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FORMERLY SHORT WAVE & TELEVISION

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- World-Wide Radio Digest
- Best S-W Station List
- Building a "Ham" Transmitter
- Radio Test Quiz
- S-W Listening Tips
- Receiver Construction

ROSTER of NEW "HAMS"

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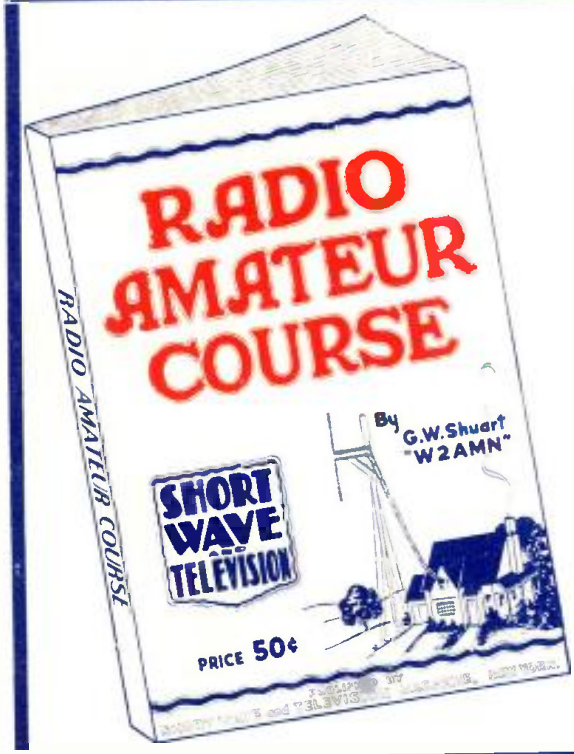

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RADIO & TELEVISION

The Popular Radio Magazine

JANUARY—1939

Vol. IX No. 9

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Cover composition by H. Gernsback and Thomas D. Pentz.
See special article—page 522.

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New Radio Amateur Course—C. W. Palmer, E.E.

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"Economy-3" Battery Receiver Using 1.4 Vt. Tubes—Harry D. Hooton, W8KPX.

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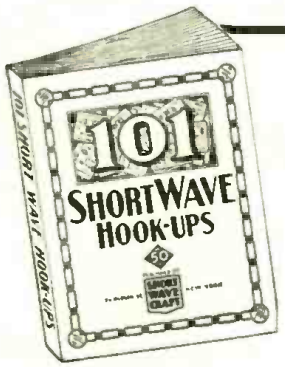

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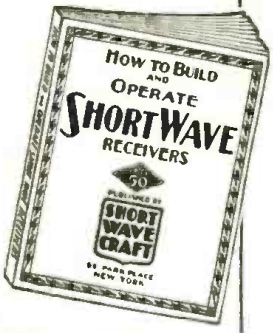

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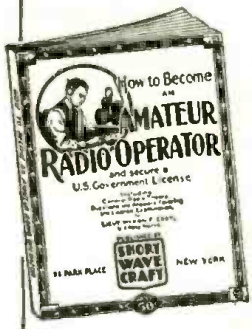

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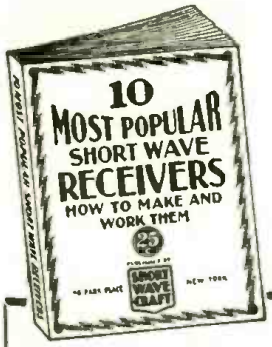

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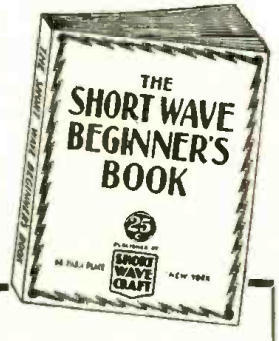

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RADIO & TELEVISION readers will want to know what one of America's foremost radio men thinks of the future of television. Mr. Dubilier's views on amateur radio are also expressed.

● RADIO is probably the most challenging scientific phenomenon of our civilization. Television and ultra-short waves, now on the threshold of epoch-making developments, promise shortly to revolutionize communication as dramatically as contemporary broadcasting revolutionized it during the recent European war crisis.

The prospects for the immediate future of ultra-short waves are brilliant. The American Telephone and Telegraph Company recently succeeded in communicating up to fifty miles with micro waves, using only a few watts of power. The experiments might almost be said to have been carried on with "match" or "candle" power. Reflectors similar to optics were used. This form of ultra-short wave broadcasting should meet with immediate success on small boats and in ship-to-shore communication over short distances. When it is more fully developed it will bring a new efficiency to airplane communication and all types of indicating instruments, and will open the way to the development of robot-direction of airplanes.

Although European nations, through government subsidies, have for the moment progressed further in the technical development of television than the United States and perfected apparatus which makes home television possible, the lack of interesting programs to be televised has halted the popular adoption of this latest advance of radio. It has been found that the public is not interested in *seeing* programs which are not visually attractive. If radio artists are not handsome or beautiful and the presentations well-staged, listeners would prefer to depend upon imagination. The future of television depends upon its ability to find subjects to be televised which come up to the standards of pulchritude set by the cinema. Without the cooperation of the motion picture industry, it will be impossible for television to be used for anything but the transmission of such spectacular news events as parades and coronations, horse races and prize fights. On the modern industrial front, a struggle between radio and the motion picture industry for the control of television threatens to duplicate the old conflict between the radio and the press for the control of broadcasting.

In the United States, progress in television is being made by many large corporations, including the broadcasting chains. While the engineering technique is being perfected, leaders in the field of communications are working for an initial cooperation between the radio and the cinema-makers as efficient as that which now prevails between the radio and the press. Without the cooperation of the film industry, radio leaders believe, it will be impossible to build widespread interest in television. Film-makers, on the other hand, recognize that if television is improved and developed to a stage where reasonably priced sets are placed on the market, and if television programs are developed which capture the public imagination, the effects on the motion picture industry, particularly the smaller theatres, may be catastrophic.

Twenty-third of a Series of "Guest" Editorials.

The *Society of Motion Picture Engineers* has taken steps to appoint a committee, headed by Dr. Alfred N. Goldsmith, well-known radio expert and engineer, to coordinate the pictures and television. It has been definitely proven that without good plays and actors to be televised, public interest in television sets could not long be maintained.

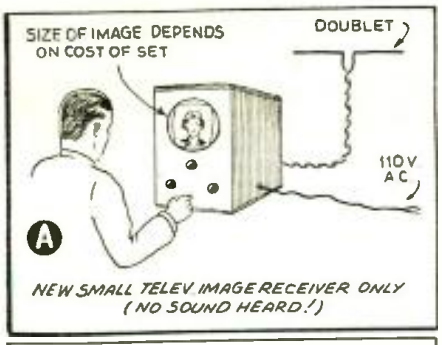
The United States inevitably is destined to play a brilliant role in the future of radio and television by virtue of the freedom from government control which her communications system enjoys. Largely because of this liberty, developments and contributions in all fields of communications in this country long have been more important than those of all the other countries combined. In the field of telephony alone, we have more than 50 per cent of all the telephones in the world.

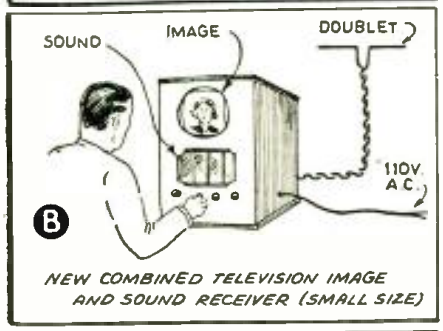
The most significant result of this freedom, however, has been its encouragement of widespread and extremely inventive activity among amateurs in the fields of radio and television. Since the birth of radio, there have been more *amateur* radio builders and operators in the United States than in any other country.

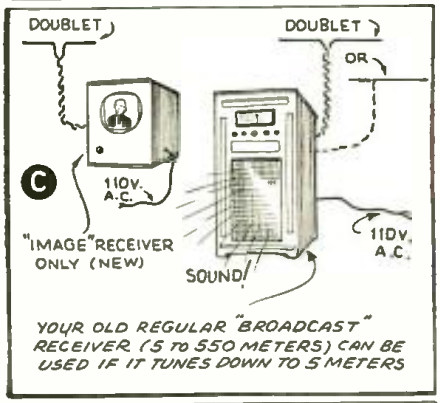
In 1905, an amateur society of which the writer was an officer included among its members thousands of high school boys

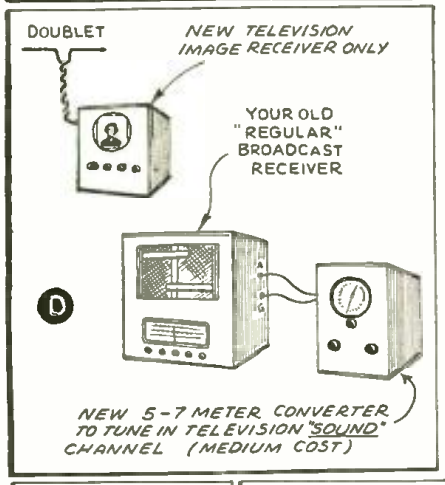
(*Continued on page* 561)

TELEVISION









● DAVID SARNOFF, President of the Radio Corporation of America, has made the statement that television will be ready when the New York World's Fair opens in the spring. Other signposts along the avenue of television which point to a great activity shortly in this newest radio art are that several leading radio set manufacturers are starting to build television receivers of the *home* type. Further, RCA has announced that they are ready to supply television transmitters—a 1 KW. unit, at a cost of about $60,000. A number of new licenses for the erection of experimental television stations have been granted by the F.C.C., so, all in all, it looks as if television will surely make its début early in the year, and several well-known radio authorities have voiced this opinion.

Can I adapt my present *broadcast* receiver to television?
Can I pick up the television sound channel on my B.C. set?
Should I defer buying a new radio broadcast receiver?
What will the average television receiver cost?
How large will the images be?

Television—First Transmitters

The larger cities will undoubtedly be first to enjoy television programs, and New York will have two stations in operation shortly after the first of the year—the NBC transmitter, atop the 1300 foot Empire State Building; and the CBS transmitter in the Chrysler Tower. Another station is to be erected by the Du Mont Laboratories at Passaic, N. J., about 16 miles from New York. Several experimental television station permits for points in New England have been sought by the General Electric Company. Chicago and Kansas City will soon have television broadcasts, according to reports; and on the West Coast, the Don Lee Station in Los Angeles has been active for several years.

The local broadcasting companies in the larger cities will undoubtedly have to finance the erection and operation of the television stations at first, until the F.C.C. grants regular commercial licenses for these stations, so that sponsored programs can be broadcast, and thus provide revenue to make the television stations self-supporting.

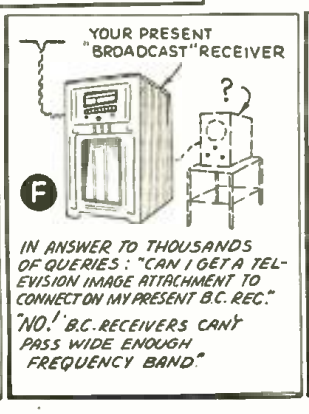
The writer predicts that by the fall of 1939 at least 25 active television stations will be in operation in this country.

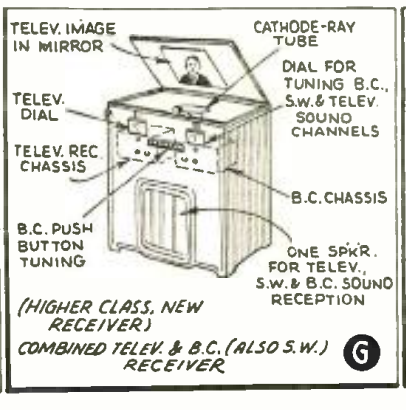
What to Expect in a Television Set

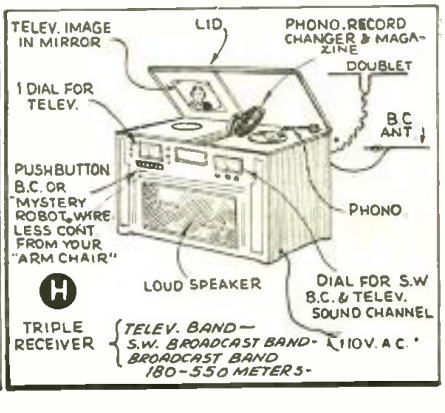
The illustrations on this page show how television stacks up so far as the average home set is concerned. Of course, many experimenters and radio fans will build kit receivers for the images, and several of these kits have been on sale in the New York area for some time. To receive an image about 3 x 4", a receiving kit complete with the cathode-ray tube is available at a little under $100.00. For half this sum or less, the experimenter may build a set to pick up the image on a smaller C-R tube, and the small picture may be enlarged with a magnifying lens.

Looking at the illustrations herewith—Fig. "A" shows the cheapest start in home television, utilizing an image receiver only with no sound pickup. At "B" is shown a combined image and sound receiver available for a slightly higher price. On the small table type sets, the image will average about 3 x 4 inches and these sets will probably cost about $125.00 to $175.00.

Many people ask whether their present *broadcast* or *all-wave* receivers can be used for television. No receiver of this type can be used to pick up the image—a brand new specially built television receiver capable of passing 1½ to 2½ megacycles must be employed for seeing the image. At Fig. "C"—







In the Spring!

H. W. Secor

TELEVISION HAS TECHNICALLY BEEN DEVELOPED TO A HIGH DEGREE. THIS ARTICLE PROVIDES THE LATEST INFORMATION. IT WILL BE SOME TIME BEFORE HOME TELEVISION IS REALIZED. THE ART HAS GREAT OPPORTUNITIES FOR EXPERIMENTERS AND TECHNICIANS.

all-wave receivers, which tune down to 5 meters, can be used to pick up the sound channel, which will be somewhere in the neighborhood of six meters.

Converters for "Sound" Pick-up

Another arrangement for both *seeing* and *hearing* television images will be to purchase a receiver for the images only, and a 5 to 7 meter short-wave converter may be built or purchased for the sound channel. This converter may be connected to your present broadcast or all-wave receiver. (See Fig. "D.")

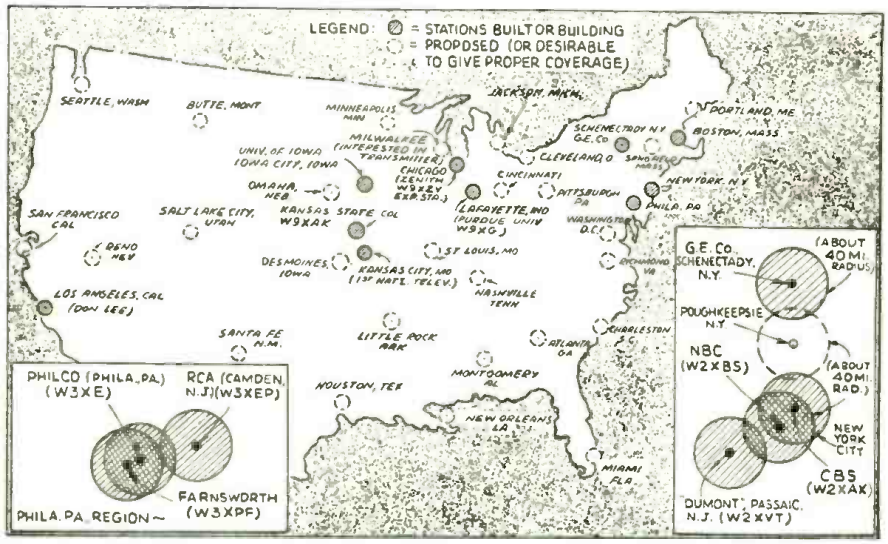
For a price varying between possibly $250.00 and $350.00, a combined television image and sound receiver built into a console cabinet will be available. The size of the image in this class of receivers will be about 7 x 9".

Fig. "F" answers the question raised by many of our readers as to whether a television *image* converter will be available for use in connection with their broadcast receiver. The answer is "No"—except for sound reception, as has been already explained.

In the price class of $350.00 and up, there should be a console receiver providing reception of television images and sound, and also reception of the regular broadcast programs in the 200 to 550 meter band, as well as the usual short-wave broadcast bands. Two tuning dials will probably be built into these receivers to facilitate the tuning of such a great variety of stations, and one loud speaker will probably be used, as only one type of station would be tuned in at any given time. (See Fig. G.)

For those who can afford them, a still more advanced model will incorporate an electric phonograph, along with the reception on the television, broadcast and short-wave bands. Possibly also, these DeLuxe models will incorporate home-talking pictures, using either the 8 or 16 mm. film. (See Fig. "H.")

On the television receivers costing from $350.00 up to $500.00, a larger cathode-ray tube will be used, having a diameter of 14 to 16 inches and producing an image about a foot square.



Map shows Television stations built, being built or suggested for preliminary coverage of the U. S. Eventually several hundred transmitting stations will be in daily use. Remember that all licenses thus far are for "experimental" or test transmissions. Programs on regular daily schedules are still in the future.

Images measuring up to 18 x 20" will become available in more advanced models by projecting the image onto a ground glass screen, as shown in Fig. "I." Several models of this type have been available on the European market for some time, but the large image is not so bright on present models and some means of intensifying the brilliancy of the image must be found.

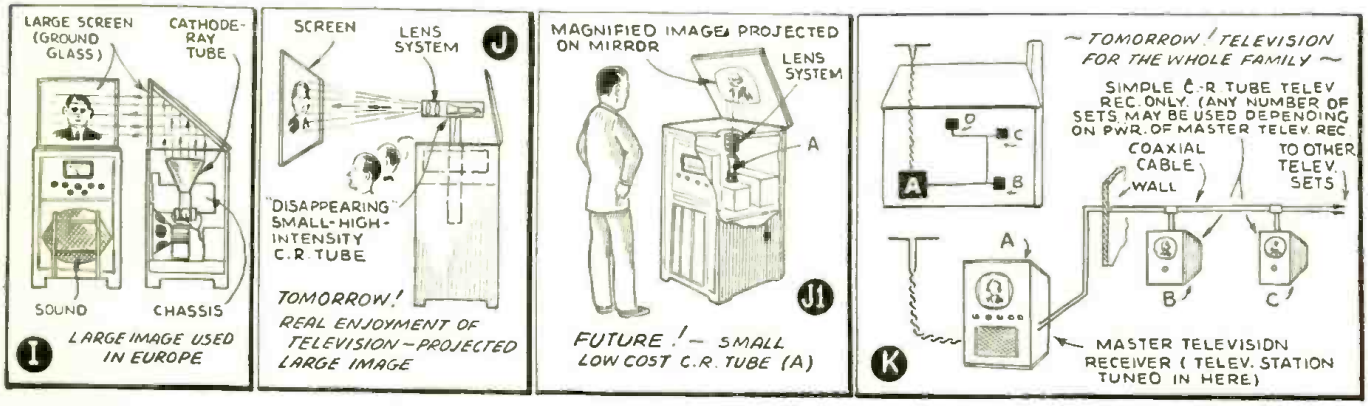
Undoubtedly some arrangement, like that shown in Fig. "J," will be offered in the near future, when a small high intensity c-r tube will be used, together with a projection lens, and the image thrown onto the screen as shown.

The illustrations on these two pages, beginning at the top of the left-hand page, show the evolution of "home" television, so far as the average person is concerned. The pictures show progressively television receivers of increasing cost and entertainment value.

The present high cost of the large size c-r tubes will, in the future, be reduced to a nominal sum for it appears certain that a tube with a screen no larger than 2½ to 3" will be necessary, to be used with a lens projecting the image, as shown in Figs. "J," "I" and "J1."

A New York television company has already developed a further idea whereby a number of television image receivers can be connected to a *master* receiver for home or public hall use. These secondary receivers are small units of nominal cost and these are wired to the master receiver by means of co-axial cable, as Fig. K shows.

Several years ago, Hugo Gernsback, the editor, devised a television receiver in the form of a pair of spectacles. Recently a similar idea has taken the form of a miniature television receiver, somewhat resembling the French type telephone, the image being seen at one end and the sound issuing from the other.



WORLD WIDE

Blimp Seeks Site for Transmitter

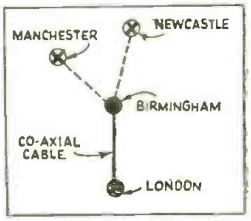
● A 50-foot blimp carrying a 1000-foot antenna is making a radio survey to select a possible site for a proposed new transmitter, with which it is hoped to strengthen the primary broadcast signals of station KDKA. The blimp is being used to determine the broadcasting efficiency of several locations which are being considered.

If the antenna is moved to within 10 miles of Pittsburgh's center, the signals will be

strengthened several fold. If the tests indicate one of the proposed new sites is suitable, the station's present 718-foot steel antenna will be dismantled and rebuilt on the new location. The four short-wave transmitters of W8XK will also be moved to the new location.

New British Television Station

● A TELEVISION station will soon be opened in Birmingham, England, to supplement the one which has been operating satisfactorily in London. And already two more stations, in Manchester and Newcastle, are planned. Coaxial cable will be used to link them, and has already been installed for the Birmingham link.



There has been considerable agitation among British radio dealers who felt that television was holding back radio sales in areas not supplied with the video service, and this is believed to be the BBC's answer.

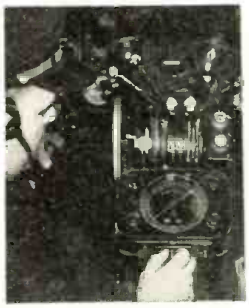
The Birmingham station will add a potential audience of several millions to the group of television "lookers-in," for it is to serve the thickly populated Midlands area. Heretofore, the benefits of television have been available only to those living in the London area.

Britain's Buying Boom

● THE biggest increase in radio receiver licenses in seven years has been noted in Great Britain for September, according to *Wireless World*. The jump was 68,294; the year's total increase was 410,810. The increase is attributed to (a) Intense interest in news bulletins during the crisis with Germany; (b) Fear that the Government would check up on unlicensed sets if the war, which appeared so near, really came.

New Airplane Radio Direction Finder

● A NEW Sperry-RCA automatic direction finder, when once tuned to a station points continuously and automatically at the station so that the pilot may devote his full attention to the plane's operation, having only to glance at the pointer on the direction finder's face. In addition to indicating the station's bearing, it immediately shows the pilot when he has passed over the beacon, and gives positive information to confirm the "cone of silence" which he may not have noticed if he has been flying on the regular radio beam. The cone of silence is a momentary, complete absence of any signal. The automatic feature makes it possible for the pilot to obtain his bearings when static is so bad that it is virtually impossible to obtain a null or "no signal," if operating the ordinary type of loop.



Remote "Hams" to Get Distinctive Calls

● TWO-LETTER prefixes, such as KB, KC, KD, etc., will be used in future call assignments for various portions of the Pacific and to differentiate Virgin Islands from Puerto Rican Ham stations. The suffixes on such calls will continue to be chosen from 3-letter combinations. The new prefixes will be used in new, renewed or modified licenses, and present license holders may request a change by applying for modification. Three-letter suffixes will remain unchanged in such modifications.

Scores by Radio

● THE man at the scoreboard may not be able to see the finish of a foot-race, and the man stationed at the finishing line cannot get his information to the scorekeeper quickly and accurately—without radio. In Britain, A.A.A. championships were covered with portable radio. Observer Kendrew, shown here with a portable transmitter, gave the results to the scorekeeper who posted them—quickly and accurately.

Cleveland Gets Largest 2-Way Police Radio

● THE Cleveland Police Department is installing the world's largest and most modern two-way police radio system, to cover the entire metropolitan district and

the police departments of 56 suburbs, serving an area of 600 square miles around the city. Installation of the first 4½ tons of RCA equipment has already been commenced. The system will include three trans-

Are You a German Spy?

● DAVID SCHOLES, special RADIO & TELEVISION reporter in Canada, has unearthed a spy plot of wide-reaching importance. Mr. Scholes, VE5DY, states that listeners to broadcasts from Germany (aimed at the United States and Canada) are invited to enter a photo contest under the terms of which entrants are required to give *full details* as to the *exact locality* of the scene depicted. Civic and industrial scenes are apparently favored entrants in the contest. In this way, Mr. Scholes states, a highly useful fund of information of strategic value in time of national emergencies can be built up, and the contributors to this fund of information are spies, and voluntary ones at that, in their own country, but most important, they are absolutely unaware of the harm they are doing their native land. According to Mr. Scholes, this subterranean spy system was first detected by VE3EO and reported in the *Toronto Star Weekly*.

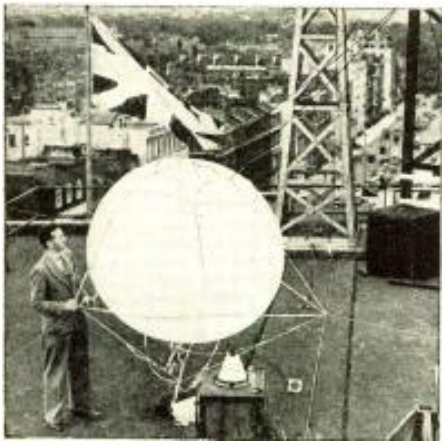
RADIO DIGEST

mitters in various parts of the city, together with two-way equipment for their patrol cars, detective cruisers and accident prevention cars, and receiving equipment for every ambulance and police motorcycle.

Ten years ago, Cleveland was the first city to operate a licensed police radio station. "Now," says Lloyd Chatterton, the city's Superintendent of Police Communication, "we will have the largest and most modern system in the world. In many cases, messages will be dispatched to patrol cars even before the complainant has finished telephoning for help. We saw a marked decrease in crime when the old one-way system was put in, and we look for a further decrease now. There will be a patrol car within ⅜ of a mile of any point in the city at all times."

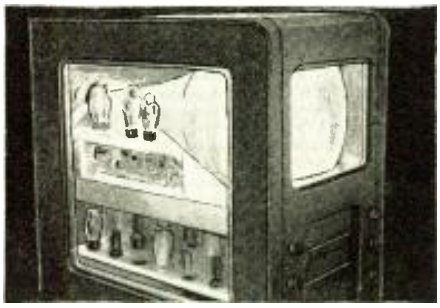
Short Waves Go Up?

● HOW do short waves travel——vertically as well as horizontally? This was the question that had been bothering engineers of the British Broadcasting Corporation. The answer was found by sending balloons aloft above Broadcasting House, each carrying a short-wave receiver. The accompanying picture was taken on the roof of Broadcasting House.



Television by Christmas

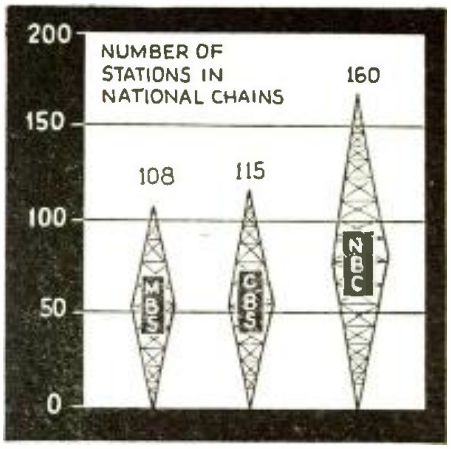
● ACCORDING to Paramount Pictures, who have acquired a large interest in Allen B. Du Mont Laboratories, television receivers to sell for $150.00 to $200.00 will be available by Christmas. These receivers will show pictures 8" x 10". Du Mont's pres-



ent receivers cost $395 for the table model and $445 for the console. A "cutaway" view of the table model is shown. Despite this progress, Stanton Griffis, executive committee chairman of Paramount, says that television is still "in the experimental stage."

Radio City of the West

● HOLLYWOOD, heart of the movie industry, is making its bid for similar position in radio through a new 3-story studio-office building erected by NBC. Ultra-modern in style, the building, shown in the picture below, is 367½ feet long and contains all offices and departments, in addition to eight studios. The exterior is done in blue-green, to reduce glare and to blend with the sky and surrounding foliage. The only decorations are aluminum strips on rounded corners, and huge metal NBC and RCA signs visible from all directions. The major studio seats 340 and can accommodate 1500 persons standing. Studios "B," "C," and "D" also seat 340 persons each. Studios "E," "F," "G" and "H" do not accommodate audiences. The building is completely air-conditioned and ultra-modern in every way.



160 Links in NBC Now

● WAPO of Chattanooga, Tenn., a 1420 kc. station using 250 watts daytime power and 100 watts at night, forms the 160th link in the NBC chain. The number of stations in the other networks are CBS, 115; MBS, 108.

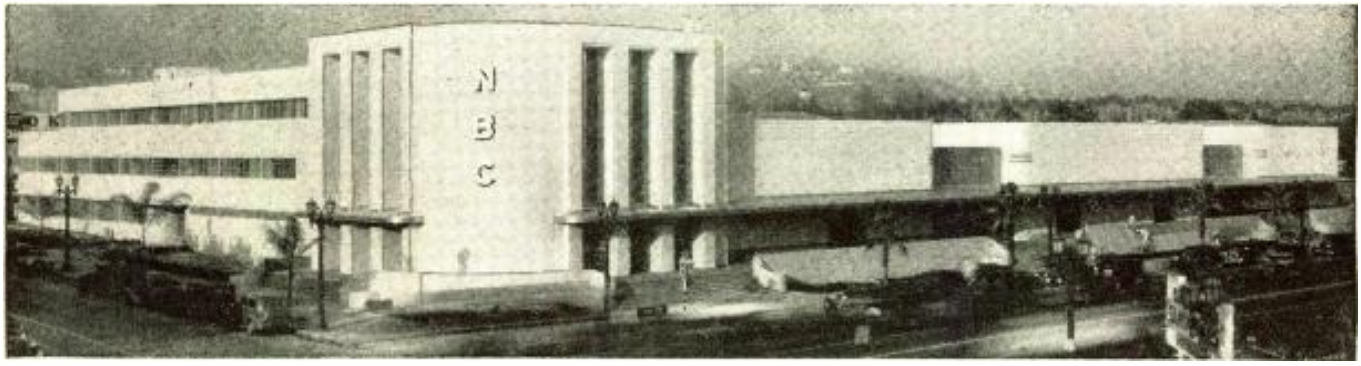
Mutes Converse by Television

● DEAF mutes are obviously unable to speak by telephone; normal persons are equally unable to speak by television unless it has associated sound. But, recently, two deaf mutes visited the NBC television studios—one stood before the transmitter, the other at the receiver—and with flying fingers, the man being televised gave his impressions of the tour to his friend at the receiver.

Perhaps television is the answer to long distance communications for those who are thus handicapped.

Radio on the Links

● WHILE most golfers want silence when they drive and putt, Roy S. Mather of Atlanta, Ga., has his own ideas. Wishing to hear a football game while he had a golf date, Mr. Mather showed up at the Country Club with a separate caddy carrying a portable set which blatted away throughout the 18 holes. Mr. Mather reported his complete satisfaction with the set's performance. What his fellow golfers said cannot be printed here.



Stolen Money-Bag Calls Police

Cover Feature

Radio transmitter, concealed in money-bag, broadcasts alarms to police.

● UNAWARE that every move he makes is being broadcast to the police, the crook who steals a new messenger's case, designed by Hugo Gernsback, Editor of RADIO & TELEVISION, can be tracked down and captured before he has a chance to touch the money he has stolen.

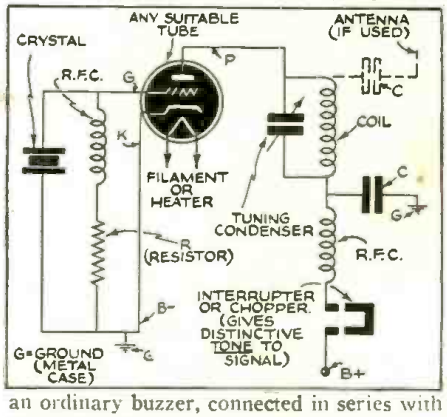
The case—containing the payroll and a miniature transmitter—is locked at the bank. The condition shown on the cover of this magazine could not actually occur; it is posed merely to explain the action. The case does not come open until it is *unlocked*.

Externally, there is nothing to distinguish the radio money bag from any other small suitcase used for a similar purpose. The thief has no way of knowing that it broadcasts an alarm for his arrest every instant it is in his possession. Obviously, if he knew it was a radio transmitter, set to call the police when taken, he would not touch it!

Essentially, this crime prevention device consists of a strong, leather-covered metal suitcase, large enough to accommodate not only the payroll, but a miniature short-wave transmitter with its battery power-supply as well. The metal case acts as the transmitting antenna. When transmitting, it would be located instantly by means of a police radio direction finder.

A simple automatic switch turns the transmitter on if it is snatched from the messenger's hand, or dropped. It consists of an ordinary toggle switch mounted on the *inside* of the suitcase, to one side of the handle, in such a way that it is "on" when the knob is brought toward the handle. A piece of weak cotton string is tied to the switch knob and brought through a hole under the handle, after which it is tied around the messenger's wrist. Though this sounds crude, it ensures the switch being turned on automatically if the bag is snatched from the messenger's grasp. The string breaks, freeing the messenger—and the thief is unable to shut off the transmitter. Modulation is achieved by means of an ordinary buzzer, connected in series with the plate lead of the tube. The received signal has a distinct tone, instantly recognizable by the police.

Circuit of the Radio Money-Bag.



RADIODDITIES

Right—D. W. Moje of Seattle, Wash., has a Ham neighbor. Whenever his rig goes on the air, the porch light glows, day or night, because of the power radiating from the antenna. The explanation offered by engineers is that the leads connected to the porch light have a length one-half or one-quarter the wave length being transmitted, and therefore resonate to the radiated wave. Perhaps the outfit is working somewhat in the manner of a Lecher wire system for measuring wavelengths.

Left—Prize Winner—Next door to the Paseo Methodist Episcopal Church in Kansas City, there lives a Ham, J. N. Blair, and when said Ham went on the air calling his mother in Oklahoma, the electric organ in the church picked up the signal and reproduced it, much to the surprise of the minister——who looks NOTHING like the picture here.

This item was reported by R. B. Tizzard of Long Beach, Calif., who wins First Prize for it.

You can't put anything over on these modern youngsters, according to Mrs. Robert Clark, then living in St. Johnsbury, Vt. Mrs. Clark went to the home of a neighbor, Miss Bertha Lee, to call a physician to vaccinate her four young children. When she returned home, she was met at the door by the youngsters who announced, "We know when he's coming; we heard it on the radio." Miss Lee's outgoing messages are often received on the Clark's radio on a frequency between 700 and 800 kc.

$5.00 for Best "Radioddity"

● THE accompanying pictures show a number of freak radio reception conditions which actually occurred in the vicinity of radio transmitters. The editors will pay a $5.00 monthly prize for the best "Radioddity" sent in by our readers. The description should be about 150 words in length and may be accompanied by a sketch or photo. The occurrences described must be based on fact, like those here illustrated.

If you have never run across any "Radioddity" of any nature, you may be able to act as a reporter for us by interviewing radio friends and engineers, especially those connected with broadcasting stations. You will probably pick up some very amusing Radioddities.

For the best Radioddity submitted each month, the editors offer a $5.00 prize. Others, whose contributions are used, will receive a 1 year's subscription to RADIO & TELEVISION. In the event of a tie between two or more contestants, an equal prize will be awarded to each.

Closing date for the next contest is January 10th. Prize-winning contributions will be published in the March, 1939, issue.

Address all contributions and communications to

Editor, Radioddities,
RADIO & TELEVISION MAGAZINE,
99 Hudson Street,
New York, N. Y.

When Robert C. Hurson of Melvindale, Mich., worked in a recording studio a few blocks away from the Detroit News' short-wave station, W8XWJ, the programs from that station were picked up on the amplifier, although there was no receiver in the studio. When a crystal mike on a 6-foot stand was used, test discs had W8XWJ as a background on all recordings. Mr. Hurson believes that the mike acts as a crystal detector in this strange phenomenon.

"MYSTERY" Control

Tunes Receiver by Short Waves

One of the greatest advances in the design of radio receivers is the new "mystery" tuning control. This device permits the selection of stations by remote control from a miniature transmitter that can be carried about the house.

● IT seems that American radio listeners are the first to have offered to them a remote control which works without connecting wires, thanks to the use of a small radio transmitter which can be carried about the house. So far as the editors know, this is the first control of this type actually offered for sale to the public.

Push-button or dial-type control boxes, which can be placed on your favorite arm chair, have been available for several years, but these all have to be connected to the radio set proper by means of a flexible cable which is sometimes hidden under a rug. The Philco *Mystery Control* operates in a purely *wire-less* manner and there are no connecting wires at all.

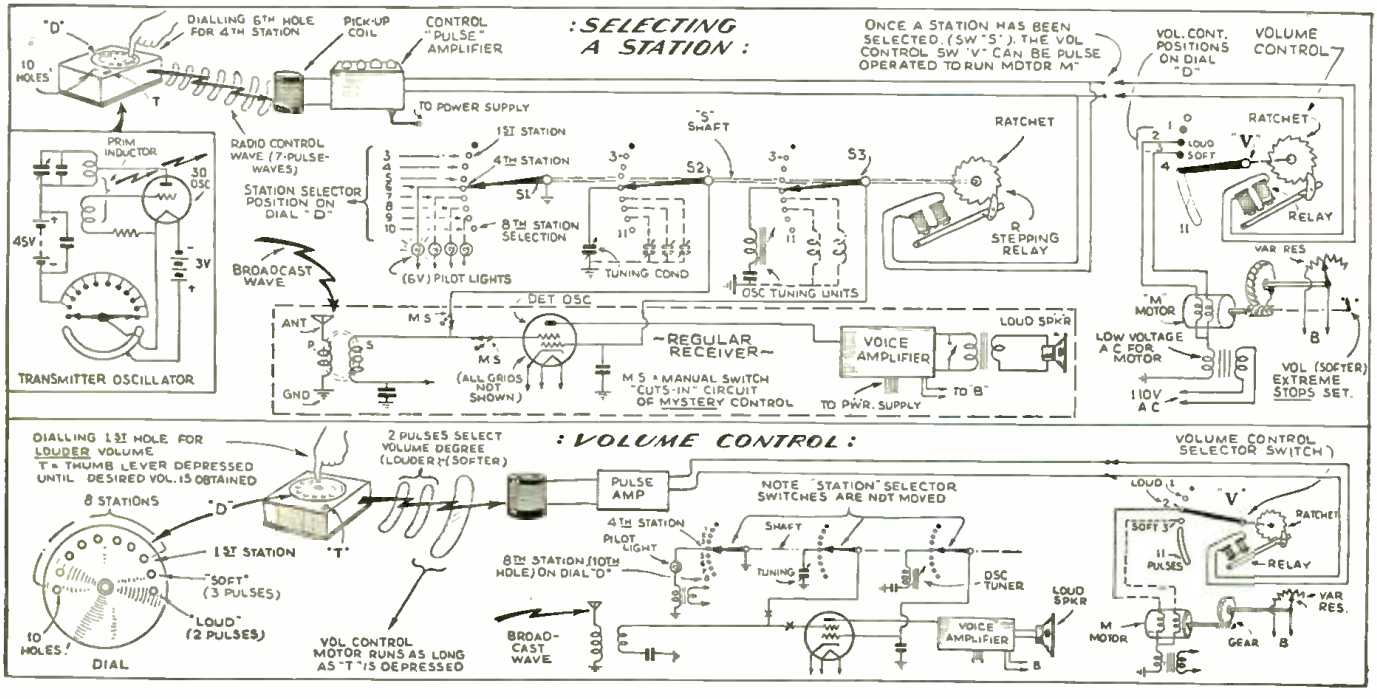
Briefly explained, the mystery control works in this fashion: A small battery-operated radio transmitter sends out an impulse wave (or several of them) as the dial on the control box is twirled. Suppose you want a certain station; this may require four control impulses in order to actuate the selector switch in the receiver. You place your finger in the third hole on the dial, in the same way as you dial a telephone number. A special receiving set, tuned to the same frequency as the waves sent out from the miniature control transmitter, picks up these four pulses or waves and a *stepping relay* in the receiver moves the control switches around to the fourth position. When this occurs, the receiving set circuits are tuned to the particular station corresponding to this number. For the convenience of the average listener, the station *call letters* are, of course, placed opposite each hole on the control dial, but the numbers are used here to help carry the reader's mind through the sequence of operations taking place.

The accompanying diagrams show in simplified fashion what takes place when the *mystery control* is used. In the first place, the receiver has a regular manual tuning control, too, and this can be used in the usual way whenever desired. When you are through using this control and wish to have the receiving set ready for operation by the robot or mystery control, a manually operated switch on the receiving set proper is set to *auto* (automatic). Now you can pick up your miniature radio transmitter and proceed to walk about the house or even out in the yard and select stations to your heart's content by merely dialing the station desired.

Looking at the diagram in Fig. 1, it will be seen that the control box houses a miniature transmitter, comprising a 30 type tube, operating on a 3-volt flashlight battery, together with a miniature 45-volt "B" battery. A spring-operated dial containing ten holes is also fitted onto this box; dialing the first hole (2 pulses) gives *louder* volume and dialing the second (3 pulses) gives *softer* volume. As the dial is twirled

(Continued on page 564)

Fig. 1, top; Fig. 2, below: "Station selector" switch and volume control are operated by a series of signals, transmitted from the portable control.



? RADIO ? TEST-QUIZ ?

Meet Your Professor — Robert Eichberg

Can you better the score of Hugo Gernsback, Editor-in-Chief of RADIO & TELEVISION? Mr. Gernsback, taken unaware by the Prof., attained a score of 83% in 17 minutes of answering. To calculate YOUR average, credit yourself with 4 points for every answer you get right; 2 points for every answer you get half right, etc. If you can get 65%, be proud; if 85%, be boastful; if 100%, don't tell anybody—they won't believe you.

1. In a recent public statement, David Sarnoff, president of RCA, said that home television
   a. Would not be feasible in our lifetime.
   b. Would start early in 1939.
   c. Would never be a commercial success.
   d. Would start late in 1938.

2. If you were erecting a television antenna, which type would you be most likely to use?
   a. Zep. *d. T*
   b. Dipole. *e. Wire doublet.*
   c. Spiderweb. *f. Inverted L.*

WHAT TYPE OF ANTENNA TO USE ?

3. The standard automatic volume control works by
   a. Controlling the plate voltage of the detector.
   b. Permitting some energy to leak from antenna to ground.
   c. Controlling the bias on the R.F. and/or I.F. grids.
   d. Controlling the bias on the A.F. grids.

4. An amateur operator who has a ragged, almost unintelligible way of hammering out code is specifically called
   a. A wouff-hong. *c. A lid.*
   b. A fist. *d. A prawn.*

5. The beamascope, as used in radio, is highly useful, for it
   a. Makes an outdoor antenna unnecessary for local reception.
   b. Helps airplanes locate the beam sent out by the landing field.
   c. Is a particularly efficient oscilloscope, employing an electronic beam.
   d. Locates steel beams in buildings, which might shield indoor antennas.

6. The control grid lead of a screen-grid tube is brought out through a cap on top of the envelope
   a. To make it easier to connect and disconnect this lead.
   b. So that a meter can be connected easily in order to take readings.
   c. To make shorter grid-coil leads possible.
   d. To keep the grid lead inside the tube farther away from the rest of the tube's internal leads.

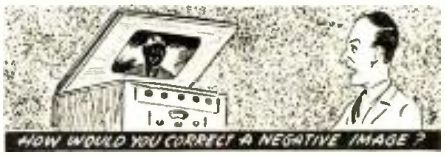
7. If you were an electron inside a radio tube you would
   a. Flow from the cathode to the anode.
   b. Flow from the anode to the cathode.
   c. Flow from the cathode to the plate, and never, never play hookey by stopping at the grid.
   d. Flow from the grid to the cathode.

8. Assuming that there are fewer than 50,000 licensed amateurs in the United States today, approximately how many would you say are now receiving new licenses each month, as an average?
   a. 100 *d. 1000*
   b. 250 *e. 1500*
   c. 500 *f. 2500*

9. Even if you fell for the Invasion from Mars, you ought to realize that a secondary cell is
   a. A "C" battery connected to a tap on a transformer secondary.
   b. A dry "B" battery.
   c. A small battery used to boost the voltage of a primary cell.
   d. Any storage battery.
   e. Any battery used in secondary circuits.

10. If you were lucky enough to own a transducer, you would use it
   a. In place of a magnetic phono pick-up.
   b. As a combined microphone and loud-speaker.
   c. For work on 5 meters only.
   d. In an intercommunicator.
   e. As part of an auto radio.

11. As a radio listener you should be aware that Hertzian Waves
   a. Were named in honor of Heinrich Hertz.
   b. Are waves of 5 meters or shorter.
   c. Are radio waves of any length.
   d. Are undamped radio waves.



HOW WOULD YOU CORRECT A NEGATIVE IMAGE ?

12. If your home-made television receiver, using a cathode-ray tube, showed a negative image, you would correct it by
   a. Adding a video frequency amplifier stage.
   b. Taking out a video frequency amplifier stage.
   c. Getting a new cathode-ray tube.
   d. Reversing the connections to the anode and cathode of the cathode-ray tube.

13. Of the following men, some are associated with radio, but one or more are not. Can you tell which of these are not active in the radio field?
   a. Lenox R. Lohr.
   b. Merlin H. Aylesworth.
   c. Harry Einstein.
   d. William S. Paley.
   e. George Bernstein.
   f. Hugo Gernsback.

14. Lost on a desert island, you have certain materials at hand to make a radio detector. Which of the following might you throw into the ocean because it would not work?
   a. Cymoscope. *d. Sodium chloride.*
   b. Common coal. *e. Carborundum.*
   c. Coherer. *f. Galena.*

CAN YOU TELL WHERE YOU ARE BY BROADCAST AERIALS ?

15. Your airplane is off the broadcast beam, but you can tell where you are by the lights on broadcasting station aerials. See if you can match up the lighting arrangements in the left-hand column with the call letters in the right-hand column.

a. Red; top, 2/3, 1/3. 1000-watt revolving red beacon on building.	*A. WABC, Wayne, N. J.*
b. Red globes each tower, 500-watts on top, side lights 100-watts.	*B. KNX, Van Nuys, Calif.*
c. Two red flashers; one on each tower.	*C. WGN, Elgin, Ill.*
d. 1000-watt red beacon and 4 75-watt lights at 1/3 and 2/3 heights.	*D. WBAP, Dallas Co., Tex.*
e. Flood.	*E. WOR, Carteret, N. J.*

16. You detective story fans who tune-in on the police broadcasts doubtless know

WHAT DOES POLICE SIGNAL "30" MEAN ?

that the New York City police have three code signals, but can you match up each of them with its meaning?

a. Signal 30	*A. Report of suspicious persons (or car).*
b. Signal 31	*B. Report of a crime.*
c. Signal 32	*C. Arrest persons (or occupants of car) described.*

17. The term "cone of silence," as applied to radio, refers to
   a. A broken loud-speaker.
   b. A dead spot over a vertical radiator.
   c. A position in front of a loud-speaker where bass notes are poorly heard.
   d. The positions near a undirectional microphone where pick-up is poorest.

18. You are a hotel manager, and a number of people come to you looking for rooms. Can you match up the following lists to put the husbands and wives together?

a. Gracie Allen	*A. Ben Bernie*
b. Dorothy Wesley	*B. Edgar Guest*

(Continued on page 571)

NEW TELEVISION APPARATUS

TELEVISION HAS TECHNICALLY BEEN DEVELOPED TO A HIGH DEGREE. THIS ARTICLE PROVIDES THE LATEST INFORMATION. IT WILL BE SOME TIME BEFORE HOME TELEVISION IS REALIZED. THE ART HAS GREAT OPPORTUNITIES FOR EXPERIMENTERS AND TECHNICIANS.

● AN English television inventor recently devised the very clever miniature television receiver, illustrated in the accompanying photo, which can be held in the hand. It provides both sound and image reproduction and is tuned by a small dial. As television develops in this country, there will undoubtedly be many miniature television receivers built and put on the market, somewhat resembling the one shown here. The image is reproduced by one of the small cathode-ray tubes now available. Using midget size amplifying tubes, together with small coils and condensers, all of which are available, such a receiver can be built right now by any ingenious experimenter.

Televisor Fits Your Hand

First Commercial "Telemitter"

● **THE first medium-powered television transmitter to be made available by RCA is rated at 1 kw. It is believed that the power of this transmitter is sufficient to enable experimental stations to render a satisfactory service without too great an initial expense. The video response of the transmitter extends well beyond the range required for present day 441-line pictures, thus providing for possible future requirements as to frequency response for greater definition.**

● AS simple in operation as any radio set, fully capable of entertaining a dozen or more persons at a time with a combined sight-and-sound program. Occupying small space on a table or stand, the latest television receiver now available marks the advent of video broadcasting in the living room. Over a hundred such sets have already been sold in the New York metropolitan area alone. And with the promise of regular sight-and-sound programs early this coming year, production is now being

Bright 8- x 10-Inch Image Home Televisor

(Continued on page 562)

Zworykin Extends Range of Ultra Short Waves Beyond Horizon

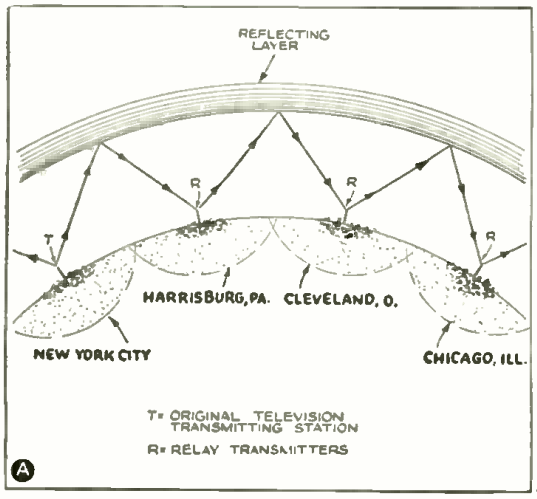
● THE Kennelly-Heaviside layer, cause of shifting and fading of radio waves, has been harnessed and made to work for its living by Dr. Vladimir Zworykin, noted radio inventor. He has patented a system particularly adapted to the transmission of ultra-high frequencies, such as are used in television work. His method makes it possible to transmit the waves beyond the horizon, automatically shifting the frequency of the radiated waves to take advantage of the shifting of the ionized layer above the earth, or by altering the angle of radiation of the transmitting aerial, so that signal strength remains level at the receiving end.

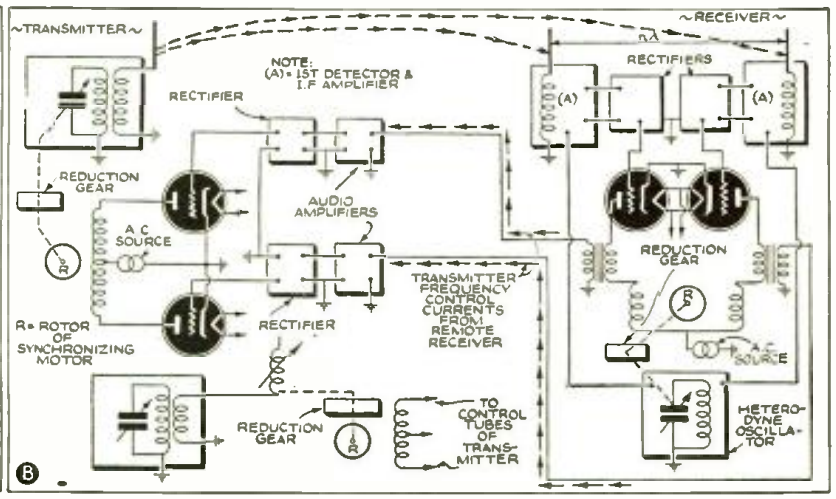
This is not a method for use with individual stations so much as a means for linking *relay* stations to a central transmitter, or for monitoring an area.

According to Dr. Zworykin, "The field strength at a pair of suitably positioned receiving antennas varies with the transmission path, i.e., one antenna may receive more or less energy than the other at any instant. The difference in signal strengths may be used to initiate a monitoring signal, which will simultaneously adjust the wavelength at receiver and transmitter to thereby maintain the frequencies which afford the optimum transmission path. Thus, by monitoring at the receiver, a condition of constant field strength may be maintained between the receiving antennas. The monitored received signals of constant strength may be used as a relay to modulate a second (relay) transmitter, or for normal long distance reception.

"The transmitter and receiver may be connected by a pair of ordinary telephone lines or low frequency (high wavelength) radio channels."

Fig. A—Repeater stations will relay television programs in the near future. Fig. B—Simplified circuit of Zworykin system for feeding back checking signals to transmitter.





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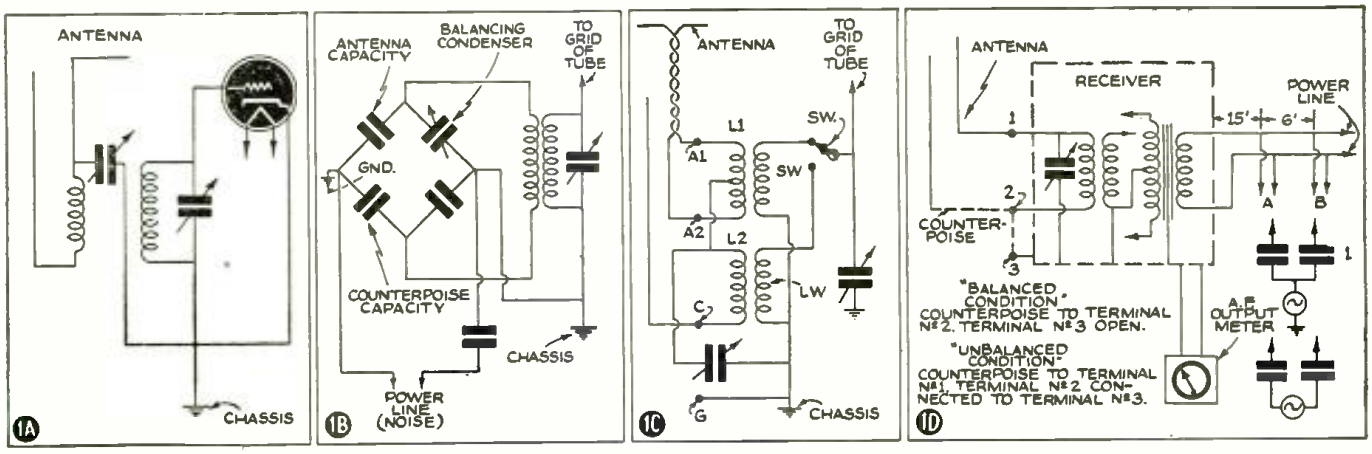


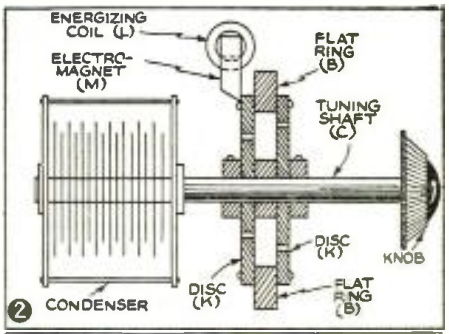
Master Antenna Reduces Interference

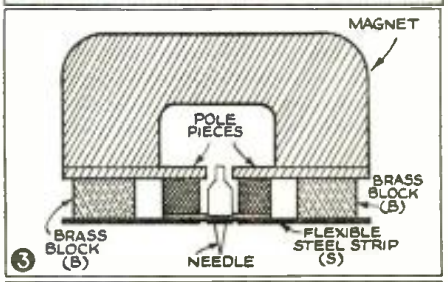
1 WITH a properly designed master antenna system, radio enthusiasts can listen to radio with much less interference from man-made static, according to RCA engineers. Fig. 1A shows an effective method of eliminating such interference and it is not critical to balance. The antenna consists of an inverted L about 80 feet long, with the counter-poise close to and parallel to the antenna, for a distance of about half its length, a space of about six inches being left between these two wires. A high inductance primary coil is connected between the antenna and counter-poise and is coupled to a resonant secondary. A small variable condenser, connected between the antenna and chassis, is used to balance out the noise.

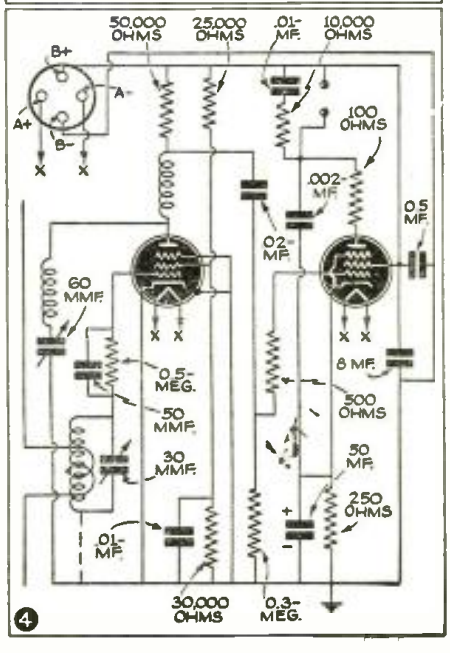
Fig. 1B gives an explanation of this circuit which is, in effect, a bridge, two of the arms of which are the antenna and counter-poise capacities. A third arm is the distributed capacity of the lower end of the primary winding to the chassis, while the fourth arm is the capacity of the other end of the primary to chassis in parallel with the balancing condenser. The balance adjustment is made at the time of installation. The antenna need not be in a noise-free area. Fig. 1C shows the use of a dipole in a balanced circuit.

To adapt the antenna to use with receivers not especially designed for it, an external transformer is needed. Fig. 1D shows this circuit. The only difference between this arrangement and the previous ones is that when the primaries are built in the receiver, the broadcast primary circuit is resonant just outside the low frequency end of the band, but when an external transformer is used, the broadcast primary and secondary circuits are separately resonant in the band, but are so coupled as to push the peaks to the extremes of the band. A resistor of about 2000 ohms is shunted across the primary to flatten the resonance.

While such antenna systems are suitable for installation in any locality, they are especially desirable in areas where there is much man-made interference.







Automatic Brake Tuning

2 INSTEAD of a visible indication of resonance, a new German patent provides tactile indication. As shown in Fig. 2, the shaft C of the tuning condenser is provided with two discs, K, of non-magnetic metal, between which is a brake-shoe B, made of magnetic metal. The electro-magnet M attracts B, when its energizing coil L receives power from the set. This can be done from the I.F. stages, much as such power is used to swing the indicator of a tuning meter to indicate resonance. A noticeable drag is put on the tuning knob when the set is tuned to a station, but turning the knob brings the set past the point of resonance, releasing the brake and permitting other stations to be tuned in.

New Pick-up Design

3 A NEW type of magnetic pick-up which uses a different type of magnetic path and a lighter armature and needle, has been described in *Wireless World*. The effect is to decrease record wear and increase frequency response. The coil in the standard pick-up is within the main magnetic circuit, which is completed through two pairs of pole-pieces. The accompanying illustration, Fig. 3, shows the new type of pick-up, in which P is the single pair of pole-pieces, while S is a flexible steel strip supporting the armature and mounted on brass blocks B. The needle and armature in this device are about ¼ the size of those commonly employed.

Two-Tube Television Sound Set

4 WITH a range equal to that of the usual television receiver, this 2-tube sound channel costs little to build and affords good loud-speaker volume. The super-regenerative circuit is shown in Fig. 4. It is, as the figure shows, a straight set with capacity controlled feed-back, an R.F. type pentode being used as a grid-leak detector. The grid coil, which consists of four complete turns of No. 16 wire ¾" in diameter and spaced approximately the thickness of the wire, may be mounted directly across the 30 mmf. variable condenser. The tickler

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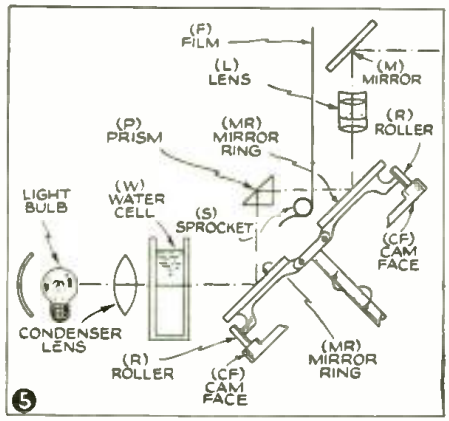
winding is three or four turns of ordinary flexible hookup wire, jumble-wound around the center of the grid coil. An additional single turn coil is looped around the ground end of the grid coil and connected to a dipole or to antenna and ground. All other parts are standard. All resistors of 10,000 ohms or less should be of the 1-watt type, while the others are preferably ½-watt resistors, though ¼-watt resistors may be used where but little current is drawn. This receiver was described in *Television & Short Wave World* of Britain.

New Film Transmitter for Britain

5 BECAUSE an ordinary intermittent motion film projector used in conjunction with an Emitron does not give satisfactory results, a new type of transmitter has been designed for British television stations. As described in *Television & Short Wave World*, the film runs from a horizontal take-off in this new scanner. A system of oscillating and rotating mirrors interposed between the light source and the film, and the film and the objective lens, puts a stationary picture on the screen of the Emitron (which corresponds to our Iconoscope). As Fig. 5 shows, the light source is focused through a cooling cell W, upon the lower part of the mirror ring MR, which comprises 64 pivoted mirrors rotating on an inclined spindle, and each tilted by the rollers R, working on the cam face CF.

Synchronous Motor for High Definition Television

6 THE Scophony system of Britain has developed a 30,375 R.P.M. synchronous motor for use in large screen, high definition, *mechanical* television. The motor, which is the heart of the system, is really two motors running on the same shaft—one an induction motor; the other, a synchronous phonic wheel, according to *Television & Short Wave World*. The induction motor, as seen in Fig. 6, is of the two-pole squirrel cage type and supplies the torque necessary to overcome friction and maintain the motor at approximately the correct speed. To obtain synchronism, a 20-pole phonic wheel, running in a 10-pole stator, is mounted on the same shaft. The stator winding is tuned to resonance at the signal frequency and D.C. of a value equal to the peak A.C. is passed through the winding so that the magnetic flux remains uni-directional. The light source used in the Scophony system consists of a high illumination lamp working through special lenses and a supersonic lighting control, and two scanning wheels to provide vertical and horizontal scanning. The sets, as now made in England, use 39 tubes and produce a picture 20" x 24". Scophony plans to enter the American market with a company organized and operating over here.



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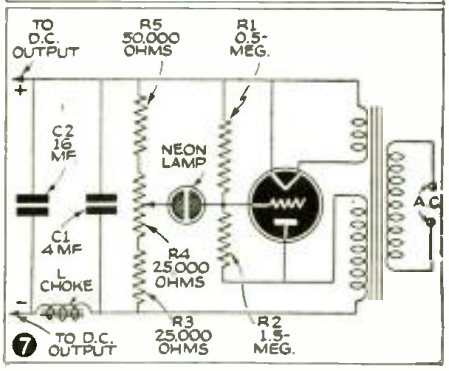

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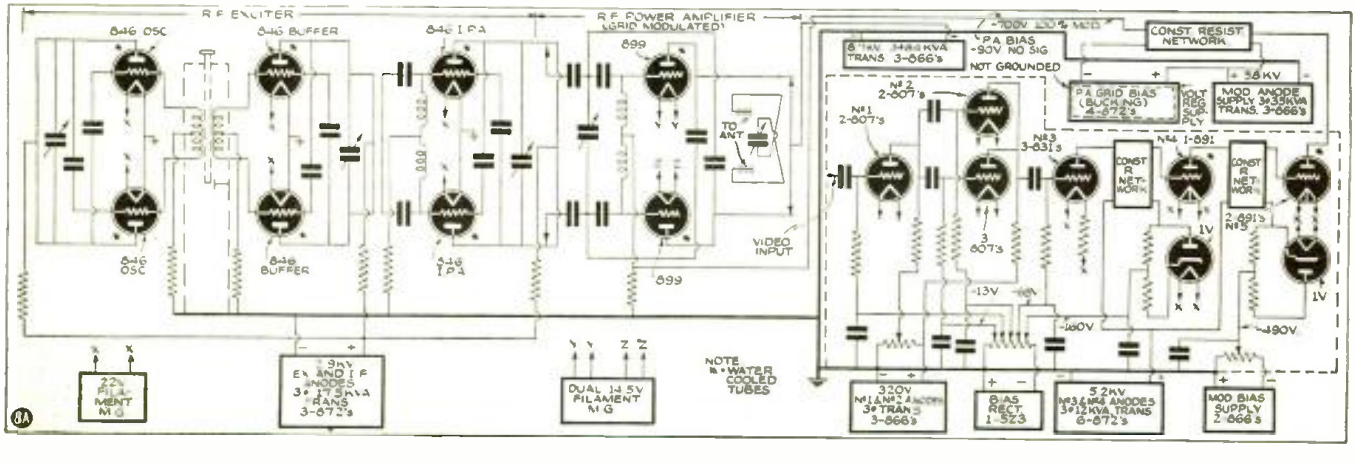
Neon Controlled Stabilizer

7 THE voltage of a power pack may be maintained at a relatively constant level through the use of a neon tube. Not only does the tube serve to keep the output of the pack relatively level, though the input voltage may fluctuate as much as plus or minus 15%, but it also serves to reduce hum. By way of example, though the A.C. input may vary 10%, the output will only increase or decrease 2%. The rectifier is of any standard type capable of providing ample current. Connected as shown in Fig. 7 is the neon tube M. The breakdown of the tube is such that if the voltage rises to an excessive amount, the tube glows and by-passes some of the current. According to *Wireless World*, the arrangement is patented.

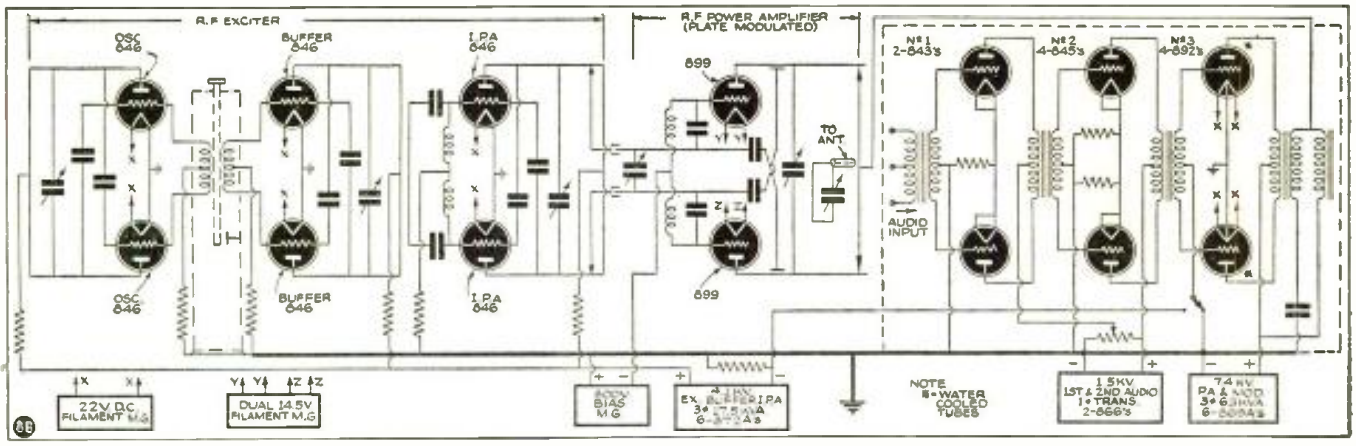
Television Station W2XAX

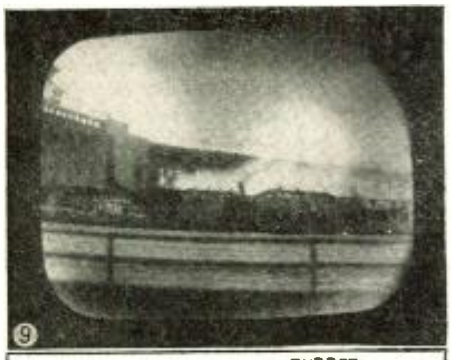
8 THE preceding issue of RADIO & TELEVISION showed the studio set-up and a control room layout for television station W2XAX, the new New York layout for the Columbia Broadcasting System's visual programs. Now Dr. Peter C. Goldmark, Chief Television Engineer of the CBS, has prepared a block diagram of the video and audio transmitters. These recently appeared in *Communications*. Fig. 8A shows the video transmitter; 8B, the audio transmitter to carry the sound portion of the program.

In Fig. 8A, the master oscillator will be



8A



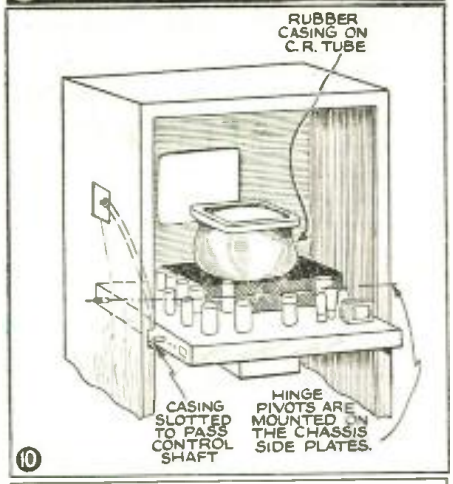


INTERNATIONAL

supplied with a temperature-compensated grid line, using two 846's to produce the carrier frequency, which will be constant within .02%. The two 899's shown in the diagram will be operated with 9,000 volts on the plate to produce a current of 3 amperes per tube.

New Vacuum Tube Includes Television

9 A FEW days ago, Philo (whom the *New York Times* refers to as "Philip") T. Farnsworth described a new television pick-up tube to the Institute of Radio Engineers and the Radio Manufacturers Association. The new tube is used in conjunction with an F2.5 lens of 9" focal length. The tube, which will sell for around $500.00, will be capable of being used with interchangeable lenses so that a turret may be mounted before it and close-up, wide-angle, telephoto and other special lenses used. Mr. Farnsworth says this will permit news pick-ups of fires, etc., much as RCA's television chanced to pick up a fire on Wards Island a few days later. In the illustration, Fig. 9, a photo of RCA's image in this transmission, the diagonal lines were caused by interference from a nearby radio transmitter. The RCA television pick-up truck happened to be in the neighborhood when the fire broke out.



Hinged Chassis Swings Out for Repairs

10 THE Murphy radio (a British sight and sound set) has an ingenious way of aiding the service man. The chassis is mounted on a hinge so that it may be swung out to become easily accessible for the repair man, as seen in Fig. 10. The set is a 15-tube outfit, producing a 7½" x 6" picture. The end of the tube is tilted at a slight angle to make viewing easy, as described in *Television & Short Wave World*.

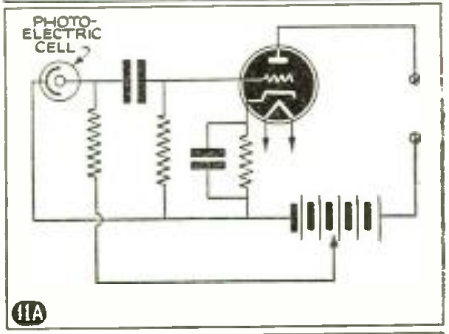
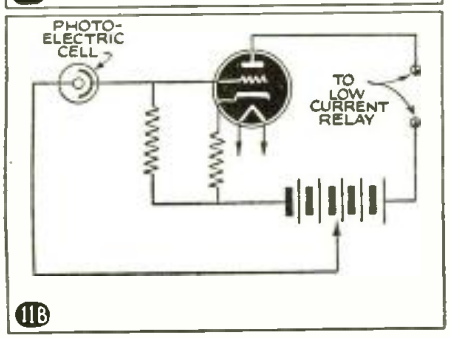


Photo Cell Applications

11 A HIGH quality gas-filled P.E. cell can be used for a great number of purposes, particularly when the cell is sensitive to the red and infra-red portions of the spectrum. Some of the uses include burglar alarms, counting systems, timing devices, light measurement, smoke density measurement, etc. The *Australasian Radio World* publishes two circuits. Fig. 11A is a hookup to use when rapid response to light variation is required, as in reproducing sound-on-film. Where the apparatus must respond to a breakage of a light beam, the circuit shown in Fig. 11B is preferred.



Fields of Force in Tuning Coils

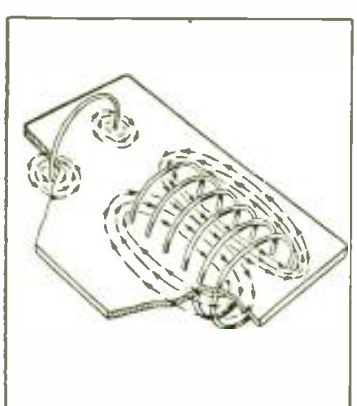
12 FIG. 12A illustrates the field's magnetic lines resulting from—at the left, a single turn; and at the right, a number of turns to form a solenoid. You will notice that a single turn field surrounds the wire, whereas where a number of turns are wound together, the field surrounds the turns as a group, instead of individually. If it is desirable to eliminate stray inductance, the wire may be doubled by being wound as

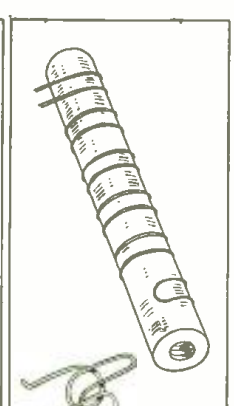
What Are Television's

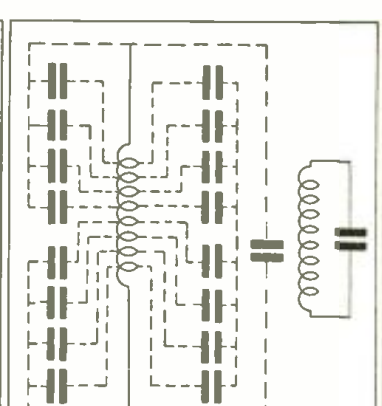
● **THE quality of television pictures achieved in the past few years has certainly been good enough to interest an increasingly large proportion of the population, but there are still two major questions to be answered, I. J. Kaar, design engineer of the General Electric Company's radio division, pointed out in a paper delivered before the Society of Motion Picture Engineers. The first of these—fixing satisfactory television standards—has practically been settled now, he added. The second is a method of paying for the programs.**

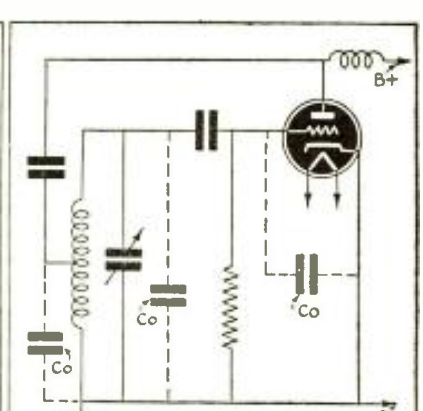
"In television, because of the use of scanning and the necessity of synchronization between receiver and transmitter, if transmission standards are changed, receivers designed for the old standards become useless. Because of this fact no responsible manufacturer would sell receivers to the public until standards were fixed by the industry and sponsored by the Federal Communications Commission.

"It required considerable technical perfection to justify our high standards, but this has now been attained and the essential standards agreed upon. It may be said with some assurance that the last technical obstacle in the path of









RADIO REVIEW

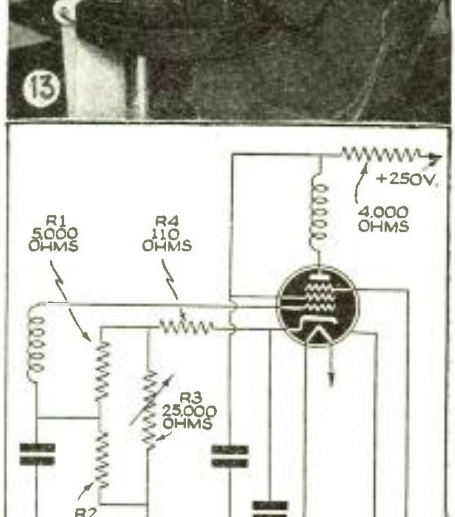
shown in Fig. 12B. In this case, the fields of the individual turns of wire oppose each other so that the lines of force "buck themselves out." Not only does stray inductance exist in a set, but stray capacity likewise, between the individual turns and throughout the field as a whole, according to a group of diagrams explaining an article published in *Practical and Amateur Wireless* (see Fig. 12C). Fig. 12D shows the effect of such stray capacities.

Radio Operates Typewriter

13 THE new Radiotype machine, developed by International Business Machines Corporation, will write letters, cut stencils—in fact, do anything that any typewriter will do—and may be operated completely by radio. A typist at the transmitter operates the transmitting machine, shown in Fig. 13, at good speed—up to 100 words per minute. Radio transmission is accomplished in much the usual way, and pick-up is by a modification of the standard radio receiver, the output being fed into a special circuit for the receiving radio typewriter.

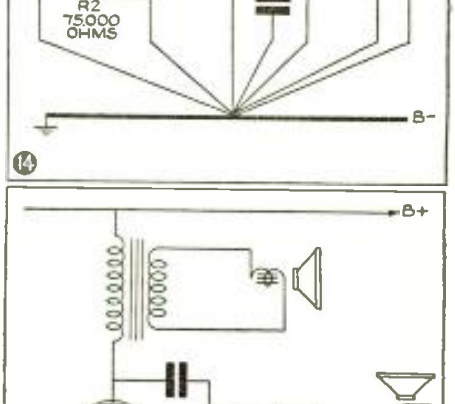
Biasing Control and Suppressor Grids

14 IN keeping control and suppressor grid biases in the correct ratio, it is often important to adopt a point connection, as shown in Fig. 14, particularly when voltages are supplied from the common power-pack. It is well known, according to an article in *Wireless World*, that the tube's input capacity includes inter-electrode capacities which vary with individual tubes. These capacities may make considerable difference in tuning when the tube is used for ultra short-wave work. Variation in tube capacities can be largely overcome by biasing control and suppressor grids together, the bias on the former being about 1/17 of that of the latter. Fig. 14 shows how such biasing may be secured. Note particularly that it is necessary to bring the grounded leads to a single point in order to avoid a "ground loop" effect in the chassis.



Connecting Extra Speakers

15 SOME hints on connecting remote speakers appeared in an article by W. J. Delaney in *Practical and Amateur Wireless* of England. Fig. 15 indicates a simple means of achieving this result. In this case, the speaker requires but one wire connecting it to the set. In the average radio receiver, the negative B lead is grounded, either directly or through a condenser. Therefore one terminal of the remote speaker may likewise be grounded, a single wire being used to connect the remaining terminal to a condenser in series with the plate of the output tube. In some cases, where it is desirable to have the remote speaker working without the speaker in the set in use, a SPDT may be used to switch over from one speaker to the other. As shown in the diagram, a variable resistor connected to the remote speaker serves to control the volume.



Immediate Problems?

commercial television, at least so far as the excellence of the picture under proper conditions is concerned, has been removed."

The question of who shall pay for television programs has not been answered, Mr. Kaar said, pointing out that the present broadcasting system, with its commercial sponsors who pay the bill, requires the existence of tens of millions of receivers, with listeners who may be induced to buy the advertised products.

"Such an audience does not exist in television," he said, "and cannot be expected for several years."

Answering the questions as to how good television will be and how much it will cost means discussing how large and bright the picture will be and how much it will show, said Mr. Kaar.

"The standard high quality television system which will possibly be commercialized shortly will have a 12-inch tube with a picture 7½ by 10 inches. The matter of increasing the size of a cathode ray picture presents serious obstacles," Mr. Kaar declared. "As tubes become larger they also become longer, and their overall size becomes such that it is difficult to find suitably attractive cabinets for them."

What Do You Think?

Jack Buitekant's busy S-W Listening Station. This month's prize winner—1 year's subscription to "R. & T." for best "Listening Post" photo.

Buitekant's Listening Post

Editor,

Herewith photo of my DX shack. The receiver shown is a *Hallicrafter Challenger*, model S-15, which I purchased last year. This is my first S-W receiver, and since its purchase I have logged 90 countries on all continents, of which 70 countries have been kind enough to QSL. The pre-selector shown is a revamped PR-10, which helps to bring in those weak signals.

Among my better QSL's are: JZK, JZJ, JZI, JVF, JDY, CR6AA, ZBW, CR7BH, PLE, YDC, VWY-2, TPZ, ZS2N, CN8MU, CN1AF, 25 VK "hams" and many others scattered around the globe.

I can truthfully say that I have received great help in my better DX tuning from your column—"Let's Listen In with Joe Miller." I find this column very useful, and can hardly wait 'til the next issue arrives on the newsstand. I can assure you that I would feel lost without this magazine on my DX table.

Your magazine has many fine features and these new "ham" departments make great reading.

I have just swapped in my Challenger receiver for a Super-Skyrider model SX16, and hope to "go to town" with this receiver.

I would certainly appreciate letters from all DXers, and promise to answer all received.

JACK BUITEKANT,
1695 Andrews Ave.,
Bronx, New York City.

VAC Through "Station Lists"

Editor,

I am a very ardent SWL and have just finished reading the November issue. I like your magazine a lot. The departments that interest me most are *Joe Miller's* column, *On the Ham Bands, Radio Kinks, Barter and Exchange* ads and, of course, *What Do You Think?* department. I know many fellows who have built your sets and they certainly go for them in a big way.

At present, I have a 9-tube Philco and certainly get results with it. I have heard all continents, and 48 countries. I also have all continents verified and 43 countries. Your *Station Lists* are very valuable for me. If it weren't for them, I would not have been able to log so many. Altogether now I have 347 QSL cards, thanks to your valuable information.

On the amateur bands, I have heard all districts of U. S., Canada, Cuba and Mexico. I also hear quite a few VK's.

I am going to send you my Listening Post photo soon. Why don't you have other contests for SWL's like the Short Wave Scout Trophy contest?

If any SWL happens to read this far, I would like to hear from him. I exchange cards, reports and gab, to all countries. Let's hear from some of you.

BILL RASINS,
6611 S. Rockwell St.,
Chicago, Ill.

A Voice from Oklahoma

Editor,

I have just purchased my copy of the new RADIO & TELEVISION and think that it is the best so far. It has more of what the "SWL" and the Ham want now.

I noticed particularly the section "On the Ham Bands" (with listening post observers) and think it is the most interesting in the magazine, although the rest of them are of great value.

Herewith is a photo of my listening den.

To the extreme left of the table is a 3-tube regenerative receiver. I took the diagram for this receiver from R. & T. It has a 57 det., a 56 audio, and a power-supply with 80 rect. This power-supply is sitting under the table. I have brought in many DX stations with this receiver. Just to the right of it is a Hallicrafters Sky-Buddy. I am very well satisfied with it. Sitting on top of the Sky-Buddy is a small receiver using a 19 tube. This diagram was obtained from your magazine; I sometimes use this set as a portable. Around my neck is seen a pair of Brush crystal phones for CW reception.

The first few rows of QSL cards, which are cut off in this photo. are QSL's from PY2CK, CO2KL, PAZB, F8NE, F8GQ, K5AN, VK2PX, D4SNP, LU6AT, LU4BH, XE1LK, LU5AN, HK4EA, HI1C, and H6KEF.

Dorsey T. Dobson, the only S-W Listener in Durant, Oklahoma.

The antennae used here are a 64 ft., single wire 28 ft. in the air and an 8 ft. vertical 28 ft. in the air.

I have been an SWL for the past 4 years and hope to keep on being one from now on. I'm the only SWL in Durant at present.

I listen in on the Ham bands only. DX on the Ham bands has been very good lately.

DORSEY T. DOBSON,
704 West Beech Street,
Durant, Oklahoma.

Liked Our Oct. "Ham" Features

Editor,

I certainly enjoyed your October issue of RADIO & TELEVISION. Your Ham articles were indeed most interesting and I hope you will continue publishing more in future issues.

The article about the "Phone Ham" was very good. Now I would like to see one on C. W. Hams—I work phone occasionally but like C. W. best—(you know we C. W. boys can't let those phone guys get ahead of us, Hi!).

Another thing I greatly enjoyed was those "historical" articles—they sure brought

(Continued on page 569)

[Live Ham Station W8NCJ at Knox, Pa. Operators—Ray and Beth Rosenberg.

THE

Lesson 3

RADIO BEGINNER

Martin Clifford, W2CDV

What happens when a condenser is connected to D.C.? To A.C.? In parallel with an inductance? How is the relation between voltage and current affected by a condenser?

● EVERY radio circuit, regardless of how simple or complicated, may actually be considered as a combination of resistance, capacitance, and inductance. Since these factors basically constitute radio, they should be considered in two ways. First, resistance, capacitance and inductance should be thoroughly understood when acting alone in the form of pure resistance, capacitance or inductance. They should then be studied when acting in combination. This latter form is the more important of the two, since rarely do we consider inductance or capacitance alone, except possibly when studying isolated portions of radio circuits.

Condensers and Capacitance

In previous articles we have considered resistance and inductance. We now come to the third factor—capacitance. Condensers come in a variety of forms, depending upon the use to which they are to be put. The most elementary type consists of two metal plates, separated by a sheet of insulating material which may be mica, air, glass, hard rubber, or generally any non-conducting or insulating material. The *capacity* of condensers to store electricity depends upon the type of insulator used (called *dielectric*), and upon the area of and distance between the plates. In order to understand simple condenser action let us put a condenser across a source of direct current supply, such as a battery. It can easily be seen in Fig. 1 that the introduction of a condenser in the circuit is tantamount to opening the circuit. The side of the condenser connected to the plus side of the battery is said to accumulate a positive charge, due to the fact that the interposition of the dielectric prevents the current from continuing to the other terminal of the battery. It can be proved that a condenser stores electricity, by carefully removing the condenser from the circuit and then shorting the condenser with a bit of wire. A small spark will result. It must not be thought that placing a condenser in a direct current circuit means that no current will flow. If we were to observe the meter in the circuit, we would notice a momentary deflection, indicating a current flow. The meter needle would then drop back to zero, showing that the condenser had been charged. When the voltage across the condenser builds up to a value equal to that of the battery voltage, the current ceases to flow. If the student has difficulty in visualizing voltages opposing each other, he should remember the action of the two north magnetic poles opposing each other. In this case, the plus charge on one side of the condenser and the negative charge on the other oppose the positive and negative battery charge. A voltage which opposes another voltage is technically known as a counter E.M.F. (electro-motive force) or a back E.M.F.

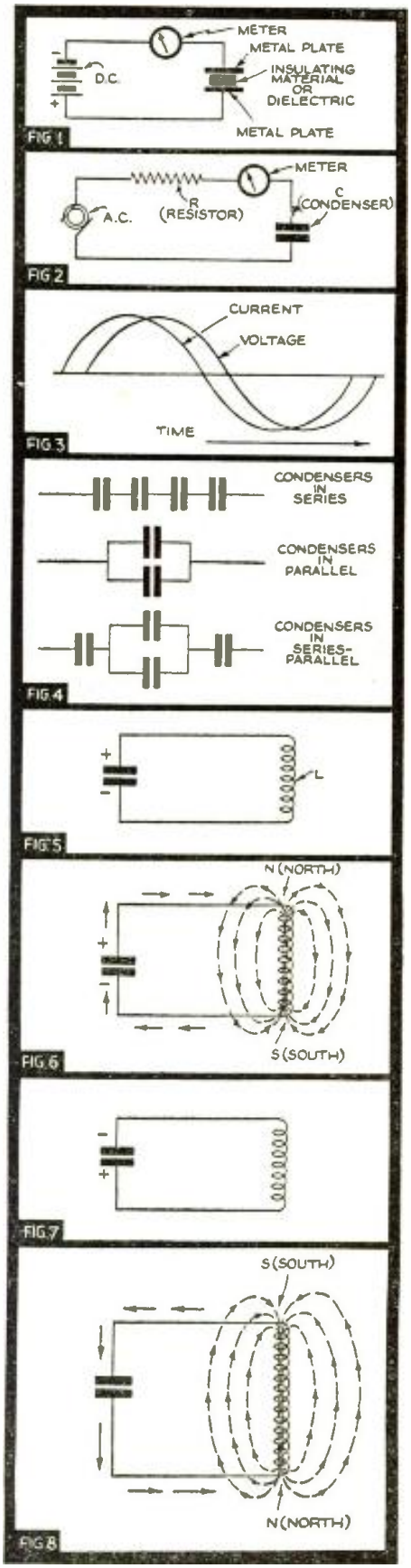
We may very well ask of what use condensers are in circuits in which direct currents are flowing, since it is equivalent to preventing the current from flowing in the circuit. The answer is that we take advantage of condenser action to couple circuits electrically, or to compel currents to flow in designated circuits and not to wander around out of control.

Condenser on A.C.

We are, however, not only concerned with *direct* currents but with *alternating* currents as well. What would happen if we substituted an alternating current generator for our battery, as in Fig. 2? In this case the meter would continually show a reading, indicating a constant current flow. We must remember that an alternating current varies between a maximum positive charge and a maximum negative charge. The condenser is then rapidly charged, discharged, and charged again. Since the condenser does not prevent the flow of alternating current, placing one of large value across the A.C. generator might cause a short-circuit. For this reason, we place a resistance of suitable value in the circuit to reduce the amount of current flowing, and thus protect the generator.

When a condenser is placed in an alternating current circuit, some very interesting things happen. Before reaching the condenser, we may say that both the current and voltage go through their cycles "in step" with each other. The introduction of capacitance causes the current to *lead* the voltage, as shown by the graph of Fig. 3. The amount that the current will jump ahead depends upon the capacity and type of condenser. Many students have the idea that alternating current and voltage are identical——one and the same thing. While a relationship does exist between the two, they are separate units. If, for example, we replace the condenser in Fig. 2 with a coil of wire (in other words, an inductance), the opposite effect will take place and the current will lag behind the voltage. In an alternating current circuit, the voltage may start to build up to a maximum first, or the current first, depending upon which we have in the circuit——capacitance or inductance. If we wished the voltage and the current to build up to a maximum at the same time, we could have suitable values

(Continued on page 565)



1—Condenser on D.C. 2—Condenser on A.C. 3—Capacity causes current to lead voltage. 4—Various condenser connections. 5—Oscillating circuit. 6, 7 and 8—show reversal of current in circuit due to condenser charge and discharge.

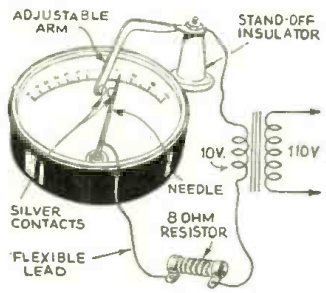
Radio Kinks

Each month the Editor will award a 2 year subscription for the best kink submitted. All other kinks published will be awarded eight months' subscription to RADIO & TELEVISION. Look over these kinks; they will give you some idea of what is wanted. Send a typewritten or ink description with sketch, of your favorite to the Kink Editor.

1st Prize Winner

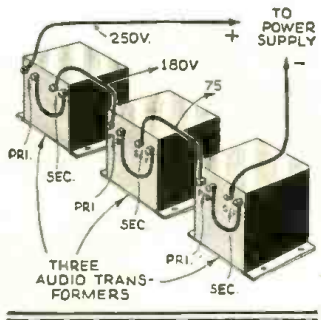
Cheap Crystal Oven

A few weeks ago I had need for a crystal oven. I bought a thermometer of the bi-metal type and soldered a contact onto the hand. The thermometer was mounted on a small tin can, which is large enough to cover a crystal holder and socket. As a source of current, I used a 10-volt filament transformer and an 8-ohm wire-wound resistor for the heater. Another contact was, of course, necessary, so this was mounted on an insulator and placed in such a way that it contacted the thermometer hand at the desired temperature. When the heat passes this point of setting, contact is broken when the hand moves to a higher temperature. Resistors can be made from iron wire, and the whole can is insulated with asbestos paper or corrugated cardboard. This type of thermostat will keep the heat accurate to about 5°.—*Eugene W. Happle.*



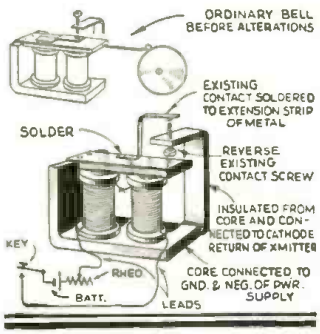
Emergency Voltage Divider

When I had nearly completed my power-supply, I found that I had no voltage divider available. Not wishing to wait until the following day when the stores opened, I took three old audio transformers from my junk box and connected the primary and secondary of each in series. I then connected the three units thus formed in series also; the total resistance was about 1,800 ohms. Not only did it serve admirably as a voltage divider, but it improved the filtering action of the power-pack. —*Vito Pavelt.*



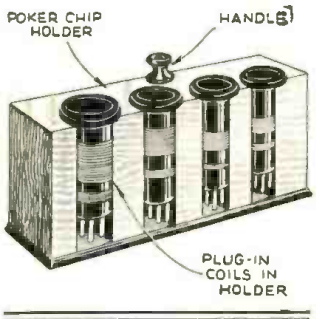
Home-Made Keying Relay

An ordinary electric bell can easily be converted into a reliable keying relay with practically no expense. As shown in the accompanying sketch, the contact screw is reversed, so that it makes contact with the extended contact point when the windings of the armature are energized. The contact screw is insulated from the frame of the bell and is connected to the cathode return of the transmitter. The point with which it makes contact is connected to the ground and negative side of the power supply. The windings of the bell are insulated from these parts and are connected to the key circuit.—*G. E. Bormy.*



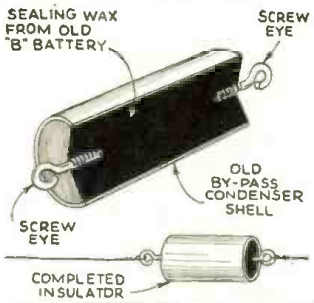
Holder For Coil Kit

Plug-in coils for short-wave receivers are likely to become lost or damaged if merely kept loose in a box. Therefore I went to the 10-cent store and bought a wooden poker chip case. The coils which I use fit the openings in the chip box perfectly, and as there are four such holes, coils for the 160, 60, 40 and 20 meter bands are all accommodated. If the receiver uses more than four coils, two or more of the chip boxes may be screwed together. —*George Wann, W8QKE.*



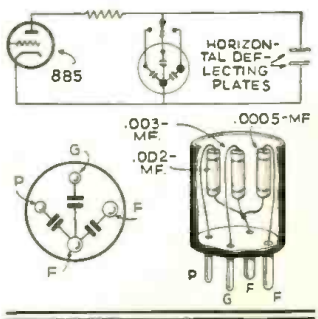
Strain Insulator

Some of us experimenters who have lots of time, but no money, get a kick out of making as much of our own equipment as possible. One of the little devices with which we have had a good bit of success is a strain insulator improvised from an old by-pass condenser shell, screw-eyes, and sealing wax from "B" batteries. If screw-eyes are not available, the end eyelets may be made from heavy wire. The drawing shows how this insulator is assembled. We have tested these insulators and found them to resist a pull of 100 lbs.—*George Brown and Dick Wooley.*



Plug-In Condenser

The tapped switch for the condensers in my oscilloscope had only three taps and I wished to have a greater range of values than was possible with this unit. I therefore mounted midget condensers in old tube bases, as shown. I also mounted a 4-prong socket in the oscilloscope, one of its connections going to the common lead and the other three going to the three switch contacts. By having a variety of capacities in the plugs, I was able to get an extremely wide range of frequencies in the sawtooth oscillator. The condensers must be well shielded; a standard can type coil shield or tube shield will do.—*Bill Fields.*



Simple Multi-Meter

I have built a simple multimeter which will trace circuits, test resistors, measure D.C. currents and voltages. The meter used is of the high resistance type and the resistor values, as shown in the diagram, should range from about 1,500 ohms to ¼ megohm. The following tables are used in making calculations:

To figure a voltage:
$E = I\ (R_1 + R)$
E_1 = actual meter dial reading
E = voltage to be tested
R_1 = original resistance of meter
R = size of multiplier resistor used
I = Known current

To calibrate meter

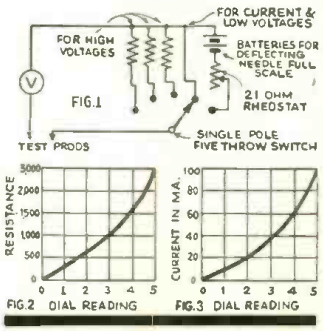
$$\frac{E}{E_1} = \frac{R_1 + R}{R_1} \text{ or}$$

$$E = \frac{E_1\ (R_1 + R)}{R_1}$$

To measure resistors: Take down on paper dial reading from some resistors you know the size of. Then plot a curve on a chart (see Fig. 2). Always have rheostat adjusted so needle deflects full scale when prods touch.
To measure current: The current that will deflect needle, full scale, is:

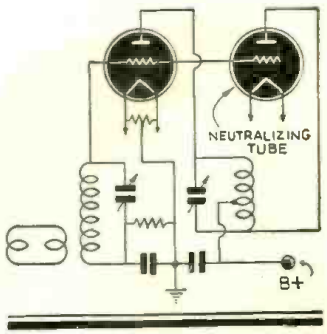
$$I = \frac{E}{R}$$

I = current to be tested
E = full scale voltage reading
R = resistance of meter with shunt
After several readings of known current are noted, a calibration can be plotted.—*Carl Eastman.*



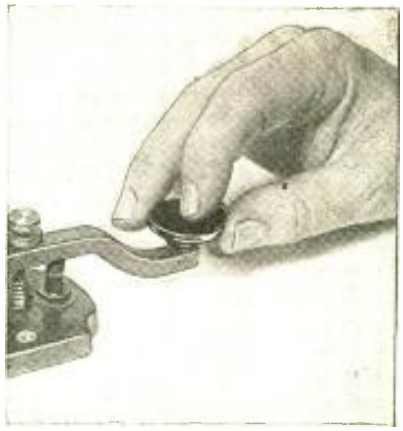
Neutralizing Method

Tubes which have burned out or are otherwise inoperative may be used as neutralizing condensers in circuits with other tubes of the same model. The accompanying diagram shows how the grid-plate capacity of the burned-out tube is used to neutralize an amplifier. Not only is this inexpensive, but as tubes' interelectrode capacities are now quite well standardized, it affords an exceptionally accurate method.—*S. Yasunaga.*



How to Learn the International Radio Code

Everett L. Dillard and Frank Collins



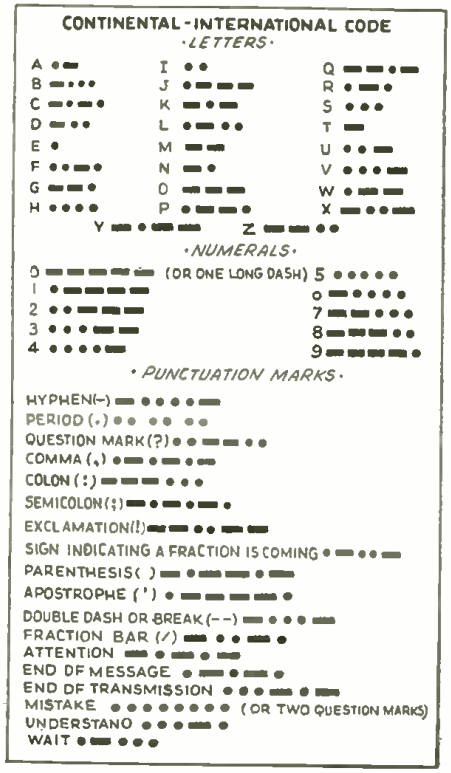
The grip on the radio key should be light; the position of the thumb, also the first and second fingers is shown above.

The dot and dash code used by Hams the world over is quite easy to learn, if you follow the right method. The editors are sure that every prospective Ham will appreciate this article.

● LEARNING code is not an easy task, and often to some it seems to be a very discouraging process. The most difficult thing about learning code is to maintain continued interest; for to the beginner who is anxious to progress rapidly the actual progress may seem at times to be quite slow in comparison with the speed with which other subjects can be learned. That is why it is best to learn code with the help of another beginner, or with an organized code class. Then there is always the feeling of competition and greater interest and, because of the mutual interest created by each student assisting and coaching the other, the learning of code becomes a very interesting process. Where interest is sustained, the code is learned in a much shorter period of time than otherwise. This is not meant to convey the impression that a person working by himself cannot easily learn code, for many who have constructed home-made audio oscillators, and who have worked alone and practiced by themselves have become proficient radio operators.

When progress seems the slowest it is always hardest to continue. However, code is just like anything else worthwhile, and mastery of the code gives the radio operator an additional asset when it comes to seeking a job, for the code-trained operator is in demand by broadcasting stations, police stations, aeronautical stations and other classes of radio services. Knowing all the benefits which are to be derived from the learning of code, the student should continually remember the future that lies ahead to spur him on when progress seems slowest.

Perhaps the most important thing besides *learning* the actual code characters themselves is practice—and herein lies the secret of becoming a skilled radiotelegraph operator . . . . Practice . . . . Practice . . . . and MORE Practice.



called, "International Morse"), differs from the code used on *wire* telegraph circuits in two ways: First, the combinations of dots and dashes that go to make up many of the letters are different; and second, the sound of Continental Morse is that of a musical tone broken up into long and short audible sounds, whereas, the American Morse on land-line circuits is read by listening to a sounder. The length of dots and dashes in American Morse is indicated by the length between clicks, and in Continental Morse by the actual length of the character transmitted—a short character being a dot and a long character representing a dash. Since for radio communication we are interested primarily in the International (Continental) Morse System, we will not consider the American System in this study.

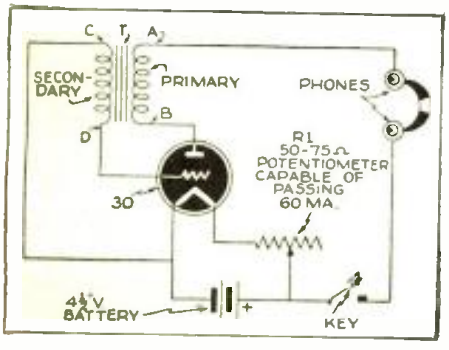
The Continental Code, with all common letters of the alphabets, numbers, and most common punctuation marks, is listed in the chart herewith. You will note that each letter, number, or punctuation mark is made up of a certain grouping of dots and dashes. For instance, the letter "A" is always . —; a comma (,) is always .—.—.—; the number "6" is always —. . . . .; etc. The student should memorize all of the list given before attempting

(Continued on page 553)

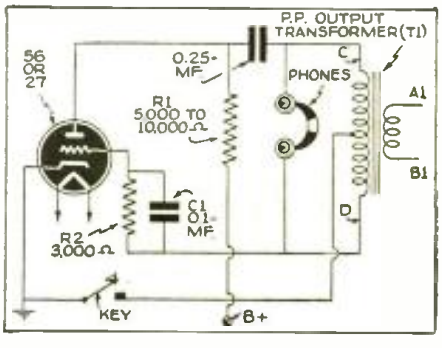
The Continental Code

The code used by radio operators, known as the Continental Morse Code (sometimes

Diagram of a simple oscillator for use in learning the code is shown below. The tone of the signal may be varied.



Another form of code teaching oscillator circuit easily built and one which may appeal to the readers and students.



World Short Wave Stations

Revised Monthly

Complete List of SW Broadcast Stations

Reports on station changes are appreciated.

Mc.	Call	
31.600	W1XKA	BOSTON, MASS., 9.494 m., Addr. Westinghouse Co. Daily 6 am.-1 am., Sun. 8 am.-1 am. Relays WBZ.
31.600	W1XKB	SPRINGFIELD, MASS., 9.494 m., Addr. Westinghouse Co. Daily 6 am.-1 am., Sun. 8 am.-1 am. Relays WBZ.
31.600	W3XEY	BALTIMORE, MD., 9.494 m., Relays WFBR 4 pm-12 m.
31.600	W2XDV	NEW YORK CITY, 9.494 m., Addr. Col. Broad. System, 485 Madison Ave. Daily 6-11 pm.; Sat. and Sun. 1.30-6, 7-10 pm.
31.600	W9XHW	MINNEAPOLIS, MINN., 9.494 m. Relays WCCO 9 am.-12 m.
31.600	W3XKA	PHILADELPHIA, PA., 9.494 m., Addr. NBC. Relays KYW 9 am.-10 pm.
31.600	W5XAU	OKLAHOMA CITY, 9.494 m., Sun 12 n-1 pm., 6-7 pm. Irregular other times.
31.600	W4XCA	MEMPHIS, TENN., 9.494 m. Addr. Memphis Commercial Appeal. Relays WMC.
31.600	W8XAI	ROCHESTER, N. Y., 9.494 m., Addr. Stromberg Carlson Co. Relays WHAM 7.30-12.05 am.
31.600	W8XWJ	DETROIT, MICH., 9.494 m., Addr. Evening News Ass'n. Relays WWJ 6-12.30 am., Sun. 8 am-12 m.
31.600	W9XPD	ST. LOUIS, MO., 9.494 m., Addr. Pulitzer Pub. Co. Relays KSD.
26.450	W9XA	KANSAS CITY, MO., 11.33 m., Addr. Commercial Radio Eqpt. Co. Testing
26.400	W9XAZ	MILWAUKEE, WIS., 11.36 m., Addr. The Journal Co. Relays WTMJ from 1 pm.
26.300	W2XJI	NEW YORK, N. Y., 11.4 m., Addr. Bamberger Broad. Service, 1440 Broadway. Relays WOR 8 am.-1 am. Irregular.
26.100	W9XJL	SUPERIOR, WIS., 11.49 m. Relays WEBC daily.
26.050	W9XTC	MINNEAPOLIS, MINN., 11.51 m. Relays WCTN 9 am.-1 pm., 7 pm.-12 m.
25.950	W6XKG	LOS ANGELES, CAL., 11.56 m., Addr. B. S. McGlashan, Wash. Blvd. at Oak St. Relays KGFJ 24 hours daily.
25.950	W9XUP	ST. PAUL, MINNESOTA. 11.56 m. Relays KSTP evenings.
21.550	GST	DAVENTRY, ENG., 13.92 m., Addr. (B.B.C., London) Irregular at present.
21.540	W8XK	PITTSBURGH, PA., 13.93 m., Addr. Grant Bldg. Relays KDKA 6.45-9 am. Also Sunday. 6 pm.
21.530	GSJ	DAVENTRY, ENG., 13.93 m., Addr. (See 21.550 mc.) 5.45-8.50 am.
21.520	W2XE	NEW YORK CITY, 13.94 m., Addr. Col. Broad. Syst., 485 Madison Ave. Daily exc. Sat. and Sun. 7.30-10 am. Sat. and Sun. 8 am.-1 pm.
21.500	W2XAD	SCHENECTADY, N. Y., 13.95 m., General Electric Co., 8 am.-12 n.
21.470	GSH	DAVENTRY, ENG., 13.97 m. (See 21.550 mc.). 5.45 am.-12 n.
21.450	DJS	BERLIN, GERMANY, 13.99 m., Addr., Broadcasting House. 12.05-11 am.
19.020	HS6PJ	BANGKOK, SIAM, 15.77 m. Mondays 8-10 am. See 15.23 mc.
18.480	HBH	GENEVA, SWITZERLAND, 16.23 m., Addr. Radio Nations. Sun., 10.45-11.30 am.

16 Met. Broadcast Band

17.820	—	ROME, ITALY. 16.84 m., Addr. (See 2RO, 11.81 mc.) Relays 2RO to 6 pm. irregularly.
17.810	TPB3	PARIS, FRANCE, 16.84 m. Addr. (See 15.245 mc.) 9.30-11 am.
17.800	TGWA	GUATEMALA CITY, GUAT., 16.84 m., Addr. Ministre De Fomento. Irregular.
17.790	GSG	DAVENTRY, ENG., 16.86 m., Addr. B.B.C., London. 5.45 am.-12 n., 12.20-4 pm.
17.785	JZL	TOKYO, JAPAN, 16.87 m. 8-8.30 pm.
17.780	W3XL	BOUND BROOK, N. J., 16.87 m., Addr. Natl. Broad. Co., 9 am.-5 pm. to Europe, 5-11 pm. to So. Amer.
17.770	PHI2	HUIZEN, HOLLAND, 16.88 m., Addr. (See PHI, 11.730 mc.) Daily 7.25-8.25 am. Tues. and Thurs., 7.25-8.40 am., Sun. 6.25-9.40 am.
17.760	DJE	BERLIN, GERMANY, 16.89 m., Addr. Broadcasting House. 12.05-10 am.; also Sun. 11.10 am-12.25 pm. Daily 4.50-10.50 pm.
17.760	W2XE	NEW YORK, N. Y., 16.89 m., Addr. Col. Broad. System, 485 Madison Ave. Irregular.
17.755	ZBW5	HONGKONG, CHINA, 16.9 m., Addr. P.O. Box 200. Dly. 11.30 pm.-1.15 am., 5-10 am., Sun. 9 pm. (Sat.)-1.30 am., 5-9.30 am. Operates irreg.

End of Broadcast Band

17.310	W2XGB	HICKSVILLE, L. I., N. Y., 17.33 m., Addr. Press Wireless, Box 296. Tests 9.30-11.30 am. except Sat. and Sun.
17.280	FZEB	DJIBOUTI, FRENCH SOMALILAND, 17.36 m. Test XMSN 1st Thurs. each month 8-8.30 am. Next B.C. Jan. 5.
15.550	CO9XX	TUINICU, ORIENTE, CUBA, 19.29 m., Addr. Frank Jones, Central Tuinicu, Tuinicu, Santa Clara. Broadcasts irregularly evenings.
15.510	XOZ	CHENGTU, CHINA, 19.34 m. Daily 9.45-10.30 am.
15.370	HAS3	BUDAPEST, HUNGARY, 19.52 m., Addr. Radiolabor, Gyali Ut 22. Sun. 9-10 am.
15.360	DZG	ZEESEN, GERMANY, 19.53 m., Addr. Reichspostzentralamt. Tests irregularly.
15.360	—	BERNE, SWITZERLAND. 19.53 m. Irreg. 6.45-7.45 pm.

19 Met. Broadcast Band

15,340	DJR	BERLIN, GERMANY, 19.56 m., Addr. Br'dcast'g House, 8-9 am., 4.50-10.50 pm.
15.330	W2XAD	SCHENECTADY, N. Y., 19.56 m., Addr. General Electric Co. Relays WGY, 12.15-7 pm.
15.320	OLR5B	PRAGUE, CZECHOSLOVAKIA. 19.58 m. Addr. (See 11.840 mc.) Sun., Wed., Sat. 5-5.10 pm.; Mon., Tues., Thurs., Fri. 6.55-9.55 pm.
15.310	GSP	DAVENTRY, ENG., 19.6 m., Addr. (See 17.79 mc.) 3-5.15 am., 1.45-4 pm.
15.300	YDB	SOERABAJA, JAVA, N. E. I. 19.61 m. Addr. NIROM. 7.30 pm.-2 am.
15.300	XEBM	MAZATLAN, SIN., MEX., 19.61 m., Addr. Box 78, "El Pregonero del Pacifico." Irregularly 9-10 am., 1-2, 8-10 pm.
15.300	2ROS	ROME, ITALY. 19.61 m., Addr. (See 2RO, 11.81 mc.) 12.10-2, 7.30-9 pm. and irreg.
15.290	LRU	BUENOS AIRES, ARG., 19.62 m., Addr. El Mundo. Relays LRI, 7-9 am.
15.280	DJQ	BERLIN, GERMANY, 19.63 m., Addr. Broadcasting House. 12.05-5.50 am., 4.50-10.50 pm. Also Sun. 11.10 am-12.25 pm.
15.270	HI3X	CIUDAD TRUJILLO, D. R., 19.65 m. Relays HIX Sun. 7.40-10.40 am. Tues. and Fri. 8.10-10.10 pm.
15.270	W2XE	NEW YORK CITY, 19.65 m., Addr. (See 21.520 mc.) Daily except Sat. and Sun. 1-6 pm., Sat. and Sun. 2.30-6 pm.
15.260	GSI	DAVENTRY, ENG., 19.66 m., Addr. (See 17.79 mc.) 5.45-8.50, 9 am-noon, 12.20-1.30 pm.
15.250	W1XAL	BOSTON, MASS., 19.67 m., Addr. University Club. Tues., Thurs. 4.30-6.30 pm.
15.245	TPA2	PARIS, FRANCE, 19.68 m., Addr. 98 Bis. Blvd. Haussmann. "Paris Mondial" 6-11 am.
15.230	HS6PJ	BANGKOK, SIAM, 19.7 m. Irregularly Mon. 8-10 am.
15.230	OLR5A	PRAGUE, CZECHOSLOVAKIA, 19.7 m. Addr. (See OLR4A, 11.84) Mon.-Fri. 7.50-10.55 pm. Sat. and Sun. 5-5.15 pm., Sun. 5.55-8.55 pm., Tues. 4.40-5.15 pm.
15.220	PCJ2	HUIZEN, HOLLAND, 19.71 m., Addr. N. V. Philips' Radio Hilversum. Tues. 2-3.30 am., Wed. 9.30-11.30 am.
15.210	W8XK	PITTSBURGH, PA., 19.72 m., Addr. (See 21.540 mc.) 9 am.-1 pm.
15.200	DJB	BERLIN, GERMANY, 19.74 m., Addr. (See 15.280 mc.) 12.05-11 am., 4.50-10.50 pm. Also Sun. 11.10 am.-12.25 pm.
15.195	TAQ	ANKARA, TURKEY, 19.74 m., 5.30-7 am., 1.20-5 pm. Irreg. Relays 2RO irreg.
15.190	—	ROME, ITALY. 19.75 m. Relays 2RO till 6 pm., irreg.
15.190	OFO	LAHTI, FINLAND. 19.75 m. Addr. (See OFO, 9.5 mc.) 1-3 am., 9 am.-n., 12.15-5 pm. Irreg.
15.190	ZBW4	HONGKONG, CHINA, 19.75 m., Addr. P. O. Box 200. Irregular. 11.30 pm. to 1.15 am., 3-10 am.
15.180	RW96	MOSCOW, U.S.S.R., 19.76 m. Mon., Tues., Fri., Sat. 2.30-3.30 pm. Daily 3-4 am. Mon., Wed., Thurs. 7-9.15 pm.
15.180	GSO	DAVENTRY, ENG., 19.76 m., Addr. (See 17.79 mc.) 4.15-6, 6.20-8.30 pm., 3-5.15 am., 9 am.-11 am.
15.170	TGWA	GUATEMALA CITY, GUAT., 19.77 m., Addr. (See 17.8 mc.) Daily 12.15-1.45 pm.; Sun. 12.45-5.15 pm.
15.165	OZH	SKAMLEBAK, DENMARK, 19.78 m., Sun. 8 am.-1.30 pm.
15.160	XEWW	MEXICO CITY, MEXICO, 19.79 m., 12 n.-12 m., irregular.
15.160	JZK	TOKYO, JAPAN, 19.79 m. 12.30-1.30 am., 2.30-4, 4.30-5.30, 8-8.30 pm.
15.160	VUD3	DELHI, INDIA, 19.79 m., Addr. All India Radio. 1.30-3.30 am., 8.30-10.30 pm.
15.155	SM5SX	STOCKHOLM, SWEDEN, 19.79 m., Daily 11 am.-5 pm., Sun. 9 am.-5 pm.
15.150	YDC	BANDOENG, JAVA, 19.8 m., Addr. N. I. R. O. M. 6-7.30 pm., 10.30 pm.-2 am., Sat. 7.30 pm.-2 am., daily 4.30-10.30 am.
15.140	GSF	DAVENTRY, ENG., 19.82 m., Addr. (See 17.79 mc.) 3-5.15 am., 5.45 am.-12 n.
15.130	TPB6	PARIS, FRANCE. 19.83 m., Addr. "Paris Mondial," 98 Bis Blvd. Haussmann, 7-9.15 pm.
15.130	W1XAL	BOSTON, MASS., 19.83 m., Addr. World-Wide B'cast'g Foundation. University Club. 10-11 am., Mon.-Fri. Sun. 10 am.-1 pm.

(Continued on page 536)

All Schedules Eastern Standard Time

Milburne O. Sharpe, who has WAC for thousands of contacts in the past two years. In his set-up, below, notice the lucky elephant which stands between the transmitter and receiver to keep the QRN & QRM demons away from W4CED's rig.

SEVENTH Silver Trophy

Awarded to

Milburne O. Sharpe

W4CED

Knoxville, Tennessee

For Best HAM Station photo of the month

This beautiful silver trophy stands 11¾" high and is to be awarded monthly by RADIO & TELEVISION magazine for the best photo of a Ham station. The silver statue stands on a handsome bakelite base on which is a silver plate. The name of the winner will be engraved on this plate before the trophy is sent to him.

● SHOWN in the photo is the operating position and transmitter and receiver units of amateur station W4CED, located in Knoxville, Tenn. (P.O. Box 25). This station is also Unit Control station for the U. S. Naval Reserve, using the call N4CED in the 80 meter amateur band and special tactical calls on naval reserve frequencies.

The receiver is a standard SX-16 Super Skyrider, with a tuning range of 540 kc. to 62 mc., on which amateur stations of all continents have been logged.

The transmitter at present is used on CW only, although provision has been made for plugging in a modulator when phone operation is desirable. Operation is on three bands —20, 40, and 80 meters, and frequency selection on any one of six crystals is by switching, no plug-in coils or condensers being used. The oscillator is a 6L6G, operating at about 375 volts, and is capacitatively coupled to a pair of 6L6G's in the final, no buffer being employed. Input to the final stage is 150 watts on 80 meters, 120 watts on 40 meters, and 90 watts on 20 meters. Keying is in the oscillator circuit in order that break-in operation may be used. This is accomplished with an S.P.D.T. relay, which opens the "B" supply of the receiver when the transmitting key is closed.

Only one transmitting antenna is used—a half-wave single wire feed, which is tapped off center at such a point that good impedance matching is obtained at all the frequencies used. This antenna is also used for receiving when break-in operation is not being used, being switched between the transmitter and receiver by means of a relay which is operated in conjunction with the main power switch on the transmitter. When break-in is used, a short horizontal antenna is switched to the receiver automatically.

Amateur stations on all continents have been worked over a period of the last two years, and the total number of contacts will run into the thousands. The greater part of amateur operation is confined to the 40 meter band, while all naval reserve activities are carried on in the 80 meter band and on the special naval reserve frequencies.

Rules for Trophy Contestants

● WOULD you like to win one of these beautiful silver trophies? It is very easy to do so—simply send the Editors, a good, clear photograph of your Ham station. If your station photo is selected as the best of those submitted each month, you will be awarded one of these handsome silver trophies with your name engraved on it.

The trophy stands nearly 12" high and is a fine example of the silversmith's art. We are sure that every Ham in the country will be tickled with it, if he should win it. The silver trophy represents the spirit of victory and it was designed by one of the leading silversmiths. The name of the winner each month will be engraved on a silver plate mounted on the black bakelite pedestal before the trophy is sent to the successful contestant.

The next award will be announced in the February issue, and the closing date for that contest is December 10.

The judges of the contest will be the Editors of RADIO & TELEVISION. In the event of a tie, duplicate prizes shall be awarded to the contestants so tying.

Mc.	Call	
15.120	SPI9	WARSAW, POLAND, 19.84 m., 6-9 pm.
15.120	HVJ	VATICAN CITY, 19.83 m., 10.30-10.45 am., exc. Sun.
15.110	DJL	BERLIN, GERMANY, 19.85 m., Addr. (See 15.280 mc.) 12 m.-2, 8-9 am., 10.40 am.-4.25 pm., also Sun. 6-8 am.
15.080	RKI	MOSCOW, U.S.S.R., 19.87 m. Works Tashkent near 7 am. Broadcasts Sun. 12.15-2.30 pm. Daily 7-9.15 pm.

End of Broadcast Band

14.970	LZA	SOFIA, BULGARIA, 20.04 m., M., W., F., Sat. 5-7, 10 am.-5 pm.; T., Th. 1-3 pm. Sun. 12.30-8, 10 am.-4.30 pm.
14.940	PSE	RIO DE JANEIRO, BRAZIL. 20.08 m., Broadcasts Wed. 3.45-4.15 pm.
14.600	JVH	NAZAKI, JAPAN, 20.55 m. Broadcasts irregularly 5-11.30 pm. Works Europe 4-8 am.
14.535	HBJ	GENEVA, SWITZERLAND, 20.64 m., Addr. Radio Nations. Broadcasts Sun. 1.45-2.30 pm., Mon. 1.30-1.45 pm.
14.440	—	RADIO MALAGA, SPAIN, 20.78 m. Relays Salamanca 5.40-8.40 am. Sometimes 2-4 pm.
14.430	HCJB	QUITO, ECUADOR, 20.79 m. Sun. 9-9.30 pm. and irreg.
14.166	PIIJ	DORDRECHT, HOLLAND, 21.15 m., Addr. (See 7.088 mc.) Sat. 12 n.-12.30 pm.
14.004	EA9AH	TETUAN, SPANISH MOROCCO, 21.4 m. Apartado 124. News at 4.30 and 7.15 pm. Relays Salamanca from 5.40 pm.
13.635	SPW	WARSAW, POLAND, 22 m. Daily 6-8 pm. Sat. & Sun. 6-9 pm.
13.000	CR6AA	LOBITO, ANGOLA, 23.06 m., Mon., Wed., Sat., 2.45-4.45 pm.
12.862	W9XDH	ELGIN, ILL., 23.32 m. Press Wireless, Tests 2-5 pm.
12.460	HC2JB	QUITO, ECUADOR, 24.08 m. Daily exc. Mon. 8-10.30 pm.
12.235	TFJ	REYKJAVIK, ICELAND, 24.52 m. Works Europe mornings. Broadcasts Sun. 1.40-2.30 pm.
12.200	——	TRUJILLO, PERU, 24.58 m., "Rancho Grande." Address Hacienda Chiclin. Irregular.
12.060	RNE	MOSCOW, U.S.S.R., 24.88 m. Daily 6-7 am., 12 n.-2 pm., 3-6, 10.15-11 pm., also Tues., Thurs. 8.30-9 pm., also Sun. 6-10.30 am., 12 n.-5 pm., 6-6.30, 8.30-9, 10.15-11 pm.
11.970	HI2X	CIUDAD TRUJILLO, D. R., 25.07 m., Addr. La Voz de Hispaniola. Relays HIX Tue. and Fri. 8.10-10.10 pm.

25 Met. Broadcast Band

11.928	TI2XD	SAN JOSE, COSTA RICA. 25.5 m. La Voz del Pilot. Apartado 1729. 10 am.-n., 4-10 pm.
11.910	CD1190	VALDIVIA, CHILE, 25.2 m., P. O. Box 642. Relays CB69 10 am.-1 pm., 7-10 pm.
11.900	—	HANOI, FRENCH INDO-CHINA. 25.21 m. "Radio Hanoi", Addr. Radio Club de l'Indochine. 12 m.-2 am., 6-10 am. 150 watts.
11.900	XEWI	MEXICO CITY, MEXICO, 25.21 m., Addr. P. O. Box 2874. Mon. Wed., Fri. 3-4 pm., 9 pm.-12 m. Tues. and Thur. 7.30 pm.-12 m., Sat. 9 pm.-12 m., Sun. 12.30-2 pm.
11.885	TPA3	PARIS, FRANCE, 25.24 m., Addr. (See 15.245 mc.) 2-5 am., 11.15 am.-6 pm., 7-9.15 pm.
11.885	TPB7	PARIS, FRANCE, 25.24 m. (See
11.875	VLR	MELBOURNE, AUSTRALIA, 25.26 m. Testing around 1.30-3 am. Irregular.
11.870	W8XK	PITTSBURGH, PA., 25.26 m., Addr. (See 21.540 mc.) 1-11 pm.
11.865	——	BERNE, SWITZERLAND. 25.28 m. Irreg. 8-9 pm. to No. Amer.
11.860	GSE	DAVENTRY, ENG., 25.29 m., Addr. (See 11.75 mc.) 3-5.15 5.45 am.-12 n.
11.855	DJP	BERLIN, GERMANY, 25.31 m., Addr. (See 15.280 mc.) Irregular. 7.15-10.50 pm. for No. Amer.
11.840	KZRM	MANILA, P. I., 25.35 m. Addr. Erlanger & Gallinger, Box 283. 9 pm.-10 am. Irregular.
11.840	CSW	LISBON, PORT., 25.35 m. Nat'l Broad. Station. 11.30 am.-1.30 pm. Irregular.
11.840	OLR4A	PRAGUE, CZECHOSLOVAKIA, 25.34 m., Addr. Czech Shortwave Sta., Praha XII, Fochova 16. Daily 1.55-4.30 pm. Mon. to Fri. 7.55-10.55 pm., Sun. 5.55-8.55 pm.
11.830	W9XAA	CHICAGO, ILL., 25.36 m., Addr. Chicago Federation of Labor. Irregular 7 am.-6 pm.
11.830	W2XE	NEW YORK CITY, 25.36 m., Addr. Col. Broad. System, 485 Madison Av., N.Y.C. 6.30-11 pm.
11.826	XEBR	HERMOSILLA, SON., MEX., 25.37 m., Addr. Box 68. Relays XEBH. 9.30-11 am., 1-4 pm., 9 pm.-12 m.
11.820	GSN	DAVENTRY, ENG., 25.38 m., Addr. (See 11.75 mc.) Irregular.
11.810	2RO4	ROME, ITALY, 25.4 m., Addr. -E.I.A.R., Via Montello 5. Daily 4.40-8.45 am., 10 am.-12 n.
11.805	COGF	MATANZAS, CUBA, 25.41 m., Addr., Gen. Betancourt 51. Relays CMGF. 2-3, 4-5, 6-11 pm.
11.805	OZG	SKAMLEBOAEK, DENMARK, 25.41 m. Addr. Statsradiofonien. Irreg.
11.801	DJZ	BERLIN, GERMANY, 25.42 m. 7.15-10.50 pm.
11.800	JZJ	TOKYO, JAPAN, 25.42 m., Addr. Broadcasting Co. of Japan, Overseas Division. 7-7.30, 8-9.30 am., 2.30-4, 4.30-5.30, 8-8.30 pm., 12.30-1.30 am.
11.795	DJO	BERLIN, GERMANY, 25.43 m., Addr. (See 15.280 mc.) 7.15-10.50 pm. Irreg.
11.790	WIXAL	BOSTON, MASS., 25.45 m., Addr. (See 15.250 mc.) Daily 4.55-6.30 pm., Tues., Thur., 4.40-6.30 pm., Sat. 1.45-6 pm., Sun. 5-6.30 pm.
11.780	HP5G	PANAMA CITY, PAN., 25.47 m., Addr. Box 1121, 8-11 pm.
11.780	OFE	LAHTI, FINLAND. 25.47 m. Addr. (See OFE, 9.5 mc.) 1.05-3 am., 5-6.20, 10 am.-12.30 pm.
11.770	DJD	BERLIN, GERMANY, 25.49 m., Addr. (See 15.280 mc.) 10.40 am.-4.30 pm., 4.50-11 pm.
11.760	TGWA	GUATEMALA CITY, GUAT., 25.51 m. (See 17.8 mc.) Irregular 10-11.30 pm. Sun. 6-11.30 pm., irregular.
11.760	XETA	MONTEREY, MEX. 25.51 m., Addr. Box 203. Relays XET, n.-3.30 pm. and evenings.
11.760	OLR4B	PRAGUE, CZECHOSLOVAKIA, 25.51 m., Addr. (See 11.840 mc.) Irregular.
11.750	GSD	DAVENTRY, ENG., 25.53 m., Addr. B.B.C., London. 3-5.15 am., 12.20-4 pm., 4.15-6 pm., 6.20-8.30, 9.20-11.30 pm.
11.740	SP25	WARSAW, POLAND, 25.55 m., 6-9 pm.
11.740	COCX	HAVANA, CUBA. 25.55 m. P. O. Box 32. Daily 8 am.-1 am. Sun. 8 am.-12 m. Relays CMX.
11.740	HVJ	VATICAN CITY, 25.55 m. Testing irregular.
11.730	PHI	HUIZEN, HOLLAND, 25.57 m., Addr. N. V. Philips' Radio. Daily 6.15-6.45 pm. Sat. 7.15-7.45 pm.
11.730	WIXAL	BOSTON, MASS., 25.57 m. Addr. World-Wide B'cast'g Foundation, University Club. Daily exc. Sat. and Sun. 9-11 pm.
11.720	CJRX	WINNIPEG, CANADA, 25.6 m., Addr. James Richardson & Sons, Ltd. Daily 6 pm.-12 m., Sun. 5-10 pm.
11.718	CR7BH	LAURENCO MARQUES, PORTUGUESE E. AFRICA, 25.6 m. Daily 12.05-1, 4.30-6.30, 9.30-11 am., 12.05-4 pm., Sun. 5-7 am., 10 am.-2 pm.
11.715	TPA4	PARIS, FRANCE, 25.61 m., (See 15.245 mc.) 7-9.15 pm., 9.30 pm.-12 m.
11.710	YSM	SAN SALVADOR, EL SALVADOR, 25.63 m., Addr. (See 7.894 mc.) 1-2.30 pm.
11.710	—	SAIGON, FRENCH INDO-CHINA. 25.62 m., Addr. Boy-Landry, 17 Place A Foray. 6-9.15 am.
11.705	SBP	MOTALA, SWEDEN, 25.63 m., 1.20-2.05, 6-9 am., 11 am.-1 pm., Sat. 1.20-2 am., 6 am.-1.30 pm., Sun. 3 am.-1.30 pm. Wed. and Sat. 8-9 pm.
11.700	HP5A	PANAMA CITY, PAN., 25.65 m. Addr. Radio Teatro, Apartado 954. 10 am.-1 pm., 5-10 pm. Sun. 6-10 pm.
11.700	CB1170	SANTIAGO, CHILE, 25.65 m. Addr. P.O. Box 706. Relays CB89 10 am.-2 pm., 3.30-11 pm.

End of Broadcast Band

11.691	XTJ	HANKOW, CHINA, 25.66 m., m.-12.30 am., 7-7.30 am.
11.676	IQY	ROME, ITALY. 25.7 m. Relays 2RO 1.35-2.25, 6-9 pm.
11.535	SPD	WARSAW, POLAND, 26.01 m., Addr. 5 Mazowiecka St. 6-9 pm.
11.402	HBO	GENEVA, SWITZERLAND, 26.31 m., Addr. Radio Nations. Sun. 7-7.45 pm., Mon. 1-1.15 am., 7-8.30 pm.
11.040	CSW2	LISBON, PORTUGAL, 27.17 m., Addr. Nat. Broad. Sta. 2.15-4.15 pm., irreg.
11.000	PLP	BANDOENG, JAVA, 27.27 m. Relays YDB. 6-7.30 pm., 10.30 pm.-2 am., 4.30-10.30 or 11 am. Sat. until 11.30 am.
10.950	——	TANANARIVE, MADAGASCAR, 27.40 m., Addr. (See 9.38 mc.) 12.30-45, 10-11 am., 2.30-4 am., exc. Sun.
10.670	CEC	SANTIAGO, CHILE, 28.12 m. Irregular.
10.660	JVN	NAZAKI, JAPAN, 28.14 m. Broadcasts daily 1.50-7.40 am. Works Europe irregularly at other times.
10.600	ZIK2	BELIZE, BRIT. HONDURAS, 28.30 m., Tue., Thurs., Sat. 1.30-2, 8.30-9 pm.
10.535	JIB	TAIHOKU, TAIWAN, 28.48 m. Works Japan around 6.25 am. Broadcasts, relaying JFAK 9.05-10 am., 1-2.30 am. Sun. to 10.15 am.
10.400	YSP	SAN SALVADOR, EL SALVADOR, 28.85 m., 7.30-8.30 am., 1.30-11 pm.
10.350	LSX	BUENOS AIRES, ARG., 28.98 m., Addr. Transradio International. Tests irregularly.
10.330	ORK	RUYSSELEDE, BELGIUM, 29.04 m. Broadcasts 12.30-2 pm. Works OPM 1-3 am., 3-5 pm.
10.290	TIEMT	SAN JOSE, COSTA RICA, 29.15 m., 4.30-8 pm.
10.290	DZC	ZEESEN, GERMANY, 29.16 m., Addr. (See 15.360 mc.) Irregular.
10.260	PMN	BANDOENG, JAVA, 29.24 m. Relays YDB 6-7.30 pm., 10.30 pm.-2 am., 4.30-10.30 or 11 am., Sat. to 11.30 am.
10.220	PSH	RIO DE JANEIRO, BRAZIL, 29.35 m., Addr. Box 709. Broadcasts 6-7 pm., Mon. 8-8.30 pm.
10.042	DZB	ZEESEN, GERMANY, 29.87 m., Addr. Reichspostzenstralamt. Irregular.
10.100	——	DEUTSCHE FREIHEITS SENDER, 29.70 m., loc. in Germany, undercover. 4-5 pm.
9.995	COBC	HAVANA, CUBA, 30.02 m., Addr. P. O. Box 132. Relays CMBC 6.55 am.-1 am.
9.920	JDY	DAIREN, MANCHUKUO, 30.24 m. Relays JQAK daily 7-8 am. Works Tokyo occasionally in early am.
9.892	CP1	SUCRE, BOLIVIA, 30.33 m., 11 am.-n., 7-9 pm.
9.860	EAQ	MADRID, SPAIN, 30.43 m., Addr. Post Office Box 951. 7.30-8, 8.40-9 pm.
9.830	IRF	ROME, ITALY, 30.52 m. Works Egypt afternoons. Relays 2RO, 6-9 pm.
9.805	COCM	HAVANA, CUBA, 30.60 m. Addr. Transradio Columbia, P. O. Box 33. 8-1 am. Relays CMCM.
9.760	——	SAIGON, INDO-CHINA, 30.72 m., Addr. 17, Place A. Foray. "Radio Boy-Landry." Heard 6-9.15 am.
9.708	COCQ	HAVANA, CUBA, 30.90 m. Addr. 25 No. 445, Vedado, Havana, 7-1 am. Sun. 6.55 am.-1 am.
9.735	CSW7	LISBON, PORTUGAL, 30.82 m. Addr. Nat. Broad. Sta. n.-2 pm., 6-9 pm. for No. Amer.
9.705	——	FORT DE FRANCE, MARTINIQUE, 30.92 m., Addr. P. O. Box 136.
9.690	TI4NRH	HEREDIA, COSTA RICA, 30.94 m., Addr. Amando C. Marin, Apartado 40. Sun. 7-9 am., Tues., Thurs., Sat. 9-10 pm.

(Continued on page 538)

All Schedules Eastern Standard Time

Let's Listen In with Joe Miller

● THE variable weather conditions prevalent along the East Coast, with unseasonably warm weather during the fall, brought with them increased noise, and a noticeable decrease in favorable DX conditions, particularly during the daytime.

We have repeatedly remarked on the usually excellent DX conditions prevalent on cloudy, cold and overcast days, which would indicate that ol' Sol has a good deal of influence upon reception, even if proven only by his absence!

Winter conditions are now beginning to prevail; as the cold weather finally moves in, the signals come in crisply, stronger in most cases, and with very little left of the annoying background noise (especially on the lower frequencies) that we have come to associate with the warm seasons.

We are now taking charge of the station list, and would appreciate all data that would help to make this list as up-to-date as possible. A note on your observations will always be welcomed, even though we cannot promise to answer or acknowledge all letters. To those DXers who write us and require an answer, we would appreciate it if a stamped self-addressed envelope is enclosed with query.

After a long "pull," the VAC certificates have finally been realized, and they are beauties! We feel certain that if you could see one, you would send for yours at once! See picture of one reproduced on this page.

We turn to DX:

NEW CALEDONIA

FK8AA, 6.12 mc., at Noumea, known also as "Radio Noumea," has finally QSL'd our report on their weak transmissions of last March, when logged on one of their Saturday broadcasts.

FK8AA, as mentioned last month, is in reality an *amateur* station, operated by Charles Gaveau, and lately transmitting programs on the 6 mc. band. The card is a plain black and white print, and on the reverse side Mr. Gaveau gives some data on the station. Power at present is only 20 watts input to antenna, so this qualifies FK8AA as a really rare catch for any DXer.

OM Charles adds that he also works on 21 meters, the 14 mc. band, using fone and C.W., and has contacted W stations. Look for FK8AA at any time when the Aussies may be heard, as New Caledonia is just off the east coast of Australia.

One important tip was derived from this coveted QSL. The sked is Weds. and Sats., 2:30-3:30 a.m., E.S.T., not Tues. and Sats. as has been believed, and reported to us. QRA (address) in last issue is correct.

TURKEY

Since last month, much new and reliable data on Turkey has come to hand, and here's the latest:

Turkey officially opened broadcasting services on Oct. 29. The transmitters heard to date are TAP, on 9.465 mc., and TAQ, 15.195 mc., these calls being authentic, heard announced over the air on the Turkish broadcasts.

TAQ, on 15.195 mc., is reported on a sked of 1:20-5 p.m., and TAP, 9.465 mc. It was heard here with a powerful R9+ signal one week-end afternoon, signing off at 4:40 p.m. It has a reported sked of only 6:30-7 a.m., but we believe that TAP can be heard any afternoon on the same sked as TAQ's. TAP was heard signing off in perfect English as *"TAP, the Turkish National Broadcasting station at Ankara."*

Reports, which are verified by letter, should be sent to: Station Director, TAP-TAQ, TÜRK MÜHENDISLER BIRLIGI, 5 No. LU ODA, YENI-SEHEI, ANKARA, TÜRKEY.

These stations have often re-broadcast the Rome programs of 2RO-4, as previously reported, and we believe the station was erected by Italian engineers.

Carl Weber, W2, reports TAQ re-broadcasting Rome from 1:20 p.m. on, and using English.

STRAITS SETTLEMENTS

ZHO, 6.175 mc., Singapore, was used for 3 weeks during October, but now transmissions have been resumed from ZHP, 9.69 mc., according to latest advices received.

Ashley Walcott, W6, reports a veri of ZHP, from Broadcasting House, Thomson Road, Singapore, which supplies the following schedule: Monday—Saturday, 4:40-9:40 a.m. Also, ZHP is on Wednesdays, 12:40-1:40 a.m., and Saturdays, 12:25-1:40 a.m., besides the daily Monday-Saturday schedule.

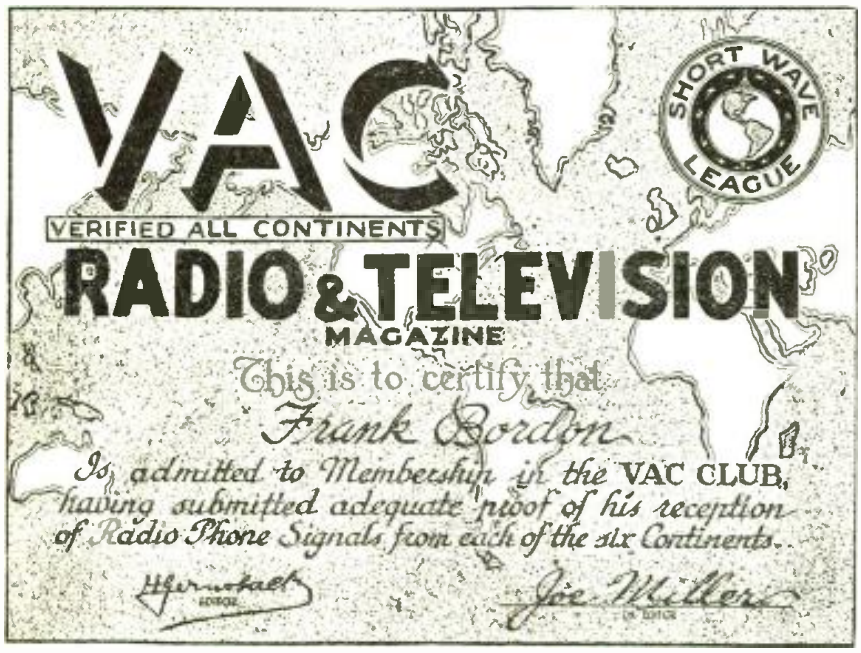
On Sundays, ZHP is heard from 10:40 p.m. Sat. night to 1:10 a.m. Sundays, and from 5:25 or 5:40 to 9:40 a.m.

ZHO is reported by Ashley Walcott, James Moore, W6, and by Jim Lanyon, VE5. ZHP should be heard O.K. here in the East and in central U. S., during the a.m.'s when conditions are good. This station should be easy to find, all by itself on the L.F. end of the 31 meter band. QRA (address) given above.

BURMA

XYO, 6.007 mc., at Rangoon, is being reported well heard on the Pacific Coast by Jim Lanyon, VE5, daily, until 9:45 a.m., sometimes later. No data available as to start of XYO's transmission, so no schedule can be given as yet. English is used, as James Moore reports, and announcement is given as *"Government Experimental Short-Wave Station."* Heard with excellent volume in California, VVS, 12.87 mc., Mingaladon, is heard excellently at 6:30 a.m. with VVN.

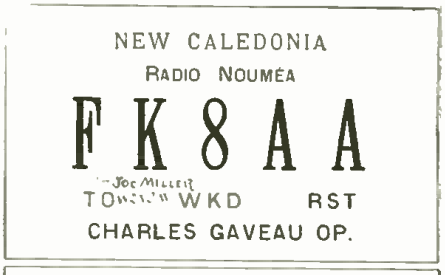
(Continued on page 567)

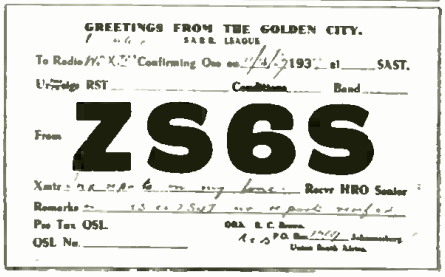


A reproduction of the handsome new VAC certificate. The certificate is printed in black on a blue background on heavy ledger paper, 9½" x 12" in size. See rules at end of this article.

VS6AB—Hong Kong, China. This handsome print of a Chinese junk is in black and grey.

FK8AA—Radio Noumea, New Caledonia. A plain black and white card, from this rare and low-powered DX catch. ZS6S—South Africa. A black and white card, also confirming old call, ZS4J.





Mc.	Call	
9.690	LRA	BUENOS AIRES, ARG., 30.94 m., 6-9 pm.
9.685	TGWA	GUATEMALA CITY, GUAT., 30.96 m. Daily 10-11.30 pm.; Sun. 7-11.30 pm.
9.680	ZHP	SINGAPORE, MALAYA. 30.98 m. Sun. 5.40-9.40 am., Wed. 12.40-1.40 am., Mon.-Fri. 4.40-9.40 am., Sat. 12.25-1.40 am., 4.40-9.40 am., 10.40 pm.-1.10 am. (Sun.).
9.675	DZA	ZEESEN, GERMANY, 31.01 m., Addr. (See 10.042 mc.) Irregular.
9.670	—	ROME, ITALY. 31.03 m. Relays 2RO 7.30-9 pm.
9.670	W3XAL	BOUND BROOK, N. J., 31.03 m. Addr. N8C, N. Y. C. 5 pm.-1 am.
9.660	LRX	BUENOS AIRES, ARG., 31.06 m., Addr. El Mundo. Relays LRI, 10.30 am.-10.30 pm., Sat. to m.
9.650	W2XE	NEW YORK CITY, 31.09 m. (See 21.520 mc. for addr.) 6.30-11 pm.
9.650	CS2WA	LISBON, PORTUGAL, 31.09 m., Addr. Radio Colonial. Tues., Thurs. and Sat. 4-7 pm.
9.645	HH3W	PORT-AU-PRINCE, HAITI, 31.1 m., Addr. P. O. Box A117. 1-2, 7-9 pm.
9.640	CXA8	COLONIA, URUGUAY, 31.12 m., Addr. Belgrano 1841, Buenos Aires, Argentina. Relays LR3, Buenos Aires 7 am.-m., Sat. to 2.15 am.
9.635	2RO	ROME, ITALY, 31.13 m., Addr. (See 11.810 mc.) 12.05-9 pm.
9.630	HJ7ABD	BUCARAMANGA, COL., 31.14 m. 5.45-6.30, 11.30 am.-1 pm., 6-11 pm.
9.636	JFO	TAIHOKU, TAIWAN, 31.13 m. Relays JFAK irreg. 4-10.30 am.
9.618	HJ1ABP	CARTAGENA, COL., 31.20 m., Addr. P. O. Box 37. Daily 9 am.-1.30 pm., 4.30-10.15 pm., Sun. 4.30-9 pm.
9.615	ZRK	KLIPHEUVAL, SOUTH AFRICA, 31.2 m., Addr. P. O. Box 4559, Johannesburg. Daily, exc. Sat. 11.45 pm.-12.50 am. Daily exc. Sun. 3.20-7.20, 9-11.45 am., Sun. 3.30-4.30 or 4-5, 5.30-7, 9-11.45 am.
9.607	HP5J	PANAMA CITY, PANAMA, 31.23 m. Addr. Apartado 867. 12 n. to 1.30 pm., 6-10.30 pm.

31 Met. Broadcast Band

9.600	RAN	MOSCOW, U.S.S.R., 31.25 m. Daily exc. Sun. 6-10 pm. Sun. 6-7, 9.15-10 pm.
9.595	HBL	GENEVA, SWITZERLAND, 31.27 m., Addr. Radio Nations. Irregular.
9.590	VUD2	DELHI, INDIA, 31.28 m. Addr. All India Radio, 1.30-3.30 am., 7.30 am.-12.30 pm., 8.30-10.30 pm.
9.590	PCJ	HUIZEN, HOLLAND, 31.28 m., Addr. (See 15.220 mc.) Sun. 2-3, 7-9.25 pm. Tues. 1.45-3.40, 7.15-8.45, 9-10.30 pm., Wed. 7.15-8.30 pm., Fri. 8-9 pm.
9.590	VK6ME	PERTH, W. AUSTRALIA, 31.28 m., Addr. Amalgamated Wireless of Australasia, Ltd. 6-9 am. exc. Sun.
9.590	VK2ME	SYDNEY, AUSTRALIA, 31.28 m., Addr. Amalgamated Wireless of Australasia, Ltd., 47 York St., Sun. 1-3 am.; 4.30-8.30 am.; 9-11 am.
9.590	W2XE	NEW YORK, N. Y., 31.28 m., Addr. CBS, 485 Madison Ave., Irregular.
9.590	W3XAU	PHILADELPHIA, PA., 31.28 m. Relays WCAU. Mon., Thu., Sat. 1 pm.-1 am., Tue., Fri., Sun. m.-1 am., Wed. 10 pm.-1 am.
9.580	GSC	DAVENTRY, ENGLAND, 31.32 m., Addr. B. B. C., Portland Pl., London, W. 1, 4.15-6, 6.20-8.30, 9.20-11.25 pm., 9 am.-12 n.
9.580	VLR	MELBOURNE, AUSTRALIA, 31.32 m. Addr. Box 1686, G. P. O. Daily 3.30-8.30 am. (Sat. till 9 am.) Sun. 12.01-7.30 am. Also daily exc. Sat. 9.25 pm.-2 or 2.15 am. Sat. 5-10.30 pm.
9.570	KZRM	MANILA, P. I., 31.35 m., Addr. Erlanger & Galinger, Box 283. Sun. 3-10 am. Daily exc. Sat. 4.30-7 pm., 11.15 pm.-12.15 am. Daily exc. Sun. 4-10 am.
9.570	WIXK	SPRINGFIELD, MASS., 31.35 m., Addr. Westinghouse Electric & Mfg. Co. Relays WBZ 7 am. to 1 am. Sun. 8 am.-1 am.
9.560	XGAP	PEKING, CHINA, 31.38 m., 9 am.-2 pm.
9.560	DJA	BERLIN, GERMANY, 31.38 m., Addr. Broadcasting House. 12.05-11 am., 6-10.50 pm.
9.550	HVJ	VATICAN CITY, 31.41 m., Sun. 5-5.30 am.
9.550	TPBII	PARIS, FRANCE, 31.41 m. Addr. (See 15.245 mc.) 2-5 am., 11.15 am.-6 pm.
9.550	W2XAD	SCHENECTADY, N. Y., 31.41 m., General Electric Co., 6.15-10 pm.
9.550	OLR3A	PRAGUE, CZECHOSLOVAKIA, 31.41 m. (See 11.840 mc.) Mon. 4.40-5.10 pm.
9.550	XEFT	VERA CRUZ, MEX., 31.41 m. 10.30 am.-4.30 pm., 10.30 pm.-12.30 am.
9.550	YDB	SOERABAJA, JAVA, 31.41 m., Addr. N.I.R.O.M. Daily exc. Sat. 6-7.30 pm., 4.30 to 10.30 am. Sat. 4.30-11.30 am.
9.550	VUB2	BOMBAY, INDIA, 31.41 m., Addr. All India Radio. 9.30-10.30 pm., 12 m.-2.30 am.
9.540	DJN	BERLIN, GERMANY, 31.45 m., Addr. (See 9.560 mc.) 4.50-10.50 pm. to So. Amer.
9.540	HJ5ABD	CALI, COLOMBIA, 31.45 m., Addr. La Voz de Valle. 12 n.-1.30 pm., 5.10-9.40 pm.
9.538	VPD2	SUVA, FIJI ISLANDS, 31.46 m., Addr. Amalgamated Wireless of Australasia, Ltd. 5.30-7 am., exc. Sun.
9.535	JZI	TOKYO, JAPAN, 31.46 m., Addr. (See 11.800, JZJ) 2.30-4, 4.30-5.30 pm.
9.535	—	BERNE, SWITZERLAND, 31.46 m., 1-2 pm. exc. Mon. and Tues.
9.530	W2XAF	SCHENECTADY, N. Y., 31.48 m., Addr. General Electric Co. 4 pm.-12 m. Sat. 1 pm.-12 m.
9.530	VUC2	CALCUTTA, INDIA, 31.48 m. Addr. All India Radio. 1.06-3.06 am.
9.526	XEDQ	GUADALAJARA, GAL., MEXICO, 31.49 m., n.-4.30 pm., 8-11.30 pm.
9.526	ZBW3	HONGKONG, CHINA, 31.49 m., Addr. P. O. Box 200. 11.30 pm. to 1 am., 3-10 am.
9.525	LKC	JELOY, NORWAY, 31.49 m., 4.30-10.30 am., Sun. 2.30-10.30 am.
9.523	ZRH	ROBERTS HEIGHTS, S. AFRICA, 31.5 m., Addr. (See ZRK, 9.606 mc.) Daily exc. Sun. 5-7.30 am.; Sun. 5.30-7 am.
9.520	OZF	SKAMLEBOAEK, DENMARK, 31.51 m., Addr. Statsradiofonien, Helbergsgade 7, Copenhagen, 8-9.30, 9.30-11 pm. to No. Amer.
9.520	YSH	SAN SALVADOR, EL SALVADOR 31.51 m., Addr. (See 7.894 mc.) Irregular 6-10 pm.
9.510	GS8	DAVENTRY, ENGLAND, 31.55 m., Addr. (See 9.580 mc.—GSC) 1.30-4, 4.15-6, 6.20-8.30, 9.20-11.25 pm.
9.510	HJU	BUENAVENTURA, COLOMBIA, 31.55 m., Addr. National Railways. Mon., Wed. and Fri. 8-11 pm.
9.510	HS6PJ	BANGKOK, SIAM, 31.55 m. Thursday, 8-10 am.
9.510	—	HANOI, FRENCH INDO-CHINA, 31.55 m. "Radio Hanoi", Addr. Radio Club de L'Indochine. 12 m.-2 am., 6-10 am. 15 watts.
9.500	VK3ME	MELBOURNE, AUSTRALIA, 31.58 m., Addr. Amalgamated Wireless of Australasia, 167 Queen St. Daily except Sun. 4-7 am.
9.503	XEWW	MEXICO CITY, MEX., 31.57 m. Addr. Apart. 2516. Relays XEW. 9 am.-12.30 am.
9.500	OFD	LAHTI, FINLAND, 31.58 m., Addr. Finnish Broad. Co., Helsinki. 12.15-5 pm.
9.490	OAX5C	ICA, PERU, 31.61 m., Radio Universal, 8-11.30 pm.
9.488	EAR	MADRID, SPAIN, 31.6 m., Addr. (See 9.860 mc.) 7.30-8.30 pm. Mon., Tues., Thur., Sat. at 9.30 pm. also.

End of Broadcast Band

Mc.	Call	
9.465	TAP	ANKARA, TURKEY, 31.70 m., 1.20-5 pm. Irreg.
9.445	HCODA	GUAYAQUIL, ECUADOR, 31.77 m., 8.15-10.15 pm., exc. Sun.
9.437	COCH	HAVANA, CUBA, 31.8 m., Addr. 2 B St., Vedado. 8 am.-9.30 pm. Sun. 8 am.-12 m.
9.380	—	TANANARIVE, MADAGASCAR, 31.96 m. Addr. Le Directeur des PTT, Radio Tananarive, Administration PTT. 12.30-12.45, 10-11 am., 2.30-4 am., exc. Sun.
9.370	XOY	CHENGTU, CHINA, 32.02 m., 9.45-10.30 am.
9.355	HCIETC	QUITO, ECUADOR, 32.05 m., Addr. Teatro Bolivar, Thurs. until 9:30 p.m.
9.350	COCD	HAVANA, CUBA, 32.08 m., Addr. Box 2294. Relays CMCD 10 a.m.-11.30 pm. Sun. 10 am.-9 pm.
9.345	HBL	GENEVA, SWITZERLAND, 32.11 m., Addr. Radio Nations. Sun. 8-8.45 am., Mon. 6.45-8.30 pm.
9.340	OAX4J	LIMA, PERU, 32.12 m., Addr. Box 1168, "Radio Universal," 12 n.-3 pm., 5 pm.-1 am.
9.300	XGOW	SHANGHAI, CHINA, 32.26 m., 8-9.05 am. Veris between 9.180-9.300.
9.300	HIG	CIUDAD TRUJILLO, D. R., 32.28 m. 7.10-9.40 am., 11.40 am.-2.10 pm., 3.40-9.40 pm.
9.200	COBX	HAVANA, CUBA, 32.59 m. Addr. San Miguel 194, Altos. Relays CMBX 7 am.-12 m.
9.165	HC2CW	GUAYAQUIL, ECUADOR, 32.74 m., 7-11.30 pm., Sun. 3.30-6 pm.
9.125	HAT4	BUDAPEST, HUNGARY, 32.88 m., Addr. "Radiolabor," Gyali-ut, 22. Daily 7-8 pm., Sat., 6-7 pm.
9.100	COCA	HAVANA, CUBA, 32.95 m., Addr. Galiano No. 102. Relays CMCA 9 am.-12 m.
9.100	PJC2	CURACAO, D. W. INDIES, 32.97 m., 6.36-8.36 pm., Sun. 10.36 am.-12.36 pm.
9.030	COBZ	HAVANA, CUBA, 33.32 m., Radio Salas Addr. P. O. Box 866. 7.45 am.-1.15 am. Sun. 7.45 am.-12 m. Relays CMBZ.
8.965	COKG	SANTIAGO, CUBA, 33.44 m. Addr. Box 137. 9-10 am., 11.30 am.-1.30 pm., 3-4.30, 5-6, 10-11 pm., 12 m.-2 am.
8.841	HCJB	QUITO, ECUADOR, 33.5 m. 7-8.30 am., 11.45 am.-2.30 pm., 5-10 pm., except Mon. Sun. 12 n.-1.30 pm., 5.30-10 pm.
8.700	HKV	BOGOTA, COLOMBIA, 34.46 m. Tues. and Fri. 7-7.20 pm.
8.665	COJK	CAMAGUEY, CUBA, 34.64 m., Addr. Finlay No. 3 Altos. 5.30-6.30, 8-11 pm., daily except Sat. and Sun.
8.665	W2XGB	HICKSVILLE, N. Y., 34.64 m., Addr. Press Wireless, Mon. to Fri. News at 9 am. and 5 pm.
8.580	YNPR	MANAGUA, NICARAGUA, 34.92 m. Radiodifusora Pilot.
7.894	YSD	SAN SALVADOR, EL SALVADOR, 37.99 m., Addr. Dir. Genl. Tel. & Tel. 7-11 pm.
7.870	HCIRB	QUITO, ECUADOR, 38.1 m. La Voz de Quito. 9-11 pm.
7.854	HC2JS8	GUAYAQUIL, ECUADOR, 38.2 m. Evenings to 11 pm.
7.797	H8P	GENEVA, SWITZERLAND, 38.48 m., Addr. Radio-Nations.
7.510	JVP	NAZAKI, JAPAN, 39.95 m., 8-9.30 am.
7.450	TI2R3	SAN JOSE, COSTA RICA, 40.27 m. "Radioemisora Athena". 9.30-11 pm., exc. Sun.
7.410	HCJ84	QUITO, ECUADOR, 40.46 m., 7-9.30 pm. irregularly.
7.410	YDA	TANDJONGPRIOK, JAVA, 40.46 m., Addr. N.I.R.O.M., Batavia, 10.30 pm.-2 am.; Sat. 7.30 pm.-2 am.
7.380	XECR	MEXICO CITY, MEX., 40.65 m., Addr. Foreign Office. Sun. 7-8 pm.
7.220	HKE	BOGOTA, COL., S. A., 41.55 m. Tues. and Sat. 8-9 pm. Mon. and Thurs. 6.30-7 pm.
7.200	YNAM	MANAGUA, NICARAGUA, 41.67 m. Irregular at 9 pm.
7.177	CR6AA	LOBITA, ANGOLA, PORT. WEST AFRICA. 41.75 m., Wednesday and Saturday 2.45-4.30 pm.

(Continued on page 540)

All Schedules Eastern Standard Time

The Short Wave League

On the Ham Bands

(with the "Listening Post" Observers)

Edited by Elmer R. Fuller

HONORARY MEMBERS

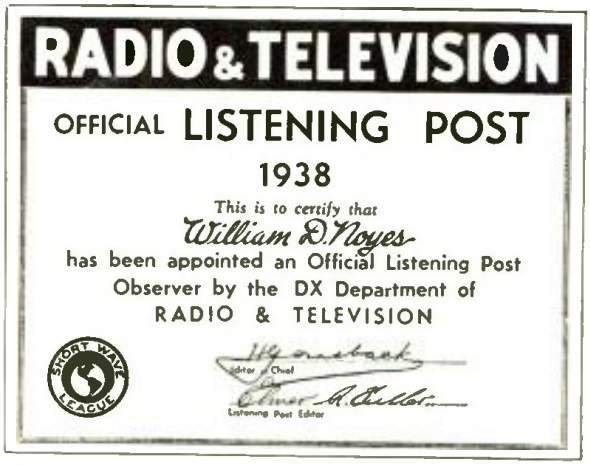
Dr. Lee de Forest — Manfred von Ardenne
D. E. Replogle — E. T. Somerset
John L. Reinartz — Hollis Baird

Hugo Gernsback, Executive Secretary

● WE hope that 1939 will be the best DX year that we have ever experienced. Up to November 1 the conditions were not any too good. The far distant stations did not seem to come in as they have been known to do in the past. Also, neither have the reports of reception. hi!

At last the Listening Post certificates are finished and will be in the mail by the time you read this. Many thanks for your patience in waiting for them. The change in name of our publication necessitated the delay. Commencing with 1939 all observers will be subject to reappointment at the end of each year. Therefore it is essential that you send in your reports regularly, and make them complete. A record is being kept of every observer and his reports filed. Observers who fail to meet the necessary requirements one year, are quite likely not to be appointed for the next.

At present fifty-eight observers have been appointed throughout the world. These represent every continent except South America and Australia. An observer for each of the following states is wanted:—New Hampshire, Massachusetts, Delaware, Maryland, District of Columbia, Florida, Mississippi, Louisiana, New Mexico, Nevada, Oregon, Idaho, Montana, Wyoming, West Virginia, Missouri, North Dakota and South Dakota. All other states are now represented. Send your application to Elmer R. Fuller, in care of RADIO & TELEVISION, *99 Hudson Street, New York, N. Y.*



The handsome RADIO & TELEVISION official "listening post" certificate is reproduced above. The original certificate measures 7¼ by 9½ inches and is attractively printed in two colors, red and blue.

Beginning with this issue, reports of all observers will be published according to continent. Stations' call letters will be followed by the approximate frequency usually used, the readability, signal strength, and the last names of the observers who reported hearing them. This will allow more space in which to publish reports. It is our desire to publish every complete report sent in by an observer.

Reports for October were received from the following:—

Bolhender, Homer . . Ohio
Carling, Len M. . . . . Illinois
Davenport, E. H. . . . Vermont
Fitzpatrick, John . . . New Jersey
Fuller, C. H. . . . . Special Observer for the Editor
Fuller, Lester . . . . . Arizona
Hartzell, Clarence . . Pennsylvania
Jordan, Tom . . . . Pennsylvania
Lang, Ernest W. . . Washington
Noyes, William Dean . Nebraska
Patterson, Pat . . . . . Georgia
Plotz, Walter . . . . Iowa
Robinson, Hugh . . . . Oklahoma
Rowley, A. R. . . . . Canal Zone
Rush, Richard A. . . . . California

Listening post of J. M. Ruiz, Manila, Observer for the Philippine Islands.

Slaughter, Edward C. . . Texas
Taglauer, Bob . . . . . Kentucky
Walker, E. H. . . . . England
Wells, Jack . . . . . Alabama
Wood, James R. . . . . Minnesota

Now to get down to the stations heard and the other dope: — Only a very few were reported being heard from Asia.

Call	*Freq. mc.*	*R*	*S*	*Observer*
XU2DI	14.070	3	4	L. Fuller
XU8AM	14.080	4	7	Wood
VS2AE	14.360	4	6	Wood
VS7GJ	14.130	5	7	Wood
J2M1	14.340	3	2	Yours truly

Africa proved to be a very good source of signals during the past month.

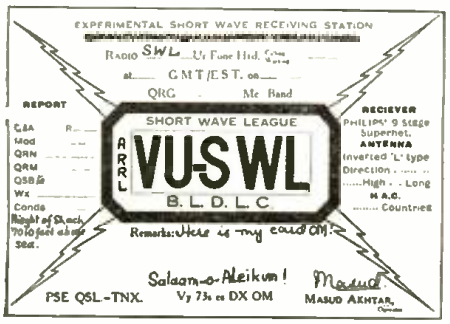
ZE1JR	28.370	5	8	Taglauer
ZE1JU	14.040	4	6	Hartzell
CN8AY	28.175	5	6-9	Taglauer, Jordan
	28.982			
CN8AM	14.100	5	7	Wells
CN8AV	14.088	5	6	Wells
CN8MA	14.090	5	8	Wells
CN8MU	14.080	4-5	7-8	Wells, Fitzpatrick, Noyes, Yours truly
	14.060			
	14.020			
CN1AF	14.025	3	6-7	Carling, Fitzpatrick
	14.105			
FB8AD	14.300	–	–	Robinson
SU1MW	14.100	5	6	Jordan
ZS1AX	14.080	4	7	Wells, Hartzell, Slaughter, Rush, Fitzpatrick, Noyes
ZS1BL	14.300	5	5	Wells, Slaughter, Rush
	14.140			
ZS2S	14.162	4	8	Hartzell
ZS2N	14.020	4	6	Slaughter, Fitzpatrick
ZS2X	14.070	3	5	Noyes
ZS3F	14.090	5	8	Jordan, Slaughter, Yours truly
ZS3C	14.115	5	2	Yours truly
ZS4H	14.170	4	8	Hartzell, Yours truly
ZS5CL	14.120	5	7	Wells
ZS5AW	14.080	3	4	L. Fuller
ZS5CO	14.140	4	6	Slaughter
ZS5T	14.050	5	6	Slaughter
ZS6S	14.120			
	14.135	4	6	Jordan, Slaughter, Fitzpatrick
ZS6BJ	14.064	4	5	Hartzell
ZS6DW	14.060	3-5	5-8	Slaughter, Fitzpatrick, Noyes
	14.075			
	14.060			
ZS6EF	14.075	4	6	Slaughter
ZS6BR	14.040	3-5	4-6	Slaughter, Fitzpatrick
	14.100			
ZS6A	14.070	5	7	Slaughter
ZS6X	14.182	2	2	Yours truly

European stations were not heard as often as during the previous month, but several were received now and then. During the total lunar eclipse on November 7th, we turned on the receiver to see if any effect of the moon could be noticed on the amateur bands. It was too late for the ten meter band to show much, but the twenty meter band seemed to behave rather strangely. It was clearer than it had been for some time, and signal strength seemed to be high, especially from European stations. As the shadow of the earth was leaving the surface of the moon, the conditions seemed to change. The Europeans faded out of the picture, and for the rest of the evening, the *skip* was very short. The following were reported:—

Call	*Freq. mc.*	*R*	*S*	*Observer*
G2VG	28.580	5	7	Jordan, Hartzell
G2LA	28.285	3	6	Hartzell
G2PO	14.005	5	8	Rowley
G2MF	14.040	4	6	Wood
G5BM	28.280	5	8	Taglauer, Jordan
G5ML	14.100	5	7-9	Carling, Jordan
G5BJ	28.500	5	7	Jordan
G5BJ	14.120	5	7-9	Jordan, Fitzpatrick
	14.180			
G5SH	28.170	3	5	Hartzell
G5MI	28.400	3	4	Rush
G5NI	14.115	5	9	Fitzpatrick
G6BW	28.130	5	7-8	Taglauer, Hartzell
	28.348			
G6WT	28.450	5	7	Taglauer
G6BH	28.160	5	9	Taglauer
G6GO	29.990	5	7	Jordan
G6AG	28.992	5	7	Jordan
G6JL	28.992	5	8	Jordan
G6GA	14.030	5	9	Fitzpatrick
G6OS	14.090	5	7	Fitzpatrick, Yours truly
G6GA	29.080	–	–	Robinson
G6YG	28.300	–	–	Robinson
GM8MN	14.030	4	8	Carling
GM6WD	14.310	5	7	Carling, C. Fuller
GM6WD	14.305	5	7	Jordan
G8BM	28.385	3	5	Hartzell
G8MX	28.235	3	5	Hartzell
GM6RG	28.470	5	9	Rush
G8UJ	14.080	4	6	Fitzpatrick
GW5KJ	28.210	5	8	Hartzell
GW6JW	14.205	5	9	Fitzpatrick
G3DO	14.110	5	6	Lang
G3BM	14.160	5	9	Fitzpatrick, Yours truly
G8MA	28.198	2	4	Hartzell
G18UW	14.337	3-5	7-8	Hartzell, Fitzpatrick
	14.205			
F3HN	28.375	5	8	Taglauer
F3OA	28.310	5	7	Taglauer
F3OX	14.085	5	7	Jordan
F8NT	14.050	3	5	Noyes
F8DR	14.300	5	5	C. Fuller
F8RR	28.275	4	7	Hartzell
F8LX	14.170	5	5	Fitzpatrick

(Continued on page 570)

The man who heard six continents in five minutes, Masud Akhtar, Observer for India, uses this card for veris.



Mc.	Call	
7.100	FO8AA	PAPEETE, TAHITI, 42.25 m., Addr. Radio Club Oceanien. Tues. and Fri. 11 pm.-12.30 am.
7.088	PIIJ	DORDRECHT, HOLLAND, 42.3 m., Addr. Dr. M. Hellingman, Technical College. Sat. 11.10-11.50 am.
6.990	XEME	MERIDA, YUCATAN, 42.89 m., Addr. Calle 59, No. 517, "La Voz de Yucatan desde Merida." Irregular.
6.977	XBA	TACUBAYA, D. F., MEX., 43 m. 9.30 am.-1 pm., 7-8.30 pm.
6.805	HI7P	CIUDAD TRUJILLO, DOM. REP., 44.06 m., Addr. Emisoria Diaria de Commercio. Daily exc. Sat. and Sun. 12.40-1.40, 6.40-8.40 pm. Sat. 12.40-1.40 pm. Sun. 10.40 am.-11.40 am.
6.790	PZH	PARAMIRABO, SURINAM, 44.16 m., Addr. P. O. Box 18. Daily 6.06-8.36 am., Sun. 9.36-11.36 am. Daily 5.36-8.36 pm.
6.775	HIH	SAN PEDRO DE MACORIS, DOM. REP., 44.26 m. 12.10-1.40 pm., 7:30-9 pm. Sun. 3-4 am., 4.15-6 pm., 4.40-7.40 pm.
6.750	JVT	NAZAKI, JAPAN, 44.44 m., Addr. Kokusai-Denwa Kaisha, Ltd., Tokyo. Irregular.
6.730	HI3C	LA ROMANA, DOM. REP., 44.58 m., Addr. "La Voz de la Feria." 12.30-2 pm., 5-6 pm.
6.720	PMH	BANDOENG, JAVA, 44.64 m. Relays N.I.R.O.M. programs. 4.30-11 or 11.30 am. Also Sat. 9.30 pm.-1.30 am.
6.690	TIEP	SAN JOSE, COSTA RICA, 44.82 m., Addr. Apartado 257, La Voz del Tropico. Daily 7-10 pm.
6.675	HBQ	GENEVA, SWITZERLAND, 44.94 m. Addr. Radio-Nations. Off the air at present.
6.672	—	—— 44.94 m., relays Salamanca, Spain, 7-9.45 pm.
6.672	YVQ	MARACAY, VENEZUELA, 44.95 m. Irregular.
6.635	HC2RL	GUAYAQUIL, ECUADOR, S. A., 45.18 m., Addr. P. O. Box 759. Sun. 5.45-7.45 pm.. Tues. 9.15-11.15 pm.
6.630	HIT	CIUDAD TRUJILLO, D. R., 45.25 m., Addr. "La Voz de la RCA Victor," Apartado 1105. Daily exc. Sun. 12.10-1.40 pm., 5.40-8.40 pm.; also Sat. 10.40 pm.-12.40 am.
6.625	PRADO	RIOBAMBA, ECUADOR, 45.28 m. Thurs. 9-11.45 pm.
6.610	YNLG	MANAGUA, NICARAGUA. 45.39 m. Emisora Ruben Dario. 1-3, 7-11 pm.
6.558	HI4D	CIUDAD TRUJILLO, D. R., 45.74 m. Except Sun. 11.55 am.-1.40 pm.
6.550	XBC	VERA CRUZ, MEX., 45.8 m. 8.15-9 am.
6.550	TIRCC	SAN JOSE, COSTA RICA, 45.8 m., Addr. Radioemisora Catolica Costarricense. Sun. 11 am.-2 pm., 6-7, 8-9 pm. Daily 12 n.-2 pm., 6-7 pm., Thurs. 6-11 pm.
6.545	YV6RB	BOLIVAR, VENEZUELA, 45.84 m., Addr. "Ecos de Orinoco." 6-10.30 pm.
6.520	YV4RB	VALENCIA, VENEZUELA, 45.98 m. 11 am.-2 pm., 5-10 pm.
6.516	YNIGG	MANAGUA, NICARAGUA, 46.02 m., Addr. "La Voz de las Lagos." 8-9 pm.
6.500	HIL	CIUDAD TRUJILLO, D. R., 46.13 m. Addr. Apartado 623. 12.10-1.40 pm., 5.40-7.40 pm.
6.480	HIIL	SANTIAGO DE LOS CABALLEROS, D. R., 46.28 m., Addr. Box 356. 9.40-11.40 am., 7.40-9.40 pm.
6.470	YNLAT	GRANADA, NICARAGUA, 46.36 m., Addr. Leonidas Tenoria, "La Voz del Mombacho." Irregular.
6.465	YV3RD	BARQUISIMETO, VENEZUELA, 46.37 m. Radio Barquisimeto, irregular.
6.450	HI4V	SAN FRANCISCO DE MACORIS, D. R., 46.48 m. 11.40 am.-1.40 pm., 5.10-9.40 pm.
6.440	TGQA	QUEZALTENANGO, GUATEMALA, 46.56 m. Daily 6.10-10.10 pm., Sun. 1-3 pm.
6.340	HIIX	CIUDAD TRUJILLO, D. R., 47.32 m., Sun. 7.40-10.40 am., daily 12.10-1.10 pm., Tues. and Fri. 8.10-10.10 pm.
6.335	OAXIA	ICA, PERU, 47.33 m., Addr. La Voz de Chiclayo. Casilla No. 9. 8-11 pm.
6.324	COCW	HAVANA, CU8A, 47.4 m., Addr. La Voz del Radio Philco, P. O. Box 130. 6.55 am.-12 m. Sun. 9.55 am.-10 pm.
6.310	HIZ	CIUDAD TRUJILLO, D. R., 47.52 m. Daily except Sat. and Sun. 11.10 am.-2.25 pm., 5.10-8.40 pm. Sat. 5.10-11.10 pm. Sun. 11.40 am.-1.40 pm.
6.300	YV4RD	MARACAY, VENEZUELA, 47.62 m. 6.30-9.30 pm. exc. Sun.
6.295	OAX4G	LIMA, PERU, 47.63 m., Addr. Apartado 1242. Daily 7-10.30 pm.
6.280	HIG	TRUJILLO CITY, D. R., 47.77 m. 7.10-9.40 am., 11.40 am.-2.10 pm., 3.40-9.40 pm.
6.270	YV5RP	CARACAS, VENEZUELA, 47.79 m., Addr. "La Voz de la Philco." Daily to 10.30 pm.
6.255	YV5RJ	CARACAS, VENEZUELA, 47.18 m.
6.243	HIN	CIUDAD TRUJILLO, D. R., 48 m., Addr. "La Voz del Partido Dominicano." 12 n.-2 pm., 6-10 pm.
6.240	ZGE	KUALA LUMPUR, FED. MALAY ST., 48.1 m. Addr. Malayan-Amateur Radio Society. Sun. Tues. and Fri. 6.40-8.40 am.
6.235	HRD	LA CEIBA, HONDURAS, 48.12 m., Addr. "La Voz de Atlantida." 8-11 pm.; Sat. 8 pm.-1 am.; Sun. 4-6 pm.
6.225	YVIRG	VALERA, VENEZUELA, 48.15 m. 6-9.30 pm.
6.210	——	SAIGON, INDO-CHINA, 48.28 m., Addr. Radio Boy-Landry, 17 Place A. Foray. 4.30 or 5.30-9.15 am.
6.205	YV5RI	CORO, VENEZUELA, 48.32 m., Addr. Roger Leyba, care A. Urbina y Cia. Irregular.
6.200	HI8Q	CIUDAD TRUJILLO, D. R., 48.36 m. Irregular.
6.190	TG2	GUATEMALA CITY, GUAT., 48.4 m., Addr. Dir. Genl. of Electr. Commun. Relays TGI Mon.-Fri. 6-11 pm., Sat. 6 pm.-1 am. Sun. 7-11 am., 3-8 pm.
6.185	HIIA	SANTIAGO, D. R., 48.5 m., Addr. P. O. Box 423. 7 am.-5 pm.
6.156	YV5RD	CARACAS, VENEZUELA, 48.71 m. 11 am.-2 pm., 4-10.40 pm.
6.153	HI5N	MOCA CITY, D. R., 48.75 m. 6.40-9.10 pm.

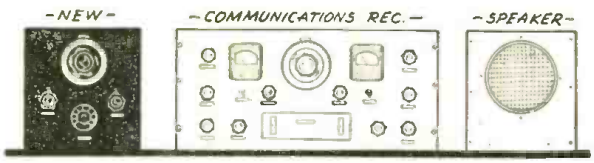
49 Met. Broadcast Band

Mc.	Call	
6.150	CJRO	WINNIPEG, MAN., CANADA, 48.78 m., Addr. (See 11.720 mc.) Daily 6 pm.-12 m., Sun. 5-10 pm.
6.150	ZPI4	VILLARRICA, PARAGUAY, 48.75 m. 5-6 pm.
6.147	ZRD	DURBAN, SOUTH AFRICA, 48.8 m., Addr. (See ZRK, 9.606 mc.) Daily exc. Sat. 11.45 pm.-12.50 am.; Daily exc. Sun. 3.30-7.30 am., 9 am.-3.45 pm.; Sun. 5.30-7, 9-11.30 am., 12 n.-3.20 pm. Also 4-5 am., 3rd Sun. of month.
6.147	ZEB	BULAWAYO, RHODESIA, S. AFRICA, 48.8 m. Mon., Wed. and Fri. 1.15-3.15 pm.; Tues. 11 am.-12 n.; Thurs. 10 am.-12 n. Sun. 3.30-5 am.
6.145	HJ4ABG	MEDELLIN, COL., 48.79 m. 11 am.-12 n., 6-10.30 pm.
6.140	W8XK	PITTSBURGH, PA., 48.83 m., Addr. Westinghouse Electric & Mfg. Co. Relays KDKA 11 pm.-12 m.
6.137	CR7AA	LAURENCO MARQUES, PORT. E. AFRICA, 48.87 m. Daily 12.05-1, 4.30-6.30, 9.30-11 am., 12.05-4 pm., Sun. 5-7 am., 10 am.-2 pm.
6.133	XEXA	MEXICO CITY, MEX., 48.93 m., Addr. Dept of Education. Daily 8-11 am., 2.30-4 pm., 7.30 pm.-12.45 am. Sun. 1.30 pm.-12.45 am.
6.130	VP3BG	GEORGETOWN, BRIT. GUIANA. 48.94 m. From 5 pm. on.
6.130	TIEM	SAN JOSE, COSTA RICA. 48.94 m. "El Mundo", Apartado 1049. 11 am.-11 pm., Sun. 10 am.-6 pm.
6.130	CHNX	HALIFAX, N. S., CAN., 48.94 m., Addr. P. O. Box 998. Mon.-Fri. 7 am.-11.15 pm., Sat. 11 am.-11 pm., Sun. 12 n.-11.15 pm. Relays CHNS.
6.130	LKL	JELOY, NORWAY, 48.94 m. 11 am.-6 pm.
6.125	CXA4	MONTEVIDEO, URUGUAY, 48.98 m., Addr. Radio Electrico de Montevideo, Mercedes 823. 10 am.-12 n., 2-8 pm.
6.122	HJ3ABX	BOGOTA, COL., 49. m., Addr. La Voz de Col., Apartado 26-65. 12 n.-2 pm., 5.30-11 pm.; Sun. 6-11 pm.
6.122	HP5H	PANAMA CITY, PAN., 49 m., Addr. Box 1045. 10 am.-1 pm., 5-11 pm.
6.120	W2XE	NEW YORK CITY, 49.02 m., Addr. Col. B'cast. System, 485 Madison Ave. 10.30-11.30 pm.
6.117	XEUZ	MEXICO CITY, MEX., 49.03 m., Addr. 5 de Mayo 21. Relays XEFO 1-3 am.
6.115	OLR2C	PRAGUE, CZECHOSLOVAKIA, 49.05 m. (See 11.40 mc.)
6.110	GSL	DAVENTRY, ENGLAND, 49.1 m., 6.20-8.30, 9.20-11.20 pm.
6.110	XEGW	MEXICO CITY, MEX., 49.1 m., Addr. La Voz de Aguila Azteca desde Mex., Apartado 8403. Relays XEJW 11 pm.-1 am.
6.110	VPB	COLOMBO, CEYLON, 49.1 m. Daily 7-9.30 am; Sun. 6.30-9.30 am.
6.108	HJ6ABB	MANIZALES, COL., 49.14 m., Addr. P. O. Box 175. Mon.-Fri. 12.15-1 pm.; Tue. and Fri. 7.30-10 pm.; Sun. 2.30-5 pm.
6.100	YUA	BELGRADE, JUGOSLAVIA, 49.18 m. 12.45-2.30, 4-8 am., 1-6 pm.
6.100	W3XAL	BOUND BROOK, N. J., 49.18 m., Addr. Natl. Bcoad. Co.
6.100	——	NOUMEA, NEW CALEDONIA, 49.18 m., Radio Noumea, Addr. Charles Gaveau, 44 Rue de l'Alma. 2-3.30 am., exc. Sun. and Mon.
6.097	ZRK	KLIPHEUVEL, S. AFRICA, 49.2 m., Addr. S. African Broad. Co., Johannesburg. Daily 12 n.-4 pm., Sun. 12 n.-3.20 pm.
6.097	ZRJ	JOHANNESBURG, S. AFRICA, 49.2 m, Addr. S. African Broad. Co. Daily exc. Sat. 11.45 pm.-12.50 am.; Daily exc. Sun. 3.15-7.30, 9-11.30 am. (Sat. 8.30-11.30 am.) Sun. 3.30-4.30 or 4-5 am., 5.30-7, 9-11.30 am.
6.095	JZH	TOKYO, JAPAN, 49.22 m., Addr. (See 11.800 mc., JZJ.) Irregular.
6.090	CRCX	TORONTO, CAN., 49.26 m., Addr. Can. Broadcasting Corp. Daily 7.45 am.-5 pm., Sun. 10.30 am.-12 n.
6.090	ZBW2	HONGKONG, CHINA, 49.26 m., Addr. P. O. Box 200. Irregular.
6.083	VQ7LO	NAIROBI, KENYA, AFRICA, 49.31 m., Addr. Cable and Wireless, Ltd. Mon., Fri. 5.30-6 am., 11.15 am.-2.15 pm., also Tues. and Thurs. 8.15-9.15 am.; Sat. 11.15 am.-3.15 pm.; Sun. 10.45 am.-1.45 pm.
6.081	YV1RD	MARACAIBO, VEN., 49.32 m. 6-11 pm.
6.080	W9XAA	CHICAGO, ILL., 49.34 m., Addr. Chicago Fed. of Labor. Relays WCFL irregular.
6.079	DJM	BERLIN, GERMANY, 49.34 m., Addr., Broadcasting House. Irregular.
6.077	OAX4Z	LIMA, PERU, 49.35 m. Radio National 7-11 pm.
6.075	VP3MR	GEORGETOWN, BRI. GUIANA, 49.35 m. Sun. 7.45-10.15 am.; Daily 4.45-8.45 pm.
6.070	HP3ABF	BOGOTA, COL., 49.42 m., La Voz de Bogota.
6.070	CFRX	TORONTO, CAN., 49.42 m. Relays CFRB 7.30 am.-12 m., Sun. 10 am.-12 m.
6.070	VE9CS	VANCOUVER, B. C., CAN., 49.42 m. Sun. 1.45-9 pm., 10.30 pm.-1 am.; Tues. 6-7.30 pm., 11.30 pm.-1.30 am. Daily 6-7.30 pm.
6.069	——	TANANARIVE, MADAGASCAR, 49.42 m., Addr. (See 9.53 mc.) 12.30-12.45, 3.30-4.30, 10-11 am., Sun 2.30-4.30 am.
6.065	SBO	MOTALA, SWEDEN, 49.46 m. Relays Stockholm 1.30-5 pm.
6.060	—	TANANARIVE, MADAGASCAR. 49.5 m., 12.30-12.45, 3.30-4.30, 10-11 am.
6.060	W8XAL	CINCINNATI, OHIO, 49.5 m., Addr. Crosley Radio Corp. Relays WLW Tues., Fri., Sun. 5.45 am.-12 n., 11 pm.-2 am.; Wed. 5.45 am.-12 n., 9 pm.-2 am.; Mon., Thurs., Sat. 5.45 am.-2 am.

(Continued on page 562)

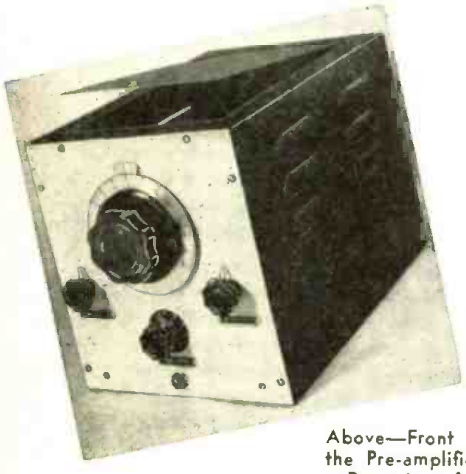
All Schedules Eastern Standard Time

Increase Your DX with This Pre-Amplifier

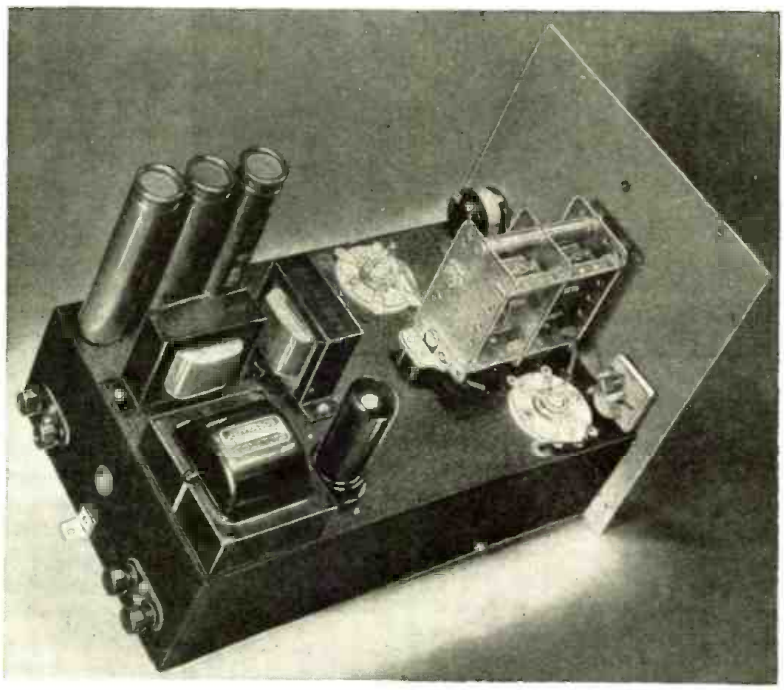


H. G. McEntee, W2FHP

How many times have you tried to raise that distant station—but to no avail! This 7 to 200 meter pre-amplifier will do the trick by boosting the strength of the signal.

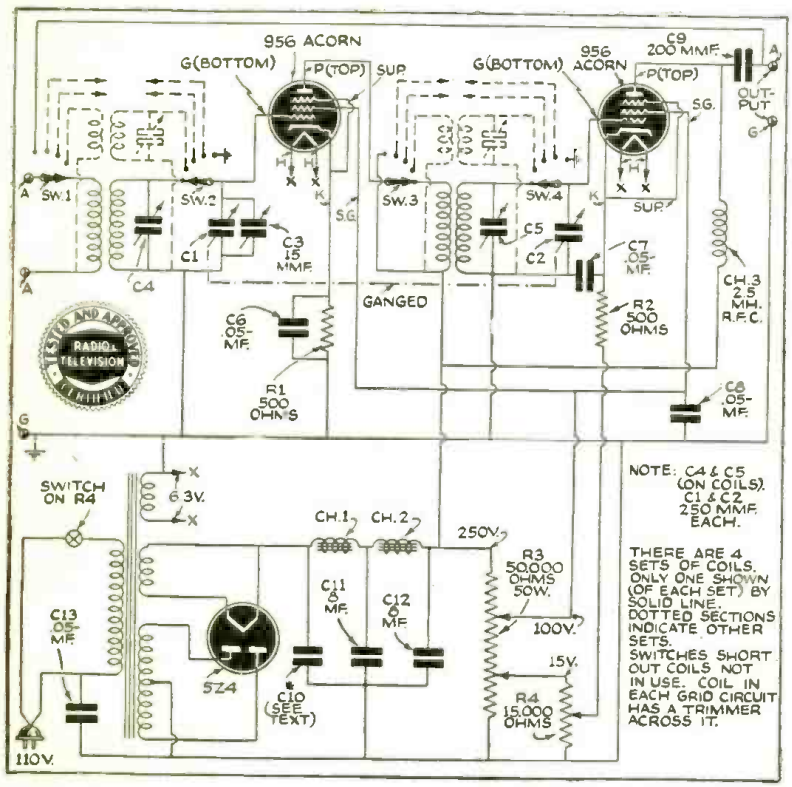


Above—Front view of the Pre-amplifier. Right—Rear view of the chassis. Below—wiring diagram.



● SEVERAL years ago it was the dream of practically every DXer, be he Ham or SWL, to own a superhet receiver with an R.F. stage and all the fixings. Nowadays, a receiver in the higher price ranges is not considered to be very "hot" unless it has at least one R.F. stage—and several of the more expensive makes have two such stages. Not content with this, the Hams have put *pre-selectors* in front of these modern receivers and have found them of great help in reception under the difficult present-day conditions.

The pre-selector described herein brings signals out of the noise-level and so can be utilized to advantage with any receiver from the simple regenerative job, right up to the latest "super-dooper." Another advantage of this instrument is in *reducing image interference*, which is particularly annoying on the high frequency bands, or with superhets that have no R.F. stage and an I.F. amplifier of 470 kc. or lower.



This unit is self-powered, so that no extra drain need be put on an already over-taxed receiver power-supply, if such is used. The power-supply also makes the unit handier and more versatile in use, where it is to be employed on several different receivers.

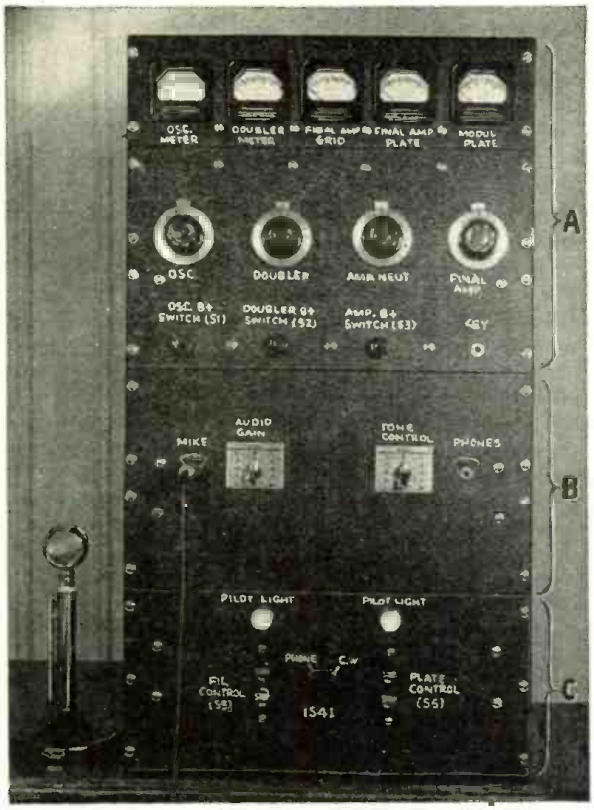
The R.F. tubes are of the Acorn type, as these give very high efficiency on the *higher* frequencies, where efficiency is badly needed. The new television amplifier tubes, or even 6K7's, may be used in place of the 956's, but the latter have proved to be very fine for this application.

Suitable ready-made low cost coils are available. These come with an air-tuned trimmer already in place on each coil, and they fit nicely on the band-changing switch. The lugs on the coils are soldered directly to the switch lugs, thus dispensing with many leads.

The switch must be disassembled, and an aluminum shield put in place, as seen in the underside view. The shield is of 1/16" stock and has several holes drilled in it to allow leads to pass into the front compartment. The manual antenna trimmer is of use where there are several antennas to be employed with the pre-selector. It enables the antenna or input R.F. stage to be kept right in resonance, regardless of antenna loading.

(Continued on page 557)

A De Luxe Desk



Top is the meter panel; below it, the R.F. amplifier; next, the speech amplifier and modulator; exciter power-supply is at bottom.

●

● THIS article presents a 13-tube transmitter designed for operation on phone or code on 10 or 20 meters and features a new type of flexible, variable frequency oscillator, as well as a high-gain audio amplifier and provision for *remote* control. The transmitter is sufficiently small for use on a desk as it measures 35¼" high, 19⅛" wide and 14½" deep.

The audio complement consists of a 6J7 pentode, coupled to a 6N7 phase inverter, capacity coupled to a pair of 6J5's in push-pull which are transformer coupled to a pair of 6L6's operating Class AB². The audio power developed is sufficient to modulate 100 watts of radio frequency input power.

The exciter consists of a Gunn oscillator using a 6A6 dual triode, which operates on the fundamental frequency of 20 meters. It is capacity coupled to a 6L6 which acts as a neutralized amplifier on 20 meters or a doubler on 10 meters. The D.C. input power for all bands on code is 120 watts and the output approximately 80 watts. On phone, the input is decreased to 80 watts and the output is approximately 50 watts.

The 6L6 is capacity coupled to a pair of 807's in push-pull.

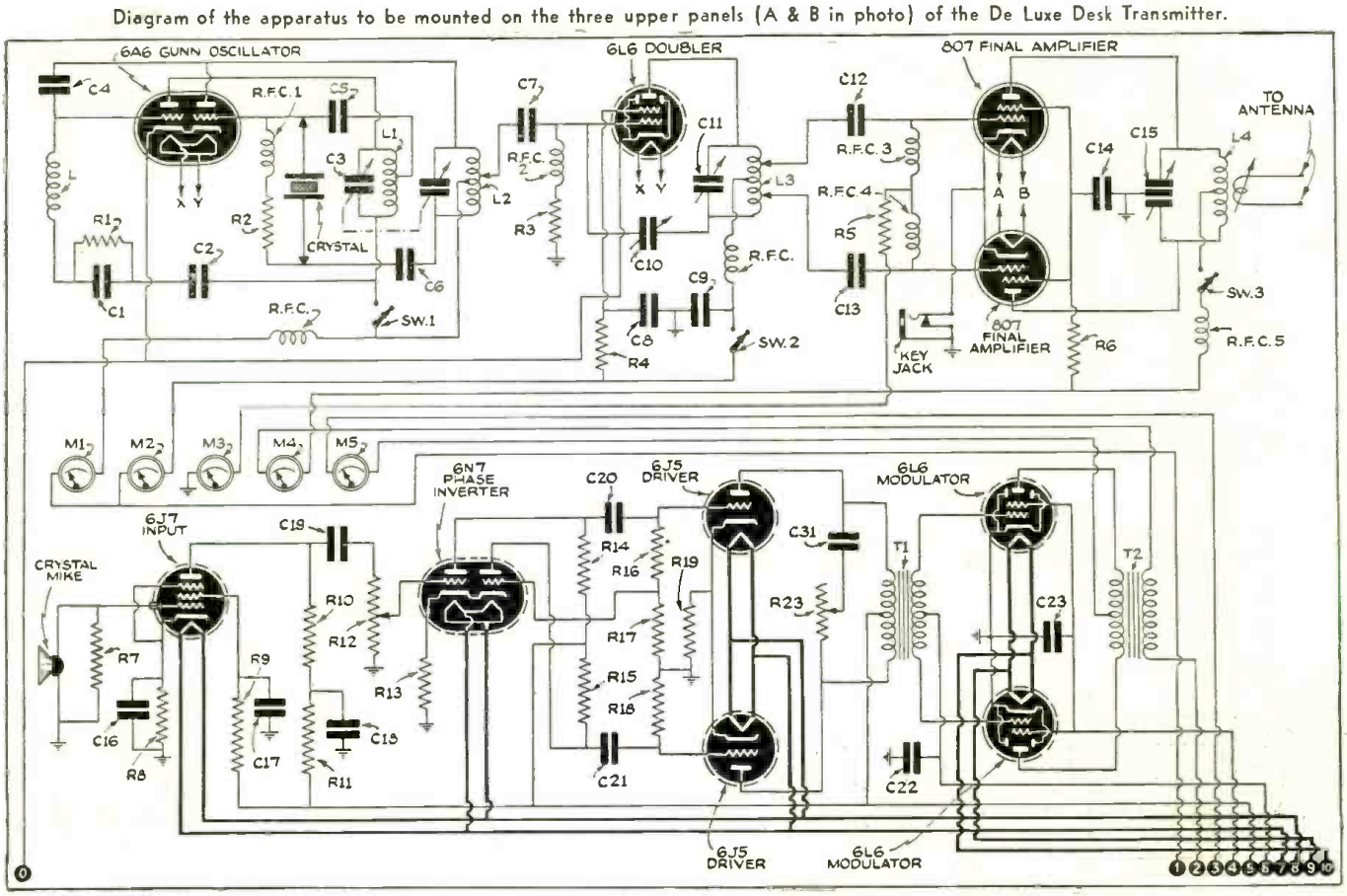
Notes on Gunn Oscillator

Since the Gunn oscillator has not been described for use in amateur transmitters heretofore, some notes on the theory and development of it will prove of interest.

The oscillator was required for airplane usage and had to be capable of operating over a wide and high range of frequencies. The possibility of using quartz crystals was precluded because of the great number that would be required.

An analysis by Gunn showed that the factors affecting frequency change were (1) Changes in plate potential, (2) Changes in mean grid potential, (3) Changes in filament potential, (4) Changes in emission due to causes other than (3), (5) Changes in spacing of the tube elements, (6) Interruption (keying) of the circuit.

Diagram of the apparatus to be mounted on the three upper panels (A & B in photo) of the De Luxe Desk Transmitter.



Transmitter

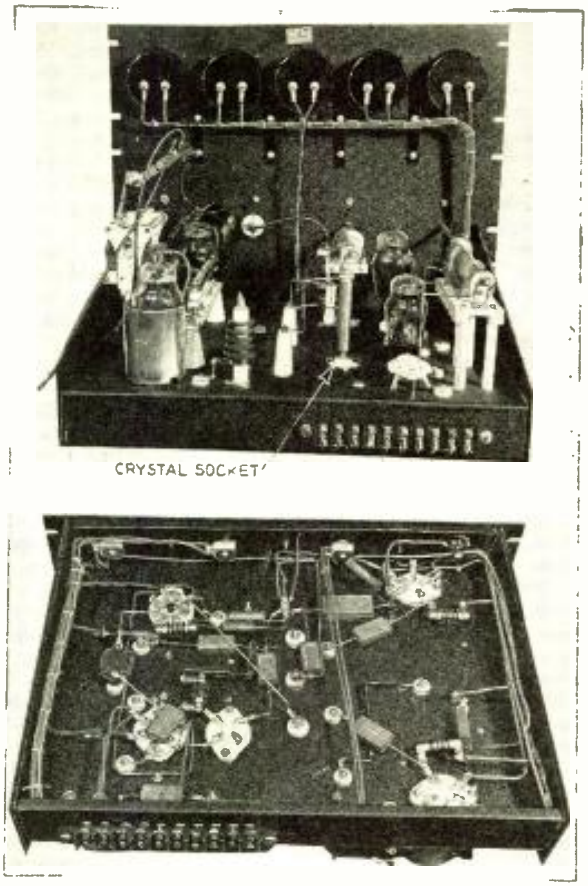
This 13-tube 10- and 20-meter transmitter, adapted for Remote Control, uses the Gunn oscillator.

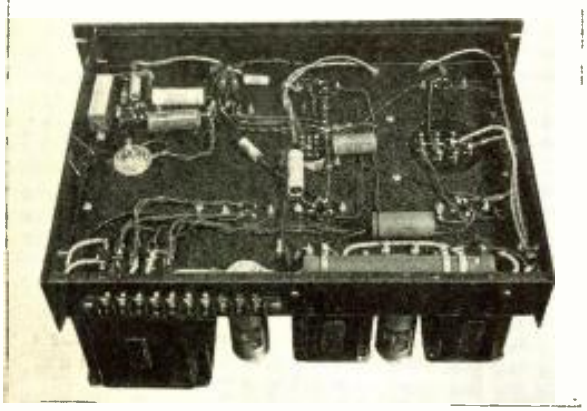
Alvin Abrams, W2DTT

Therefore to use a self-excited oscillator, without a means of stabilization, would produce an unsatisfactory frequency stability characteristic, particularly at the higher frequencies. A new approach had to be made to the problem and Gunn decided that a new fundamental principle had to be developed.

The new principle utilizes the well-known fact that a filter having a great number of sections can be made to approach single frequency transmission as closely as may be desired, by the use of as many filter sections as required.

The circuit works as follows: The tuned plate circuit of the first tube, which will be called L1 and C1, and the plate circuit of the second tube, L2 and C2, are tuned to nearly the same frequency, which is approximately the frequency of oscillation. The resultant frequency is also somewhat dependent on the resistance of the tuned circuits and the internal tube plate resistance and on the input coupling units to the succeeding tubes. The circuits L1, C1 and L2, C2 are sharply tuned and their parallel impedance is high for the particular frequency to which they are tuned and is low for all other frequencies. If a suitable change in potential be applied to the grid of the first tube, the variation is amplified, its phase reversed, and is passed on to the second grid. The magnitude of the potential passed on to the second grid will depend on the magnitude of the original change of potential and equally on the apparent impedance of the tuned circuit L1, C1 since this circuit is effectively across the grid and filament of the second tube. Since the two tubes stand in identical electrical relation to each other, the second tube will repeat the process in exactly the same manner, and the initial pulse will be returned to the first grid, amplified or attenuated and approximately in phase with it. When the returning pulse is larger than the initial one, it is evident that oscillations will set in in both the circuits L1, C1 and L2, C2 since these will assume to be tuned to identical frequencies. The oscillations will be impressed on each grid successively and if the interstage coupling is correct, those frequencies corresponding to a high parallel impedance in the coupling units will be amplified and pass through the system again and again and give rise to a steady oscillation. On the other hand, those frequencies corresponding to a lower parallel impedance in the coupling units will be less amplified and in the process of passing through the tuned systems again and again will be attenuated to such an extent that they will vanish from the system.





Above, right—rear view of meter and R.F. panels, together with under-chassis picture, showing placement of all parts. Below, left—similar views of the speech amplifier and modulator. Note self-contained power-pack.

It is then easily seen that the re-entrant circulation of oscillations through such a system stimulates with great accuracy the selective effect of a filter having a very great number of sections.

The stability of the oscillator is comparable to that of an electron-coupled oscillator and can be improved still further by using screen grid tubes. The reader who would like to delve more fully into the oscillator, will find a full description by Ross Gunn of the Naval Research Laboratories, in the September, *1930 Proceedings of the I. R. E.*

Construction

The transmitter consists of three sections. The bottom one contains the exciter power supply which delivers 300 volts D.C. at 100 milliamperes for the oscillator and doubler, and also contains the filament and plate relays.

The second chassis holds the speech amplifier and modulator with its self-contained power supply.

The third chassis is the radio frequency amplifier with the 5¼" meter

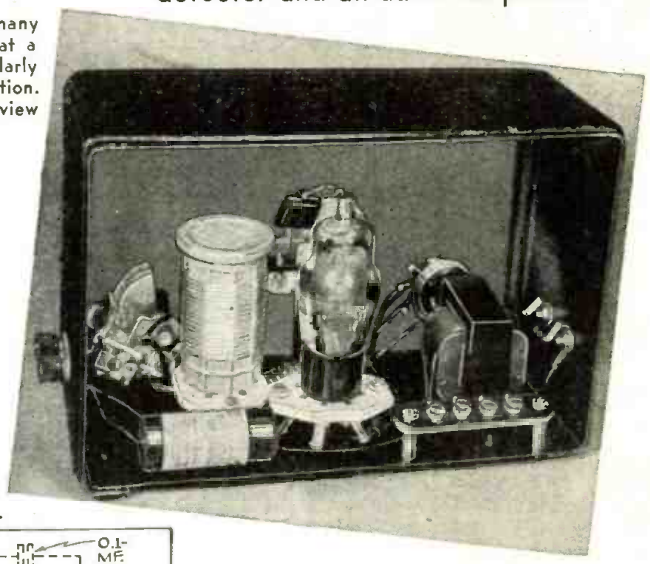
(Continued on page 571)

A Band-Spread 1-Tube Receiver

Herman Yellin, W2AJL

Beginners just entering the short-wave field will appreciate this up-to-date one-tube receiver, as it provides very smooth operation and excellent DX range. A single tube acts both as a detector and an audio amplifier.

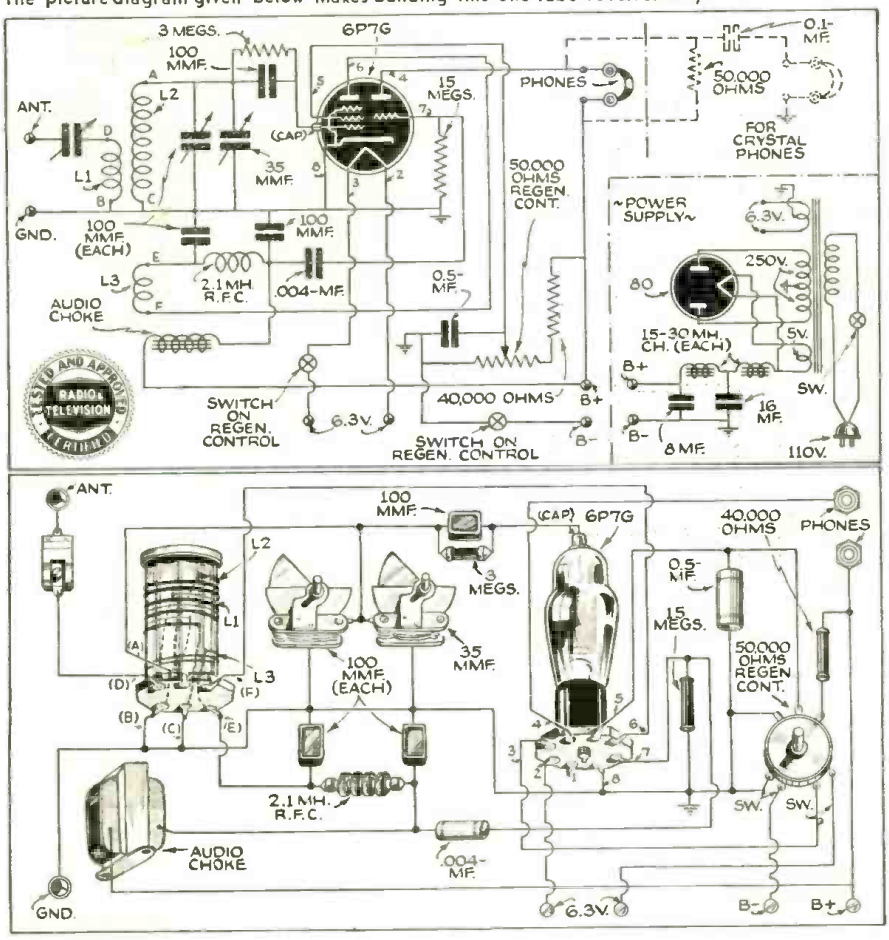
This one-tube receiver has many fine points and can be built at a nominal cost. It is particularly designed for headphone reception. Photo at right shows a rear view of the chassis.



● MANY amateurs and SWL's rather like the idea of a simple receiver held in reserve for the time when the big set becomes inoperative. During periods of emergency when the regular power lines are wiped out, effectively silencing the regular receiver, a simple one-tuber such as will be described, can quickly be connected to a couple of batteries and operations resumed. As a companion unit to the portable-emergency transmitter described on page 548, it can be operated from the transmitter's vibrapack. As explained in the transmitter article, one storage battery supplies plate and filament power to both the transmitter and receiver.

Since a stage of audio is a helpful adjunct to a regenerative detector, a tube containing two sets of elements in one envelope obviously becomes a very desirable solution to our problem. Containing in glass envelope a separate pentode and a separate triode section, the 6P7G is ideal for purpose. Although both sets of elements are so close to each other, there is no harmful interaction between the two because they perform widely different tasks.

The picture diagram given below makes building this one-tube receiver easy.



1 Tube Performs Two Functions

The pentode section of the 6P7G is operated as a three-circuit *regenerative detector*, while the triode section operates as a single stage of *audio amplification*. Since the cathode of the 6P7G is common to both the pentode and triode sections, the tickler method of regeneration was used in preference to the cathode type which might have led to some difficulty. Besides, bringing out taps from a coil is generally a difficult process for the beginner. Regeneration is controlled by varying the screen-grid voltage, resulting in exceptionally smooth control. A little difficulty was encountered at first in the form of a terrific fringe howl as the detector went into oscillation on the higher frequency bands. This was easily cured by shunting a 500,000 ohm resistor across the audio choke coil in the detector plate circuit. Thereafter, the smoothness of action of the regeneration control was all that could be desired.

In order to have little reaction between the antenna and tuning circuits, a separate antenna or primary coil is used. This coil is interwound with the grid coil turns at

(Continued on page 572)

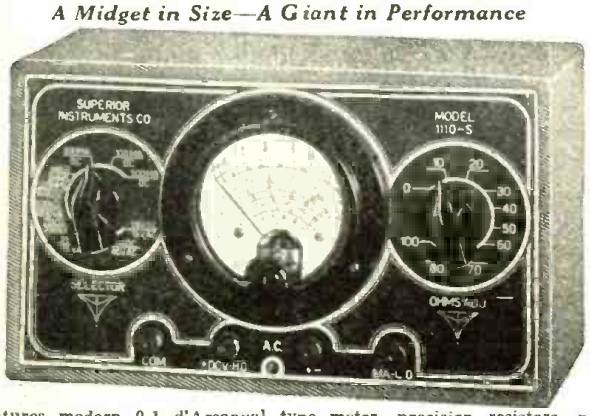
SUPERIOR PRESENTS 5 INSTRUMENTS

from its NEW 1100 series!!!!! Never before has Superior offered so much for so little! Always the Best Buy in the Instrument Field, Superior in this new 1100 series gives you even more value! We have incorporated many refinements, many new features . . . all proven to be sound and practical. We urge you to read the descriptions below carefully; see how these instruments fit your needs. Buy direct from manufacturer and save 50%.

SUPERIOR INSTRUMENTS ARE GUARANTEED FOR ONE YEAR

THE NEW MODEL 1110-S
A.C. - D.C. VOLT OHM MILLIAMMETER

A Midget in Size—A Giant in Performance



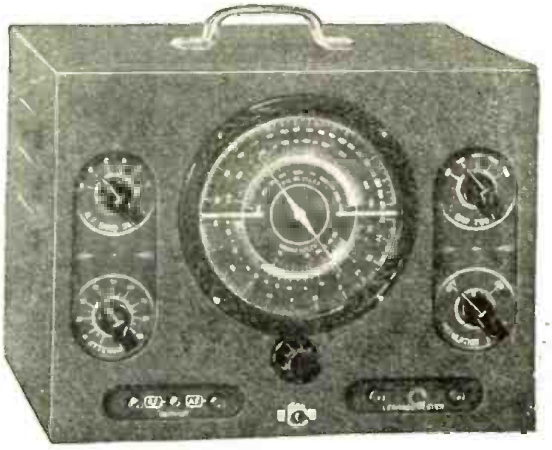
Features modern 0-1 d'Arsonval type meter, precision resistors, neat etched panel housed in new striped fabricoid case.

SPECIFICATIONS:

0-1.5	volts	D.C.	0-500	ohms.....500-500,000	ohms.	0-15	volts A.C.
0-15	volts	D.C.		0-1	ma. D.C.	0-40	volts A.C.
0-25	volts	D.C.		0-10	ma. D.C.	0-75	volts A.C.
0-75	volts	D.C.		0-100	ma. D.C.	0-200	volts A.C.
0-500	volts	D.C.		0-500	ma. D.C.	0-1200	volts A.C.

Model 1110-S supplied complete with batteries, test leads and instructions. Size: 8½" x 5" x 3¼". Shipping weight, 5½ pounds. Our net price..... **$7.85**

THE NEW MODEL 1130-S
Signal Generator with Audio Frequencies



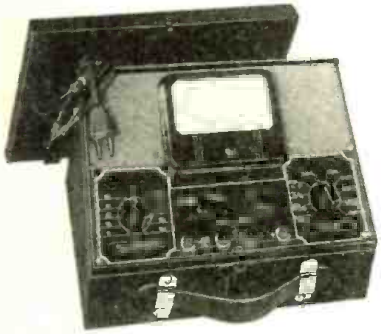
SPECIFICATIONS:

1. Combination R.F. and Audio Signal Generator. R.F. 100 kc. to 100 Mc.. A.F.—100-7,500 cycles. All Direct reading, all by front panel switching. 2. R.F. and A.F. output independently obtainable alone or with A.F. (any frequency) modulating R.F. 3. Accuracy is within 1% on I.F. and Broadcast bands; 2% on higher frequencies. 4. Audio frequencies in 5 bands: 100, 400, 1000, 5000, and 7500 cycles. 5. Giant airplane full vision, direct-reading dial. 6. Condenser and other leakages tested to 100 megohms. 7. All services on 90-130 volts A.C. or D.C. (any frequency).

Model 1130-S comes complete with tubes, test leads, carrying handle, instructions. Size 12" x 9" x 6½". Shipping weight 15 pounds. Our net price..... **$11.85**

THE NEW MODEL 1150-S
SUPER-ALLMETER

Featuring the New Sloping Panel



A genuine achievement! For accurate and rapid measurements. Note the following features: A.C. and D.C. Volts. A.C. and D.C. currents. Resistance. Capacity. Inductance. Decibels. Watts.

SPECIFICATIONS:

D.C. Voltage: 0-15, 0-150, 0-750 volts D.C.
A.C. Voltage: 0-15, 0-150, 0-750 volts A.C.
D.C. Current: 0-1, 0-15, 0-150, 0-750 ma. D.C.
A.C. Current: 0-15, 0-150, 0-750 ma. A.C.
2 Resistance Ranges: 0-500 ohms
500-5 megohms
High and Low Capacity Scales: .0005 to 1 mfd. and .05 to 200 mfd.
3 Decibel Ranges: -10 to +19, -10 to +38, -10 to +53.
Inductance: 1 to 700 Henries
Watts:
Based on 6 mw. at 0 D.B. in 500 ohms. .006000 to 600
Utilizes new 4½" square 0-1 d'Arsonval type meter with precision resistors housed in our newly devised sloping case for rapid and accurate servicing.

Model 1150-S supplied complete with test leads, tabular charts and instructions. Size 10" x 7¼" x 4¼", shipping weight 9 pounds. Our net price **$11.85**
Model 1150-A Portable carrying cover 75c additional.

THE NEW MODEL 1180-S
SET TESTER

A Complete Laboratory All in One Unit!

Featuring Our New Type Sloping Panel for Precise and Rapid Servicing

A complete testing laboratory all in one unit! Combines Superior models 1140-S and 1150-S. For specifications read the description of both these models herewith. Comes housed in sturdy, black case with sloping panel for rapid and simple measurements. Complete with test leads, tabular charts, instructions and tabular data for every known receiving type tube, including many transmitting types. Size 11¼" x 9¼" x 5"; shipping weight 18 pounds . . . Our net price **$17.85**

Model 1180-A for Portable Cover, add 95c.

THE NEW MODEL 1140-S
TUBE TESTER

A really modern tube tester conforming to all standards of good engineering practice. Utilizes a 3" d'Arsonval type meter with calibrated scale. Furnished in a sturdy black case with sloping panel for easy operation. Removable cover and carrying handle for either portable or counter use.

SPECIFICATIONS:

1. Tests all 4, 5, 6, 7, 7L, and octal base tubes, including diodes.
2. Tests by the well-established emission method for tube quality, directly read on the GOOD? BAD scale of the meter.
3. Affords separate neon test for leakage and shorts between elements.
4. All services performed by the use of only five controls at maximum, and many tests do not require working all the controls.
5. Supplied with instructions and reference table so that the filament voltage and emission measuring controls may be properly set for the enumerated long list of tubes, which includes all tubes commonly encountered in servicing.
6. Works on 90-120 volts A.C. 60 cycle.

Model 1140-S comes complete with instructions and tabular data for every known receiving type of tube as well as many transmitting types. Shipping weight 10 pounds, size 10" x 7¼" x 4½". Our net price **$10.85**
Model 1140-A with Portable Cover ..... 75c additional

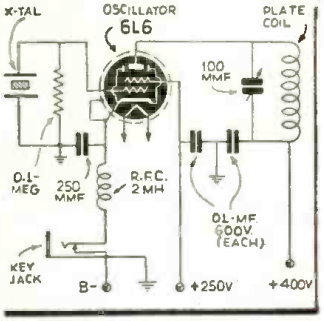
SUPERIOR INSTRUMENTS CO.

136 Liberty St., SW-139
NEW YORK, N. Y.

Question Box

Diagram of Simple Oscillator

In the construction of my transmitter I intend to make use of a simple oscillator using a 6L6 in order that the crystal will work on the 80 meter as well as the 40 meter band by simply changing the plate coil. Please publish a diagram showing such an oscillator with complete list of parts.—Lester Morosky, Cincinnati, Ohio.



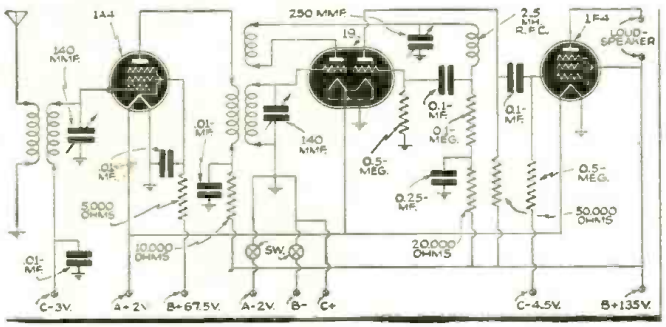
Oscillator works 2 bands.—1165

A. Here is a diagram of an oscillator using a single crystal, a 6L6, an untuned regenerative cathode circuit, and a plate coil tuned to the desired frequency. It will deliver an output on 80 meters with an 80-meter plate coil and an 80-meter crystal; likewise for 40 meters, all that is needed is a 40-meter plate coil in place of the 80-meter plate coil. In other words the same crystal operates on both bands. The only change needed is tuning the plate condenser to make the circuit resonate at the desired output frequency.

Two-Volt Battery Receiver

I wish to build a short-wave receiver for 2-volt battery operation. Please show a diagram for such a receiver using a 1A4 as a T.R.F. stage, a 19 as a regenerative detector and first audio, with a type 1F4 as an output tube.

A. The circuit you request is shown here with the values of the various parts marked on the diagram.



Dual purpose tubes give this set R.F., Detector and 2 A.F. stages with only 3 tubes.—1166

Facsimile Broadcasting

I am informed that there are a number of broadcast stations now broadcasting facsimile transmissions on an experimental basis. If so, can you supply a list of such stations and the time that they are "on the air," together with any other data that you might have? Also how long will the experimental period last before it gets under way for "home" reception?—Peter Lorry, Red Bank, N. J.

A. Regular broadcasting frequencies are being employed between midnight and 6 a.m. in experimental transmissions to determine public reaction and to obtain basic engineering data for home facsimile services. Stations already licensed on this basis are: WLW, 500,000 watts, Cincinnati, Ohio; WOR, 50,000 watts, Newark, New Jersey; WGN, 50,000 watts, Chicago, Illinois; WSM, 50,000 watts, Nashville, Tennessee; WHO, 50,000 watts, Des Moines, Iowa; WSAI, 5,000 watts, Cincinnati, Ohio; WWJ, 5,000 watts, Detroit, Michigan; WHK, 2,500 watts, Cleveland, Ohio; WGH, 250 watts, Newport News, Virginia; KSTP, 25,000 watts, St. Paul, Minnesota; WCLE, 500 watts, Cleveland, Ohio; W8XAL and W8XNU, 10,000 watts, both in Cincinnati, Ohio. Other stations have also applied to the FCC for facsimile permits.

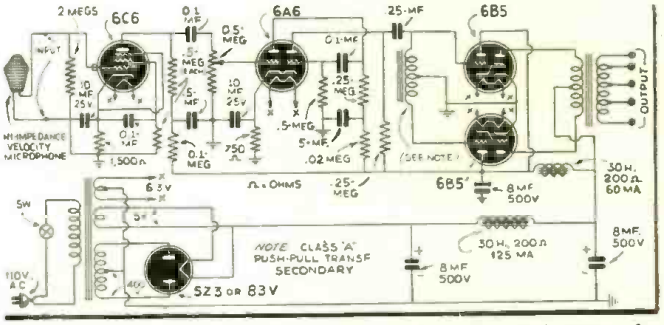
Facsimile receivers will not be available to the public until much experimentation has been done, dependable apparatus developed to sell at a moderate price, and a means found for financing regular broadcasts.

As the stations are now operating on an experimental basis, it is impossible to give you their exact schedules. Further information may be obtained by writing to the individual stations.

Public Address System

I have been given the job of constructing a public address system for our community church building and therefore request a schematic diagram of a four-tube amplifier with power-supply, using the 6.3 volt tubes. I also would welcome a list of parts.—Silas Morgan, Philadelphia, Penna.

A. Here is a diagram of a public address system that should be adequate for the work that you intend to use it for. The amplifier consists of a 6C6, a 6A6, two 6B5's in push-pull, and a 5Z3 or 83V as a rectifier. A high gain velocity microphone is employed, providing excellent reproduction. The parts specifications are given in the diagram.



Low cost Public Address System gives ample undistorted output for small auditoriums.—1167

Adding an "R" Meter to a Receiver

If possible please publish a diagram showing how I may add an "R" meter to my present all-wave receiver. Also explain how this may be done.—Lester Barker, Brooklyn, N. Y.

A. Such a circuit with a complete explanation showing how this may be accomplished appeared in our issue of August, 1938. We refer you to Diagram Number 1141. This issue may be obtained from our circulation department for 25 cents.

Address, *Circulation Department*, RADIO & TELEVISION, *99 Hudson Street, New York, N. Y.*

5-Meter Receiver

I intend to construct a 5-meter Acorn tube receiver of the super-regenerative type for headphone operation. Therefore, I would like to see in the Question Box a diagram of such a receiver; preferably one using a stage of tuned radio frequency.—Allen Porter, Newark, N. J.

A. Data for building such a receiver appeared in our August, 1938, issue. It may be had from our Circulation Department.

For the address, see the preceding reply.

A fee of 25c (stamps, coin or money order) is charged for letters that are answered by mail. This fee includes only hand-drawn schematics. We cannot furnish full-size working drawings or picture layouts. Letters not accompanied by 25c will be answered on this page. Questions involving considerable research will be quoted upon request. Names and addresses should be clearly printed on each letter.

Revolutionary Engineering by

BERNARD

The 24-Range SUPERMETER $19.90

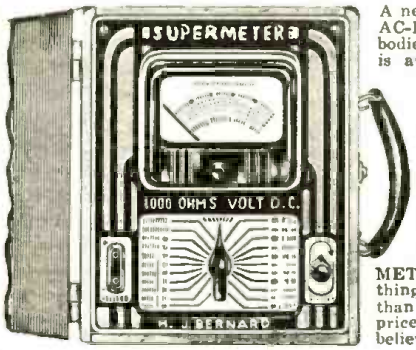
HERE is an analyzer extraordinary! The new SUPERMETER, in handsomest imaginable solid instrument wood cabinet, is tops for accuracy and rock bottom for price. The cabinet has removable hinged cover and carrying handle. Supermeter is what the serviceman, experimenter, student and engineer need most at a price they can best afford!

WHEN an instrument affords 24 ranges, each one with that high accuracy for which the BERNARD name is world-famous, and sells for about what others charge for a little pocket meter, there is no choice left except to buy the BERNARD instrument. Others charge about three times as much for analyzers with far fewer ranges, so you naturally insist on enjoying the fullest advantages at minimum cost.

SUPERMETER has a 4" square Bakelite meter, 2% accurate, with long knife-edge pointer and d'Arsonval movement. The scale is extremely extended, having large numerals, easy to read. The meter is rugged and reliable.

Everything else equal, it is always important to compare number of ranges. Take d-c volts. EIGHT RANGES to 2500 volts, including the tiny voltage range 0-100 millivolts (0.1 volt full-scale). In therapy, photo-cell and other electronic applications this low range is important. Take resistance. FIVE RANGES. By introducing 300 volts from a B supply you can measure up to 25,000,000 ohms. At the other extreme (1.5-volt cell) you can measure a fraction of an ohm, with nearly ¼ inch space between 0 and 1 ohm!

These are some of the things we mean when we say Bernard engineering is revolutionary.



1,000 OHMS PER VOLT

The appearance of SUPERMETER is outstanding. The cabinet alone evokes a thrill of possessing something fine. Simplicity marks the panel and also the operation of the instrument. Only one selector switch, only one ohms control, only one pair of jacks. That's all. Others may crowd their panels with confusing jacks and controls, but we don't have to. Expert engineering is the reason.

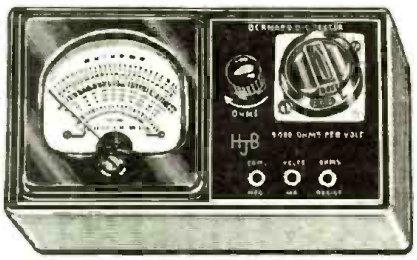
A new feature in Bernard AC-DC instruments, embodied in SUPERMETER, is automatic a-c service. Turn the selector to a-c and the copper-oxide rectifier is automatically cut in. No AC-DC switch to cause mistakes and confusion.

SUPERMETER uses a costly 22-position switch, the only switch in the instrument. SUPERMETER gives you everything you want and more than you'd expect at a price far less than you'd believe possible.

SPECIFICATIONS

0-100 millivolts; 0-2.5-10-50-250-500-1000-2500 volts d.c., all at 1000 ohms per volt.
0-2500 ohms (30 ohm center); 0-25,000-250,000-2,500,000-25,000,000 ohms.
0-1.5-15-150-1500 volts a.c.
0-1.5-15-150-1500 volts output meter.
-10 to +58 DB in three ranges.

SUPERMETER, Model 389, in portable cabinet; removable hinged cover; includes all batteries to 250,000 ohms; less test leads.



1,000 OHMS PER VOLT

TROUBLE TESTER $5.90

UNUSUALLY low-priced, the BERNARD TROUBLE TESTER has 14 accurate ranges. It uses a 2% accurate 3" square Bakelite meter, d'Arsonval movement, knife-edged pointer. The insulated voltage multipliers are completely sealed against moisture, while wire-wound resistors are used on three ranges. The resistors stay put.

This is the simplest d-c tester to operate because it has a common negative jack, one post for all volts and currents, and a third post for all resistance measurements. There are no dangling wires to connect as awkward substitute for switching. No need to touch test leads together for full-scale ohms adjustment. Protection against burn-out is 25 times greater than in most other instruments.

The scale is large and easy to read. Particularly accurate are the two ohms ranges, due to our special laboratory technique. Equal accuracy is not obtained in instruments of other makes until you reach the $50 price level.

SPECIFICATIONS

0-100 millivolts; 2.5-5-10-25-50-100-250-500-1000-2500 volts d.c., all at 1000 ohms per volt.
0-1000 microamperes d.c. (1 milliampere).
0-400-250,000 ohms, with self-contained 3-v. flashlight battery (renewal cost, 10c).

BERNARD Model 390 Trouble Tester; shipping weight, 3 lbs. **Net price, $5.90.**

PUSH-BUTTON TUBE TESTER $20.90

AN up-to-the-minute push-button tube tester and tube seller for direct readings on all tubes, both metal and glass, AC or battery types. Tests for quality, individual element leakage (both hot and cold); shorts, opens, noise and gas, all in accordance with highest engineering standards for emission testers.

A line-voltage control is included.

Fast, accurate, simple, the BERNARD TUBE TESTER uses no adapters.

Large 4" square illuminated meter, with provision for external use of the meter alone (0-1 ma).

Tests include all the new tubes, among them the new television tubes, e.g., 1851; the 1.4-volt 50 ma and other battery tubes; gas tubes, such as 2A4G, 0A4G, 884, etc.; ballasts, magic eyes, S or loctal tubes, etc.

Bernard Tube Tester, Model 387, shipping weight 9 lbs. Net price, with handle, $20.90.

ALL-WAVE SIGNAL GENERATOR $19.90

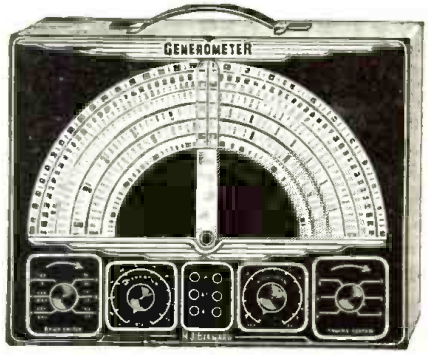
OPERATING entirely on fundamentals, GENEROMETER is a signal generator covering 120 kc to 70 mc in six bands, by front-panel switch selection. Thus it supplies all the useful intermediate and radio frequencies for the complete alignment of all types of radio receivers. Future requirements are provided for by the inclusion of television bands.

The leakage has been controlled, so that the attenuator works efficiently on all bands. By means of a switch, modulated or unmodulated carrier output may be selected. Modulation is fully effective on all bands. The modulating voltage is kept to a sine form. Overmodulation and modulation distortion are avoided. GENEROMETER combines low price with the perfection of service found only in the highest-priced signal generators.

Housed in a black crinkle-finished shield cabinet that gives really effective shielding, GENEROMETER produces an ample and stable output at frequencies read directly on a great 11" diameter vernier dial, the largest dial of all! This enormous spreadout makes frequency reading very easy, while the precision calibration affords 1% accuracy on i-f and broadcast bands, 2% on short waves.

The r-f attenuator, 200 ohms, operates from maximum to minimum without detuning the generator. Also the modulation is strictly of the amplitude type and introduces no frequency modulation and no generator detuning.

Great pains have been taken to insure an extraordinary degree of i-f, r-f and ripple filtration, to prevent spurious modulation and trouble from hum, even on short waves. Unmodulated output is impossible in generators that hum on short waves as badly as many do.



The controls are: extreme left, band selector; next, r-f attenuator; tip jacks at center, then tuning control; extreme right, audio attenuator and modulation switch combined. Wobbler posts are included.

The six bands, selected by a switch having 60° between stops, are:

A. 120 kc to 380 kc
B. 380 kc to 1,100 kc
C. 1.1 mc to 4 mc
D. 4 mc to 12 mc
E. 12 mc to 50 mc
F. 25 mc to 70 mc

GENEROMETER is 12½" wide by 8¼" high by 6" front to back. For 50-60-cycle, 90-130-volt a-c operation. Shipping weight, 12 lbs.

GENEROMETER, Model 382, complete with tubes. Shipping weight, 12 lbs., net price—$19.90.

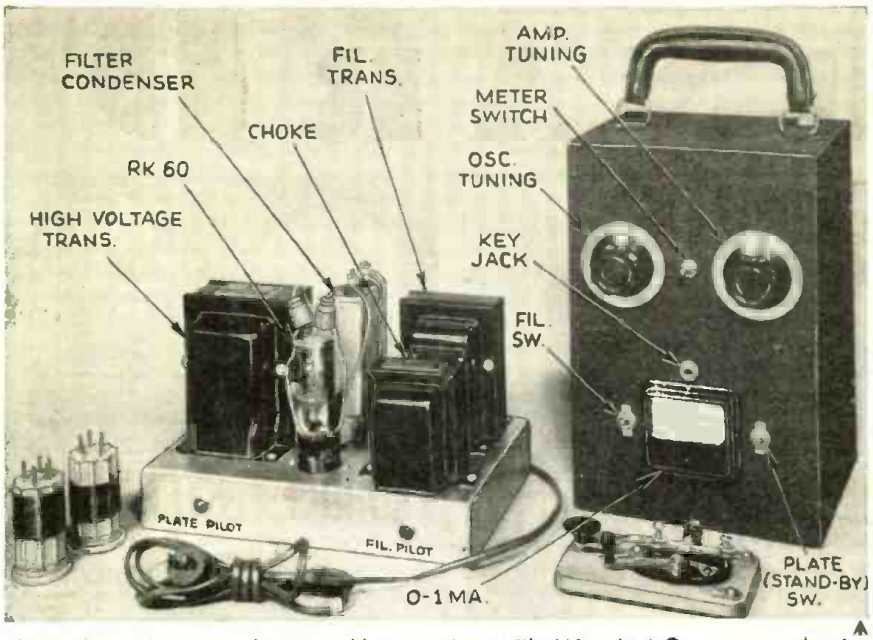
Exclusive Export Representative:
PAN-MAR CORP.
1470 Broadway,
New York, N. Y., U. S. A.
For Cables: PANTILMAR

Lowest Priced But Priceless

BERNARD

H. J. BERNARD 319-V THIRD AVENUE BROOKLYN, N. Y.

All Bernard instruments carry a 90-day guarantee of freedom from mechanical or electrical defects, of the instruments as a whole and every part in them. You are wise in buying only guaranteed instruments.



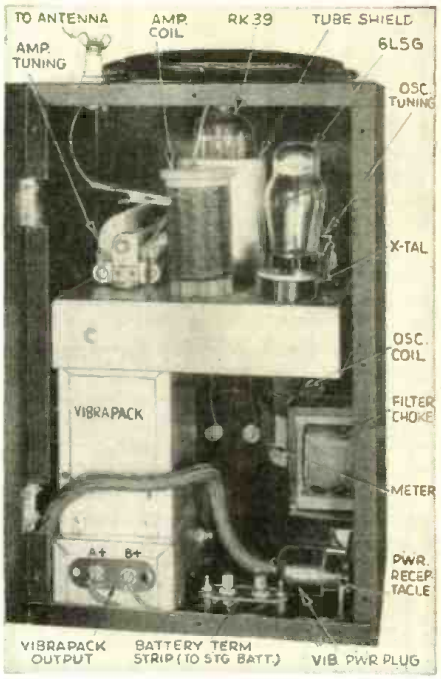


Photo above shows complete portable transmitter with 110 volt A.C. power-supply. A vibrapack is built in for 6 volt operation.

2-Tube

Portable Transmitter

Every Ham will find use for this portable emergency transmitter which operates on 40, 80 and 160 meters. Its plate supply is derived from a vibrapack when operating on 6 volts. It can also be operated from a 110 volt A.C. circuit.

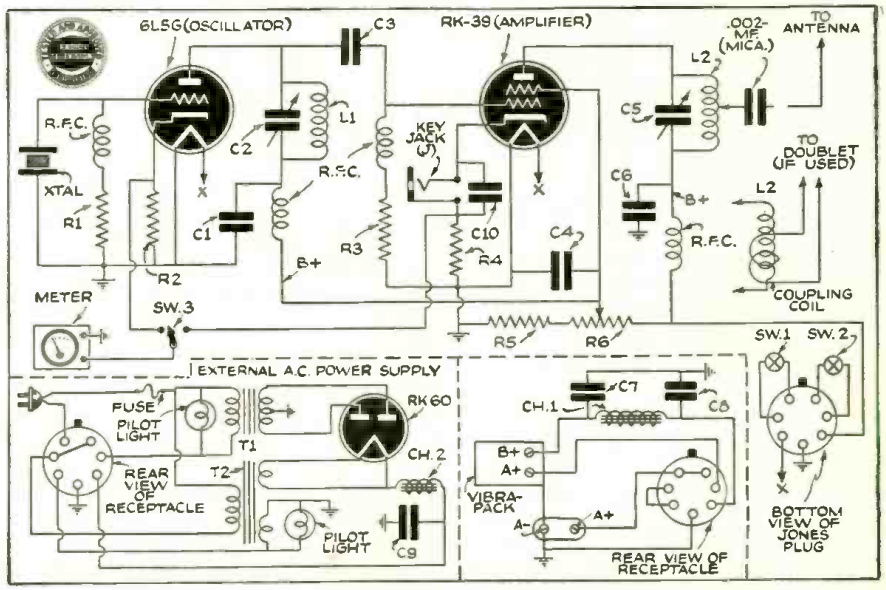
Herman Yellin, W2AJL

● THE desirability of self-powered amateur equipment was brought strikingly home recently when a tropical hurricane roared through the New England states. The amateur desirous of preparing himself for emergency service should place no reliance on the regular power lines, since these are generally among the first to become inoperative. Rather, some form of locally generated power should be made available. A vibrator power-supply operating from a 6 volt storage battery will provide an adequate source of power for all emergency purposes.

The portable transmitter about to be described uses such a power-supply and in addition is readily converted for operation from the regular A.C. power lines when used under normal conditions. Thus we have an outfit serving a dual purpose, being both a *regular station* transmitter and a *self-powered portable-emergency* transmitter. It is ideal for week-end touring trips, besides being a *"must"* item for the Ham touring the country with his trailer.

The transmitter consists of a 6L5G tube used as a crystal-controlled oscillator in a circuit characterized by its extreme simplicity, feeding into an RK-39 amplifier, which in turn feeds into the antenna. The transmitter is completely mounted on a small 6½ x 6¼ x 1½ inch chassis. This chassis is mounted in a portable 12 x 7¾ x 6½ inch cabinet. The chassis is mounted in the upper section of the cabinet. In the bottom of the cabinet are mounted the vibrapack and its filter, consisting of a choke and a double 8 mf. condenser. On the panel are mounted a milliammeter, the main *power* switch and the *standby* switch, besides a meter selector switch and a keying jack. A pair of hinges was fastened to the back plate of the cabinet in order to provide ready accessibility to the variable gap crystal and the coils. A small notch cut into this back plate at the lower edge will allow the cable to enter the cabinet while the back is closed.

Diagram of the portable emergency transmitter; with auxiliary A.C. power-supply.



300 Volts from Vibrapack

The vibrapack used with the "rig" delivers 300 volts, when operated from a storage battery delivering 6.3 volts. During the normal charge and discharge cycles of a storage battery, the voltage will vary generally from 5.5 to 7 volts. The output voltage from

(Continued on page 552)

Coil Winding Data

Band Meters	Oscillator	Amplifier
40	16 turns No. 18 enameled spaced to 1½" long	same as oscillator
80	32 turns No. 18 enameled close wound	32 turns No. 18 enameled spaced to length of 2"
160	60 turns No. 24 enameled close wound	60 turns No. 24 enameled spaced to length of 2"

All coils wound on Hammarlund forms, 1½" diameter, type SWF-5.

EMERGENCY TRANSMITTER
Parts List

HAMMARLUND (Condensers)
1—100 mmf. tuning condenser MC-100-M (C-2)
1—100 mmf. tuning condenser double-spaced type MC-100 SX (C-5)
4—2.5 mh. R.F. chokes type CH-X (RFC)
1 -octal isolantite socket type S-8
4– 5-prong isolantite sockets type S-5
6—5-prong coil forms type SWF-5

I.R.C. (Resistors)
1—50,000 ohms ½ watt type BT½ (R-1)
1– 20,000 ohms 1 watt type BT-1 (R-3)
1–-10,000 ohms 25 watt type DG (R-5)
1—25,000 ohms 25 watt with slider type DHA (R-6)

CORNELL-DUBILIER (Condensers)
2—.004 mf. type 4-12D4 (C-6, C-1)
1—.006 mf. mica type 4-12D6 (C-4)
2—dual 8 mf. electrolytic, 450 volts type JR-458 (C-7, C-8)
1—.006 mf. mica postage stamp type (C-10)
1 .0001 mf. mica type 4-12T1 (C-3)

TRIPLETT (Meters)
1—2" 0-1 milliampere meter
1—25 ma. shunt (R-2)
1 -150 ma. shunt (R-4)

BLILEY (Crystal)
1—type VF-180 meter variable gap crystal

PAR-METAL (Cabinet and Chassis)
1 —12x7¾x6½ inch portable cabinet, type PC1276
1—6½x6¼x1½ inch chassis for above, type 15760

THORDARSON
1—10 henry, 75 ma. choke coil type T-43C92 (CH-1)

P. R. MALLORY & CO.
1—Mallory vibrapack, 300 volts at 100 ma., type VP-552
1—single-circuit jack, type 701
1—7-conductor cable connector plug with 5 ft. cable and mounting plate, type No. 600
1—phone plug No. 75

CROWE
2—2¾" dials No. 294

RAYTHEON (Tubes)
1—6L5G tube
1—RK-39 tube

EXTERNAL A.C. POWER-SUPPLY
Parts List

PAR-METAL
1—7x11x2 inch chassis, type C4512

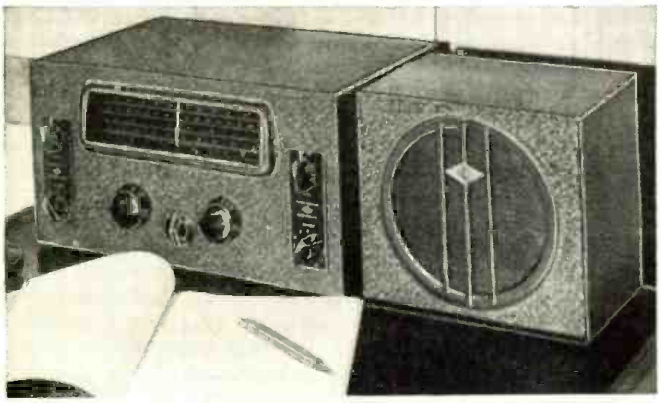
CORNELL-DUBILIER
1 -4 mf. 1000 volt condenser, type TJU-10040

HAMMARLUND
1—4-prong wafer socket, type BS-4

THORDARSON
1—800-800 volt plate transformer, type T-19P56
1—multiple filament transformer, type T-79F84
1—12 henry, 150 ma. choke, type T-17C00-B (CH-2)

MALLORY
1—7-prong pin plug with mounting ring, type 631

RAYTHEON
1—RK-60 rectifier tube



One feature is the uniform direct-reading frequency scale. Large knob at left—main frequency tuning control; right is the band-spread tuning control. Both controls of the high-ratio free-spinning inertia drive type.

The New NC-44 Receiver

of the Communications Type

James Millen

● REALIZING, as the result of years of experience in the design and manufacture of the communication receivers most used in amateur and commercial applications, that low-priced mass production parts designed for broadcast reception would not give acceptable results on short waves in even the popular price field, we started our work in designing the new National NC-44 receiver by designing a series of rugged component parts suited for the chosen circuit.

Most important of these special units is the main tuning condenser.

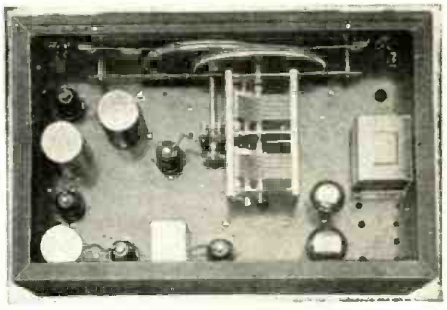
The Main Tuning Condenser: The lower photo shows that this condenser, which is really the heart of the receiver, is extremely rugged; has isolantite insulation, and above all, is quite different in mechanical design from the normal type of variable condenser ordinarily used in broadcast band receivers. It is the rugged design that contributes so much to the stable performance of a true *communication receiver.*

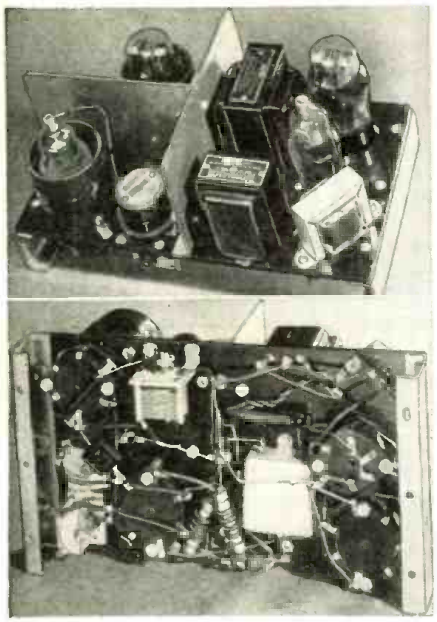
An important feature of the main tuning condenser is the straight line frequency tuning characteristic. In addition to making the tuning scale easy to read and record, straight line frequency tuning means *uniform tuning ease at any frequency.*

A dual tuning system provides both general coverage and band-spread operation. It is operated through a vernier reduction drive having a ratio of about 30 to 1. The electrical band-spread system comprises a separate two-gang tuning condenser, with a separate dial mechanism and dial scale. Practically all tuning in the short-wave ranges will be done with this band-spread condenser and the

(Continued on opposite page)

Top view shows the special variable condenser and dial-drive mechanism. Square aluminum shield can at the rear center of the chassis contains the beat frequency oscillator circuits.





Top and bottom views of Transmitter.

A Low-Power Emergency 'Phone Transmitter

D. L. Warner, W91BC

● A PORTABLE transmitter can be built for less than ten dollars, obtaining most of the needed parts from the spare parts found in every "Ham Shack."

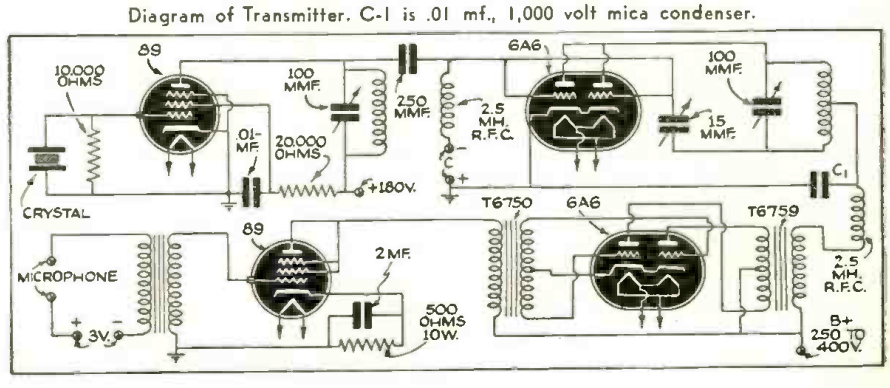
The highly efficient unit described here is simple and compact and can be built in a few hours time, requiring only a minimum of parts, yet will deliver about twenty watts of modulated carrier to the antenna. It was originally fitted with coils and crystal for operation in the crowded 75 meter 'phone band. Using a temporary antenna of the single-wire end-fed type about 100 feet long, it turned in a flock of very enjoyable contacts.

If the coil and crystal combination is changed so that operation on 10 or 20 meters is made possible, this little transmitter will provide some fairly decent DX contacts. Because of its small size the unit adapts itself very readily for use in any type of emergency communication set-up, especially since it was designed to operate either from a separate A.C. power-supply when at home, or from a six volt storage battery and either "B" batteries or vibrator power-supply for portable use.

The circuit is straight-forward, employing no freak or trick arrangements to accomplish the purpose. A type 89 tube as crystal oscillator supplies more than sufficient driving power for the R.F. amplifier which consists of a single 6A6 tube with the

(Continued on page 575)

Diagram of Transmitter. C-1 is .01 mf., 1,000 volt mica condenser.



The New NC-44 Receiver

(Continued from opposite page)

various amateur bands are spread as follows:

3.5 to 4.0	megacycles	65 Divisions
7.0 to 7.3	"	50 "
14.0 to 14.4	"	56 "
28.0 to 30.1	"	40 "

The Circuit: The new set differs from its predecessors in the National line, in that many features that are included in the higher-priced models have been purposely eliminated.

It does not have a crystal filter; nor air dielectric condenser-tuned aircore I.F.'s. Instead, it has only permeability-tuned iron-core I.F.'s. The receiver does not have permanent factory laboratory calibrated band-spread; instead, the main tuning condenser must be set to indicated points on the main tuning scale, and the band-spread action secured with the separate band-spread condenser and dial scale. This system inadvertently offers an advantage in that electrical band-spread is available at all frequencies, including all of the different short-wave broadcast bands, the police bands, the aviation bands, etc. Instead of automatic plug-in coils aluminum sliding catacomb; it has a much less expensive multi-wave coil and gang switch arrangement for band-changing.

The new receiver does have the special power-supply circuit.

The circuit is simple but effective; it consists of a 6K8 combination first detector and oscillator, two I.F. stages with permeability-tuned iron-core transformers and 6L7 tubes, a 6K7 combination second detector and AVC tube, and a single audio stage employing a 25L6G. The C.W. oscillator is a 6J7 and the rectifier is a 25Z5. The receiver is designed for operation from 105-130 volt A.C. or D.C. lines and draws approximately 40 watts.

Separate audio and I.F. gain controls are provided and each is fitted with a switch. When the audio gain control is turned to the "off" position, the B supply circuit is opened to place the receiver in stand-by position. Turning the R.F. gain control to the minimum position turns the receiver completely off. In addition to these controls, separate switches are provided for the C.W. oscillator and the AVC circuits.

The output terminals of the receiver are connected in the plate circuit of the 25L6G power output tube. The speaker terminals are at the rear of the chassis. The speaker furnished with the receiver is of the permanent-magnet dynamic type, having a suitable coupling transformer to match the load impedance of the tube—1500 ohms. A headphone jack is mounted at the rear of the chassis and is wired in such manner that the speaker is quiet when the phones are in use. The impedance of the headphones should be approximately 20,000 ohms, this being the usual impedance of phones having a total D.C. resistance of between 2000 and 3000 ohms. The receiver should not be operated unless the speaker terminals are connected. The output tube cannot be removed from its sockets (except in battery operated models) since the heaters are connected in series. As previously stated, the receiver may be connected to either the A.C. or D.C. lines.

It should be noted that the frequency calibration of the main scale will only be correct when the band-spread pointer is at ninety. After a station has been found, however, the band-spread control will provide a vernier action which makes tuning of high frequency signals very easy, particularly where the receiver is to be used in amateur communication work.

(Continued on following page)

The New NC-44 Receiver

(Continued from preceding page)

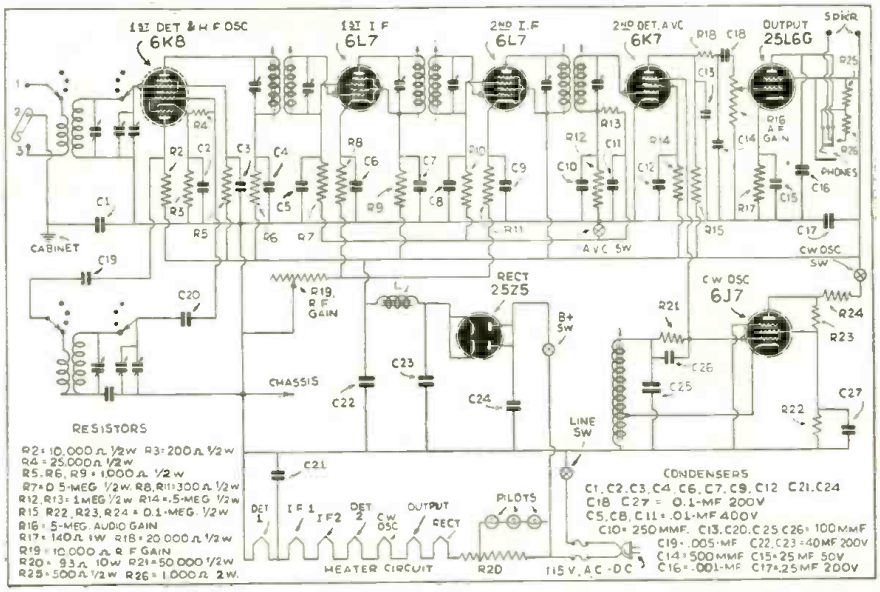
For all-around short-wave reception, the simple single-wire antenna will be found satisfactory except in extremely noisy locations. For amateurs who wish to obtain best performance on any particular band, the antenna should be made to have an overall length, including lead-in, approximately equal to an odd quarter-wave length. For instance, at 10 meters the antenna may be 24, 40 or 56 feet, etc. These figures represent 3, 5 and 7 quarter-wave lengths, respectively. An antenna designed in this manner will provide good signal pick-up with efficient transfer to the receiver and will, at the same time, minimize hand-capacity and other similar undesirable effects.

From the above it will be seen that the same antenna cannot be expected to function with full efficiency on more than one band, unless some provision is made for tuning. Such tuning can often be satisfactorily accomplished by means of a series variable condenser having a maximum capacity of 100 or 200 mmf.

Doublet antenna, directive arrays, etc., having two-wire feeder systems, can be connected directly to the two outside antenna terminals, the center terminal and strap not being used.

The intermediate frequency of the NC-44 receiver is 456 kilocycles. The three I.F. transformers are of the permeability tuned iron-core type and are adjustable from the outside of the cabinet. The transformers are of such construction that the factory adjustment is permanent and they should not be retuned unless there are definite indications that such tuning is required.

Protective Devices: A double fuse block is mounted underneath the chassis and contains two standard fuses designated as the type 3AG, having a rating of 2 amperes.



The diagram clearly shows the straight-forward circuit employed in the NC 44. Of particular interest is the "transformerless" power-supply. This is not to be confused with the so-called AC-DC power circuits used in midget broadcast receivers.

2-Tube Portable Transmitter

(Continued from page 549)

the vibrapack will also vary proportionately to the battery voltage. With normal voltage an input of 25 to 30 watts to the RK39 is easily attained. Even with a poor antenna, this power is highly satisfactory for emergency work, and with a good antenna distances of 1,500 miles on the lower frequency bands are commonplace. However, when it is desired to use the transmitter at the home station, operating from the regular power lines, it is possible to double the input power, since the RK39 has a maximum plate voltage rating of 600 volts. With the external power-supply shown in the diagram and photo, inputs of 60 watts were obtained. In order to attain this power-supply flexibility, the vibrapack is not wired up directly to the transmitter, but a 7-wire cable is wired to the transmitter and 7-prong receptacles are mounted near the vibrapack and on the A.C. power supply chassis. By means of the cable, the power switches on the front panel are enabled to control either the vibrapack power-supply or the A.C. supply, besides conducting the power to the transmitter. Two double-pole, single-throw toggle switches furnish complete control of either power-supply. One switch controls the filament voltage and the other controls the plate voltage. Thus the filaments can be kept heated at all times, even during standby periods, while the vibrapack is connected only during transmission, thereby resulting in economical battery operation.

The transmitter, although compact, is easily constructed, being readily duplicated by even the inexperienced amateur without recourse to a blacksmith shop. Fig. 1A shows the position of all holes on the transmitter chassis while Fig. 1B shows the necessary holes on the front panel. Fig. 2 is a complete plan layout of the external A.C. power-supply used by the author.

(Further details, including "Tuning Up," in Part II, next month.)

How to Learn the International Code

(Continued from page 533)

to proceed with his study of code.

Nothing more should be done until you have learned all of the more common symbols. There are, of course, a few other symbols which must still be learned if you are to become a proficient radio operator, but these can be picked up later.

It is desirable to attempt to associate each character in its "dot and dash" form to a phonetic recognition as soon as possible; and some progress can be made in this direction even while learning the combinations of dots and dashes that go to make up the simple letters, numbers, and punctuation marks. This can be done as follows:

Instead of calling the (.) a "dot" and the (—) a "dash", say aloud for each dot that you see the word, "dit" — and for each dash that you see say the word, "dah" (holding onto the word "dah" so that it lasts approximately three times as long as the word, "dit"). As you can readily appreciate, once you have tried this you can simulate the sounds of dots and dashes by your voice in much the same manner as it would sound when sent with a key and code oscillator.

After code has been memorized the student should take simple copy such as newspaper print, and slowly go through the copy saying to himself (aloud) the phonetic combinations of characters such as previously outlined. Such practice for an hour or so each day for about two weeks will in most cases familiarize the student thoroughly with the code.

How to Grip the Key

All beginners should learn to use a *hand* key to send code. Later on the use of a "bug" key, or other semi-automatic sending device can be attempted, but only after the student has learned to send well with a standard *hand* key. This means a smooth, easy sending pace of at least 18 words per minute. Remember that the man at the other end of the radio circuit forms his opinion of your ability as a radio operator by the *style* of your sending. There is nothing worse than a "sloppy" sender who mushes his words and letters together; while, on the other hand, the trained operator can listen for hours with genuine satisfaction to the fast clean-cut sending of a good operator. It is a pleasure to listen to a good sending "fist". It is most disgusting and tiring to attempt to decipher poor sending.

To send code, place the key far enough back on the table to allow the whole arm from the elbow down to rest comfortably on the table. Grasp the key lightly between the thumb and second finger, with the first finger resting on the top of the key knob. Keep both feet on the floor and sit up straight in your chair. DO NOT GRIP THE KNOB TIGHTLY—only lightly. Lift the wrist slightly above the table top and make all of the motion appear in the wrist. Keep the remainder of the arm and the rest of the body relaxed. Under any conditions do not send with a stiff arm . . . . relaxation of the arm is all-important, and the sending motions *must come from the wrist action*, with the arm relaxed.

In order to gain control of the wrist motion and to promote even sending, send long strings of dots, one group after another (from two to ten dots in each group). Make each dot the same length as the others, and make the space between the dots exactly as long as each dot. Do not skip or change the speed of sending. . . . At first, try for smooth, even, slow sending—speed will come later.

(Part 2, next month)

New HAM Licenses

COMPILED FROM THE LATEST RECORDS OF THE FEDERAL COMMUNICATIONS COMMISSION

THERE are now nearly 50,000 licensed radio amateurs in this country. And hundreds of new amateurs are being licensed every month.

Heretofore no publication has listed the names and addresses of the new licensees as issued. RADIO & TELEVISION Magazine now provides this unique service, and will publish a list of newcomers in every issue. Check the names carefully so that you will be able to get in touch, not only with those amateurs in your neighborhood and vicinity, but also those distant amateurs whom you wish to contact either by mail or by radio.

This list contains 279 names of newly licensed amateurs. YLs' names appear in blackface type.

K4FSP Pedro L. Jimenez, 31 Acosta, Caguas, Puerto Rico.
K6QMA Raymond N. Gomes, 939 A 3rd Ave., Honolulu, T. H.
K6QMC Robert T. Hosken, Hq. Co., 21st Inf., Schofield Barracks, T. H.
K6QNX Charles R. Freeman, Regimental Hq. Bldg. 27th Inf. U. S. A., Schofield Barracks, T. H.
K7HEN **Lucille R. Wright, Tetlin, Alaska.**
KD6QLS Harold John Strickland, Pan American Base, Midway Island.
W1CEU Frederick L. Sherman, Jr., 26 Pine St., Palmer, Mass.
W1GDC Frederick M. Dingwall, 270 W. Hazel St., New Haven, Conn.
W1IFD Joseph Marks, 1111 Smithfield Ave., Sayles-ville, R. I.
W1LPH Abraham Siegelman, 20 Highland St., Pawtucket, R. I.
W1LPI Carl J. Quirk, 32½ Wheeler Ave., North Adams, Mass.
W1LPO Richard J. Dowling, 16 Bull, Newport, R. I.
W1LPP Robert R. Ralston, 255 Pomeroy Ave., Pitts-field, Mass.
W1LPQ Carl O. Lillpopp, 92 Brown St., Pittsfield, Mass.
W1LPR Melvin H. Torpacka, 30 St. George Rd., Thomaston, Maine.
W1LPS Lawrence Gagnon, 932 Lisbon St., Lewiston, Maine.
W1LPT Thomas J. Riley, Jr., 49 Oxford St., Hart-ford, Conn.
W1LQM Wm. E. Kenney, 35 Langley Rd., Brighton, Mass.
W1LQN Lawrence S. Holbrook, 101 Salem St., Rockland, Mass.
W1LQR Markle T. Smith, Naval Radio Station, Winter Harbor, Me.
W1LQS Olin C. Marrison, 325 Spring St., Win-chendon, Mass.
W1LQT Gilbert Richmond, Jr., Main St., Montague City, Mass.
W1LQU Bertram Selverstane, Vanderbilt Hall, Har-vard Med. School, Boston, Mass.
W1LQV Wm. H. Potter, 116 Penbroke St., Boston, Mass.
W1LQY Raymond Mulse, 4 Forest St., Middleboro, Mass.
W1LQZ Angelo J. Mora, 48 Emerald St., Malden, Mass.
W2BBY Thaddeus Ferguson, 1779 3rd Ave., N. Y. C.
W2LPY Theodore R. DuPont, 16 Ogden St., New-ark, N. J.
W2LQD Frederick W. Marshall, 104 Gabriel Ave., Franklin Sq., N. Y. C.
W2LQE Paul Frank Var, 476 West 165th St., N. Y. C.
W2LQF Wm. F. Doll, 931 Amsterdam Ave., N. Y. C.
W2LQG Ballard F. Jolley, R.F.D. 1, Jamesburg, N. J.
W2LQH Richard McLaury King, 606 State St., Schenectady, N. Y.
W2LQI Frank B. Jones, 27 Broad St., Newark, N. J.
W2LQJ Elmer C. Scholes, Greenport Ave., Schen-ectady, N. Y.
W2LQK August R. Ryan, 542 Brandywine Ave., Schenectady, N. Y.
W2LQL Wm. Albert Davis, 2801 Hudson Blvd., Jersey City, N. J.
W2LQM Wm. J. Paley, Jr., 39 Ontario, Albany, N. Y.
W2LQN Frank C. French, Shadyside Ave., South Nyack, N. Y.
W2LRM Harry F. Klebs, 25 Milford, Brooklyn, N. Y.
W2LRP Harry M. Kalish, 67 Winfred, Yonkers, N. Y.
W3AQK George J. Porter, 931 Graydon Ave., Nor-folk, Va.
W3CFU Joseph F. O'Keefe, 325 Conway Ave., Nar-berth, Pa.
W3EHX Aloysius W. Haranzy, 4165 Terrace St., Phila., Pa.
W3ETS Samuel Traeger, Parker St., West Falls Church, Va.
W3HTQ Chas. F. Reily, 1029 N. Fulton Ave., Balti-more, Md.
W3HTW Wm. A. Tauberschmidt, 1706 Kearney St., Washington, D. C.
W3HTY Joseph J. Sarno, 233 Dale St., R.F.D. No. 1, Norfolk, Va.
W3HUA Wm. H. Kepler, 3601 Powelton Ave., Philadelphia, Pa.
W3HUB Wm. J. Kunz, 2600 Goodwood Rd., Balti-more, Md.
W3HUD Albert P. McCabe, 2330 Wilson Blvd., Arlington, Va.
W3HUG Robert O. Fullman, 111 Locust, Hampton, Va.
W3HUH Nathan Pearlman, 1715 N. Wilton St., Phila., Pa.
W3HUJ Paul H. Singewald, 330 Maple Ave., Drexel Hill, Pa.
W3HUK Haden E. Rogers, Hylton Hall, School-field, Va.
W3HUL George E. Kramme, 2427 Dennison, Balti-more, Md.
W3HUO Roy J. Smith, 1800 Longwood St., Balti-more, Md.
W3HUP Harold Lee Russell, 405 N. Rodney St., Wilmington, Del.
W3HVJ Edgar L. Hannum, 3333 Marion St., Laurel-dale, Pa.
W3HVK Robert J. Phelps, 1729 W. Ontario St., Phila., Pa.
W3HVL Paul S. Gardner, Fresh Valley Dr., R.F.D. No. 1 Temple, Reading, Pa.
W3HVM Robert M. Girdler, Beta Theta Pi, Lehigh University, Bethlehem, Pa.
W3HVN Clyde M. Hunt, 208 Mass. Ave., N. E., Wash., D. C.
W3HVO **Pauline A. Raeser, 315 Beechwood Ave., Trenton, N. J.**
W3HVQ Martin J. Malqueen, 823 W. 34th St., Norfolk, Va.
W4CMC James Covey Ping, 1102 Rozelle, Mem-phis, Tenn.
W4FRI Thomas W. Sparrow, 203 Bragg Ave., Auburn, Ala.
W4FRJ Charles L. Williams, 429 Broadway, Ashe-ville, N. C.
W4FRK Gordon B. Williams, 415 W. Darlington St., Florence, S. C.
W4FRM Grady B. Fox, Jr., Route 4, Sevierville, Tenn.
W4FRO John Hammond, 1828 Killarney Dr., Winter Park, Fla.
W4FRP Murray Kittredge, 1488 Challen Ave., Jacksonville, Fla.
W4FRQ Hewitt Hillard Penton, 433 Magnolia, Panama City, Fla.
W4FRR George B. Smith, 3806 N. Broadway, Knox-ville, Tenn.
W4FRS Jack Ehlerding, 2403 N. 17th Ave., Pensa-cola, Fla.
W4FRT Arthur C. Gerhardt, 50 Old Shell Rd., Crichton, Ala.
W4FRU John H. Parrott, 595 McDavitt, Memphis, Tenn.
W4FRV Charles O. Roberts, 644 N. W. 49th St., Miami, Fla.
W4FRW James A. Wilson, 729 N. Belvedere Blvd., Memphis, Tenn.
W4FRX Wm. Thomas Harris, 45 Spartansburg, Ly-man, S. C.
W4FRY John C. Groce, 30 Upland St., Lyman, S. C.
W4FRZ Russell C. Stone, 1517 Monroe St., Holly-wood, Fla.
W4FSA Wm. Clark Wing, 1501 13th St., Tuscaloosa, Ala.
W4FSM John D. Hudson, R.F.D. No. 3, Chipler, Fla.
W4FSO Wm. R. Hood, Co. 4459 C.C.C., Buena Vista, Ga.
W4FST Marvin C. Dunun, Jr., 9 Charles, Asheville, N. C.
W4FSV George C. Monts, Quarters of District Ra-dio School, Moultrieville, S. C.
W5BBK Preston T. Sellers, 1612 Milam, Houston, Texas.
W5EIR Cecil M. Polvado, 604 N. Reynolds St., Alice, Texas.
W5EJT Eugene Albert Jank, 313 Toledo, San An-tonio, Texas.
W5EVX Hays Pool, Ola, Arkansas.
W5FA Clifton H. Williams, Hazen, Ark.
W5HLQ Ernest L. Smith, R.F.D. No. 2, Buffalo, Okla.

W5HLV Wm. H. McDowell, 315 W. Mesquite, Coleman, Texas.
W5HMC Henry B. Wallace, 408 Travis St., Luling, Texas.
W5HMD Tommie W. West, Schertz, Texas.
W5HME George Williams, Jr., 522 Kayton Ave., San Antonio, Texas.
W5HMF Lester L. Williams, 840 13th St., Brownsville, Texas.
W5HMG Carson N. Snow, Jr., 1026 Matador, Abilene, Texas.
W5HMI Anthony W. Connaughton, Paris, Ark.
W5HMJ John Raymond Geno, Jr., 1515 Texas, San Antonio, Texas.
W5HML Wm. N. Kiser, Near Russellville, Ark.
W5HMM Monroe Albert Miller, 612 S. St. Mary's St., Beeville, Texas.
W5HMN James Douglas Nance, Route 2, McDade, Texas.
W5HMO Wadel A. Welch, 208 N. Gregg St., Big Spring, Texas.
W5HMP Jennings Roy David, Huber Camp, Borger, Texas.
W5HMQ S. Webb Ruff, 4005 Avenue B, Austin, Texas.
W5HMR Louis Marcel Taix, 1125 North White St., New Orleans, La.
W5HMS Ray Ross Summersgill, 1900 W. Montana, Roswell, N. Mex.
W5HMT Wm. Walker Holmes, Jr., 719 Cedar, McAllen, Texas.
W5HMU Thomas F. Solly, 317 N. Bridge St., Jonesboro, Ark.
W5HNQ Robert G. Nisle, 2718 Arbor St., Houston, Texas.
W5HNU Jack J. Gammill, Fort Smith, Ark.
W5HNW John P. Foster, Hodge, La.
W5HNX Edward H. Lee Blane, Jr., 1129 W. Vine St., Opelousas, La.
W5HNY Paul D. Marshall, 1633 Walnut St., Shreveport, La.
W5HNZ Wilbur R. McDowell, 429 W. Elm St., Tylor, Texas.
W5HOA Solomon S. Coldman, 7333 Jeannette St., New Orleans, La.
W5HOB Earle E. Pettey, 1 mi. W. of Cushing, Texas.
W5HOC Smith Preston, 1504 Clarendon Dr., Dallas, Texas.
W5HOD Glenn G. Prewitt, 4 mi. W. of Harlingen, Texas.
W5HOE Geoffrey D. Payburn, 4900 El Campo St., Ft. Worth, Texas.
W5HOF John M. Wilder, Evant, Texas.
W5HOG Margaret K. Houston, 1811 McDaffie, Houston, Texas.
W5HVI Andrews P. Massey, 215 Cockerville Ave., Takoma Park, Md.
W6AGG Wendell M. Fales, 10923 Ayres, West Los Angeles, Calif.
W6ART Arthur L. Stevenson, 121 S. Broadway, Blythe, Calif.
W6BHR John H. Ludemann, 111½ S. Claremont, San Mateo, Calif.
W6JCA Orde E. Raines, 245 Upper Terrace, San Francisco, Calif.
W6KZH Jack M. Story, 542 Holmes Ave., Ontario, Calif.
W6QJM Francis H. Horton, Bell Canyon Spike C.C.C., Los Angeles, Calif.
W6QLJ Raymond A. Wood, Sec. 2, 11th Naval Dist. U.S.N.R., City Hall, Santa Ana, Calif.
W6QLK Howard W. Swartout, 1170 King St., San Bernardino, Calif.
W6QLL Duane C. Vaus, 429 E. Esther St., Long Beach, Calif.
W6QLM Dorothy E. Williams, 361 Marie Ave., Los Angeles, Calif.
W6QLN Fred J. Spieler, Alma College, Alma, Calif.
W6QLO James P. West, 304 El Camino Real, San Mateo, Calif.
W6QLP Ralph E. Herndon, Minnesota Ave., San Jose, Calif.
W6QLR Allan S. Robertson, 6214 Merriewood Dr., Oakland, Calif.
W6QLT William F. Kempf, Jr., 1801 Fairview Ave., San Gabriel, Calif.
W6QLU Frank Gunther, 149 Liberty St., Santa Cruz, Calif.
W6QLV Charles J. Schauers, 82 W. 2nd St., N. Price, Utah.
W6QLW Dena L. Gentry, 2714 Broadway, San Diego, Calif.
W6QLX Thomas J. Gillispie, 4926 73rd St., San Diego, Calif.
W6QLY Earl H. Damm, Route 2, Fresno, Calif.
W6QLZ Clyde E. Criswell, Mission Ranch, Phoenix, Ariz.
W6QMB John F. Kraus, 825 S. Second St., Alhambra, Calif.
W6QMD Roy P. Stoops, 1714 E. 22nd St., Oakland, Calif.
W6QMF Edward L. Sutherland, 501 Utah St., Boulder City, Nevada.
W6QMG Louis W. Towle, Benson, Ariz.
W6QMH Anson Gerner, Jr., Route 3, Fresno, Calif.
W6QMI Wm. O. Davis, 801 Aspinwal, Winslow, Ariz.
W6QNT Paul W. Heasley, 317 W. Lime Ave., Monrovia, Calif.
W6QNV Carlisle D. Scott, 1333 S. Westlake Ave., Los Angeles, Calif.
W6QNZ Thomas G. Sayeg, 146 N. Caleveras, Fresno, Calif.
W6QOA Richard L. Sheehy, 2182 41st Ave., Oakland, Calif.
W6QOC Arthur R. McKinniss, 2091 Ellis St., San Francisco, Calif.
W7AGV Kenneth R. Sullivan, Route 7, Yakima, Wash.
W7AMN Cecil R. Thompson, 401 S. 2nd St., Yakima, Wash.
W7BFZ Frank A. Kalberg, 2nd and Main St., Seattle F. D. Hq., Seattle, Wash.
W7BLA Kenneth P. Sharp, 601 S. Tracey, Bozeman, Mont.
W7HDC Harold J. Eck, 4323 Palatine Ave., Seattle, Wash.
W7HDD Willard D. Jemson, 806 Pacific Ave., Yakima, Wash.
W7HDE Jim P. Seargeant, 1938 47th Ave., S. W. Seattle, Wash.
W7HDF Clifton W. Pittelkau, 29 2nd Ave., Forest Grove, Ore.
W7HDG Virgal R. Stark, 212 Unity St., Bellingham, Wash.
W7HDH Elmo L. Wyke, 1419 N. 50th St., Seattle, Wash.
W7HDI Rowland W. Haegele, Jr., 12th and Ball, Parma, Idaho.
W7HDJ Doyle Joslin, 107 Cedar St., Rock Springs, Wyo.
W7HDK Wm. E. Harden, 904 12th Ave., Seattle, Wash.
W7HEI Evert Rodenhouse, Trustee, Lincoln High School Radio Club, N. 44th St. and Interlake Ave., Seattle, Wash.
W7HEJ Wm. B. Simpson, 3407 East D St., Tacoma, Wash.
W7HEK Bob A. Smith, Bridger, Mont.
W7HEM Charles W. Newman, 915 2nd Ave., N. Great Falls, Mont.
W7HEO Max E. Harris, Westpoint, Ore.
W8BAQ Theodore Cunningham, Argyle Blk. 310, Findlay, Ohio.
W8DWC Kenneth A. Gilbert, 376 W. Grand Blvd., Detroit, Mich.
W8EBN Frank W. Walker, 207½ E. Grand River, E. Lansing, Mich.
W8EDD Allen L. Stratton, 93 Park Ave., Canandaigua, N. Y.
W8GKP Ralph L. Hitman, 600 S. Boston, Calion, Ohio.
W8LYR Richard J. Sloane, Trustee, Walnut Hills High School Radio Club, Blair Ave., Cincinnati, Ohio.
W8SNA Joe Marshall, 305 Grant, Greensburg, Pa.
W8SNB John L. Sullivan, 255 Bennett, Luzerne, Pa.
W8SNC Willard P. Swearingen, 209 Spring St., Meadville, Pa.
W8SND Wm. P. Turpin, III, Qtrs. 32-B Plattsburg Barracks, N. Y.
W8SNE Mitchell B. Wozniak, 193 Erie Ave., Towanda, N. Y.
W8SNF Robert E. Zuber, 278 Carey Ave., Wilkes-Barre, Pa.
W8SNG Frank G. Ferenezi, Jr., 9 Mygatt St., Binghamton, N. Y.
W8SNH Leroy R. Genaw, 1435 Lincoln Ave., Port Huron, Mich.
W8SNI George R. Hauser, 191 Whitesboro St., Yorkville, N. Y.
W8SNJ Ralph J. Roode, 219 Castner Ave., Donora, Pa.
W8SNK Kenneth R. McFadden, Aloha, Mich.
W8SNL Clarence L. Elliot, 5479 Olentangy River Rd., Worthington, Ohio.
W8SNM Robert B. Gehrke, 2452 Calvert, Detroit, Mich.
W8SNN Henry W. Gosztyla, 3329 Holbrook, Hamtramck, Mich.
W8SNO Norman V. Warner, Madison, W. Va.
W8SNP Saul Udman, 205 Tabor St., Pittsburgh, Pa.
W8SNQ Donald R. Howard, 536 Potter, Toledo, Ohio.
W8SNR Ray A. Johns, Maple, No. 17, Osborn, Ohio.
W8SNS Wm. H. Kuntz, 224 W. Main St., Pomeroy, Ohio.
W8SNT Frank L. Grover, 260 Rotary Rd., Huntington, W. Va.
W8SNU Harry W. Sprague, 121 E. Rose St., Springfield, Ohio.
W8SNV Alfred G. Waack, 630 E. Town St., Columbus, Ohio.
W8SNX Steve Palviscsak, 4310 2nd Ave., Pittsburgh, Pa.
W8SOM Donald K. Monroe, 639 Plymouth, Toledo, Ohio.
W8SOY John H. Hinemon, Jr., Columbus General Depot, Columbus, Ohio.
W8SPO Helen V. Smith, Sycamore, Ohio.
W8SPQ Wm. A. D. Kach, 2603 W. 22nd St., Erie, Pa.
W8SPR John A. Jarrett, Trustee, Aspinwall Radio Club, Aspinwall High School, 4th St., Aspinwall, Pa.
W8SPS Robert B. Ireland, 367 Tulane Rd., Columbus, Ohio.
W8SPT Morton E. Riegel, Stockdale, Ohio.
W8SPV Don P. Miller, 380 Dalano St., Allenton, Mich.
W8SPW Wm. W. Winebrenner, 225 E. Filbert St., East Rochester, N. Y.
W8SPX Leonard M. Schaafsman, 1007 Jenneth, Grand Rapids, Mich.
W9ACQ Lawrance B. Ward, Memphis, Missouri.
W9ACW Morris E. Winn, 802 S. Walnut St., Brazil, Ind.
W9AHT Nuford Clay Lane, 1117 Hazel, Deerfield, Ill.
W9ALJ Urban H. Palking, Breda, Iowa.
W9ALN Carl B. Hempel, 340 N. 36th St., Omaha, Neb.

(Continued on following page)

New HAM Licenses

(Continued from preceding page)

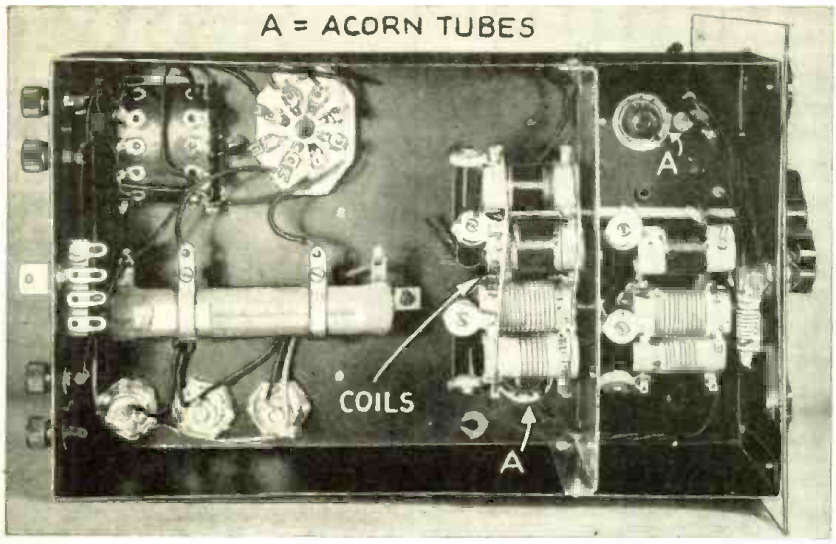
W9ARP Francis I. Richman, 2235 Lowell, Kansas City, Kans.
W9BBE Earle Wm. Runnds, 811 C Ave., West Oskaloosa, Iowa.
W9CDZ Louis H. Schurkman, 709 S. Sanborn, Mitchell, S. Dak.
W9CHV Richard M. Simonsen, 410 W. South St., Blair, Neb.
W9DCM Webster F. Soules, 3549 36th Ave., S. Minneapolis, Minn.
W9DUZ Walter J. Mikaitis, 4125 S. Maplewood Ave., Chicago, Ill.
W9EBZ George O. Mitchell, Greenfield, Iowa.
W9ENK Martin L. Redman, 213½ S. 13th St., Fargo, N. Dak.
W9EZE Ray E. Rudy, Orangeville, Ill.
W9FOI Ralph E. Signaiga, C.C.C. Co. 624, Camp Wheeler, Edwardsville, Ill.
W9FRT Robert A. Patelke, 2816 Greenview Ave., Chicago, Ill.
W9HZT Theodore P. Conolly, Webster, S. Dak.
W9JEN Roya C. Jones, 4027 Tracy Ave., Kansas City, Mo.
W9JDZ Murice L. Sinift, 1417 Grove, Adel, Iowa.
W9KGD Eugene C. Volz, 307 Washington St., Covington, Ind.
W9KHT Wm. C. Wilde, 624 N. Cherry, Galesburg, Ill.
W9KIY Duane B. Haagensen, 516 Reeves Dr., Grand Forks, N. Dak.
W9KLT Donald R. Willard, Ranier, Minn.
W9KMY Joseph M. McClain, 1814 Spear, Logansport, Ind.
W9KNC Willard D. Inman, R.F.D. No. 1, Smithland, Iowa.
W9KNR John R. Frederickson, 4864 N. Magnolia Ave., Chicago, Ill.
W9KNT Harold C. Cook, 223½ N. 16th St., Clarinda, Iowa.
W9KNX Leo Rosenman, 4306 Monroe St., Chicago, Ill.
W9KOH Dow B. Summers, 1502 Grant St., Unionville, Missouri.
W9KOL Melvin W. Werking, 126 S. Spring St., Port Washington, Wis.
W9KOM Eugene W. White, 2616 S. Cherokee, Denver, Colo.
W9KQN Gerald E. Wilson, 151 Main St., Blythedale, Mo.
W9KSL Thurston B. Krebs, 233 Broadway, Monett, Mo.
W9KUF Harold Wm. Koch, 1736 Sheridan, Whiting, Ind.
W9KUV Seymour E. Sabitt, 4459 N. Francisco Ave., Chicago, Ill.
W9KUX Robert W. Shortridge, 1419 W. Main St., Crawfordsville, Ind.
W9KVG Raymond H. Schaaf, 3217 Barr St., Fort Wayne, Ind.
W9KWH Harold A. Morris, 305½ Main, Rushville, Ind.
W9KWK Cyril E. McCarthy, 927 La Salle, Racine, Wis.
W9KWU Richard G. Mies, 7944 Clyde Ave., Chicago, Ill.
W9KYL Wm. D. Price, Jr., 1015 E. 27th St., Kansas City, Mo.
W9KZT John M. Courtney, 1010 E. 27th St., Kansas City, Mo.
W9LAA Ward H. Justus, 432 S. 9th, Lincoln, Neb.
W9LCP Yung Sing Yee, 812 Barr St., Ft. Wayne, Ind.
W9LCW Richard Straughn, 4600 S. Wash. R. R. No. 3, Marion, Ind.
W9LDA Vernon W. Talberg, Outlet "L," Flaxton, N. D.
W9LEM Kenneth J. Stenrude, Lot 11, Block 13, Bowbells, N. D.
W9LEW Harry L. Saunders, 311 State St., Alamosa, Colo.
W9LFR Lyle R. Simons, 1292 Hartford Ave., St. Paul, Minn.
W9LFW Roy M. Currence, 315 W. North Ave., Eldon, Mo.
W9LQZ Noel W. Hancock, 1125 18th St., Marion, Iowa.
W9MNA Robert A. Sperry, Stone St., Blk. 4, Lot 5, Clermont, Iowa.
W9NKT Converse Hittinger, 300 W. Howard St., Portage, Wis.
W9NKZ Phineas J. Icenbice, Jr., Church, Deep River, La.
W9NNT Fred A. Rahr, 824 Derby Lane, Allouez, Wis.
W9NVX Laurel D. Holdridge, 918 Lincoln St., Waterloo, La.
W9NWP Floyd D. Raasch, 421 N. Broadway, Watertown, S. D.
W9NYV L. Donald Lewis, Ave. F West, Hutchinson, Kan.
W9OAZ David P. Essad, 304 Florance, Houghton, Mich.
W9OHH Wm. B. Deane, 3653 S. Grand St., St. Louis, Mo.
W9OHS Dean E. Herman, St. Ignace, Mich.
W9OJG J. H. Kohn, 3020 Sheridan, Lincoln, Neb.
W9TKG Wm. C. Wilkinson, Oxford, Ind.
W9TMU Maryan W. Plaza, 1627 W. 37th Pl., Chicago, Ill.

CORRECTION

In the list of newly licensed Hams, published in the December issue, the call letters W9JWR were incorrectly listed; they belong to Byron Britt, 616 Cheyenne Ave., Alliance, Nebr. Also W8SNJ belongs to Ralph J. Roode, 219 Castner Ave., Donora, Pa.

Increase Your DX with Pre-Amplifier

(Continued from page 541)



Bottom view of the Pre-amplifier.

Many small transformers do not supply 250 volts. The transformer chosen gives 250 volts when a value of .5 mf. is used at C10. No higher voltage should be applied to the 956's, and the screen voltage should be set on the divider to about 90.

The coils are simply tuned in pairs until the receiver shows greatest output. The antenna trimmer should be set at about 1/3 full capacity when tuning up, so that there will be some leeway in its range for use with various antennas.

PARTS LIST—7 TO 200 METER PRE-SELECTOR

R.C.A.

2—Type 956 "Acorn" tubes
1—Type 524 tube

SOLAR

2—8 mf., 500 V. dry electrolytic condensers
1—.5 mf., 400 V. paper condenser
4—.05 mf., 400 V. paper condensers
1—.0002 mf. midget mica condenser

I.R.C.

2—300 ohm ½ watt resistors
1—50,000 ohm 50 watt wire-wound resistor
1—15,000 ohm variable resistor with A.C. switch

KORROL

1—Case 8" x 8¾" x 12" deep, black crackle finish
1—8" x 8" x 8¾" steel panel
1—Steel chassis

HAMMARLUND

2—S-900 "Acorn" tube sockets
1—S-8 octal socket
1—CHX R.F. choke
1—HF-15 variable condenser

JEFFERSON

1—No. 466-390 power transformer (6.3 V.—300 V.)
2—No. 463-561 midget chokes (30 H. at 40 ma.)

CROWE

1—Vernier dial, No. 296
3—1⅛" pointer knobs

MEISSNER

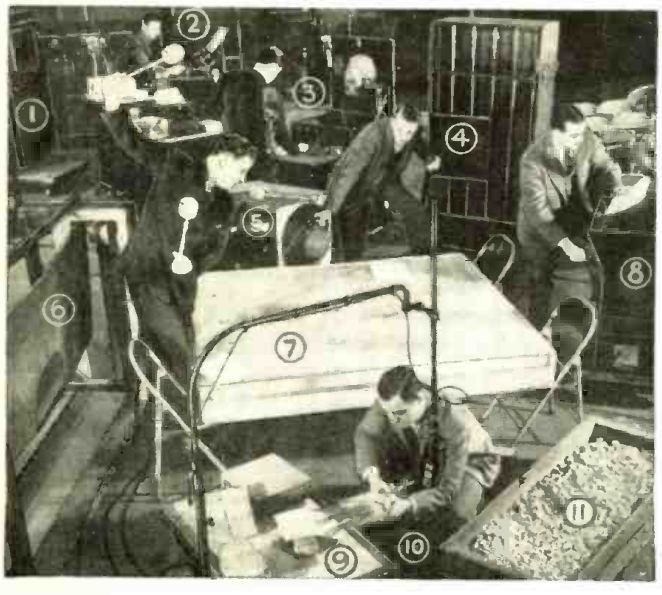
1—2-gang, 250 mmf. variable condenser
1—Set coils: 4 Ant. and 4 R.F. (to cover from 7 to 200 meters)
1—4-gang, 5-position band-switch
3—Soldering lug strips

COIL DIMENSIONS

All coils on ¾" diam. forms.

Band		Wire Size	Turns	Length of Winding	Primary Turns (all No. 32 d.c.c. wire)
1.4—4.5 mc.	R.F.	28	45	½" Close	20
	ANT.	28	46	½" Wound	12
4—12 mc.	R.F.	24	19	⅝"	10
	ANT.	24	19	⅝"	7
7—17 mc.	R.F.	18	12	⅜"	6
	ANT.	18	12	⅜"	4
11—33 mc.	R.F.	18	5	½"	3
	ANT.	18	5	½"	2

Did YOU Know?



● That December cover—Proceeding from top around to right, we have these broadcast studio sound effects: Striking soft rubber block to give effect of blow being struck; rattling bone effect; thunder sound effect; squirting two jets of water alternately into a pail to imitate milking a cow; rustling straw to give a burning fire effect; crumpling cellophane between fingers for "frying bacon" effect. Did you know the answers, or were you one of those who were mystified?

●

● The NBC sound effects shown are: (1) auto door. (2) playing recorded effects. (3) code oscillator. (4) jail door. (5) echo chamber. (6) electric thunder sheet for "big explosions" and thunder. (7) thunder drum for small explosions, distant cannon, thunder, (8) splash box for water effects. (9) concrete walk for footsteps. (10) straw for sounds in underbrush. (11) pit for "walking in gravel."

Local HAM Gossip

Covington, Ind.

● HERE at Covington, Ind., Zane Sprague and three other fellows have built a transmitter which they use for code. One member of the four is Jean Volts, a member of the "Hams Club"; another is Jack Cambal, who helped build the transmitter.—*Jesse W. Nicholson, P. O. Box 162, Covington, Ind.*

Randolph, Mass.

● THE Progressive Amateur Radio Association is composed of local Hams and others interested in Ham radio, and is the outcome of the Radio School which is conducted near here. In order to be able to have a "rig" on the air we formed this club. At the Brockton Fair we had our own booth and sent out between 300 and 400 messages, some as far as Hawaii.

The club is open the first four nights of the week for code practice and radio theory. We hold meetings every Thursday night. Last month we ran a "social" and plan to repeat it each month. The other evening we listened to a very interesting talk by W1ZK, Radio Technician of the local Police Dept., on the new rules of the F.C.C. regarding the 5 meter band which went into effect December 1st. The membership of our club is well over fifty and increasing every week. At present we are building 5-meter and 80-meter rigs.

The recent "Hidden Transmitter Hunt" was won by one of our members—W1LIF—who only recently received his "ticket." The officers of the club are President, Treasurer and Secretary; and a council includes the President, Technical Advisor and eight members elected by the general membership. The council at their meetings recommend to the general membership what to purchase for the "rigs." Then the membership votes on the council's recommendations, and in that way we do not spend money without the approval of the members.

The members attended the annual Hamfest at the Hotel Bradford in Boston, Mass. Many of them who have "tickets" are now rebuilding their 5 meter "rigs" to MOPA in accordance with the new regulations on 5 meters, which mean no more modulated oscillators.

Next month some more of the members are going to take their "exams," and we hope that eventually all of the club members will be licensed Hams. In closing, let me say that the W8JK Flat-top Beam Antenna, described in the November issue of RADIO & TELEVISION is up and giving fine results. We find this to be an excellent antenna.—*Charles Stephens, 1 North St., Randolph, Mass. (Council member of PARA and Ex-1CFJ.)*

Lawrence, Mass.

● THE Merrimack Valley Amateur Radio Club is now in its fourth year, and those four years have brought about the existence of a strong organization. Believe me, it is truly a "live wire" Ham radio club. It includes both amateur radio operators and short wave listeners. That famous old speed key man, T. McElroy, will be the guest speaker at our next meeting.

The amateurs in this district are positively convinced of RADIO & TELEVISION'S sincere friendship for all amateur radio operators. The series of articles under the heading, "*Famous Radio Experts 'Salute' to the Amateur,*" was great.—*William A. Beatty, Editor, M.V.A.R.C. News, 96 Essex St., Lawrence, Mass.*

Five Meters at New Brunswick, N. J.

● THIS Autumn there was held in New Brunswick, New Jersey, a "soap box" race under the sponsorship of the merchants of that city, for the benefit of the kiddies. There was nothing unusual about the race, but there was about the method of communication used between the start and finish lines. As the race was held on a comparatively long hill, it was quite impossible to use a Public Address system to announce the results, so that the people at the starting line could get them immediately.

In other such races previously held, those at the starting line were forced to wait for the results until the winners were brought back, which took quite a long time. However, that was not the case this year, for at each end of the hill there was located a 5-meter transceiver. At the starting line was W2IBF operated by Silvio Romano, while at the finish line was W2KAV operated by James Scarribon, who are well known local amateurs. Both used portable, commercial sets. By this method the results could be sent from the finish line on 5 meters, received at the starting point and immediately announced through a low power P.A. system. Special announcements from either end were quickly transmitted to the other as was deemed necessary. The advantage of this method can be clearly seen, for results were obtained immediately at the starting line and no elaborate, high-power P.A. system was required.

The services of these Hams were gladly donated free of charge, a characteristic of most amateurs. There were several other amateurs present, as well as a few Ham aspirants (SWL's).—*Tony R. Smolar, R.F.D. No. 2, Box 21-M, New Brunswick, N. J.*

NEW RADIO APPARATUS

Crystal Microphones

● THE new crystal microphones which are wide range, multi-unit, pressure operated devices of modern design, having an output level of −56 db. are the Astatic models MU-2 and MU-4. The MU-2 has two double diaphragm, yoke-driven crystal units using four diaphragms. The MU-4 assembly employs four units using eight diaphragms and is characterized by smoother response. Both models are furnished standard with 25 ft. single-wire shielded cable and three-prong socket connector. Extremely small losses in level are encountered when long cables are used, with no frequency discrimination being encountered.

Mechanical construction is such that acoustic over-loading is entirely eliminated. The self-locking, tilting head swings through an angle of 70 degrees to aid in obtaining better pickup. Noises from mechanical vibrations are minimized through the use of a special floating interior suspension of the crystal units.

Miniature Receivers

● A SERIES of eight powerful, 2-band miniature radios, housed in molded plastic cabinets and named "Little Nipper" after the famous Victor Dog, has been announced by RCA-Victor.

Cabinets available in 6 color combinations, measure 8 inches wide, 4-⅜ inches high and 4-½ inches deep. Features include AC-DC operation, five Metal Tubes, electro-dynamic speaker, automatic volume control, and built-in antenna.

The tiny sets cover the 49-meter foreign short-wave band in addition to the domestic band and police, aviation and amateur calls. All bands are covered on a single compact dial.

1½ Volt Battery Super

● A NEW 1½ volt radio which features extremely low battery drain without sacrificing power, distance, or tone quality is one of the latest models offered by Allied Radio Corporation. Designed to meet the demand of rural areas for low-cost, economical radio reception, the Knight 4 uses the latest type low-drain 1½ volt tubes.

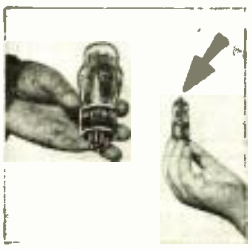
The entire set has an "A" drain of only .2 amp., and a "B" drain of only 8 milliamperes. It operates from standard 1½ volt "A" batteries and 45 volt "B" batteries.

The receiver is available in a special cabinet which will conveniently hold the "AB" power pack or standard batteries.

Latest Communication Receivers

● A NEWLY published folder describing five communication receivers has been issued by the E. M. Sargent Company. The line includes a new superhet, the model 51, using ten tubes but equivalent in performance to a thirteen-tube job. The circuit uses regenerative input and has numerous other desirable features. Picture of this set appears herewith. It has shadow tuning, band-spread, C-W pitch control, R.F. and Det. panel trimmers, break-in switch, etc. Also in the line are a 5-tube superhet which tunes from 9½ to 550 meters; an all-purpose receiver for yachts and small boats; an exceptionally rugged communication type receiver; and a three range receiver especially designed for radio operators. It is interesting to note that one of these receivers was used on Pitcairn Island, which has kept in touch with stations 8000 miles away in time of emergency. The "operator's receiver" has a range from 9½ to 20,000 meters, the widest range that has as yet been afforded in a commercially built job. In addition, it has a separate band-spread dial which is calibrated for 18, 24, 27 and 36 meter ship bands and 20, 40 and 75 meter amateur bands. This particular model includes a sharply tuned R.F. stage, regenerative detector and two audio stages. It is said to be exceptionally good on weak C.W.

New Miniature Tubes



Standard Tube at Left.

● TINY tubes which operate on 1.4 volts and 70 ma. in the filament have just been announced by the Hytronic Laboratories. These tubes measure but 1⅝" from the top of the glass envelope to the bottom of the base, and the bulb is but 9/16 of an inch in diameter — or about as thin as your little finger. Primarily designed for use in hearing aids, it is also foreseen that they will be applicable to military and police work, for they make possible extremely small and light radio receivers. Among the tubes now included in the line are R.F. oscillator or A.F. power output triode; A.F. interstage or output amplifier pentode; and power output pentode.

New C-R Television Tubes

● FOUR new cathode-ray tubes for amateur and experimental use in television have just been made available by the RCA Manufacturing Co. These include two *white* phosphor "Kinescopes"—one with 3-inch and the other with 5-inch screen; and a 5-inch screen model using *green* phosphor. All are of the medium-persistence type. In addition, there is a "Monoscope" which produces a video signal from a test pattern built into the tube, and is used for testing and demonstrating television receivers.

For Night Listeners

● A NEW luminous paint, to be used for marking dials and indicators for "night owls'" radio sets, is being produced by the Eastern Mfg. Co. This affords the advantage that a set may be operated in a dark room with all the tuning controls purely visible and without the need of a pilot light. As many communications receivers are provided with external dials that are not illuminated, this should come in very handy for the man who loves to sit up until the wee small hours listening to the "sigs" of some transmitter thousands of miles away.

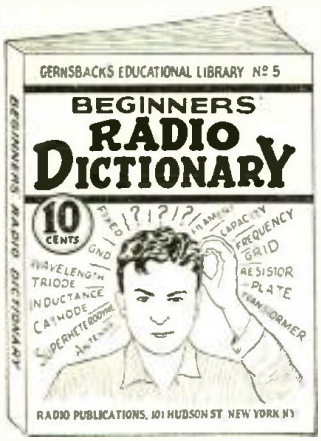
BOOK REVIEW

ELECTROLYTIC CAPACITORS by Paul McKnight Deeley. Size 7" x 5¼"; 270 pages, plus index; illustrated. Published by The Cornell-Dubilier Electric Corp., South Plainfield, N. J.

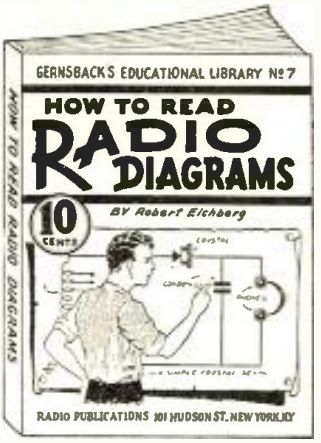
Mr. Deeley, who is a practical man in the electrolytic condenser field, bases his work on his years of experience in making laboratory investigations. While the book does not disclose various manufacturers' trade secrets, it is an excellent discussion on the principles involved in making wet and dry electrolytic capacitors. The final chapter contains much useful information, such as the measurement of peak voltages, specific resistivities of electrolytes, radio and audio frequency impedance of electrolytic capacitors, and means for conducting life tests. This chapter also includes a number of tables useful to those engaged in working with, or manufacturing and designing electrolytic condensers.

FOUR NEW 10¢ RADIO BOOKS

RADIO FANS EVERYWHERE—these little ten cent text books give you an excellent foundation for the study of radio. They are clearly written, profusely illustrated and contain over 15,000 words in each book. You'll be amazed at the wealth of information these volumes have. They are handy for review or reference books.



FAMOUS GERNSBACK EDUCATIONAL LIBRARY ADDS FOUR NEW BOOKS!



NO. 5—BEGINNERS' RADIO DICTIONARY

Are you puzzled by radio language? Can you define frequency? Kilocycle? Tetrode? Screen grid? Baffle? If you cannot define these very common radio words and dozens of other, more technical, terms used in all radio magazines and instruction books, you need this book in your library. It's as modern as tomorrow—right up to the minute. It tells you in simple language just what the words that puzzle you really mean. You cannot fully understand the articles you read unless you know what radio terms mean. This is the book that explains the meanings to you. Can you afford to be without it, even one day longer?

NO. 7—HOW TO READ RADIO DIAGRAMS

All of the symbols commonly used in radio diagrams are presented in this book, together with pictures of the apparatus they represent and explanations giving an easy method to memorize them. This book, by Robert Eichberg, the well-known radio writer and member of the editorial staff of RADIO-CRAFT magazine, also contains two dozen picture wiring diagrams and two dozen schematic diagrams of simple radio sets that you can build. Every diagram is completely explained in language which is easily understood by the radio beginner. More advanced radio men will be interested in learning the derivation of diagrams, and the many other interesting facts which this book contains.

WIN $10

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ALFRED CETTIE
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Title: BEGINNERS' RADIO DICTIONARY, Book 5

KENNETH WARNER
Burbank, Ohio
Title: HOW TO READ RADIO DIAGRAMS, Book 7

CLYDE SORRELL
Rockyford, Colo.
Title: RADIO FOR BEGINNERS, Book 8

NO. 6—HOW TO HAVE FUN WITH RADIO

Stunts for parties, practical jokes, scientific experiments and other amusements which can be done with your radio set are explained in this fascinating volume. It tells how to make a newspaper talk—how to produce silent music for dances—how to make visible music—how to make a "silent radio" unit, usable by the deafened—how to make toys which dance to radio music—sixteen clever and amusing stunts in all. Any of these can be done by the novice, and most of them require no more equipment than can be found in the average home. Endless hours of added entertainment will be yours if you follow the instructions given in this lavishly illustrated book.

NO. 8—RADIO FOR BEGINNERS

Hugo Gernsback, the internationally famous radio pioneer, author and editor, whose magazines, RADIO & TELEVISION and RADIO-CRAFT are read by millions, scores another triumph with this new book. Any beginner who reads it will get a thorough ground work in radio theory, clearly explained in simple language, and through the use of many illustrations. Analogies are used to make the mysteries of radio as clear as "2+2 is 4". It also contains diagrams and instructions for building simple radio sets, suitable for the novice. If you want to know how transmitters and receivers work, how radio waves traverse space, and dozens of other interesting facts about this most modern means of communication, this is the book for you!

Other Titles in This Series!

Four other volumes in this ten-cent radio book series—each on a popular subject—are available. The titles are:

No. 1—HOW TO BUILD 4 DOERLE SHORT-WAVE SETS
No. 2—HOW TO MAKE THE MOST POPULAR ALL-WAVE 1- AND 2-TUBE RECEIVERS
No 3—ALTERNATING CURRENT FOR BEGINNERS
No. 4—ALL ABOUT AERIALS

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Every book in the GERNSBACK EDUCATIONAL LIBRARY has 32 pages—with illustrations varying from 30 to 66 in number. Each title volume contains over 15,000 words. Positively radio's greatest book buys! If you do not think these books worth the price asked, return them in 24 hours and your money will be instantly refunded.

RADIO PUBLICATIONS
101 HUDSON STREET NEW YORK, N. Y.

MAIL COUPON TODAY!!

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Gentlemen: Please send immediately, POSTPAID, the book numbers circled below. I am enclosing....cents —each book being 10c.

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Recorded Code Course

● THREE phonograph records comprise the new Ralston Radio Code Course. Each side contains between six and three-quarters and seven minutes of instruction, because the lessons have been recorded at 160 lines per inch. Each lesson has been divided into sections, with a separate stop line and automatic feed line at the beginning and end. Any phonograph using a medium tone needle will reproduce these records.

New "Marine" Transmitters

● FOUR new phone and c.w. transmitters, rated at 150, 300, 500 and 800 watts have just been announced by the Marine Radio Corp. The transmitters proper are mounted in dual wall type cabinets and the high gain speech amplifier is furnished in a separate cabinet for desk mounting.

All units are of ample rating and will not overload or cause loss of stability even when operated at their maximum rated output, nor will distortion occur in the audio channels.

The standard transmitters will operate on frequencies from 1.6 to 30 mc., and other frequency ranges are obtainable on special order. The manual frequency change control is a single handle on the front panel, the transmitters being built for operation on 1 to 6 predetermined frequencies, as ordered. Optional added equipment includes automatic frequency change control (either panel or remote) with all circuits pretuned to specified frequencies. Quartz crystals are used for frequency control.

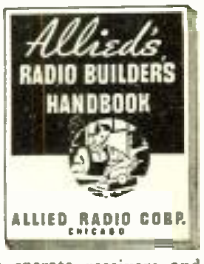
Modulation is high level Class B, capable of 100% modulation, at which the amplitude distortion is less than 5%. The A.F. response is virually flat from 50 to 10,000 cycles, plus or minus 1.5 db. The set includes a C-R modulation indicator with a 3" screen, upon which both the trapezoidal and modulation type of figure may be produced.

Power is taken from 115 or 230 volt, single-phase 50/60 cycle lines, and a panel-controlled autoformer is provided to compensate for variations in line voltage. Special voltages may be provided for on special order. A master switch removes all plate voltages while frequency is being changed, and all components are protected with fuses and fast acting relays. Keying is done in the cathode circuit.

New Ham Catalog

● A NEW 72-page catalog, published by The Radio Shack Corporation, specializes in amateur communication supplies, sound systems and service parts. The catalog contains a complete variety of apparatus, together with net prices. Parts listed are of standard manufacture and range all the way from such simple gadgets as pilot lights and switches to complete receivers, recorders, playbacks and test equipment. The company offers an interesting time-payment plan to those who make purchases in excess of $30.00.

"Builder's Handbook" For Beginners



● TO help novice radio builders, experimenters, and future amateurs, the engineering staff of Allied Radio Corp., has prepared a new and different "Builder's Handbook." All radio fundamentals are covered in a simplified, practical manner. This booklet tells how to select suitable circuits, read schematic diagrams, lay out and punch chassis bases and panels, correctly place and wire radio parts, and efficiently operate receivers and transmitters. It includes tube socket data, coil-winding information and other charts, as well as many diagrams and parts lists of beginner sets, transmitter, fence control, photo-electric relay, etc. Size: 8½x11 inches. Forty pages, illustrated. Supplied for 10 cents to cover mailing charge. Ask for bulletin No. 9-A, Service Dept., RADIO & TELEVISION, 99 Hudson St., New York City.

TELEVISION—
Tomorrow's Big Opportunity

William Dubilier

(Continued from page 517)

who, using screws, nails, corks, wire, plate glass and foil, plus a few tools—had built sufficient equipment for a widespread network of radio-communication. Today there are more than 49,000 such amateurs in the United States. The present rapid development of ultra-short waves and television is principally the result of their work.

The achievements of these amateurs frequently go far beyond the world of the leading radio engineers of Europe. Ten years ago a well-known European engineer, president of the greatest engineering organization in Europe and an official of one of the largest corporations, during a visit to this country ridiculed the reports which occasionally appeared in American newspapers and magazines of school boys communicating thousands of miles with "home-made" apparatus. He maintained that amateurs could not possibly do what his vast organization with unlimited funds and resources had been unable to accomplish.

When he was taken to a Brooklyn home to listen to a high school boy communicate with another boy more than 1000 miles away with short wave equipment costing about $50, he labeled the demonstration a hoax, insisting that the unseen broadcaster must be just around the corner. In the greatest radio centers in Europe, equipment costing hundreds of thousands of dollars and occupying large buildings would be necessary to do the same thing, he explained.

To prove the authenticity of the demonstration to him, it was arranged that his ambassador in Washington should have the other amateur's home visited by the nearest consul, who would exchange a code message with the engineer through the "home-made" short wave equipment. The experiment was completely successful, and the engineer agreed that, however fantastic it seemed, the feat must be authentic.

When the writer discussed the experiment with him again several months later in Europe, he related sadly that when he had described it before a leading engineers' society he had been denounced for being "so easily fooled by the American fakers." European companies consistently refused to accept the findings of "hams," and not until years later did their engineers rediscover the short-wave achievements of American amateurs.

Communication probably is the greatest single factor in the advancement of civilization. Countries covering vast areas such as the United States with distributed populations in isolated spots benefit the most. The news broadcasts during the recent European war crisis proved dramatically that radio is the most outstanding and important means of transmitting intelligence. It safely can be said that newspapers and periodicals have become a secondary system for distributing news quickly. During the German-Czech crisis, 26,000,000 American homes having radios received news flashes, many of them coming directly from European capitals, every fifteen minutes. It was hours, sometimes days, before newspapers were able to give the same news.

Because of the acute and critical political situation abroad, the control of all radio has been jealously watched by government officials. In some countries, arrangements have been completed for the manufacture of special attachments for connecting all

(Continued on following page)

All about 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:

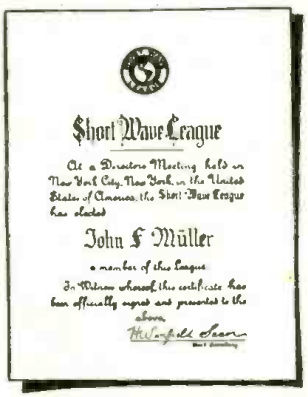
Dr. Lee de Forest, John L. Reinartz, D. E. Replogle, Hollis Baird, E. T. Somerset, Baron Manfred von Ardenne, Hugo Gernsback, Executive Secretary.

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 pamphlet 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, provided 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.



If you wish your name engraved on the Free membership certificate, as illustrated above, please send 25c to cover cost.

SHORT WAVE ESSENTIALS LISTED IN OPPOSITE COLUMN 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 below (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 1-39
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.

home radio sets with telephone and electric light wires, eliminating the use of aerials and thus the possibility of receiving broadcasts from foreign countries. According to present plans, these would be widely distributed in time of war. Such a system immediately would transform all broadcasting into a carrier current system.

Modern radio has been made possible largely by two developments: the radio tube and the condenser. The writer is proud to have been able to contribute to the development of the latter and therefore to have participated in such an important contribution to humanity.

New Television Apparatus

(Continued from page 525)

geared up to take care of a heavy and growing demand.

The present Du Mont sight-and-sound receiver is a table model not much larger than a really good table model radio.

World S-W Stations

(Continued from page 540)

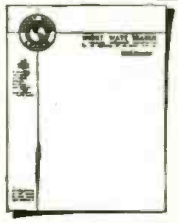
6.060	W3XAU	PHILADELPHIA, PA., 49.5 m. Relays WCAU Tues., Fri., Sun. 12 n.-11 pm.; Wed. 12 n.-9 pm.
6.057	ZHJ	PENANG, FED. MALAY STATES, 49.51 m. 6.40-8.40 am., except Sun., also Sat. 11 pm.-1 am.
6.054	HJ6ABA	PEREIRA, COL., 49.52 m. 9.30 am.-12 n., 6.30-10 pm.
6.050	GSA	DAVENTRY, ENGLAND, 49.59 m., 12.20-4, 4.15-6 pm.
6.050	HP5F	COLON, PAN., 49.59 m., Addr. Carlton Hotel. Irregular.
6.045	XETW	TAMPICO, MEXICO, 49.6 m. Irregular 7-11 pm.
6.042	HJ1ABG	BARRANQUILLA, COL., 49.65 m., Addr. Emisora Atlantico. 11 am.-11 pm.; Sun. 11 am.-8 pm.
6.040	W4XB	MIAMI BEACH, FLA., 49.65 m. 1-3 pm., 9 pm.-12 m. Relays WIOD.
6.040	W1XAL	BOSTON, MASS., 49.65 m., Addr. University Club. Irregular.
6.033	HP5B	PANAMA CITY, PAN., 49.75 m., Addr. P. O. Box 910. 9.30 am.-1 pm., 5-10 pm.
6.030	VE9CA	CALGARY, ALTA, CAN., 49.75 m. Thur. 9 am.-1 am.; Sun. 12 n.-12 m.
6.030	OLR2B	PRAGUE, CZECHOSLOVAKIA, 49.75 m. (See 11.875 mc.) Off the air at present.
6.023	XEUW	VERA CRUZ, MEX., 49.82 m., Addr. Av. Independencia 98. 8 pm.-12.30 am.
6.020	DJC	BERLIN, GERMANY, 49.83 m., Addr. (See 6.079 mc.) 10.40 am.-4.30 pm.
6.017	HI3U	SANTIAGO DE LOS CABALLEROS D. R., 49.85 m. 7.30-9 am., 12 n.-2 pm., 5-7 pm., 8-9.30 pm.; Sun. 12.30-2, 5-6 pm.
6.015	PRA8	PERNAMBUCO, BRAZIL, 49.84 m., Radio Club of Pernambuco, 6-9 pm.
6.012	ZHP	SINGAPORE, MALAYA. 49.89 m. 5.40-9.40 am., irregular.
6.010	OLR2A	PRAGUE, CZECHOSLOVAKIA. 49.92 m., Addr. (See OLR, 11.84 mc.) Off the air at present.
6.010	COCO	HAVANA, CUBA, 49.92 m., Addr. P. O. Box 98. Daily 7.55 am.-12 m., Sun. until 11 pm.
6.010	VK9MI	S. S. KANIMBLA, 49.92 m. (Travels between Australia and New Zealand). Sun., Wed., Thurs. 6.55-7.30 am.
6.010	CJCX	SYDNEY, NOVA SCOTIA, 49.92 m. Relays CJCB 7 am.-1 pm., 4-8 pm.
6.007	ZRH	ROBERTS HEIGHTS, S. AFRICA, 49.94 m., Addr. (See ZRK, 9.606 mc.) Daily exc. Sun. 10 am.-3.30 pm.; Sun. 9 am.-12 n., 12.15-3.15 pm. Daily exc. Sat. 11.45 pm.-12.50 am.

(Continued on page 576)

Accessories for Members of the

SHORT WAVE LEAGUE

Every member of the SHORT WAVE LEAGUE wants to identify himself in some way. For your convenience the League directors have prepared suitable letterheads, lapel buttons, stickers, etc. In addition there are many short-wave accessories, such as maps, globes, etc., which the League offers only to members at special prices. Take your choice from this advertisement. THESE ESSENTIALS ARE SOLD ONLY TO LEAGUE MEMBERS.



LEAGUE LETTERHEADS

A beautiful, official letterhead has been designed for members' correspondence. The letterhead is invaluable when it becomes necessary to deal with the radio industry, mail order houses and radio manufacturers, as many houses offer members of the LEAGUE 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

WORLD GLOBE

This 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 foreign stations. The base is of solid walnut, and the semi-meridian of a nickel-like 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 **89c**

D—89c each

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**

WORLD RADIO MAP 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**

C—25c each

LEAGUE LAPEL BUTTON

E—35c each

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**

LEAGUE SEALS

G—15c for 25

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 LEAGUE
99-101 Hudson St.,
New York, N. Y.

SHORT WAVE LEAGUE 1-39
99-101 Hudson Street, New York, N. Y.
Gentlemen.

☐ I am a member of the SHORT WAVE LEAGUE

☐ Please send me application for membership in the SHORT WAVE LEAGUE

Please send me the following short wave essentials as listed in this advertisement:

.....

.....

.....

.....

for which I enclose $..... herewith.

Name .....

Address .....

City and State .....

Country .....

(The LEAGUE accepts money order, cash or new U. S. Stamps in any denomination. Register cash and stamps.)

FLASH! EXTRA! FIPS Returns!

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SPECIAL EXTRA

The Wireless Screech

OUR MOTTO ..—.. ...—.

THE ETHER: TRANSPARENT OPAQUE AT NIGHT

No. 24½ FEBRUARY, 1909 Price One Spark

The Wireless Screech

A Magazine devoted entirely to the Wireless Sparks.

Published when we feel like it, by Interplanetarian Wireless Pub. Co.

"Fips" *Editor*

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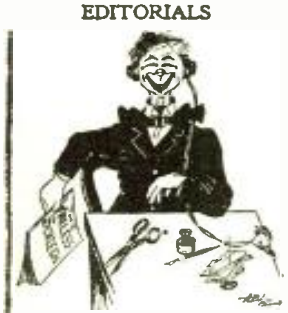
EDITORIALS



Of course all our wireless fiends screeched because of our non-appearance last month and we desire to present our deep-felt regrets, but you see even editors may get sore throats.

But the cat is back. Incidentally we might say that we have had a tremendous success with our new paper. We have received about 62,427 1-2 letters so far congratulating us on our noble enterprise. Every mail brings carloads of them, and conditions are so bad that the Editor who fell under a pile of letters recently had to be dug out, which involved the services of six coal shovelers, two mining engineers, a wrecking car and a 5-ton crane. After 10 hours' hard labor he was discovered at the bottom and it took 18 cakes of oxygen to revive him. 89,512 sparks have been received so far for subscriptions.

Success? Well, we should screech.

WIRELESS ON MARS.

By Our Martian Correspondent.

Mr Spif Marseroni, the great national wireless scientist, has scored another great triumph. As will be recalled, Martians have been for a long time in the habit of receiving and sending telephone messages, no matter if they were walking in the street or gliding in an aeroplane. In fact, this system is now so popular that the "Interplanetarian Remembering Co." has found no trouble whatsoever in getting over 60 million subscribers to their new system. The system is simple enough.

Suppose you are a busy man. During the night you suddenly recall that you must see a certain party to-morrow afternoon, 4 p. m. While you stay in bed you call up the Remembering Co. and tell the operator to call you to-morrow afternoon at 3.30 p. m.

Next day at 3.30 p. m. the little buzzer which you carry in your vest pocket suddenly "goes off" and when you put your pocket phone to the ear a young lady will tell you in a silver voice, that you have to meet a party at 4 p. m. The service of the new company is so efficient that it does not make much difference *where* you are. The Remembering Co will locate you, whether you are taking a bath, or whether you are napping in a Morris chair in the lobby of an airship.

It will also be recalled that Mr. Marseroni is the inventor of the Telewirltransport. This as will be known, has been considered up to a few days ago, his greatest invention. By means of his system Martians may ride on electric motor rollers, the energy being supplied from a central station wirelessly through the ether The power on all Martian airships and aeroplanes is furnished wirelessly to them from the same central station to which the users must be subscribers.

Now Mr. Marseroni has succeeded by conveying food through the ether wirelessly for unlimited distances. Already a large syndicate has been formed under name of "Interplanetarian Wireless Food Co." to exploit the invention. If you are a subscriber and you are walking in the street, and if it is 12 o'clock noon, your call buzzer suddenly rings. You put the phone to your ear and this may be what you hear:

"Luncheon ready, please. What will you have?"

"Ham sandwich and a glass of milk," you call back.

You then draw your silver case out of your pocket and connect its terminals with your antenna, fastened on your hat. Two seconds later and a ham sandwich has "materialized" in the silver case. The milk is received in the same manner. In fact, Mr. Marseroni has succeeded to send almost anything now from champagne down to lobster salad. The only thing he does not send are onions, as the odor is lost in transmission and an onion without smell is like a river without water

The process of sending food by wireless is not as difficult as might be thought at first.

The food is passed through "puffers," which blow it to atoms step by step. It is finally reduced so much that its consistency is brought in "ballance" with the ether. It is then passed through a system of Leyden jars and sent out in form of ether waves, carrying the infinite minute food particles. The receiving apparatus condenses these particles again and the food appears in its original condition, only far more palatable.

"Mystery" Control Tunes Receiver by Short Waves

(Continued from page 523)

to give softer or louder volume, a thumb lever is pressed, which keeps the control motor operating until the desired degree of volume is obtained. At this moment, the control button is released and the motor stops.

Eight stations can be selected by dialing one of the respective dial holes, from numbers 3 to 10 (giving 4 to 11 pulses or control waves).

For example, in Fig. 1, we see that if seven control pulses or waves are sent out from the control box, these are picked up on a coil antenna connected with a pulse amplifier. These amplified control pulses or currents are fed to a stepping relay "R." For each pulse, this relay advances a ratchet wheel one tooth, and all of the switches attached to the ratchet wheel shaft are advanced correspondingly. In the diagram, the fourth station has been selected by means of the seven pulses transmitted, one after the other, by spinning the dial on the control box.

Suppose the fourth station has been selected and that next you wish to change the volume. To make the sound *louder*, you dial the first hole; this causes a special arrangement of the stepping relay and a second ratchet to move the volume control switch in the receiver to the position which passes current through the proper winding of the V.C. motor, so as to cause the V.C. resistance to be reduced. As long as the control box button is depressed, the motor keeps slowly moving the potentiometer arm, and when the music or speech is at the proper strength to suit you, you simply release the button and the motor stops.

Fig. 2 shows, in a greatly simplified manner, how the volume control switch works.

For more detail, refer again to Fig. 1, where the technically-minded reader will see that the first selector switch, S1, changes the pilot light for each station selected. The second switch, S2, connects into circuit a different size condenser (or capacity) for each station selected. The third switch, S3, in turn, simultaneously connects the proper size or value of permeability—tuned (moving iron core) inductance in the oscillator circuit for the respective station dialed. Other refinements, such as muting switches, which quiet the set while a new station is being selected, automatic clutches which prevent over-riding the volume control, etc., are incorporated, but are too technical to be explained in this popular discussion. Where several of these controls are installed near each other, they can be set at different frequencies, five being provided—355, 367, 375, 383 and 395 kc. (ranging from 844 to 759 meters).

The Radio Beginner

(Continued from page 531)

of both capacitance and inductance in the circuit.

Farad—Unit of Capacity

In measuring quantities of water we use units such as quart, gallon, etc. We measure the capacity of condensers in a unit known as a farad (named after Michael Faraday who pioneered in condenser research). However, a condenser having a capacity of one farad would be too large for practical purposes. For this reason, condensers are usually measured in microfarads (one millionth of a farad).

Like resistors, condensers may be used in series, in parallel, or in series-parallel, as shown in Fig. 4.

The condensers that we have been considering so far are known as fixed condensers, in that we are unable to vary their capacities, except by connecting them in combinations, as shown in Fig. 4. Condensers can be constructed so that one set of plates is fixed and the other set is movable. The fixed set of plates is known as the *stator*, the movable set as the *rotor*.

Looking at Fig. 5 we have a condenser in series with a coil. Let us place a charge on the condenser, such that there will be a positive charge on the upper plate and a negative charge on the lower plate. The condenser is now charged, but since we have placed a coil of wire across it, we have made provision for discharging the condenser. But we have already learned that when we pass a current through a coil of wire, we set up a magnetic field around the coil, causing it to become an electromagnet, with one end having *north* polarity and the other end *south*, as shown in Fig. 6. When the condenser becomes thus discharged, the current ceases to flow. When this happens, the magnetic field around the coil collapses. In collapsing, the magnetic field induces a current in the coil, opposite in direction to the original flow of current. This means that the condenser receives a reverse charge. This second charge places a positive potential on the bottom condenser plate and a negative potential on the top one, as shown in Fig. 7. Once again the condenser discharges, but the reversal of charges on the condenser will change the polarity of the magnetic field again building up around the coil, as in Fig. 8. We might imagine that this could continue indefinitely, but such is not the case. The resistance in the circuit causes dissipation of energy, with the result that in a short period all current ceases to flow unless we continually supply the condenser with a charge.

Controlling Frequency of Oscillations

We have stated that we have oscillations in the circuit shown. The circuit is of little value to us unless we can control the frequency of these oscillations. Fortunately, this can be done in two ways—either by *varying the number of turns in the coil*, or *by increasing or decreasing the capacity of our condenser.*

If we were to put more turns of wire on our coil, it would take longer for the current to go through, and once again we would have less impulses per second. On the other hand, if we were to make our coil with fewer turns, it would take less time for the current to go through and we would have an increase in the frequency of oscillations. This is secured in a practical fashion, in radio receivers or transmitters, through the use of a variable condenser, the number of turns in the coil usually remaining fixed.

(Next Month—Vacuum Tubes)

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Full parts lists are always given, and the printed text runs anywhere from 500 to 3,000 words, depending on the complexity of the radio receiver.

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Let's Listen In with Joe Miller

(Continued from page 537)

INDIA

Quite a number of the Indian transmitters are well heard on West Coast, and we'll first list those reported: VUC2, 4.88 mc.; VUB2, 4.905 mc.; VUM2, 4.95 mc.; VUD2, 4.99 mc. VUD2, 9.59 mc., is reported with a very powerful signal on the West Coast, daily 9:30-10:30 a.m., and is heard up to 12:30 p.m. sign-off.

The above DX was reported by G. C. Gallagher and Ashley Walcott, with Jim Lanyon reporting VUD2.

Our Indian DXing friend, Masud Akhtar, of New Delhi and Simla, India, forwards the latest data concerning the Indian schedules, all of which is now incorporated in the present station list. Masud tells us that an ordinary U. S. receiver costing $100.00 here retails in India at $400.00!!

Regarding reports to different Indian stations, one merely has to address *"All India Radio,"* and then the particular city in which the station heard is located, as all these stations are part of the All India Radio network.

CANARY ISLANDS

EAJ43, located at Tenerife, and well-known to all DXers as the "easy" African on 10.37 mc., now has moved to a frequency of 7.50 mc., which enables it to reach this country even better than it did before. It now "pounds in" daily at an R9 clip, and anyone can easily locate it.

A veri stating that reception was on 7.50 mc., will count as another station, apart from the 10.37 mc. veri, so all should take this opportunity to add another African veri to their collections. QRA is same as before: Radio Club Tenerife, Apartado 225, Tenerife, Canary Islands. Schedule: 1:15-3:30, 4-6, 6:45-7:45, 8-9 p.m. (I.D.A.)

CHINA

There is plenty of activity on the short waves from China, as broadcasting carries on despite hostilities in the Far East.

XTJ, 11.691 mc., Hankow, a frequency formerly used exclusively for phoning, now transmits a daily program, from midnight-12:30 a.m. and 7-7:30 a.m., on which latter schedule it is well heard all over the U. S. XTJ announces as the *"voice of China,"* and reports may be sent to China Information Committee, P.O. Box 90, Hankow, but we can't say if veris can be had, due to the hostilities in the immediate vicinity of Hankow (I.D.A.).

XGAP, 9.56 mc., Peking, operates daily from 9 a.m.-2 p.m. with a native program and a woman announcer (I.D.A.).

XGXA, 6.98 mc., location still unknown, and lately moved to a frequency varying inside 7.0-7.25 mc., is reported by James Moore and G. C. Gallagher, W6. Schedule is 9-10 a.m., but has been heard still operating at 10:45 a.m. by Mr. Moore. (Woman announcer.)

XGX, at Hankow, still transmits 8-9:05 a.m. on frequencies which vary between 9.18-9.30 mc., relaying XGOW, the BCB call of Hankow Municipal Broadcasting. XGX uses only 150 watts. G. C. Gallagher reports XGX. Ashley Walcott's veri of XGX gives QRA as: Central Broadcasting Administration, Central Executive Committee of Kuomintang, Chungking.

XTR, 9.40 mc., and XTS, 11.44 mc., at Swatow, heard at 6 and 5:40 a.m., respectively, phoning. Other Chinese phones still operating between 4:30-9:30 a.m. are XTJ, 11.69 mc., and XTK, 9.08 mc., at Hankow, and XTV, 9.48 mc., Canton.

JAVA

PMH, 6.727 mc., Bandoeng, is beginning to be heard nicely here on East Coast, mornings, on their schedule of 4:30-11 a.m., with best sig from 6-7 a.m. YDB, 15.30 mc., on a daily schedule of 1-2 a.m., is a catch to try for.

PMY, 5.16 mc., Bandoeng, is a good one to tune for during the winter, being well heard on this low frequency from 5:30 a.m. to 7 a.m. on East Coast, during its daily transmissions from 5:30-11 a.m.

YDC, 15.15 mc., Bandoeng, is a stand-by daily on its schedule of 4:30-10:30 a.m., best 6-7:30 a.m.

YDA, 6.04 mc., Tandjong-Priok, is a new signal on the air, being well reported on the Pacific Coast, with a schedule of 4:30-10:30 a.m. YDA reported by G. C. Gallagher and also by Jim Lanyon, VE5. YDA not on daily, however.

For the NIROM transmitters, PMH, YDA, YDB, YDC, the QRA (address) is: NIROM, Batavia, Java; and for PMY, Nillny-Building, Bandoeng, Java. G. C. Gallagher also reports an unknown Javanese on 4.87 mc.

Of the Javanese "commercials," PLE, 18.825 mc., was reported at 8 p.m. and 1 a.m.; PMA, 19.345 mc., at 9 a.m., and PLV, 9.415 mc., at 10 a.m. by G. C. Gallagher. PLQ, 10.68 mc., is heard often between 5:30-6:30 a.m. with a very strong signal, just to the H.F. side of JVN. PMC, 18.135 mc., is believed to be the station heard broadcasting several mornings, with a fine signal, about 7 a.m.

All of these stations are located in Bandoeng.

(Continued on following page)

Let's Listen In with Joe Miller

(Continued from preceding page)

and may be verified by writing IR. P. C. Arends, Engineer-in-Charge, Java Wireless Stations, Bandoeng, Java. The "commercials" may be heard at any time of morning, but usually around 5:30-7 a.m. when they have the best signal strength.

Of the East Indies islands, YBG, 10.43 mc., at Medan, Sumatra, is most frequently heard on an almost daily transmission anywhere between 5:30-6:30 a.m. Also keep a watch for PNI, 8.775 mc., Makassar, Celebes, and YCP, 9.125 mc., Balikpapan, Dutch Borneo, two other rare countries, which may be heard usually around 5:30-7 a.m., phoning other Javanese transmitters. YCP also reported as regularly heard at 4 a.m.

All these transmitters are verified by the QRA given for the PL "commercials."

JAPAN

All "commercials" are now being verified by the new card shown in last issue, confirming our reception of JFZC, which is the transmitter aboard the Japanese liner *Chichibu Maru*. The card is in pale green and white, with a faint white background showing one of their volcanic mountains.

Several new 'phones, apart from those listed last month, are reported heard. There is JZA, 7.11 mc., reported by James Moore, W6, and JIA, 15.74 mc., Nazaki. JZA broadcasts regularly, signing off at 10:19 a.m., while JIA was heard phoning at 1 a.m. by G. C. Gallagher, W6, who also reports JVL, 11.66 mc., at Nazaki, at 1 a.m., also heard here at 6:55 a.m. And we just found an item in our log that JIA was heard here at 3:15 a.m. JVH, 14.60 mc., heard at 4:45 a.m., and also heard very often near 7 a.m.

A new QSL is also being issued in confirming the Jap broadcasters, this one a card, not a letter; this will be welcomed by all DXers.

ASIATIC REVIEW

Fed. Malay States—ZGE, 6.24 mc., Kuala Lumpur, which veri was pictured last month, is being well heard on West Coast, according to Jim Lanyon, VE5, and James Moore.

Straits Settlements—ZHJ, 6.05 mc., the old stand-by at Penang, reported by James Moore, often, till s.o. at 8:40 a.m. ZHJ is on daily except Sundays, 6:40-8:40 a.m.

Siam—A new transmitter at Saladeng, Bangkok, on 6.11 mc., reported heard 8-10 a.m., usually on Wednesdays only, once on a Thursday, by G. C. Gallagher, W6. Another schedule is given as Wednesdays, 6:30-10:15 a.m.

Indo-China—Radio Boy-Landry is heard by G. C. Gallagher on their 3 frequencies, 11.71, 9.72, and 6.21 mc., anywhere between 6-11 a.m., although listed on a schedule of 7:30-9:15 a.m. We have a report out for the 9.72 mc. frequency, recently heard at 6 a.m., very fine signal, so their schedule is not a fixed one. We'll try to land their 6.21 mc. transmission this winter to make all 3 verified.

Radio Hanoi II, 11.90 mc., was recently heard, though not very strong, having only 150 watts, on their regular schedule of 6-10 a.m. There is also Radio Hanoi I, on 9.51 mc., but it will be a rare day when anyone logs this one, as it has only 15 watts! These stations were built by Réné Lebon, FI8AC, famous for his excellent phone sigs on 20 meters, heard all over the world. Address reports on Radio Hanoi to Radio Club de l' Indiochine, Hanoi, Indo-China.

FZR, 16.25 mc., at Saigon, recently heard at 6:36 a.m., phoning FTK, 15.88 mc., St. Assise, France.

OTHER DX

Finland—OFE, 11.78 mc., Lahti, was heard one morning at 1:30 a.m., with an excellent church program, but with poor modulation, on a strong carrier. Other Finnish transmitters operating are OFO, 15.19 mc., and OFD, 9.50 mc. OFO is listed as on from 1-3 a.m., 9 a.m.-Noon, and 12:15-5 p.m., irregular. OFE's schedule: 1:05-3 a.m., 5-6:20 a.m., 10 a.m.-12.30 p.m., irregular. OFD is on from 12:15-5 p.m., data courtesy IDA.

Vatican City—HVJ, 15.12 mc., can be counted as a separate country from Italy, and is excellently heard during their daily exercises. Sunday broadcasts from 10:30-10:45 a.m. 'Way out West in Vancouver, Jim Lanyon reports HVJ R9 on a Sunday broadcast at 1 p.m., this a new time for HVJ to be heard. A nice serrated edge card with some Vatican City photo on one side will be the reward of all reporters who address Radio HVJ, Citta del Vaticano, Italy.

Australia—VLR, now being heard on 11.875 mc., and located at Melbourne, and announcing as VLR3, reported by Jim Lanyon with an excellent signal, at 1:45 a.m. Try for VLR3 anytime between 1-3 a.m. This is the old VK3LR.

Madagascar—Radio Tananarive, 6.07 mc., is reported by Ashley Walcott during its morning broadcast from 10-11 a.m. It fades out after first quarter hour and Ashley adds its quality is much better than before.

Mozambique—CR7AB, 3.49 mc., at Laurenco Marques, has joined with CR7AA and CR7BH in daily broadcasts, making three transmitters in operation in this Portuguese African colony. However, the low frequency precludes much chance of CR7AB being heard in the States. Schedule is believed to be same as for other 2 stations, viz., 12-1, 4:30-6:30, 9-11 a.m., Noon-4 p.m., daily. Sundays 5-7, 10 a.m.-2 p.m. CR7BH is being fairly well heard between 3-4 p.m. daily, on 11.718 mc.

HAM STARDUST

The African season is definitely "in," and nightly up to a score of mostly South African phones are heard here on East Coast, from 11 p.m.-12:30 a.m. Asiatics are poor on East Coast, but West Coast enjoys good reception of both the South Africans and Asiatics, with the South Africans best from 9:30-10:30 a.m., the same time as for Asiatics out there! It would be indeed an experience for us "East Coasters" to have the opportunity of digging through a mess of both African and Asiatic phones at the same time, hi!

After the Africans die out around 1 a.m., soon after come the Australians, which are heard for most of the morning thereafter. At 2 a.m. or so, Europeans are being very well heard, and continue for between 1 and 2 hours. It has been noted by Ralph Gozen, W2, former I.D.A. Ama-Touring Editor, that Asiatic amateurs are usually best heard on East Coast *after* the Aussies die out, which is usually about 7:30 a.m., although this varies with each month somewhat. So, whenever tuning during a.m.'s, keep right on, even when the VK's "pass out," as the band may produce some FB Asiatic DX.

On 10 meters, South Africans vanished, surprisingly, on their formerly reliable time of reception from about 11:30 a.m.-1:30 p.m. We believe they will return during the winter, though only on days with better than average conditions. However, 10 has "opened up" amazingly, and good DX can be heard from as early as 7 a.m. up to as late as 6 p.m.! During the morning, European and North African "sigs" are heard and near 6 p.m. a few New Zealand and, occasionally, a VK or two are heard, but with difficulty, here in the East.

Oh, yes! Try for New Zealand on 20 after 7:30 a.m., from which time they are licensed to operate.

AFRICA

VQ8AA, at Port Louis, Mauritius, lately QSL'd our report from 20 meter phone. VQ8AA was heard during June at 6:15 a.m. on 20, an odd time for such DX, but we were using our ol' reliable "rhombic" antenna with VQ8AA directly in the path of the beam and, as we have heard 7 stations in Madagascar, near which Mauritius is

located, we can't quite maintain it was an accident, hi! This FB QSL will be shown next month.

OM Regnaud says he'll be operating from September with more power on phone, so keep a sharp ear for him! Also noted is that VQ8AE also is on phone in Mauritius.

FR8VX, 14,400 kc. approx., at Reunion Island, reported by Max Fisher at 6:30 p.m., a FB catch, Max. OB, and our congratulations.

VQ4KTB, 14,030 kc., Kenya Colony, reported by Bob Hatcher, W4, 4 p.m. VQ4KTB and VQ4SNB, 14,084, reported by Ian Jamieson, with the former reported regularly on Sundays at 2 p.m. Ian says VQ4SNB refused to QSL.

VQ2HC, 14,320 kc., in Northern Rhodesia, is also reported by Ian, whose QRA (address) is the land of the "G's," England. Ralph Gozen also reports this one. A new one heard here one morning at 12:30 o'clock the other day is VQ2PL, on approx. 14,420 kc.

ZE1JE, 14,050 kc., Southern Rhodesia, also by Ian. Murray Buitekant reports ZE1JX, 14,090 kc.

CN1AF, lately on 14,130 kc., formerly on 14,278, located at Tangiers, International Zone, is "booming" into the U. S. almost any hour of the day with his powerful 500 watt phone. Here's a new country for all, and easy to get! We got our QSL from him in 24 days some service! CN1AF reported by many. Handsome veri card can be had by anyone reporting to: Jose M. Sierra, 19, Rue Sources, Tangiers, International Zone, No. Africa.

CN8BA, 14,040 kc.; CN8AW, 14,050; CN8AN, 14,050, 14,120, reported by Murray Buitekant, W2, in Morocco.

Other Moroccans are: CN8MA, 14,060; CN8MI, 14,300; CN8AR, 14,260; CN8AI, 14,250; CN8AV, 14,130.

From Egypt: SU1MW, 14,130; SU1AX, 14,030; SU8MA, 14,100.

Algeria: FA8CF, 14,070; FA3HC, 14,125.

These North Africans heard at same times as Europeans, during afternoons, early evenings.

From South Africa comes this batch of calls: ZS6ED, 14100, 14280; ZS5AB, 14300; ZS5BZ, 14040; ZS2AZ, 14140; ZS6DJ, 14040; ZS1CN, 14080; ZS5AW, 14100; ZS1BV, 14060; ZS1BL, 14010; ZS6A, 14080; ZS6DY, 14100; ZS6DF, 14040; ZS1AX, 14080; ZS5CA, 14140; ZS5M, 14030; ZS5CO, 14400, 14280; ZS6DL, 14050; ZS4H, 14080; ZS6S, 14135; ZS5CL, 14130; ZS1AL, 14400; ZS6L, 14080; ZS6BR, 14030; ZS1AF, 14075; ZS2N, 14020; and in Southwest Africa, ZS3F, 14060, just "roared in"! All heard between 11 p.m.-1 a.m. Murray Buitekant, W2; Harry Honda, W6; Carl Weber, W2, and "yours truly" report these.

ASIA

From Ian Jamieson comes a nice list of Asiatic 20 meter phones. From India: VU2FQ, 14190; VU2FS, 14090; VU2FV, 14210.

Ceylon: VS7RF, 14180; VS7GJ, 14080; also by Ian J.

Java: PK3WI, 14060, also by Ian, and PK1PK, PK1SK QSL'd 40 meter phone reception for Ashley Walcott, FB!

Burma: XZ2DY, 14360, by Ian. Ashley reports a veri from 2DY, also XZ2PB. 2PB tells Ashley that the following are active on 20 meter phone, XZ2EX, 2EZ, 2DP, 2DY, 2AC, 2DX, and shortly 2LZ and 2JB. Almost all listed hams on phone!

China: It is with much regret that we learned through Hal Clein, W6, that XU8RB lost his ham license due to excessive traffic handling. This ruling probably made by Jap authorities now in Shanghai. Penalized for excessive public service, we do hope to have "Reg" back on air soon, as he's a FB chap indeed! Ashley reports a veri of XU8RJ, located in the business center of Shanghai, and who would appreciate any East Coast reports. XU8RJ says he uses 80 watts; XU8MC, 135 watts, and XU8ET, 60 watts.

Japan: J5CC, 14300, 14380, is reported as using a power of 1-3 kw., according to Harry Honda, who learned this from XU8EN. This makes J5CC one of the most powerful Ham phones in the world today.

OTHER DX—20 Meters

New Guinea: VK9XX, 14280, at Rabaul, reported at 7 a.m. by Harry Honda. Also on 14001 at 5:40 a.m. by James Moore.

New Zealand: ZL2BE, 14210, heard by Harry Honda, W6, at 1-3 a.m. in American phone band. On East Coast, ZL3KX, 14170, reported, 7:30-8 a.m. ZL's are not permitted to transmit on phone before 7:30 a.m. E.S.T.

From Europe, reported by Ian Jamieson are: LY1BE, 14050; LY1KK, 14110, in Lithuania. Also OH5NR, L.F. side; OH2OI, 14100, in Finland, and YU7XX, 14140, in Yugoslavia.

TF3C, H.F. side, Iceland, heard 6:47 p.m. by Bob Hatcher, W4, who also reports ZB1R, 14300, 5:22 p.m., in Malta. FB DX, Bob!

10 METERS

New Zealand: Roger Legge reports some FB DX here, in: ZL1MR, 28100; ZL2AU, 28400; ZL2FY, 28100; ZL3AY, 28150; ZL3KZ, 28140; making 9 ZL's for Rog, who is in W8 district. FB, OB! Also ZL3KZ, here.

China: XU3AA, 28260, as yet unlisted, is a FB catch which Chris Jaffe snared at 9 a.m., while XU3AA contacted a W5 on schedule. Chris, using a National 1-10 receiver, also snared HR4Z, on 5 meter phone, 56,620, which is somp'n to brag about! This catch in Honduras was heard at 3 p.m.

Africa: SU1GP, 28090, Egypt, heard here at 7:30 a.m., also by Rog Legge.

South Africa: ZS6EG, 28250; ZS1AX, 28400; ZS6ED, 28300; ZS6A, ZS6S, ZS6DY, by Harry Honda, Rog Legge and Y. T.

Morocco: CN8AJ, 28250, and CN8AV, 28230.

For your VAC entries, note that Philippines and Java definitely count as Asia.

Rules for VAC Certificate

● RADIO & TELEVISION Magazine has prepared a handsome VAC (Verified All Continents) certificate which will be issued to all short-wave listeners submitting adequate proof of verification from all continents. To secure a VAC certificate the listener must send in a verification card from each of the continents. The VAC certificate will only be issued for verifications of radiophone stations, not C.W. stations. The certificates will be signed by the DX Editor, and Hugo Gernsback, Editor-in-Chief of RADIO & TELEVISION.

It is advisable that the cards be sent in a neat package and insured for safe delivery. All cards submitted will be returned. The listener should enclose return postage.

A nominal charge of twenty-five cents (25c) will be made for the certificate to cover the cost of handling and printing.

The DX Editor will be the judge as to whether the verifications submitted are bona fide.

A special notation will be made on the certificate in the event that a listener has more than one complete set of verifications from all continents.

All entries should be made to the VAC Editor, RADIO & TELEVISION, 99 Hudson Street, New York, N. Y.

What Do YOU Think?

(Continued from page 530)

back memories of old days when we used crystal detectors, loose couplers, variometers, etc., in our receivers, and high voltage transformers, rotary or quenched gaps, etc., in the Xmitters. Hope you will from time to time include articles of this nature because it sure is good to look back once in a while and see how far we have come in so few years.

And now for the station—the transmitter is crystal-controlled, using a 47 oscillator, a 46 as a doubler or buffer and an RK20 final, running 125 watts input on the three bands we work; namely, 80, 40 and 20 meters.

The receiver is an RCA—ACR175; the antenna is at present an 80 meter Zepp with 45-foot feeders—this antenna has proven very effective on the three bands used by this station, some of our accomplishments being as follows: W. A. S., W. A. C., 3 times, and 50 foreign countries worked. Several prizes have been won in western Pennsylvania contests.

W8NCJ is always glad to GSP and never too busy to ragchew with nearby Hams or "newcomers" in the Ham game. SWL cards with accurate reports are always promptly answered and we have exchanged many station photos for those of SWL receiving post photos.

For phone work we use suppressor-grid modulation of the RK20 final, the audio, and start with a crystal mike feeding into the grid of a 6J7 to 6C5 into 6F6 modulator. Three separate power supplies are used, one for modulator, one for osc. and buffer/doubler stages, and a high voltage power-supply using two 866 tubes, furnishing 1250 volts to the plate of the RK20 final.

R. R. ROSENBERG, W8NCJ,
Box 43,
Knox, Pa.

ON4BA	28.195	3	5	Taglauer
ON4DI	29.990	5	7	Jordan
ON4BG	14.135	4	8	Fitzpatrick
ON4PA	28.870	–	–	Robinson
ON4DI	14.010	5	7	Rowley
ON4TO	14.420	5	7	Rowley
EI2L	14.100	4	7	Wood
EI6G	14.000	3-4	7-8	Carling. Fitzpatrick
	14.100			
PAFT	28.120	5	7	Hartzell
PAMZ	14.038	4	6	Hartzell
SV1CA	14.370	5	5	Yours truly
CT1AY	14.100	5	7	Slaughter, Yours truly

The Aussies are coming in quite regularly now, and with fairly good signal strength. The following were reported:—

Call	*Freq. mc.*	*R*	*S*	*Observer*
VK2GU	28.250	4-5	6-9	Taglauer, Rush
	28.420			
VK2HX	14.120	3	5	L. Fuller
VK2ABP	14.045	2	5	Hartzell
VK2NS	14.050	5	8	Hartzell
VK2AB	14.030	4	7	Hartzell
VK2UY	14.300	5	8	Hartzell
VK2AP	14.090	4	6	Hartzell
VK2UZ	14.095	5	8	Slaughter
VK2YX	14.120	3	6	Fitzpatrick
VK3ZL	14.100	5	6	Slaughter
VK3ZS	14.020	5	8	Lang
VK4JP	14.050	5	6-8	L. Fuller, Lang
	14.270			
VK4KO	14.050	5	6	L. Fuller
VK4AX	14.100	5	8	Hartzell
VK4VD	14.148	4	7	Wood

In the area known as Oceania, we find several, among them these:—

Call	*Freq. mc.*	*R*	*S*	*Observer*
PK6XX	14.020			
	14.009	3-5	4-9	Taglauer, L. Fuller, Wood, Hartzell.
	14.000			Robinson

S. W. League

(Continued from page 539)

PK2AY	14.270	5	7	Wood
K6OFW	14.000	5	7	L. Fuller
K6BAZ	14.150	5	8	Rowley
K6LKN	14.190	5	8	Rowley, Yours truly
K6MVA	14.180	5	8	Rowley
K6BNR	14.150	5	8	Noyes
K6OTT	14.220	5	9	Noyes
K6NZQ	14.200	5	9	Noyes
K6OJI	14.150	5	9	Noyes
K6POR	29.580	5	9	Noyes
VR6AY	14.345	5	5-8	Noyes, C. Fuller
KA1JM	14.260	5	8	Slaughter, Lang
	14.080			
KA1ZL	14.260	5	6	Lang
KA1CS	14.146	5	6	Wood
KA3KK	14.310	4	6	Lang
KA7EF	14.140	5	7	Lang, Wood
	14.150			
ZL2FY	28.410	5	6	Rush
ZL2CI	14.012	3	5	Wood

Observer John Versfeld reports to us that the following American Hams are being heard in his locality of South Africa:—

Call	*R*	*S*	*Call*	*R*	*S*
W1BES	5	8	W6IFJ	5	8
W2JAA	5	8	W8JOV	5	8
W2EOA	5	8	W9CSY	5	9
W2JCY	5	7	W9ZXX	5	8
W4CDQ	5	9	W9KIP	5	9
W6OSY	5	6			

Also, he reports the following as having been received in South Africa during September.

Call	*R*	*S*	*Call*	*R*	*S*
VK5DR	5	6	KA3KK	5	8
VK6WZ	4	5	G6WX	5	8
VK3EK	5	6	G8MX	5	7
F8XD	5	8	VQ2PL	5	9
PK1ZZ	5	7	VQ2HC	5	9
PK3WI	5	8	ZE1JR	5	8
CR7AK	5	9	ZE1JX	5	9
CO2GO	5	6	ZE1JZ	5	8
CN8AR	5	7	ZE1JS	5	7
KA1CS	5	9			

Mr. Versfeld heard these American Hams on 10 meters.

Call	*R*	*S*	*Call*	*R*	*S*
W2JCY	5	6	W9EAG	5	5
W9DAY	5	6			

Observer Rowley of the Canal Zone reports the following as being heard in his district:—VE3SM, W61XY, W6LXA, W7AXS, and W7ESK. And there you have it, om. This finishes up our reports for this month.

Some time ago, we reported that Observer Hatcher had made a good record in receiving all six continents. Well, this has been broken by our observer for India, Masud Akhtar. Observer Akhtar received all six of the continents in less than five minutes. On January 4th of this year, Mr. Akhtar heard a QSO among W2DLH, VU2CQ, HK5AR, SU1SG, VK4JU, and G5ML. These stations sent a message from one to the other until it had been around the world, and received again at the station of origin. Mr. Akhtar heard this message as it was transmitted by all six of the stations representing the six continents. The time it took this message to go around the earth was just three and one-half minutes.

Well, this about winds up the *rag-chewing* for this month. Here's wishing you the best of luck and lots of DX for the coming year.

A De Luxe Desk Transmitter

(Continued from page 543)

panel bolted to the amplifier panel by means of 4 2" flat rods. All chassis are 13" x 17" x 2" and are supported by side brackets to maintain rigidity. Socket holes are cut out with punches and for the transformer holes a circle cutter is used.

List of Parts

ASTATIC MICROPHONE LAB.
1—GT 3 Microphone
1—G Stand

BUD RADIO
1—No. 698 Cabinet Rack
1—No. 443A Panel
1—No. 1254A Panel
1—No. 1255A Panel
2—No. 692 Chassis Bottoms
3—No. 659 Chassis
3—No. 460 Brackets
1—No. 958 Isotex 7 Medium Prong Socket
2—No. 955 Isotex 5-Prong Sockets
3—No. 954 Isotex 4-Prong Sockets
3—No. 268 4-Prong Sockets
6—No. 1063 8-Prong Sockets
4—No. 920 R.F. Chokes RFC 1-2-3-4
1—No. 568 R.F. Choke RFC 5
2—No. 125 1½ inch dia. forms
1—No. 594 1¼ inch dia. form
1—¼ lb. No. 16 P.E. Wire
2—No. 232 Open Circuit Jacks
1—No. 233 Closed Circuit Jack
2—No. 282 Shielded Phone Plugs
4—No. 163 2¾ inch diameter Tuning Dials
1—No. 330 Double Gang Midget Condenser (C3)
1—No. 898 Dual Spaced Midget Condenser (C11)
1—No. 1552 Junior Dual Transmitting Condenser (C15)
1—No. 1075 Double Throw Double Pole Switch (S4)
3—No. 499 Single Throw Single Pole Switches (S1), (S2), (S3)
4—No. 805 Knobs
1—No. 795 Ceramic Flexible Coupling
1—No. 890 Condenser (C10)
2—No. 796 Brass Couplings
1—No. 863 Flex-O-Shaft Coupling

I.R.C. (Resistors)
2—BT-1 25,000 ohm Resistors (R1), (R2)
2—BT-1 50,000 ohm Resistors (R3), (R11)
2—BT-1 100,000 ohm Resistors (R14), (R15)
1—BT-1 1,500 ohm Resistor (R13)
1—BT-1 250,000 ohm Resistor (R10)
1—BT-½ 5 megohms Resistor (R7)
1—BT-½ 1,000 ohm Resistor (R8)
2—BT-½ 250,000 ohm Resistors (R16), (R18)
1—BT-½ 15,000 ohm Resistor (R17)
1—BT-½ 500 ohm Resistor (R19)
1—BT-2 25,000 ohm Resistor (R5)
1—BT-2 1 megohm Resistor (R9)
1—Type AB 10 Watt 15,000 Ohm Resistor (R4)
1—Type AB 10 Watt 10,000 Ohm Resistor (R6)
1—Type ESA 80 Watt 50,000 Ohm Resistor (R21)
1—Type ESA 80 Watt 40,000 Ohm Resistor (R20)
1—Type ESA 80 Watt 15,000 Ohm Resistor (R22)
2—Type 13-133 500,000 Ohm Potentiometers (R12), (R23)

R.C.A. (Tubes)

1—Type 6J7	1—Type 6A6
1—Type 6X7	2—Type 807
2—Type 6J5	2—Type 83
3—Type 6L6G	1—Type 5Z3

SOLAR MANUFACTURING CORP.
(Condensers)
4—Type XB-1-22 .002 mf. 1,000 volt Condensers (C1), (C2), (C6), (C9)
5—Type XB-1-31 .0001 mf. 1,000 volt Condensers (C4), (C5), (C7), (C12), (C13)
1—Type XB-1-28 .008 mf. 1,000 volt Condenser (C14)
1—Type XB-1-11 .01 mf. 1,000 volt Condenser (C8)
1—10 mf. 25 volt Electrolytic (C16)
1—8 mf. 450 volt Electrolytic (C18)
1—25 mf. 50 volt Electrolytic (C22)
4—.01 mf. 400 volt Paper Tubulars (C19), (C20), (C21), (C17)
2—.1 mf. 600 volt Paper Tubulars (C23), (C31)
4—Type XC-64 4 mf. 600 volt Condensers (C24), (C25), (C28), (C29)
2—Type XC-12 2 mf. 1,000 volt Condensers (C26), (C27)
1—Type M-324 24 mf. 350 volt Condenser (C30)

TRIPLETT ELECTRICAL INSTRUMENT CO.
(Meters)
2—No. 327 0-100 DC Milliammeters (M1), (M2)
1—No. 327 0-10 DC Milliammeter (M3)
1—No. 327 0-250 DC Milliammeter (M4)
1—No. 327 0-150 DC Milliammeter (M5)

Coils
L—20 turns No. 16 enameled wire on 1¼" dia. form spaced to 2 inches
L1 and L2—18 turns No. 12 enameled wire 2½" diam. Length of winding—4 inches.

(Balance of Parts List and further details of construction, including Power Supply, in next issue.)

RADIO Test-Quiz???

(Continued from page 524)

c. Dixie Lee — *C. George Bernstein*
d. Nellie Crossman — *D. H. L. Crosby*
e. Olga von Nordenflycht — *E. Herbert W. King*
f. Dorothy Janis — *F. A. V. Kaltenborn*

19. If you asked your radio dealer for a Mansbridge condenser, he should hand you
a. A waxed paper and metal foil condenser.
b. An electrolytic condenser.
c. A widely spaced variable condenser for transmitting.
d. A coil of copper wire for your still.
e. An imported British fixed condenser.

20. In television transmission and reception, the synchronizing signal
a. Is transmitted separately from the image signal.
b. Is transmitted together with the image signal.
c. Is carried by the power lines.
d. Is dispensed with in modern apparatus.

21. When the Columbia Broadcasting System links its transmitter and its studios with dual conductor coaxial cable, the copper sheaths spaced around the wire cores will be made
a. Of drawn copper tubing.
b. Of wrapped copper foil.
c. Of numerous copper strips arranged longitudinally to form a tube.
d. Of drilled copper rod.

22. White light, when used for color television, is broken up into the various shades of the spectrum, and the correct order, beginning at the lowest frequency end, is

a. Orange — *c. Violet*
b. Indigo — *f. Blue*
c. Green — *g. Yellow*
d. Red

23. Just in case you don't know, a spark suppressor
a. Is used to prevent sparks from getting out of the lightning arrester and setting fire to the curtains.
b. Keeps transmitting spark gap from getting overheated and burning out.
c. Makes the ignition wires of an auto engine aperiodic and therefore non-radiating.
d. Usually has a resistance of about 250 ohms.
e. Usually has a resistance of about 2,500 ohms.
f. Usually has a resistance of about 25,000 ohms.

24. You can adapt your present broadcast receiver to reproduce high definition television images
a. By adding an ultra-short wave converter.
b. By adding a cathode-ray tube.
c. By doing both the foregoing.
d. It cannot be done without completely rebuilding the set.

25. The cathode of a radio tube, when in use, is
a. Always directly heated.
b. Always indirectly heated.
c. Not always heated.
d. Never heated.
e. Always heated.

(See Answers on page 575)

COMMERCIAL NOTICES 10¢ A WORD

Under this heading only advertisements of a commercial nature are accepted. Remittance of 10c per word should accompany all orders. Copy should reach us not later than the 10th of the month for the second following month's issue.

AGENTS WANTED

300% PROFIT SELLING GOLD Leaf Letters for Store Windows; Free samples. Metallic Co., 446 North Clark, Chicago.

CORRESPONDENCE COURSES

500,000 USED CORRESPONDENCE Courses and Educational Books Sold, Rented, Exchanged. All subjects. Satisfaction guaranteed. Cash paid for used courses. Complete details and bargain catalog free. Send name. Nelson Company, 3488 Manhattan Building, Chicago.

INSTRUCTION

RADIO ENGINEERING, BROADcasting, aviation and police radio, servicing, marine and Morse telegraphy taught thoroughly. All expenses low. Catalog free. Dodge's Institute, Colt St., Valparaiso, Ind.

MANUFACTURERS' REPRESENTATIVE

SCANDINAVIA. AGENT FIRSTclass introduced wants for Scandinavia representation of manufacturer of portable radios, etc. Zaun, 9 Rue General Gratry, Bruxelles.

MISCELLANEOUS

BOYS — DON'T BE BULLIED! Learn how to throw an antagonist even though he be twice your size—how to disarm a gunman and render him helpless. These and a hundred other effective methods explained in book on Jui-Jitsu (scientific method of self defense). Taught to law enforcement bodies in the U.S. and throughout the world. Only until March. Price $1 postpaid. V. Kaupas, 114th & Homan, Chicago.

7 MILLIAMMETER, HEAVY RUBber insulation, high voltage lacquered cable, suitable for transmitter, 2c per foot. Gold Shield Products, 350 Greenwich St., New York City.

PATENT ATTORNEYS

INVENTORS—PROTECT YOUR rights before disclosing your invention to anyone. Form "Evidence of Conception"; "Schedule of Government and Attorneys' Fees" and instructions sent free. Lancaster, Allwine & Rommel, 436 Bowen Building, Washington, D. C.

PUBLICATIONS

COLLECTORS! SUBSCRIBE TOday! Swapper's Digest—Only 50c Year. Coloradio, Texas.

MONEY MEANS PLEASURE. MY 64 page book shows how. 25c. Write today. Gurney, 4825 So. Marshfield, Chicago.

QSL—CARDS—SWL

100 NEAT SWL CARDS PRINTED with your name and address sent postpaid for $1. Bunch of samples and RST Chart for five cents in stamps. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

RADIOS

KITS—DISTANCE CRYSTAL SET $1.00 plans 10c; metal tube receiver $2.00. Information free. Callradio, Box 94, Saugus, Calif.

SHORT WAVE COMPONENTS

PLUG-IN COILS, SPACE WOUND on four prong 1¾x1¾ forms. Tune 15-210 meters with .00014 condenser. 35c set postpaid. Noel, 728 Birch, Scranton, Pa.

SHORT WAVE DIATHERMY

EARN $56.00 PER UNIT. SELLing nationally advertised short-wave diathermy unit to physicians. Reliable firm. Estab. 60 years. Valuable territories now open. McIntosh Electrical Corp., 223 N. California Ave., Chicago.

SHORT WAVE RECEIVERS

USED DOERLE'S, D-38, BS-5, 7C, reconditioned by factory, 40% off. See January Short Wave & Television for description. Kusterman, 68 Barclay St., New York.

SONG POEMS WANTED

WANTED ORIGINAL POEMS, songs for immediate consideration. Send poems to Columbian Music Publishers, Ltd., Dept. K49, Toronto, Can.

TELEVISION

TELEVISION EXPERIMENTAL Kit $9.50. Arthur Pohl, 2123 Hubbard, Detroit, Mich.

FOR SALE (NON COMMERCIAL) 3¢ A WORD

Under this heading we accept advertisements only when goods are offered for sale without profit. Remittance of 3c per word should accompany all orders. Copy should reach us not later than the 10th of the month for the second following month's issue.

FOR SALE—RCA BATTERY superhet. Uses 6 199 type tubes. Several meters. 5 meter converter. Crossman Air "Gun." Harry Ackerson, Box 322, Ramsey, N. J.

EXPERIMENTER-SERVICEMAN selling out. Dozens of bargains! Send for free list. Stecher, 605 Wenonah, Oak Park, Illinois.

BARTER AND EXCHANGE — FREE!

NO ADVERTISEMENT TO EXCEED 35 WORDS, INCLUDING NAME AND ADDRESS

Space in this department is not sold. It is intended solely for the benefit of our readers, who wish to buy or exchange radios, parts, phonographs, cameras, bicycles, sporting goods, books, magazines, etc. As we receive no money for these announcements, we cannot accept responsibility for any statements made by the readers. Use these columns freely. Only one advertisement can be accepted from any reader in any one issue. All dealings MUST be above board. Remember you are using the U. S. mail in all these transactions and therefore you are bound by the U. S. Postal Laws. Describe anything you offer accurately and without exaggeration. Treat your fellow men the way you wish to be treated. We welcome suggestions that will help to make this department interesting and helpful to our readers.

Copy should reach us not later than the 10th of the month for the second following month's issue.

HAVE NEW AMPERITE MICROphone, books, field glasses, violin, camera, projector, electric shaver, etc. Your list for mine. M. Epstein, 2953 Ruckle St., Indianapolis, Ind.

SWAP, NEW TUBES OR CASH for old automobile and motorcycle license plates from every state and country on earth. Trade radio set for old automobile. What say? Anthony Shuplenus, Newport, N. J.

WILL SWAP GILBERT NO. 4½ erector with 110 V. A.C. motor, 25 airplane magazines and $1.00 book on flying. Want radio parts, 5 or 10 meter receiver or? Robert A. Yheulon, 1222 W. Thompson St., Phila., Pa.

HAVE HOWARD MODEL 430 communication receiver. Will swap for 36 or later Super Skyrider, 39 model Howard. Or what have you in good shape. Steve Vargo Jr., 2338 Riverview Ave., Dayton, Ohio.

HAVE MODEL 89 DELUXE SUpreme Radio tester, Model 20 Weber oscillator, seven volumes Riders Manuals, good as new, for what have you. Glenn Wilson, Box 193, Pretty Prairie, Kans.

SWAP CRYSTALS AND BLANKS for all bands, new $8.00 radio bugs, good receiver type tubes, Supreme 85PL tube tester. Will test metal, glass tubes and condensers for ham parts. Dawson, 1308-F, The Dalles, Oregon.

MODERN RADIO SERVICING, Field Data book, hundreds resistors, transformers, condensers, speakers, receiving tubes, two hundred dollar stamp collection. Swap for fifty watter, high voltage ham equipment. W5GUY, Rio Hondo, Texas.

TRADE FOR PHOTOGRAPHIC equipment, rifles: Triplett signal generator, VT voltmeter, modulation monitor, audio oscillator, volt-ohm-milliammeter. Clough-Brengle OMA generator, RCA 5 meter transceiver, Xtal Ultra Skyrider, Mark Potter, East Avenue, Parkridge, Ill.

HIGH GRADE 12-GAUGE DOUBLE barrel shotgun. Latest Marlin .25-20 repeater rifle. Both A-1. Trade for revolver, radio, typewriter, or? C. Moore, 211 East 108th Street, Los Angeles, Calif.

AMERICAN CODE READER COMplete, extra tape, 150-26,000 meter coils, etc., for heavy duty xmitter power units, tubes, meters, condensers 440-500 capacity, or for what have you. Thomas, Proctorville, Ohio.

STAMPS—HAVE LARGE AMOUNT of all types of U. S. duplicates on hand to swap for British Colonies and foreign airmails mint or used in lots or singles. W2IAG, 2807 Claflin Ave., New York, N. Y.

WANT TO BUY FOR CASH 500 watt fone and CW rig for 160 fone operation and twenty forty eighty CW. Must be in good condition. W8JZT, Alfred, N. Y.

PRINTING EXCHANGED FOR 5-6-7 tube AC-100V receiver, bug, 5 meter transceiver or equipment, or good relays. Give complete information. All mail answered. III-Class, 5744 East New York Street, Indianapolis, Indiana.

WANT RECORDS BY ROSWELL Sisters, Andrews Sisters, Helen Ward, Edythe Wright. Will give other records, expensive exerciser, short wave radio, radio parts, also postage stamps. Please write. Walt McIntosh, Jr., 8 Summer Street, Melrose, Mass.

HAVE GENEMOTOR; 56-2A5, 5-10M receiver; 10M, converter; power supply; portable mobile DX receiver, Freneh mike. Want crystal, key, other radio or photographic equipment. Saul Weingarten, Rt. 1, Box 94, Saugus, Calif.

WANT — CORRESPONDENCE from all over the world. Will trade stamps, photos, postcards, magazines, information. I am a student of Radio-Television (Beginner). Will answer all mail. Tom Wasserman, 1975 Pingree B7, Det., Mich., U.S.A.

WILL SWAP HUNDREDS OF ASsorted magazines. Want small 4 or 5 tubes A.C. broadcast band radio in working order. E. W. Bellington, 754 Bergen Street, Brooklyn, New York.

I HAVE GOOD CARTER GENEmotor, .22 rifle, and 25 watt electron coupled transmitter. I would like to trade for crystals, short wave receiver, or transmitting equipment. Milton Bender, Saugus, Calif.

WANTED: RECENT PUBLICAtion of "Radio Operating Questions and Answers" by Nilson and Hornung, and "How to Pass Radio License Examinations" by Drew. William Rosenthal, 1624 19th Street, Monroe, Wisconsin.

WANTED: MICROSCOPE ABOVE 300X, of fine make, or SM18 "S" meter. Trade U.H.F. Products Co. 2 tube (6.15G-12A7) trans.recr. 2.5—4,000M. Conrad Routh, 1060 Spring St., Atlanta, Ga.

TRADE 1937 HARLEY-DAVIDSON model 74 motorcycle blue finish perfect condition, good tires, for high power fone rig. Must be complete and in good shape. Jayne Arrance, Box 651, Alfred, New York.

WILL SWAP A TRUETONE model 585 complete, A.K. 94 chassis only, Confidence automatic tube tester, and other radio parts, for a good A.C. all wave oscillator or? J. Finney, 45 River St., Cambridge, Mass.

SWAP COMPLETE PARTS FOR model 90 Philco, tubes and speaker, deluxe Schick razor and few dollars cash for good A.C. short wave set working speaker. All replies answered. John Toth, 347 Hancock Ave., Bridgeport, Conn.

WANTED: CRYSTAL PICKUP, or? Will trade battery charger, RCA 7 tube radio, 4 tube A.C. radio, Readrite 245 analyzer, Am. Flyer electric train, Winchester pump .22. Norman Berg, New Richmond, Wisc.

(Continued on opposite page)

1-Tube Receiver

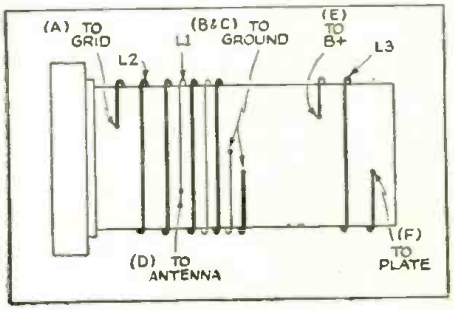
(Continued from page 544)

the ground end of the grid coil. These three-winding coils can be procured already wound.

All three windings must be wound in the same direction.

Band-spread Provided

Our system of continuous electrical band-spread is obtained by the use of two variable condensers, a 100 mmf. unit used for



Details of 3-Winding Coil

band setting and a 35 mmf. unit with a vernier dial used for actual band-spread tuning.

Grid bias for the 6P7G triode section is obtained by the grid-leak method. This system has the double advantage of being beautifully simple and much more effective than a bias cell, which might ordinarily be used where only a small amount of bias is needed. Essentially its operation is as follows: since most tubes draw a minute amount of grid current, even with a negative bias applied to the grid, a very high resistance in the grid circuit will cause a drop of voltage of the proper polarity across it. Generally a resistor of about 15 megohms is sufficient. This, in common with a rather small size coupling condenser, a .004 mf., were used in this receiver. Incidentally the condenser should have a very high leakage resistance, one having mica insulation being called for.

The diagram shows the output of the receiver hooked up for use of a pair of magnetic phones. If crystal phones are to be used, a slight change must be made since *no direct current must be allowed to pass through the phones.* The addition of a 50,000 ohm resistor and .1 mf. condenser as shown in Fig. 1A will effectively isolate the crystal phones from direct current.

The author's model of this band-spread receiver was constructed in a small Crowe metal cabinet 9¼ x 6 5/16 x 4⅞ inches. This cabinet proved highly satisfactory, being not only of a convenient size, but more ornamental than any that could be home-made. Use of a cabinet instead of the panel and base-board type of assembly is advantageous in that the receiver is not only completely shielded, but dust, the bête noir of short-wave efficiency, is kept out of the receiver parts.

The only parts mounted on the front panel are the 100 mmf. band-setting condenser and the 50,000 ohm regeneration control. All the other parts are fastened to the base plate. The various components have been so arranged that the length of the R.F. leads is an absolute minimum. In order to facilitate duplication, placement of the mounting holes has been indicated in Fig. 2A. Similarly Fig. 2B shows the location of the mounting holes on the front panel.

Both the six-prong isolantite coil socket and the octal tube socket are mounted above the base plate by means of the mounting studs furnished with the sockets. In mount-

ing the isolantite sockets, care should be exercised to use the fiber washers which are also furnished with the sockets. A fiber washer should be placed on each side of the socket mounting hole where the socket comes in contact with the stud or the nut holding the mounting bolt. Failure to use these washers in this manner may result in cracking the socket.

The four terminal connection strip shown in the photo in front of the audio choke is also mounted on a pair of brass studs. This terminal strip serves as a means of connecting the receiver to its power supply. Alternatively a four-wire cable can be directly connected to the proper points in the circuit, thereby eliminating the need for the terminal strip.

Since the Crowe vernier dial required that the band-spread condenser be mounted back of the panel, it was mounted on a pair of 2-inch brass studs on the base plate.

On the side of the cabinet near the regeneration control are mounted a pair of insulated phone tip jacks, providing a convenient method of attaching the earphones. On the other side of the cabinet is a dual binding post strip to which are connected the antenna and ground.

Wiring Is Simple

Wiring is very simple. After mounting the two sockets, band-spread condenser and the audio choke and the terminal strip on the base plate, wire these components together. Keep all R.F. leads as short as possible, remembering that the shortest distance between two points is a straight line. The 15 megohm grid resistor is mounted right at the socket terminals between the triode grid and the cathode which is grounded. Do not depend on the chassis itself for grounding, but connect together all points going to ground and ground to the chassis at one point. Before fastening the base plate to the cabinet sides, bring out leads from the parts mounted on the plate which are to be connected to the band-setting condenser and regeneration control. Now fasten the base plate to the sides of the cabinet with the four rubber feet furnished with the cabinet. After wiring in the phone tip jacks and antenna strip, fasten the front section of the cabinet to the sides with the two small screws and connect the proper leads to the band-setting condenser and regeneration control. The receiver is now complete and ready for operation.

A simple power supply such as is shown in the accompanying diagram can be used. If desired, however, battery supply may be used. For heating the filament, a 6 volt storage battery is ideal. Alternatively, 3 dry cells can be used, since the filament drain is only three-tenths of an ampere. Either 45 or 90 volts may be used for plate supply, although the higher voltage will give a little better sensitivity and greater volume. If batteries are used, it will be necessary to have a double-pole single-throw switch mounted on the regeneration control as shown in the diagram in order to disconnect the "B" battery as well as the "A" battery; otherwise the "B" battery will continue to discharge through the regeneration control even when the receiver is not in use. When using an external power supply, the filament and plate switch may be omitted and the power supply controlled by a switch mounted directly on the power supply.

Any type of antenna may be used, although a single wire of about 50 feet will give all-around satisfactory results. If a doublet type of antenna is used, the number of primary turns (L$_1$) must be reduced to the value shown in the coil chart. Also the primary must not be grounded.

(Continued on following page)

BARTER and EXCHANGE FREE ADS (continued)

EXCHANGE READRITE TUBE tester in carrying case, Model 405, for transmitting parts, or what am I offered in trade? A. Kimeldorf, 1487 Vyse Ave., Bronx, N. Y.

WANT—ULTRA SKY ROVER battery model, 19+1ETG tubes, speaker in same cabinet, coils. Swap Univex 5.6 camera plus projector; or $9.00 set drawing instruments plus $10.00 Federal enlarger. William Gerber, Hampton, New Hampshire.

WILL SWAP A GOOD SET OF story books for left hand golf clubs or fishing tackle, or short wave set, will also swap SWL cards. Leo Wasnieski, 1143 Lincoln St., North Chicago, Ill.

50 POWER MICROSCOPE AND KIT, 6 power prism field glass with case, pocket camera 1¼ x 1½, earphone 2100 ohms. What have you? Correspondence invited. Gerard Begin, 17 Godoin St., Lauzon, P. Q., Canada.

WANT—GOOD CRYSTAL MICROphone, 701 preferred, or some other good make, also want a 20 meter Billey crystal, or what do you have. Have almost new tennis racket. Floyd Chadwell, 111 Pajaro St., Salinas, Calif.

WANTED: SKY-BUDDY RECEIVER. Will trade 1000 different, unused postcard views. $4.00 credit on a used correspondence course. Joseph McGuire, 5022 So. 38th St., Omaha, Nebr.

WILL TRADE: 8 TUBE SHORT wave super, magic eye, tubes, coils, 8" speaker in cabinet, built in power supply. All continents logged. Want good camera. Henry Miller, 3540 Beta St., Chicago, Ill.

DISPOSING OF EQUIPMENT AND parts. Swap transformers, chokes, power packs, tubes, meters, transmitter, transceiver, coil forms, etc. What do you need? What have you? Card brings list. W9LAQ, 600 Wisconsin, Oak Park, Ill.

I HAVE ONE GOOD "TURRET Tool Post" a device which holds six tools at once for a metal turning lathe. Let's do some trading. Paul Kincaid, Braymer, Missouri.

HAVE $10, 8MM MOVIE EQUIPment (camera, projector, films). Would like Ham or all wave superhet or record changer. Tom Cullen, 22 Simpson Ave., Wallingford, Conn.

WANTED—FREQUENCY MODUlator and Rider's manuals in good condition. Will exchange blade saw and jig saw. These have been used but once. All letters answered. William Nathan, 521 N. Division St., Ann Arbor, Mich.

SWAP HOMEBUILT R.S.R. receiver, value $8.00. Also All-Star senior, has cabinet, and speaker, coils 10-80, 250-555 meters. Want switch-band receiver, Sky-Buddy, etc. H. J. Gehl, 2204 Crane Ave., Cincinnati, Ohio.

HAVE: HOTPOINT ELECTRIC water heater, 230 volts 1000 watts—installs in tapping on hot water tank. Hotpoint Thermostap with settings from 130° to 200° Want transmitting or recording equipment. H. S. Lair, Vineyard Haven, Mass.

WANTED, A CLARINET, MUST be in good condition, have a Sargent 10AA communications receiver 9.5 to 550 meters. Paul Carroll, 118 Vine Street, Bridgeport, Conn.

WILL SWAP 5 METER TRANSceiver and good saxophone for good short wave receiver and what have you. John Orth, 252 South Ardmore, Dayton, Ohio.

WILL GIVE 50 U.S. SILVER dollars for any revolver, gun or rifle stamped "Patent Arms Mg. Co., Paterson, N. J.—Colt's Pt." C. St. John, Berrien Springs, Michigan.

WANTED: MEISSNER SIGNAL Shifter and power supply complete, good communications receiver. Have an "Ultra Stratosphere II" transmitter-receiver coils and mike—heard all continents. Radio W80QU, Wellsville, N. Y.

STAMP COLLECTORS IN ALL countries. Would like to exchange U.S. stamps for those of yours. Would also like to correspond with short-wave listeners. Russell Laitala, 128 Harding Ave., Ironwood, Michigan.

WILL SWAP OR SELL, IDEAL photo enlarger, 16MM projector and unused U.S. com. stamps. I am interested in radio parts, small transmitter or power supply. A. C. Conlin, 83 Westfield Rd., Holyoke, Mass.

SWAP—SUNDRY NOVELS, CAMera, 50 diff. cachets, first days, flights, Silver Jubilee sets (mint). Harry Rovair, Wayland, Mich.

WANTED: INSTRUCTOGRAPH OR Teleplex Code Machine. Will swap Esquire magazines from June 1935, 1936, 1937 and 1938. All letters answered. Charles H. Goss, 137 Washburn Avenue, Freeport, New York.

WANTED: USED INSTRUCTograph tapes, Morse or Continental, any numbers, except 1 to 1 Continental. Write Archibald Bursey, Burlington, Green Bay, Newfoundland.

WANTED: WESTON 665 ANALYzer and Sprayberry's Reg. General Radio Course. Have to trade meters, generators, microphones, sw parts, lettergraph, etc. For list write to Stanley J. Niecwirz, 79 Church St., Broad Brook, Conn.

WILL GIVE 50 DIFFERENT FORelgn stamps for any and every 15 U.S. commemoratives. William Senerchia, 45 East Avenue, Natick, R. I.

HAVE SILVER MARSHALL chassis complete. Majestic International compact, induction phono motor, theatre type pick up, P.M., electro dynamic, and A.C. dynamic speakers. Want Sky Buddy or similar receiver. Anthony Ravutsky, 112 N. 4th St., West Hazleton, Pa.

HAVE A AND B SUPPLY AND combined 2 tube AF amplifier, requires driver, less tubes. Inquiries invited. Value approximately $5. Desire IF transformers or? Henry Newhouse, R. R. No. 2, Amora, Ind.

HAVE: B ELIMINATOR, POWER pack, Genemotor, radio parts, mounted porcupine, Want rifles or what. John Haynes, Doe Run, Missouri.

HAVE BAT. MOTOR-GENERATOR in good shape and other radio parts. Trade for 5-10 meter transceiver sets. Chester L. Knight, Central Park, Box 221, Houston, Texas.

CALLING ALL READERS. CORREspondents, either sex wanted in all countries. Write English or French. Exchange local views, near London. Send with first letter. Reply 100%. Ernest B. Riley, 12 Springfield Road, Thornton Heath, Surrey, Eng.

WANT TO SWAP A GOOD BATtery operated 4 tube amateur receiver for a 3 tube AC ham receiver. Write to me for more information. Harold C. Lantow, W9SEF, Renwick, Iowa.

WANT TO CORRESPOND WITH 3 or 4 readers who are studying Radio Beginners series of lessons in Radio & Television, preparing for amateur examination. Geo. B. Thompson, M.D., 1013 South Orange Drive, Los Angeles, California.

WANTED: BURNED OUT POWER and modulation transformers. State type and what wanted. Geo. W. Coleman, Clinton, Pa.

WANTED—RC RECEIVER PEARL model 41D, chassis only. Will pay cash. All letters answered. Harry Vincent, 52 Swinton St., Albany, New York.

WANTED—RIDER MANUALS, 0 to 5 milliamp meter, and 6F7, 6A4, 1V and 76 tubes. Pay cash or trade stamps, 12 inch speaker and Kolster transformer for pair of 81's. William Ballou, Rt. 2, Circleville, Ohio.

8MM PROJECTOR, CAMERA, Silver Deluxe screen, three 200 ft. reels and splicer. Practically new. Will trade for radio testing equipment or a late model gas driven washing machine motor. John Talbott, Draper, North Carolina.

HAVE 2 TUBE BATTERY SHORT wave set. Will swap for transceiver, physics course, signal generator, tube tester, or what have you? John Rusnak, 154 Spring St., Johnstown, Pa.

HAVE SET HIGGINS GOLF clubs, fishing reels, 1, 2 and $5 stamps; want SW3, parts, receiver, meters, or? H. C. Campbell, P. O. Box 582, Austin, Texas.

WILL TRADE 7096.9 KC QUARTZ crystal for a quartz crystal which is ground for anywhere between 3500 and 3650 KC. Must be good oscillator. M. W. Schuster, 919 W. 4th St., Mt. Carmel, Ill.

HAVE WINGS AUTO RADIO, Atwater Kent Genemotor 180V. at 40 mil.-amp. 6V.-at 2 amps. Trade for good portable 2vt. receiver or any good receiver of 2vt. type. Ben F. Locke, Marthaville, La.

WANT STAMPS, MINT AND used U.S. and foreign. Will trade new .22 cal. rifle for mint U.S. comm. before 1935, etc. Write W. F. Weatherly, R.R.1, Menominee, Mich.

TRADE 2 GAS MODEL AIRplanes, radios, meters, s.w. converter, chemicals, microscopes and rifles for what have you. Am interested in outboard motor. Need not be in running condition. Specify faults. Harry Rohm, R-1, Hinsdale, Ill.

SWAP: REMINGTON REPEATER, Crossman air rifle, Senior Brownie, leather puttees, stamps, model airplane equipment, bugle, post cards from many countries. Want Sky Buddy or? J. Bryant, Jr., 304 E. Walnut St., Washington, Indiana.

HAVE KOLSTER RCVR., 7 TUBES with power supply, good condition; 2 tube s.w. revr., verifications 28 countries; magnetic speaker, earphones. Also will exchange printing for musical instrument or what? Daniel Platek, 225 Division Ave., Brooklyn, N. Y.

WANTED: TOY MOLDS, RADIOS, movie films and machines, etc., binoculars, testing instruments, windcharger. Have radios, record changers, amplifiers, anything. Warren W. Wigner, 1220 Fairview, Fort Wayne, Ind.

TRADE: 75M. COTO-COILS AND four crystal for 160m. Coto coils and crystal, never used. Class A prime; mod. 10 watt for class B 4-46's speech included, also 3A Shure mike. Send for list. E. W. Saxe, 1932 Faye Rd., Akron, Ohio.

HAVE A 1938, 6 TUBE, 6 VOLT Reliance all wave, 3 bands, 19 to 49 meters S.W. Will trade for typewriter. Francis W. Bilderback, Durand, Wis.

SWAP 12" WRIGHT-DECOSTER P.A. speaker and other radio parts for meters, microphone, crystals on any band, or "bug" key. Also swap genemotor for Sky Buddy or similar receiver, or? Jack Spencer, 513 W. Lee Ave., Ruston, La.

HAVE 17 AVIATION MAGAZINES, cost $2.50, stamps cost $10, new knife kit cost $5.50, drill kit cost $2.50, scout knife, handbook, signaler. Want camera, or? Sidney Young, E. Machias, Maine.

SWAP GENERAL RADIO WAVE meter scale calibrated, three bands, using hot wire galvanometer as indicator also have coil winder winds plugin. Want MacKey or other good bug. John Zubas, Irvington, N. Y.

SWAP—425 POWER WOLLENSAK amateur microscope for model "A" or "B" Argus camera or Argus enlarger. F. P. Pratt, Jr., Salisbury, N. C.

WILL SWAP A GOOD KENNEDY S.W. converter covering 15 meters to B.C., 2 tubes, for what have you. C. L. Sheffler, 230 E. Main St., Waynesboro, Pa.

WANTED—TELEPLEX OR OTHER code instruction equipment including solenoid, honeycomb, and transformers, taps. Charles Lewis Berkemeier, 3614 Ferndale Avenue, Baltimore, Maryland.

WANTED: JEWELL VOLTMETER, 4 inch; Model 25 0-3000 volts D.C. With resistance box; must be in repairable condition. George Sandt, 11 Pen Argyl St., Pen Argyl, Pa.

STAMPS WANTED — MEDIUM priced Br. Colonies, Newfoundland. Will trade handsome men's wristwatch, recent-old Radio & Televisions, etc., boy's books, camera, stamp catalog, also stamps, cash. Make offers. Box 755, Leamington, Ont., Canada.

TRADE: ALMOST NEW NATIONal SW3 with three sets of coils and power supply. Want Hallicrafters new model Sky Champion or other Hallicrafters other than Sky Buddy. QRA Hue Diament, Perkiomen School, Pennsburg, Pa.

WANTED: SHORT WAVE RECeiver, or what have you. Will trade ¼ H.P. electric motor, $15 chemistry set, $15 bicycle, 200 scientific and radio magazines, cornet, 8 tube auto receiver. Guy Carter, Lynchburg College, Lynchburg, Va.

HAVE NEW MOVIEMATIC CAMera, new electric shaver, cameras, books, etc. Want Reflex or fast miniature camera, enlarger, photographic items, or? Michael Gianfrocco, 604 Union Ave., Prov., R. I.

AUTOGRAPH COLLECTION, ALL personally obtained, many dedicated "To Paul". Will trade for 110 V. A.C. gasoline generator or? Inquiries invited. Address Paul Kowtna, 347 East 61 Street, N.Y.C.

TRANSMITTER. WANTED CW-Phone all bands about 75 watts, would like Utah kits 1-2-3, will pay cash or trade for Leedy trap drum outfit complete. William Tietz, 1610 Mahan Ave., Bronx, N. Y. C.

HAVE: S-W CONVERTER (3 amateur bands), transformers, speakers, other radio parts, and a mandolin-guitar. Want: S-W rec'v. for all bands, small x-mitter, radio mags., or what have you. H. Aelker, Jr., Henderson, W. Va.

WANTED, COMPLETE A.C. 110 volt 2 tube all wave receiver using plug in coils. Have 1 tube bat. receiver, radio parts, etc. Send for list. W. R. Cunningham, R.R. 10, Box 12, Indianapolis, Indiana.

HAVE DYNAMIC SPKR., 620 Brownie camera, Erector set, electric train, Jewell 0 to 6 voltmeter, floor model marble pin game, Cook electrical course, Popular Science & Mechanics books. Want Sky Buddy (similar recvr.). Douglas Phelps, Sidney, New York.

SWAP FOR RECEIVER, KODAK Recomar f.45, exposure meter, filters, etc. Johnson 16 H.P. outboard motor value $200.00. R. Blanchard, 59 Sweet Ave., Woonsocket, R. I.

WANT VOLT-OHMMETER, OR meter alone, "iron core" coils and I.F.'s (262 KC.) Radio course, Trade Freemanship course, auto radio, typewriter, etc. Geo. T. Kell, 418½ W. Spring, Freeport, Ill.

SWAP PORTABLE B.C. RECEIVer complete batteries and earphone self contained (6x8x8in.) using 1 19, for what have you. R. Perlich, 3635 So. Wood St., Chicago, Ill.

(Continued on following page)

BARTER and EXCHANGE FREE ADS (continued)

WANT USED CODE INSTRUCTOR, Teleplex, Instructograph, etc. Swap aviation, stamp, magazines; model airplane kits. Will pay cash for difference, if any. Will consider all cash if not too much. Lewis, 54 Highland, Port Washington, N. Y.

WANTED FIVE HAMMARLUND XP53 4-prong coils 17-560 meters. Also single Hammarlund type MC semi-circular tuning condensers 140 mmfd cap. Must be a bargain. Peter Luciw, 56 Palmerston Ave., Toronto, Ont., Canada.

TRADE 4"X5" PLATE CAMERA with fast lens, printing frames, developing trays, and movie slide projector for FB7A or any other communication receiver. Harold Christianson, 1121 Molinc Street, Stoughton, Wisconsin.

1000 RCA RESISTOR-CONDENSER strips of 5-8 popular size units; Photographic History World War; assortment parts; tubes; custombuilt preheater-neon short-checker; Majestic 15 chassis Magnavox speaker. What have you? Mosieh, 4002 Sixth Ave., Brooklyn, N. Y.

WANT P.A. TRUMPETS AND units 4 to 6 ft. State lowest cash price or will trade radios or parts. Also want recording equipment, recording heads, etc. QRA V. C. Halls, St. Marys, Ohio.

WANTED — RADIO PHYSICS course, Modern Radio Servicing and other radio, electric, watch repairing books and volt-ohm-milliammeter. Have electric shaver, jewelled wrist and pocket watches. Miner, Oakdale, Iowa.

TRADE RADIO PARTS AND AMplifier; 110 volt DC to AC converter; 35mm motion picture projectors; B.&S. gas engines. Want —RCA 16 mm sound camera or 16mm projector. Wm. Hansen, Niles, Mich.

WILL SWAP RADIO AMATEUR'S Handbook, Radio Amateur Course, also stamp collection for pair of 6L6's, 40 meter xtal, or good radio parts. All letters answered. John Ritchie, 69 Marlborough Ave., Toronto, Canada.

WILL TRADE ONE RACO R-9 signal booster and pre-selector for portable typewriter or small portable battery radio or what have you. D. F. Duranso, Route 1, Box 161-A, Cashmere, Wash.

AM A BEGINNER IN HAM radio. Would like some "OT" to send me plans for an economical 20, 40, 75, 160 meter xmitter, fone. Vy best 73's. Seymour Albin, 255 Quincy Ave., New York, N. Y.

HAVE GUITAR WITH CASE, cost $16.00 new, was in use only a few hours. Want communication receiver in good condition. Frank Gazarek, 1124 W. 18th Pl., Chicago, Ill.

SWAP CAMPAIGN BUTTONS FOR paper match folders. Would like to have old Thordarson 1-kw. spark transformer, 25,000 volt. Bill McCord, 3060 Phipps St., Indianapolis, Ind.

HAVE RADIOLA 33, CAN BE converted to a fb TRF SW receiver with 2 changes, as good as new. Also Fall 1938 Call Book—Want xmitter parts. WILDD, 64 Zeigler St., Roxbury, Mass.

WILL SWAP A 3-TUBE S.W. SET, radio parts, swing phonograph records for what have you? I have many articles for swap. Write for list. Marty Weltz, 80 Lawrence St., Oswego, N. Y.

SWAP CHEMICRAFT CHEMICAL set with box and instructions. Want uke, banjo-uke or banjo, also recording head and leadscrew. What do you want? Will swap SWL's. Henry R. Botkin, Jr., 118 N. Main St., St. Marys, Ohio.

WILL TRADE GOOD FOREIGN stamps for mint U.S. blocks or singles. Also want old U.S. coins, Lincoln mint cents. Collander, 905 5th Ave., Moline, Ill.

TRADE 1-5G GRUNO AND 1-11A Gruno, both in A1 condition. Will trade for anything in the radio line. John Wallace, 3623 So. Galitan St., Marion, Ind.

POSTCARD COLLECTORS, WOULD like to exchange view cards with you, any place in the world. Would also like to exchange first day covers with foreign collectors. Correspond? Robert Camp, 1042 Water St., Moosic, Pa., U.S.A.

HAVE WORLD'S SMALLEST camera, made by Coronet, England. Takes ½x¾" pictures. Unused, with leather case. Also radio equipment. Want 35mm candid camera, used chemistry set, photographic equipment. Georges Chouinard, 4599 Papineau, Montreal, Canada.

50 FOREIGN STAMPS FOR 15 U.S. commems, except Chicago, NRA and Anthony. Ten tax tokens for 10 U.S. commems., 25 postmarks for 10 U.S. commems. One newspaper for 10 commems. Orville Arnold, Box 311, Henryetta, Oklahoma.

WANTED, PORTABLE BATTERY receiver for B.C. band, completely self-contained in small case and preferably with 1½ or 2 volt tubes. Swap parts or pay cash. W8QEM, 1415 Center St., Wilkinsburg, Pa.

HAVE TUBES, SPEAKERS, chokes, speaker units, B eliminator, Riders No. 1, Philco manual, tone records, chokes, transformers. Want IRE, Univex, transmitting condenser and cathode ray tube. D. Buck, 43 Hagen Ave., N. Tonawanda, N. Y.

WANTED: A "SKY BUDDY" OR similar short wave receiver in exchange for a six tube Stewart-Warner automobile radio in good condition. Stephen Clark, 538 Parkway, High Point, N. C.

HAVE 2 SETS OF PROJECTOR lenses (Kollmarger Optical Corp.) (22203) 8.5 in. Want 5 meter receiver or short wave parts. What have you? Bernard Gerber, 51 Essex St., Swampscott, Mass.

TRADE — STAMP COLLECTION cataloguing $200 for good camera. Also radio magazines for photographic magazines, general chemicals for photographic chemicals and equipment. T. O'Connell, 2977 North 52nd Street, Milwaukee, Wisconsin.

WANTED RADIO PARTS OR A 3 tube A.C. short wave radio or what have you? Will trade chemical supplies and chemicals. Lawren Harbison, Route 1, Box 102, Fort Collins, Colorado.

LYRIC 7 TUBE ELECTRIC RADIO with shortwave converter battery radio, odd parts. Want camera, enlarger, photographic supplies. Best trade offer takes them. You pay freight. Will accept other offers. Edward Labadie, 4522 South Salina, Syracuse, N. Y.

WILL SWAP, 12 FOOT JAMESTown Kayak, gas models, gas motors, plans, One Biplane gas model with new Pee Wee motor. For all kinds of photography equipment. Bernard Linklad, 503 E. 149 St., Cleveland, Ohio.

WANTED: ALL MAGAZINES BY the name of Television published between 1925-28. Will pay cash for all I can get. Give price and condition. Swap SWL cards also. Roger E. Gilbert, 25 Apel Place, Manchester, Conn.

WILL PRINT YOUR QSL CARDS in exchange for Weston, Jewell or Triplett meters, quartz crystals or microphones. Send description and will furnish samples. Write W7AMA, 4036 E. Sixth, Spokane, Wash.

WILL SWAP—15 WATT AMPLIfier 12" spkr. (brand new), Turntable pickup, etc. complete, or 5 tube s.w. receiver, 5 meter transceiver, for small car or? John Liddle, 52 Spring St., Lodi, N. J.

EXCHANGE STAMPS WITH BOYS and girls. Also want to correspond and exchange stamps with people living abroad. Joseph Geller, 39 Myrtle Avenue, Albany, N. Y.

HAVE SEVERAL PAIRS OF EARphones in excellent condition, cartooning course, 150 power microscope, B-eliminator with tube. Want short wave parts or? H. C. Patchen, 23 Grand St., Sidney, N. Y.

HAVE A 50 WATT 6L6-T20-80 CW transmitter, complete, ready to connect to antenna. What have you to offer? Leonard Pochop, W9YRF, 204 So. 16th St., Norfolk, Nebraska.

HAVE USED RADIO PARTS, harmonica, R'A 2 tube radio, 2 tube amplifier, loudspeaker. Want small short wave receiver or transmitter, radio magazines, power supply, stamps, or what? Thomas Silvaggio, 50 Steuben Street, Providence, Rhode Island.

MODEL AF ARGUS (f4.5-1/200) with med. yellow filter in holder, 3 rolls and 25 ft. of E. K. Super-X; F.R. developing tank (35mm to 116); value new $26, for photo, radio supplies, rifle. C. Dye, 7510 S. Figueroa, Los Angeles, Calif.

WILL PAY $12.00 CASH FOR 2 OR 3 tube transceiver with tubes, coils and cabinet. James Hagen, 109 Allendale Street, Rochester, New York.

24 VALUABLE BOOKS, 29 POPUlar Educator, 24 various radio mags, including S.W.&T., first edition "Pleasure" mag., Elgin wrist watch for transmitter radio, parts, radio manuals or what have you. Charles Capses, Grandin, N. Dak.

WILL GIVE CASH FOR RIDERS manuals, tubes, resistors, volume controls, condensers, etc., or will swap. What have you? Joseph Geriado, 159 Sabin St., Pawtucket, R. I.

WILL TRADE WOLLENSAK 450x microscope (value $20.00), for 35mm. candid camera with F:4.5 lens, enlarger, or Weston exposure meter. Give specifications. Will make up difference if necessary. Edwin Bozenski, 2313 Bertrand, South Bend, Ind.

WILL GIVE 25 DIFFERENT postmarks for 10 U.S. commemoratives, or will exchange stamps with any one. Harry Ives, Hardwick, Vt.

TRADE HALLICRAFTERS ULTRA-Skyrider, A-1 condition, less than year old, for Hammarlund Super-Pro, National HRO, RME 69 in equally good condition. Others inquire. Would pay moderate difference if justified. J. H. Hood, 37 Club Drive, Greenville, S. C.

SWL EXCHANGE

SWL LISTENERS IN THE U.S.A. or foreign countries. Will exchange SWL cards and stamps. Also answer any letters the same day I get them. Roy H. Babbitt, R. 1, Killingly, Conn., U.S.A.

CALLING S.W. LISTENERS! I will exchange correspondence and SWL cards with anyone in the world. I QSL 100% here. Q.R.A. Dick Winne, 10 Elmhurst Avenue, Stop 39 Schenectady Road, Albany, New York, U.S.A.

SWL'S ANYWHERE, WANT TO swap cards? We QSL 100%. QRA. Marie and Vince Stasen, 5347 Priscilla St., Phila., Pa., U.S.A.

WOULD LIKE TO EXCHANGE SWL cards with any SWL in U.S. or foreign countries. All cards received here will be answered with our card. QRA. John L. Ballin, 40 East 66 St., New York, N. Y.

SWL'S—I QSL 100%, WUD LIKE to correspond or trade cards with SWL's from U.S. es foreign countries. K. QRA—Robert Parker, Box 41, Ogden, Utah, U. S. A.

ATTENTION YL'S! I WILL QSL 100% with you. 73's es 88's. QRA—Bob Rasche, 2170 E. Lake Rd., N.E., Atlanta, Georgia, U. S. A.

NEED A SWL CARD FROM UTAH? If so, ship one out es I'll oblige by return mail. 100% QSL. Let's hear from you. What sa? QRA: Mac Elwyn Van, Sandy B.F.D., Box 332, Union, Utah.

OM'S! YL'S! HAMS! SWL'S! I exchange correspondence and SWL cards. Send your QSL and I'll send mine. Let's hear from the foreign countries. Bill Rasins, 6611 S. Rockwell Street, Chicago, Illinois, U.S.A.

SWL SWAPPERS, ATTENTION! Send me your card and I'll send you mine, U.S. and foreign 100% always. Do it today. My QRA is John L. Tate, 612 Halifax Street, Petersburg, Virginia, U. S. A.

HI, YL'S ES OM'S. WILL SEND my SWL card for yours. I QSL 100%. Nicholas Spanos, 340 Market St., Lowell, Mass.

WILL SWAP SWL CARDS. SEND your cards. We will send our cards. A. J. Schwartz, P.O. Box 695, Albany, N. Y.

ATTENTION SWL'S AND "VERI" collectors throughout the world. Will swap SWL cards and correspond with anybody. I QSA 100%. Charles Baxa, 2678 N. Halsted St., Chicago, Ill., U.S.A.

ENGLISH SWL CALLING, WOULD like to exchange cards and correspond with any foreign SWL's or hams. What say someone please? dah-dit-dah. G. Miles, 73 Palm Avenue, Footscray, Kent, England.

SHORT WAVE LISTENERS U.S. and foreign countries. Will swap my QSL card for yours. I QSL 100 per cent. Denys Crampton, 35, York Road, Southport, England.

YOUR SWL CARD WILL BE appreciated for my collection. Will answer all received. Lewis Neuman, Box 8363, Pittsburgh, (18), Pa.

SWL'S IN U.S.A. AND FOREIGN countries, I will send one of my new SWL cards to anyone who sends me one of theirs. I SWL 100%. QRA John Zsembik, Jr., 1574 Lakewood Ave., Lakewood, Ohio.

WILL SWAP SWL CARD IN ALL countries. I QSL 100%. All mail answered by return. Luther Schnake, 1608 Campbell Ave., Des Plaines, Ill.

ATTENTION ALL DX SWL'S. I will be very glad to exchange SWL cards and keep correspondence with you. DX SWL's only. My QTH is: Hensley Morehen, 66 Curtis Street, San Francisco, California, U. S. A.

SWL'S OF THE WORLD, WOULD like to swap my SWL cards for one of yours. I will QSL 100% by return mail. QRA is Arthur E. Coleman, 1208 4 Ave., Watervliet, N. Y., U.S.A.

SWL'S AND HAMS—ANYWHERE in the world. I wish to correspond with you. Your SWL or QSL appreciated. I will send you my SWL. Robert Guest, 359 N. Charlotte St., Pottstown, Penna., U.S.A.

SWL'S IN THE U.S.A. AND FOReign countries, let's swap cards and photos, wotsa? Will also swap U.S. and foreign stamps. Will QSL 100%. QRA: Noel E. Kurtz, Xenia, Illinois, U.S.A.

SWL'S IN ANY COUNTRY, LET'S exchange SWL cards. We QSL 100%. Come on OM es YL's. QRA. John Goslin, 738 1st St., N.W., Clarion, Iowa, U.S.A.

1-Tube Receiver

(Continued from preceding page)

Tuning this receiver is simplicity itself. Connect the power supply, phones and antenna. Insert a coil in the coil socket, and with the two condensers at any random setting advance the regeneration control until a faint and smooth plop is heard. This indicates that the detector has broken into oscillation and is the most sensitive position of the control for the reception of CW-telegraph signals. For the reception of music and voice signals the regeneration control should be backed off a little, so that the detector does not oscillate. The band-set condenser is then set to some value of capacity such that varying band-spread tuning condenser will result in the reception of the desired band of frequencies. To set the condenser for operation in one of the amateur bands, set the band-spread condenser to about 10 per cent of its maximum value and slowly turn the band-setting condenser until the high frequency end of the desired band is heard. Thereafter, all tuning is accomplished with the band-spread condenser.

1-Tube Receiver—Parts List

HAMMARLUND

1—Six-prong isolantite socket, type S-6
1—Octal isolantite socket, type S-8
1—35 mmf. tuning condenser, type MC-35-M
1—100 mmf. tuning condenser, type MC-100-M
1—Set 6-prong coils, type SWK-6
1—10 meter, 6-prong coil, type SWC-60
1—2.1 mh. R.F. choke, type CH-X
1—3-30 mmfd. trimmer condenser, type "MEX"

SPRAGUE PRODUCTS CORP.

3—.0001 mfd. mica condensers, type 1FM-31
1—.004 mfd. mica condenser type, LFM24
1—.5 mfd. paper condenser, type TC-5

I.R.C. (Resistors)

1—40,000 ohms ½ watt resistor, type BT-½
1—3 megohms ½ watt resistor, type BT-½
1—15 megohms ½ watt resistor, type BT-½
1—500,000 ohm ½ watt resistor, type BT-½
1—50,000 ohm potentiometer, type 11-123
1—Double pole single throw switch for mounting on potentiometer

THORDARSON ELECTRIC MFG. CO.

1—1080 henry audio choke, type T-29C27

CROWE NAME PLATE & MFG. CO.

1—4" dial, type 296
2—Small bar knobs, type 286
1—Metal cabinet, type 245
1—Small 1¾" dial plate, type 569
1—Small 1¾" dial plate, No. 25

RAYTHEON

1—6P7G tube.

COIL TABLE

Frequency	L1 (Reg. Ant.)	Doublet
10- 20 meters	2.2 turns	2
17- 41 meters	5.8 turns	3
33- 75 meters	11.8 turns	5
66-150 meters	24.1 turns	7
135-270 meters	47.8 turns	12

Follows same frequency sequence

L2	L3
3.3 turns #16, length ⅞"	3.2 turns
8.7 turns #16, length 1¼"	3.8 turns
17.7 turns #20 enameled, length 1½"	5.8 turns
37.7 #24, length 1 9/16"	10.8 turns
81.7 #28 enameled, length 1⅞"	16.8 turns

ALL COILS WOUND ON HAMMARLUND XP-53 FORMS (dia. 1½"). L1 and L3 wound with #32 d.s.c. wire. L3 wound ¼" from L2.

Correction

In the "Question Box" for November diagram of Beam-a-Scope was incorrect.

In the diagram, the gang condenser (450 mmf.) was shown as being connected between the combined "C" and "D" band grid coils. In reality, this is the "B" band antenna trimmer and has a value of 5-40 mmf. The antenna gang of the tuning condenser is connected directly between the grid of the 6K7 R.F. tube and ground; in this manner, the Beam-a-Scope is tuned over the complete broadcast band the same as an ordinary "B" band grid coil.

A Low-Power Emergency 'Phone Transmitter

(Continued from page 550)

two triode sections tied in parallel. The speech section is equally simple, an 89 acting as speech amplifier to drive a single 6A6 as a Class "B" modulator. This modulator arrangement will provide an adequate supply of audio power to fully modulate the R.F. stage at any input power up to about thirty watts.

As will be seen from the top photograph, the base is divided evenly into two compartments by using a vertical aluminum shield four inches high crosswise of the base. One of these compartments is then used to hold the microphone transformer, speech amplifier tube, the Class "B" input transformer, the modulator tube, and the modulation transformer.

Because the unit was designed for 75 meter operation, the coils were wound on short lengths of 2" diameter bakelite tubing, and then were mounted by means of small angle brackets in a vertical position so that the plate coil encircled the tube with which it was used. By putting the tubes in the center of the coil, a smaller and more compact unit was possible.

The plate tuning condenser for the oscillator is mounted below the chassis, directly under the crystal socket and alongside the tube socket. The neutralizing and plate condensers for the R.F. amplifier are mounted under the chassis with the shafts protruding up alongside the plate coil. The oscillator tank is adjusted from the side, while the neutralizing and amplifier plate condensers are adjusted from above.—Courtesy Allied Radio Corp.

Parts List for Emergency Phone Transmitter

1—1 W. 10,000 ohm carbon resistor
3—2.5 mh. midget R.F. chokes
2—Eby 6-prong baseboard tube sockets
2—Eby 7-prong baseboard tube sockets
1—Eby 5-prong baseboard tube socket
1—Single-button mike transformer
1—Thordarson T67D60 Class B input transformer
1—Thordarson T67M59 Class B output transformer
2—2" pieces bakelite tubing, 2" diameter
2—Grid clips, glass tube type
1—Baseboard ⅛" bakelite 5¾" x 10½"
2—Base brackets, U shape, 1½" x ½" x 6"
1—.00025 mf. mica condenser 600 V.
1—**AEROVOX** type No. 1450 .01 mf. 1,000 V. mica condenser
1—50,000 ohm 1 watt carbon resistor
1—1 mf., 200 V. bypass condenser
2—Cardwell 100 mf. Trimair condensers, type ZU-100-AS
2—Piece aluminum shield, 4¼" x 6" x 1/16"
1—Cardwell 10 mf. Trimair condenser, type ZR-10-AS
1—.002 mf., 600 V. mica condenser
3—4-lug terminal strips
6—¾" x ¾" angle brackets

Answers to QUIZ on page 571

1. b
2. b
3. c
4. c
5. a
6. d
7. a
8. b
9. d
10. b & d
11. a & c
12. a or b—both will work
13. b—he has become a newspaper publisher
14. d—it's common table salt
15. aA, bC, cE, dB, eD
16. aB bC cA
17. b
18. aC bA cD dB eF fE
19. a
20. b and sometimes c
21. c
22. d a g c f b e
23. e & f
24. d
25. c

OOOPS! SORRY!

Errors crept into two of the answers to the November Quiz. In Ans. 9, the data should have read, "a—but more from the negative lead." In Ans. 24, the correct data are, "d 8, c 6." The Prof. thanks the more than 2000 readers who wrote in about it.

FREE CATALOGS and INFORMATION

By carefully reading the advertising columns, you will find many offers to furnish literature containing valuable technical information that will help you in your work. Use this list freely.

Firm	Business	Offer	No.	Cost	Adv. Page
Allied Engineering Inst.	Kit Mfr.	Circulars		Free	552
Allied Radio Corp.	Mail Order	1939 Catalog		Free	555
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Brush Development Co.	Parts Mfr.	Catalog		Free	551
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		Station Log & Data Bk.		10c	
Burstein-Applebee Co.	Mail Order	Catalog		Free	567
Cameradio Co.	Mail Order	Information		Free	567
Candler System Co.	Code Course	Book of Facts		Free	569
Cannon, C. F., Co.	Parts Mfr.	Folder	T-1	Free	556
Cornell-Dubilier Elec. Corp.	Parts Mfr.	Catalog	161	Free	554
		C-D Condenser		Free	
Coyne Electrical School	Trade School	Electrical Catalog		Free	515
		Radio Catalog		Free	
Dodge's Institute	Radio School	Catalog		Free	569
Eagle Radio Co.	Kit Mfr.	S. W. Diagrams		Free	565
Eastern Mfg. Co.	Mfr.	Circular		Free	563
Gold Shield Products	Mail Order	Catalog		Free	558
Hammarlund Mfg. Co.	Set & Parts Mfr.	1939 Catalog		Free	551
		16 page Booklet	T-1	Free	
Harrison Radio Co.	Mail Order	Information		Free	558
Henry, Bob	Mail Order	List		Free	556
Instructograph Company	Code Machine	Information		Free	569
International Corres. Schools	Corres. School	Booklet		Free	576
Korrol Radio Products Co.	Parts Mfr.	Folder		Free	556
Kusterman, Oscar B.	Set & Kit Mfr.	Catalog		10c	553
		Circular	D39	3c	
Mass. Radio School	Radio School	52-page Catalog		Free	569
Midwest Radio Corp.	Set Mfr.	1939 Catalog		Free	554
National Company, Inc.	Set & Parts Mfr.	Catalog		Free	I.B.C.
National Radio Institute	Radio School	64-page Book		Free	513
National Schools	Radio School	Radio & Television Bklt.		Free	569
N. E. Radiocrafters	Parts Mfr.	Catalog		Free	563
New York YMCA Schools	Trade School	Booklet		Free	568
Par-Metal Products Corp.	Parts Mfr.	Catalog		Free	576
Radio & Technical Publ. Co.	Radio Textbooks	Circulars on each Book		Free	549,568
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RCA Mfg. Co., Inc.	Set & Parts Mfr.	Literature		Free	553
Sargent, E. M., Co.	Set Mfr.	Data		Free	561
Sears, Roebuck & Co.	Mail Order	1939 Radio Catalog	8132	Free	561
Solar Mfg. Corp.	Parts Mfr.	General Parts Catalog	9S	Free	549
		Transmitting Catalog	2X	Free	
		Condenser Testers Cat.	CBCC-1	Free	
Sprague Products Co.	Parts Mfr.	Catalog		Free	565
Sprayberry Acad. of Radio	Radio School	52-page Book		Free	B.C.
Superior Instruments Co.	Test Equipment	Catalog		Free	545
Teleplex Co.	Code Machine	Folder	S-1	Free	568
Triplett Electrical Inst. Co.	Parts Mfr.	Catalog		Free	549
Tri-State College	Radio School	Catalog		Free	568
Turner Co., The	Parts Mfr.	Catalog		Free	567
Universal Television System	Television School	Literature		Free	559
Ward, Montgomery, & Co.	Mail Order	1939 Radio Catalog		Free	563
Wholesale Radio Service Co.	Mail Order	1939 Radio Catalog	73	Free	557
		Record Player Bulletin	4	Free	

World S-W Stations

(Continued from page 562)

6.007	ZRJ	JOHANNESBURG, S. AFRICA. 49.94 m., Addr. S. African Broadcast. Co., 3.30-4 pm. exc. Sun.
6.005	HP5K	COLON, PAN., 49.96 m., Addr. Box 33, La Voz de la Victor. 7-9 am., 10.30 am.-1 pm., 5-11 pm.
6.005	CFCX	MONTREAL, CAN., 49.96 m., Can. Marconi Co. Relays CFCF 6.45 am.-12 m.; Sun. 8 am.-10.15 pm.
6.005	VE9DN	DRUMMONDVILLE, QUE., CAN., 49.96 m., Addr. Canadian Marconi Co.
6.004	RV59	MOSCOW, U.S.S.R., 49.97 m. Irregular.
6.002	CXA2	MONTEVIDEO, URUGUAY, 49.98 m. Addr. Rio Negro 1631. Relays LS2, Radio Prieto, Buenos Aires. 10 am.-10 pm.
6.000	ZEA	SALISBURY, RHODESIA, S. AFRICA, 50 m. (See 6.147 mc., ZEB.) Also Sun. 3.30-5 am.
6.000	XEBT	MEXICO CITY, MEX., 50 m. Addr. P. O. Box 79.44. 8 am.-11 am.

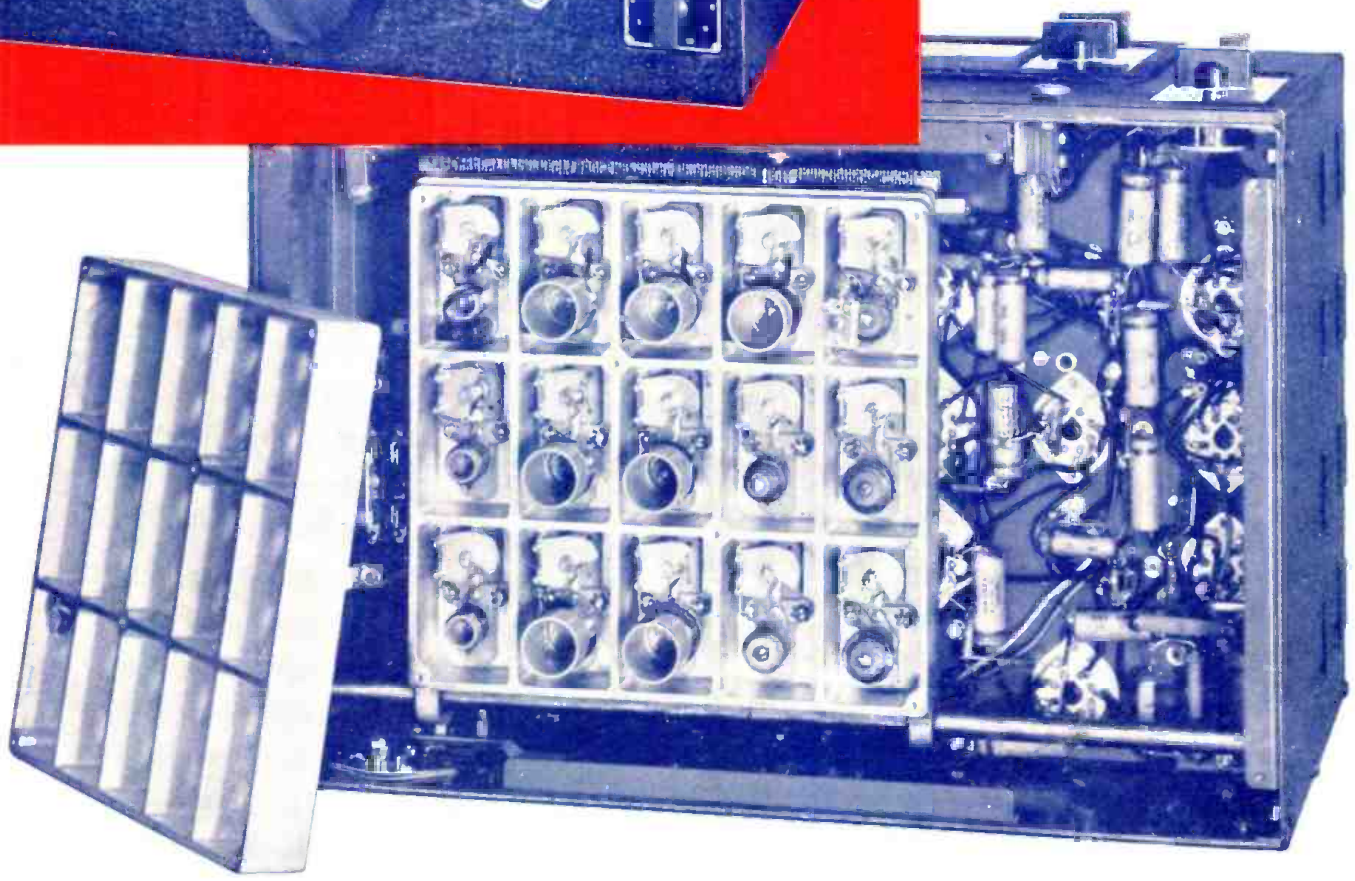
End of Broadcast Band

5.977	CS2WD	LISBON, PORTUGAL, 50.15 m., Addr. Rua Capelo 5. 3.30-6 pm.
5.975	OAX4P	HUANCAYO, PERU, 50.16 m. La Voz del Centro del Peru. 8 pm. on.
5.970	YV5RC	CARACAS, VEN., 50.26 m., Addr. Radio Caracas. Sun. 7 am.-10 pm. Daily 7-8 am., 1-1.45 pm., 4-9.30 or 10 pm.
5.968	HVJ	VATICAN CITY, 50.27 m. Off the air at present.
5.950	HH2S	PORT-AU-PRINCE, HAITI, 50.37 m., Addr. P. O. Box A103. 7-9.45 pm.
5.935	YVIRL	MARACAIBO, VEN., 50.52 m., Addr. Radio Popular, Jose A. Higuera M, P. O. Box 247. Daily 11.43 am.-1.43 pm., 5.13-10.13 pm.; Sun. 9.13 am.-3.13 pm.
5.913	YV4RP	VALENCIA, VEN., 50.71 m. Irreg.
5.900	ZNB	MAFEKING, BRI. BECHUANALAND S. AFRICA, 50.84 m. Addr. The Govt. Engineer, P. O. Box 106. 6-7 am. 1-2.30 pm.
5.900	TILS	SAN JOSE, COSTA RICA, 50.85 m. 6-10 pm.
5.898	YV3RA	BARQUISIMETO, VEN., 50.86 m., Addr. La Voz de Lara, 12 n.-1 pm., 6-10 pm.
5.885	HI9B	SANTIAGO, D. R., 50.95 m. Irregular 6-11 pm.
5.875	HRN	TEGUCIGALPA, HONDURAS, 51.06 m. 1.15-2.15, 8.30-10 pm.; Sun. 3.30-5.30, 8.30-9.30 pm.
5.855	HI1J	SAN PEDRO DE MACORIS, D. R., 51.25 m., Addr. Box 204. 12 n.-2 pm., 6.30-9 pm.
5.845	YVIRB	MARACAIBO, VEN., 51.3 m., Addr. Apartado 214. 8.45-9.45 am., 11.15 am.-12.15 pm., 4.45-9.45 pm.; Sun. 11.45 am.-12.45 pm.
5.825	TIGPH	SAN JOSE, COSTA RICA, 51.5 m., Addr. Alma Tica, Apartado 800. 11 am.-1 pm., 6-10 pm. Relays TIX 9-10 pm.
5.813	TIGPH2	SAN JOSE, COSTA RICA, 51.59 m., Addr. Senor Gonzalo Pinto, H.
5.790	TGS	GUATEMALA CITY, GUAT., 51.75 m. Casa Preidencial, Senor J. M. Caballeroz. Irregular.
5.758	YNOP	MANAGUA, NICARAGUA, 52.11 m. 8-9.30 pm.
5.740	YV2RA	SAN CRISTOBAL, VENEZUELA, 52.23 m., Addr. La Voz de Tachira. 11.30 am.-12 n., 5.30-9 pm., Sun. till 10 pm.
5.735	HCIPM	QUITO, ECUADOR, 52.28 m. Irregular 10 pm.-12 m.
5.145	OK1MPT	PRAGUE, CZECHOSLOVAKIA, 58.31 m., Addr. (See OLR, 11.84 mc.) Fri. 4.45-5.10 pm.; Sat. 5.15-5.40 pm.
5.145	PMY	BANDOENG, JAVA, 58.31 m. 5.30-11 am.
4.995	VUD2	DELHI, INDIA, 60.06 m., Addr. All India Radio. 7.30 am.-12.30 pm.
4.950	VUM2	MADRAS, INDIA. 60.61 m. Addr. All India Radio. 7 am.-12 n.
4.905	VUB2	BOMBAY, INDIA, 61.16 m. Addr. All India Radio, 7 am.-12.30 pm.

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.)

NC-100 XA



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Look at the HF coils in the NC-100XA above. Each in its own separate compartment in the heavy cast aluminum shield. Each of low-loss construction, painstakingly wound and carefully matched. Each trimmed by an air-dielectric condenser. And each with the shortest possible leads, for the entire coil assembly moves on a track, bringing the desired coil range into position directly below the main tuning condenser. Such construction is expensive, but it is typical of the quality that extends to every detail . . . National builds to a quality standard, for men who judge receivers on performance.

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. . . . These will enable you to carry out additional interesting experiments that will further make the theory of Radio crystal clear to you. Don't forget . . . . what you learn by working with your own hands, you always remember

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