Foreign, and Amateur Stations on loudspeaker. Complete with tubes, coils, power supply, speaker, cabinet, $15.50. Stanley Balkowski, 12 Marble Terrace, Hastings-on-Hudson, N.Y.

INSTRUCTION

SHORT WAVE FANS, YOU'LL get more stations by using our World Time Chart. Gives the time for 111 countries, operating schedule for 45 stations. Send 15c to Lines & Fitzpatrick, Box 366, Marion, Indiana.

LOG MORE FOREIGN STATIONS, by making a small change in your present antenna. Complete instructions 50c. George Lehlahi (W3DGS), 7012 Gillespie St., Philadelphia, Penna.

QSL—CARDS—SWL

QSL CARDS, NEAT, ATTRACtive, reasonably priced, samples free. Miller, Printer, Ambler, Pa.

QSL'S 75c A 100, 2 COLOR. W9DGH, 1816 N. 5 Ave., Minneapolis, Minn.

SHORT WAVE LISTENER'S, QSL cards. Cartoons. Special Time Offer. Stamp for Samples—W8ENN, 1827 Cone, Toledo.

SWL—QSL CARDS—SAMPLES—W1AZF, 83 Orange St., Roslindale, Mass.

SHORT WAVE COMPONENTS

PLUG-IN COILS, WOUND ON tube bases 30c per set. Regular forms 50c. 6 prong 75c. Noel, 809 Alder, Scranton, Pa.

4 BAKELITE PLUG-IN COILS, tall forms 15-200 meters Set—.50 2 broadcast .40 "List Free." Short Wave Accessories, 121 Derby Street, Valley Stream, New York.

CHOKE COILS—4 SECTIONS—low all-distributed capacity—light weight—excellent for plate circuit—prepaid anywhere in United States. 25c—address Box 315, Idaho Springs, Colorado.

2-1 SHORTWAVE COIL PLANS 25c, Johnson, Box 816, Spokane, Wash.

SHORT WAVE RECEIVERS

SHORT WAVE RECEIVERS MADE to order. Send full details of receiver for our reasonable prices, also parts and kits at greatly reduced prices. Radio Service, 1666 Edgerton St., St. Paul, Minnesota.

FOR SALE: NEW AND USED Shortwave Receivers, Sets of all types, Hammarlund—Nationals—Scotts—Patterson, etc. Edward Schwarz, Dumont, N.J.

IN STOCK: SUPER-SKYRIDERS $59.95 prepaid, Skyriders $39.95 prepaid, Silver SCs $74.70 prepaid, PR-12s, RAIE9Ds, Nationals, Hammarlunds. Trade-in your receiver. Code machines rented. Write. Henry Radio Shop, Butler, Mo.

NEW LONG DISTANCE CRYSTAL Receiver. Blueprint. 17 Others 25c Coin. Particulars Free. Modern Radiolabs, 151-A Liberty, San Francisco.

SHORT WAVE SUPPLIES

CRYSTALLINE CRACKLE PAINT—a new single coat air-dry finish—jobbers name and folder sent free. Campbell Radio Specialties, Ann Arbor, Michigan.

TELEVISION

TELEVISOR COMPLETE $10.00. Arthur Pohl, 2131 Palms Ave., Detroit, Mich.

TRANSCEIVERS

TRANS-CEIVERS ONLY $3.95—Guaranteed. New one-tube sets. Foreign reception, local transmission. For detailed information write—The Burks Radio Company, 1148 W. Decatur St., Decatur, Illinois.

TRANSMITTING EQUIPMENT

RADIOPHONE TRANSMITTERS, Twenty Five Watt, $25.00. Manufacturers of Receivers, Transmitters, Transformers, Chokes, Inductances, Monitors, Frequency Meters, Condensers, Crystals, Power Supplies. Construct any type Receiver or Transmitter to order. Prices on Request. Ensall Radio Laboratory, 1527 Grandview St., S.E., Warren, Ohio.

• • • SHORT WAVE ESSENTIALS

FOR MEMBERS OF THE SHORT WAVE LEAGUE • • •

A FEW WORDS AS TO THE PURPOSE OF THE LEAGUE

The SHORT WAVE LEAGUE was founded in 1930. Honorary Directors are as follows:

Dr. Lee de Forest, John L. Reinartz, D. E. Replogle, Hollis Baird, E. T. Somerset, Baron Manfred von Ardenne, Hugo Gernsback, Executive Secretary.

The SHORT WAVE LEAGUE is a scientific membership organization for the promotion of the short wave art. There are no dues, no fees, no initiations, in connection with the LEAGUE. No one makes any money from it; no one derives any salary. The only income which the LEAGUE has is from its short wave essentials. **A pamplet setting forth the LEAGUE'S numerous aspirations and purposes will be sent to anyone on receipt of a 3c stamp to cover postage.**

FREE MEMBERSHIP CERTIFICATE

As soon as you are enrolled as a member, a beautiful certificate with the LEAGUE'S seal will be sent to you, providing 10c in stamps or coin is sent for mailing charges.

Members are entitled to preferential discounts when buying radio merchandise from numerous firms who have agreed to allow lower prices to all SHORT WAVE LEAGUE members.

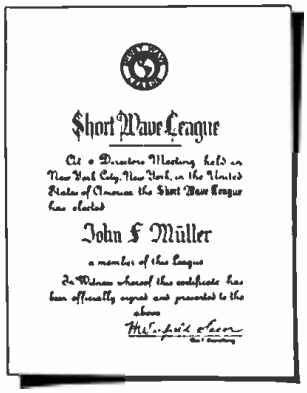


Illustration of engraved free membership certificate

SHORT WAVE ESSENTIALS LISTED HERE SOLD ONLY TO SHORT WAVE LEAGUE MEMBERS

They cannot be bought by anyone unless he has already enrolled as one of the members of the SHORT WAVE LEAGUE or signs the blank on this page (which automatically enrolls him as a member, always provided that he is a short wave experimenter, a short wave fan, radio engineer, radio student, etc.).

Inasmuch as the LEAGUE is international, it makes no difference whether you are a citizen of the United States or any other country. The LEAGUE is open to all.

Application for Membership SHORT WAVE LEAGUE

SHORT WAVE LEAGUE 5-35
99-101 Hudson Street, New York, N. Y.

I, the undersigned, herewith desire to apply for membership in the SHORT WAVE LEAGUE. In joining the LEAGUE I understand that I am not assessed for membership and that there are no dues and no fees of any kind. I pledge myself to abide by all the rules and regulations of the SHORT WAVE LEAGUE, which rules you are to send to me on receipt of this application.

I consider myself belonging to the following class (put an X in correct space): Short Wave Experimenter ☐ Short Wave Fan ☐ Radio Engineer ☐ Student ☐

I own the following radio equipment:

Transmitting .....

Call Letters.....

Receiving .....

Name .....

Address .....

City and State.....

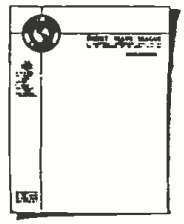
Country .....

I enclose 10c for postage and handling for my Membership Certificate.

SHORT WAVE LEAGUE LETTERHEADS

A beautiful letterhead has been designed for members' correspondence. It is the official letterhead for all members. The letterhead is invaluable when it becomes necessary to deal with the radio industry, mail order houses, radio manufacturers, and the like; as many houses have offered to give members who write on the LEAGUE'S letterhead a preferential discount. The letterhead is also absolutely essential when writing for verification to radio stations either here or abroad. It automatically gives you a professional standing.

A—SHORT WAVE LEAGUE letterheads, per 100..... 50c

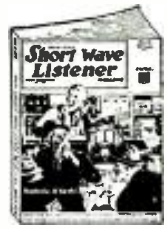


A—50c per 100

OFFICIAL SHORT WAVE LISTENER MAGAZINE

The finest magazine of its kind ever published—totally different in get-up and contents from any other. Contains the largest listing of short wave stations in the world, up-to-the-minute, including "Police," "Television" and short-wave stations, as well as a special list of the star short-wave stations with their frequencies and call letters. Also contains photos and descriptions of short-wave broadcasting stations in various parts of the world with photos of short wave studio artists—How to locate "weak" distance stations, and other hints for the "short-wave listener"—Question and Answer Department for the "listener"—Silver Cup Trophy for best photo of readers' listening "Posts," etc

B—Official Short Wave Listener Magazine.....Prepaid 25c



B—25c per copy

RADIO MAP OF THE WORLD AND STATION FINDER

The finest device of its kind published. The world's map on heavy board is divided into 23 sections, while the rotary disc shows you immediately the exact time in any foreign country. Invaluable in logging foreign stations. Also gives call letters assigned to all nations. Size 11"x22".

C—Radio Map of the World and Station Finder.....Prepaid 25c

GLOBE OF THE WORLD AND MAGNETIC COMPASS

This highly important essential is an ornament for every den or study. It is a globe, 6 in. in diameter, printed in fifteen colors, glazed in such a way that it can be washed. This globe helps you to intelligently log your foreign stations. Frame is of metal. Entire device substantially made, and will give an attractive appearance to every station, emphasizing the long-distance work of the operator.

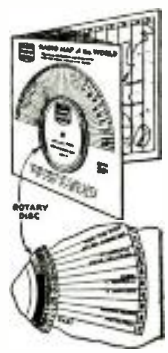
D—Globe of the World.....Prepaid $1.25

SHORT WAVE LEAGUE LAPEL BUTTON

This beautiful button is made in hard enamel in four colors, red, white, blue and gold. It measures three quarters of an inch in diameter. By wearing this button, other members will recognize you and it will give you a professional air. Made in bronze, gold filled, *not plated*. Must be seen to be appreciated.

E—SHORT WAVE LEAGUE lapel button.....Prepaid 35c

EE—SHORT WAVE LEAGUE lapel button, like the one described above but in solid gold.....Prepaid $2.00



C—25c each

SHORT WAVE LEAGUE SEALS

These seals or stickers are executed in three colors and measure 1¼ in. in diameter, and are gummed on one side. They are used by members to affix to stationery, letterheads, envelopes, postal cards and the like. The seal signifies that you are a member of the SHORT WAVE LEAGUE. Sold in 25 lots or multiples only.

G—SHORT WAVE LEAGUE seals.....per 25, Prepaid 15c

SHORT WAVE MAP OF THE WORLD

This beautiful map, measuring 18x26 in. and printed in 18 colors is indispensable when hung in sight or placed "under the glass" on the table or wall of the short wave enthusiast. It contains a wealth of information such as distances to all parts of the world, political nature of the country in which a broadcast station is located, etc., and from the manner in which the map is blocked off gives the time in different parts of the world at a glance.

F—SHORT WAVE Map of the World.....Prepaid 25c

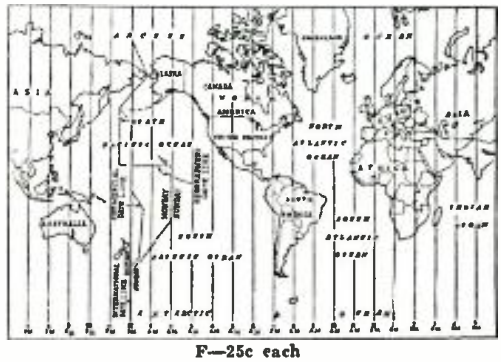
PLEASE NOTE THAT ABOVE ESSENTIALS ARE SOLD ONLY TO MEMBERS OF THE LEAGUE—NOT TO NON-MEMBERS WITH EXCEPTION OF ITEM B.

Send all orders for short wave essentials to SHORT WAVE LEAGUE, 99-101 Hudson Street, New York City.

If you do not wish to mutilate the mazagine, you may copy either or both coupons on a sheet of paper.

SHORT WAVE LEAGUE 99-101 Hudson St., New York, N. Y.

G—15c for 25



F—25c each

D—$1.25 each

E—35c each

NRA
WE DO OUR PART

SHORT WAVE LEAGUE, 99-101 Hudson Street, New York, N. Y.

Gentlemen:

I am already an enrolled member in the SHORT WAVE LEAGUE ☐
I am a new member and attach my application to this coupon ☐
Please send me the following short wave essentials as listed in this advertisement

.....

.....

.....

.....

for which I enclose $ ..... herewith

(The LEAGUE accepts money order, cash or new U. S. Stamps in any denomination. Register cash and stamps.)

Name .....
Address .....
City and State.....
Country .....

4-35

• Index to Advertisers •

(While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this index.)

When to Listen In

(*Continued from page* 33)

for the benefit of foreign listeners. They are apparently operating on new schedule, as yet unknown.

Portugal

CT1AA at Lisbon has been testing on 50.17 met. from 4:30-7 p.m. on Mondays, Wednesdays, and Fridays, and on about 25.2 met. daily from 9-10 a.m. in addition to their regular broadcasts on 31.25 meters. This station will probably operate from 3:30-6 p.m. after Apr. 21 when daylight saving time goes into effect in Portugal. A new station at Lisbon is reported. This is CSL, Emissora Nacional on 48.78 met. The schedule is supposedly 1:30-7 p.m.

New Stations

Reported in the last month are the following South Americans: HJ1ABJ, 50.5 met., Santa Marta, Colombia; HJ1ABH 47.8 met., Cienaga, Col.; HJ3ABH on 50.3 or 49.92 met. located at Bogota; HJ4ABC on 48 met. at Perira, Col. In Central America there is YNLF at Managua, Nicaragua, on 50.3 met. In Costa Rica there TIGPH at San Jose on 52 met. and TIX or TIXGP3, "La Reina del Aire," at San Jose on approximately 51.5 met. In Cuba there is a new station at Santiago, call letters unknown, near 48.79 meters.

In the East there is ZHJ at Penang, Straits Settlements (Asia), on about 6072 kc. One report says the schedule is Mondays, Wednesdays, and Saturdays from 8-10 a.m. One listener heard them sign off at 3:30 a.m. of a Friday morning, leaving us up in the air. CQN at Macao, China, on 6020 kc. (same as DJC) operates on Mondays and Fridays from 3-5 a.m.

All Schedules in Eastern Standard Time.

Junior Velocity "Mike"

(*Continued from page* 24)

thusiastic sport broadcaster can jump around, turn his head in any direction—but his audience will always be right with him. Walking after-dinner speakers, will find it impossible to get away from the 7-point Junior—that includes the women. And the detective might find it a useful little gadget to place at some particular spot, especially since the reproduction is so real, without peaks, or background noises.

Including the transformer, which is concealed inside the microphone case, the total weight is only 8 oz. It, therefore, can be used for a hand microphone as well. Obtainable with 50 or 200 ohm output impedance. It has a frequency response from 60 to 7500 cycles and an output of —68 db. on open line. The microphone cable can be any length up to 2,000 feet. Its directional quality makes it easy to eliminate acoustic feedback and audience noises. It is a microphone that can be used where a microphone should not be seen. (Refer to No. 275.)

Keystone Radio Club

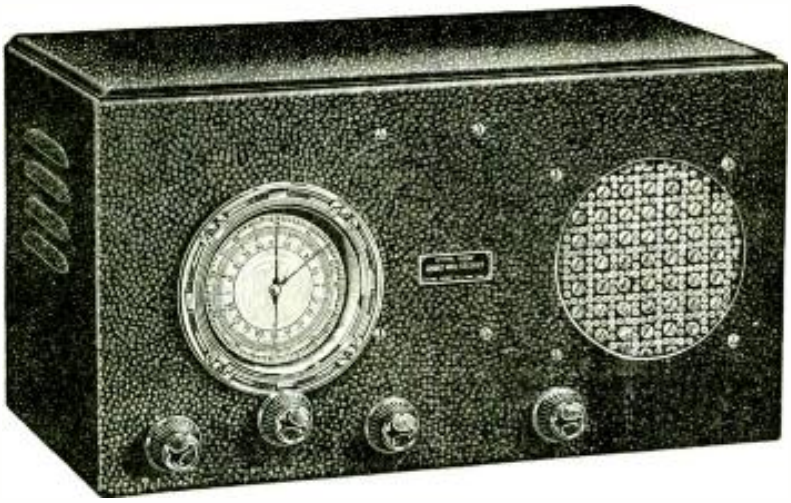
Editor, SHORT WAVE CRAFT:

With arguments pro and con, going on among our thirteen members, on the 5 meter question it would be hard to say just how the club as a whole body would stand. Nevertheless we're all strong 5 meter enthusiasts. There are at present about six outfits in this particular section, four of which are operated by KRC members. Give us a call gang—who knows what the outcome of this 5 meter rage will lead to.

73

JOHN N. PROUDFIT, W8AHX,
Secretary.
Burgettstown, Pa.

W8AHX
W8BFX
W8JEK
W8KWB



at last! CONTINUOUS BANDSPREAD *on all bands*

THE OFFICIAL DOERLE BANDSPREAD 5-TUBE DE-LUXE A. C. SHORT-WAVE RECEIVER

NATION-WIDE *TESTIMONIALS* PRAISE THIS SET

Gentlemen:
I received your "Official Doerle A. C. 5" today, after being adjusted by your engineers. I have had the receiver turned on less than 10 minutes and at the present time I am listening to the American Hour coming from IRA Rome, Italy. It is a wonderful relief to listen in without hearing a lot of noise. I would like to at this time thank you ever so much for making this adjustment. You cannot tell how much I appreciate this favor. You can certainly count on me as one of your boosters and I shall spread your name and products to all of my friends.
GEORGE LESLIE ALLEN,
Morris Plains, N.J.

Dear Sir;
Just a letter of recommendation concerning the Doerle A. C. 5. What a set, oh boy, for bringing in the DX night after night. I receive about 10 stations a week, that are new programs, besides 50 I already received. Besides I logged 700 hams. Stations that aren't even listed in call books give me a thrill. I only use a 20 ft. antenna wrapped around a chimney.
FRANCIS KMEC, Allentown, Pa.

Gentlemen:
This will acknowledge receipt of my Doerle short-wave receiver. This 1935 model is the smoothest and best operating set I have ever operated, both on amateur and foreign reception. I have heard practically all of the South American stations, Russia, Spain, and of course, France, Germany, Japan, and lots of others. This little receiver is just as you say it is—the best for the money and I have seen sets selling for lots more, which do not come within a mile of this Doerle.
If anybody wants to know if you people will treat them white, just let me know and I will tell absolutely yes.
S. L. SMITH, Colorado, Texas.

Gentlemen:
I am very well satisfied with the set and here are some of DX stations which I have received on it:
On 20 meter coil: EAQ—Madrid, Spain; PRF5—Rio Grande, Brazil, S.A.; LSX—Monte Grande, Argentina, S.A.; DIQ—Germany (Koenig Wusterhausen); GSB—England (Daventry); COH—Havana, Cuba.
On 49 Meters: DJD—Berlin, Germany; H2-CRL—Guayaquil, So. America; 2RO—Rome, Italy; DKC and DKF—Germany; XEBT—Mexico City, Mexico.
Also many other South American Stations and Central American stations. Amateurs in more than 36 different states and including Canadian amateurs.
AUGUSTE THEBERGE, River Edge, N.J.

Complete Price
$27.50 WITH TUBES
Nothing Else to Buy

- Doublet Antenna Input or
- Standard Antenna input
- 8-Low Loss Ribbed Plug-in Coils
- 15-200 Meters
- 12,500 Mile Range
- Airplane Dial
- Dynamic Speaker
- Headset Jack
- Beautiful Cabinet

BEFORE you buy any other Short-Wave Receiver, be sure to take advantage of our FREE five day trial offer explained below. Satisfy yourself, in your own home and at your leisure that this IS one of the greatest values in radio, and that it DOES have features which are found only in more expensive receivers.

Will Outperform Many 10-Tube Expensive Sets

A powerful 5-tube "rig" complete with its self-contained hum-free power pack and dynamic speaker; all mounted on a single chassis and contained in a large handsomely finished black crackle cabinet with patterned screen speaker grill.
Two tuned stages—regenerative detector, 3AF stages with powerful 41 pentode output and perfectly matched dynamic speaker; all these features contribute to the enormous power and superlative performance of this Doerle short-wave receiver.
CONTINUOUS BANDSPREAD ON ALL BANDS. A special double-pointer, double-scale, airplane dial having a tuning ratio of 125 to 1 is employed.
Amateurs may now use this receiver for their daily communications work with the greatest of confidence. It is a real, reliable performer—A FULL-FLEDGED "HAM" RECEIVER.
All the fine features that you would expect to find in more expensive receivers are incorporated in this "ACE TOP-NOTCHER" of the entire Doerle line.
Either a short-wave doublet or standard antenna may be used. A new antenna-adjusting scheme permits perfect alignment of both tuned circuits without affecting the setting of the tuning dial. This means that all stations can be accurately logged on the single tuning dial and always found in their allotted places. Provisions are made to use headphones if desired, with a switch to cut out the dynamic speaker.

LOOK AT THIS DX-QSL LIST!

During its initial test, in one sitting, this receiver pulled in on its loud speaker, at good room volume, the following enviable log: **W1XAL, W1XAZ, Boston; W3XAL, Boundbrook, N.J.; W8XAL, Cincinnati; W9XAA and W9XF, Chicago; GSC, GSD, GSE, GSF, Daventry, England; DJA, DJB, DJC, DJD, Zeesen, Germany; HBL, HBP, Geneva; VE9GW Ontario; V9DN Quebec; GE9DR Montreal; VE9HX Halifax; XETE Mexico City; YU1BC, YV3BC Caracas CP5 Bolivia; LSN Buenos Aires; COC Havana; EAQ Madrid; WQO and WEF, testing with the Byrd Expedition** and a whole flock of amateurs in practically every radio district of the United States. After that, we could no longer keep our eyes open so we "signed off" to bed.
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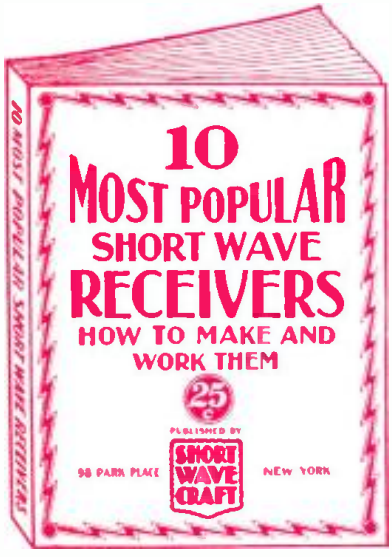

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CONTENTS

The Doerle 2-Tube Receiver That Reaches the 12,500 Mile Mark, by Walter C. Doerle.

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My de Luxe S-W Receiver, by Edward G. Ingram.

The Binneweg 2-Tube 12,000 Mile DX Receiver, by A. Binneweg, Jr.

Build a Short Wave Receiver in your "Brief-Case," by Hugo Gernsback and Clifford E. Denton.

The Denton 2-Tube All-Wave Receiver, by Clifford E. Denton.

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The "Stand-By" Electrified.

The Short-Wave MEGADYNE, by Hugo Gernsback.

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Boy, Do They Roll In on this One Tuber by C. E. Denton.

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The Short Wave Beginner's Book

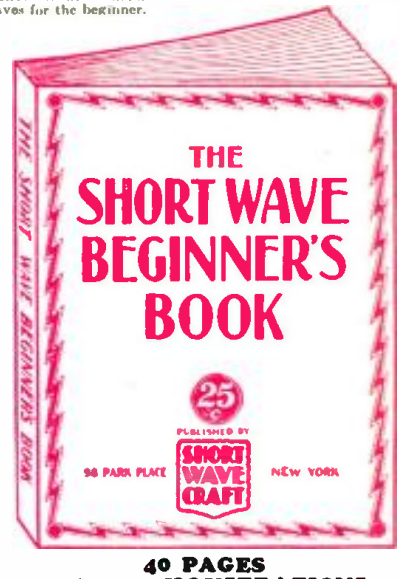
Here is a book that will solve your short wave problems—leading you in easy stages from the simplest fundamentals to the present stage of the art as it is known today. It is the only low-priced reference book on short waves for the beginner.

The book is profusely illustrated with all sorts of photos, explanations and everything worth while knowing about short waves—the book is not "technical." It has no mathematics, no "high-falutin'" language and no technical jargon. You are shown how to interpret a diagram and a few simple sets are also given to show you how to go about it in making them.

It abounds with many illustrations, photographs, simple charts, hookups, etc., all in simple language. It also gives you a tremendous amount of very important information which you usually do not find in other books such as time conversion tables, all about aerials, noise elimination, how to get verification cards from foreign stations, all about radio tubes, data on coil winding and dozens of other subjects.

Partial List of Contents

Getting Started in Short Waves—the fundamentals of electricity. Symbols, the Short Hand of Radio—how to read schematic diagrams. Short Wave Coils—various types and kinks in making them.
Short Wave Aerials—the points that determine a good aerial from an inefficient one.
The Transposed Lead-in for reducing Man Made Static.
The Beginner's Short-Wave Receiver—a simple one tube set that anyone can build.
The Beginner's Set Gets an Amplifier—how the volume may be increased by adding an amplifier.
How to Tune the Short-Wave Set—telling the important points to get good results.
Regeneration Control in Short Wave Receivers.
Audio Amplifiers for S. W. Receivers.
How to Couple the Speaker to the set.
Learning the Code—for greater enjoyment with the S-W set.
Wave length to Kilocycle Chart.
Wire Chart—to assist in the construction of coils.
Kinks in the construction of S-W Receivers.



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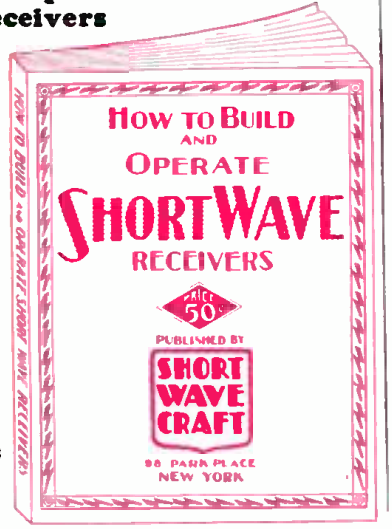
How to Build and Operate Short Wave Receivers

is the best and most up-to-date book on the subject. It is edited and prepared by the editors of SHORT WAVE CRAFT, and contains a wealth of material on the building and operation, not only of typical short-wave receivers, but short-wave converters as well. Dozens of short-wave sets are found in this book, which contains hundreds of illustrations; actual photographs of sets built, hookups and diagrams galore.

The book comes with a heavy colored cover, and is printed throughout on first-class paper. No expense has been spared to make this the outstanding volume of its kind. The book measures 7½x10 inches.

This book is sold only at such a ridiculously low price because it is our aim to put this valuable work into the hands of every short-wave enthusiast.

We know that if you are at all interested in short waves you will not wish to do without this book. It is a most important and timely radio publication.



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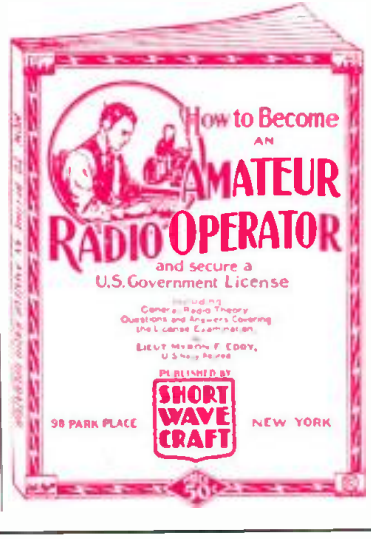
How to Become an Amateur Radio Operator



We chose Lieut. Myron F. Eddy to write this book because his long years of experience in the amateur field have made him pre-eminent in this line. For many years he was Instructor of radio telegraphy at the R.C.A. Institutes. He is a member of the I.R.E. (Institute of Radio Engineers), also the Veteran Wireless Operators' Association.

If you intend to become a licensed code operator, if you wish to take up phone work eventually, if you wish to prepare yourself for this important subject—this is the book you must get.

Partial List of Contents

Ways of learning the code. A system of sending and receiving with necessary drill words is supplied so that you may work with approved methods. Concise, authoritative definitions of radio terms, units and laws, brief descriptions of commonly used pieces of radio equipment. This chapter gives the working terminology of the radio operator. Graphic symbols are used to indicate the various parts of radio circuits. General radio theory particularly as it applies to the beginner. The electron theory is briefly given, then waves—their creation, propagation and reception. Fundamental laws of electric circuits, particularly those used in radio are explained next and typical basic circuits are analyzed. Descriptions of modern receivers that are being used with success by amateurs. You are told how to build and operate these sets. Amateur transmitters. Diagrams with specifications are furnished so construction is made easy. Power equipment that may be used with transmitters and receivers, rectifiers, filters, batteries, etc. Regulations that apply to amateur operators. Appendix which contains the International "Q" signals, conversion tables for reference purposes, etc.

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