

# RADIO & TELEVISION

FORMERLY  
SHORT WAVE & TELEVISION

In This Issue —

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

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of NEW  
"HAMS"



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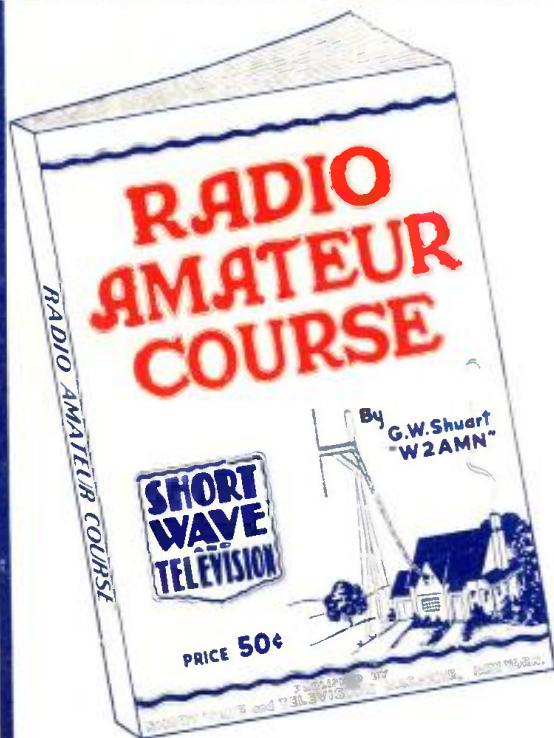
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I'll take your training. That's what S. J. Ebert said. He is making good money and has found success in Radio.

*two men*



I'm not interested. That's what this fellow said. Today he would be ashamed if I gave you his real name and salary.

*when I said:*

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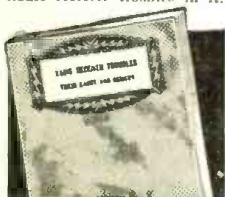
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# RADIO & TELEVISION

*The Popular Radio Magazine*

JANUARY—1939

Vol. IX No. 9

HUGO GERNSBACK, Editor  
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RADIO & TELEVISION

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- Radio Inventions of Tomorrow.
- A One-Tube Watch Charm Receiver—L. S. Hoover.
- New Radio Amateur Course—C. W. Palmer, E.E.
- Television for the Beginner.
- Britain Invading U.S. Television Field.
- "Economy-3" Battery Receiver Using  $\frac{1}{4}$  Vt. Tubes—Harry D. Hooton, W8KPX.
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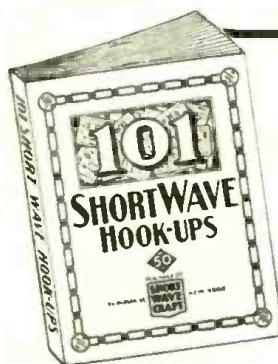
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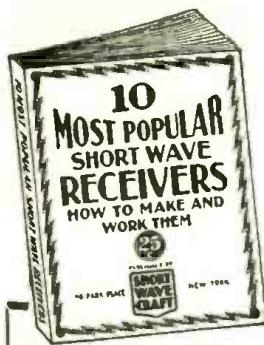
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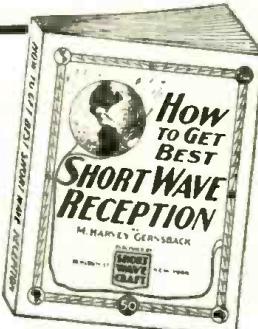
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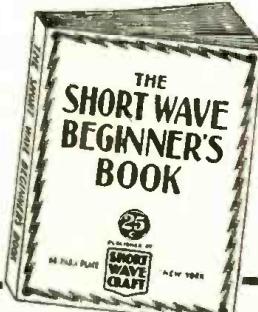
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Please say you saw it in **RADIO & TELEVISION**

# RADIO & TELEVISION



HUGO GERNSBACK, EDITOR

H. WINFIELD SECOR, MANAGING EDITOR

## Television—

### *Tomorrow's Big Opportunity*

William Dubilier

● 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 prettiness 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 broad-

casting 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.



Copyright by Elwin Neame

William Dubilier, a pioneer in the realm of radio invention and development. Mr. Dubilier is Technical Director of the Cornell-Dubilier Electric Corporation. He is also associated with a number of other radio companies, both in this country and abroad.

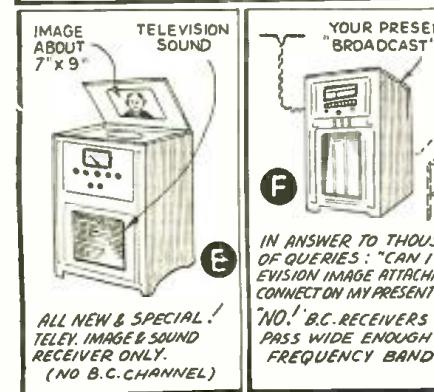
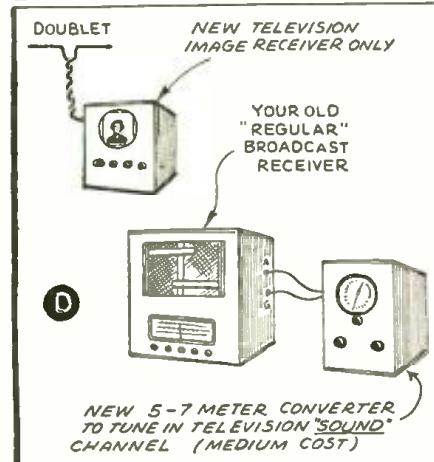
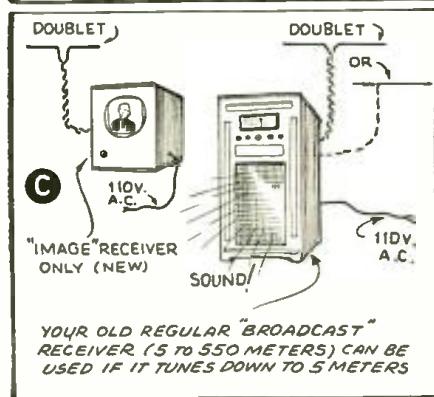
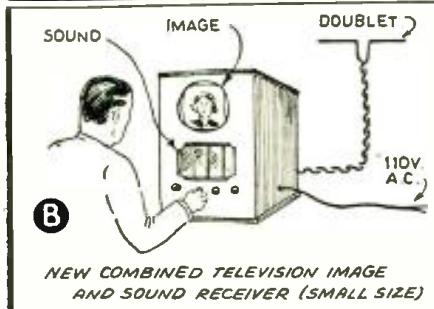
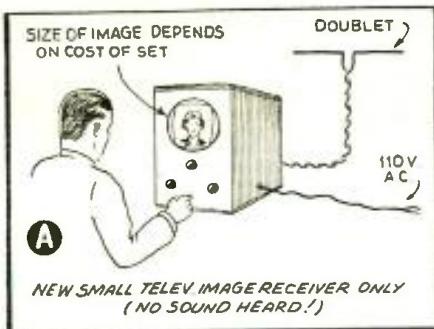
The Society of Motion Picture Engineers has taken steps to appoint a committee, headed by Dr. Alfred N. Goldsmith, well-known radio expert and engineer, to coordinate the pictures and television. It has been definitely proven that without good plays and actors to be televised, public interest in television 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.

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

**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

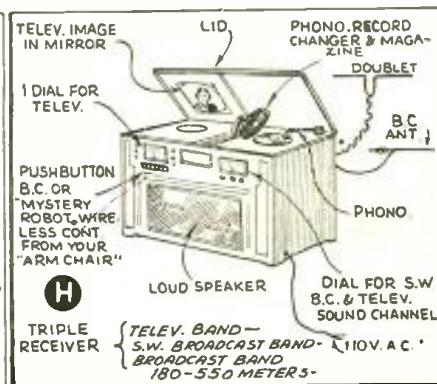
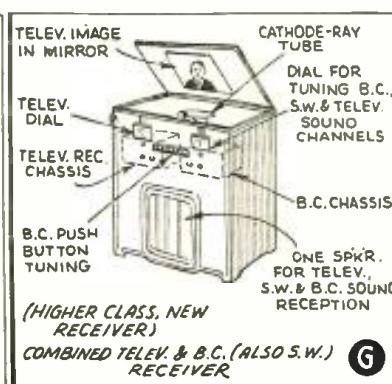
The larger cities will undoubtedly be first to enjoy television programs, and New York will have two stations in operation shortly after the first of the year—the NBC transmitter, atop the 1300 foot Empire State Building; and the CBS transmitter in the Chrysler Tower. Another station is to be erected 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

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".)

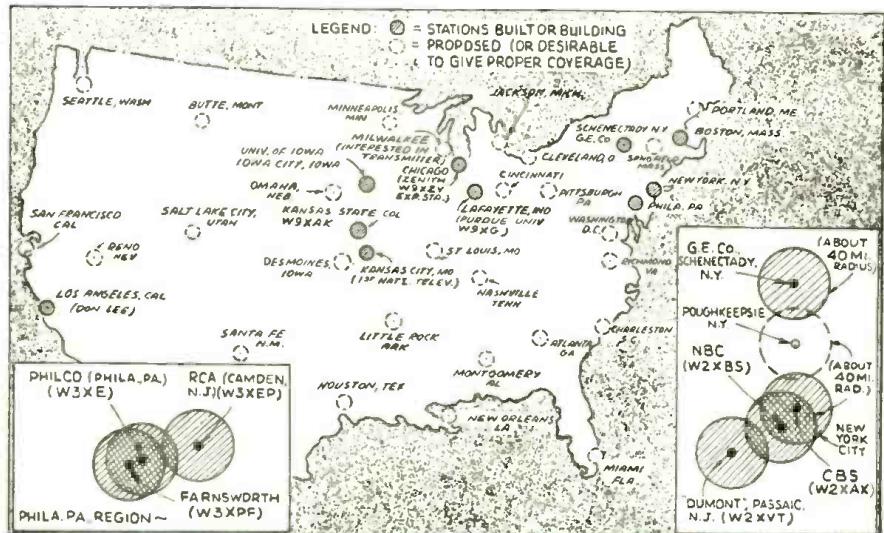
For a price varying between possibly \$250.00 and \$350.00, a combined television image and sound receiver built into a console cabinet will be available. The size of the image in this class of receivers will be about 7 x 9".

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. "J." 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.

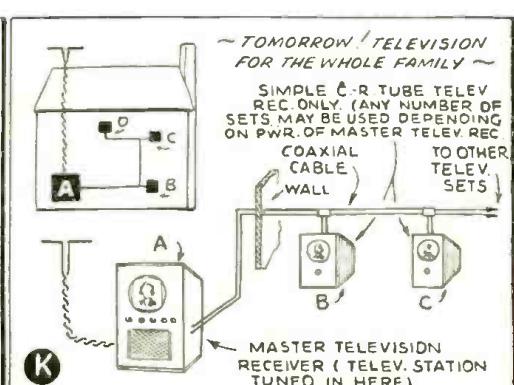
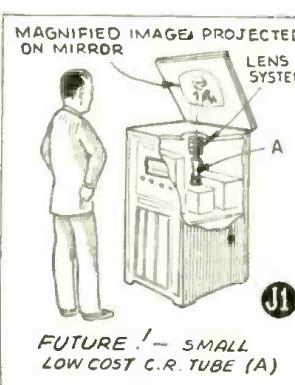
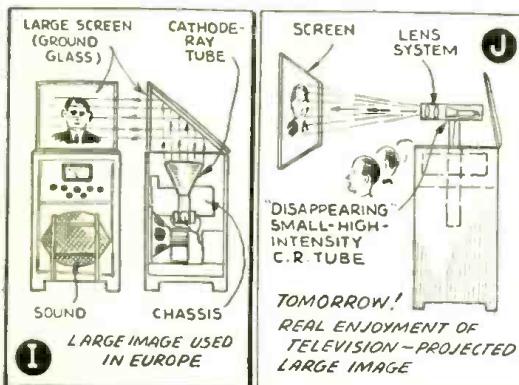
Undoubtedly some arrangement, like that shown in Fig. "J," will be offered in the near future, when a small high intensity C-R tube will be used, together with a projection lens, and the image thrown onto the screen as shown.

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.



## 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



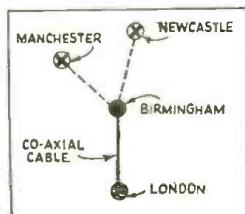
strengthened several fold. If the tests indicate one of the proposed new sites is suitable, the station's present 718-foot steel antenna will be dismantled and rebuilt on the new location. The four short-wave transmitters of W8XK will also be moved to the new location.

## 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.



# WORLD WIDE

## 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 score-board 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*.

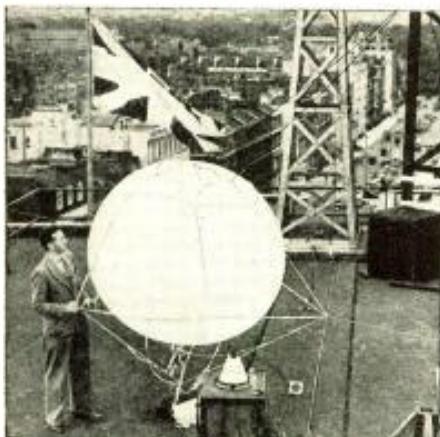
# RADIO DIGEST

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  $\frac{3}{8}$  of a mile of any point in the city at all times."

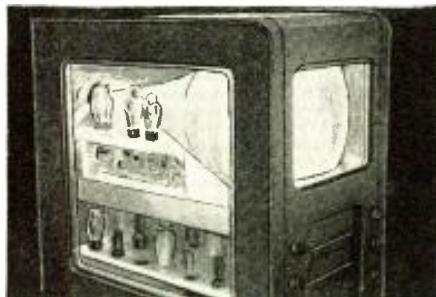
## Short Waves Go Up?

• 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

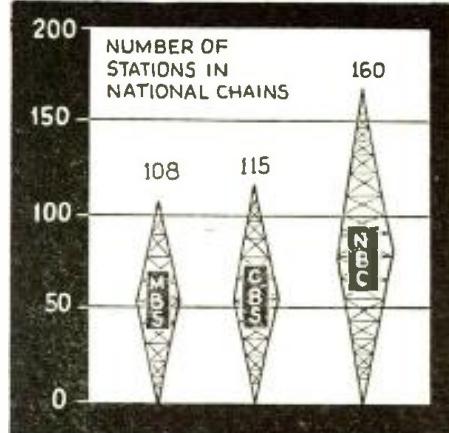
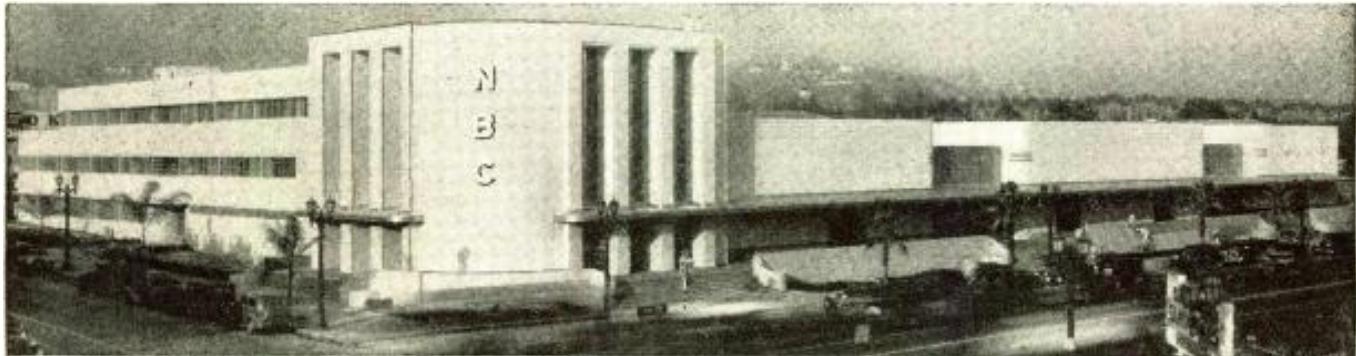
• ACCORDING to Paramount Pictures, who have acquired a large interest in Allen B. Du Mont Laboratories, television receivers to sell for \$150.00 to \$200.00 will be available by Christmas. These receivers will show pictures 8" x 10". Du Mont's pres-



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.





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

# Stolen Money-Bag Calls Police

## Cover Feature

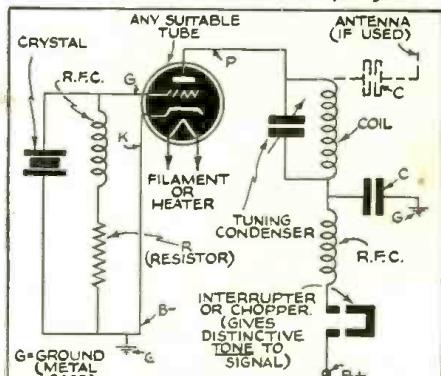
suitcase used for a similar purpose. The thief has no way of knowing that it broadcasts an alarm for his arrest every instant it is in his possession. Obviously, if he knew it was a radio transmitter, set to call the police when taken, he would not touch it!

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.

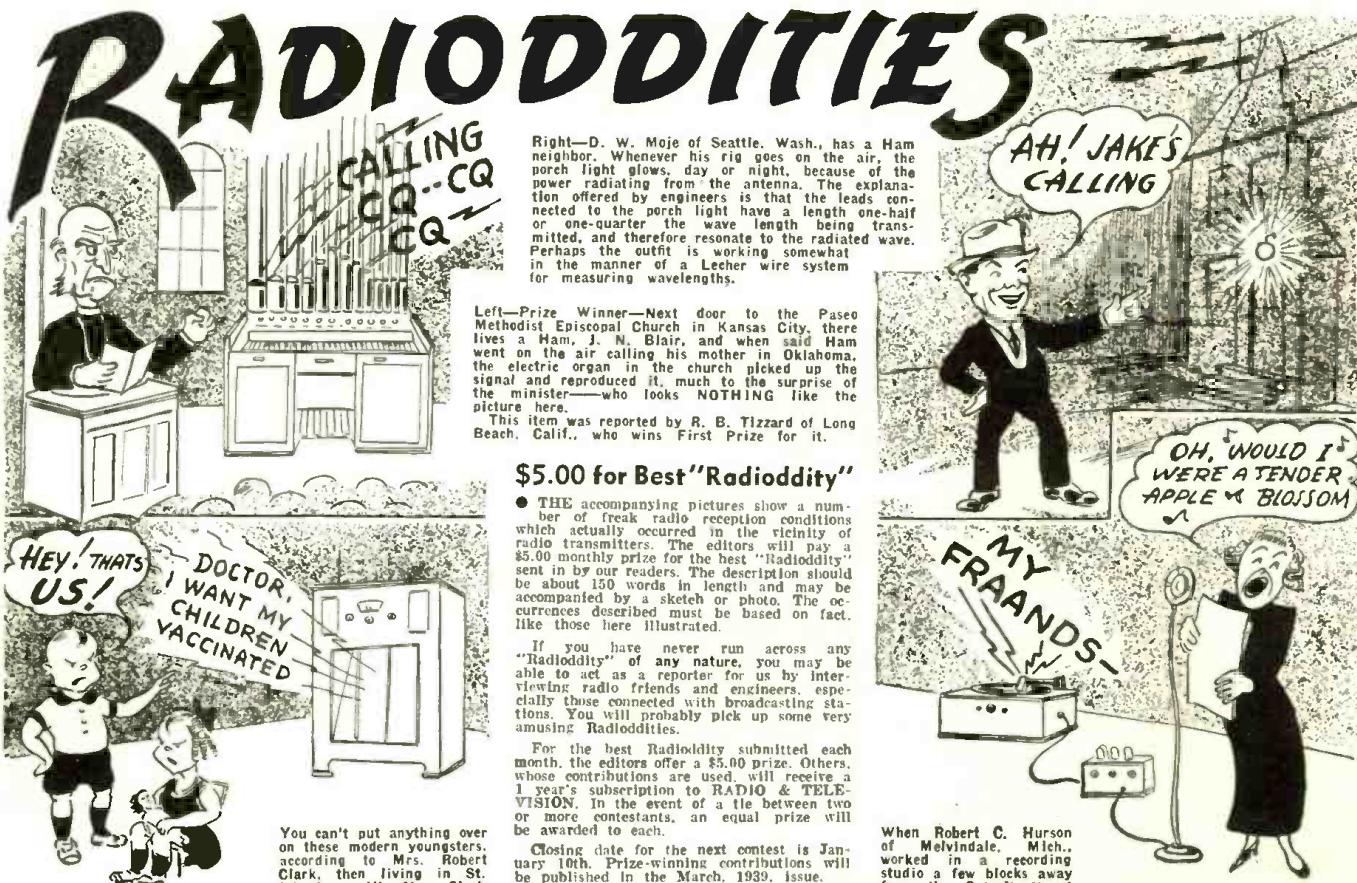
A simple automatic switch turns the transmitter on if it is snatched from the messenger's hand, or dropped. It consists of an ordinary toggle switch mounted on the inside of the suitcase, to one side of the handle, in such a way that it is "on" when the knob is brought toward the handle. A piece of weak 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

### Circuit of the Radio Money-Bag.



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.



### \$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 editor 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, WBXWJ, 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 WBXWJ as a background on all recordings. Mr. Hurson believes that the mike acts as a crystal detector in this strange phenomenon.

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.

You can't put anything over on these modern youngsters, according to Mrs. Robert Clark, then living in St. Johnsbury, Vt. Mrs. Clark



# "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.

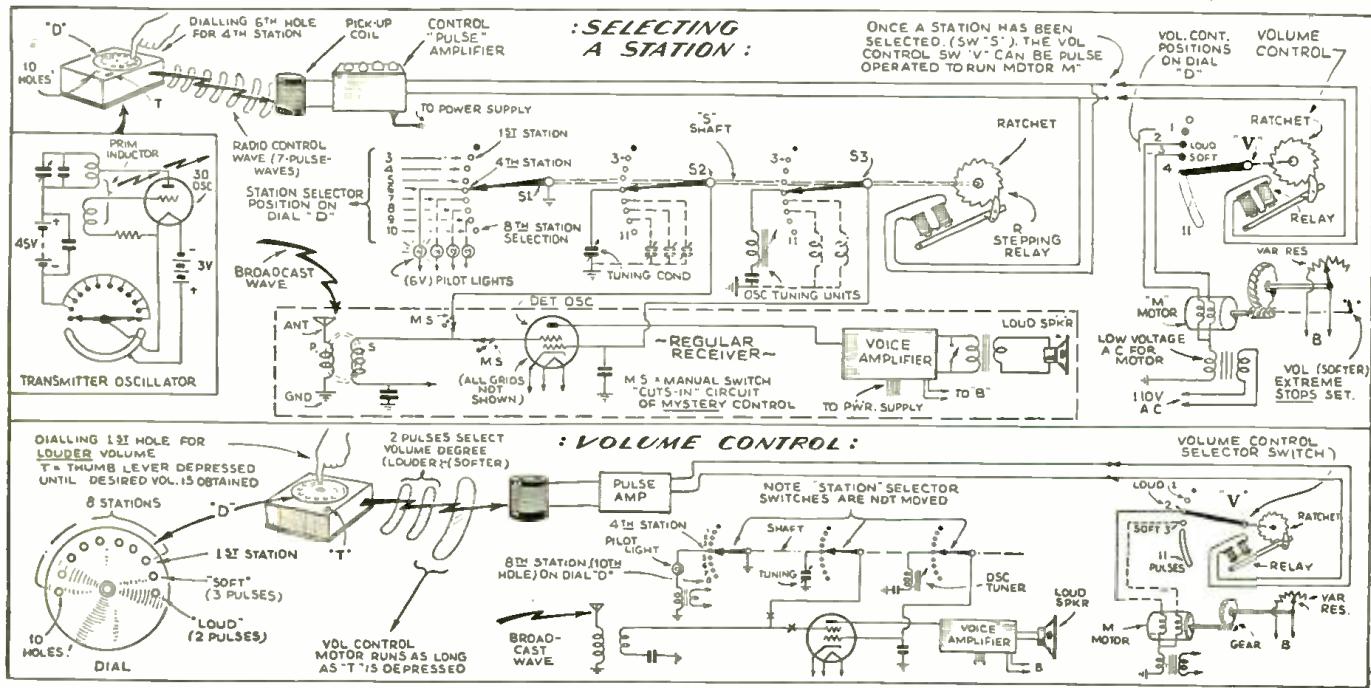
The accompanying diagrams show in simplified fashion what takes place when the mystery control is used. In the first place, the receiver has a regular manual

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.
- b. Dipole.
- c. Spiderweb.
- d. T
- e. Wire doublet.
- f. Inverted L.



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*.
- b. A fist.
- c. A lid.
- d. A *prawn*.

5. The beamscope, 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.



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.
- b. Common coal.
- c. Coherer.
- d. Sodium chloride.
- e. Carborundum.
- f. Galena.



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.   | A. WABC,<br>1000-watt revolving red beacon on building. |
| b. Red globes each tower, 500-watts on top, side lights 100-watts. | B. KNX,<br>Van Nuys, Calif.                             |

- |  |                              |
|--|------------------------------|
| c. Two red flashers; one on each tower.                              | C. WGN,<br>Elgin, Ill.       |
| d. 1000-watt red beacon and 4 75-watt lights at 1/3 and 2/3 heights. | D. WBAP,<br>Dallas Co., Tex. |

- |                            |           |
|----------------------------|-----------|
| E. WOR,<br>Carteret, N. J. | F. Flood. |
|----------------------------|-----------|

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



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 unidirectional 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



● 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.

## Televistor Fits Your Hand

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.

## 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.



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.



● 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

(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.

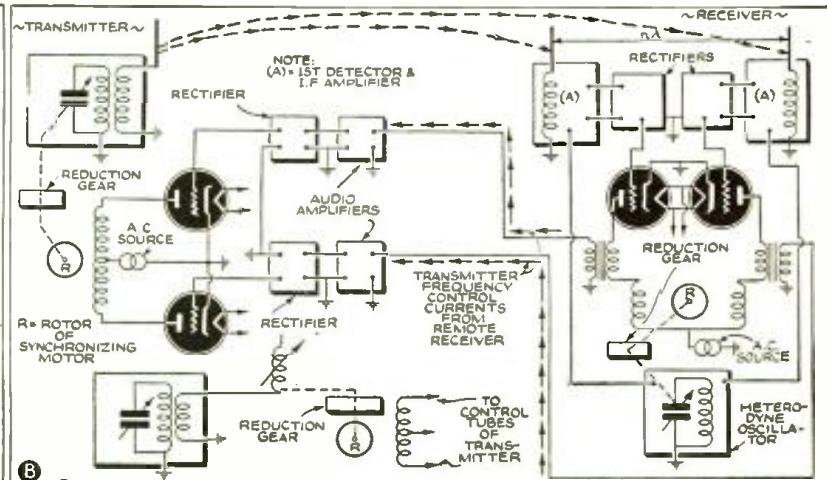
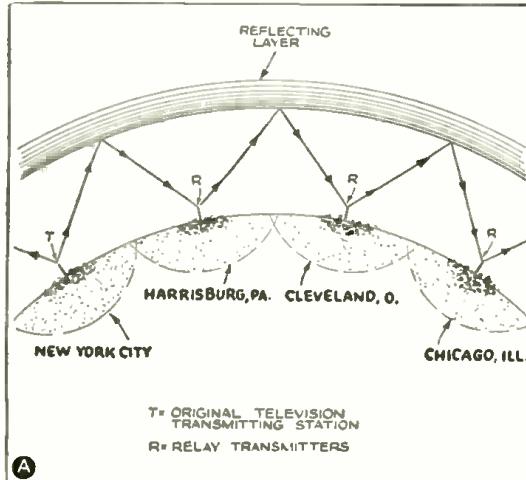
This is not a method for use with individual stations so much as a means for linking relay stations to a central transmitter, or for monitoring an area.

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

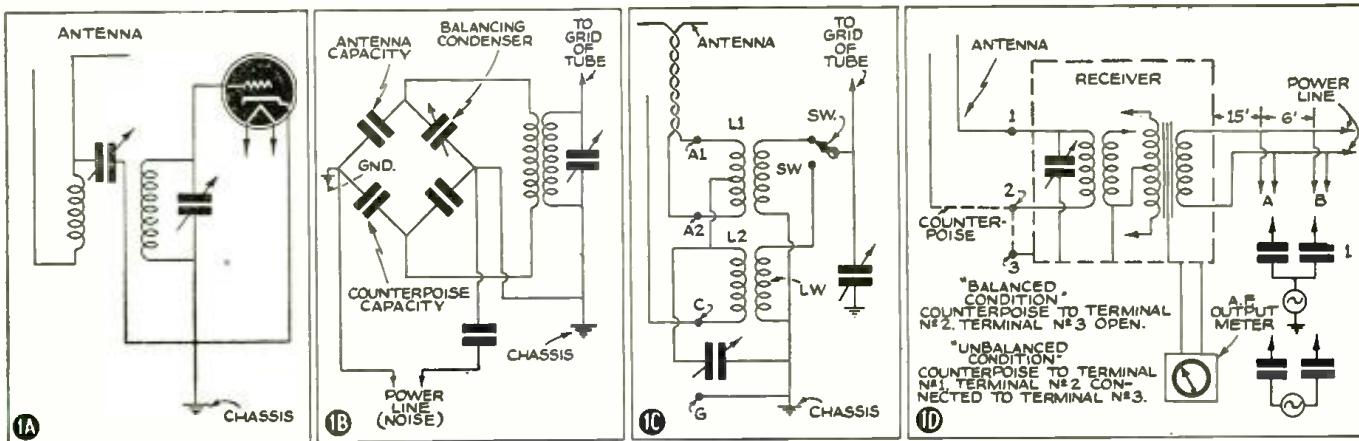
the wavelength at receiver and transmitter to thereby maintain the frequencies which afford the optimum transmission path. Thus, by monitoring at the receiver, a condition of constant field strength may be maintained between the receiving antennas. The monitored received signals of constant strength 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.



# INTERNATIONAL



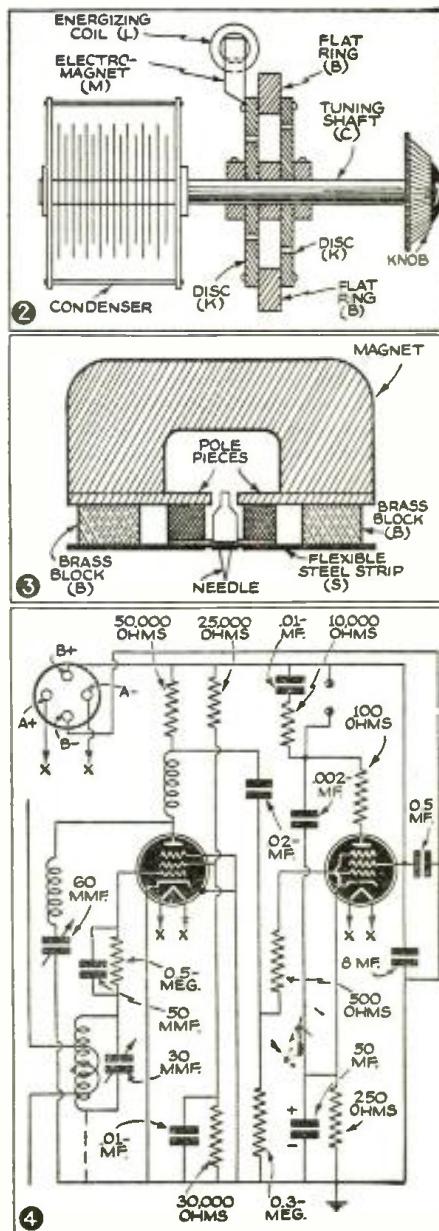
## Master Antenna Reduces Interference

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 counterpoise 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  $\frac{1}{4}$  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  $\frac{3}{4}$  in diameter and spaced approximately the thickness of the wire, may be mounted directly across the 30 mmf. variable condenser. The tickler

# RADIO REVIEW

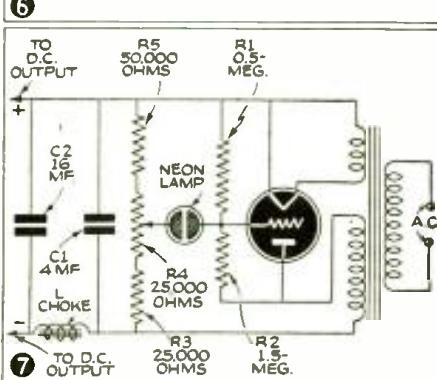
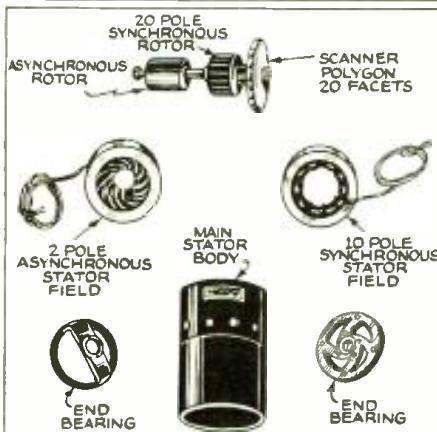
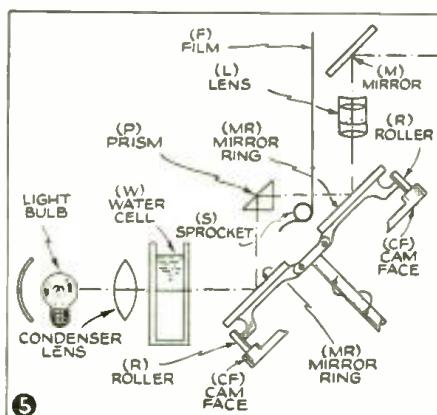
winding is three or four turns of ordinary flexible hookup wire, jumble-wound around the center of the grid coil. An additional single turn coil is looped around the ground end of the grid coil and connected to a dipole or to antenna and ground. All other parts are standard. All resistors of 10,000 ohms or less should be of the 1-watt type, while the others are preferably  $\frac{1}{2}$ -watt resistors, though  $\frac{1}{4}$ -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.

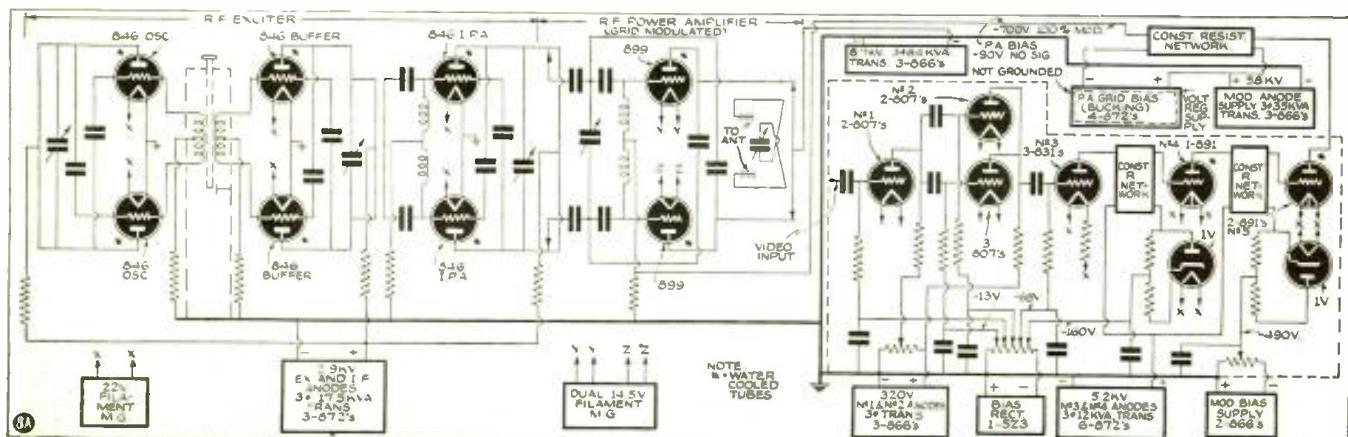
## Neon Controlled Stabilizer

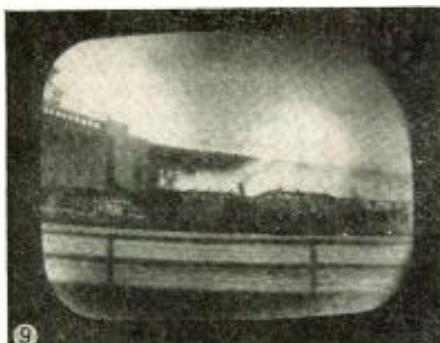
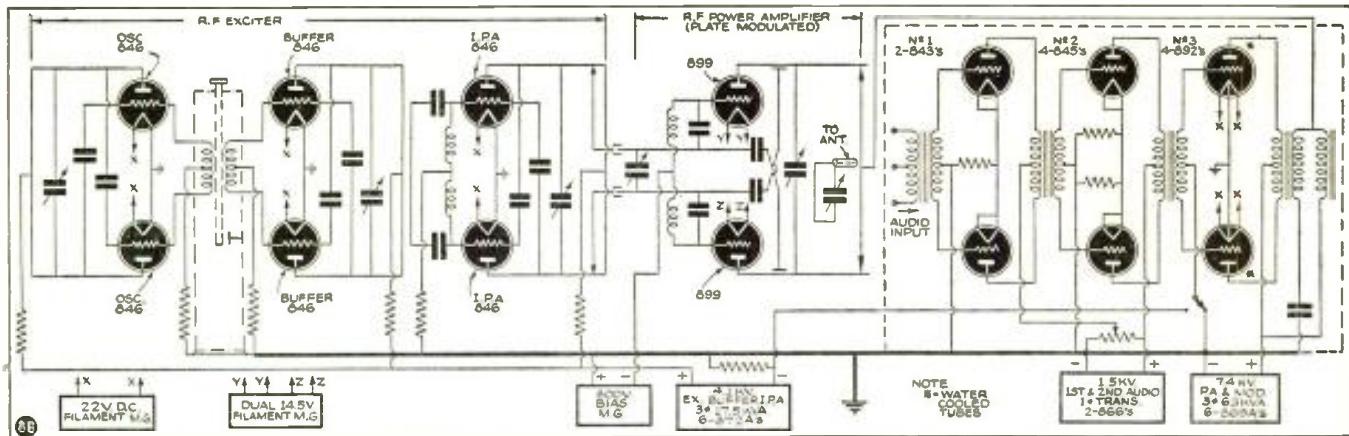
**7** THE voltage of a power pack may be maintained at a relatively constant level through the use of a neon tube. Not only does the tube serve to keep the output of the pack relatively level, though the input voltage may fluctuate as much as plus or minus 15%, but it also serves to reduce hum. By way 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





9

## 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*.

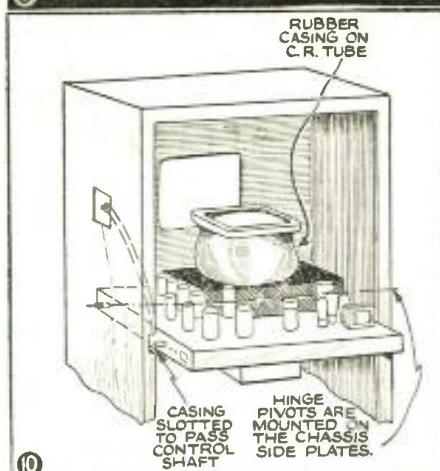
### Photo Cell Applications

**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,

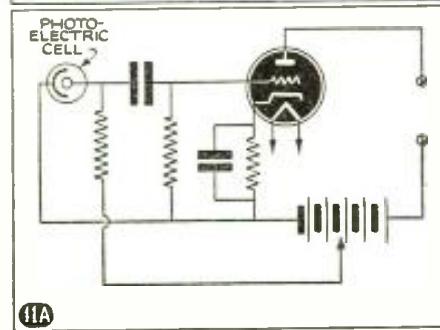
light measurement, smoke density measurement, etc. The *Australasian Radio World* publishes two circuits. Fig. 11A is a hookup to use when rapid response to light variation is required, as in reproducing sound-on-film. Where the apparatus must respond to a breakage of a light beam, the circuit shown in Fig. 11B is preferred.

### Fields of Force in Tuning Coils

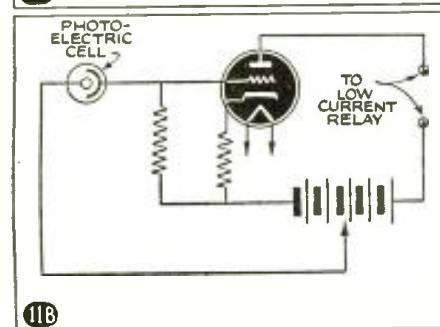
**12** FIG. 12A illustrates the field's magnetic lines resulting from—at the left, a single turn; and at the right, a number of turns to form a solenoid. You will notice that a single turn field surrounds the wire, whereas where a number of turns are wound together, the field surrounds the turns as a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



10



11A



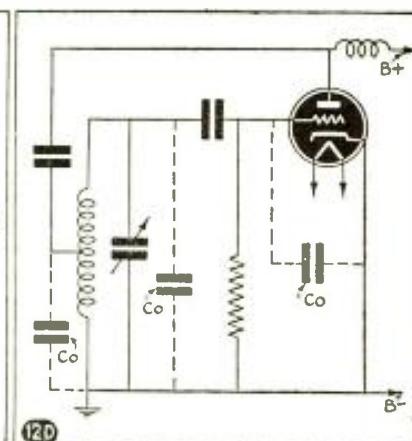
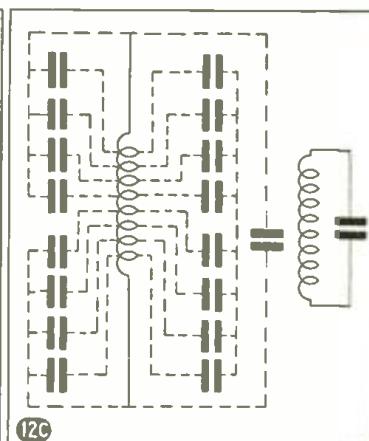
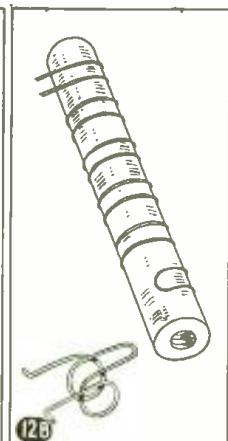
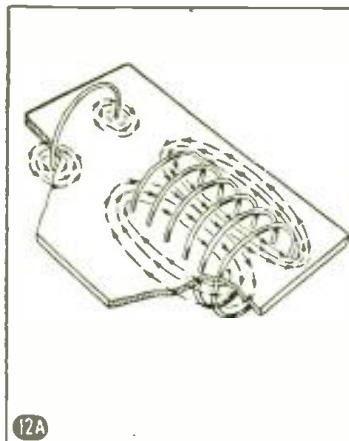
11B

### 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

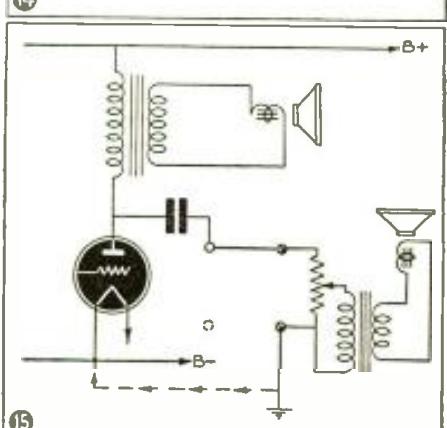
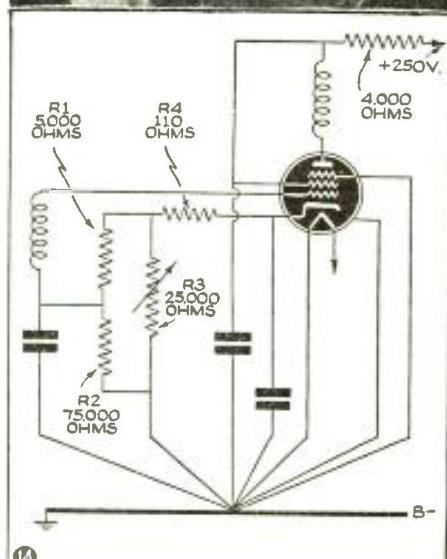
in Fig. 13, at good speed—up to 100 words per minute. Radio transmission is accomplished in much the usual way, and pick-up is by a modification of the standard radio receiver, the output being fed into a special circuit for the receiving radio typewriter.

## 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, JVY, JDY, CR6AA, ZBW, CR7BH, PLE, YDC, VVY-2, TPZ, ZS2N, CN8MU, CN1AF, 25 VK "hamis" 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



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

are cut off in this photo, are QSL's from PY2CK, CO2KL, PAZB, F8NE, F8GO, K5AN, VK2PX, D4SNP, LU6AT, LU4BH, XE1LK, LU5AN, HK4EA, HI1C, and H6KEF.

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 RADIO BEGINNER

Lesson 3  
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.

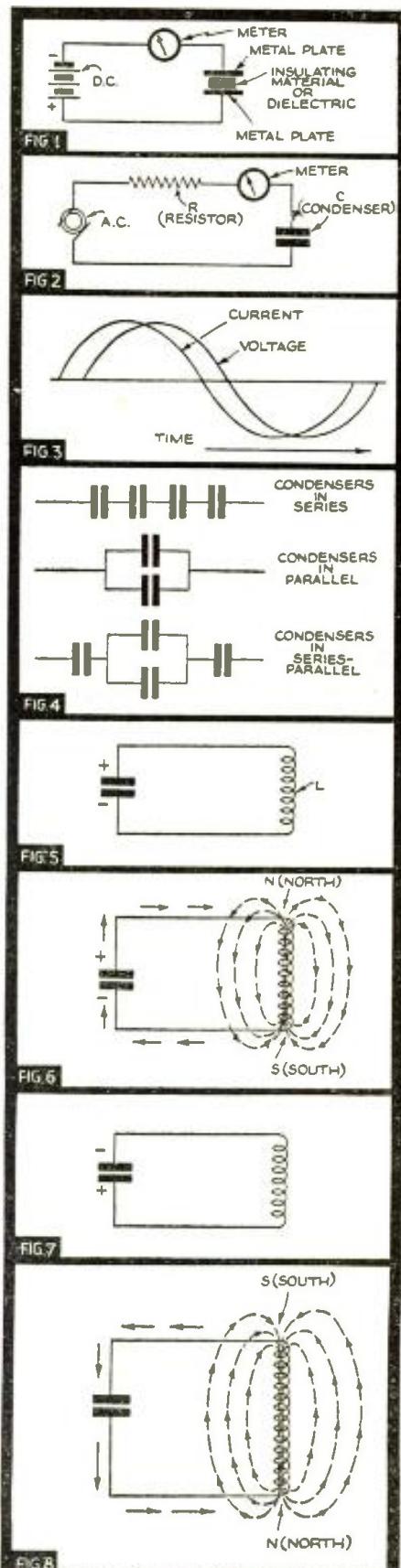
We may very well ask of what use condensers are in circuits in which direct currents are flowing, since it is equivalent to preventing the current from flowing in the circuit. The answer is that we take advantage of condenser action to couple circuits electrically, or to compel currents to flow in designated 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

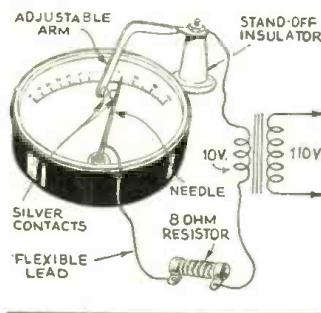
(Continued on page 565)



- 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.

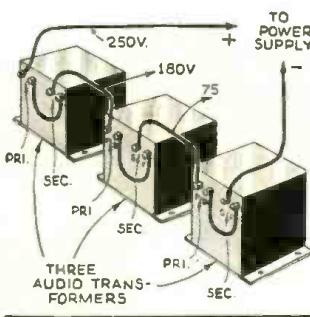
1st Prize Winner  
**Cheap Crystal Oven**

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 Pavetti.

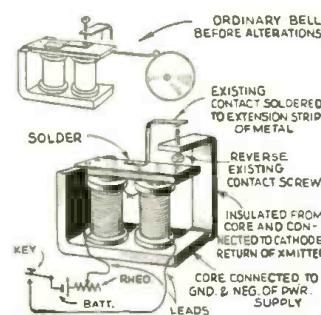


# Radio Kinks

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.

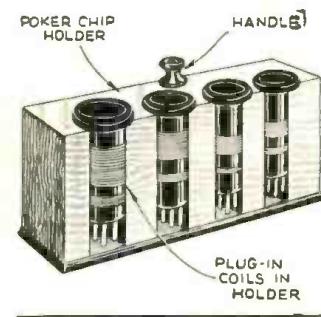
**Home-Made Keying Relay**

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.



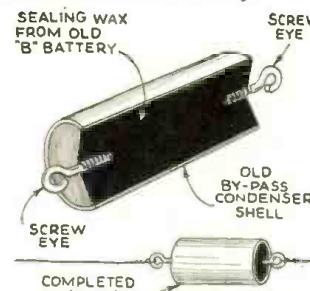
**Holder For Coil Kit**

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.



**Simple Multi-Meter**

I have built a simple multi-meter 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  $\frac{1}{4}$  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

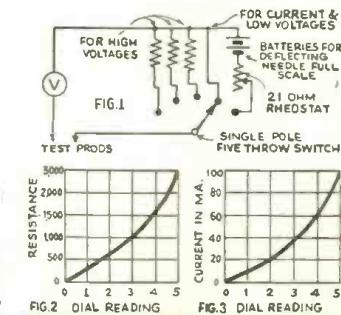
To calibrate meter:  
 $E = \frac{R_1 + R}{R_1} \cdot E_1$  or

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

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:

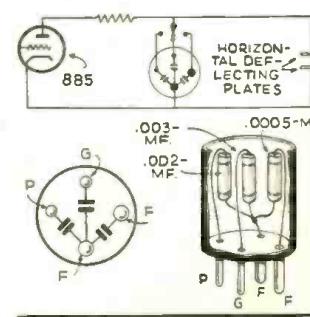
$$I = \frac{E}{R}$$

$I$  = 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.



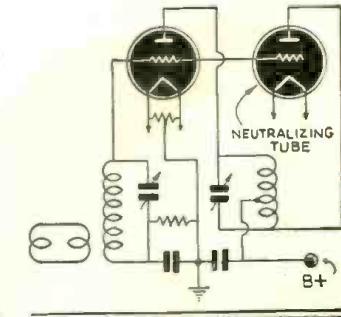
**Plug-In Condenser**

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.



**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

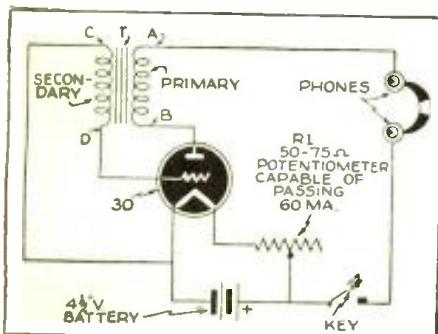
CONTINENTAL-INTERNATIONAL CODE		
LETTERS.		
A . -	I . ..	Q - - -
B - - ..	J - - - -	R - - -
C - - - .	K - - - -	S - - -
D - - - ..	L - - - -	T -
E .	M - - -	U - - -
F - - - - .	N - - -	V - - -
G - - - - ..	O - - -	W - - -
H - - - - - .	P - - -	X - - -
Y - - - - - -	Z - - - -	
NUMERALS.		
0 - - - - - (OR ONE LONG DASH)	5 - - - -	0 - - - -
1 - - - - -	6 - - - -	7 - - - -
2 - - - - -	7 - - - -	8 - - - -
3 - - - - -	8 - - - -	9 - - - -
PUNCTUATION MARKS.		
HYPHEN(-) - - - - -		
PERIOD(.) - - - - -		
QUESTION MARK(?) - - - - -		
COMMA(,) - - - - -		
COLON(:) - - - - -		
SEMICOLON(;)- - - - -		
EXCLAMATION(!)- - - - -		
SIGN INDICATING A FRACTION IS COMING - - - - -		
PARENTHESIS( ) - - - - -		
APOSTROPHE(') - - - - -		
DOUBLE DASH OR BREAK(--) - - - - -		
FRACTION BAR(/) - - - - -		
ATTENTION - - - - -		
END OF MESSAGE - - - - -		
END OF TRANSMISSION - - - - -		
MISTAKE - - - - - (OR TWO QUESTION MARKS)		
UNDERSTAND - - - - -		
WAIT - - - - -		

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)

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



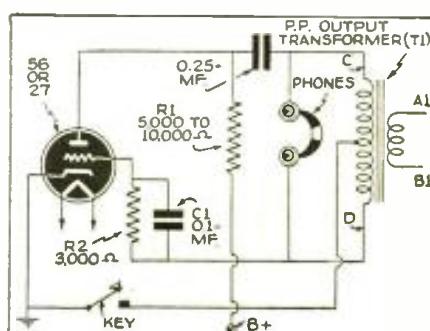
stations, aeronautical stations and other classes of radio services. Knowing all the benefits which are to be derived from the learning of code, the student should continually remember the future that lies ahead to spur him on when progress seems slowest.

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.

## The Continental Code

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

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		Mc.	Call		Mc.	Call	
31.600	WIXKA	BOSTON, MASS., 9.494 m., Addr. Westinghouse Co. Daily 6 am.-1 am., Sun. 8 am.-1 am. Relays WBZ.	17.810	TPB3	PARIS, FRANCE, 16.84 m. Addr. (See 15.245 mc.) 9.30-11 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.
31.600	WIXKB	SPRINGFIELD, MASS., 9.494 m., Addr. Westinghouse Co. Daily 6 am.-1 am., Sun. 8 am.-1 am. Relays WBZ.	17.800	TGWA	GUATEMALA CITY, GUAT., 16.84 m., Addr. Ministre De Fomento. Irregular.	15.270	H13X	CIUDAD TRUJILLO, D. R., 19.65 m. Relays HIX Sun. 7.40-10.40 am. Tues. and Fri. 8.10-10.10 pm.
31.600	W3XEY	BALTIMORE, MD., 9.494 m., Relays WFBP 4 pm-12 m.	17.790	GSG	DAVENTRY, ENG., 16.86 m., Addr. B.B.C., London. 5.45 am.-12 m., 12.20-4 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.
31.600	W2XDV	NEW YORK CITY, 9.494 m., Addr. Col. Broad. Syst., 485 Madison Ave. Daily 6-11 pm.; Sat. and Sun. 1.30-6, 7-10 pm.	17.785	JZL	TOKYO, JAPAN, 16.87 m. 8-8.30 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.
31.600	W9XHW	MINNEAPOLIS, MINN., 9.494 m. Relays WCCO 9 am.-12 m.	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.	15.250	WIXAL	BOSTON, MASS., 19.67 m., Addr. University Club. Tues., Thurs. 4.30-6.30 pm.
31.600	W3XKA	PHILADELPHIA, PA., 9.494 m., Addr. NBC. Relays KYW 9 am.-10 pm.	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. Daily 4.50-10.50 pm.	15.245	TPA2	PARIS, FRANCE, 19.68 m., Addr. 98 Bis. Blvd. Haussmann. "Paris Mondial" 6-11 am.
31.600	W5XAU	OKLAHOMA CITY, 9.494 m., Sun 12 n-1 pm., 6-7 pm. Irregular other times.	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.	15.230	HS6PJ	BANGKOK, SIAM, 19.7 m. Irregularly Mon. 8-10 am.
31.600	W4XCA	MEMPHIS, TENN., 9.494 m., Addr. Memphis Commercial Appeal. Relays WMC.	17.760	W2XE	NEW YORK, N. Y., 16.89 m., Addr. Col. Broad. Syst., 485 Madison Ave. Irregular.	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.
31.600	W8XAI	ROCHESTER, N. Y., 9.494 m., Addr. Stromberg-Carlson Co. Relays WHAM 7.30-12.05 am.	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.	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.
31.600	W8XWJ	DETROIT, MICH., 9.494 m., Addr. Evening News Ass'n. Relays WWWW 6-12.30 am., Sun. 8 am-12 m.				15.210	W8YK	PITTSBURGH, PA., 19.72 m., Addr. (See 21.540 mc.) 9 am.-1 pm.
31.600	W9XPD	ST. LOUIS, MO., 9.494 m., Addr. Pulitzer Pub. Co. Relays KSD.	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.	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.
26.450	W9XA	KANSAS CITY, MO., 11.33 m., Addr. Commercial Radio Eqpt. Co. Testing	17.280	FZEB	DJIBOUTI, FRENCH SOMALILAND, 17.38 m. Test XMSN 1st Thurs. each month 8-8.30 am. Next B.C. Jan. 5.	15.195	TAQ	ANKARA, TURKEY, 19.74 m., 5.30-7 am., 1.20-5 pm. Irreg. Relays 2RO irreg.
26.400	W9XAZ	MILWAUKEE, WIS., 11.36 m., Addr. The Journal Co. Relays WTMJ from 1 pm.	15.550	CO9XX	TUINICU, ORIENTE, CUBA, 19.29 m., Addr. Frank Jones, Central Tuinicu, Tuinicu, Santa Clara. Broadcasts irregularly evenings.	15.190	—	ROME, ITALY, 19.75 m. Relays 2RO till 6 pm., irreg.
26.300	W2XJI	NEW YORK, N. Y., 11.4 m., Addr. Bamberger Broad. Service, 1440 Broadway. Relays WOR 8 am.-1 am. Irregular.	15.510	XOZ	CHENGDU, CHINA, 19.34 m. Daily 9.45-10.30 am.	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.
26.100	W9XJL	SUPERIOR, WIS., 11.49 m. Relays WEBZ daily.	15.370	HAS3	BUDAPEST, HUNGARY, 19.52 m., Addr. Radiolabor, Gyali Ut 22. Sun. 9-10 am.	15.190	ZBW4	HONGKONG, CHINA, 19.75 m., Addr. P. O. Box 200. Irregular. 11.30 pm. to 1.15 am., 3-10 am.
26.050	W9XTG	MINNEAPOLIS, MINN., 11.51 m., Relays WCTN 9 am.-1 pm., 7 pm.-12 m.	15.360	DZG	ZEESSEN, GERMANY, 19.53 m., Addr. Reichspostzentralamt. Tests irregularly.	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.
25.950	W6XKG	LOS ANGELES, CAL., 11.56 m., Addr. B. S. McGlashan, Wash. Blvd. at Oak St. Relays KGJ 24 hours daily.	15.360	—	BERNE, SWITZERLAND, 19.53 m. Irreg. 6.45-7.45 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.
25.950	W9XUP	ST. PAUL, MINNESOTA, 11.56 m., Relays KSTP evenings.				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.
21.550	GST	DAVENTRY, ENG., 13.92 m., Addr. (B.B.C., London) Irregular at present.				15.165	OZH	SKAMLEBAK, DENMARK, 19.78 m., Sun. 8 am.-1.30 pm.
21.540	W8XK	PITTSBURGH, PA., 13.93 m., Addr. Grant Bldg. Relays KDKA 6.45-9 am. Also Sunday. 6 pm.	15.340	DJR	BERLIN, GERMANY, 19.56 m., Addr. Br'dcast'g House, 8.9 am., 4.50-10.50 pm.	15.160	XEWW	MEXICO CITY, MEXICO, 19.79 m., 12 n.-12 m. Irregular.
21.530	GSJ	DAVENTRY, ENG., 13.93 m., Addr. (See 21.550 mc.) 5.45-8.50 am.	15.330	W2XAD	SCHEECTADY, N. Y., 19.56 m., Addr. General Electric Co. Relay WGJ, 12.15-7 pm.	15.160	JZK	TOKYO, JAPAN, 19.79 m., 12.30-1.30 am., 2.30-4, 4.30-5.30, 8-8.30 pm.
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.	15.320	OLR5B	PRAGUE, CZECHOSLOVAKIA, 19.59 m. Addr. (See 11.840 mc.) Sun., Wed., Sat. 5-5.10 pm.; Mon., Tues., Thurs., Fri. 6.55-9.55 pm.	15.160	VUD3	DELHI, INDIA, 19.79 m., Addr. All India Radio. 1.30-3.30 am., 8.30-10.30 pm.
21.500	W2XAD	SCHENECTADY, N. Y., 13.95 m., General Electric Co. 8 am.-12 n.	15.310	GSP	DAVENTRY, ENG., 19.6 m., Addr. (See 17.79 mc.) 3-5.15 am., 1.45-4 pm.	15.155	SM5SX	STOCKHOLM, SWEDEN, 19.79 m., Daily 11 am-5 pm., Sun. 9 am.-5 pm.
21.470	GSH	DAVENTRY, ENG., 13.97 m. (See 21.550 mc.), 5.45 am.-12 n.	15.300	YDB	SOERABAJA, JAVA, N. E. 1. 19.61 m., Addr. NIROM, 7.30 pm.-2 am.	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.
21.450	DJS	BERLIN, GERMANY, 13.99 m., Addr. Broadcasting House. 12.05-11 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.	15.140	GSF	DAVENTRY, ENG., 19.82 m., Addr. (See 17.79 mc.) 3-5.15 am., 5.45 am.-12 n.
19.020	H56PJ	BANGKOK, SIAM, 15.77 m. Mondays 8-10 am. See 15.23 mc.	15.300	2ROS	ROME, ITALY, 19.61 m., Addr. (See 2RO, 11.81 mc.) 12.10-2, 7.30-9 pm. and irreg.	15.130	TPB6	PARIS, FRANCE, 19.83 m., Addr. "Paris Mondial," 98 Bis Blvd. Haussmann, 7-9.15 pm.
18.480	HBH	GENEVA, SWITZERLAND, 16.23 m., Addr. Radio Nations. Sun., 10.45-11.30 am.	15.290	LRU	BUENOS AIRES, ARG., 19.62 m., Addr. El Mundo. Relays LRI, 7.9 am.	15.130	WIXAL	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 QRM & QRM demons away from W4CED's rig.



• 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 Skyriter, 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

# SEVENTH Silver Trophy

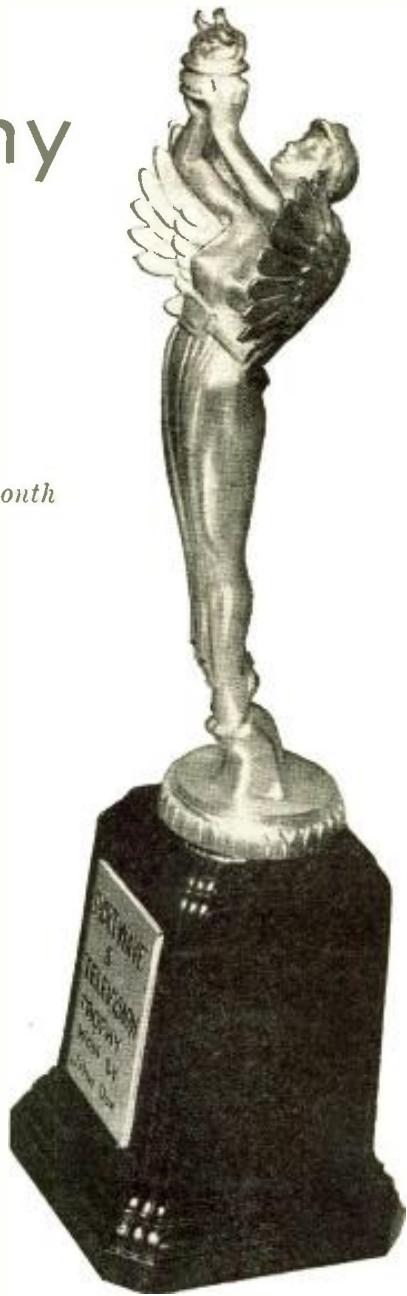
Awarded to

*Milburne O. Sharpe*

**W4CED**

**Knoxville, Tennessee**

*For Best HAM Station photo of the month*



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

This beautiful silver trophy stands 11 3/4" 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.

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	Mc.	Call	Mc.	Call
15.120	SPI9	WARSAW, POLAND, 19.84 m., 6-9 pm.	11.840	KZRM	MANILA, P. I., 25.35 m. Addr. Erlanger & Gallinger, Box 283. 9 pm.-10 am. Irregular.
15.120	HVJ	VATICAN CITY, 19.83 m., 10.30-10.45 am., exc. Sun.	11.840	CSW	LISBON, PORT., 25.35 m. Nat'l Broad. Station. 11.30 am.-1.30 pm. Irregular.
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.	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.
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.	11.830	W9XAA	CHICAGO, ILL., 25.36 m., Addr. Chicago Federation of Labor. Irregular 7 am.-6 pm.
<b>End of Broadcast Band</b>					
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.	11.830	W2XE	NEW YORK CITY, 25.36 m., Addr. Col. Broad. System, 485 Madison Av., N.Y.C. 6.30-11 pm.
14.940	PSE	RIO DE JANEIRO, BRAZIL, 20.08 m., Broadcasts Wed. 3.45-4.15 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.
14.600	JVH	NAZAKI, JAPAN, 20.55 m. Broadcasts irregularly 5-11.30 pm. Works Europe 4-8 am.	11.820	GSN	DAVENTRY, ENG., 25.38 m., Addr. (See 11.75 mc.) Irregular.
14.535	HBJ	GENEVA, SWITZERLAND, 20.64 m., Addr. Radio Nations. Broadcasts Sun. 1.45-2.30 pm., Mon. 1.30-1.45 pm.	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.
14.440	—	RADIO MALAGA, SPAIN, 20.78 m. Relays Salamanca 5.40-8.40 am. Sometimes 2-4 pm.	11.805	COGF	MATANZAS, CUBA, 25.41 m., Addr. Gen. Betancourt 51. Relays CMGF. 2-3, 4-5, 6-11 pm.
14.430	HCJB	QUITO, ECUADOR, 20.79 m. Sun. 9-9.30 pm. and irreg.	11.805	OZG	SKAMLEBOAEK, DENMARK, 25.41 m., Addr. Statsradiofonien. Irreg.
14.166	PIIJ	DORDRECHT, HOLLAND, 21.15 m., Addr. (See 7.088 mc.) Sat. 12 n.-12.30 pm.	11.801	DJZ	BERLIN, GERMANY, 25.42 m. 7.15-10.50 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.	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, B-8.30 pm., 12.30-1.30 am.
13.635	SPW	WARSAW, POLAND, 22 m. Daily 6-8 pm. Sat. & Sun. 6-9 pm.	11.795	DJO	BERLIN, GERMANY, 25.43 m., Addr. (See 15.280 mc.) 7.15-10.50 pm. Irreg.
13.000	CR6AA	LOBITO, ANGOLA, 23.06 m., Mon.-Wed., Sat., 2.45-4.45 pm.	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.
12.862	W9XDH	ELGIN, ILL., 23.32 m. Press Wire less, Tests 2-5 pm.	11.780	HP5G	PANAMA CITY, PAN., 25.47 m., Addr. Box 1121. 8-11 pm.
12.460	HC2JB	QUITO, ECUADOR, 24.08 m. Daily exc. Mon. 8-10.30 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.
12.235	TFJ	REYKJAVIK, ICELAND, 24.52 m. Works Europe mornings. Broadcasts Sun. 1.40-2.30 pm.	11.770	DJD	BERLIN, GERMANY, 25.49 m., Addr. (See 15.280 mc.) 10.40 am.-4.30 pm., 4.50-11 pm.
12.200	—	TRUJILLO, PERU, 24.58 m., "Rancho Grande," Address Hacienda Chilcín. Irregular.	11.760	TGWA	GUATEMALA CITY, GUAT., 25.51 m., (See 17.8 mc.) Irregular 10-11.30 pm. Sun. 6-11.30 pm., irreg.
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.	11.760	XETA	MONTEREY, MEX., 25.51 m., Addr. Box 203. Relays XET, n. 3.30 pm. and evenings.
11.970	H12X	CIUDAD TRUJILLO, D. R., 25.07 m., Addr. La Voz de Hispaniola. Relays HIX Tue. and Fri. 8.10-10.10 pm.	11.760	OLR4B	PRAGUE, CZECHOSLOVAKIA, 25.51 m., Addr. (See 11.840 mc.) Irregular.
<b>25 Met. Broadcast Band</b>					
11.928	TI2XD	SAN JOSE, COSTA RICA, 25. 5 m. La Voz del Pilot. Apartado 1729. 10 am.-n., 4-10 pm.	11.750	SP25	WARSAW, POLAND, 25.55 m., 6-9 pm.
11.910	CDII190	VALDIVIA, CHILE, 25.2 m., P. O. Box 642. Relays CB69 10 am.-1 pm., 7-10 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.
11.900	—	HANOI, FRENCH INDO-CHINA, 25.21 m., "Radio Hanoi". Addr. Radio Club de l'Indochine. 12 m.-2 am., 6-10 am. 150 watts.	11.740	HVJ	VATICAN CITY, 25.55 m. Testing irregular.
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.	11.730	PHI	HUIZON, HOLLAND, 25.57 m., Addr. N. V. Philips Radio. Daily 6.15-6.45 pm. Sat. 7.15-7.45 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.	11.730	WIXAL	BOSTON, MASS., 25.57 m., Addr. World-Wide B'castg Foundation. University Club. Daily exc. Sat. and Sun. 9-11 pm.
11.885	TPB7	PARIS, FRANCE, 25.24 m. (See 15.245 mc.) 4.30 pm.-12 m.	11.720	CJRX	WINNIPEG, CANADA, 25.6 m., Addr. James Richardson & Sons, Ltd. Daily 6 pm.-12 m., Sun. 5-10 pm.
11.875	VLR	MELBOURNE, AUSTRALIA, 25.26 m. Testing around 1.30-3 am. Irregular.	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.
11.870	WBXK	PITTSBURGH, PA., 25.26 m., Addr. (See 21.540 mc.) 1-11 pm.	11.715	TPA4	PARIS, FRANCE, 25.61 m., (See 15.245 mc.) 7-9.15 pm., 9.30 pm.-12 m.
11.865	—	BERNE, SWITZERLAND, 25.28 m. Irreg. 8.9 pm. to No. Amer.	11.710	YSM	SAN SALVADOR, EL SALVADOR, 25.63 m., Addr. (See 7.894 mc.) 1-2.30 pm.
11.860	GSE	DAVENTRY, ENG., 25.29 m., Addr. (See 11.75 mc.) 3-5.15 5.45 am.-12 n.	11.710	—	SAIGON, FRENCH INDO-CHINA, 25.62 m., Addr. Boy-Landry, 17 Place A Foray. 6-9.15 am.
11.855	DJP	BERLIN, GERMANY, 25.31 m., Addr. (See 15.280 mc.) Irregular. 7.15-10.50 pm. for No. Amer.	<b>End of Broadcast Band</b>		
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	CBI170	SANTIAGO, CHILE, 25.65 m. Addr. P.O. Box 706. Relays CB89 10 am.-2 pm., 3.30-11 pm.	<b>End of Broadcast Band</b>		
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.
11.404	CSW2	DAVENTRY, ENG., 25.38 m., Addr. (See 11.75 mc.) Irregular.	11.000	PLP	LISBON, PORTUGAL, 27.17 m., Addr. Nat. Broad. Sta. 2.15-4.15 pm., irreg.
11.000	—	RADIOENG, 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.	10.400	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	DAIREN, MANCHUKUO, 30.24 m. Relays JQAK daily 7-8 am. Works Tokyo occasionally in early am.
10.220	PSH	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.	10.042	DZB	SUCRE, BOLIVIA, 30.33 m., 11 am.-n., 7-9 pm.
10.100	—	RIO DE JANEIRO, BRAZIL, 29.35 m., Addr. Box 709. Broadcasts 6-7 pm., Mon. 8-8.30 pm.	9.995	COBC	MADRID, SPAIN, 30.43 m., Addr. Post Office Box 951. 7.30-8, 8.40-9 pm.
9.920	JDY	ZEESEN, GERMANY, 29.87 m., Addr. Reichspostzenralamt. Irregular.	9.892	CP1	ROME, ITALY, 30.52 m. Works Egypt afternoons. Relays 2RO, 6-9 pm.
9.860	EAQ	DEUTSCHE FREIHEITS SENDER, 29.70 m., loc. in Germany, under-cover. 4-5 pm.	9.830	IRF	HAVANA, CUBA, 30.02 m., Addr. P. O. Box 132. Relays CMBC 6.55 am.-1 am.
9.805	COCM	HAVANA, CUBA, 30.02 m., Addr. P. O. Box 132. Relays CMBC 6.55 am.-1 am.	9.760	—	DAIREN, MANCHUKUO, 30.24 m. Relays JQAK daily 7-8 am. Works Tokyo occasionally in early am.
9.708	COCQ	SUCRE, BOLIVIA, 30.33 m., 11 am.-n., 7-9 pm.	9.735	CSW7	HAVANA, CUBA, 30.90 m. Addr. 25 No. 445, Vedado, Havana, 7-1 am. Sun. 6.55 am.-1 am.
9.705	—	FORT DE FRANCE, MARTINIQUE, 30.92 m., Addr. P. O. Box 136.	9.690	TI4NRH	LISBON, PORTUGAL, 30.82 m. Addr. Nat. Broad. Sta. n-2 pm., 6-9 pm. for No. Amer.

(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 old 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

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



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

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.

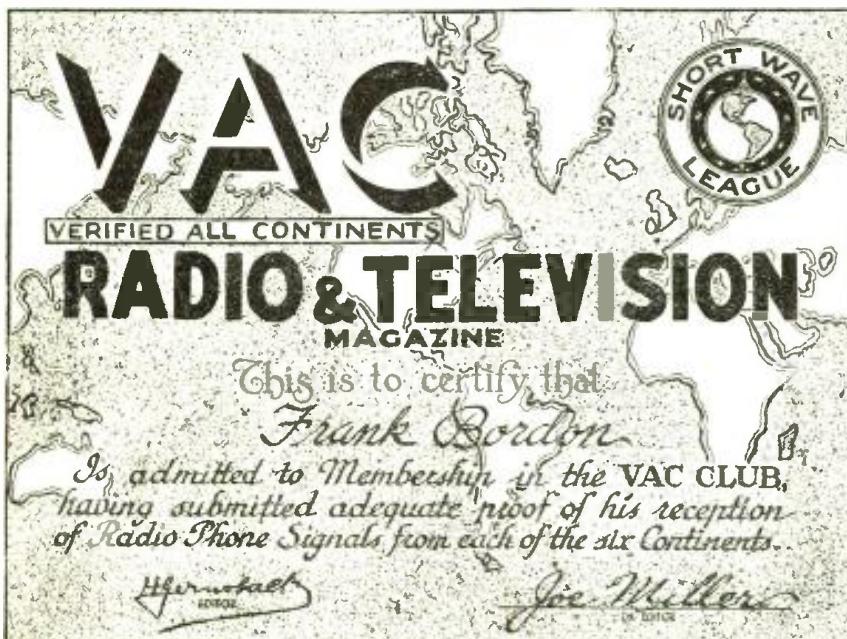
ZHO is reported by Ashley Walcott, James Moore, W6, and by Jim Lanyon, VE5. ZHP should be heard O.K. here in the East and in central U. S., during the a.m.'s when conditions are good. This station should be easy to find, all by itself on the L.F. end of the 31 meter band. QRA (address) given above.

## 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)

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.



A reproduction of the handsome new VAC certificate. The certificate is printed in black on a blue background on heavy ledger paper, 9 1/2" x 12" in size. See rules at end of this article.

(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.,

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, TURK MUHENDISLER BIRLIGI, 5 No. LU ODA, YENI SEHİEL, ANKARA, TURKEY.

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 Weher, 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

### NEW CALEDONIA RADIO NOUMÉA

**F K 8 A A**  
Joe Miller  
TOWN'S WKD RST

GREETINGS FROM THE GOLDEN CITY.  
SABA LEAGUE

To Radio N.Y. X. 21 Confirmed On 11-16-38 SAST.

Uruguay RST Conditions Band

CHARLES GAVEAU OP.

From **ZS6S**

Xmts 12-15-38 6-10 my time Rec'd HRO Sealer

Remarks 12-15-38 6-10 my report verified

Pw Tax OSL QSL L.C. Davis 4x10 P.O. Box 1442, Indianapolis, Indiana

OSL No. 12-15-38 6-10 my report verified

Mc.	Call		Mc.	Call		Mc.	Call	
9.690	LRA	BUENOS AIRES, ARG., 30.94 m., 6-9 pm.	9.570	WIXX	SPRINGFIELD, MASS., 31.35 m., Addr. Westinghouse Electric & Mtg. Co. Relays WBZ 7 am. to 1 am. Sun. 8 am.-1 am.	9.465	TAP	ANKARA, TURKEY, 31.70 m., 1.20-5 pm. Irreg.
9.685	TGWA	GUATEMALA CITY, GUAT., 30.96 m. Daily 10-11.30 pm.; Sun. 7-11.30 pm.	9.560	XGAP	PEKING, CHINA, 31.38 m., 9 am.-2 pm.	9.445	HCODA	GUAYAQUIL, ECUADOR, 31.77 m., 8.15-10.15 pm., exc. Sun.
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.).	9.560	DJA	BERLIN, GERMANY, 31.38 m., Addr. Broadcasting House. 12.05-11 am., 6-10.50 pm.	9.437	COCH	HAVANA, CUBA, 31.8 m., Addr. 2 B St., Vedado. 8 am.-9.30 pm. Sun. 8 am.-12 m.
9.675	DZA	ZEESSEN, GERMANY, 31.01 m., Addr. (See 10.042 mc.) Irregular.	9.550	HVJ	VATICAN CITY, 31.41 m., Sun. 5-5.30 am.	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.
9.670	-	ROME, ITALY, 31.03 m. Relays 2RO 7.30-9 pm.	9.550	TPBII	PARIS, FRANCE, 31.41 m. Addr. (See 15.245 mc.) 2-5 am., 11.15 am.-6 pm.	9.370	XOY	CHENGTU, CHINA, 32.02 m., 9.45-10.30 am.
9.670	W3XAL	BOUND BROOK, N. J., 31.03 m. Addr. NBC, N. Y. C. 5 pm.-1 am.	9.550	W2XAD	SCHENECTADY, N. Y., 31.41 m., General Electric Co., 6.15-10 pm.	9.355	HCIETC	QUITO, ECUADOR, 32.05 m., Addr. Teatro Bolívar, Thurs. until 9.30 pm.
9.660	LRX	BUENOS AIRES, ARG., 31.06 m., Addr. El Mundo. Relays LRL 10.30 am.-10.30 pm., Sat. 10 m.	9.550	OLR3A	PRAGUE, CZECHOSLOVAKIA, 31.41 m. (See 11.840 mc.) Mon. 4.40-5.10 pm.	9.350	COCD	HAVANA, CUBA, 32.08 m., Addr. Box 2294. Relays CMCD 10 a.m.-11.30 pm. Sun. 10 am.-9 pm.
9.650	W2XE	NEW YORK CITY, 31.09 m. (See 21.520 mc. for addr.) 6.30-11 pm.	9.550	XEFT	VERA CRUZ, MEX., 31.41 m. 10.30 am.-4.30 pm., 10.30 pm.-12.30 am.	9.345	HBL	GENEVA, SWITZERLAND, 32.11 m., Addr. Radio Nations. Sun. 8.845 am., Mon. 6.45-8.30 pm.
9.650	CS2WA	LISBON, PORTUGAL, 31.09 m., Addr. Radio Colonial. Tues., Thurs. and Sat. 4-7 pm.	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.	9.340	OAX4J	LIMA, PERU, 32.12 m., Addr. Box 1166, "Radio Universal," 12 n.-3 pm., 5 pm.-1 am.
9.645	HH3W	PORT-AU-PRINCE, HAITI, 31.11 m., Addr. P. O. Box A117. 1-2, 7-9 pm.	9.550	VUB2	BOMBAY, INDIA, 31.41 m., Addr. All India Radio. 9.30-10.30 pm., 12 m.-2.30 am.	9.300	XGOW	SHANGHAI, CHINA, 32.26 m., 8-9.05 am. Veris between 9.180-9.300.
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.	9.540	DJN	BERLIN, GERMANY, 31.45 m., Addr. (See 9.560 mc.) 4.50-10.50 pm. to So. Amer.	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.
9.635	ZRO	ROME, ITALY, 31.13 m., Addr. (See 11.810 mc.) 12.05-9 pm.	9.540	HJSABD	CALI, COLOMBIA, 31.45 m., Addr. La Voz de Valle. 12 n.-1.30 pm., 5.10-9.40 pm.	9.200	COBX	HAVANA, CUBA, 32.59 m., Addr. San Miguel 194, Altos. Relays CMBX 7 am.-12 m.
9.630	HJ7ABD	BUARAMANGA, COL., 31.14 m., 5.45-6.30, 11.30 am.-1 pm., 6-11 pm.	9.538	VPD2	SUVA, FIJI ISLANDS, 31.46 m., Addr. Amalgamated Wireless of Australasia, Ltd. 5.30-7 am., exc. Sun.	9.165	HC2CW	GUAYAQUIL, ECUADOR, 32.74 m., 7-11.30 pm., Sun. 3.30-6 pm.
9.636	JFO	TAIHOKU, TAIWAN, 31.13 m. Relays JFKA Irreg. 4-10.30 am.	9.535	JZI	TOKYO, JAPAN, 31.46 m., Addr. (See 11.800, JZJ) 2.30-4, 4.30-5.30 pm.	9.125	HAT4	BUDAPEST, HUNGARY, 32.88 m., Addr. "Radiolabor," Gyali-ut, 22. Daily 7-8 pm., Sat. 6-7 pm.
9.618	HJIABP	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.	9.535	-	BERNE, SWITZERLAND, 31.46 m., 1-2 pm. exc. Mon. and Tues.	9.100	COCA	HAVANA, CUBA, 32.95 m., Addr. Galiano No. 102. Relays CMCA 9 am.-12 m.
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.	9.530	W2XAF	SCHENECTADY, N. Y., 31.48 m., Addr. General Electric Co. 4 pm.-12 m. Sat. 1 pm.-12 m.	9.100	PJC2	CURACAO, D. W. INDIES, 32.97 m., 6.36-8.36 pm., Sun. 10.36 am.-12.36 pm.
9.607	HP5J	PANAMA CITY, PANAMA, 31.23 m., Addr. Apartado 867. 12 n. to 1.30 pm., 6-10.30 pm.	9.530	VUC2	CALCUTTA, INDIA, 31.48 m. Addr. All India Radio. 1.06-3.06 am.	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 CMBX.
9.600	RAN	MOSCOW, U.S.S.R., 31.25 m., Daily exc. Sun. 6-10 pm. Sun. 6-7, 9.15-10 pm.	9.526	XEDQ	GUADALAJARA, GAL., MEXICO, 31.49 m., n.-4.30 pm., 8-11.30 pm.	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.
9.595	HBL	GENEVA, SWITZERLAND, 31.27 m., Addr. Radio Nations. Irregular.	9.526	ZBW3	HONGKONG, CHINA, 31.49 m., Addr. P. O. Box 200. 11.30 pm. to 1 am., 3-10 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.
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.	9.525	LKC	JELOY, NORWAY, 31.49 m., 4.30-10.30 am., Sun. 2.30-10.30 am.	8.700	HKV	BOGOTA, COLOMBIA, 34.46 m., Tues. and Fri. 7-7.20 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.	9.520	OZF	SKAMLEBOAEK, DENMARK, 31.51 m., Addr. Statsradiofonien, Heibergsgade 7, Copenhagen, 8-9.30, 9.30-11 pm. to No. Amer.	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.
9.590	VK6ME	PERTH, W. AUSTRALIA, 31.28 m., Addr. Amalgamated Wireless of Australasia, Ltd. 6-9 am. exc. Sun.	9.520	YSH	SAN SALVADOR, EL SALVADOR, 31.51 m., Addr. (See 7.894 mc.) 1-10 pm. irregular 6-10 pm.	8.665	W2XGB	HICKSVILLE, N. Y., 34.64 m., Addr. Press Wireless, Mon. to Fri. News at 9 am. and 5 pm.
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.	9.510	G58	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.	8.580	YNPR	MANAGUA, NICARAGUA, 34.92 m., Radiodifusora Pilot.
9.590	W2XE	NEW YORK, N. Y., 31.28 m., Addr. CBS, 485 Madison Ave., Irregular.	9.510	HJU	BUENAVENTURA, COLOMBIA, 31.55 m., Addr. National Railways. Mon., Wed. and Fri. 8-11 pm.	7.894	YSD	SAN SALVADOR, EL SALVADOR, 37.99 m., Addr. Dir. Genl. Tel. B. Tel. 7-11 pm.
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.	9.510	HS6PJ	BANGKOK, SIAM, 31.55 m. Thursday, 8-10 am.	7.870	HCIRB	QUITO, ECUADOR, 38.1 m. La Voz de Quito. 9-11 pm.
9.580	GSC	DAVENTRY, ENGLAND, 31.32 m., Addr. B. B. C., Portland Pl., London, W. I., 4.15-6, 6.20-8.30, 9.20-11.25 pm., 9 am.-12 n.	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.	7.854	HC2JS8	GUAYAQUIL, ECUADOR, 38.2 m. Evenings to 11 pm.
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.	9.500	VK3ME	MELBOURNE, AUSTRALIA, 31.58 m., Addr. Amalgamated Wireless of Australasia, 167 Queen St. Daily except Sun. 4-7 am.	7.797	H8P	GENEVA, SWITZERLAND, 38.48 m., Addr. Radio-Nations.
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.	9.503	XEWW	MEXICO CITY, MEX., 31.57 m., Addr. Apart. 2516. Relays XEW. 9 am.-12.30 am.	7.510	JVP	NAZAKI, JAPAN, 39.95 m., 8-9.30 am.
9.500	OFD		9.500	OAXSC	LAHTI, FINLAND, 31.58 m., Addr. Finnish Brest. Co., Helsinki. 12.15-5 pm.	7.450	TI2R3	SAN JOSE, COSTA RICA, 40.27 m., "Radioemisora Athena". 9.30-11 pm., exc. Sun.
9.490	OAXSC		9.498	EAR	ICA, PERU, 31.61 m., Radio Universal, 8-11.30 pm.	7.410	HCJ84	QUITO, ECUADOR, 40.46 m., 7-9.30 pm., irregularly.
9.498	EAR		9.498	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.	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.
9.200	YNAME		9.200	YNAME	MEXICO CITY, MEX., 40.65 m., Addr. Foreign Office, Sun. 7-8 pm.	7.380	XEGR	BOGOTA, COL., S. A., 41.55 m., Tues. and Sat. 8-9 pm. Mon. and Thurs. 6.30-7 pm.
7.177	CR6AA		7.177	CR6AA	MANAGUA, NICARAGUA, 41.67 m., Irregular at 9 pm.	7.220	HKE	LOBITA, ANGOLA, PORT. WEST. AFRICA, 41.75 m., Wednesday and Saturday 2.45-4.30 pm.

—End of Broadcast Band—

(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

• 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.

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:—  
 Bolender, 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.



**RADIO & TELEVISION**  
**OFFICIAL LISTENING POST**  
**1938**

This is to certify that  
*William D. Noyes*  
 has been appointed an Official Listening Post  
 Observer by the DX Department of  
 RADIO & TELEVISION

*H. Gernsback*  
 Editor, Chief  
 Elmer R. Fuller  
 Listening Post Editor

**SHORT WAVE LEAGUE**

The handsome RADIO & TELEVISION official "listening post" certificate is reproduced above. The original certificate measures 7 1/4 by 9 1/2 inches and is attractively printed in two colors, red and blue.

## HONORARY MEMBERS

Dr. Lee de Forest  
 D. E. Replogle  
 John L. Reinartz

Hugo Gernsback, Executive Secretary

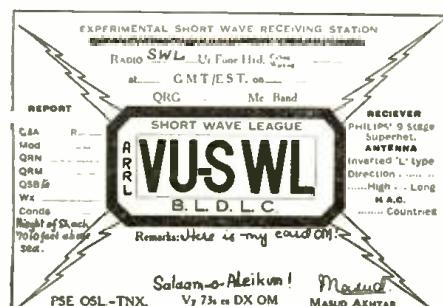
ZS6A 14.070 5 7 Slaughter

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. inc.	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
G5BT	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
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, Yourstruly
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
G6RG	28.470	5	9	Rush
G8UJ	14.080	4	6	Fitzpatrick
GW5KJ	28.210	5	8	Hartzell
GW6JW	14.205	5	9	Fitzpatrick
G3DÖ	14.110	5	6	Lang
G3BM	14.160	5	9	Fitzpatrick, Yourstruly
G8MA	28.198	2	4	Hartzell
G1BUW	14.337	3.5	7.8	Hartzell, Fitzpatrick
G1205	—	—	—	—
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.

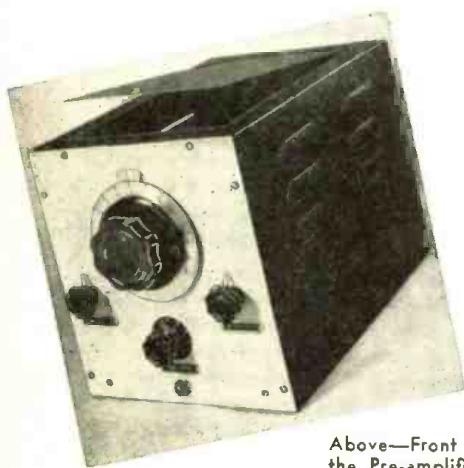


Mc.	Call		Mc.	Call		Mc.	Call	
7.100	FOBAA	PAPEETE, TAHITI, 42.25 m., Addr. Radio Club Oceanien, Tues. and Fri. 11 pm.-12.30 am.	6.335	OAXIA	ICA, PERU, 47.33 m., Addr. La Voz de Chiclayo, Casilla No. 9. 8-11 pm.	6.125	CXA4	MONTEVIDEO, URUGUAY, 48.98 m., Addr. Radio Electrico de Montevideo, Mercedes 823. 10 am.-12 n., 2-8 pm.
7.088	PIIJ	DORDRECHT, HOLLAND, 42.3 m., Addr. Dr. M. Hellingman, Technical College, Sat. 11.10-11.50 am.	6.324	COCW	HAVANA, CUBA, 47.4 m., Addr. La Voz del Radio Philco, P. O. Box 130. 6.55 am.-12 m. Sun. 9.55 am.-10 pm.	6.122	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.
6.990	XEME	MERIDA, YUCATAN, 42.89 m., Addr. Calle 59, No. 517, "La Voz de Yucatan desde Merida." Irregular.	6.310	HIZ	CIUDAD TRUJILLO, D. R., 47.52 m. Daily except Sat. and Sun. 11.10 am.-2.25 pm., S.10-8.40 pm. Sat. 5.10-11.10 pm. Sun. 11.40 am.-1.40 pm.	6.122	HP5H	PANAMA CITY, PAN., 49 m., Addr. Box 1045. 10 am.-1 pm., 5-11 pm.
6.977	XBA	TACUBAYA, D. F., MEX., 43 m. 9.30 am.-1 pm., 7-8.30 pm.	6.300	YY4RD	MARACAY, VENEZUELA, 47.62 m. 6.30-9.30 pm. exc. Sun.	6.120	W2XE	NEW YORK CITY, 49.02 m., Addr. Col. B'cast. System, 485 Madison Ave. 10.30-11.30 pm.
6.805	H17P	CIUDAD TRUJILLO, DOM. REP., 44.06 m., Addr. Emisora Diaria de Comercio. 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.	6.295	OAX4G	LIMA, PERU, 47.63 m., Addr. Apartado 1242. Daily 7-10.30 pm.	6.117	XEUZ	MEXICO CITY, MEX., 49.03 m., Addr. 5 de Mayo 21. Relays XEOF 1-3 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.	6.280	HIG	TRUJILLO CITY, D. R., 47.77 m. 7.10-9.40 am., 11.40 am.-2.10 pm., 3.40-9.40 pm.	6.115	OLR2C	PRAGUE, CZECHOSLOVAKIA, 49.05 m. (See 11.43 mc.)
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.	6.270	YV5RP	CARACAS, VENEZUELA, 47.79 m., Addr. "La Voz de la Philco." Daily to 10.30 pm.	6.110	GSL	DAVENTRY, ENGLAND, 49.1 m., 6.20-8.30, 9.20-11.20 pm.
6.750	JVT	NAZAKI, JAPAN, 44.44 m., Addr. Kokusai-Denwa Kaisha, Ltd., Tokyo. Irregular.	6.255	YV5RJ	CARACAS, VENEZUELA, 47.18 m.	6.110	XEGW	MEXICO CITY, MEX., 49.1 m., Addr. La Voz de Aguila Azteca desde Mex., Apartado 8403. Relays XEUW 11 pm.-1 am.
6.730	HI3C	LA ROMANA, DOM. REP., 44.58 m., Addr. "La Voz de la Feria." 12.30-2 pm., 5-6 pm.	6.243	HIN	CIUDAD TRUJILLO, D. R., 48 m., Addr. "La Voz del Partido Dominicano." 12 n.-2 pm., 6-10 pm.	6.110	VPB	COLOMBO, CEYLON, 49.1 m. Daily 7.9.30 am.; Sun. 6.30-9.30 am.
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.	6.240	ZGE	KUALA LUMPUR, FED. MALAY ST., 48.1 m., Addr. Malayan Amateur Radio Society. Sun. Tues. and Fri. 6.40-8.40 am.	6.108	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.
6.690	TIEP	SAN JOSE, COSTA RICA, 44.92 m., Addr. Apartado 257, La Voz del Tropico. Daily 7-10 pm.	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.	6.100	YUA	BELGRADE, JUGOSLAVIA, 49.18 m. 12.45-2.30, 4-8 am., 1-6 pm.
6.675	H8Q	GENEVA, SWITZERLAND, 44.94 m., Addr. Radio-Nations. Off the air at present.	6.225	YY1RG	VALERA, VENEZUELA, 48.15 m. 6-9.30 pm.	6.100	W3XAL	BOUND BROOK, N. J., 49.18 m., Addr. Natl. Broad. Co.
6.672	—	— 44.94 m., relays Salamanca, Spain, 7.9.45 pm.	6.210	—	SAIGON, INDO-CHINA, 48.28 m., Addr. Radio Boy-Landry, 17 Place A. Forey. 4.30 or 5.30-9.15 am.	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.
6.672	YVQ	MARACAY, VENEZUELA, 44.95 m., Irregular.	6.205	YV5RI	CORO, VENEZUELA, 48.32 m., Addr. Roger Leyba, care A. Urbina y Cia. Irregular.	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.
6.635	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.	6.200	H18Q	CIUDAD TRUJILLO, D. R., 48.36 m., Irregular.	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.
6.630	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.	6.190	TG2	GUATEMALA CITY, GUAT., 48.4 m., Addr. Dir. Genl. of Electr. Commun. Relays TGT Mon.-Fri. 6-11 pm., Sat. 6 pm.-1 am. Sun. 7-11 am., 3-8 pm.	6.095	JZH	TOKYO, JAPAN, 49.22 m., Addr. (See 11.800 mc., JZL.) Irregular.
6.625	PRADO	RIOBAMBA, ECUADOR, 45.28 m., Thurs. 9-11.45 pm.	6.185	HIIA	SANTIAGO, D. R., 48.5 m., Addr. P. O. Box 423. 7 am.-5 pm.	6.090	CRCX	TORONTO, CAN., 49.26 m., Addr. Can. Broadcasting Corp. Daily 7.45 am.-5 pm., Sun. 10.30 am.-12 n.
6.610	YNLG	MANAGUA, NICARAGUA, 45.39 m., Emisora Ruben Dario. 1-3, 7-11 pm.	6.156	YY5RD	CARACAS, VENEZUELA, 48.71 m. 11 am.-2 pm., 4-10.40 pm.	6.090	ZBW2	HONGKONG, CHINA, 49.26 m., Addr. P. O. Box 200. Irregular.
6.558	H14D	CIUDAD TRUJILLO, D. R., 45.74 m., Except Sun. 11.55 am.-1.40 pm.	6.153	H15N	MOCA CITY, D. R., 48.75 m. 6.40-9.10 pm.	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.
6.550	XBC	VERA CRUZ, MEX., 45.8 m. 8.15-9 am.	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.	6.081	YY1RD	MARACAIBO, VEN., 49.32 m. 6-11 pm.
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.	6.147	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.	6.080	W9XAA	CHICAGO, ILL., 49.34 m., Addr. Chicago Fed. of Labor. Relays WCFL irregular.
6.545	YV6RB	BOLIVAR, VENEZUELA, 45.84 m., Addr. "Ecos de Orinoco." 6-10.30 pm.	6.145	HJ4ABG	MEDELLIN, COL., 48.79 m. 11 am.-12 n., 6-10.30 pm.	6.079	DJM	BERLIN, GERMANY, 49.34 m., Addr. Broadcasting House. Irregular.
6.520	YV4RB	VALENCIA, VENEZUELA, 45.98 m. 11 am.-2 pm., 5-10 pm.	6.140	W8XK	PITTSBURGH, PA., 48.83 m., Addr. Westinghouse Electric & Mfg. Co. Relays KDKA 11 pm.-12 m.	6.077	OAX4Z	LIMA, PERU, 49.35 m. Radio National 7-11 pm.
6.516	YNIGG	MANAGUA, NICARAGUA, 46.02 m., Addr. "La Voz de las Lagos." 8-9 pm.	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.	6.075	VP3MR	GEORGETOWN, BRI. GUIANA, 49.35 m. Sun. 7.45-10.15 am.; Daily 4.45-8.45 pm.
6.500	HIL	CIUDAD TRUJILLO, D. R., 46.13 m., Addr. Apartado 623. 12.10-1.40 pm., 5.40-7.40 pm.	6.133	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.	6.070	HP3ABF	BOGOTA, COL., 49.42 m., La Voz de Bogota.
6.480	HILL	SANTIAGO DE LOS CABALLEROS, D. R., 46.28 m., Addr. Box 356. 9.40-11.40 am., 7.40-9.40 pm.	6.130	VP3BG	GEORGETOWN, BRIT. GUIANA. 48.94 m. From 5 pm. on.	6.070	CFRX	TORONTO, CAN., 49.42 m. Relays CFRB 7.30 am.-12 m., Sun. 10 am.-12 m.
6.470	YNLAT	GRANADA, NICARAGUA, 46.36 m., Addr. Leonidas Tenorio, "La Voz del Mombacho." Irregular.	6.130	TIEM	SAN JOSE, COSTA RICA, 48.94 m. "El Mundo," Apartado 1049. 11 am.-11 pm., Sun. 10 am.-6 pm.	6.070	VE9CS	VANCOUVER, B. C., CAN., 49.42 m. Sun. 1.45-9 pm., 10.30 am.-1 am.; Tues. 6-7.30 pm., 11.30 pm.-1.30 am. Daily 6-7.30 pm.
6.465	YV3RD	BARQUISIMETO, VENEZUELA, 46.37 m. Radio Barquisimeto, irregular.	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. Relays CHNS.	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.
6.450	H14V	SAN FRANCISCO DE MACORIS, D. R., 46.48 m. 11.40 am.-1.40 pm., 5.10-9.40 pm.	6.130	LKL	JELOY, NORWAY, 48.94 m. 11 am.-6 pm.	6.065	SBO	MOTALA, SWEDEN, 49.46 m. Relays Stockholm 1.30-5 pm.
6.440	TGQA	QUEZALTENANGO, GUATEMALA, 46.56 m. Daily 6.10-10.10 pm., Sun. 1-3 pm.				6.060	—	TANANARIVE, MADAGASCAR, 49.5 m., 12.30-12.45, 3.30-4.30, 10-11 am.
6.340	HIIIX	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.				6.060	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

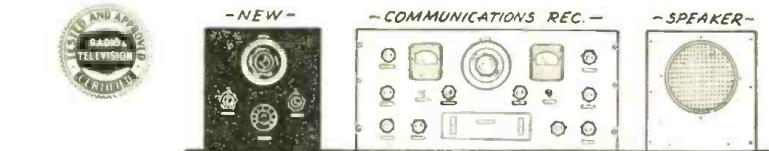
# Increase Your DX with



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.

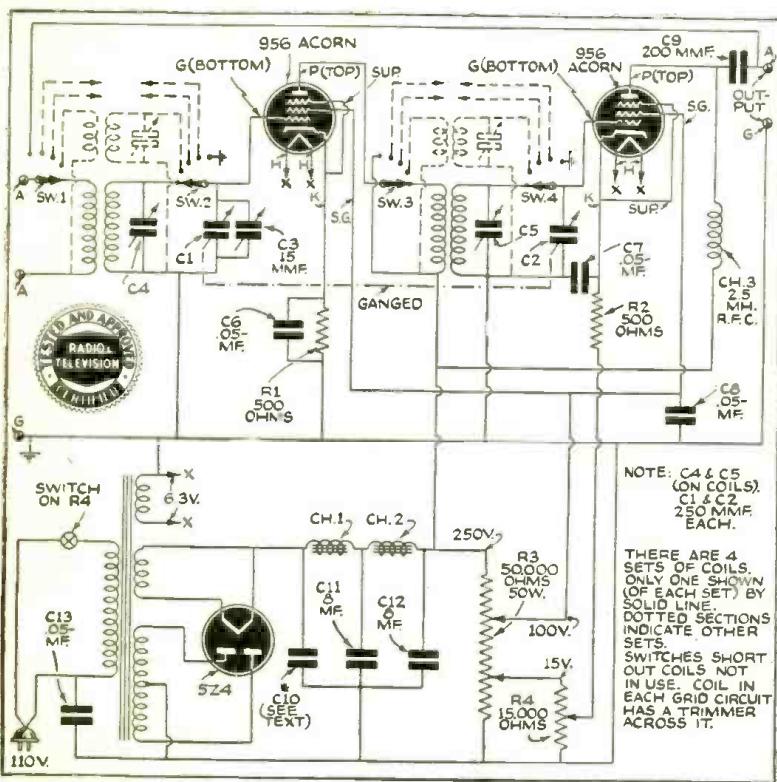
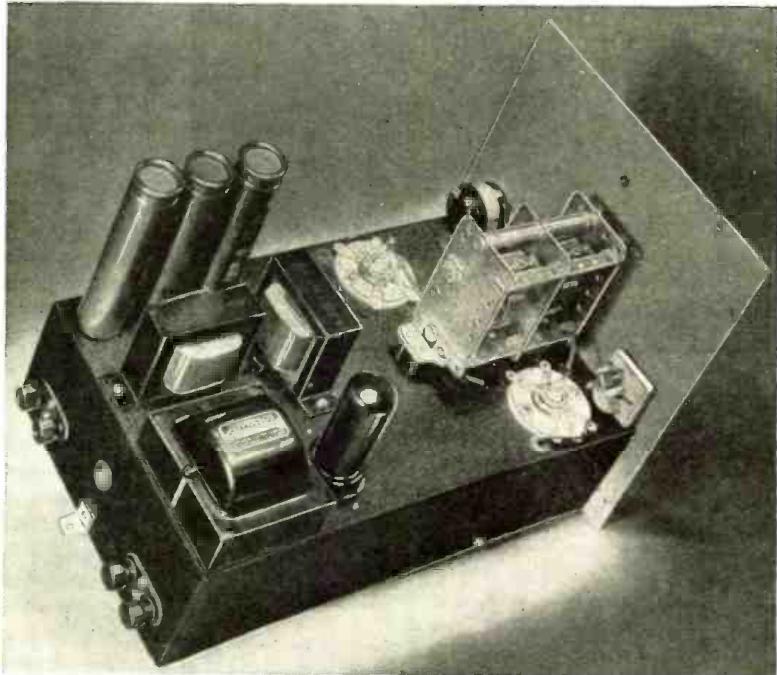
The pre-selector described herein brings signals out of the noise-level and so can be utilized to advantage with any receiver from the simple regenerative job,



## 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.



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.

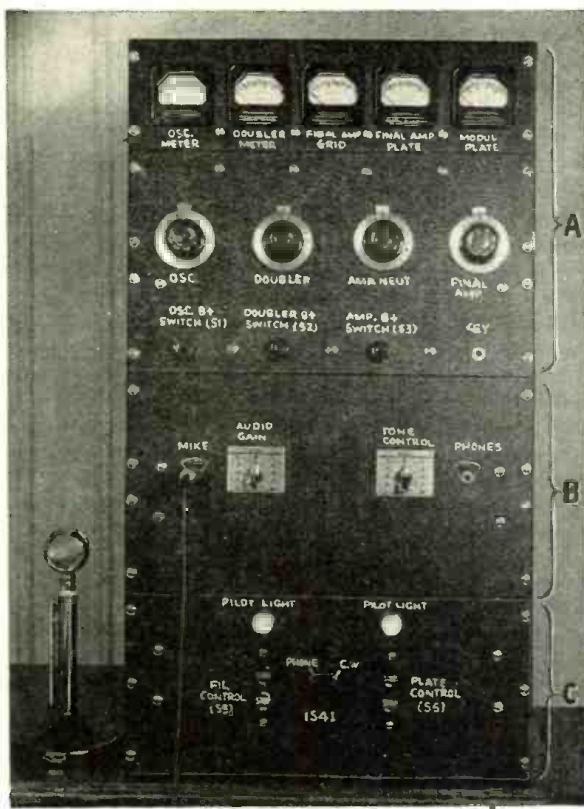
The R.F. tubes are of the Acorn type, as these give very high efficiency on the *higher* frequencies, where efficiency is badly needed. The new television amplifier tubes, or even 6K7's, may be used in place of the 956's, but the latter have proved to be very fine for this application.

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



• 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.

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

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.

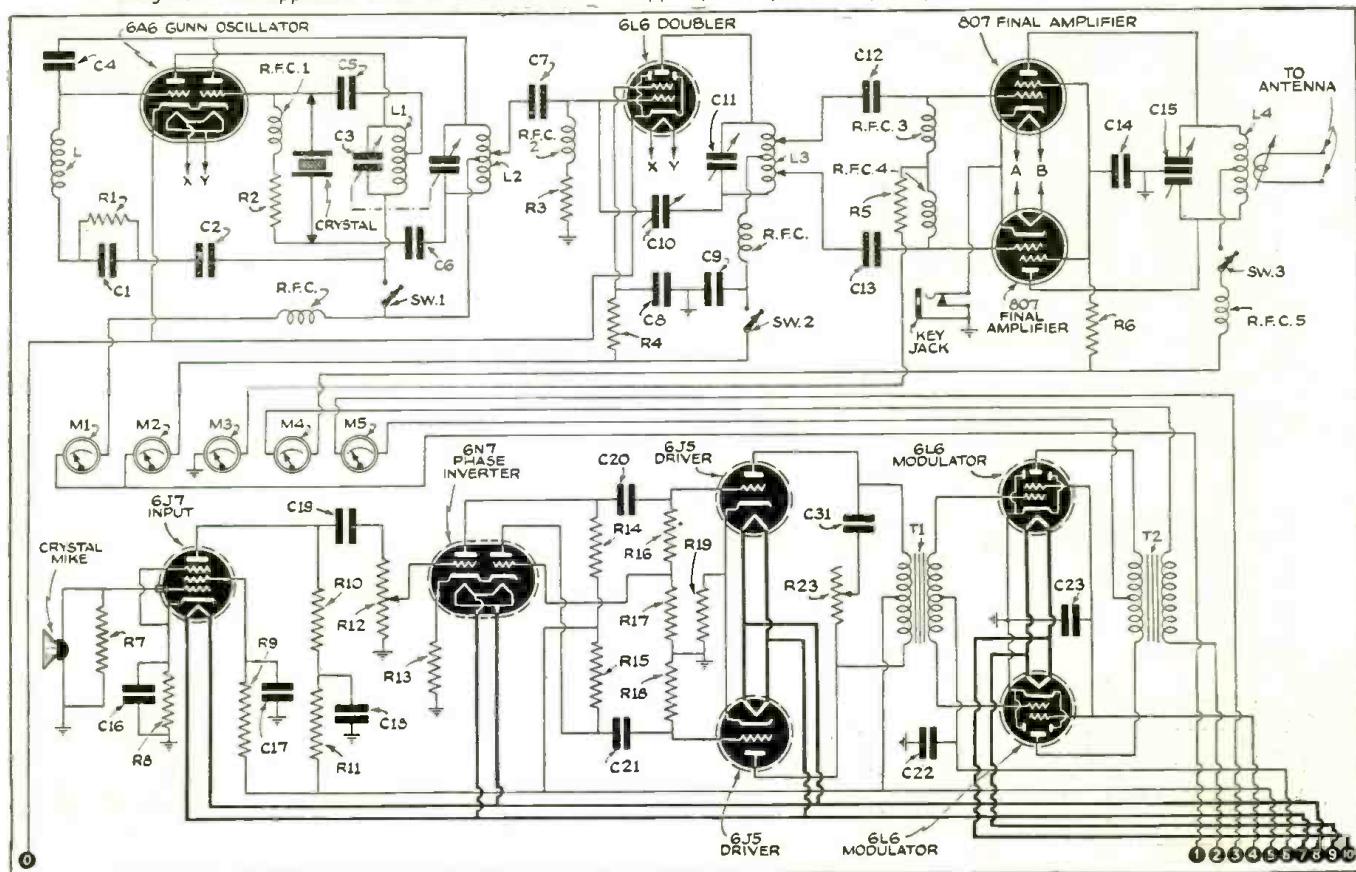
#### Notes on Gunn Oscillator

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.

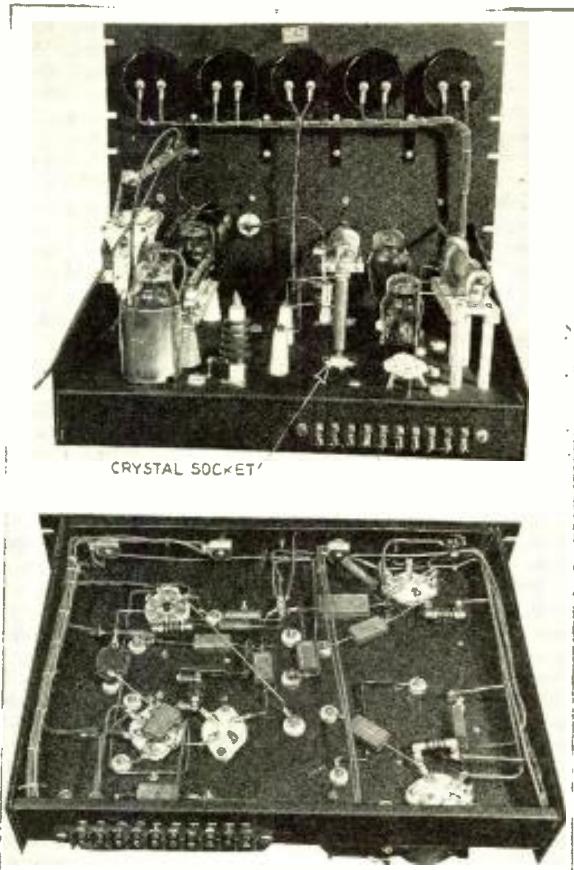
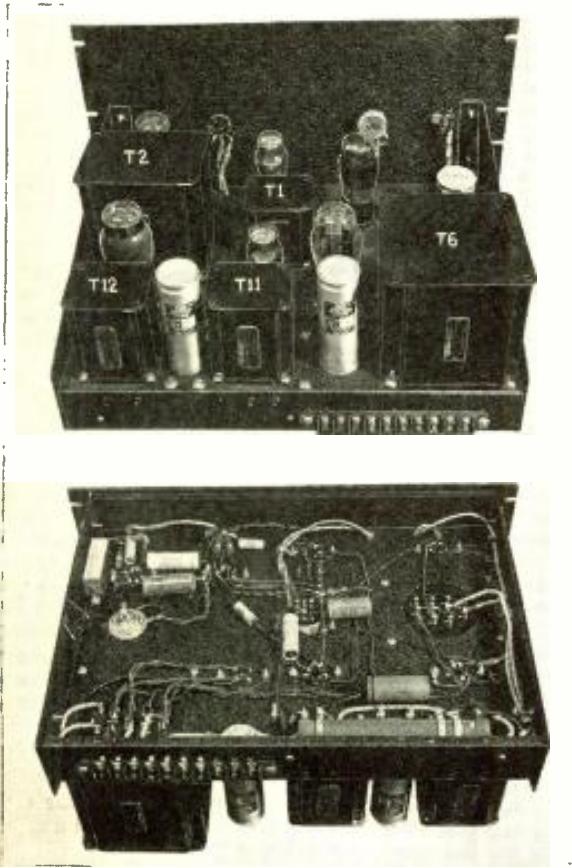
Alvin Abrams, W2DTT

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

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.



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.

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 5 1/4" meter  
(Continued on page 571)

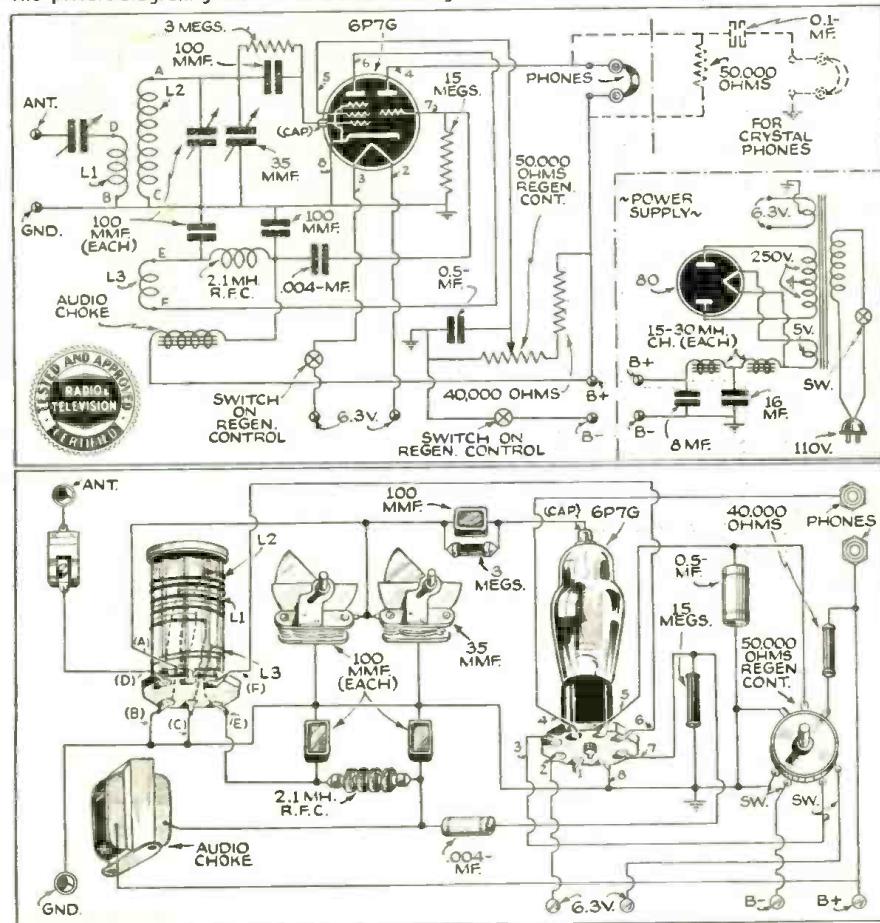


This one-tube receiver has many fine points and can be built at a nominal cost. It is particularly designed for headphone reception. Photo at right shows a rear view of the chassis.

• 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-tube 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. Con-

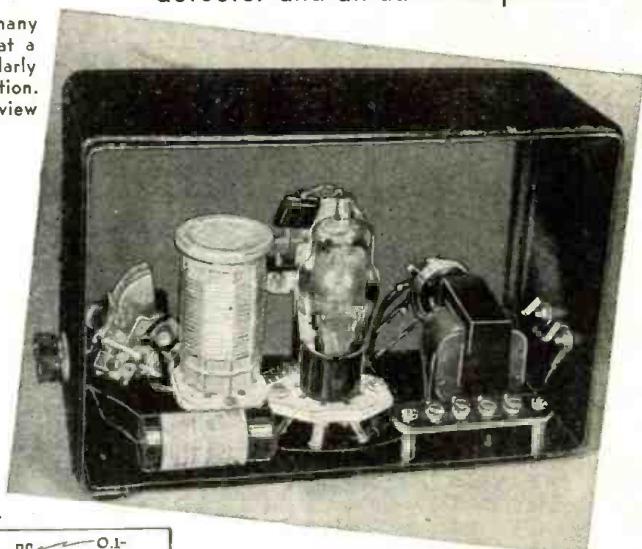
The picture diagram given below makes building this one-tube receiver easy.



# 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.



taining 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.

## I 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 refine-

ments, 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%.

**GUARANTEED FOR ONE YEAR**

**SUPERIOR INSTRUMENTS ARE**

## 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.	0-400 volts A.C.
0-25 volts D.C.	0-10 ma. D.C.	0-75 volts A.C.	0-1000 volts A.C.
0-75 volts D.C.	0-100 ma. D.C.	0-200 volts A.C.	0-2000 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.....

**\$785**

## 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. 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 +10. -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 7½" x 4½". Shipping weight 9 pounds. Our net price.....

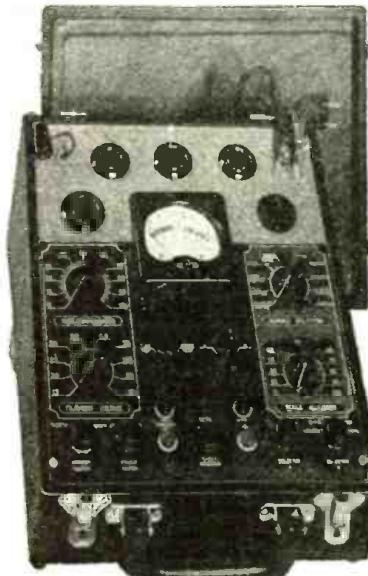
Model 1150-A Portable carrying cover 75¢ additional.

**\$1185**

## 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 transmitting and receiving type tube, including many new transmitting types. Size 10" x 7½" x 4½". Shipping weight 11½" x 14" x 5". Our net price.....

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

**\$1785**

## 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 GDO! B.A.D. scale of the meter.
3. Affords separate neon test for leakage and shorts between elements.
4. All servicing 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 valuator chart for every known receiving type of tube as well as many transmitting types. Shipping weight 10 pounds, size 10" x 7½" x 4½". Our net price.....

Model 1140-A with Portable Cover.....75¢ additional

**\$1085**

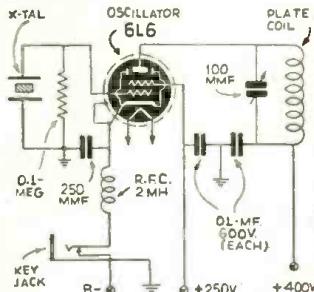
# SUPERIOR INSTRUMENTS CO.

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.



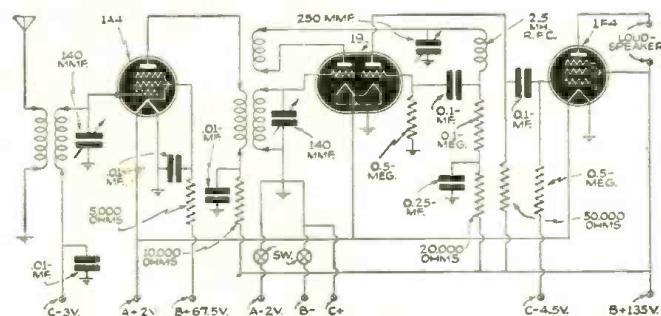
Oscillator works 2 bands.—1165

**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.

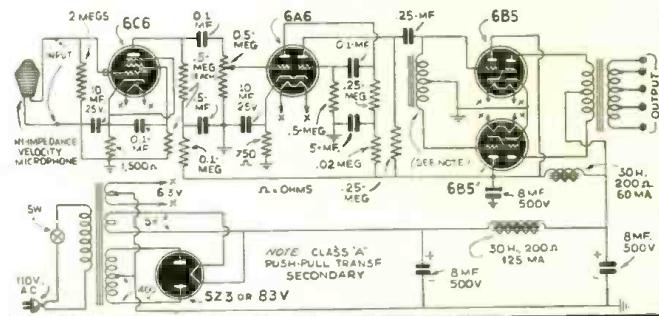
Facsimile receivers will not be available to the public until much experimentation has been done, dependable apparatus developed to sell at a moderate price, and a means found for financing regular broadcasts.

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

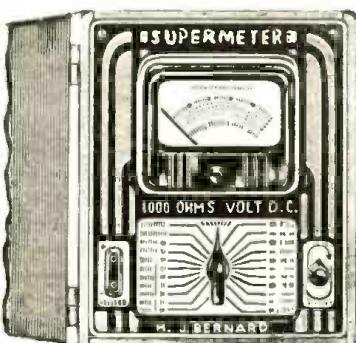
HERE is an analyzer extraordinary! The new SUPERMETER, in handsomest imaginable solid instrument wood cabinet, is tops for accuracy and rock bottom for price. The cabinet has removable hinged cover and carrying handle. Supermeter is what the serviceman, experimenter, student and engineer need most at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

WHEN an instrument offers 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 3" square Bakelite meter, 2½% 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. FIFTEEN RANGES. By introducing 300 volts from a B supply you can measure up to 23,000,000 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.

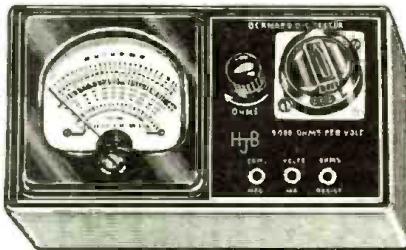
Turn the selector to a-c and the copper-oxide rectifier is automatically cut in. No AC-DC switch to cause mistakes and confusion.

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 12 accurate ranges. It uses a 2½% 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 ohm 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, 10¢).

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 fine-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 focal tubes, etc. Bernard Tube Tester, Model 387, shipping weight 9 lbs. Net price, with handle, \$20.90.

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

## ALL-WAVE SIGNAL GENERATOR \$19.90

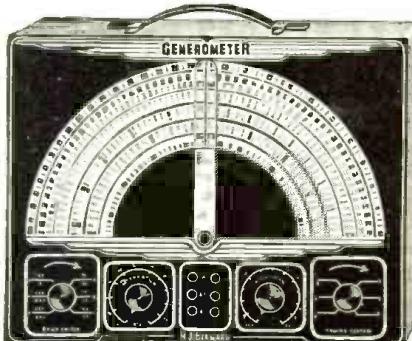
OPERATING entirely on fundamentals, GENEROMETER is a signal generator covering 120 ke to 70 me in six bands, by front panel switch selection. Thus it supplies all the useful intermediate and radio frequencies for the complete alignment of all types of radio receivers. Future requirements are provided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

The leakage has been controlled, so that the generator works efficiently in 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 ke to 380 ke
- B. 380 ke to 1,100 ke
- C. 1.1 me to 4 me
- D. 4 me to 12 me
- E. 12 me to 50 me
- F. 25 me to 70 me

GENEROMETER is 12½" wide by 8½" 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.

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.

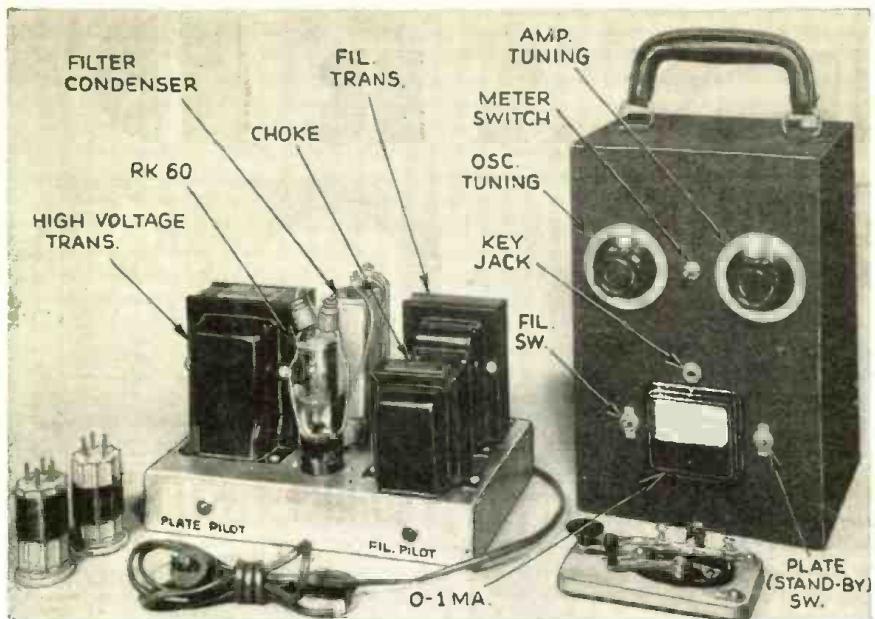


Photo above shows complete portable transmitter with 110 volt A.C. power-supply. A vibrapack is built in for 6 volt operation.



## 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.

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.

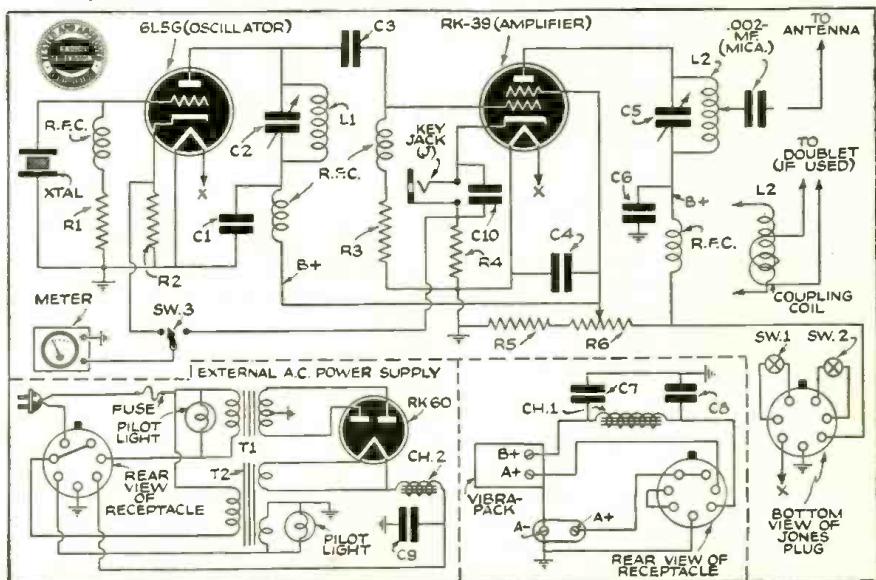
The transmitter consists of a 6L5G tube used as a crystal-controlled oscillator in a circuit characterized by its extreme simplicity, feeding into an RK-39 amplifier, which in turn feeds into the antenna. The transmitter is completely mounted on a small  $6\frac{1}{2} \times 6\frac{1}{4} \times 1\frac{1}{2}$  inch chassis. This chassis is mounted in a portable  $12 \times 7\frac{3}{4} \times 6\frac{1}{2}$  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.

Herman Yellin, W2AJL

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 enamelled, spaced to $1\frac{1}{2}$ " long	same as oscillator
80	32 turns No. 18 enamelled close wound	32 turns No. 18 enamelled spaced to length of $2^{\prime \prime}$
160	60 turns No. 24 enamelled close wound	60 turns No. 24 enamelled spaced to length of $2^{\prime \prime}$

All coils wound on Hammarlund forms,  $1\frac{1}{2}$ " 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  $\frac{1}{2}$  watt type BT<sup>1</sup> (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—.001 mf. mica type 4-12T1 (C-3)

##### TRIPLETT (Meters)

- 1—2" 0-1 milliamperc 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—12x7 $\frac{1}{2}$ x6 $\frac{1}{2}$  inch portable cabinet, type PC1276
- 1—6 $\frac{1}{2}$ x6 $\frac{1}{4}$ x1 $\frac{1}{2}$  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—2 $\frac{3}{4}$ " 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

for January, 1939

# Here's YOUR Practical TRAINING for RADIO All in ONE Handy Volume!

HERE AT LAST is a quick, easy, inexpensive way to get the practical radio training you need to qualify for a radio job. Condensed into this one great book, Ghirardi's "Radio Physics Course", you will find the equivalent of THIRTY-SIX easy-to-understand reading courses covering all the essentials of radio, electricity and sound. Here is practical self-instruction that will fit you for many different kinds of good-paying jobs.

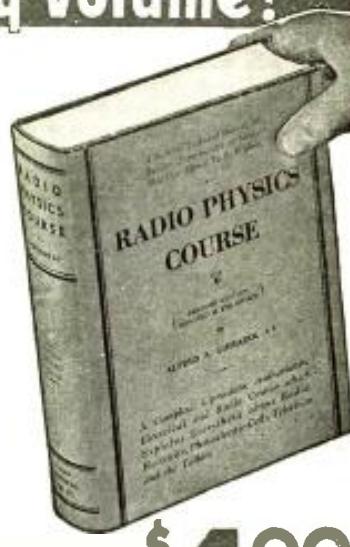
### THE OPPORTUNITY OF A LIFETIME!

No longer need you be deprived of the advantage of radio training because of its cost, or the time it usually requires. Think of getting in ONE CONCISE AND COMPACT VOLUME, a complete course in ELECTRICITY, a complete course in RADIO, a complete course in SOUND, and in addition thorough instruction in Television, Talkies, Photoelectric Cells, and Cathode-Ray Tubes, Testing and Servicing, Automobile, Aircraft and Marine Radio, Short-Wave Reception, and many other special subjects that all go to make up a complete education in the field of radio. And all for the phenomenally low price of \$4.00! This is only a fraction of what you would expect to pay for a course in just one of these essential subjects.

### Short-Cut Courses of Self-Instruction Prepared by that World-Famous Authority,

ALFRED A. GHIRARDI

Every one of the 34 big sections of "Radio Physics Course" is an expertly prepared home study course. Each is brief and simplified for time-saving and easy to understand—yet each is so thorough and practical that every minute spent with the book rapidly pushes ahead your preparation for a good-paying radio job. Self testing, review questions and problems for each section make it simple not only to understand everything but also to check your own progress. No previous training or knowledge of mathematics are required. The book is already the most popular book on the market. Because it makes learning radio so very simple, it is praised by students and radio instructors everywhere, and actually used in the courses of more radio schools than any other radio book in the world.



\$ **4 00**  
only **4** No Further Payments

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Radio, Electricity and Sound Complete  
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- 1. Radio Broadcasting System.
- 2. Sound, Speech and Music as Related to Broadcasting.
- 3. Electron Theory, Electric Current.
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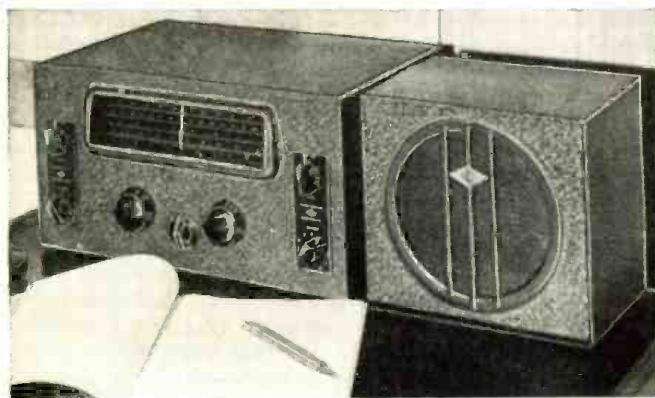
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One feature is the uniform direct-reading frequency scale. Large knob at left—main frequency tuning control; right is the band-spread tuning control. Both controls of the high-ratio free-spinning inertia drive type.

• 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.

# The New NC-44 Receiver of the Communications Type

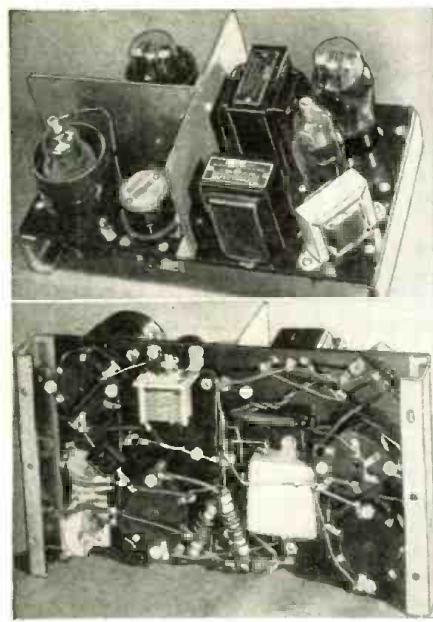
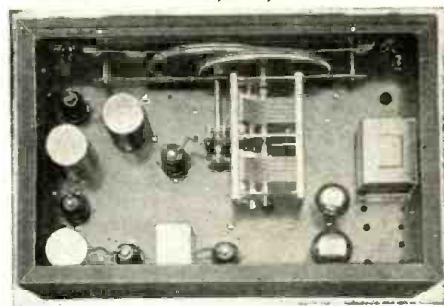
James Millen

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 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

## A Low-Power Emergency 'Phone Transmitter

D. L. Warner, W9IBC

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.

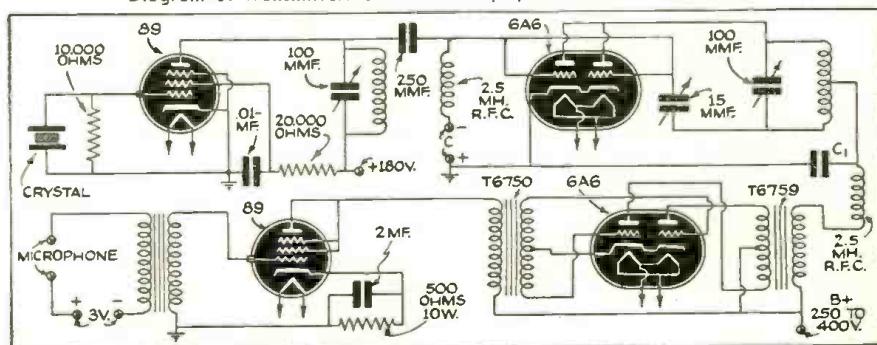
If the coil and crystal combination is changed so that operation on 10 or 20 meters is made possible, this little transmitter will provide some fairly decent DX contacts. Because of its small size the unit adapts itself very readily for use in any type of emergency communication set-up,

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 mfd., 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 2SL6G. 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.

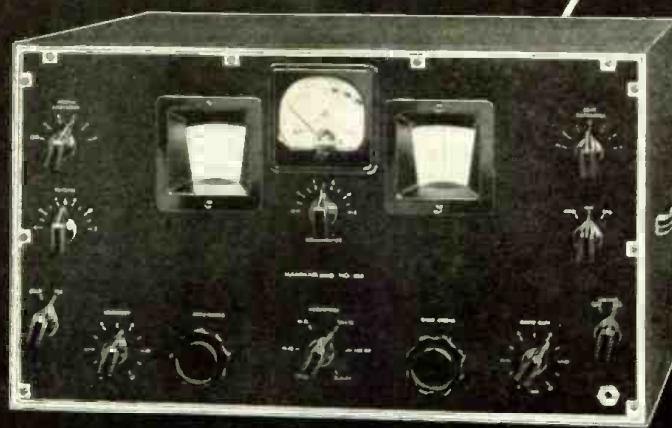
Separate audio and I.F. gain controls are provided and each is fitted with a switch. When the audio gain control is turned to the "off" position, the B supply circuit is opened to place the receiver in stand-by position. Turning the R.F. gain control to the minimum position turns the receiver completely 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 2SL6G 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)

# Announcing...



. . . THE NEW "HQ-120"

### OUTSTANDING FEATURES

- Continuous range from .31 to .54 mc.—12 tubes.
- Antenna compensating control for maximum signal-to-noise ratio and image rejection.
- 310 degrees band-spread on all amateur bands.
- Noise limiter follows A.V.C. for quiet reception.
- Variable band width crystal filter for phone reception.
- Calibrated "S" meter on all models.

THE Hammarlund "HQ-120," short wave receiver, is designed for both amateur and short wave listener. The "HQ-120" is a thoroughly new receiver. Hammarlund's engineers have developed a new and outstanding crystal filter circuit. This crystal filter, which is included in the "HQ-120," can be used for voice or music, as well as for code reception. The short wave listener can now enjoy the same benefits of a crystal filter that hams have enjoyed for many years. The adjustable selectivity range of the crystal filter in the "HQ-120" is so flexible that it can be used even in the regular broadcast band. Special tuning condenser design results in 310 degrees spread in each amateur band. This wide band spread feature works continuously throughout the high frequency range of the receiver.

In order to permit a wide selection of antennas, the "HQ-120" has an antenna compensating control providing maximum gain and highest signal-to-noise ratio for various types of antennas. Other outstanding features are: Noise limiter, for those troubled with automobile ignition interference and similar disturbances; 3 stages of I.F.; one very effective R.F. stage with high selectivity and gain, due to special antenna compensator; signal strength meter; A.V.C.; voltage regulated power supply; beat oscillator; phone jack; relay connection, and many others. Ask your jobber for a demonstration!

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CLEVELAND, OHIO



## 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)

for January, 1939

## RCA Introduces 3 New Television Tubes

### NEW WHITE SCREEN! NEW LOW PRICES!



Two of the three new RCA Television Tubes just introduced feature White Screen and extremely low prices. The 3" tube, RCA 906-P4, is similar to the present RCA 906 Cathode Ray tube—except that it has a White Screen. It is suitable for television circuits and in addition to its low initial cost provides low circuit component costs because of its low voltage rating. Has conductive coating which relieves deflecting-plate loading and prevents drifting of the pattern with changes in bias. Full details about this and the other new television tubes will be sent to you on request.

RCA 906-P4, 3", White Screen . \$15.00  
RCA 1802-P1, 5", Green Screen . \$24.75  
RCA 1802-P4, 5". White Screen . \$27.50

### Take Advantage of this RCA Oscillograph Value!

The RCA 1" Cathode Ray Oscillograph is amazingly popular with the thousands of service men who own one! Order yours now—take advantage of this outstanding value. For only \$39.95 this instrument offers you specifications and features that prove its fine quality.

#### SPECIFICATIONS:

Radiotrons Used—1 RCA-913 (1-inch), 1 RCA-885, 2 RCA-6C6, 1 RCA-80.

Sensitivity—1.75 volts (RMS) per inch. Amplifier Range and Gain—Flat 20-15,000 cycles, gain 50.

Timing Axis (Horizontal Sweep)—30-10,000 cycles.

Operation—All controls on front panel—complete with calibration screen.

Power Consumption—30 watts.

Dimensions—Length 13 $\frac{1}{4}$ ", height 9 $\frac{1}{4}$ ", depth 7 $\frac{1}{4}$ ", weight 14 $\frac{1}{2}$  lbs. Special snap handle—sturdy case.

Finish—Gray wrinkle lacquer with nickel trimming. Reversed etched, nickel-silver panel—large, soft rubber feet.

• • •

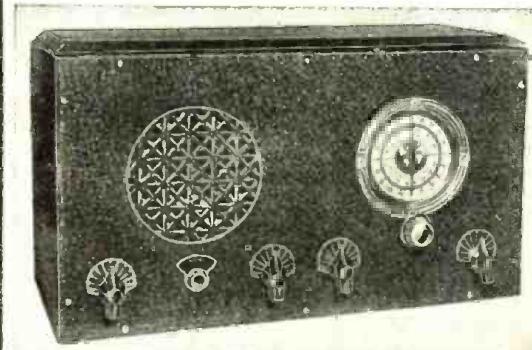
RCA presents the Magic Key every Sunday, 2 to 3 P.M., E.S.T., on the NBC Blue Network.



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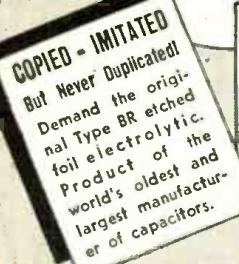
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Send me your new FREE catalog, complete details of your general 3D-line. REPLY to my offer, factory-to-you wholesale prices and big TRADE-IN offer.

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## 5 METER CRYSTAL CONTROL

**Bliley HF 2-10 METER CRYSTAL**

Your Bliley dealer will tell you how to build a simple, highly efficient 5 meter crystal controlled transmitter. Bliley Electric Co., Erie, Pa.

# 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., Saylesville, R. I.  
 W1LPH Abraham Siegelman, 20 Highland St., Pawtucket, R. I.  
 W1LPI Carl J. Quirk, 32/2 Wheeler Ave., North Adams, Mass.  
 W1LPO Richard J. Dowling, 16 Bull, Newport, R. I.  
 W1LPP Robert R. Ralston, 255 Pomeroy Ave., Pittsfield, Mass.  
 W1LPO 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., Hartford, 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. Morrison, 325 Spring St., Wincendon, Mass.  
 W1LQT Gilbert Richmond, Jr., Main St., Montague City, Mass.  
 W1LQU Bertram Selverstone, Vanderbilt Hall, Harvard Med. School, Boston, Mass.  
 W1LQV Wm. H. Potter, 116 Penobrake St., Boston, Mass.  
 W1LQY Raymond Muise, 4 Forest St., Middleboro, Mass.  
 W1LQZ Angelo J. Mora, 48 Emerald St., Malden, Mass.  
 W2BYY Thaddeus Ferguson, 1779 3rd Ave., N. Y. C.  
 W2LPY Theodore R. DuPont, 16 Ogden St., Newark, 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., Schenectady, 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.  
 W2LRL Harry M. Kalish, 67 Winfred, Yonkers, N. Y.  
 W3AQK George J. Porter, 931 Graydon Ave., Norfolk, Va.  
 W3CFU Joseph F. O'Keefe, 325 Conway Ave., Narberth, Pa.  
 W3EHX Aloisius W. Haranzy, 4165 Terrace St., Phila., Pa.  
 W3ETS Samuel Traeger, Parker St., West Falls Church, Va.  
 W3HTQ Chas. F. Reilly, 1029 N. Fulton Ave., Baltimore, 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., Baltimore, Md.  
 W3HUD Albert P. McCabe, 2330 Wilson Blvd., Arlington, Va.  
 W3HUG Robert O. Fullam, III 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, Schoolfield, Va.  
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 W3HUO Roy J. Smith, 1800 Longwood St., Baltimore, Md.  
 W3HUP Harold Lee Russell, 405 N. Rodney St., Wilmington, Del.  
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 W3HVO Pauline A. Raeser, 315 Beechwood Ave., Trenton, N. J.  
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 W4FRJ Charles L. Williams, 429 Broadway, Asheville, N. C.  
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 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 Radio School, Moultrieville, S. C.  
 W5BBK Preston T. Sellers, 1612 Milam, Houston, Texas.  
 WSEIR Cecil M. Polvado, 604 N. Reynolds St., Alice, Texas.  
 WSEJT Eugene Albert Jank, 313 Toledo, San Antonio, Texas.  
 WSEVX Hays Pool, Ola, Arkansas.  
 WSFA Clinton H. Williams, Hazen, Ark.  
 WSHLQ Ernest L. Smith, R.F.D. No. 2, Buffalo, Okla.

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**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., Tyler, Texas.  
**W5HOA** Solomon S. Goldman, 7333 Jeannette St., New Orleans, La.  
**W5HOB** Earle E. Pettry, 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, B2 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 Aspinwall, 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. Calaveras, Fresno, Calif.  
**W6QOA** Richard L. Sheehy, 21B2 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. Seargent, 1938 47th Ave., S. W. Seattle, Wash.  
**W7HDF** Clifton W. Pittelkau, 29 2nd Ave., Forest Grove, Ore.  
**W7HDG** Virgil R. Stark, 212 Unity St., Bellingham, Wash.  
**W7HDH** Elmo L. Wyke, 1419 N. 50th St., Seattle, Wash.  
**W7HDI** Rowland W. Haeggele, 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 Plattsburgh 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. Gehrk, 2452 Calvert, Detroit, Mich.  
**W8SNN** Henry W. Gosztyla, 3329 Holbrook, Hamtramck, Mich.  
**W8SNO** Norman V. Warner, Madison, W. Va.  
**W8SNP** Saul Uzman, 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. Kurtz, 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 Palvicsak, 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. Koch, 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. Schaafzman, 1007 Jenneth, Grand Rapids, Mich.  
**W9ACQ** Lawrence 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)

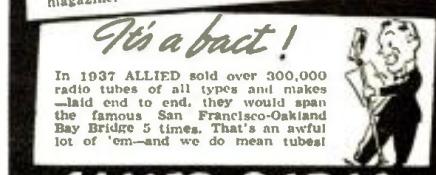
  
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*Bob Harvey*

W9ARA

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Model of Receiver	Cash Price	Down Payment	12 Mo. Payments
The NEW RME-70	\$138.60	\$27.72	\$9.79
The NEW NC-44	49.50	9.90	3.49
NC80X and NC81X	99.00	19.80	6.99
Improved NC10IX	129.00	25.80	9.11
The NEW NC100A	120.00	24.00	8.48
Latest RME-69	152.88	30.57	10.80
Sky Champion	49.50	9.90	3.49
Sky Challenger II	77.00	15.40	5.44
Breitling 9 and Super Sky Rider	99.00	19.80	6.99

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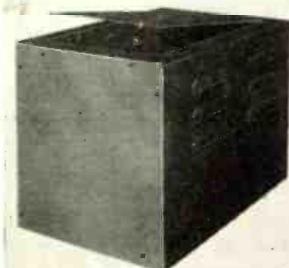
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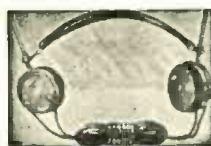


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## New HAM Licenses

(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. Signaga, C.C.G. 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. Sinitz, 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., Blytheville, 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.  
W9KWW 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.  
W9LCB 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. Rohr, 824 Derby Lane, Allouez, Wis.  
W9NYX Laurel D. Holdridge, 918 Lincoln St., Waterloo, La.  
W9NWP Floyd D. Raesch, 421 N. Broadway, Watertown, S. D.  
W9NYY L. Donald Lewis, Ave. F West, Hutchinson, Kan.  
W9OAZ David P. Essad, 304 Florence, 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.

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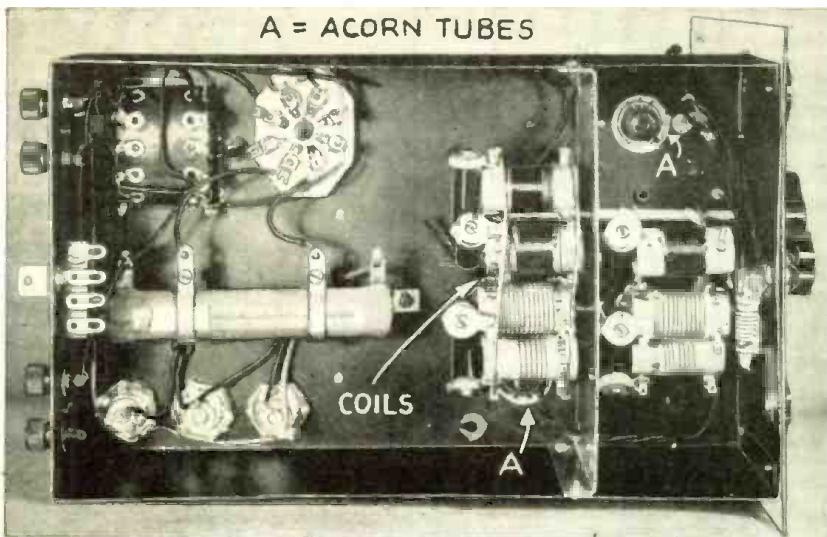
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RT-139

## Increase Your DX with Pre-Amplifier

(Continued from page 541)

A = ACORN TUBES



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 mfd. 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 mfd., 500 V. dry electrolytic condensers
- 1—.5 mfd., 400 V. paper condenser
- 4—.05 mfd., 400 V. paper condensers
- 1—.0002 mfd. midget mica condenser

### I.R.C.

- 2—300 ohm 1/2 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 8 3/4" x 12" deep, black crackle finish
- 1—8" x 8" x 8 3/4" 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—1 1/8" pointer knobs

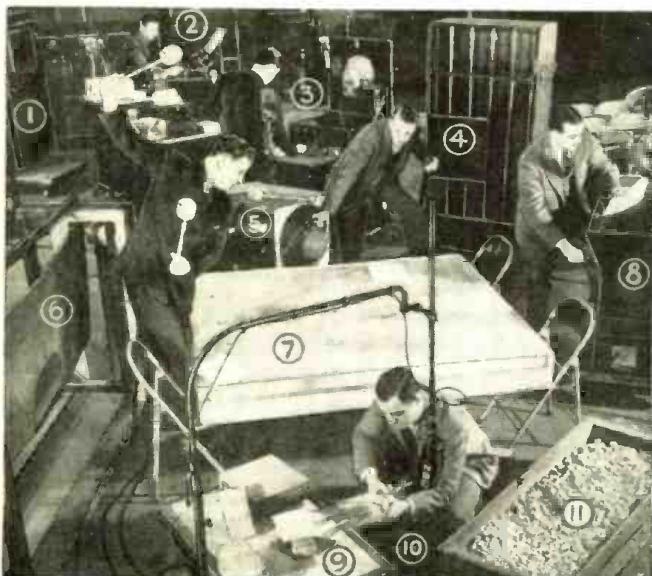
### MEISSNER

- 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

Band	Wire Size	Length of Turns	Primary Winding	Turns
1.4—4.5 mc. R.F.	28	45	1/2" Close	20
ANT.	28	46	1/2" Wound	12
5—12 mc. R.F.	21	19		10
ANT.	21	19		6
7—17 mc. R.F.	18	12		5
ANT.	18	12		3
11—53 mc. R.F.	18	5	1/2"	2
ANT.	18	5	1/2"	2

## Did YOU Know?



That December cover—Proceeding from top around 10, right, we have these broadcast studio sound effects: Striking soft rubber block to give effect of blow being struck; rattling bone effect; rattling sound effect; squirting two jets of water alternately into a pail to imitate milk-in-a-can; rustling straw to give burning fire effect; crumpling cellophane between fingers to imitate 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 record 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."

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## 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-ICF.)

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.

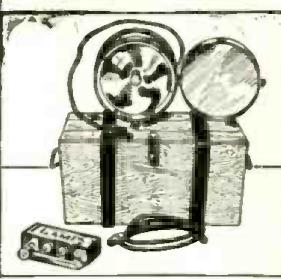
In other such races previously held, those at the starting line were forced to wait for the results until the winners were brought back, which took quite a long time. However, that was not the case this year, for at each end of the hill there was located a 5-meter transceiver. At the starting line was W2IRF operated by Silvio Romano, while at the finish line was W2KAV operated by James Scarrion, 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.

## UNUSUAL CHRISTMAS GIFTS

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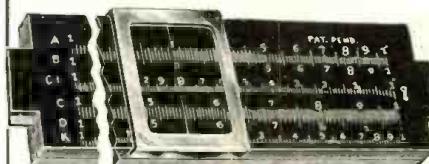
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RADIO & TELEVISION

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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, 4.75 inches high and 4.12 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



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 Hytronics Laboratories. These tubes measure but 1½" 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 "Mono-scope" 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 "sig" of some transmitter thousands of miles away.

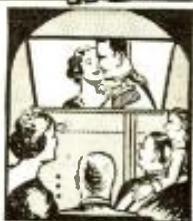
### BOOK REVIEW

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.

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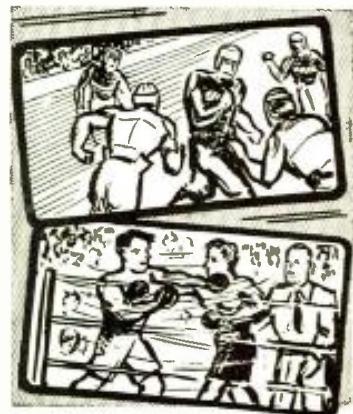


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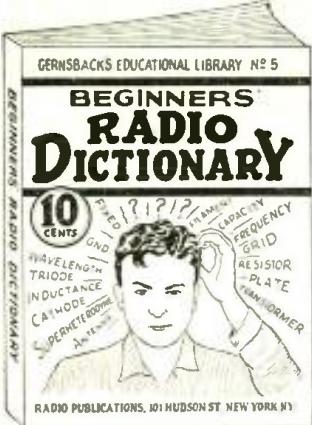
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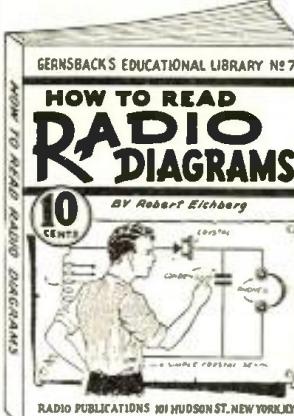
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### New "Marine" Transmitters

● 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.

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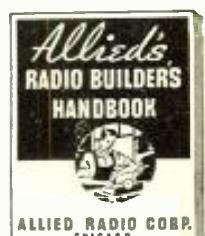
Power is taken from 115 or 230 volt, single-phase 50/60 cycle lines, and a panel-controlled autoformer is provided to compensate for variations in line voltage. Special voltages may be provided for on special order. A master switch removes all plate voltages while frequency is being changed, and all 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: 8½ x 11 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.



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# 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.

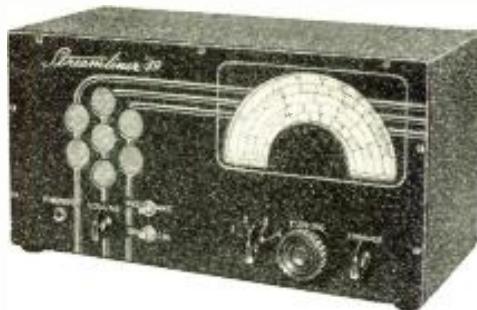
When the writer discussed the experiment with him again several months later in Europe, he related sadly that when he had described it before a leading engineers' society he had been denounced for being "so easily fooled by the American fakers." European companies consistently refused to accept the findings 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)

## These 2 Receivers are STAND-OUTS



**Streamliner '39** We believe this set to be the greatest money value ever offered in a communication-type receiver. Check these features with those found in other low priced sets:

- "Hot" on 10 Meters
- Tunes 9.5-550 Mtrs
- 4 Tuning Bands
- Individual Coils
- Illuminated Dial
- Vernier Tuning
- C.W. Oscillator
- AVC Switch
- Phone Jack
- Jensen Speaker
- Built-in Power Supply
- 5 Tube Receiver

and, most important of all:

### 2 STAGES OF I.F. AMPLIFICATION

Net Price ..... \$33.90

Includes speaker, power, R.C.A. tubes. Nothing else to buy. Also available for 6 volt battery operation, slightly higher price.

**9.5 to 20,000 Meters**

**Model 11** For the C.W. operator. Tuned R.F. with regeneration—still the best C.W. circuit in the opinion of many experienced operators in position to know. Built to 1939 standards with coil switching, band spread, calibrated dial, all other important features. No tube hiss or "images". Gets those weak C.W. signals that are lost in tube noise on larger sets. Available in all A.C., D.C. and battery voltages. 3 tuning ranges. A pleasant receiver to operate, ruggedly built from best obtainable parts, easy to tune, flexible, sensitive, selective.

#### Net Prices—A.C. Models

Model 11-AA, 9.5-550 meters.....\$52.00  
Model 11-MA, 9.5-3750 meters.....\$57.00  
Model 11-VA, 9.5-20,000 meters.....\$72.00  
Immediate Delivery. Prices include power supply, speaker and RCA tubes.

**E. M. SARGENT CO.**  
212 9th St.  
Oakland, Calif.

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Brings you up-to-date on the new things for 1939. Many "just-out" items you'll want to know about. Nationally Advertised Lines sold on our liberal Easy Payment Terms and backed by our famous guarantee ready to satisfy you completely. Your copy of this catalog is ready for mailing—where shall we send it? Ask for Catalog No. 8132.

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**SEARS, ROEBUCK and CO., Chicago, Ill.**

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ROEBUCK AND CO.

## The 1 and ONLY

### SHORT WAVE COIL DATA BOOK

Every experimenter knows that the difference between a good and a poor radio set is usually found in the construction of short-wave coils. Coil winding information is often hard to find, but the new coil book all "done" appears. There's illustrations which give instructions on how to wind coils, dimensions, sizes of wire, curves and how to plot them. Every experimenter finds this book—it also contains complete data on all types of receiving coils, together with many suitable circuits using these coils. Also complete data on various types of transmitting coils with many transmitting circuits such as exciters and amplifiers using the various coils described.

#### Contents Briefly Outlined

S-W Tuning Inductance Charts \* Coil Data for T. R. F. Receiver \* Single and Double Oscillators \* Two-Tube Bandspreaders \* The Mono-Coupled 2-Tube Old-Fashioned 2-Tube "Globe Trotter" \* 2-Winding Coils—10-500 Meters Direct, 3-Tube "Signal Gripper" Electrified \* 3-Tube Bandspreaders for the 10-500 Meters General Coverage Coils on Ribbed Forms \* Coil Data for Super-Heterodyne Converters \* All S-W Coils \* Self-Switching Coils for S-W Superhet Receivers \* S-W Antenna Tuner \* Most Popular S-W Tuning Circuits \* Double and Full Band Antenna Tuner for Transmitting \* Plug-In Coils for Exciters \* Frequency-Wavelength Conversion Chart.

#### PRICE 25c PREPAID

For a copy of this handy book, send 25c in U.S. Coin or stamps to

**RADIO PUBLICATIONS**  
97 HUDSON STREET NEW YORK, N. Y.



# 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:

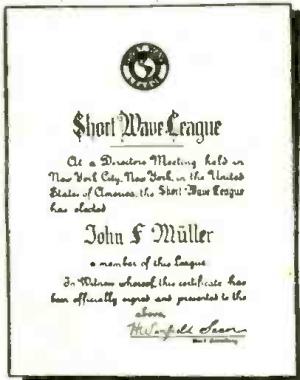
Dr. Lee de Forest, John L. Reinartz, D. E. Replogle, Hollis Baird, E. T. Somerset, Baron Manfred von Ardenne, Hugo Gernsback, Executive Secretary.

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

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 HJIABG BARRANQUILLA, COL., 49.65 m., Addr. Emisoras 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 WIXAL 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., 8.90-30 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 has 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. This letterhead is invaluable when it becomes necessary to deal with the radio industry, mail order houses and radio manufacturers as many houses often members of the LEAGUE preferential discount. The letterhead is also absolutely essential when writing advertisements to radio stations either here or abroad. It automatically gives you a professional standing.

A-SHORT WAVE LEAGUE letterheads. 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 one can easily see the globe helps you to intelligently log foreign stations. The base is of solid walnut, and the semi-mount 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. Shows the location of stations, their 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 decked 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. Within the rotary disc shows you immediately the exact location of any foreign country. Invaluable in locating foreign stations. Also gives call letters assigned to all nations. Size 11x22".

C-Radio Map of the World and Station Finder. Prepaid 25c



### LEAGUE LAPEL BUTTON



E-35c each

### LEAGUE SEALS



G-15c for 25

These seals or stickers are executed in three colors and measure 1 1/4 in. in diameter, and are made of hard enamel. They are used by members to affix to stationery, letterheads, envelopes, post 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

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 you will be identified as a member 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

E-SHORT WAVE LEAGUE lapel button like the one described above but in solid gold. Prepaid \$2.00

### SHORT WAVE LEAGUE

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

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!

WAY back in 1908 when radio still was known as wireless, there burst into bloom one day in MODERN ELECTRICS—(the pioneer radio publication of the world, and then published by Hugo Gernsback, publisher and Editor-in-Chief of RADIO & TELEVISION)—one lusty and irresponsible young character by the euphonious name of *Fips*. His full name, if you please, was and still is Mohammed Ulysses Fips, Chief Office Boy of the first radio magazine that the world had ever seen.

Fips vented his sulphuric and incredible fulminations for many years through the pages of MODERN ELECTRICS, insulting everybody, big and little, from right to left, and having a merry time of it all.

Suddenly he disappeared! For some 25 years, we understand, he roamed the space between the earth and the planet Mars on which he now makes his abode.

RADIO & TELEVISION by special interplanetarian short-wave radio communication will chronicle Fips' radio adventures on Mars! It's all vastly exciting—and if you think that our present radio is wonderful, wait till you see what is going on on Mars!

Below is a sample of Fips' page as it appeared originally in MODERN ELECTRICS. Each new installment will be a riot. Be sure you reserve your copy of RADIO & TELEVISION at your newsdealer NOW.



**SPECIAL EXTRA**

## The Wireless Screech

OUR MOTTO . . . . .

No. 24½

FEBRUARY, 1909

THE ETHER:  
TRANSPARENT  
OPAQUE AT NIGHT

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

Subscription price for U. S. and other planets, 10 Sparks, payable in advance.

Forms close the 32d of the month. Advertising rates, none of your business.

The editor is not pleased to receive contributions. He knows it all himself. Only articles accompanied by fast checks considered at all. The editor reserves himself the right to keep the checks and return the articles, if return postage is enclosed.

SATURNIAN OFFICE:  
99 Ring Street, Satonia, Sat.

### 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 roll-

ers, 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 in 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 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 "balance" 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.

You can't go wrong when you buy from Wards. Only the highest quality equipment can measure up to Wards rigid standards, and every article in Wards complete catalog is offered at "rock bottom" prices. Not only do you save money but you can pay for your equipment "As you use it" on Wards liberal Time Payment Plan. Highest Quality, Lowest Prices, Time Payments, Satisfaction or Your Money Back—all these are yours when you buy from Wards. Send for your copy of Wards 1939 Radio Catalog today!

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- \*Servicemen's Test Instruments and Equipment
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"9 GREAT MAIL ORDER HOUSES, 500 RETAIL STORES"

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Please send me Wards 1939 Radio Catalog at once.

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Address \_\_\_\_\_  
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## Luminous paint

IT SHINES IN THE DARK for your

SAFETY • CONVENIENCE • ECONOMY

It illuminates keyholes, wall switches, fence posts, hand rails. By applying Luminous Paint instead of night lights, you eliminate waste in electricity. Contains no harmful ingredients. Send 10c for a quantity of Luminous Paint and a list of 50 useful applications.

EASTERN MFG. CO.  
DEPT. 1R1, 183 POWELL ST., BROOKLYN, N. Y.

# STOP, LOOK & BUY!

## Rockbottom Prices on Surplus, and Army and Navy Merchandise

When prices are low we buy! They're low now—LOWER THAN THEY EVER WILL BE—hence this sale. Most of the merchandise is new—never used; some of it reconditioned. 100% satisfaction on each transaction or your money refunded.

**ORDER FROM THIS PAGE.** Use the convenient coupon below. Be sure to include sufficient extra remittance for parcel post charges, else the order will be shipped express, charges collect. Any excess will be refunded. C.O.D. shipments require a 20% deposit. If full remittance accompanies order deduct 2% discount. Send money order—certified check—new U. S. stamps. No C.O.D. to foreign countries.

**ORDER TODAY QUANTITIES LIMITED QUICK SHIPMENTS ASSURED**

### EDISON 1/50TH H.P. UNIVERSAL MOTOR

Made by Edison Electric Co. for Dictaphone machines. Can be used on 110 volt A.C. or 6 C. line (any frequency). Double shaft 5/16" in diam. Any speed obtainable with suitable rheostat. Size: 6" x 4" wide overall. Ship. Wt. 8½ lbs. ITEM NO. 10 Your price \$2.25

### WESTERN ELECTRIC BREAST MIKE

A lightweight aircraft-type carbon microphone with breast plate mounting. Can be adapted for home broadcasting or private communication systems. With cord and plug. Ship. Wt. 1½ lbs. (Illustrated at right.)

ITEM NO. 14 Your Price \$2.45

Magnavox Anti-Solex Microphone. Magnavox Anti-Solex Microphone. With cord and plug. Ship. Wt. 2 lbs.

ITEM NO. 15 Your Price \$1.80



### NEW FUEL PUMPS

Brown & Sharpe pumps. Brand new; never used. Can be used for gasoline, oil, kerosene, and other fuel. Not good for water. Takes standard threaded 1/4" input and output pipes. Has 1/4" drive shaft. Measures 4" x 3" x 3 1/4" diam. overall. Ship. Wt. 8 1/2 lbs. ITEM NO. 24 Your Price \$4.45

### U. S. NAVY BAUSCH & LOMB TELESCOPE

Precision-built for U. S. Navy use as finders on large calibre guns. CAMERA FANS!—USE IT FOR CLOSE-UPS OF DISTANT PICTURES. Optical system consists of lenses and erecting eyepiece lenses. Object lens: 2"; variable eye lens: 15-16"; exit pupil: 0.2" to 0.09". Angular field: 3°30' power: 3 to 10x erect image; cross hairs used. Net wt. 6 lbs. Original cost said to be over \$130. Ship. Wt. 10 lbs.

ITEM NO. 25 Your Price \$14.95

ELECTROLUX NO. 11—Radical design, cylinder type motor. Completely built-in all attachments. Foot control switch. Has 101 uses: cleaning upholsteries, walls, draperies, curtains, mattresses, etc. Ship. Wt. 18 lbs. List Price: \$69.75.

ITEM NO. 30 Your Price \$16.48

HOOVER NO. 700—Agitator type cleaner. Pistol grip handle. Switch in handle. All high polished aluminum finish. Ball bearing motor. Ship. Wt. 25 lbs. List Price: \$79.50.

ITEM NO. 31 Your Price \$26.95

HOOVER NO. 105—Motor driven brush. Foot control switch. Black enameled steel motor housing. 12-inch nozzle. Ship. Wt. 24 lbs. List Price: \$63.50.

ITEM NO. 27 Your Price \$13.95

HOOVER NO. 9—Straight suction. Fixed brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 13-inch nozzle. Ship. Wt. 20 lbs. List Price: \$52.20.

ITEM NO. 26 Your Price \$10.48

EUREKA NO. 9—Straight suction. Fixed brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 13-inch nozzle. Ship. Wt. 20 lbs. List Price: \$52.20.

ITEM NO. 26 Your Price \$10.48

HAMILTON BEACH—Motor driven brush. Pistol grip handle. Polished aluminum housing. 12-inch nozzle. Switch in handle. Ship. Wt. 20 lbs. List price. \$80.50.

ITEM NO. 27 Your Price \$13.95

HOOVER NO. 105—Motor driven brush. Foot control switch. Black enameled steel motor housing. 12-inch nozzle. Ship. Wt. 24 lbs. List Price: \$63.50.

ITEM NO. 28 Your Price \$13.95

HOOVER NO. 105—Motor driven brush. Foot control switch. Black enameled steel motor housing. 12-inch nozzle. Ship. Wt. 24 lbs. List Price: \$63.50.

ITEM NO. 28 Your Price \$13.95

### GUARANTEED REBUILT VACUUM CLEANERS

ALL NATIONALLY-KNOWN makes—GUARANTEED FOR 6 MONTHS. All parts, no matter how slightly worn, are replaced with NEW ones;—we supply new bags, new cords, brushes, handles, belts and other parts. Even the chassis itself is reprinted and polished. We've been selling these rebuilt machines since 1930; all our customers are satisfied, or money back. THERE'S NO GRIEF WITH THESE MACHINES!

PREMIER DUPLEX—Motor driven brush. Pistol grip handle. Switch trigger in handle. Polished aluminum housing. 13-inch nozzle. Ball bearing motor. Ship. Wt. 20 lbs. List Price: \$60.00.

ITEM NO. 29 Your Price \$16.95

ELECTROLUX NO. 11—Radical design, cylinder type motor. Completely built-in all attachments. Foot control switch. Has 101 uses: cleaning upholsteries, walls, draperies, curtains, mattresses, etc. Ship. Wt. 18 lbs. List Price: \$69.75.

ITEM NO. 30 Your Price \$16.48

HOOVER NO. 700—Agitator type cleaner. Pistol grip handle. Switch in handle. All high polished aluminum finish. Ball bearing motor. Ship. Wt. 25 lbs. List Price: \$79.50.

ITEM NO. 31 Your Price \$26.95

### PORTABLE TELEGRAPH AND BUZZER FIELD SETS

Made for military use by Western Electric. A very neat device, but if only for the parts it contains. New—never been used. Good for code practice, also for communications, etc. Contains 2-tone, high-frequency buzzer with platinum contacts, telephone key, telephone jack, earphone, condensers, transformers, chokes, etc. A \$50 value easily. Complete with case, diagrams and instructions. Ship. Wt. 12 lbs. ITEM NO. 16 Your Price \$5.45

### SPERRY GYROSCOPE LIQUID COMPASS

Made for U. S. Signal Corps; sensitive and accurate. Quick readings easily made from top; accurate readings of graduations through focusing magnifying lens on each axis. Complete with level sights and russet leather carrying case. Excellent for boats, boy scouts, campers, hikers, etc. A valuable piece of equipment in case; usable as a Galvanometer. Ship. Wt. 3 lbs. ITEM NO. 12 Your Price \$1.85

### TELEGRAPHIC TAPE RECORDER

A wonderful buy! Apparatus makes a written record of code and similar messages on paper tape. An ideal machine for keeping code or teaching code or groups. Radio men especially adapt to short messages. Can be used for taking permanent records of code messages. Double pen permits simultaneous two messages. Pens are operated by battery and key while tape feed is by spring driven (hand wound). Case made of solid brass on heavy iron base. Completely reconditioned. (Less tape) easily obtained anywhere. Original cost \$85.00. Ship. Wt. 20 lbs.

ITEM NO. 20 Your Price \$19.95

ANTI-CAPACITY SWITCHES

Made by Western Electric. Double throw switch with 12 terminals—equivalent to two double-pole, double-throw switches. All contacts are of platinum. Price \$1.50 each. Ship. Wt. 1 lb.

ITEM NO. 23 Your Price \$1.55

WE HAVE NO CATALOG. ORDER FROM THIS PAGE.

**HUDSON SPECIALTIES • 40-T West B'way • N.Y.C.**

IT'S EASY TO ORDER—CLIP COUPON—MAIL NOW

**HUDSON SPECIALTIES CO., 40-T, West Broadway, New York, N. Y.**

## "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).

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MONEY-BACK GUARANTEE

WELLWORTH TRADING COMPANY  
560 West Washington Blvd., Dept. RT-139, Chicago, Ill.

for January, 1939

## 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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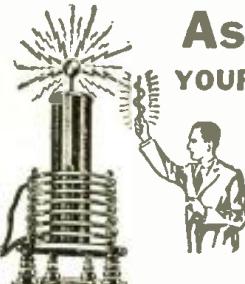
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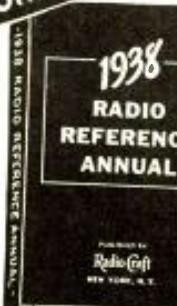
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RADIO-CRAFT

## 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, 11.69 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.).

KGXA, 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.)

KGX, at Hankow, still transmits 8:00-8:05 a.m. on frequencies which vary between 9.18-9.30 mc. relaying KGOW, the BCB call of Hankow Municipal Broadcasting. KGX uses only 150 watts. G. C. Gallagher reports KGX. A-hley Walcott's veri of KGX 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, for 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., Bandung, 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., Tandjung-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, YDC, 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 JVJ. 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)

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## 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."

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ever, 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. Amato 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 "signs" 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 old 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

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

OM Regnald 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! CNIAF 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, 14,300; SU8MA, 14,100.

Algeria: FA8CF, 14,070; FA3HIC, 14,125.

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

From South Africa comes this batch of calls: ZS6ED, 14,100, 14,280; ZS5AB, 14,300; ZS5BZ, 14,040; ZS2AZ, 14,140; ZS6JL, 14,040; ZS1CN, 14,080; ZS5AW, 14,100; ZS1BV, 14,060; ZS1BL, 14,010; ZS6A, 14,080; ZS6DY, 14,100; ZS6DF, 14,040; ZS1AX, 14,080; ZS5CA, 14,140; ZSSM, 14,030; ZS5CO, 14,000, 14,280; ZS6DL, 14,050; ZS4H, 14,075; ZS6S, 14,135; ZSSCL, 14,130; ZS1AL, 14,000; ZS6L, 14,080; ZS6RR, 14,030; ZS1AF, 14,075; ZS2N, 14,200; and in Southwest Africa, ZS3F, 14,060, 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, 14,190; VU2FS, 14,090; VU2FU, 14,210.

Ceylon: VS7RF, 14,180; VS7GJ, 14,080; also by Ian J.

Java: PK3WJ, 14,060, also by Ian, and PK1PK, PK1SK, QSL'd 40 meter phone reception for Ashley Walcott, FB!

Burma: XZ2DY, 14,360, 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, 2DC, 2JB, and shortly 2LZ and 2JB. Almost all listed hams on phone!

China: It is with much regret that we learned through Hal Klein, 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, 14,300, 14,380, 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, 14,280, at Rabaul, reported at 7 a.m. by Harry Honda. Also on 14001 at 5:40 a.m. by James Moore.

New Zealand: ZL2BE, 14,210, heard by Harry Honda, W6, at 1-3 a.m. in American phone band. On East Coast, ZL3KX, 14,170, reported, 7:30-8 a.m. ZL3 are not permitted to transmit on phone before 7:30 a.m. E.S.T.

From Europe, reported by Ian Jamieson are: LY1BE, 14,050; LY1KK, 14,110, in Lithuania. Also OH5NR, L.F. side; OH2OI, 14,000, in Finland, and YU7XX, 14,140, in Yugoslavia. TF3C, H.F. side, Iceland, heard 6:47 p.m. by Bob Hatcher, W4, who also reports ZB1R, 14,300. 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, ZS6DV, by Harry Honda, Rog Legge and V. T.

Morocco: CN8AJ, 28250, and CN8AV, 28230.

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

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• **RADIO & TELEVISION Magazine** has prepared a handsome VAC (Verified All Continents) certificate which will be issued to all shortwave 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 radio-phone stations, not C.W. stations. The certificates will be signed by the DX Editor, and Hugo Gernsback, Editor-in-Chief of **RADIO & TELEVISION**.

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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.

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 PAFT 28.120 5 7 Hartzell  
 PAMZ 14.038 4 6 Hartzell  
 SVICA 14.370 5 5 Yours truly  
 CTIAY 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:

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 VK2JX 14.120 3 5 L. Fuller  
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 VK2AB 14.030 4 7 Hartzell  
 VK2UY 14.300 5 8 Hartzell  
 VK2AP 14.090 4 6 Hartzell  
 VK2UZ 14.095 5 8 Slaughter  
 VK2VX 14.120 3 6 Fitzpatrick  
 VK3ZL 14.100 5 8 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. m. 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)

Call	R	S	Observer
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	5-8	Noyes, C. Fuller
KAIJM	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
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	5
VK3EK	5	6	G8MX	5	5
F8XD	5	8	VO2PL	5	5
PK1ZZ	5	7	VQ2HC	5	5
PK3WI	5	8	ZE1JR	5	5
CR7AK	5	9	ZE1JX	5	5
CO2GO	5	6	ZE1JZ	5	5
CN8AR	5	7	ZE1JS	5	7
KA1CS	5	9			

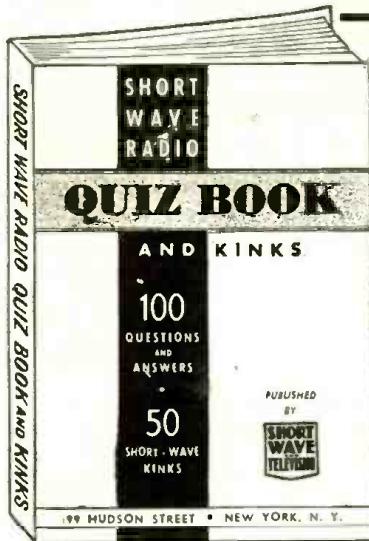
Mr. Versfeld heard these American Hams on 10 meters.

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, W6LXY, W6LXA, WAXS, 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.



## FREE BOOKS—AND HOW YOU CAN GET THEM!

HERE is a brand new book—with an unusually interesting content. The text—prepared by the Editorial Staff of RADIO AND TELEVISION, contains a variety of material which only experts could select and incorporate in such an excellent volume.

"SHORT WAVE RADIO QUIZ BOOK AND KINKS" cannot be bought—it is sent to you absolutely FREE with your subscription to RADIO AND TELEVISION at the Special Rate of Seven Months for One Dollar. (Old subscribers may get this book by extending their subscription.) The book contains 64 pages with a heavy flexible colored cover. It measures 5½ x 8½ inches, and includes hundreds of photographs and diagrams. The contents are outlined below.

### Contents of the "QUIZ BOOK"

How to Connect an R.F. Stage Ahead of Your Present Receiver.

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Clear diagrams showing how to connect the latest type tubes in place of your old tubes, so as to obtain greater DX.

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Noise Silencers

Power supplies

Modulators

Beat Oscillators

Antennas

Pre-selectors

5-meter receivers

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Contains latest material on television developments. It covers theory of scanning, aiming of television receiver, how the eye sees, the photo-electric cell, neon lamp, need for broad channel width in transmission of high-fidelity television signals, color television tubes, and television receivers; Farnsworth system of television transmission, and other important features.

### SHORT WAVE GUIDE



Covers hundreds of Short-Wave questions and answers; illustrates popular Short-Wave kinks; gives instructions for building simple Short-Wave receivers; instruction on the best type antenna; uses diagram and construction details for building a simple ham transmitter; practical hints on Short-Wave tuning.

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Questions and Answers Covering S-W Receivers.

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How to Add an Audio Amplifier to a Small S-W Receiver.

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# 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
<b>BUD RADIO</b>
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. 1062 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—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
<b>I.R.C. (Resistors)</b>
2—BT-25 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 megohm Resistor (R7)
1—BT-½ 1,000 ohm Resistor (R8)
2—BT-½ 250,000 ohm Resistor (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 13-13 500,000 Ohm Potentiometers (R12), (R23)
<b>R.C.A. (Tubes)</b>
1—Type 6J7 1—Type 6A6
1—Type 6N7 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. 500 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)

### TRIPPLETT 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

L20 turns No. 16 enameled wire on 1 ¼" dia. form spaced to 2 inches

L1 and L2—18 turns No. 12 enameled wire 2 ½" diam. Length of winding—4 inches.

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

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## RADIO PUBLICATIONS, 97 HUDSON ST., NEW YORK, N. Y.

### RADIO Test-Quiz ???

(Continued from page 524)

c. Dixie Lee	c. George Bernstein
d. Nellie Crossman	d. H. L. Crosby
e. Olga von Nordey	e. Herbert W. King denflicht
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 | e. 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 10¢ 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.

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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 FIRST-CLASS introduced wants for Scandinavia representation of manufacturer of portable radios, etc. Zaan, 9 Rue General Gratry, Brussels.

## 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 by law enforcement bodies in the U.S. and throughout the world. Only until March. Price \$1 postpaid. V. Kaups, 114th & Homann, Chicago.

7 MILLIAMMETER, HEAVY RUBBER INSULATION, HIGH VOLTAGE LACQUERED CABLE, SUITABLE FOR TRANSMITTER. 2¢ per foot. Gold Shield Products, 350 Greenwich St., New York City.

## PATENT ATTORNEYS

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

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

**RADIOS**  
KITS—DISTANCE CRYSTAL SET \$1.00 plans 10¢; metal tube receiver \$2.00. Information free. Calradco, Box 94, Saugus, Calif.

## SHORT WAVE COMPONENTS

PLUG-IN COILS, SPACE WOUND ON FOUR PRONG 1 1/4 x 1 1/2 INCHES. TUNE 15-20 METERS WITH .00014 CONDENSER. SET POSTPAID. NOEL, 728 Birch-Saratoga, Pa.

## SHORT WAVE DIATHERMY

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## SHORT WAVE RECEIVERS

USED DOERLE'S, D-38, BS-5, 7C, RECONDITIONED BY FACTORY, 40% OFF. SEE JANUARY SHORT WAVE & TELEVISION FOR DESCRIPTION. KUSTERMANN, 68 BROAD ST., NEW YORK.

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WANTED ORIGINAL POEMS, SONGS FOR IMMEDIATE CONSIDERATION. SEND THEM TO COLUMBIAN MUSIC PUBLISHERS, LTD., DEPT. K49, TORONTO, CANADA.

## TELEVISION

TELEVISION EXPERIMENTAL Kit \$9.50. ARTHUR POHL, 2123 Hubbard, Detroit, Mich.

## 1-TUBE RECEIVER

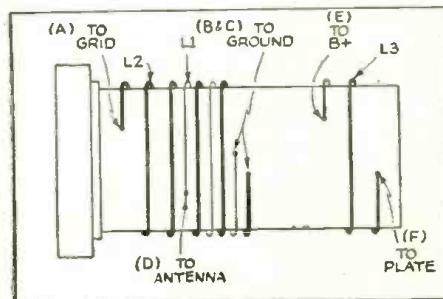
(Continued from page 544)

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 Crove metal cabinet 9 1/4 x 6 5/16 x 4 7/8 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-

# FOR SALE (NON COMMERCIAL) 3¢ A WORD

Under this heading we accept advertisements only when goods are offered for sale without profit. Remittance of 3¢ 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 6 100 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 those 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. Post Office laws. Deposit 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 Rockwell 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 Shuplensky, 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 Skyriter, 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 \$5.00 tube tester. Will test metal, glass tubes and condensers for ham parts. Dawson, 1308-E, The Dalles, Oregon.

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

TRADE, RIFLES—PHOTOGRAFIC equipment, Triplet signal generator, Voltmeter, modulation monitor, audio oscillator, rot-o-milliammeter, Clough-Bengle OMA generator, RCA 3 meter transceiver, Xtal Ultra Skyriter, Mark Pouter, East Avenue, Parkridge, Ill.

HIGH GRADE 12 GAUGE DOUBLE BARREL SHOTGUN. Latest Martin 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 transmitter 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. W21AG, 2807 Clifton Ave., New York, N. Y.

WANT TO BUY FOR CASH 500 wattfone and CW rig for 160 meter operation and twenty forty eighty CW. MUST be in good condition. W8ZTT, Alfred, N. Y.

PRINTING EXCHANGED FOR 5-6-7 TUBE AC-100V receiver, bux. 5 meter transceiver or equipment, or good relays. Give complete information. All mail answered. III-Class, 5743 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 GENERATOR: 56-2A5, 5-10M receiver; 10M, converter; power supply; portable mobile DX receiver. French 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 Pinetree Bld., Det., Mich., U.S.A.

WILL SWAP HUNDREDS OF ASSORTED MAGAZINES. Want small 4 or 5 tube A.C. broadcast band radio in working order. E. F. Bellington, 754 Bergen Street, Brooklyn, New York.

I HAVE GOOD CARTER GEN. MOTOR, 22 tube, 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 PUBLICATIONS of "Radio Operating Questions and Answers" by Nilson and Hornsby, 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 time (6.5MG-12AT) trans.recv. 2.5-4.000M. Conrad Roth, 1060 Spring St., Atlanta, Ga.

TRADE 1937 HAILEY DAVIDSON 5-10-74 transceiver, blue finish, power control, good tires, for high power tone rig. Must be complete and in good shape. Jayne Arrance, Box 651, Alfred, New York.

WILL SWAP A TRUE TONE 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? A. Flinney, 45 River St., Cambridge, Mass.

WANT COMPLETE PARTS FOR model 99 Philco, tubes and speaker, deluxe Sellick, razor and few dollars cash for 20001 A.C. short wave set working speaker. All replies answered. John Tott, 347 Hancock Ave., Bridgeport, Conn.

WANTED: CRYSTAL PICKUP. Will trade battery charger, RCA 7 tube radio, 4 tube A.C. radio, Headrite 245 analyzer, Am. Flyer electric train, Winchester pump, 22 Norman Berg, New Richmond, Wis. (Continued on opposite page)

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 (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. Kinselدور, 1487 Vyse Ave., Bronx, N. Y.

**WANT—ULTRA SKY ROVER** battery model, 19+1ETG tubes, speaker in same cabinet, coils. Swap Univer. 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 of fishing tackle, or short wave set, will also swap SWL cards. Leo Waaleek, 1143 Lingold St., North Chicago, Ill.

**70 POWER MICROSCOPE AND** KIT, 6 power prism field glass with case, pocket camera 1 1/2 x 1 1/2, earphone 2100 ohms. What have you?

Correspondence invited. Gerald Begun, 17 Goddin St., Lauzon, P. Q., Canada.

**WANT—GOOD CRYSTAL MICROPHONE**, full preferred, or some other good make, also want a 20 meter Biley 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, Neb.

**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, 3340 Rita 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. WSLAQ, 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 Kineald, Brainerd, 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, 250-553 meters, want switch-band receiver, Sky-Buddy, etc. H. J. Gehr, 2204 Crane Ave., Cincinnati, Ohio.

**HAVE: HOTPOINT ELECTRIC** water heater, 230 volts 1000 watts. Installs in tapping on hot water tank. Hotpoint Thermosnap 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 100A communications receiver, 9.5 to 50 meters. Paul Carroll, 118 Vine Street, Bridgeport, Conn.

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

**WANTED: MEISSNER SIGNAL** shifter and power supply complete, good communications receiver. Have an "Ultra Stratosphere III" transmitter-receiver coils and mike—heard all continents. Radio W8QQU, 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, 129 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—SUNDAY NOVELS, CAM**ERA, 50 diff. cameras, first days, flights. Silver Jubilee sets (mint). Harry Rovalt, Wayland, Mich.

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

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

**WANTED: WESTON 665 ANALYZER** and Sprague's Reg. General Radio Course. Have to trade meters, generators, microphones, s.w. pairs, lettergraph, etc. For last write to Stanley J. Nieewitz, 79 Church St., Broad Brook, Conn.

**WILL GIVE IN DIFFERENT FOR**ign stamps for any and every 15 U.S. commemoratives. William Neher, 15 East Avenue, Natick, R. I.

**HAVE SILVER MARSHALL** chassis complete, Majestic International compact, induction phone motor, theatre type pick up, P.M., electrodynamic and A.C. dynamic speakers.

Want Sky Buddy or similar receiver. Anthony Rayush, 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? Harry Newhouse, R. R. No. 2, Aurora, Ind.

**HAVE: B ELIMINATOR, POWER** pack. Generator, radio parts, mounted purpleone. 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, CORRE**spondents, 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, W8SEF, Renwick, Iowa.

**WANT TO CORRESPOND WITH** 3 or 4 readers who are studying Radio & Television, preparing for amateur examination. Geo. B. Thompson, M.D., 1013 South Orange Drive, Los Angeles, Calif., 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 Kineald, Brainerd, 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—BC RECEIVER (EARL** model 41), chassis only. Will pay cash. All letters answered. Harry Vincent, 52 Swinton St., Albany, New York.

**WANTED—RIDER MANUALS,** 0 to 5 million watt, and 5PT, 6AV, 1V, and 2G tubes. Pay cash or trade stamp, 12 inch speaker and Kolster transformer for pair of SI's. William Ballou, Rt. 2, Cheleville, Ohio.

**3MM PROJECTOR, CAMERA, SIL**ver 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 Talbot, Diaper, North Carolina.

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

**HAVE SET HIGGINS GOLF** clubs, fishing reels, 1, 2 and 3 stamps; want SW3, parts, receiver, meters, or? H. C. Campbell, P. O. Box 582, Austin, Texas.

**WILL TRADE 500.9 KC QUARTZ** crystal for a quartz crystal which is ground for anywhere between 3400 and 3650 KC. Must be good oscillator. M. W. Schuster, 919 W. 4th St., Mt. Carmel, Ill.

**HAVE WINGS AUTO RADIO, AT** water Kent Generator, 180V, at 40 mill.-amp. 6V, at 2 amps. Trade for good portable 2V. receiver or any good receiver of 2V. type. Ben F. Locke, Marquetteville, La.

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

**TRADE 2 GAS MODEL AIR** planes, radios, meters, s.w. converter, chemicals, microscopes and rifles for what have you. Am interested in nutboard motor. Need not be in running condition. Specify faults. Harry Bohm, R-1, Hindale, 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 BCVR., 7 TUBES** with power supply, good condition; 2 tube s.w. revr., verifications 20 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, wind-charger. Have radios, record changers, amplifiers, anything. Warren W. Wiggin, 1220 Fairview, Fort Wayne, Ind.

**TRADE: 75M. COTO-COILS AND** one crystal for 160m. Coto coils and crystal, never used. Glass A prime; mod. 10 watt for class B 4-46's speech included, also 3.3 Shure mike. Send for list. E. W. Saxe, 1932 Faye Rd., Akron, Ohio.

**HAVE A 1638, 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-DECASTER** P.A. speaker and other radio parts for metes, microphone, crystals on any band, or "bug" key. Also swap generator for Sky Buddy or similar receiver, or? Jack Spencer, 513 W. 1st Ave., Huston, La.

**HAVE 17 AVIATION MAGAZINES,** cost \$2.50, stamps cost \$10, new knife kit cost \$7.50, drill kit cost \$2.50, scout knife, handbook, signaller. Want ranger, or? Sidney Young, E. Matthias, Maine.

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

**SWAP—425 POWER WOLLENSACK** 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. Shaffer, 250 E. Main St., Waynesboro, Va.

**WANTED—TELEPLEX OR OTHER** code instruction equipment including solenoid, honeycomb, and transformers. Charles Lewis Bremerton, 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 wrist-watch, recent-old Radio & Televsion, etc., boy's books, camera, stamp catalog, also stamps, cash. Make offers. Box 155, Lexington, Ont., Canada.

**TRADE: ALMOST NEW NATIONAL** SW3 with three sets of coils and power supply. Want Hallcrafters new model Sky Champion or other Hallcrafters other than Sky Buddy. QRA Blue Diamond, Perkiomen School, Pennsboro, Pa.

**WANTED: SHORT WAVE RE**ceiver, or what have you. Will trade 1 1/2 H.P. electric motor, \$12 chemistry set, \$15 bicycle, 200 scientific and radio magazines, canet, 8 tube auto receiver. Guy Carter, Lynchburg College, Lynchburg, Va.

**HAVE NEW MOVIEMATIC CAM**ERA, new electric shaver, cameras, books, etc. Want Reflex or fast miniature camera, enlarger, photographic items, or? Michael Gianfranco, 601 Union Ave., Prow, 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 Kowina, 347 East 61 Street, N.Y.C.

**TRANSMITTER, WANTED CW**

Phone all bands about 7.5 watts, would like Utah kits 1-2-3, will pay cash or trade for Leedy trap drum both 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. recvr. for all bands, small x-interfer, radio mags., or what have you. H. Aeiker, Jr., Henderson, W. Va.

**WANTED: COMPLETE A.C. 110** vol. 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 9 to 6 volteter, floor model marble pin game. Cook electrical course, Popular Science & Mechanics books. Want Sky Buddy (similar reevr.), Douglas Phelps, Sidney, New York.

**SWAP FOR RECEIVER KODAK** Recorar f.4.5, exposure meter, filters, etc. Johnson 16 H.P. outboard motor value \$200.00. R. Blanchard, 39 Sweet Ave., Woonsocket, R. I.

**WANT VOLT-OHM-METER, OR** meter alone, iron core coils, and I.F.'s (282 KC.) Radio course. Trade Firemanship course, auto radio, typewriter, etc. Geo. T. Kell, 418½ W. Spring, Freeport, Ill.

**SWAP PORTABLE B.C. RECEIV**er complete batteries and earphones self contained (6x8x8in. 1 using 1 19, for what have you. R. Perlitch, 3635 So. Wood St., Chicago, Ill.

**(Continued on following page)**

# BARTER and EXCHANGE FREE ADS (continued)

**WANT USED CODE INSTRUCTOR**  
Teleplex, Instrucograph, etc. Swap aviation, stamp, magazines; model airplane kits. Will pay cash for different. 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 Lucia, 56 Palmerston Ave., Toronto, Ont., Canada.

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

**1000 RCA RESISTOR-CONDENSER**  
strips of 5-8 popular size units: photographic History World War; assortments parts; tubes; custom-built preheater-neon short-checker; Majestic 15 chassis Magnavox speaker. What have you? Molesh, 4002 Sixth Ave., Brooklyn, N.Y.

**WANT F.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, jeweler's wrist and pocket watches. Miner, Oakdale, Iowa.

**TRADE RADIO PARTS AND AMPLIFIERS**: 110 volt DC to AC converter; 35mm motion picture projectors; B&S gas engines. Want — RGA 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 60's, 40 meter xtal, or good radio parts. All letters answered. John Ritchie, 69 Marlborough Ave., Toronto, Canada.

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

**AM A BEGINNER IN HAM**  
radio. Would like some "OT" to send up plans for an economical 20, 40, 75, 160 meter xmitter. One "V" best 73's. Seymour Albin, 235 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, 23,000 volt. Bill McCord, 3060 Philips St., Indianapolis, Ind.

**HAVE RADIO-A 33, CAN BE**  
converted to a (b) 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 ukulele, banjo-like 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., Moose, Pa., U.S.A.

**HAVE WORLD'S SMALLEST**  
camera, made by Coronet, England. Takes  $\frac{1}{2} \times \frac{1}{2}$  pictures. Unused, with leather case. Also radio equipment. Want 35mm candid camera, used chemistry set, photographic equipment. Georges L'houinard, 4399 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 eliminators,riders No. 1, Philex manual, tone recorder, chokes, transformers. Want IRE Univex transmitting condenser and cathode ray tube. D. Buck, 43 Stephen Clark, 538 Parkway, High Point, N.C.

**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 (Kollmeyer Optical Corp.) 2203 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 cameras. Also radio magazines for photographic chemicals and equipment. O'Connell, 2777 North 52nd Street, Milwaukee, Wisconsin.

**WANTED RADIO PARTS OR**  
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 JAMES**  
town Kayak, gas models, gas motors, planes. One Biplane gas model with new Pee Wee motor. For all kinds of photography equipment. Bernard Lukk, 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, 23 Ape Place, Manchester Conn.

**WILL PRINT YOUR QSL CARDS**  
in exchange for Weston, Jewell or Triplet meters, quartz crystals or microphones. Send description and will furnish samples. Write WTAMA, 4036 E. Sixth, Spokane, Wash.

**WILL SWAP—15 WATT AMPLIFIER**  
12" spkr. (brand new). Turntable pickup, etc. complete, or 3 tube s.w. receiver. 3 meter transceiver, for small car or? John Liddle, 52 Spring St., Lowell, 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 EAR-**  
phones 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 6LS-T20-80**  
CW transmitter, complete, ready to connect to antenna. What have you to offer? Leonard Pochop, 939 WYR, 204 No. 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, on what? Thomas Silvaggio, 50 Steuben Street, Providence, Rhode Island.

**MODEL AF ARGUS (f4.5-1/200)**  
with med. yellow filter in holder, 3 rods and 23 ft. of E.K. Super-X; F.R. developing tank (35mm to 116); value new \$28; for photo, radio supplies, rifle, C. Dye, 730 S. Figueroa, Los Angeles, Calif.

**WILL PAY \$12.00 CASH FOR 2 OR**  
3 tube transceivers with tubes, coils and cabinet. Jim Haugen, 109 Alderdale Street, Rochester, New York.

**24 VALUABLE BOOKS, 29 POPU-**  
lar 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 Capes, Grandin, N.Dak.

**WILL GIVE CASH FOR RIDERS**  
manuals, tubes, resistors, volume controls, condensers, etc. or will swap. What have you? Joseph Geylado, 159 Bahn St., Pawtucket, R.I.

**WILL TRADE WOLLENSAK 450x**  
microscope (value \$20.00), for 35mm candid camera with F4.5 lens enlarger, or Weston exposure meter. Give specifications. Will make up difference if necessary. Edwin Bozen skil, 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 HALICRAFTERS ULTRA-**  
Skylrider, 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.

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**SWL'S ANYWHERE, WANT TO**  
swap cards? We QSL 100%. Q.R.A. 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 will be answered with our card. Q.R.A. 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. Q.R.A.—Robert Parker, Box 41, Ogden, Utah, U.S.A.

**ATTENTION YL'S! I WILL QSL**  
100% with you. 73's es 88's. Q.R.A. 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 111 oblige by return mail. 100% QSL. Let's hear from you. What's Q.R.A.: Mac Elwin Van, Sandy R.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 Bassins, 6811 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. It's today. My Q.R.A. is John E. Tate, 612 Halifax Street, Petersburgh, Virginia, U.S.A.

**III. 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 "VER-**  
collectors throughout the world. Will swap SWL cards and correspond with anybody. I QSL 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-dash. G. Miles, 73 Palm Avenue, Footscray, Kent, England.

**SHOUT WAVE LISTENERS U.S.**  
and foreign countries. I will swap my QSL card for yours. I QSL 100% per cent. Denys Crampton, 35, York Road, Northport, England.

**YOUR SWL CARD WILL BE**  
appreciated from collection. Will answer all required. Lewis Neuman, Box 8363, Pittsburgh, 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 QSL 100%. Q.R.A. John Ziembeck, 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 Curls 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. Q.R.A. 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 card. Robert Guest, 359 N. Charlotte St., Pottstown, Penna., U.S.A.

**SWL'S IN THE U.S.A. AND FOR-**  
eign countries. Let's swap cards and photos, wotsa? Will also swap U.S. and foreign stamps. Will QSL 100%. Q.R.A. Noel E. Kurtz, Xenia, Illinois, U.S.A.

**SWL'S IN ANY COUNTRY. LET'S**  
exchange SWL cards. We QSL 100%. Come on OM's es YL's. Q.R.A. 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.

## I-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—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  $\frac{1}{2}$  watt resistor, type BT- $\frac{1}{2}$
- 1—3 megohms  $\frac{1}{2}$  watt resistor, type BT- $\frac{1}{2}$
- 1—15 megohms  $\frac{1}{2}$  watt resistor, type BT- $\frac{1}{2}$
- 1—500,000 ohm  $\frac{1}{2}$  watt resistor, type BT- $\frac{1}{2}$
- 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  $1\frac{3}{4}$ " dial plate, type 569
- 1—Small  $1\frac{3}{4}$ " dial plate, No. 25

### RAYTHEON

- 1—6P7G tube.

Frequency	L <sub>1</sub> (Reg. An.)	Doublet
10-20 meters	2.2 turns	2
17-41 meters	5.8 turns	3
33-75 meters	11.8 turns	3
66-150 meters	24.1 turns	7
135-270 meters	47.8 turns	12

Follows same frequency sequence

L <sub>2</sub>	L <sub>3</sub>
3.3 turns #16, length $\frac{7}{8}$ "	3.2 turns
8.7 turns #16, length $\frac{1}{4}$ "	3.8 turns
17.7 turns #22 enamelled, length $1\frac{1}{2}$ "	5.8 turns
37.7 #24, length $1\frac{9}{16}$ "	10.8 turns
81.7 #28 enamelled, length $1\frac{1}{2}$ "	16.8 turns

ALL COILS WOUND ON HAMMARLUND XP-53 FORMS (dia.  $1\frac{1}{2}$ "), L<sub>1</sub> and L<sub>2</sub> wound with #32 d.s.c. wire. L<sub>3</sub> wound  $\frac{1}{4}$ " from L<sub>2</sub>.

## Correction

In the "Question Box" for November diagram of Beam-a-Scope was incorrect.

In the diagram, the gang condenser (450 mmi.) 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
- 2—2.5 mil. 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—" pieces bakelite tubing, 2" diameter
- 2—Gold clips, glass tube type
- 1—Baseboard  $\frac{1}{4}$ " bakelite  $5\frac{1}{2}'' \times 10\frac{1}{2}''$
- 2—Base brackets, U shape,  $1\frac{1}{2}'' \times \frac{1}{2}'' \times 6''$
- 1—0002 inf. mica condenser 600 V.
- 1—AEROVox type No. 1450 .01 mil. 1,000 V. mica condenser
- 1—50.00 ohm, 1 watt carbon resistor
- 1—1 mil. 200 V. bypass condenser
- 2—Cardwell 100 mil. Trinnair condensers, type ZU-100-AS
- 2—Piece aluminum shield,  $4\frac{1}{4}'' \times 6'' \times 1/16''$
- 1—Cardwell 10 mil. Trinnair condenser, type ZR-10-AS
- 1—002 mil. 600 V. mica condenser
- 2—4-lug terminal strips
- 6— $\frac{1}{4}'' \times \frac{1}{4}''$  angle brackets

### Answers to QUIZ on page 571

1. b
2. b
3. c
4. e
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
17. b
18. aC
19. a
20. b and sometimes c
21. c
22. d
23. e & f
24. d
25. e

### 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.

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Name.....

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### 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. B am.-11 am.

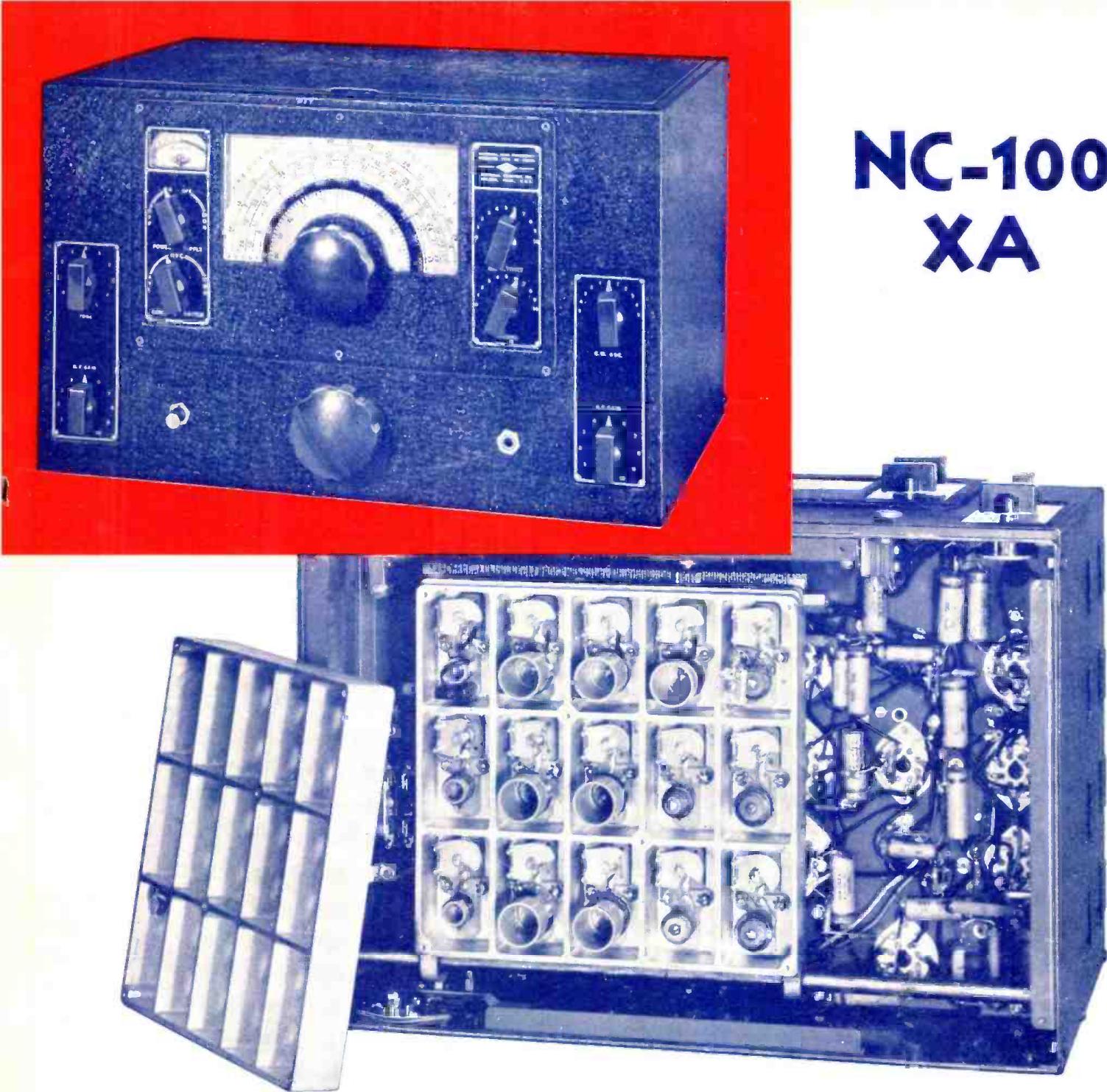
### End of Broadcast Band

- 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 YVSRC 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 YYIRL MARACAIBO, VEN., 50.52 m., Addr. Radio Popular Jose A. Higueria 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., BECHUANA-LAND 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. 1.15-2.16, 8.30-10 pm.; Sun. 3.30-5.30, 8.30-9.30 pm.  
5.855 HIIJ SAN PEDRO DE MACORIS, D. R., 51.25 m., Addr. Box 204. 12 n.-2 pm., 6.30-9 pm.  
5.845 YYIRB 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. Señor Gonzalo Pinto, H.  
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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 VUD2 BOMBAY, INDIA, 61.16 m., Addr. All India Radio. 7 am.-12.30 pm.

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