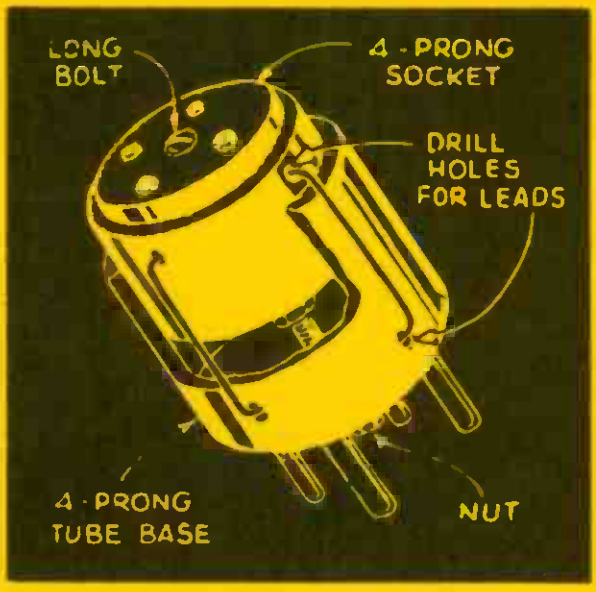
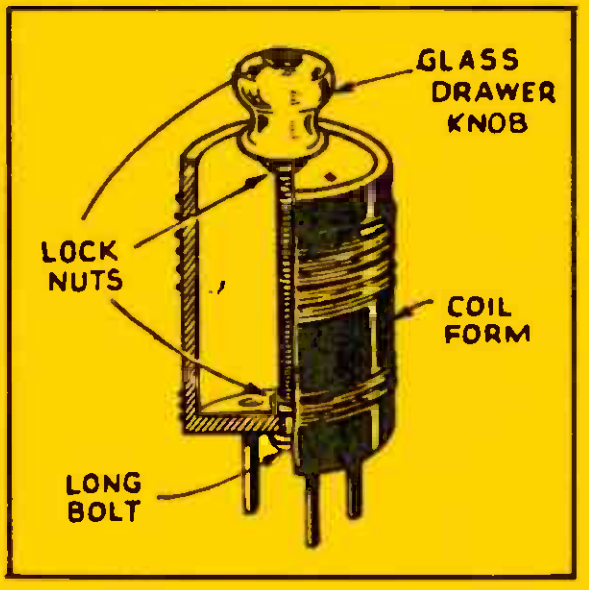
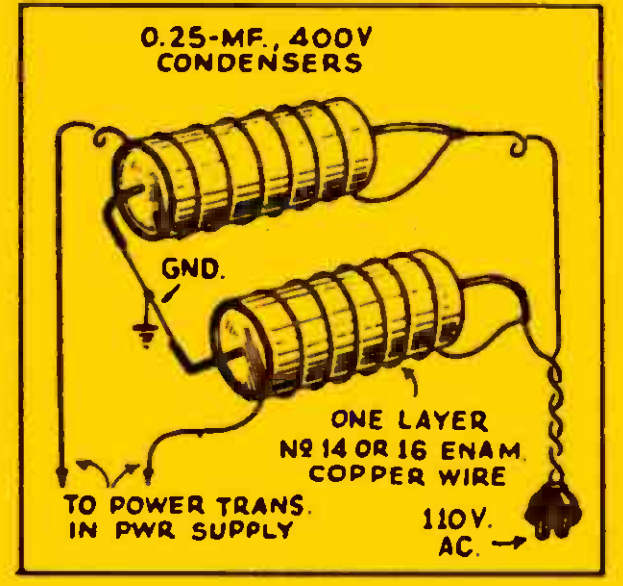
SHORT WAVE RADIO

Quiz Book

and KINKS







100 QUESTIONS AND ANSWERS

50 SHORT-WAVE KINKS

Lindsay Publications Inc.

S-W Radio Quiz Book and KINKS

Answers to Hundreds of S-W Questions and Problems

Short-Wave Receivers, Transmitters, Boosters, Pre-Amplifiers, Battery Sets, A. C. Sets, A. C. - D. C. Sets, Antennas, Converters, 5-Meter Sets, Power Supplies, Audio Amplifiers, Beat Oscillators, Code Practice Oscillators

PUBLISHED BY

SHORT WAVE AND TELEVISION

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NEW YORK CITY, N. Y.

PREFACE

The editors have tried to make this S-W-Radio Quiz Book a veritable gold-mine of information. Not only will the short-wave "fan" find answers to practically all of his questions on set-building and trouble shooting, but the "ham" has also been liberally provided for. Transmitter descriptions have been included as well as data on code-practice oscillators, and other auxiliary apparatus which the radio amateur frequently desires data on.

Dozens of short-wave Kinks for both "fans" and "hams" have been included and all in all, we are sure that every radio experimenter will find this book most valuable.—The Editors.

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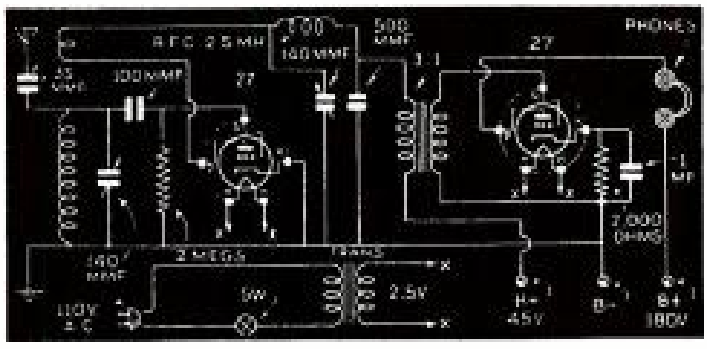
S-W Receivers for 110 Vt. A. C. Operation



2-tube receiver using type 27's.

2-TUBE DIAGRAM

Walter Newton, St. Louis, Mo.

(Q) I would like to have a circuit diagram of two type 27 tubes in a receiver. One tube used as a detector and another as an audio amplifier. This is for A.C. operation, using a filament transformer; would you please print this in your *Question Box?*

(A) In the diagram shown employing two type 27 tubes, the heater voltage is furnished by a 2½-volt filament transformer. The B voltage may be supplied either by batteries or a B eliminator.

An eliminator delivering anywhere from 180 to 250 volts should be satisfactory. Of course, the "hum level" should be low, and this means that good filtering must be effected. Some of the older eliminators produced considerable hum.

WHAT VOLTAGE?

J. Cadoane, Marshfield, Oregon.

(Q) Will you please tell me what the proper voltage would be for the plate of a 1-tube receiver employing a 6C5 tube?

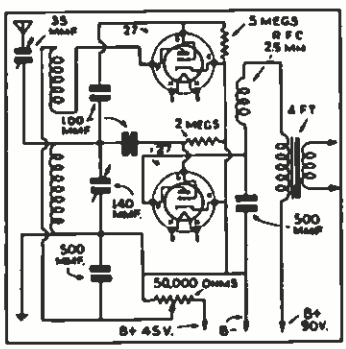
(A) Normally, we would recommend about 45 volts on the plate. However, you may experiment with various voltages between 22½ and 45 in order to ascertain the particular voltage which will give the best results.

SEPARATE REGENERATION DETECTOR

Charles Braun, Rochester, N.Y.

(Q) I have become interested in the idea of using a separate regeneration stage and would appreciate it very much if you would show a diagram in your *Question Box* employing two type 27 tubes—one as a detector and the other for regeneration.

(A) The diagram shows a 27 detector and another 27 used as a "feed-back" tube. Smooth control of regeneration is obtained with this circuit. The transformer marked A.F.T. is connected to the usual audio amplifier.



Connections for Separate Regenerator tube.

TUNABLE HUM

Norman Keller, Knoxville, Tenn.

(Q.) I am using a well filtered power supply in my short-wave receiver and still I experience hum, although this hum is not present in all parts of the short-wave band, but it seems that the hum is heard on just the bands in which I wish to receive. Adding filter condensers and chokes to the power-supply does not help matters. Can this hum be eliminated.

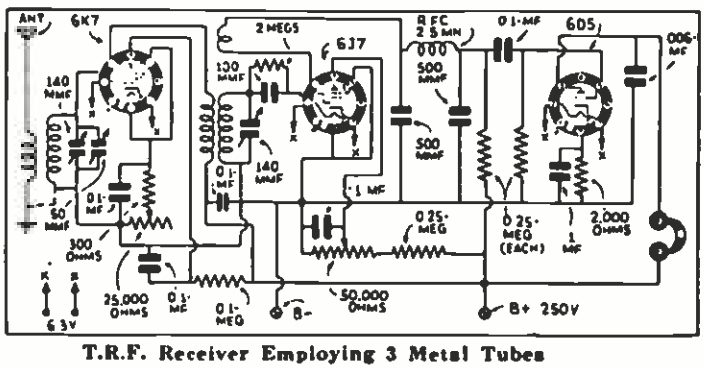
(A.) We suggest connecting .002 mf. condensers between the filament and the 2 plates of the 80 rectifier tube. Also, connect a similar condenser from each leg of the heater in the regenerative detector tube to the "B" minus.

T.R.F. WITH METAL TUBES

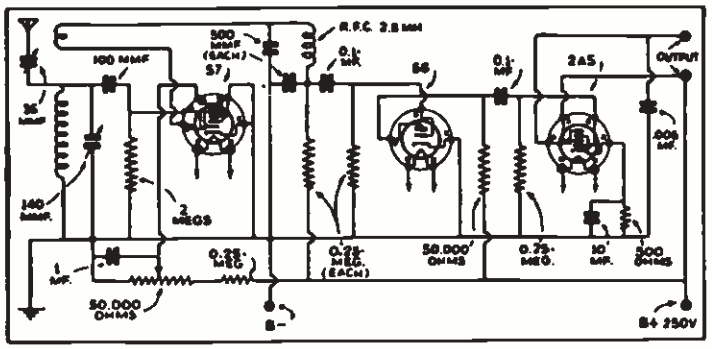
Chester Donson, Camden, N.J.

(Q.) I have noted a number of excellent circuit arrangements in past issues of the Question Box, however most of them employ glass type tubes. I would like to build a receiver of the tuned R.F. variety, employing metal tubes. Will you kindly recommend a circuit in the coming issue of the Question Box. I prefer one stage of tuned R.F. regenerative detector and one stage of audio.

(A.) Any of the circuits published in previous issues of the Question Box may be used with metal tubes with no changes in the circuit values. It is only necessary to choose the metal equivalents to the glass type tubes. Our method of showing the tube symbols includes both the physical arrangement showing the prongs of the sockets and also the tube element symbols; when employing glass tubes disregard the socket connections around the outside of the tube symbol. For your benefit, and for those who wish to build a similar set we are printing the diagram.



T.R.F. Receiver Employing 3 Metal Tubes



57, 56, and 2A5 as detector and two audios.

3 TUBER

Malcom Stetell, Caldwell, N. J.

(Q) Will you please publish a diagram of a 57, 56 and 2A5 using either resistance or impedance coupling between the 57 and 56?

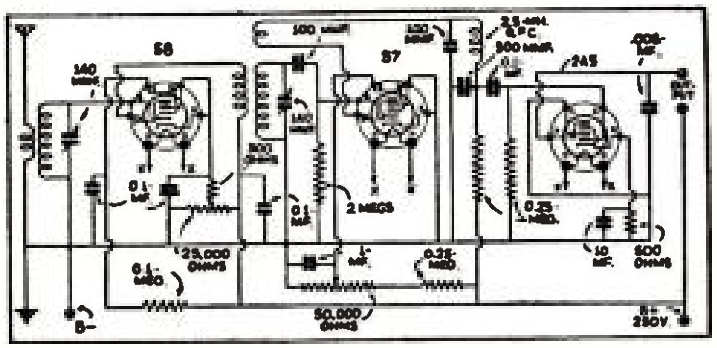
(A) The diagram requested is given here. Resistance coupling is shown, although the plate resistor of the 57 may be replaced with a high impedance A.F. choke. Something in the order of 500 to 1,000 henries will be entirely satisfactory.

RECEIVER QRM

A SWL., Wollaston, Mass.

(Q.) I built a one-tube regenerative receiver using a 30-tube. I find that this set has a fierce output, audible for at least eight miles. The QRM was so noticeable that the "Ham" annoyed by it notified the F. C. C. in Boston. When I found out how serious this was and that the set acted so, I tore it down and I will build a set that has not these qualities. Please print this in your magazine so that the innocent listeners will not get into hot water with the Radio Inspectors. Please give some causes for the terrific output-signal regenerative circuits have, and, if possible, how to eliminate them.

(A.) We are all familiar with the "bloopers" used in the "old days," and the great amount of interference they caused, and it is only natural to expect the same on the short-waves. A partial remedy is to use very loose antenna coupling and plate voltage to the detector as low as is commensurate with efficient operation. Of course, the only real remedy is the addition of an R.F. stage between the antenna and the detector.



3-Tube receiver using 58, 57, and 2A5.

3-TUBE RECEIVER

Seymour Levine, B'klyn, N. Y.

(Q) I intend building a receiver using a 58 as a radio frequency amplifier, a 57 as regenerative detector, and with a 2A5 audio amplifier. I would appreciate it very much if you would print the diagram showing the proper connections and the values of all parts required.

(A) The diagram using 57, 58, and 2A5 is shown. This set will operate a speaker on some of the stronger stations, but for full speaker volume a 56 should be connected between the 2A5 and the 57 detector.

BEST TYPE COUPLING

Wm. E. Chenoweth, Hawarden, Ia.

(Q.) Will you please answer the following in your short-wave Question Box. Just which is the best type of coupling to use between the detector and the R.F. stage of a short-wave receiver.

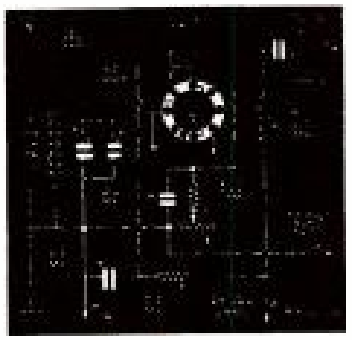
(A.) The best method so far developed is the inductive method which employs a separate winding for the plate circuit of the R. F. stage and another winding for the grid of the detector. Data on coils designed for this purpose can be found in the February, 1937, Question Box.

AMPLIFIER FOR METAL TUBE 2

Rudie Bartel, Comfort, Texas.

(Q) I would greatly appreciate it if you would print a diagram of a 6K7 T.R.F. amplifier which can be added to the "Metal Tube 2" receiver, described in the September issue of *Short Wave Craft*.

This should use standard 4-prong plug-in coils and a 140 mmf. condenser, which I want to gang with the detector condenser.



Rf. amplifier using a metal tube.

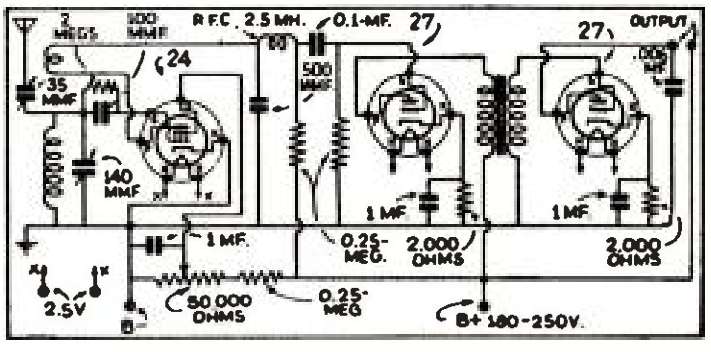
(A) The addition of an R.F. stage should greatly improve the performance of the receiver mentioned above. If the two condensers are ganged a trimmer having a capacity of approximately 50 mmf. or larger, should be connected across the R.F. tuning condenser, in order to compensate for discrepancies in the circuit.

3-TUBE RECEIVER

Ramon Fernandez, Havana, Cuba

(Q.) I have several older type tubes around which I would like to build a short-wave receiver. These consist of types 24 and 27. Would you kindly show a diagram of a suitable receiver employing 3 of these tubes.

(A.) The diagram you requested is shown. The circuit is entirely conventional and has been published a great many times. It consists merely of a regenerative detector with two stages of audio amplification. Resistance coupling is used between the detector and the first audio amplifier, while transformer coupling is used between the 2 audio stages. Resistance coupling may be employed here also. The grid circuit would be the same as the first stage, while the plate circuit of the first stage should have a 25,000 to 50,000 ohm resistor.



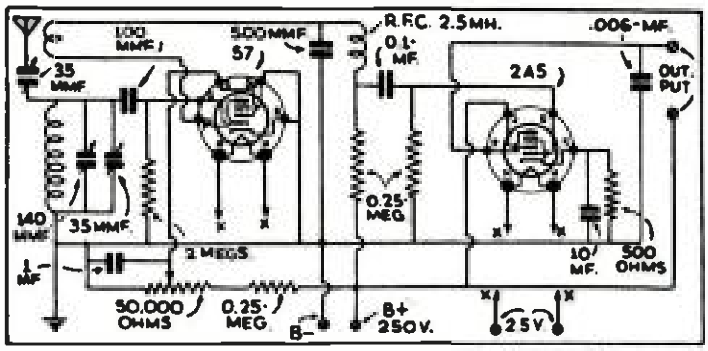
3-Tube Receiver Using Old-Style Tubes

2-TUBER

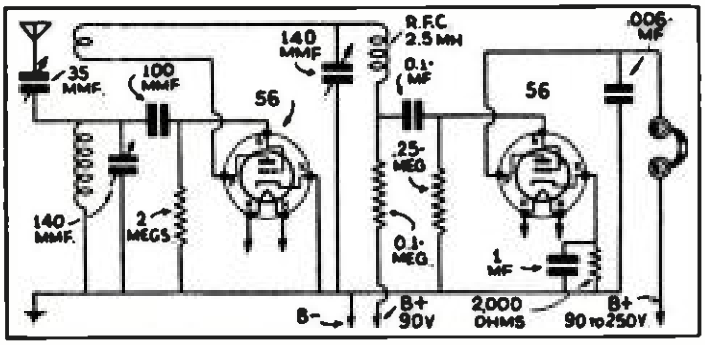
James Grigg, Chicago, Ill.

(Q) I would like to build a 2-tube receiver employing type 56 tubes. I would like to control regeneration with a variable condenser and have the A.F. amplifier resistance-coupled to the detector. Would you kindly print the diagram?

(A) The diagram requested is shown and regeneration is controlled by a 140 mmf. condenser. If you wish to incorporate "band-spread" in this receiver, merely connect a 35 mmf. condenser in parallel with the 140 mmf. grid tuning condenser and use the smaller condenser for tuning.



One of the most popular 2-tube pentode receivers.



Circuit for a 2-tube S.W. receiver built around 56 tubes.

GETTING VERIS

John Anderson, Philadelphia, Pa.

(Q) Just how do I go about obtaining verification cards in order to enter the trophy contest?

(A) Merely make a note of the time, data and character of the program received. This, together with an International Postal Reply coupon should be sent to the station together with a request for verification.

2-TUBE HAM RECEIVER

Richard Lawrence, Kingston, Mass.

(Q) I would like to build a "Ham" receiver consisting of two tubes of the 6.3 volt variety. Would you please print the diagram showing "electron" coupling? I would also like "band-spread" and a potentiometer for regeneration control.

(A) We have shown the diagram and it employs a 6C6 and a 76 for 6.3-volt operation. By employing a 57 and a 56 you may use a 2.5-volt heater supply. Standard coil data may be employed. However, the tickler should be reduced to three or four turns for the large coils (low freq.), and to two or three for the high frequency coil.

2-PENTODE BAND-SPREAD RECEIVER

John Sundstrom, Kansas City, Mo.

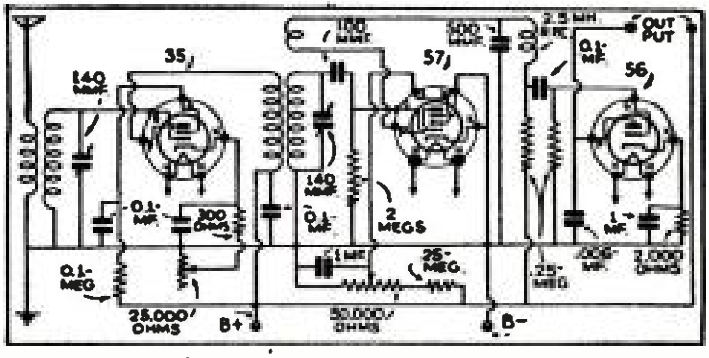
(Q) Please print the diagram of a 2-tube band-spread receiver employing pentode tubes, plug-in coils, and screen-grid regeneration control.

(A) The diagram shown illustrates a 57 pentode detector and a 2A5 pentode audio amplifier. This combination works out exceptionally well and is probably one of the most popular of the simple short-wave receivers. Band-spread is accomplished by connecting a 35 mmf. condenser in parallel with the main tuning condenser. Band-spread tuning is, of course, done with the smaller condenser.

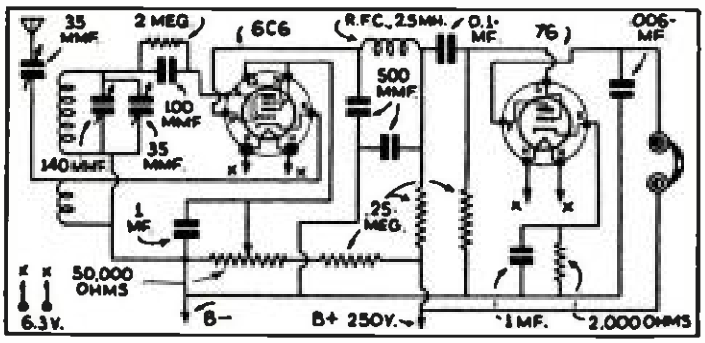
3-TUBE DIAGRAM

Ralph Hadley, Dryden, Ont., Can.

(Q) Wants diagram of a 3-tube T.R.F. bandspread set using a 235, a 57, and a 56 resistance-coupled audio.



3 tuber with tuned R.F. stage.



A "Ham" receiver, using a 6C6 and a 76. It has Band-spread and electron-coupling.

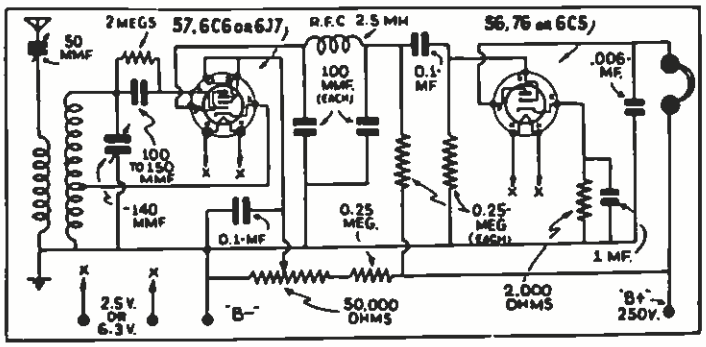
(A) We have shown a diagram using a 35 as an T.R.F. amplifier ahead of a 57 regenerative detector which, in turn, is resistance coupled to a 56 audio amplifier. Coil data for this receiver may be found in the August, 1936 issue of the *Question Box*.

INSTALLING AN "R" METER

Francis Mulkern, Norwood, Mass.

(Q.) Will you please tell me through your Question Box, how I am to add an "R" meter to a 2-tube regenerative receiver?

(A.) An "R" meter cannot successfully be used in conjunction with such a simple receiver. You will find an "R" meter in the more elaborate superheterodynes.



Regenerative E.C. Detector and 1 Stage of Audio

2-TUBER WITH E.C. DETECTOR

Chas. Mourmouris, Denver, Colo.

(Q.) Would you be kind enough to print in the forthcoming *Question Box* a circuit diagram of a receiver, using a 57 as an electron-coupled detector, and a 56 as resistance-coupled audio. I would like to tune this set with 2-winding coils and a 150 mmf. variable condenser.

(A.) In the diagram of the 2-tube receiver which we have illustrated, regeneration is controlled by the usual 50,000 ohm screen-grid resistor. The coils for this receiver can be constructed identical to the usual short-wave coils of the 4-prong, 2-winding variety, except that the grid coil should be tapped for the cathode connection. For the coils from 100 to 200 meters, this tap should include about 2 turns; for 50 to 100 meters, 1 turn; 25 to 50 meters, ½ turn and from ⅛ to ¼ turn for coils from 10 to 25 meters. For *band-spread* connect a 35 mmf. condenser in parallel with the main tuning condenser.

operates on 920 kc., and when I tune, it comes in all around the dial. The set also has no regeneration. This set was designed for the Hammarlund coils, No. SWK-4. Will you please explain the reason why the set will not work.

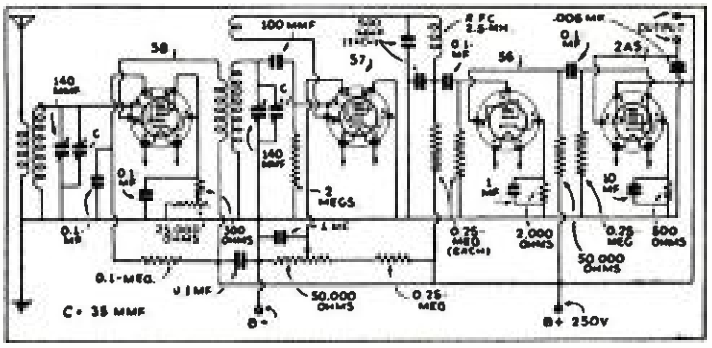
(A.) Undoubtedly the interference is due to too much coupling between the antenna and grid of the detector tube. Regarding the regeneration, it is possible that the tickler connections may be reversed on this coil. Try reversing the tickler connections and reducing the antenna coupling capacity.

4-TUBE RESISTOR DIAGRAM

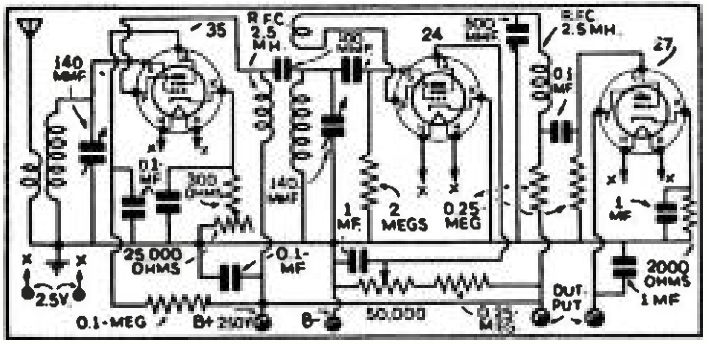
Charles Allen, Southington, Conn.

(Q) Please publish in the next issue of the *Question Box* a circuit for a "Ham" receiver using four 2.5 volts A.C. tubes. Two of them should be transformer-coupled in the audio amplifier. Also incorporate band-spread and 140 mmf. condensers.

(A) The diagram you request is shown and band-spread is accomplished by connecting 35 mmf. condensers in parallel with the large tuning condensers. We would not recommend transformer coupling,



T. R. F. receiver of the most popular design.



3-Tube T.R.F. Receiver for the Beginner

as you are liable to run into considerable difficulties.

4-TUBE A.C. SET

John W. Smith, Baltimore, Md.

(Q) Would you be so kind as to illustrate a diagram in *Short Wave and Television* employing 4 tubes. This receiver should have a 58 tuned T.R.F. amplifier, a 57 regenerative detector and a 47 pentode power amplifier with an 80 in the power supply. Also show the connections for the power supply.

(A) We have shown a standard T.R.F. circuit; however, for loud-speaker operation, we believe there should be another audio amplifier, such as a 56, connected between the 57 and 47. This will enable you to obtain full speaker volume.

T.R.F. 3-TUBER

John Pellock, Singac, N.J.

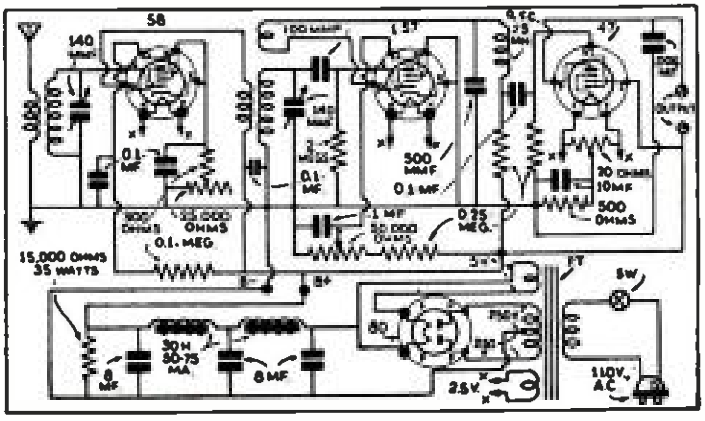
(Q) I would like to build a T.R.F. receiver using a 35 in the r.f. stage, a 24 detector and a 27 audio amplifier. Please show the diagram in the *Question Box* employing 4-prong 2-winding coils.

(A) The diagram you request is shown on this page. Capacitive coupling between the T.R.F. and detector stages is employed in order that 4-prong coils may be used. Although we believe that more satisfactory results can be obtained with inductive coupling and 3-winding coils. This receiver should give satisfactory earphone volume.

B. C. INTERFERENCE

Jack Ericsson, Chicago, Ill.

(Q.) I built the Doerle 2-tube receiver which employs two 30's. When I use the 160 to 200 meter coil, all that I can receive is WJJD which



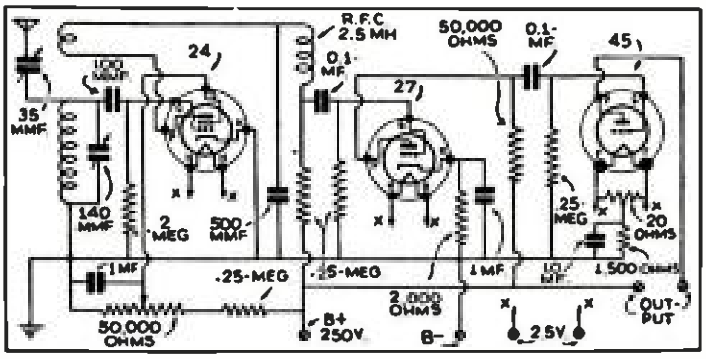
Complete 4-Tube Receiver A.C. Operated.

6C6-37—2 TUBER

Mr. Gerrano, San Leandro, Cal.

(Q) I have a set of 3 winding plug-in coils covering a range of from 17 to 500 meters. These are 5 prong coils. Kindly show a diagram employing these coils with a 6C6 regenerative detector, resistance-coupled to a 37 audio amplifier. Regeneration in the detector stage should be controlled with a 50,000 ohm potentiometer.

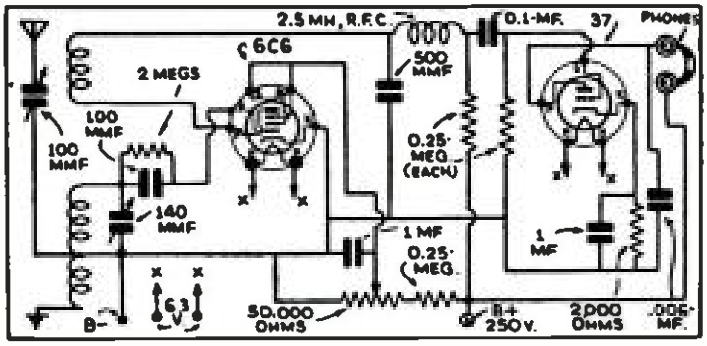
(A) We have shown the diagram you request and have indicated the separate winding which has 2 connections on the coil base, employed as the tickler. The remaining small winding which is connected with the secondary is shown employed as an antenna coupling coil. A 100 mmf. variable condenser is necessary in the antenna circuit for the elimination of "dead-spots."



3 tuber with type 45 output amplifier.

R.F. and a detector which could be employed with the audio amplifier which I already have. The tubes should be type 24 and 27. The power supply of the amplifier delivers approximately 150 volts.

(A) We here show the diagram requested. However, we would suggest that you use a type 35 in the R. F. stage rather than the 24. "Band-spread" is also indicated and is accomplished by connecting two 35 mmf. condensers in parallel with the large tuning condensers.



2-Tube Receiver Using Pentode and Triode

S-W RECEIVER WITH 45 AMPLIFIER

E. C. Richards, Edmonton, Alta., Canada.

(Q) Please show a diagram in the *Question Box* of a receiver using three tubes. I have a 24, 27, and a 45 tube. Would these three tubes make a good set?

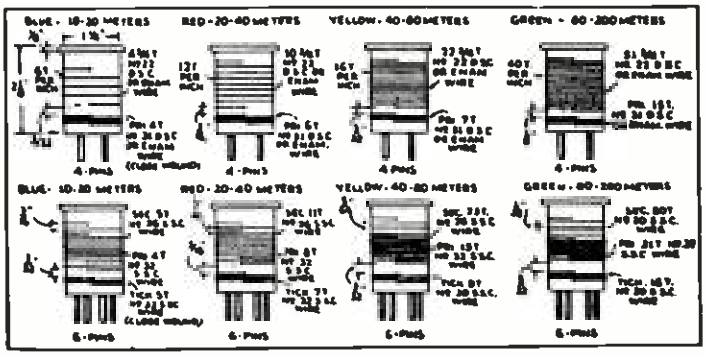
(A) We have shown the diagram requested in your letter, and it employes a type 45 in the output tube. The 45 is noted for good quality but has exceptionally low amplification, and power output. In the average regenerative receiver quality should not really be important, and the use of a pentode such as a 2A5.

WEAK SIGNALS ON SUPERHET

Richard Lindauer, Belleville, Ill.

(Q) I have constructed a 6-tube superheterodyne but it is sensitive only on one set of plug-in coils. On the other coils I receive only one or two stations very weakly. What do you think is the trouble?

(A) We suggest that you look for your trouble in the plug-in coils. From what you state, it would seem that the coils which do not give satisfactory performance are not tuning properly. You will find with a superhet the oscillator coils should have slightly less turns than the detector coils, unless you have a very large padder on the detector which will permit constant readjustment as the set is tuned.



Coil data for 2 and 3-winding, 4 and 6-prong coils.

R. F. DETECTOR CIRCUIT

Conrad Fowler, Phila., Penn.

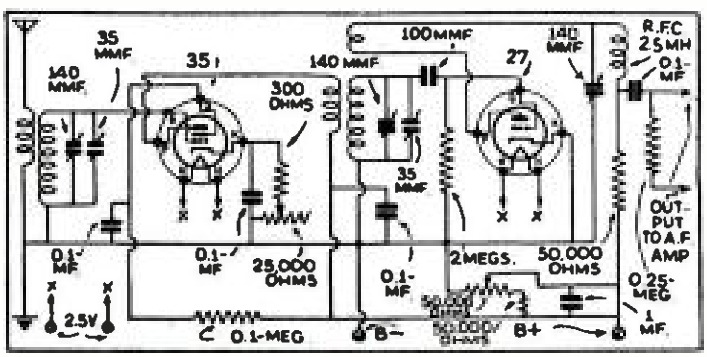
(Q) Will you please print a diagram in the *Question Box* of a short-wave receiver having one stage of

COIL DATA

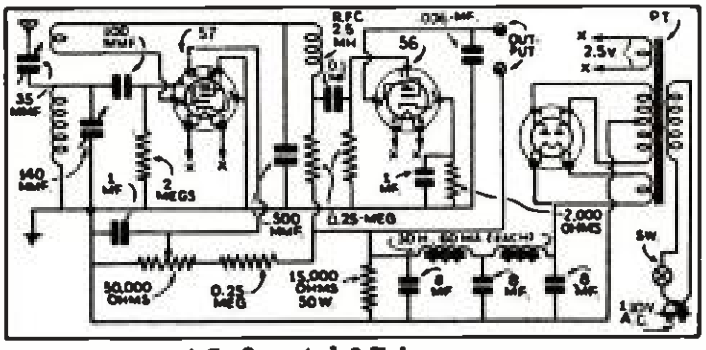
Herbert Jackson, Johannesburg, So. Africa

(Q) I would appreciate very much if you would print information in your *Question Box* on winding coils for various receivers to cover the 20, 40, 80 and 160 meter amateur bands.

(A) We are again reprinting data for winding coils of both the 4 and 6 prong variety, having two and three winding. This data will serve for practically every type of short-wave receiver described in *Short Wave Craft*. These coils are designed to tune with a 140 mmf. condenser with sufficient overlap between the coils to insure full coverage.



R.F. and detector stages for a short-wave receiver.



A.C. Operated 2-Tuber

57, 56, 80 SHORT-WAVE RECEIVER

Abel Martinez, New Orleans, La.

(Q) I would be very much obliged if you would print a diagram in the next issue of the *Question Box* consisting of a 2-tube receiver employing a 57, 56 and type 80. I would like to build an *all-electric* receiver and believe this would be the best to start with.

(A) The complete diagram is shown and you should have no trouble in getting it to operate perfectly at the first try, if diagrams and connections are followed. This power-supply shown may also be used with a 56-2A5 amplifier shown elsewhere on this page.

2-TUBE "HAM" RECEIVER

Sam Rotondo, Manayunk, Pa.

(Q) I am very much interested in receiving amateur stations and wish to construct the best possible 2-tube receiver. I will appreciate it very much if you publish the diagram in one of the coming issues of the Question Box, also furnish the coil data.

(A) Undoubtedly the most popular receiver for the embryo ham consists of a screen-grid regenerative detector and a single stage of audio amplification. Of course, in the crowded ham bands a receiver must have band-spread. As the diagram shows this is accomplished by connecting a 20 or 35 mmf. variable condenser in parallel with the 140 mmf. tuning condenser. The large condenser is used for band-setting, while the smaller one actually does the tuning. Coil data for this receiver can be found elsewhere in these pages.

IMPROVING THE "DOERLE"

Robert Marshall, New Bedford, Mass.

(Q) I have constructed the "Doerle" receiver using a 57 and a 2A5. However, I would like to obtain more volume, and would appreciate it very much if you would print a diagram of the same receiver using a 57, 56, and 2A5. I would also like to know if this receiver would be satisfactory for 10-meter operation.

(A) We have shown the Doerle circuit with the addition of a "56" first stage of audio amplification, but we do not think that you will obtain very good results on 10 meters. Past experiances have shown that a good super-heterodyne is necessary on the 10-meter band, unless you are only interested in local police calls, etc.

COMPLETE A.C. OPERATED RECEIVER

N. L. Leitsch, N.S. Pittsburgh, Pa.

(Q) I have been a reader of your wonderful magazine, *Short Waves & Television* for two years, and also have a copy of your *Short Wave Guide* which I find very useful and interesting. I have a question to ask and hope you can help me. Will you publish a diagram using Hammarlund 6-prong coils and employing two 36's, one 38, and one rectifying tube. Thanks.

(A) The complete A.C. operated receiver as requested in your letter is shown in one of the diagrams on this page. This should give excellent performance and other experimenters who are interested in building a good short-wave receiver of simple design may well follow the layout provided.

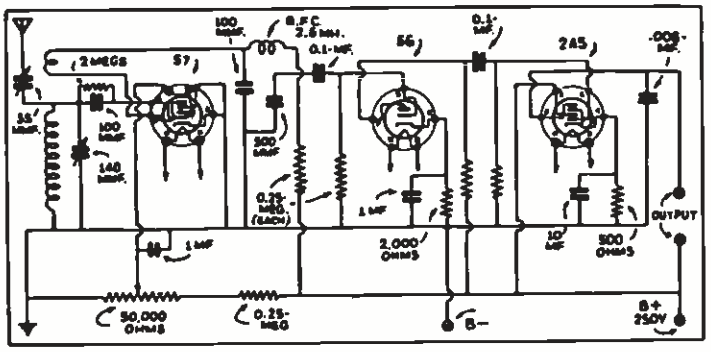
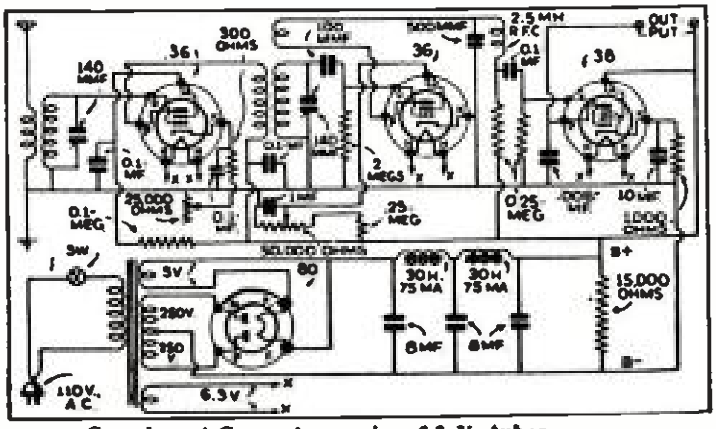
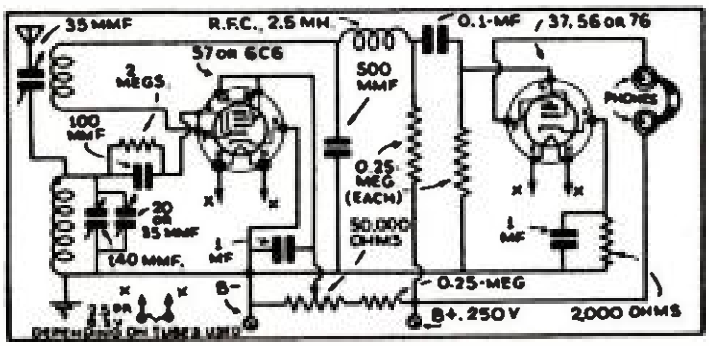


Diagram of 3-tube set using 57, 56, and 2A5.

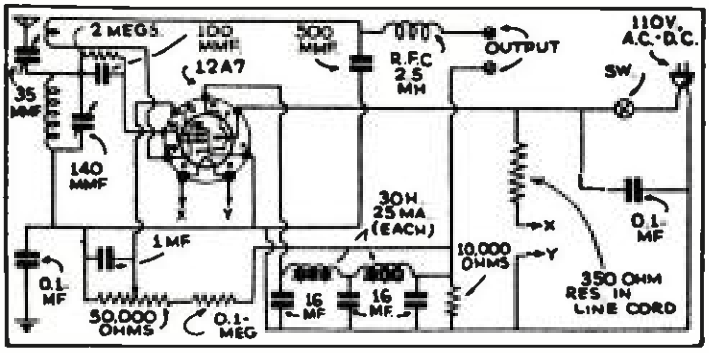


Complete A.C. receiver using 6.3 V. tubes.



2-Tube Set For The "HAM"

A. C. - D. C. Receivers



12A7 provides a 1-tube A.C.-D.C. receiver.

3 EQUALS 4 RECEIVER

Fred Elias, Reedley, Calif.

(Q) I would like to build an A.C.-D.C. receiver employing a 6F7, a 43, and a 25Z5. This receiver should be capable of operating a good magnetic speaker and operate on either A.C. or D.C. power lines.

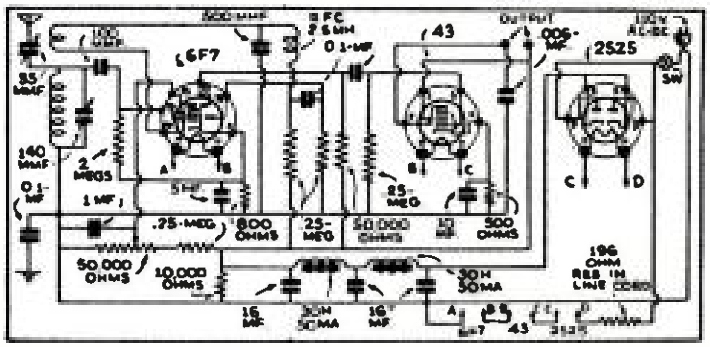
(A) In the diagram shown the 6F7 functions as a regenerative screen-grid detector with the regeneration controlled by varying the screen-grid voltage. The triode portion of the 6F7 serves as the first audio amplifier and a 43 used in the output stage. This receiver will operate a magnetic speaker fairly well on signals of moderate strength.

1-TUBE A.C.-D.C. SET

Arden Freer, Ancon, C.Z.

(Q) I would like to build a simple 1-tube receiver of the A.C.-D.C. variety and employing a 12A7 tube. I also desire to control regeneration with a 50,000 ohm potentiometer. I would appreciate it if you would publish the diagram in the *Question Box*.

(A) We have shown the diagram of the single 12A7 used as a rectifier and screen-grid detector, and excellent results may be obtained. However, there is most certainly going to be some hum in the earphones which cannot be eliminated.



Combination "3 equals 4" receiver.

USING PROPER TUBES

G. Marossi, Toronto, Ont., Can.

(Q) In past issues of *Short Wave Craft* I have seen many diagrams of A.C.-D.C. receivers using type 37, 78, or 6D6 tubes. I would like to use 2½ volt tubes in an A.C.-D.C. lineup.

(A) We do not recommend 2½ volt tubes be employed in A.C.-D.C. circuits. The proper tubes to use are shown in the diagrams and we recommend that you adhere to those recommended.

VOLUME CONTROL

Hans Martin, B'klyn, N. Y.

(Q) I would like to know where I could connect a volume control to a 1-tube receiver.

(A) We do not believe a volume control is necessary on a 1-tube set, for remember a *volume control only cuts volume down from the maximum obtainable amount*, and does not increase volume. In other words, a volume control is merely an *attenuator*.

CHANGING TUBES

C. A. Doane, Jr., Marshfield, Ore.

(Q.) In your August, 1936, issue of *Short Wave Craft* on page 226, you described a receiver using two 27's. I would like to know if type 37's or 76's could be used, providing proper heating voltage is applied.

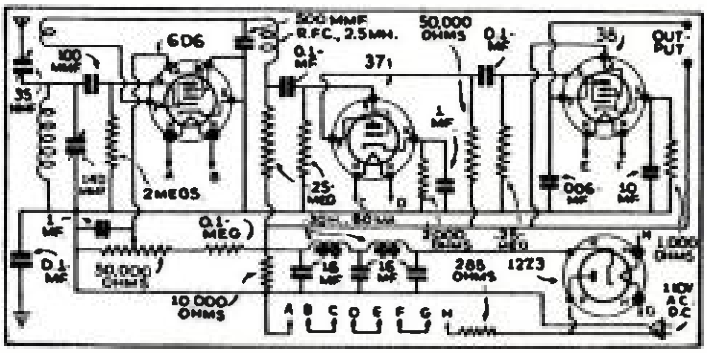
(A.) Most certainly any of the heater triodes may be used in the circuit mentioned in your question, and no changes will be necessary in values or circuit connections.

4-TUBE A.C.-D.C. SET

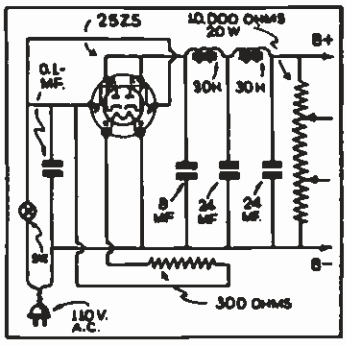
Ray Murray, St. Marys, Kan.

(Q) Please print in your *Question Box* a diagram of a 4-tube set using the following tubes: 6C6, regenerative detector; 37, audio; 38, output; and 12Z3, rectifier. I would like to use transformer coupling between the 6C6 and the 37, and resistance coupling between the 37 and the 38.

(A) We have shown the diagram of the 4 tubes mentioned in your letter. However, we recommend resistance coupling between the detector and first audio stage. If you wish to employ the transformer, we suggest that you use only the secondary and connect it in place of resistor "R" in the sketch.



All-electric A.C.-D.C. receiver using 4 tubes.



A.C.-D.C. POWER-SUPPLY

Richard Watson, New York City.

(Q.) I would like to build an A.C.-D.C. power-supply delivering somewhere around 135 volts, also with various low voltage taps. Would you be kind enough to print a diagram of such a unit; the main idea is to reduce hum as much as possible.

(A.) The diagram of the A.C.-D.C. circuit employing a 25Z5 rectifier tube is shown. The filter system consists of two 30 henry filter chokes, the current carrying capacity of which will depend upon the number of tubes you intend to operate from the power supply. The voltage divider and bleeder can be any type of tapped resistor; one having 10,000 ohms and a 20 watt rating, with 2 sliders should work satisfactorily. The taps should be adjusted with the aid of a voltmeter for desired voltage. Of course, these taps should be adjusted under load.

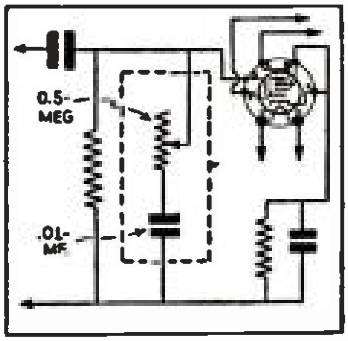
In receivers where adequate by-pass condensers are not connected between the various input voltage terminals and the common "B" negative, it is advisable to by-pass each one of the taps on the voltage divider with an 8 mf. electrolytic condenser.

A.C.-D.C. PRE-SELECTOR

W. E. Skutt, B'klyn, N. Y.

(Q) Kindly print a diagram of a 3-tube pre-selector using two 6D's and a 2A5 as a rectifier. This should be a self-powered amplifier which may be connected to the input antenna and ground posts of any short-wave receiver.

(A) A 2-stage pre-selector of this type will present a tremendous increase in sensitivity. As shown, the two tuning condensers are operated separately. If they are ganged, then a trimming condenser having a capacity of around 50 mmf. should be connected across the 140 mmf. tuning condenser in the first stage. That is the stage immediately following the antenna.



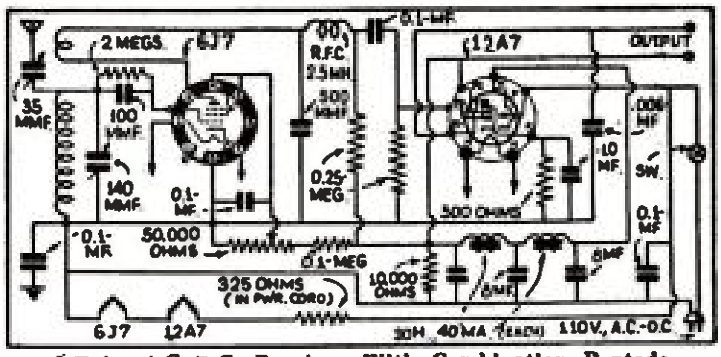
Tone Control Circuit

TONE CONTROL

Al Beck, Erie, Pa.

(Q.) I recently constructed an A.C. set using a 58 T.R.F., a 57 as regenerative detector, a 56 as driver and a resistance coupled 2A5 as final output, which operates a dynamic speaker very well. Having obtained excellent results with this set, I wish to add a tone control for the broadcast band. Will you kindly show a good tone control hook-up I could use in this set?

(A.) It is very simple to add a tone control to your receiver or any receiver for that matter. Merely connect a ½ meg. variable resistor in series with a .01 mf. condenser. These are then connected between the grid and B negative side of the circuit, as shown in the accompanying sketch. If the resistance is decreased the tonal response is lowered, attenuating with higher frequencies.



2-Tube A.C.-D.C. Receiver With Combination Pentode Amplifier and Rectifier

2-TUBE A.C.-D.C. RECEIVER

Oscar Jaime, Havana, Cuba

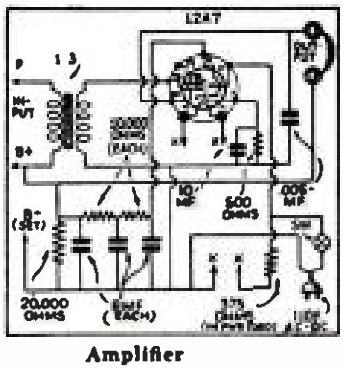
(Q.) I have benefitted considerably from the various material published in the *Question Box*, and would like to see printed a diagram of a 2-tube A.C.-D.C. receiver employing a 6J7 regenerative detector, a 12A7 rectifier, and an output tube. The coils should be of the 4-prong variety with only one tuning condenser.

(A.) We are glad you like the *Question Box*, and benefit by some of the material which is published in it. We are printing the diagram you request, which should make an excellent receiver for the beginner who desires simplicity. However, greater efficiency would be obtained with slightly better performance, insofar as quietness is concerned, with a conventional A.C. set. A hum-free A.C.-D.C. set is more difficult to build than a straight A.C. set employing a separate power-supply.

A.C.-D.C. AMPLIFIER

R. Patrick, Pullman, Wash.

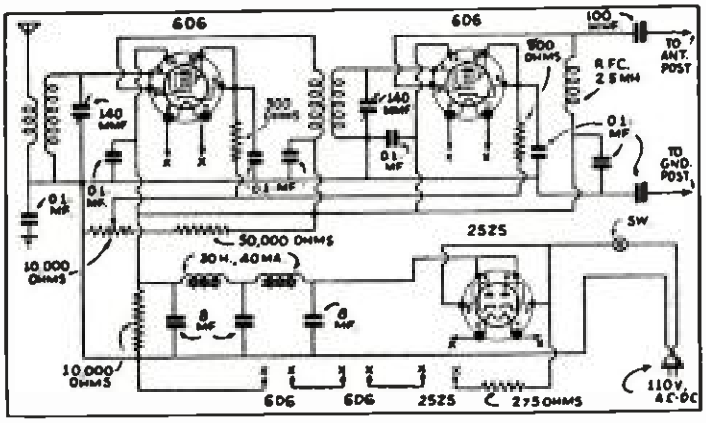
(Q.) I am now using a 1-tube receiver and would like to build an A.C.-D.C. amplifier to be used in conjunction with it. Would you



Amplifier

kindly print the diagram showing how this could be done, and also show how the power supply for the A.C.-D.C. amplifier employing a 12A7 tube may be used to operate the other tube.

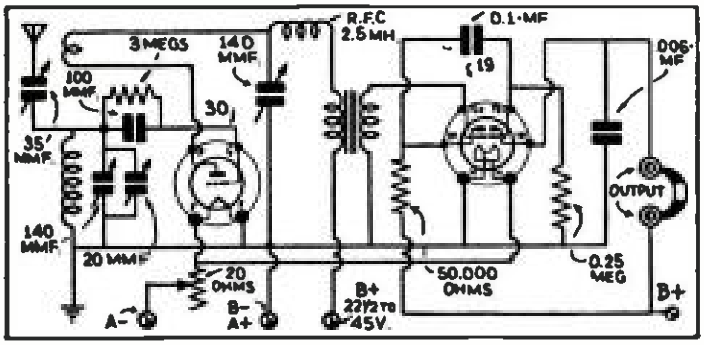
(A.) We have shown the complete diagram of a 12A7 pentode amplifier and rectifier combination. The power-supply portion may be used to furnish voltage for the other tube. We have not shown the other tube in the filament circuit. However, if you are using a 6.3 volt .3 amp. heater tube this may also be connected in series with the 12A7 heater, and in this case the line cord resistor should have 20 ohms less resistance than that shown.



2-stage pre-selector operates from either A.C. or D.C.

Battery Type

S-W RECEIVERS



The "Prof-Doerle"—An Excellent 2-Tuber.

THE "PROF DOERLE"

Edwin L. Rowland, Brooklyn, N.Y.

(Q) Could you furnish a diagram of the new Deorle 2-tube set using a 30 and a 19. Also I would like to know if another 33 could be added to increase the volume.

(A) We have shown a diagram of the "Prof. Doerle" receiver using 30 detector and a 19 as two stages of audio amplification. We do not recommend that a type 33 receiver be added to the receiver as shown, because there would be entirely too much audio gain and a great possibility of *feed-back* and *motor-boating*. If you desire to change the audio amplifier, we would advise substituting a 30 for the 19 so that the result will be only 2 stages of audio amplification. This will give you more satisfactory results.

A SIMPLE 2-TUBER

Harry Campbell, Portland, Me.

(Q.) Would you please print a diagram for a 2-tube receiver similar to the Globe Trotter. I would also like to have the lists of parts, together with their values, This receiver is to be battery-operated and should employ two type 30 tubes.

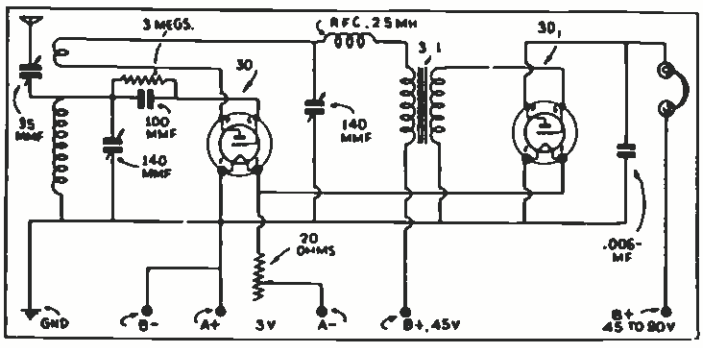
(A.) We have shown a circuit diagrem of a conventional 2-tube battery set. This would require two 1½-volt dry cells for the filament supply and two 45-volt batteries for the plate supply. While the single 45-volt battery may be used, better results will be obtained with 90 volts applied to the plate of the amplifier tube.

TOO MUCH INTERFERENCE

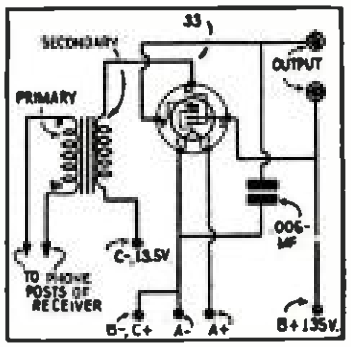
A Bodnar, Hopewell, New Jersey.

(Q) I have a 3-tube radio which gives satisfactory results except for the fact that I experience considerable interference in the *broadcast* band. For instance, WOR, WJZ, WABC, can be heard all at the same time. Could you please tell me how I might overcome this difficulty?

(A) In the first place, there is not enough inherent selectivity in a 3-tube set for operation on the *broadcast* band where powerful stations are operating. You might try using a short piece of wire only four or five feet long in place of the regular antenna. Remember that it takes a good superheterodyne to cope with the powerful local stations of the *broadcast* band.



A 2-Tube Battery Set



PENTODE AMPLIFIER

Joseph Folland, Weldon, Sask.

(Q.) I have recently constructed the 2-tube receiver using type 30 tubes and have obtained excellent results with it. However, I now desire to add a 33 pentode amplifier. In order to obtain speaker volume. Will you kindly print a diagram showing transformer coupling.

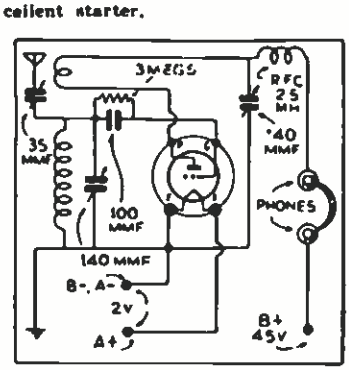
(A.) We have shown the diagram and have correctly marked the various terminals. The two primary connections of the transformer connect to the phone posts of your present receiver. The terminal marked "P" on the transformer should go to the plate of the first audio amplifier, while the other terminal marked "B" will go to the plate supply lead.

1 TUBER

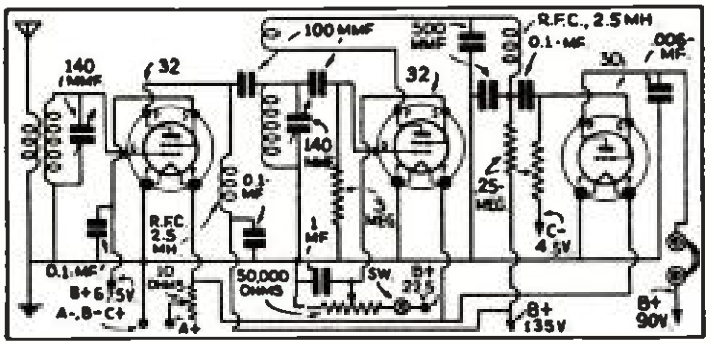
Wm. Fuller, Pittsburgh, Penn.

(Q) In order to get started in short-wave reception kindly illustrate in the form of a diagram how the type 30 tube can be employed.

(A) We have shown the diagram of a 1-tube receiver employing a type 30. This will serve as an excellent starter.



A 1-tube receiver using type 30.



A 3-tube battery receiver, using two 32's and a 30 type tube.

3-TUBE BATTERY OPERATED RECEIVER

Clay Boborb, Alexandria, Ind.

(Q) Would you please print a diagram of a receiver employing a 32 untuned R.F. amplifier, a 32 regenerative detector employing two winding coils, and a 30 resistance-coupled audio amplifier. Also show the regeneration control as a 50,000-ohm potentiometer.

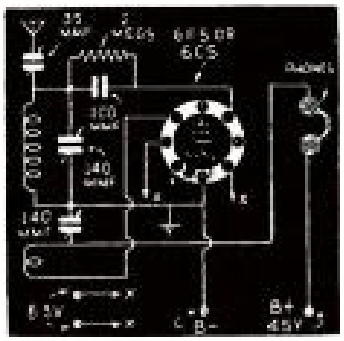
(A) We have shown the diagram with the R.F. stage tuned. However, the grid coil may be replaced by a 2.5 mh. R.F. choke and the antenna connected directly to the grid, eliminating the 140 mmf. tuning condenser. A resistor having a value somewhere between 10 and 50,000 ohms may also be used in place of the choke. We recommend, though, that the R.F. stage be tuned, because considerable interference from powerful local stations may be encountered with the "untuned" affair. Also, a switch is incorporated in series with the 50,000-ohm regeneration control, so that there will be no drain on the battery when the set is not in use.

METAL TUBE 1-TUBER

George McEvenue, Ontario, Canada

(Q) I contemplate building a receiver using one metal tube. I do not know just which type tube will give best performance, and I trust that you will publish the necessary information in the coming issue of the *"Question Box."*

(A) There are two tubes which will serve very nicely as a regenerative detector when working into a pair of earphones. They are the 6F5 and the 6C5. The 6F5 is the high-mu tube, and the 6C5 is the low-mu tube. Regeneration is controlled by a 140 mmf. throttle condenser.



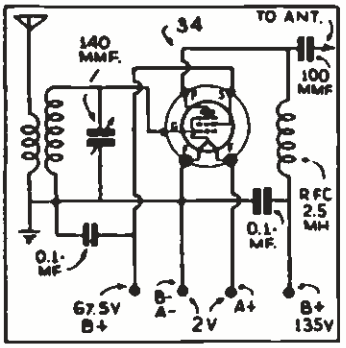
1-tube receiver using a 6C5 or 6F7 metal tube.

BOOSTER FOR BATTERY SET

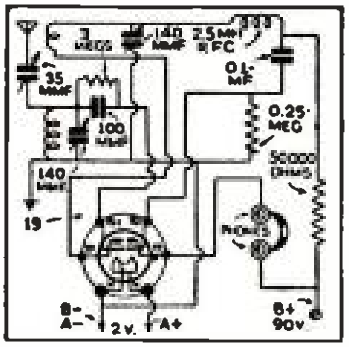
Paul MacArthur, Toledo, Ohio.

(Q) I have a battery type receiver which performs excellently. However, I would like to boost the weaker signals so that they could be more comfortably distinguished. Would you please tell me how this can be done? I have been informed that another tube may be added. Also, will this increase the selectivity?

(A) We have shown a diagram of a type 34. This may be employed as a tuned R.F. booster stage for your receiver. While this will increase the sensitivity considerably, we doubt if it will effect the apparent selectivity. It might be advisable to incorporate a small variable condenser in series with the antenna connected to this stage so that coupling could be reduced in order to cope with conjested bands.



Booster for battery set



TYPE 19 AS 2-TUBE RECEIVER

Harry M. Mobridge, Whitlash, Mont.

(Q) Would you please print a diagram of a short-wave receiver using a type 19, 2-volt tube. Since reading *Short Wave & Television*, I have built 27 short-wave sets, 1- to 4-tube battary receivers, and have had fine results with my three *Doerle's* and one *Duo-Amplidyne* now in use. Have pulled in most of the regular foreign stations on my speaker with fair signal strength. Here's to *Short Wave & Television* and many more good sets.

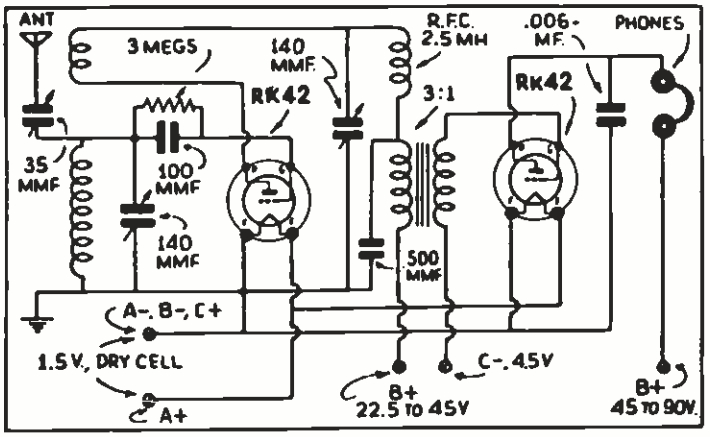
(A) We have shown the circuit diagram of a 19 used as a regenerative detector and one stage of audio amplification. Resistance coupling is employed. The plate voltage which seems to work out best is 90 volts. For low voltages it may be found necessary to use transformer coupling between the two stages.

PORTABLE USING NEW LOW DRAIN TUBES

John Hannigan, Brooklyn, N. Y.

(Q.) I would like to build a 2-tube portable receiver employing the new RK-42 1.5 volt battery tubes and 90 volts of midget B batteries. Would you kindly print the diagram showing plug-in coils and a throttle condenser for regeneration control.

(A.) The advent of the RK-42 tube greatly simplifies portable receiver construction inasmuch as only one dry cell (1.5 volts at .06 amp.) is needed. The circuit diagram is conventional in all respects and if properly constructed together with the use of standard low-loss parts, excellent results will be obtained. We would suggest building the receiver in a small metal box; this greatly simplifies construction and tends to minimize hand-capacity effects.



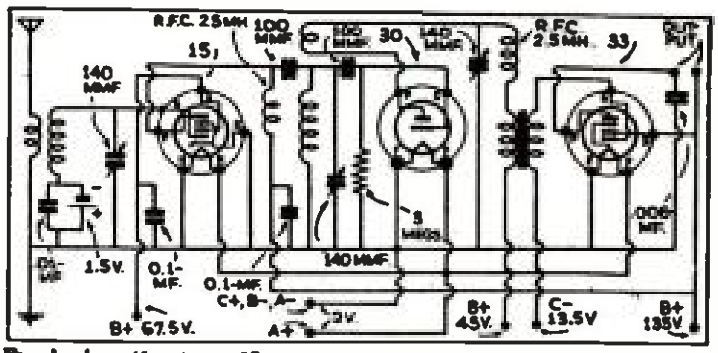
Battery Operated Receiver Using Low Drain Tubes

A GOOD BATTERY SET

Leo Knight, West Union. W.Va.

(Q) I would like to have you print at your convenience, in the *Question Box*, a diagram of a 15 tuned R.F. amplifier, type 30 detector, and a 33 pentode audio amplifier. The set should use 4-prong plug-in coils and 140 mmf. tuning condensers.

(A) We have shown the diagram you request. A fixed bias of 1.5 volts is applied to the grid of the 15 R.F. amplifier. A single flashlight dry cell will serve satisfactorily as bias and last a long time. Regeneration in the detector stage is controlled by a variable condenser.



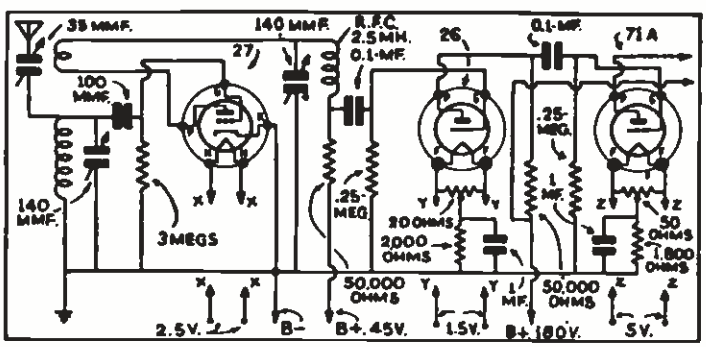
Employing the type 15 as an R.F. amplifier in a battery set.

SHORT WAVE SET USING OLD-STYLE TUBES

D. S. Miller, Jr., Altoona, Pa.

(Q) I would like to use the type 27, 26, and 71A tubes in a short-wave receiver. I have the necessary power-pack and would like very much to have you print the diagram.

(A) We are printing a diagram of a 27 regenerative detector, a 26 first audio amplifier, and a 71A second audio amplifier. Excellent results should be expected from this receiver.

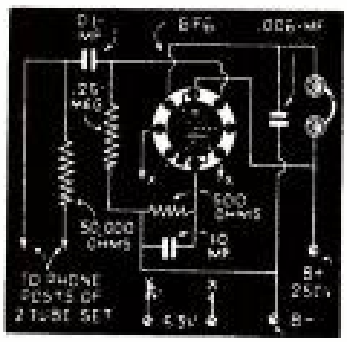


S-W receiver using "tubes of yesterday."

METAL TUBE AMPLIFIER

John Rose, W. Toledo, Ohio

(Q) I built the 2-tube metal receiver described by Harry D. Hooton on Page 718 of the April, 1936 issue, and would now like to add a pentode amplifier using a metal tube. Please publish the diagram in the *"Question Box."*



Pentode amplifier using metal tube.

(A) The addition of a 6F6 pentode amplifier to the 2-tube receiver should be a profitable undertaking in so far as results are concerned. The diagram is clearly shown. The two input terminals of the amplifier connect to the earphone posts of the 2-tuber.

CONVERTING B.C. RECEIVER

Arthur F. Hartman, New York City.

(Q) Would you please publish the information on how to convert 5-tube midget electric receiver into a long and short-wave set.

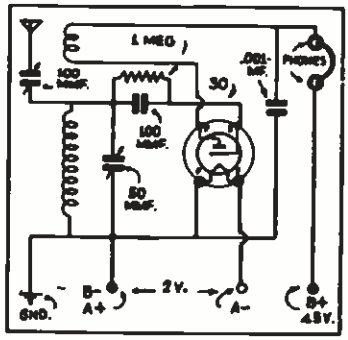
(A) As stated many times before in the Question Box, we do not advocate that fans or experimenters attempt to remodel *broadcast* receivers in order to obtain short wave reception. It is a most unprofitable proposition and in many cases the results will be entirely unsatisfactory. The best arrangement will be, of course, to build a short-wave receiver, following some of the designs found in past issues of this magazine. Or you may build a converter, many of which have been also illustrated in the Question Box.

POCKET SET

Allen Clark, N.S.W., Australia.

(Q) I have read much comment on the 1-tube pocket set described in the December, 1934 issue. However, I have been unable to obtain that issue and would be pleased if you would print the diagram in your *"Question Box."*

(A) The 1-tube pocket receiver was very popular among our readers and excellent results have been obtained with this receiver.



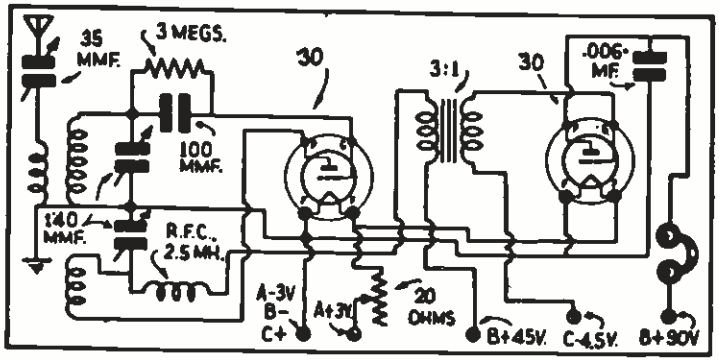
The famous pocket set.

2-TUBER WITH 8-WINDING COILS

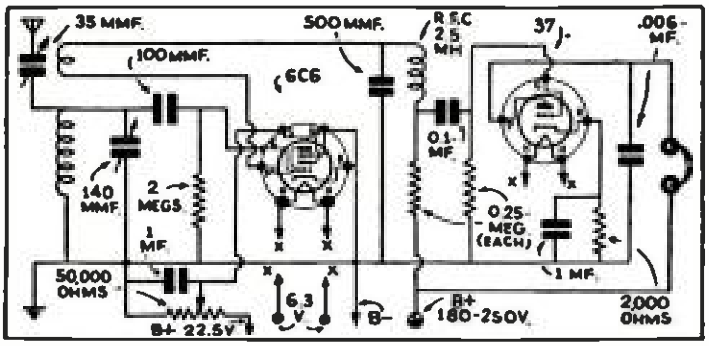
W. B. Anderson, Fernie, B.C.

(Q.) Will you please print in a coming issue of the *Question Box* a diagram of a receiver employing two type 30 tubes, with Hammarlund 8-winding plug-in coils.

(A.) The diagram we have shown is conventional and the primary winding, that is the coil which is interwound with the grid coil, is employed for antenna coupling. In addition, we must employ a small variable condenser in series with the antenna, because this unwound coil provides too much antenna coupling.



2-Tube Battery Set With 8-Winding Coils



2-tube receiver using 6C6 and 37 tubes.

6.3-VOLT SHORT-WAVE RECEIVER

Edward Daniels, Rochester, N.Y.

(Q) I would like to have you publish a diagram of a 2-tube 6.3-volt receiver using a 6C6 and a 37. Regeneration should be controlled by a potentiometer in the detector stage.

(A) We have shown the diagram you request and the 50,000-ohm potentiometer controls regeneration by varying the screen-grid voltage. This set can be used with a 6-volt storage battery and "B" batteries for the plate supply.

RE: THREE TUBE DOERLE

Todd Kubit, Cleveland, Ohio

(Q.) In regard to the improved 3-tube Doerle battery set, please tell me the reason for its quietness of operation. Also may an A.C. power supply be used for the plate voltages of the receiver?

(A.) Usually the battery set when operated from high-grade batteries is quiet because of the lack of disturbances usually communicated to the set through the power line. B batteries may be eliminated through the use of the so-called B-eliminator, which is really a power-supply intended to supply only the plate voltages.

2-TUBE DX'er

Kaye Palmer, New York City.

(Q) Would you please reprint the diagram of the 2-tube DX'er which was described in the July, 1934 issue of *Short Wave Craft*?

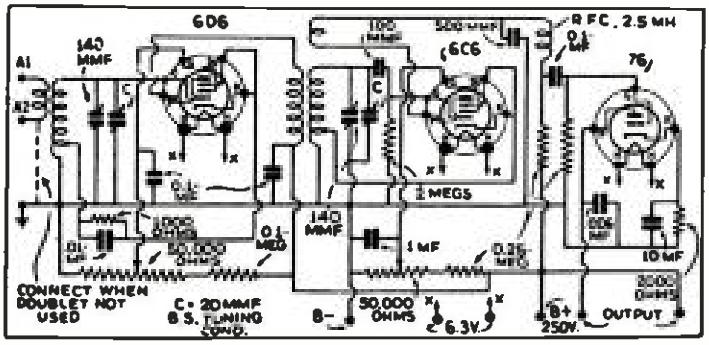
(A) The diagram of the "2-tube DX'er" is shown herewith. Regeneration is controlled by a 50,000 ohm variable resistor connected across the tickler winding. It may be well to experiment with the plate voltage applied to the detector inasmuch as some tubes may require different voltages. The voltage giving smoothest control of regeneration should be employed.

6.3V. 3-TUBER

Ham Reader, New York City.

(Q) Please print a diagram of a 3-tube T.R.F. receiver using a 6D6, 6C6, and 76. This should have electron coupling in both the R.F. and detector stages. Also, what size band-spread condenser should be used for 40-meter amateur work?

(A) We presume that by electron coupling in both stages you mean to employ regeneration in the r.f. stage. The diagram shows how this is accomplished. It will require two regeneration control potentiometers for proper results. We recommend a 20 mmf. condenser shunted across the 140 mmf. condenser. The smaller condensers are used for band spread tuning.



3-tube receiver using 6.3 V. tubes

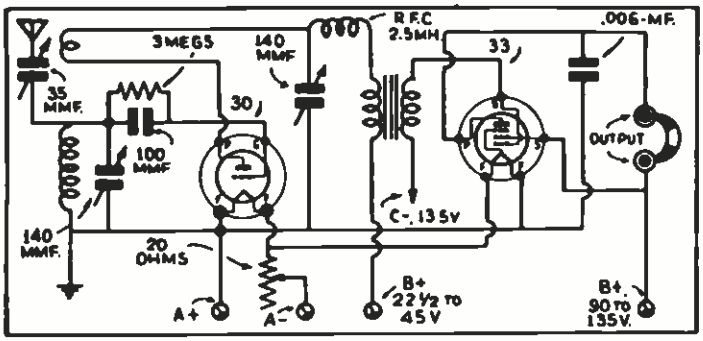
RECEIVER FOR MOTOR-CYCLE

W. J. Rogers, Toronto, Ont., Canada.

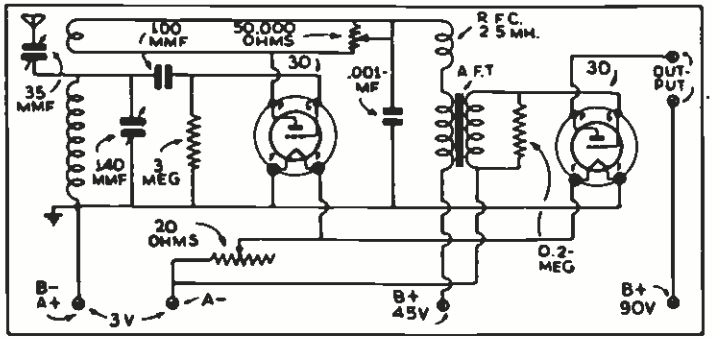
(Q) I would like to know if I could get a diagram of a small short-wave receiver which could be operated on a motorcycle, so as to pick up police calls. It should not be too expensive or bulky.

(A) Any one of the many short-wave receivers described in past issues of *Short Wave Craft* may be used in conjunction with a motorcycle. However, we might add a word of warning—it is possible that local ordinances may prohibit the use of such a "police call" receiver. In the U.S. many municipalities have such laws and they probably exist in Canada as well.

It is well to look into this matter and avoid being lodged in the local hoosgow.



Two-Tube Battery set using a 30 and 33.



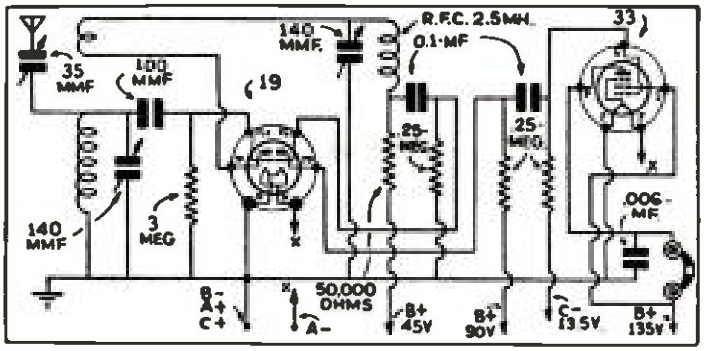
The famous 2-tube DX'er

2-TUBE BATTERY SET

Raymond Bonner, West Los Angeles, Cal.

(Q) Please print the circuit diagram of the Short-Wave receiver employing a 33 detector tube and a 30 amplifier. This should use from 45 to 90 volts B battery and standard plug-in coils. Regeneration should be controlled by a variable condenser.

(A) We have shown a diagram using 30 and 33. However we have employed the 33 as the audio amplifier, not as the detector. Regeneration is controlled by the 140 mmf. condenser and standard plug-in coils may be used. Data for the coils can be found in the February issue of the *Question Box*.



2-Tubes do the work of three in this receiver

2-TUBE BATTERY SET

Agustin Ramirez, Habana, Cuba.

(Q) I am a constant reader of *Short Wave Craft*, and would appreciate it if you would publish a diagram of a 2-tube receiver using a 19 and a 33. This should be resistance-coupled in the entire audio portion with a regenerative detector using standard two winding coils.

(A) The diagram you request using a 19 and a 33 has been shown, and it should make an excellent battery type receiver. The 19 serves as a regenerative detector and first stage of audio amplification. The second audio stage uses a 33 pentode and sufficient volume should be obtained for a sensitive speaker.

2-TUBE BATTERY SET

Fred Symthe, Biloxi, Miss.

(Q) Please print in the short wave *Question Box* a diagram of an "all-wave" 2-tube receiver using two type 30 tubes. I would like to have this tuned down to 10 meters.

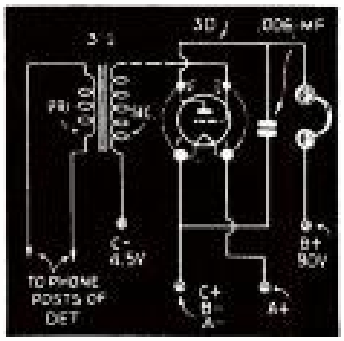
(A) We have shown a diagram of a 2-tube battery-operated receiver. However, we do not believe very good results will be obtained on 10 meters. The usual run of small receivers of the ordinary regenerative type do not perform well on the shorter wavelengths because it is difficult to make them stable.

AMPLIFIER FOR 1-TUBE RECEIVER

Will Rogers, Minneapolis, Minn.

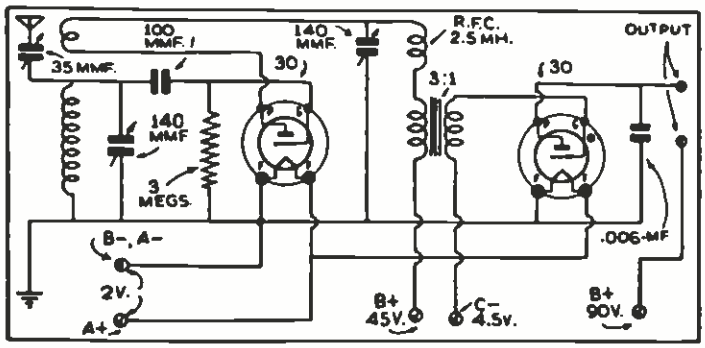
(Q) If possible, I would like to add another tube, an audio amplifier, to the 1-tube receiver which I already have. This receiver uses a type 30 as a detector. Would you be kind enough to print the necessary wiring diagram?

(A) We are showing a diagram

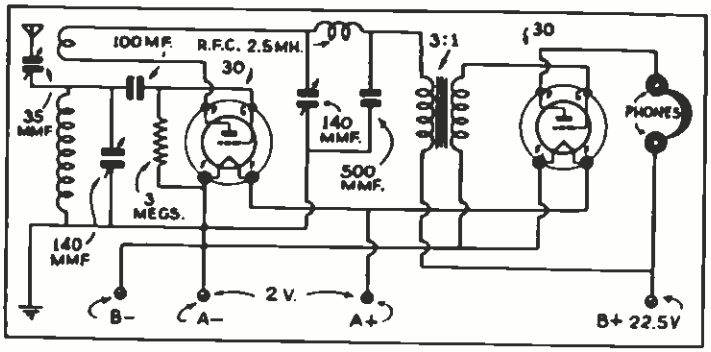


Type 30 audio amplifier.

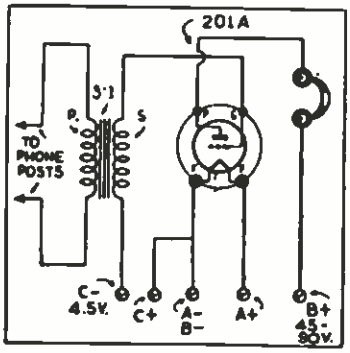
of a type 30 which may be transformer-coupled to your present receiver. The primary terminals of the 3 to 1 audio transformer connect to the terminals of the 1-tube set, which were formerly used as the earphone connections. This should give a considerable increase in volume.



A 2-tube battery operated receiver.



2-tube battery receiver using type 30 tubes.



Audio amplifier.

201A AMPLIFIER

David Tobins, Dayton, Ohio.

(Q) I have constructed a 1-tube battery receiver and would like to build a 1-stage audio amplifier for it using a 201A tube. Would you kindly print the necessary diagram in your *Question Box*?

(A) We have shown the diagram requested. The input terminals of the amplifier (the primary terminals of the transformer) should be connected to the phone terminals of your present receiver. Adding this stage of amplification should improve results considerably.

HOW TO GET VERIS

Andrew Stoker, Memphis, Tenn.

(Q) I notice each month that a great number of *Short Wave Craft* readers submit a large total of verification cards for the Trophy Contest. I would like to know how to get these verification cards from the foreign short-wave stations.

(A) Merely make a note of the time, date, and character of the program received and submit these to the station heard. Naturally, the stations require that you pay the postage and therefore it is necessary to include an International Postal Reply Coupon which may be obtained from your local post office.

RECEIVER USING TWO 30's

S. Lipshitz, New York, N.Y.

(Q) I would like to construct a set using two type 30 tubes, using 22½ volts on the plates. Would you kindly print the diagram?

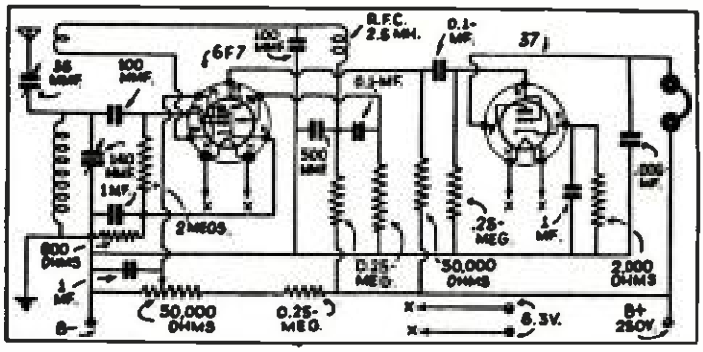
(A) The diagram you request is shown. However, we believe more satisfactory results would be obtained with 45 volts on the plates of the tubes and probably the set would be less critical in operation.

2-VOLT RECEIVER

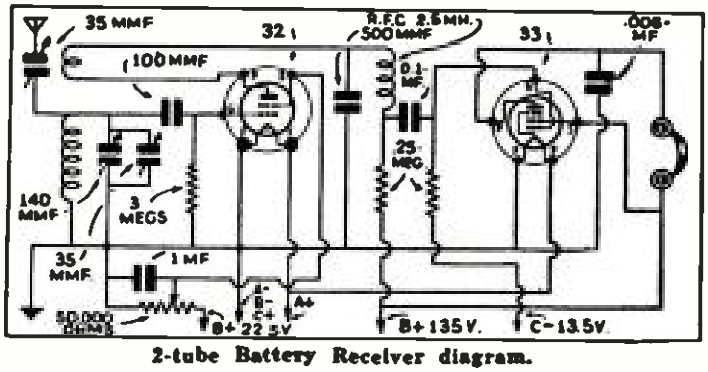
Archie Fleming, B. B. Canada.

(Q) Would you please print in the *Question Box* a diagram of the "Ham" receiver using a type 32 and any other audio amplifier which will provide good volume. This should also have band-spread.

(A) The 32 and 33 combination should make an excellent receiver for the "Ham" who wants a simple battery-operated set. Band-spread in the regenerative detector circuit is accomplished with a 35 mmf. condenser. Regeneration is controlled by a 50,000 ohm potentiometer.



6F7 and 37 used as detector and two A.F.



2-tube Battery Receiver diagram.

38 AMPLIFIER FOR 2-TUBE SET

Reg. Pearson, Wellana, Ont.

(Q) I am using at present a receiver employing a 6D6 in the T.R.F. circuit, a 6C6 as detector, and a 37 as the audio amplifier. I would like to add a 38 pentode to obtain speaker volume. Would you be kind enough to print the diagram in the *Question Box?*

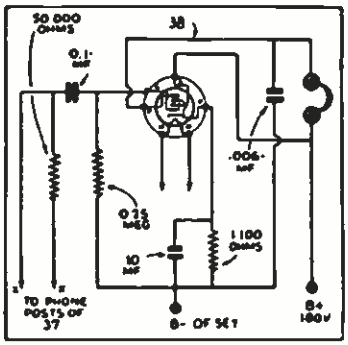
(A) The diagram has been shown, using resistance coupling. The 50,000 ohm resistor having its terminals marked "X," should be connected to the phone terminals of the 37 audio amplifier already in the receiver.

2-TUBE SET USING 76's

J. Bailey, Pittsburgh, Pa.

(Q) Would you be kind enough to print a diagram of a short-wave receiver using one 76 as a detector, regenerative, of course, and another 76 as a transformer coupled audio amplifier. This should use regular two-winding plug-in coils which were illustrated in the Jan. uary, 1936 *"Question Box."*

(A) The diagram you requested is given and it should make an excellent short-wave receiver. It is advisable to try different voltages on the plate of the detector in order to determine what voltage would give maximum sensitivity and smooth regeneration with the particular coils used.



1-tube Amplifier for S-W receiver.

"2 EQUALS 3" DIAGRAM

Carl Smetka, Owosso, Mich.

(Q) Will you publish in one of the coming issues of the *"Question Box"* a diagram of a 2-tube receiver employing 6.3 volt tubes and 4-prong, two-winding plug-in coils? The tubes which I prefer are a 6F7 used as a regenerative detector, and one stage of audio amplification and a 37 as an audio amplifier forming the second stage. The regeneration control should be in the screen-grid circuit.

(A) The combination of a 6F7 and 76 makes a very excellent receiver. In it we really have a regenerative pentode detector, with two stages of resistance-coupled audio amplification, all with two tubes. Regeneration, as requested, is controlled by varying the screen-grid voltage.

1-TUBE OSCILLODYNE

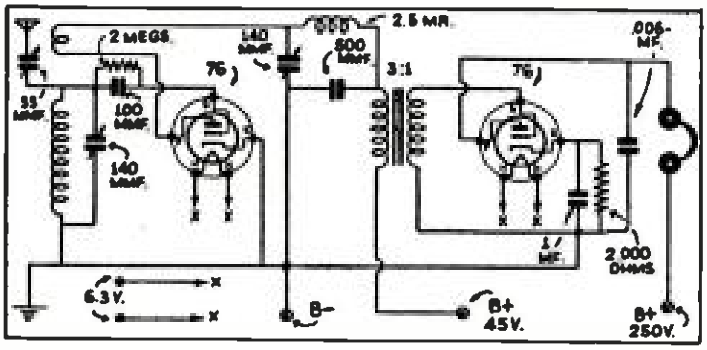
Selden James, Frisco, Texas.

(Q) Please publish a diagram in the *Question Box* of the "1-tube Oscillodyne" which appeared in the April, 1933 issue of *Short Wave Craft.*

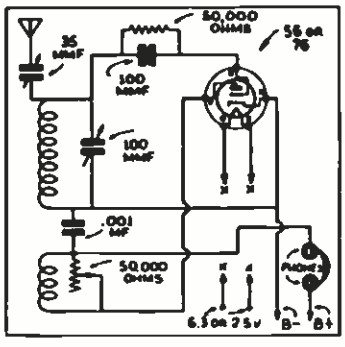
(A) We are again printing the diagram of the "Oscillodyne" and trust that our readers will save this hook-up because it is requested a great many times. The coil data for this receiver is as follows:

Coil	Secondary	Tickler
1	4	6
2	7	9
3	14	12
4	23	23
5	36	36

These coils are close wound on tube bases with No. 36 D.S.C. wire and the spaces between the two coils is ⅛ in. (Range covered 14 to 200 meters.)



2-tuber using type 76's.



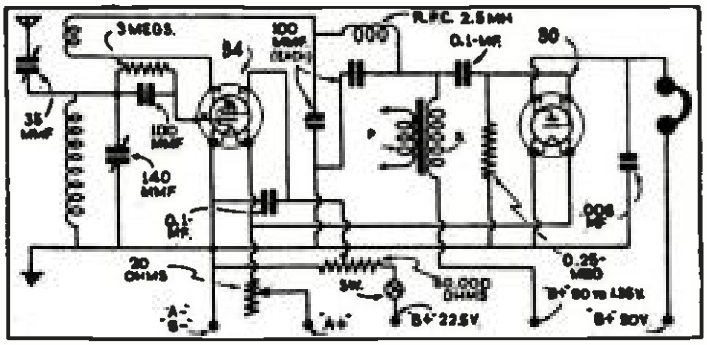
1-Tube Oscillodyne.

SCREEN-GRID BATTERY SET

Francis Medon, Yonkers, N.Y.

(Q.) Please print a diagram in your *Question Box* showing how to change a 30 detector to a 32 or 34.

(A.) We have shown in the diagram how the screen-grid type battery type tube is connected as a regenerative detector. It will be a simple matter to change your present receiver. We have also shown the secondary of the audio transformer used as a plate impedance for the detector. Of course this may be replaced with a ¼ megohm resistor to conserve space.



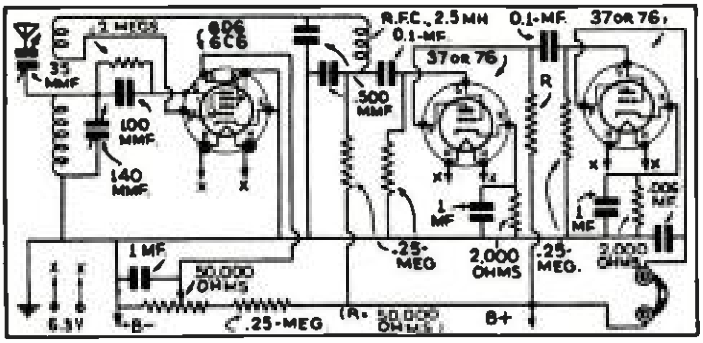
2-Tube Battery Set for Beginner

3-TUBE RECEIVER DIAGRAM

Chas. Loutzenhiser, Toledo, Ohio.

(Q) Would you please publish a diagram in the *Short-Wave Question Box* of the short-wave receiver using a 6D6, 76, and a 37? Regeneration should be controlled with a 50,000-ohm potentiometer in the screen-grid circuit of the detector.

(A) The diagram you request is shown and the different type 6.3-volt tubes which may be used are clearly indicated in the diagram.



A short-wave receiver hookup utilizing a 6D6, a 76 and a 37.

2-TUBER USING TYPE 30's

Jack Morrales, Perth Amboy, N.J.

(Q.) I have two type 30 tubes and an audio transformer. Please be kind enough to show a circuit diagram using these parts. I would also like to use .00025 mf. condensers with plug-in coils.

(A.) We have shown the conventional diagram employing type 30 tubes. Transformer coupling is employed between the two stages and regeneration is controlled with 140 mmf. variable condenser.

EFFECT OF SHIELDED BUILDING

J. C. Nix, Dapp, Alta, Can.

(Q) A short-wave transmitter and receiver is to be placed in a building which has metal sheeting on both outside and inside. This building is near a grain elevator which is 95 feet high. This also has lightning arresters. What effect will this have on transmitting and receiving conditions?

(A) So long as the transmitting and receiving antenna is sufficiently clear of all of the outside of the shielded building, there should be no ill effects. Off hand, we believe there will be a considerable advantage in having the transmitter and receiver located in the shielded building. With the proper antenna lead-in system, you should experience a minimum of man-made interfereace.

1-TUBE POCKET SET

Herbert Schmitt, Port Townsend, Wn.

(Q) I have read much about the 1-tube pocket set which was described in the December, 1934, issue of *Short Wave Craft* and would appreciate it if you would print the diagram in your *Question Box*, together with the coil data.

(A) The 1-tube pocket set sure was popular with our readers, and we are pleased to reprint the diagram. The coil data is as follows: 49-meter band:-grid, 18 turns, tickler 18 turns, 25 31-meter band:-grid, 10 turns, tickler 10. 19 meter band:-grid coil, 5, tickler 5. The above coils are close-wound on a 1 inch form with No. 26 D.S.C. wire and a spacing of ⅛ in. between the two windings. We have also had many requests for coil data for the broadcast band, but this set is not suitable for operation in the regular "broadcast" band, inasmuch as it is entirely too unselective.

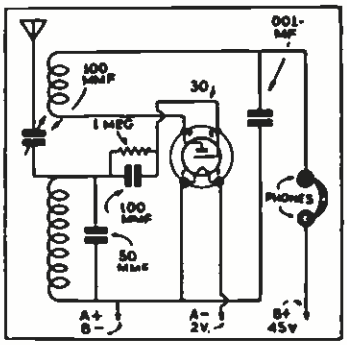
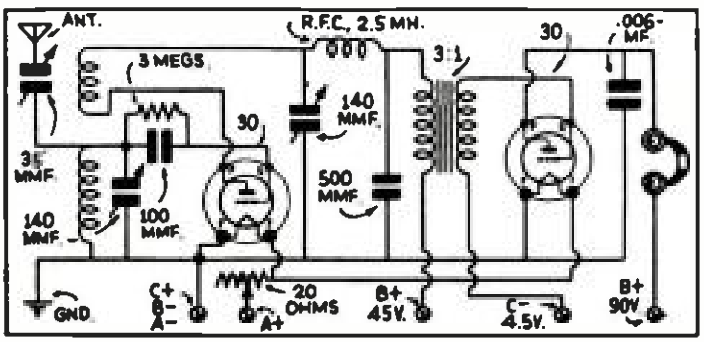


Diagram of the famous "pocket set."

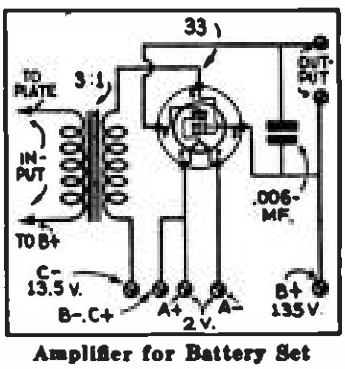
ONE STAGE AMPLIFIER FOR BATTERY SET

J. W. Huson, Cristobal, C. A.

(A) The addition of the 33 pentode should be well worth while and should provide "speaker" operation with the receiver previously using only type 30's. Either a magnetic or a permanent dynamic speaker may be used.



An Excellent Receiver for the Beginner



Amplifier for Battery Set

Short-Wave

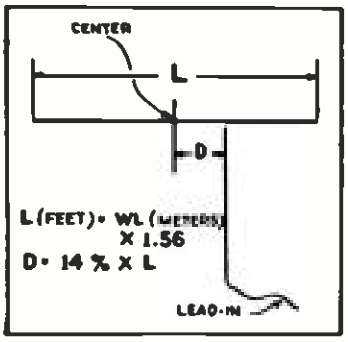
ANTENNAS

RESONANT ANTENNA FOR S W L

Arthur Squires, Paducah, Ky.

(Q) I would like to know if there is any way which I can design an antenna which would give satisfactory results on the 49-meter band, or in fact any short-wave band. If you can print such information in the *Question Box*, I believe a great number of readers would be grateful for it.

(A) Most assuredly, any one can construct an antenna which is resonant at some particular frequency and one which will give excellent results. The one shown in the diagram is a single wire Herts antenna the length, of course, is equal to ½ wavelength. To find its length in feet, multiply the desired wavelength in meters by 1.56. The *feeder* is tapped on to the antenna a short distance from the center of the antenna. This distance D, is equal to 14% of the total length of the antenna. As an example the 49 meter antenna would be 76.44 feet long, and the distance, D, would be 10.7



Receiving Antenna

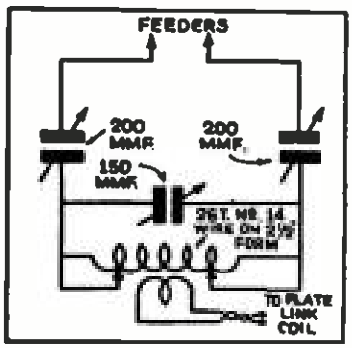
feet. The directional effect of the antenna is at right-angles to its plane and it is bi-directional. The lead-in should be brought away from the antenna at right-angles to it, for a distance equal to 30% of the length of the antenna. For those who concentrate their activities on a single band, this antenna should provide excellent results.

LINK COUPLING TO ANTENNA

Stanley Sherman, Battle Creek, Michigan.

(Q) I have seen mentioned in a number of your articles the fact that *link-coupling* is used between the antenna tuning unit and the transmitter. Will you be kind enough to illustrate in the *Question Box* just how this should be done. I would like to construct a separate antenna tuning unit.

(A) We have shown a tuning unit used in testing many of the



Link-Coupling Arrangement for Transmitting Antennas

transmitters described in this magazine. It consists of a 26 turn coil with 2 adjustable clips and a two-turn link directly in the center of the coil. This link is coupled by a twisted pair, to a similar link on the plate coil of the amplifier. Three condensers are employed, two in series with the feeders and one in parallel, thus permitting proper adjustment under almost any feeder condition.

SMALL SPACE ANTENNA

Paul Edson, Los Angeles, Calif.

Q. I would like to build an efficient transmitting antenna, however, on the 80-40-20 meter bands I find that I do not have space for a good antenna. I have tried many varieties but do not seem to get out well on 80 with them. Will you kindly help us with this problem.

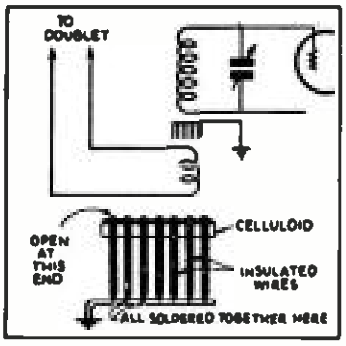
(A.) The solution of your problem is a simple one, providing you have at least 65 to 70 ft. of space available for an antenna. If you will refer to the August 1936 issue, page 211, you will find described an antenna system which works out very well. It is a 40 meter half-wave doublet with "spaced" tuned feeders. Experience had proven that it works exceptionally well on 80 meters and, of course, on 40 it is a conventional half-wave doublet and on 20 meters it operates as two half waves in phase.

COUPLING THE DOUBLET TO S-W RECEIVERS

Edward Carlson, Philadelphia, Pa.

(Q.) I have recently purchased material to construct a *doublet antenna* and would like to know just how I can couple this to my receiver. The present method of antenna coupling makes use of a small variable condenser. I would also like to know if an *electro-static* shield should be used.

(A.) Coupling a doublet to a short-wave receiver is very simple. The coil at the end of the lead-in wires should consist of from 2 to 4 turns. This small coil should be coupled inductively to the B negative or grounded end of the grid coil. The coupling here should be variable if the doublet is coupled to a regenerative detector. If the doublet is being coupled to an R.F. stage, then the coupling may be fixed and need not be variable. The electro-static shield you refer to may help in reducing noise. Should you desire to try the shield, we have shown all the data in the drawing. It consists of a group of insulated wires spaced slightly and soldered along one edge and this edge is grounded. The other end of the group of wires is not soldered together. However, they should be supported with a thin strip of celluloid and secured firmly with cellulose cement such as Du Pont's household cement.



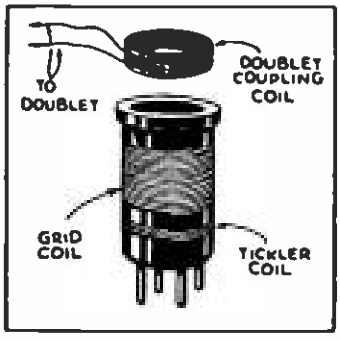
Receiving Doublet

COUPLING DOUBLET TO S.W. RECEIVER

Jos. Redman, Buffalo, N.Y.

(Q) Will you please explain how a doublet antenna may be coupled to the "1935 Prof. Doerle"?

(A) The doublet should be connected to a small coil having 7 or 8 turns of wire the same diameter as the plug-in coil in the receiver. This coil should be coupled loosely to the grid coil. The coupling should be variable so that "dead spots" might be eliminated by loosening the coupling.

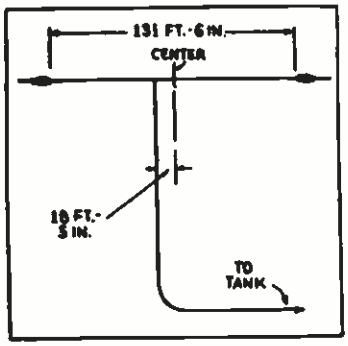


TRANSMITTING ANTENNA

R. Kobayashi, Honolulu, T. H.

(Q.) I recently received your copy of the *Short Wave Guide*. I became immediately interested in the simplest "Ham" transmitter using an 802 tube described in it. However, I will appreciate it very much if you will print in the coming issue on the Question Box page, the type of, and the dimensions if possible, of an antenna system to be operated on the 3.5 mc. band, to go with the above transmitter.

(A.) We have shown data for an antenna which will work very nicely with the 1-tube transmitter described in the *Short Wave Guide*. This is a single wire flat top with a single wire feeder. The dimensions are given in the drawing. The feeder should run at right-angles to the antenna for distance equal to at least ⅓ of the length of the antenna. The total length of the lead-in is not critical.



Antenna

TRANSMITTING ANTENNA

B. J. Morton, Marshall, N.C.

(Q) I would appreciate your answering the following question in your *Question Box* in an early issue: I would like to know the dimensions of an antenna, single wire feed Hertz, using No. 8 solid copper wire. This antenna should operate near 3550 kc. Also give the size of wire to use for a feeder on this antenna.

(A) For all general purposes it has been found that No. 12 or 14 solid copper wire is entirely satisfactory for an antenna both for receiving and transmitting, and it would seem that it would be a waste of money to use a very much heavier wire. A number of formulas have been printed in various publications covering the construction of antennas, and also various methods for calculating the position of the single feeder. However, none for the latter are exact. For instance, the size of the wire, the height and various other conditions require some adjustment of the formula. For 3550 kc. an antenna which would give good results would consist of a single wire 132 feet long with the single feeder tapped 18 feet, 6 inches one side of the center of the antenna. We suggest that various positions for the feeder be tried within a range of 8 or 10 inches either side of the approximate position given. There should be no standing waves on the feeder when the proper point is located. This can be determined by the use of a Neon bulb moved along the feeder for a distance of one-quarter wave. No change in the brilliancy of the bulb will be noticed under perfect conditions. The feeder should also run away from the antenna at right angles for a distance of at least one-third the total length of the antenna.

A Tuned S-W Aerial

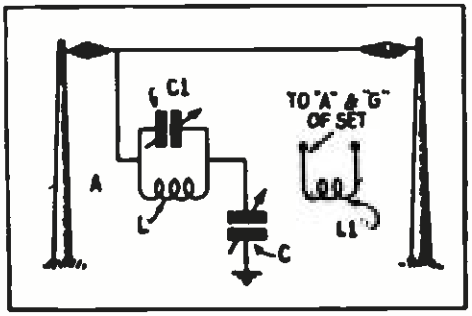
● MUCH has been written about the advantages of using an aerial for short-wave reception which resonates near the band to be received. The signal strengths resulting from such a practice may be many times greater than those received on aperiodic antenna systems.

Obviously, an aerial system which is tuned over a wide range of frequencies would be a vast improvement over most of the aerials which are used for reception by amateur listeners.

Such an aerial was described in a recent issue of *The Australasian Radio World (Sydney)*. It consisted of stranded aerial wire of a length of 75 ft. between points A and B in the accompanying sketch. The ground lead is as short as possible—C1 is 250 mmf.; C is 500 mmf.; L consists of 20 turns of 20 D.C.C. and L1 of 10 turns of 20 D.C.C. wire on a 1 in. diameter form. A space of ¼ inch between coils is needed.

This aerial operates as follows: On the 49 meter band the aerial is used as a Hertzian aerial, tuned by setting condenser C to minimum capacity and tuning to resonance with C1. On the 31 meter band the aerial functions as a ¾-wave Marconi aerial by setting C to half capacity and tuning to resonance with C1.

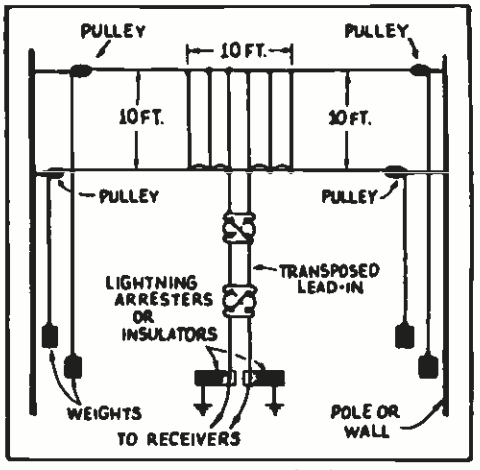
On the 25 meter band the aerial is used also as a ¾-wave Marconi system by setting C1 to minimum and tuning with C. On the 19 meter broadcast band the tuning set-up is the same as for the 25 meter band.



A simple, yet effective tuned short-wave aerial system.

A Noise-Reducing Aerial

● THE aerial shown in the accompanying sketch is taken from a late issue of The *Australasian Radio World (Sydney)*. It is described as a good aerial for thickly populated localities and noisy areas where man-made static is bad.



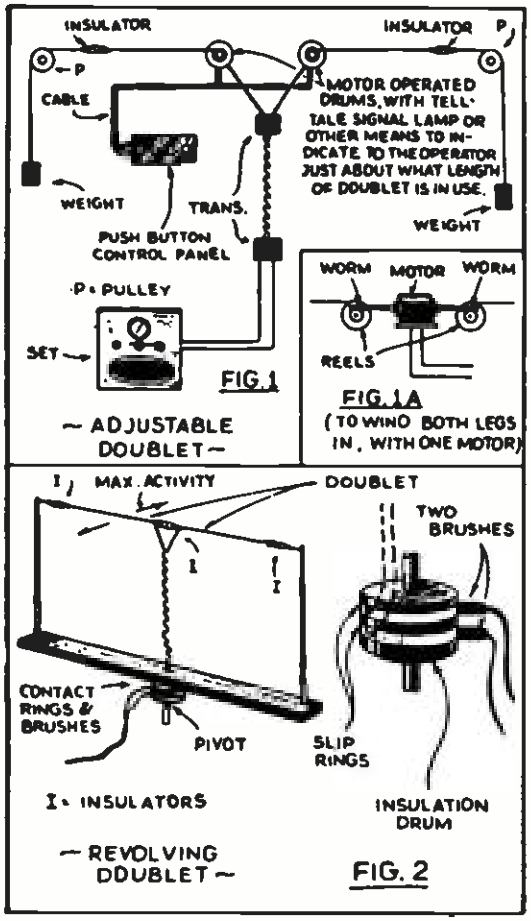
Here's a clever noise-reducing type of aerial and one that should have a very good signal pick-up.

The aerial can be swung between two poles, trees or walls and if the lower end of the grid of wires is kept 15 ft. or more above the ground, the action is undisturbed.

If necessary, the length and number of wires can be increased to suit the space available. Also, as the insulators at top and bottom of the "grid" are slipped on the rope or wire before putting the aerial in place it is advisable to add an extra insulator or two to enable the number of wires to be increased if required.

The transposition blocks should be spaced not less than 2 ft. apart. Should rope be used to support the "grid aerial," it is advisable to use weights as shown. The principal qualities of the system are that it provides an excellent signal-to-noise ratio, far better than that given by the ordinary "L" aerial.

Antenna Hints



Doublet may be tuned to different frequencies by motor-winch, which is shown in Fig. 1. A push-button control may easily be arranged. Fig. 2 shows "revolving" doublet.

Each arm of the doublet in practice is adjusted to one-quarter of the wavelength of the incoming signal or the two halves are made equivalent to the half wavelength. One of the simplest ways of applying the motor-driven winches to an adjustable wavelength doublet, is to use balance weights as shown in Fig. 1. Either solid or stranded wire can be used and as the wire is reeled in, it may be wound on metal drums of either threaded or smooth contour.

The revolving doublet is based on the principle that to receive a distant station the arms of the doublet should be presented *broad-side* to the distant transmitter.

A Clever Way to Tune the Doublet

In Fig. 3 we have an interesting suggestion made by George Shuart, W2AMN, for adjustable wavelength doublet and here the length of the wire in the lead-in sections adjacent to the doublet are made variable.

Another idea which may be employed for adjusting the wavelength response of the doublet, especially those of the "V" type, is to vary the length of the top of the "V" as shown in Fig. 4. As the legs of the "V" are closed up more and more as shown by the dotted lines, the wavelength response of the antenna is decreased.

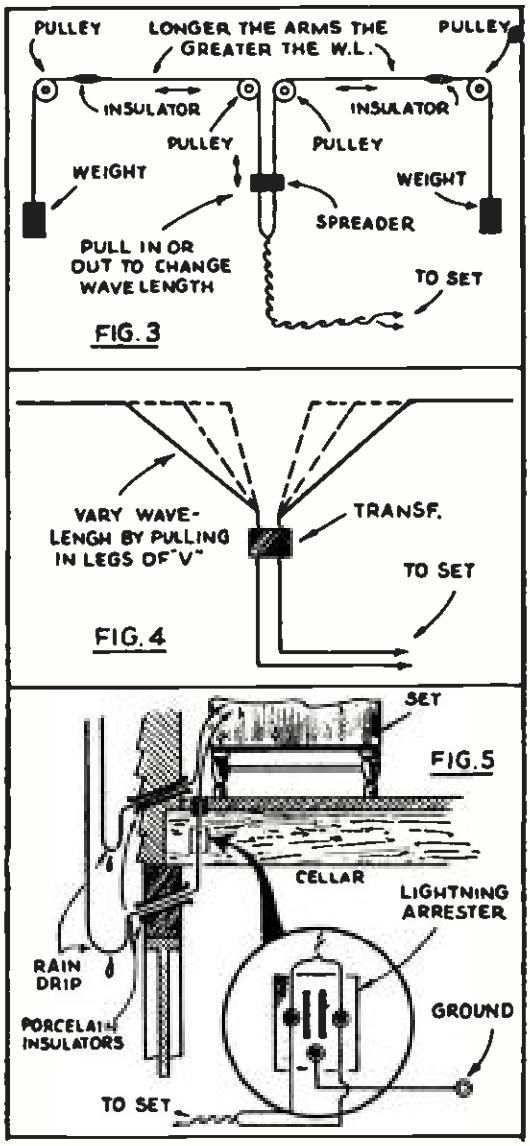
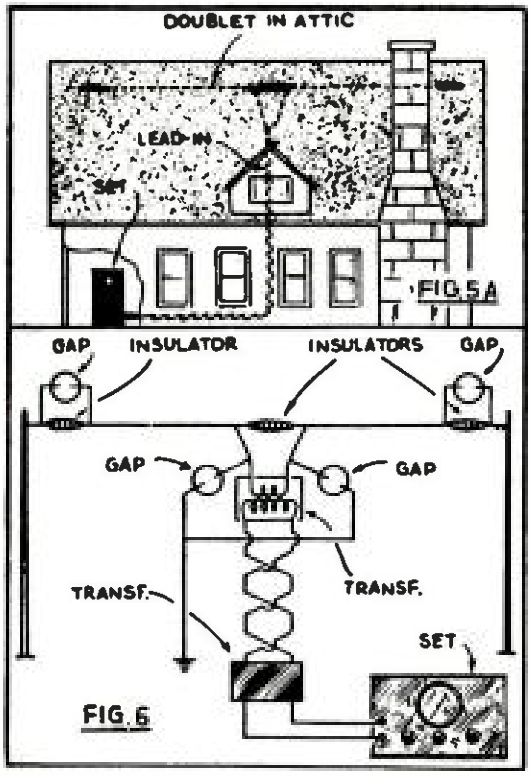


Fig. 3—Adjustable doublet; 4—variable "V" doublet: 5—lead-in detail;



5-A—doublet installed in attic; 6—lightning arrester hook-up.

Connect these lightning arrester gaps across the insulators at the very ends of the doublet, and also across the main lead-in wires *before* they enter the transformer case at the upper end of the twin lead-in section.

Fig. 5 shows one method of bringing in the two wire leadin from the doublet through porcelain tubes at either the first floor level, or just below it into the cellar of the house. The lightning arresters can be mounted on a beam inside the cellar wall or can be placed on the baseboard at the floor level. Some people prefer to place the lightning arresters on the outside of the building; the connection of the arresters to the twin lead-in cable is indicated in Fig. 5. An interesting installation of a doublet in a good size attic is also shown in Fig. 5A.

Fig. 7 shows how a lightning grounding switch may be connected to a *doublet*; gap arresters are also shown connected across the insulators, these arresters being connected to ground wires in each case.

Fig. 8 shows how a relay may be operated with a push-button and battery from inside the house, so as to *ground* the antenna during a thunderstorm or whenever the operator is away from the set.

Improving Reception With Doublet

Fig. 9 shows the connection of the G.E. "V" doublet and those who have complained of poor reception on certain wave bands when using a doublet may take a tip from this connection, and try a ground wire from the nearest water pipe to one terminal post on the set (to which the doublet twin leadin is connected).

Fig. 10 shows an auxiliary aerial connected to the doublet and also a ground connection. In some cases one experimenter found that the signals from Europe, for example, were greatly enhanced (as much as 100 per cent) by connecting the auxiliary aerial and ground (either with a clip or else by means of a relay) once a station had been "picked up" on his doublet. The auxiliary aerial may be a single wire, 50 to 60 feet long, and should point in a different direction from the plane of the doublet.

Fig. 11 shows a simple method for providing a *waterproof* leadin for the twin conductor, such as lamp-cord or light rubber-covered wire frequently used for doublets. The twisted-pair is placed inside of a rubber tube, which will cost but a few cents a foot, and the top of the "leadin" where the wires enter is covered with rubber tape or else rubber cement.

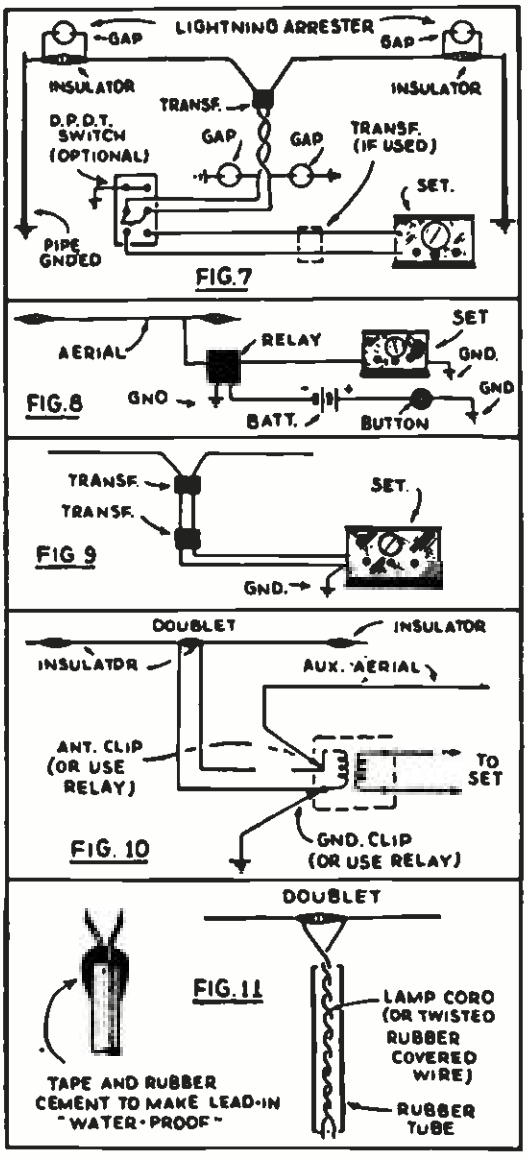
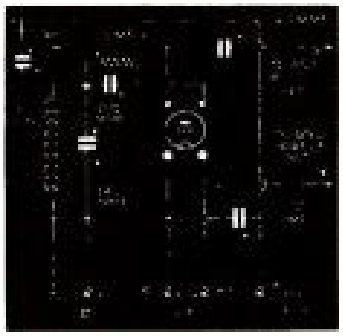
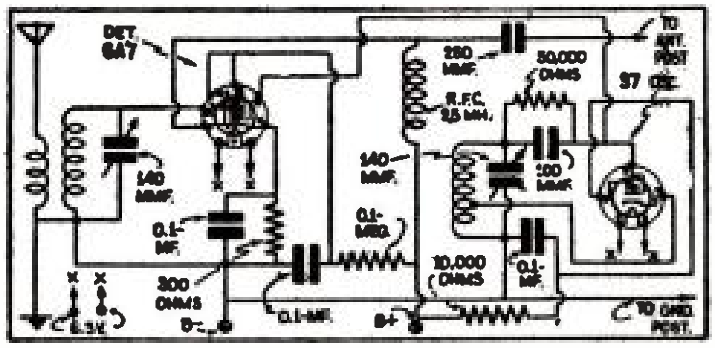


Fig. 7—Lightning "grounding" switch for doublet; 8—relay for "grounding" aerial; 9—"V" doublet connection. Fig. 10—Auxiliary aerial connected to doublet gives greater range in some cases; 11—homemade "waterproof" leadin.

Short-Wave
CONVERTERS





2-Tube Converter With Plug-in Coils

1-TUBE CONVERTER

Floyd Simmon, Oakland, Calif.

(Q) I would like to construct a 1-tube converter using a type 30 tube. I have been told that such an arrangement works out very well.

(A) This 1-tube converter must necessarily be of the autodyne type. While it provides fair sensitivity the same station will be received in two places on the dial and both positions will provide the same signal strength. This is one reason why the 1-tube converter never became very popular.

S-W CONVERTER

Alex Brown, Tacoma, Wash.

(Q) I have an excellent broadcast receiver which does not cover the short-wave bands. Would you be kind enough to publish a diagram and explanation of a *converter* circuit which would give satisfactory results. This should not be too complicated.

(A) The diagram shown is one of a standard converter employing a 57 pentode as the detector and a 56 triode as an oscillator. The two output terminals of the *converter* should be connected to the antenna and ground posts of the receiver as indicated in the diagram. For best results the broadcast receiver should be tuned to a portion of the broadcast band which is comparatively clear of local interference, if such a thing is possible. In other words, do not tune on a strong station. It may be advisable to tune relatively close to one so that, should you desire the effect of a beat oscillator in this receiver, you can tune closer to one side of the station so that it heterodynes the same as a beat oscillator. Of course this method of heterodyning is only useful for code reception, where it is an easy matter to distinguish the voice of the weak broadcast station. We say *weak* broadcast station, because the antenna not being directly connected to the broadcast set, will reduce pick-up at the frequency to which the BC set is tuned.

SHORT WAVE CONVERTER

Edward Russell, Chicago, Ill.

(Q.) I have a few 6 volt tubes such as the 6A7 and 37, and would like to build a converter which would work with my present broadcast receiver. Kindly specify all the values and give the diagram in the *Question Box*.

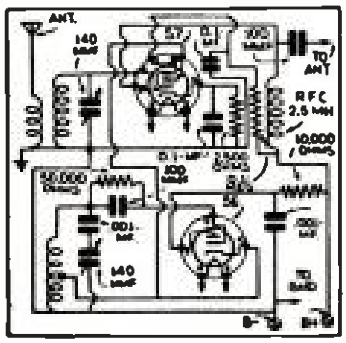
(A.) We have shown a diagram of a simple but very efficient short-wave converter. The 6A7 is employed in the detector section and the 37 as the oscillator. But due to the method of injecting the oscillator voltage, this system works out very well. It is stable in operation and the conversion gain is exceptionally good. We would advise the use of 2 separate controls for tuning, unless you wish to go to the trouble of arranging the coils and *padding* the oscillator circuit for tracking.

BATTERY OPERATED CONVERTER

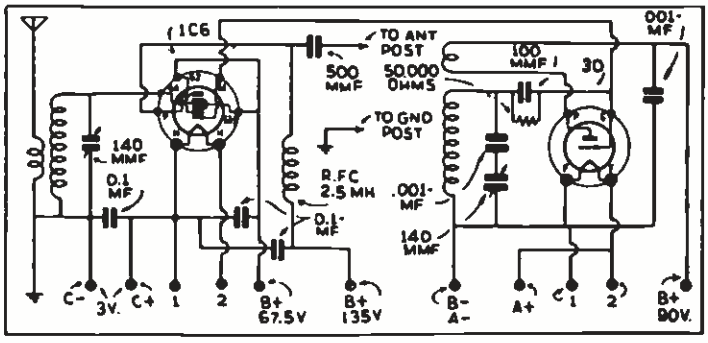
Leo Knight, W. Union, W. Va.

(Q) I have a broadcast receiver to which I would like to attach a short-wave converter employing 2-volt battery type tubes. I would very much like to see the diagram printed in *Short Wave Craft*. Kindly give all details showing connections to the broadcast set.

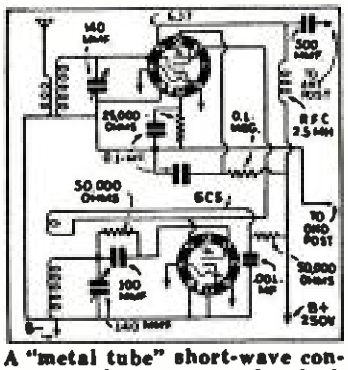
(A) In the diagram we have shown a 1C6 as the detector and a type 30 as the oscillator. This combination makes a very stable and efficient converter system and simplifies the matter of injecting the oscillator voltage into the detector circuit. The diagram also shows how the converter is coupled to the receiver.



S-W Converter



Battery operated converter



A "metal tube" short-wave converter, the output of which may be connected to practically any broadcast receiver.

CONVERTER WITH METAL TUBES

Henry Cordes, Brooklyn, N.Y.

(Q) I would like to construct a short-wave converter for my superhet. Would you please show a diagram of one using metal tubes with standard 4-prong coils and 14-mmf. tuning condensers?

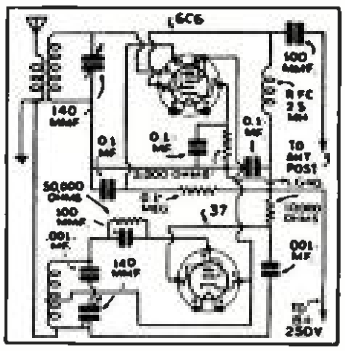
(A) The converter diagram consisting of a 6J7 first detector and a 6C5 oscillator is shown. If glass tubes are used, the 6J7 should be replaced with a 57 or a 6C6, and the 6C5 with a 76 or a 56. The two output terminals are connected to the antenna and ground posts of the receiver.

SHORT-WAVE CONVERTER

George Meyer, Whitefish, Wis.

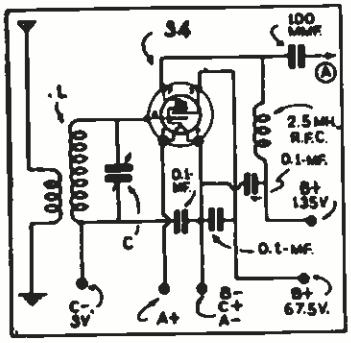
(Q) I have a broadcast receiver to which I would like to attach a short-wave converter using two tubes. These should be a 6C6 and a 37. Would you please print the necessary diagram?

(A) This converter may be attached to any broadcast receiver having a fairly good sensitivity. A 6C6 is used as the first detector or mixer tube and a 37 as the high frequency oscillator. The output of the converter should be connected to the antenna and ground posts of the broadcast set.



Converter diagram.

Pre-Amplifiers



1-TUBE BOOSTER

Charles Sanford, Troy, N. H.

(Q.) I am a constant reader of your Question Box and would like to have you print a diagram of an R.F. stage which can be added to my 8-tube battery operated receiver, in order that the radiated squealing of this receiver may be eliminated as other sets in the neighborhood are affected.

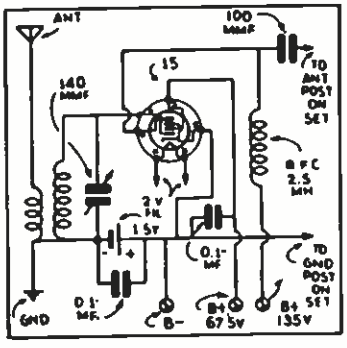
(A.) The complete diagram of the R.F. stage is shown. Connection (A) should go to the antenna post of your present receiver. Since you are probably using a common set of B batteries for the two units, the ground connection will automatically be made. However, if an antenna coil is employed in your receiver, the binding post marked "ground" should be connected to the B negative terminal of the receiver if such a connection does not already exist. The coil "L" and condenser "C" should have the same dimension as in your present receiver.

SIMPLE BOOSTER

Roman Weza, Sobieski, Wisc.

(Q) Will you please print a diagram of a simple booster which appeared in the August 34 issue of *Short Wave Craft*, but for battery operation.

(A) We have shown the diagram you requested and have employed the type 15-tube. This should give excellent results when used in conjunction with a short-wave receiver. Standard 4-prong coils, data for which can be found in the February 1937 *Question Box*.



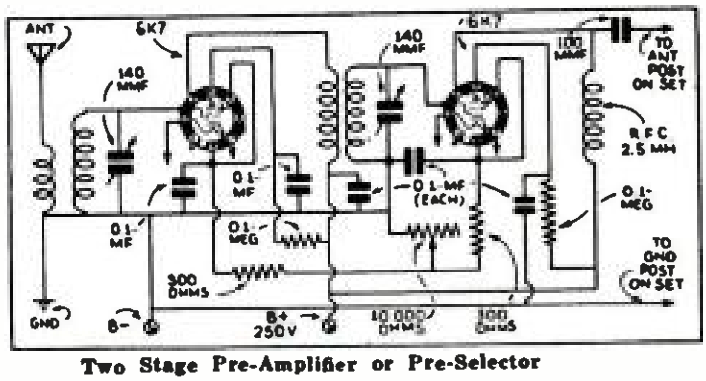
1-Tube Booster

2-STAGE BOOSTER

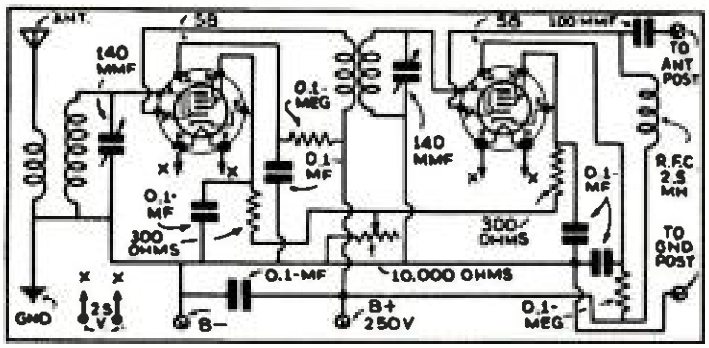
James R. Love, Harrisburg, Pa.

(Q) I have an *All-Star Senior* receiver which has given excellent results, however, I would like to add a 2-stage pre-selector employing 6K7 tubes. Kindly show the diagram in the *Question Box* giving all values and coil data together with information as to how it may be connected to my receiver. Also what advantage and improvements will I experience with this addition?

(A) We have shown the diagram as you requested. Standard 4-prong plug-in coils are employed, data of which has been given in the February Question Box. The two output terminals marked *antenna-ground* position connect to the antenna and ground positions of the receiver. The antenna and ground will then be connected to the front of the converter as shown in the diagram. These two stage boosters should increase the sensitivity of your receiver considerably, also it should eliminate or nearly so, the images which you are bound to experience where no pre-selection is employed. All in all, we believe it would be a worth-while improvement.



Two Stage Pre-Amplifier or Pre-Selector



2-Tube Pre-Selector

2-STAGE PRE-SELECTOR

Merrill Weller, Reading, Pa.

(Q) I would like to construct a pre-amplifier or a pre-selector, using two type 58 tubes. I would like to know if this would improve the selectivity of my receiver; also show the various voltages required.

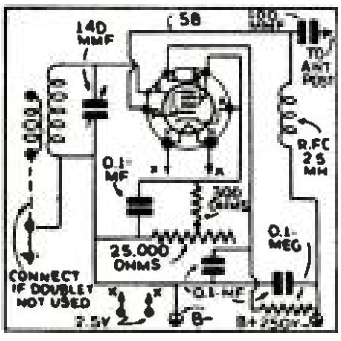
(A) We have shown a diagram of two 58's employing 4 prong coils with 2 windings on each coil. The various voltages required are also shown. A pre-selector of this type when connected in front of a super-heterodyne will increase the sensitivity tremendously, and if you are troubled with images, these will also be greatly reduced if not entirely eliminated. However the actual selectivity will apparently remain unchanged, that is if you are listening in on the 49 meter band, you will experience nearly as much interference as before, providing this interference was not due to images. We do not believe you will benefit by connecting a two-stage amplifier of this type to the regular regenerative detector.

58 R.F. AMPLIFIER

E. C. Pritchard, Birmingham, Ala.

(Q) Would you please publish in the "Question Box" a diagram of a radio frequency amplifier employing a 58 tube and standard 2-winding coils tuned with a 140 mmf. condenser? Also indicate how this amplifier may be connected to the power supply of my present receiver.

(A) The diagram requested is shown. The B plus and B minus connect to the power supply B plus and B minus terminals and the 2½-volt connections go to the filament circuit. Connections are shown for either a doublet or Marconi type antenna system.



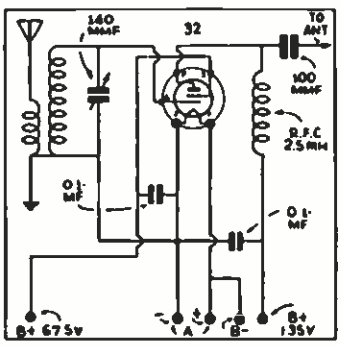
R.F. amplifier diagram

ADDING R.F. STAGE

Ira Mayfield, Baton Rouge, La.

(Q) I've been using a 3-tube receiver which employs two 76's and one 80. I would appreciate it very much if you could publish a diagram showing how an R.F. amplifier could be added in order to improve the selectivity and sensitivity.

(A) We are showing the diagram of the two 76's to which has been added a 6D6 R.F. amplifier. This will improve the sensitivity considerably but the apparent selectivity will remain unchanged.



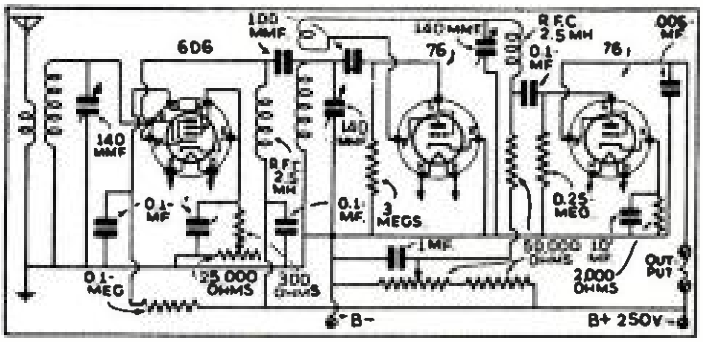
R.F. Amplifier

R.F. AMPLIFIER

B. Hillin, Ontario, Canada

(Q) I have just finished constructional work on the "12,500 mile" receiver and I would like to add a stage of tuned R.F. to it. Will you please print the diagram in the *Question Box*. This, of course, should use a 2-volt tube.

(A) The 1-stage of tuned R.F. added to the usual 2-tube battery receiver will improve results considerably. Not only will it provide a smoother control of regeneration, due to isolation of the antenna, but the R.F. gain will be greater, and especially beneficial on the weaker stations.



T.R.F., Det., and 1 stage A.F.

REDUCING VOLTAGE

W. M. Warren, Wichita, Kansas.

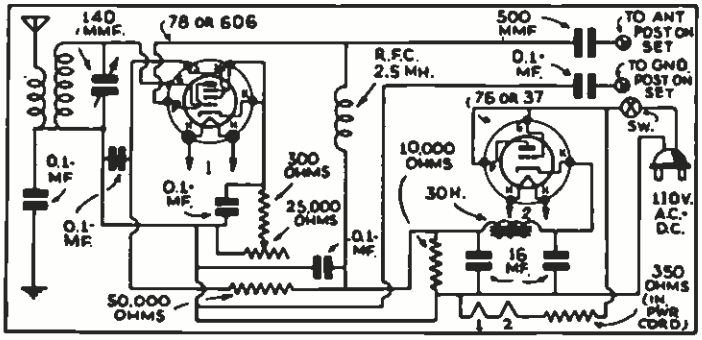
(Q) I have a 600 volt power supply and would like to reduce it to 400 volts in order to operate 53's in class B.

(A) If you wish to sacrifice the filament windings on this transformer you may use a small step-down transformer ahead of a 600 volt transformer. However, it would be more economical to obtain another 250 volt transformer. Any resistance unit used to reduce the voltage will give very poor regulation.

R.F. BOOSTER

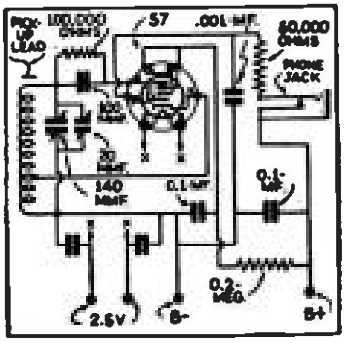
Roman Weza, Sobieski, Wis.

(A) We have shown the diagram of a self-powered R.F. "Booster" or pre-selector which may be added to any receiver. This is well worthwhile, especially on the smaller sets of the super-heterodyne variety which do not employ sufficient pre-selection.



An R.F. booster stage employing a 78 and a 76, or equivalent tubes, with plate-supply filter.

MISCELLANEOUS



Monitor

MONITOR FREQUENCY METER

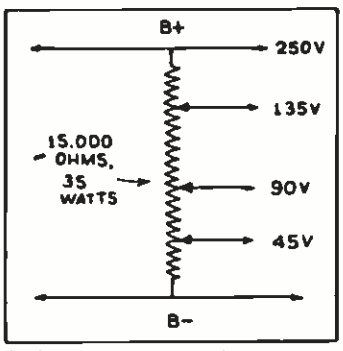
Richard Atkins, Capetown, So. Africa.

(Q.) I am completing new equipment for the transmitting station and would like to have a diagram of the most efficient yet simple combination frequency meter and monitor.

(A.) We find the diagram a 57 electron-coupled oscillator. The size of the coils will depend upon the particular band on which it is to operate. This instrument should be built in an entirely shielded cabinet or box and the power-supply leads should also be shielded in order to prevent too much pick-up. If external pick-up is needed a short piece of wire is used and one end should be placed reasonably close to the grid lead on the coil and the other end extending outside the shielded box for a distance of several inches.

POWER SUPPLY PROBLEM

(A) We presume that your power supply already has a bleeder resistor but it is not used as a voltage divider. What is required is a resistor with various taps on it such as illustrated in the diagram. This is known as a voltage divider and also serves as a bleeder. It may be found necessary in some cases to by-pass each tap on the voltage divider with a .1 mf. condenser. Remove the present resistor from the power supply.



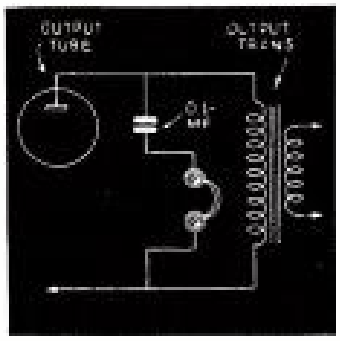
Voltage divider system

CONNECTING EARPHONES TO COMMERCIAL ALL-WAVE RECEIVERS

Gerald Grandmaison, Salem, Mass.

(Q) I have a commercial all-wave receiver and would like to know if there is any simple method by which I may connect earphones to it. If so, will you be kind enough to print the diagram in the *"Question Box?"*

(A) We are showing a diagram of one method of connecting earphones to the output amplifier of any receiver. Merely connect a .1 mf. condenser in series with a pair of earphones. Then one side of the condenser is connected to the plate of the output tube and the other connection of the earphone to the B plus or B negative. It is advisable to use a high voltage condenser, something having a working voltage of from 600 to 1,000 volts, in order that no damage will be done to the earphones due to break down of the condenser.



Connecting earphones to output tube.

HOW TO GET VERIS

Ray Ward, Chicago, Ill.

(Q) Would you please tell me how I may obtain verification cards

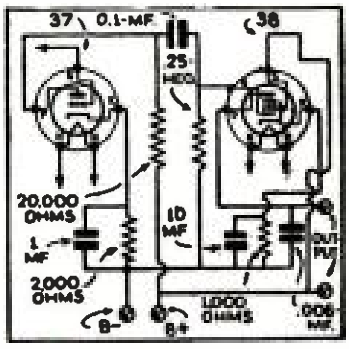
(A) Many of our readers have expressed the desire to obtain information regarding requests for veris. It is a very simple procedure. Merely make note of the time, date, and character of the program received, together with any other information which you feel may be of interest to the operators of the station, and send this to them accompanied by an *International Postal Reply Coupon.* Of course, there are a few stations which do not issue verification cards.

NOISE-SUPPRESSOR FOR RESISTANCE-COUPLED SUPER

Joseph Wittier, Dallas, Tex.

(Q.) I have been using a resistance-coupled type superheterodyne for 5 and 10 meter operation, and would like to know why no one has ever attempted to incorporate a noise-silencer in such a receiver.

(A.) It most certainly is possible for we have been using a noise-silencer in a resistance-coupled superhet at station W2AMN for almost a year. The diagram is shown. It may be necessary to add another stage of audio amplification, if you desire the same output-level as with the usual triode second-detector. The signal-level drops considerably with the diode second detector. However, the sensitivity of the receiver remains the same. The noise-silencer does not work quite as effectively in the resistance-coupled superhet as in other types, but it does reduce the auto ignition interference at least 95%, which is a most remarkable improvement, we must admit.



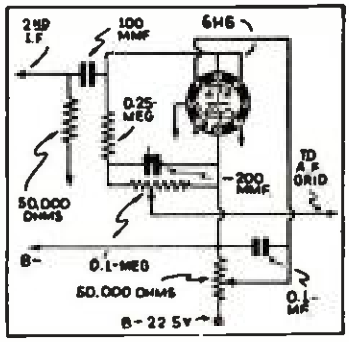
Amplifier

38 A.F. AMPLIFIER

Reginald Pearson, Welland, Ont., Can.

(Q) I would appreciate an answer to the following question in one of your coming issues of the Question Box. I am using at present, a T.R.F. receiver with the following line-up, 6D6, 6C6 and 37 Audio amplifier. I have a 38 tube and would like to have you print a diagram showing how this can be connected to my receiver in order to operate a speaker.

(A) We have shown the connections for the 38 amplifier. This is resistance-coupled to the 37 amplifier of the receiver.



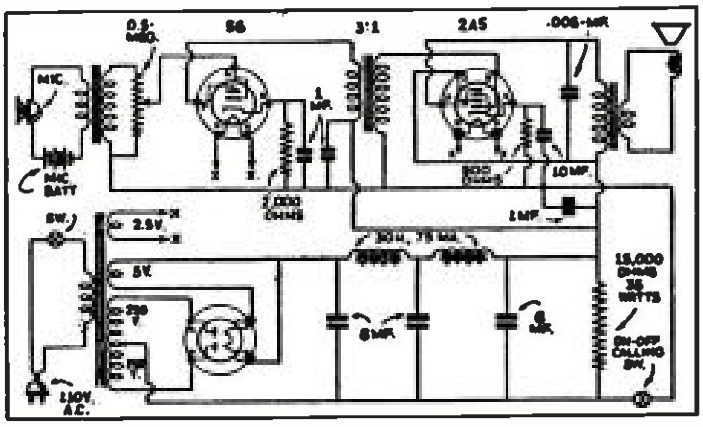
Noise Silencer for Resistance-Coupled Superhet

P. A. CALLING SYSTEM

Richard Sweeney, San Leando, Calif.

(Q) I would like to construct an amplifier system which can be used in an office for calling various members of the staff to the telephone. I would like to use two tubes and a rectifier, if necessary. I intend operating this from 110 volts A.C. and want to use a single-button microphone.

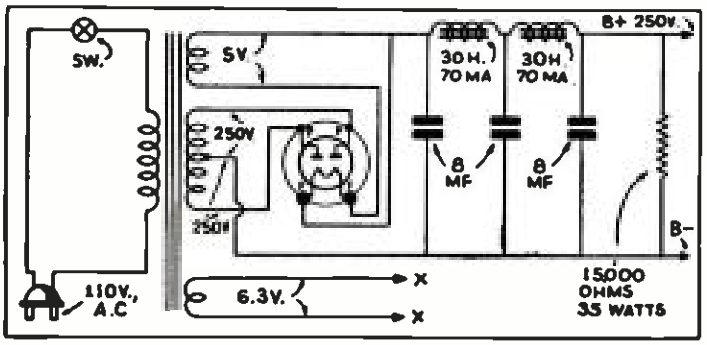
(A) The diagram published uses a 56 and a 2A5 with an 80 in the power supply. Sufficient volume should be obtained to operate a dynamic speaker. A volume control is also incorporated in the first stage of amplification in order that the amplifier may be adjusted to the desired *level*. In the B negative circuit we have incorporated an *on-and-off* switch which is independent of the primary switch. This B negative switch is used for putting the amplifier into operation.



Inter-office calling system.

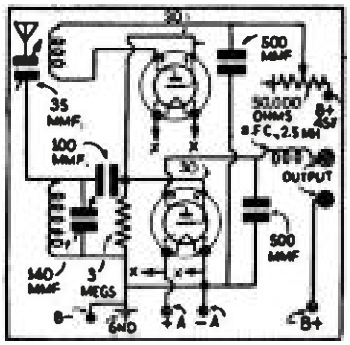
SEPARATE REGENERATION TUBE

John C. Wilson, Ontario, Canada.



A good Power-Supply for your short-wave set.

(A.) We have shown the diagram of the 2 type 30 tubes one employed as a detector and the other as a separate regeneration tube. The two grids are connected in parallel, however, the tickler is connected in the plate circuit of the regeneration tube, while the audio output is taken from the plate circuit of the detector tube only.



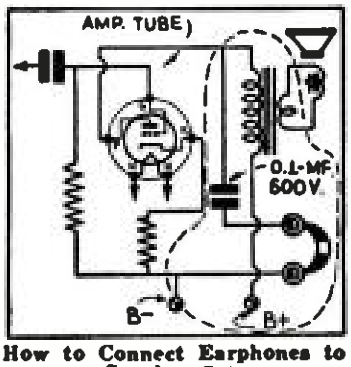
Separate Regeneration Tube

CONNECTING EAR-PHONES AND SPEAKER

J.P.A., Terre Haute, Ind.

(Q) Please print in your *Question Box* as soon as possible, a phone adapter which permits use of headphones on a speaker set. It is to be used on a 1929 Crosley "Showbox-8."

(A) Connecting phones to a commercial receiver intended for speaker operation is not at all difficult. In the diagram you will find that the phones connected in series with a .1 mf. condenser are connected between the plate of the tube and the "B" minus. If there is a first audio stage in the receiver, it is advisable to connect the phones in the plate circuit of that tube, rather than the output tube. In either case, the same procedure,



How to Connect Earphones to Speaker Set.

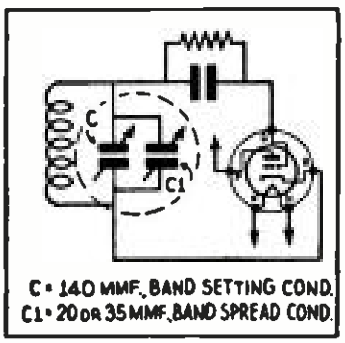
as indicated in the diagram, should be followed. In the case of the first A.F. amplifier where the transformer is not used, the phones will be connected across the plate resistor.

ELECTRICAL BAND-SPREAD

R. James Roby, Portland, Ore.

(Q) I would like to know how to install band-spread tuning in the "Louis Martin" short-wave receiver described in your manual "10 Most Popular Short-Wave Receivers" and also in the Sept. 1932 issue of *Short Wave Craft*. I am going to build the set and want to have band-spread *electrical* instead of mechanical. Please answer in your *Question Box* as soon as possible.

(A) It is a very simple matter to incorporate band-spread in any of the smaller receivers, either of the tuned R.F. or superheterodyne variety. The diagram clearly shows how a smaller condenser is connected in parallel with the present tuning condenser. The larger condenser will be used for *band-setting* and the smaller one for *band-spreading*.



How to Obtain Band-Spread

POWER-SUPPLY

R. W. Dourley, Richmond, Va.

(Q) I would like to build a power-supply delivering 250 volts for the plates of my receiver and 6.3 volts for the heater. Would you please print the diagram?

(A) The power-supply diagram shown can be used with any type of receiver. We recommend that any one purchasing a transformer for this power-supply obtain one with a 2.5-volt winding as well.

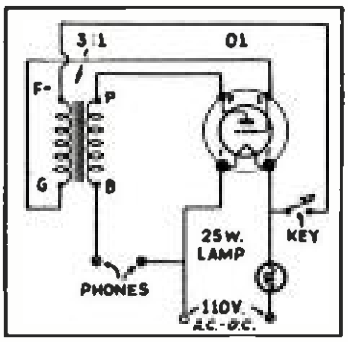
REGENERATION CONTROL GETS HOT

John Stadnick, Los Angeles, Calif.

(A) Undoubtedly, you have entirely too much current flowing through the regeneration control. Potentiometers are usually employed and one terminal of the potentiometer is connected to the B negative; the central terminal to the screen-grid of the detector stage; the other terminal of the potentiometer should be connected to a 100,000-ohm resistor, which, in turn is connected to the "B" plus. If you have a 50,000 ohm potentiometer, then the current flowing through it will be low enough to do no harm.

ALL-ELECTRIC CODE OSCILLATOR

Building the "code practice" oscillator has always been quite a problem. The one illustrated in the diagram operates from either A.C. or D.C., 110 volts. It is of the self-rectifying type and of course the note will be modulated by the A.C. Of course, approximately 110 volts will be applied to the plate of the tube and the filament of the 201A receives its power through the 25-watt lamp, which serves as a potential dropping resistor. This is a simple arrangement which can be operated any place where the line voltage is available. No batteries have to be renewed.—Ed. Toogood.



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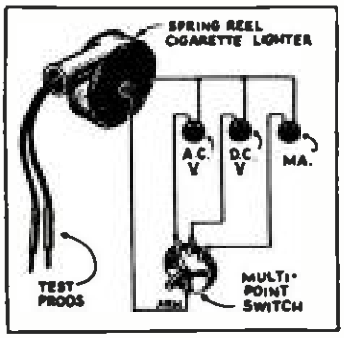
HANDY TESTER KINK

Having difficulty in finding a place for the "test leads" on my home-made tester, I struck upon the following idea: A spring-reel cigarette-lighter was remodeled and connected, as shown in the drawing. When the test leads are no longer in use, simply release them and they will wind up automatically in the spring-reel.—W. L. Irwin.



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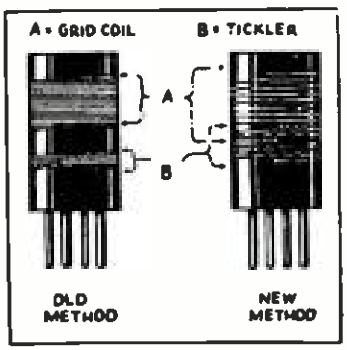
COIL WINDING SUGGESTION

Many times builders of short-wave receivers who wind their own coils have been unable to make the set oscillate around frequencies between 14 and 20 Megacycles. The writer overcame this trouble by threading a portion of the tickler winding into the B negative side of the grid coil. The drawing will convey the idea more clearly. With this arrangement, there was absolutely no trouble in obtaining regeneration or oscillation at the very high frequencies. —Carl Smeths.

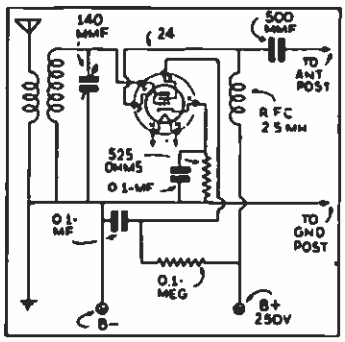


AMPLIFIER USING 24

James Kaylor, Badin, N.C.

(Q) Kindly publish a diagram in the *Question Box* showing a 24 as an untuned R.F. amplifier. Also, what makes a set squeal loudly when the regeneration control is advanced too far?

(A) We have shown a diagram of a 24 in a tuned R.F. stage. Adding an untuned R.F. stage to your receiver would be of little benefit. We recommend the tuned stage as shown. The untuned stage would consist of a 2.5 m.h. choke in place of the grid coil and grid condenser. The antenna should be coupled directly to the grid of the two through a small variable condenser. Regarding the squeal, we believe this is due to the detector breaking into super-regeneration with the quenching frequency within the audible range. This would indicate that your tickler was entirely too large. We suggest that you decrease the number of turns until the proper results are obtained.



A radio frequency amplifier stage using a 24 type tube, is shown in the diagram above.

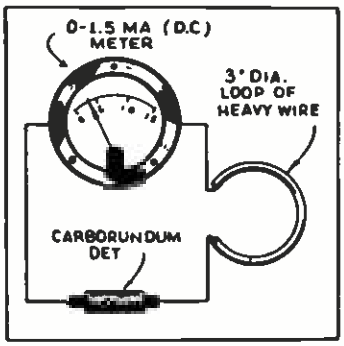
CANNOT UNDERSTAND DIAGRAM

J. A. Lawrence, Winnipeg, Man., Canada

(Q) In one of your *Question Box* diagrams I see that you have a 45-volt connection to the earphones on the plus side only, and the negative goes to the ground and filament of the tube. I would like to know how anything can come through this set without being bucked out by the positive voltage in the phones. Also, I cannot see any negative return to the battery.

(A) The battery circuit you refer to can easily be traced by starting with the battery at the B negative connection, going through the filament of the tube, then through the tube to the plate via the electron stream and from the plate back through the earphones to the B plus. These are the proper connections and there would be no danger of the plate current of the tube affecting reception, in so far as the earphones are concerned. There is nothing wrong with the diagram we assure you.

Even if there was a heavy current in the phones, the signals would not be effected, even though it might shorten the life of the phones.



R.F. pickup meter

TUNING INDICATOR FOR XMITTER

John Richardson, Kansas City, Mo.

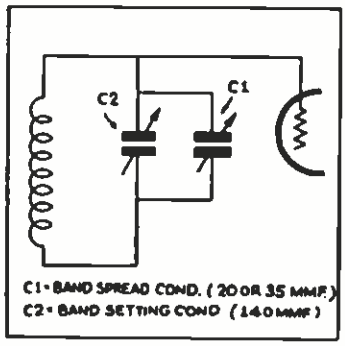
(Q) Many times I have heard about using a crystal detector on a milliameter as an aid in tuning and neutralizing transmitters. Will you be kind enough to illustrate in your Question Box just how this is accomplished?

(A) The diagram shows that the 0 to 1.5 ma. meter is connected in series with a 3 inch loop of wire and a carborundum detector. Merely couple the loop to the coil in the transmitter which you desire to analyze. Care should be taken not to have the coupling too close, otherwise it is possible for the meter to burn out. A device of this kind is exceptionally valuable when neutralizing various amplifier stages of a transmitter.

BAND-SPREAD

L. W. Parrish, Scranton, Pa.

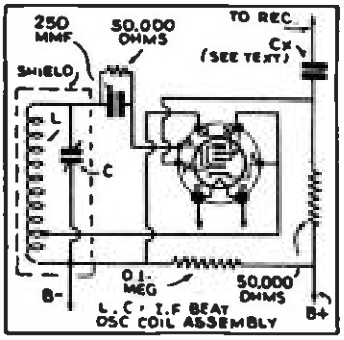
(Q) Please advise me in the *Question Box* if band-spread can be used in the *Space Explorer 6*. Also, if I add the capacities which you specify, will I have to make any alterations in the plug-in coils?



Band-spreading.

(A) We have shown how band-spread may be employed in the *Space Explorer* receiver. This system may be employed in any short-wave receiver of the type mentioned. The plan is simple enough, a small condenser is used for tuning, while a large condenser is employed for setting the particular band you wish to tune, within the range of the smaller condenser. No alterations will be necessary in the plug-in coils when employing this system.

BEAT OSCILLATORS



I.F. beat oscillator for superhets

I. F. BEAT OSCILLATOR

Harry Scott, Dallas, Texas.

(Q) I have a superheterodyne receiver which does not employ a beat oscillator. As such an accessory makes it considerably easier to locate stations and also permits CW reception, I would like to add it to this set. Will you please print a diagram showing the necessary parts?

(A) The diagram of a beat oscillator using a standard coil and condenser assembly is illustrated. The condenser CX depends upon the type of coupling used between the oscillator and the set. If the output of the oscillator is loosely coupled to the grid of either the second detector or the last I.F. stage, then condenser CX should have a capacity of about 100 mmf., and the insulated lead from it should be placed in the vicinity of the grid connected to the tube. By adjusting this spacing between the grid and the coupling wire, proper results will be obtained.

S. D. Terry, Jr., Grand Saline, Texas.

(Q) I have constructed several short-wave receivers and have trouble with motor-boating in the audio amplifier. Will you please tell me how to overcome this?

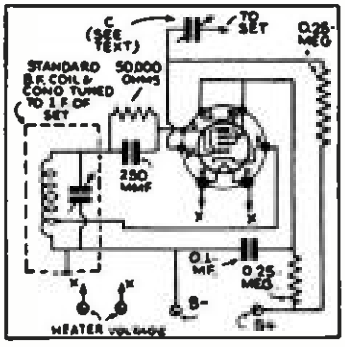
(A) Quite a few of our readers have written to us regarding the same subject. In the diagram we have shown a triode and pentode which is the usual tube combination of the audio system in the average short-wave receiver. Isolating resistor and by-pass condensers which may be used to overcome this difficulty are clearly shown. In all cases it is not necessary to employ the method illustrated in the diagram, but in some cases where a poor layout or crowding is present resort to the above methods may be necessary.

BEAT OSCILLATOR

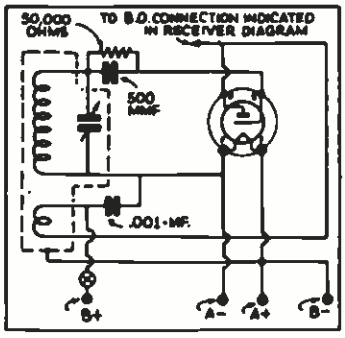
Ralph I. Hansen, So. Omaha, Nebr.

(Q) I would greatly appreciate it if you would publish a diagram of a beat frequency oscillator to be used with the Mitchell Superhet., described in the December, 1933 issue of *Short Wave Craft*. Thanks.

(A) The beat oscillator diagram shown employs a standard beat frequency oscillator coil and condenser combination. This is available from any radio supply house. These have the same appearance as an ordinary I.F. transformer. This oscillator may be coupled to any receiver of the superheterodyne variety. Condenser "C" in the diagram may be a two plate midget condenser or may consist of the capacity due to wrapping an insulated wire around the plate lead to the tube. The lead is then merely placed near the grid lead of the last I.F. amplifier in the receiver.



Beat oscillator for superhets.



Beat Oscillator

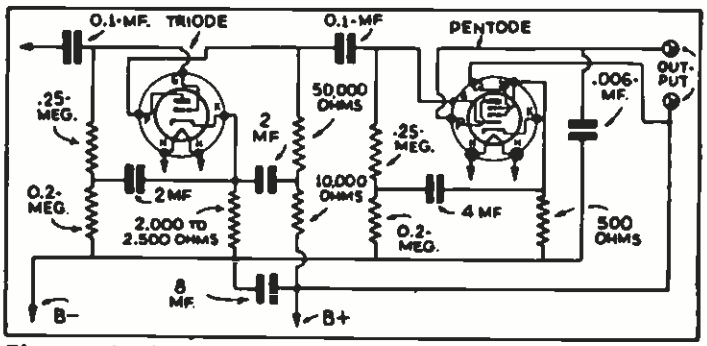
BEAT OSCILLATOR FOR BATTERY TYPE SUPER

A. A. Pinero, Buenos Aires, Argentina.

(Q.) In your December issue for 1936, page 470, there appeared a two-volt Super DX-4, which is a splendid receiver. However, I would like to add a beat oscillator to this receiver. The lead which goes to the beat oscillator is indicated in the diagram.

(A.) The beat oscillator diagram is shown. The connection from the plate of the type 30 oscillator goes to the lead indicated in the original diagram. A conventional beat oscillator transformer is used and is indicated by the dotted lines. This should respond to the same frequency as the I.F. transformers used in the receiver. A switch is located in the "B" lead for turning on and off the oscillator.

AMPLIFIER "MOTOR-BOATS"



The circuit above shows by-pass condensers and isolating resistors as employed for improving a circuit which "motor boats."

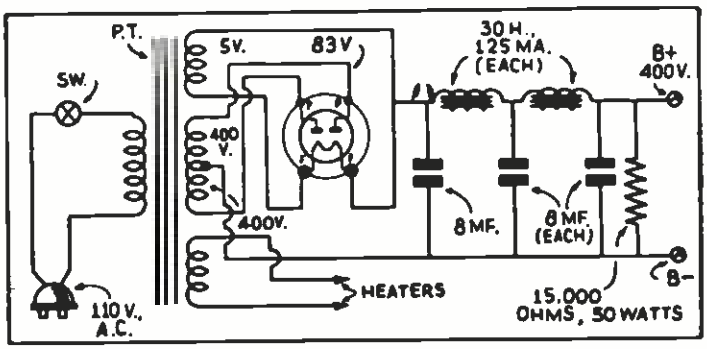
POWER SUPPLIES

400 VOLT POWER-SUPPLY

Firman Lopez, San Francisco, Calif.

(Q.) I have a 400 volt 100 ma. power transformer which I would like to incorporate in a power-supply. Will you kindly print the necessary diagram together with the data as to the ratings of the other parts. This power-supply should be capable of delivering pure D.C.

(A.) We have shown the power-supply diagram which makes use of the 400 volt transformer which you have. Two 30-henry filter chokes and three 8 mf. electrolytic condensers are used in the filter portion and should result in a hum-free power-supply. We suggest that you use good electrolytic condensers, such as the wet 500-volt variety. If the input condenser, that is, the one nearest to the 83V rectifier tube sparks over, evidenced by a crackling or buzzing sound, we suggest that you connect another one of similar value in series with it. We have put no value on the heater or filament winding. This depends upon the particular type of transformer employed.

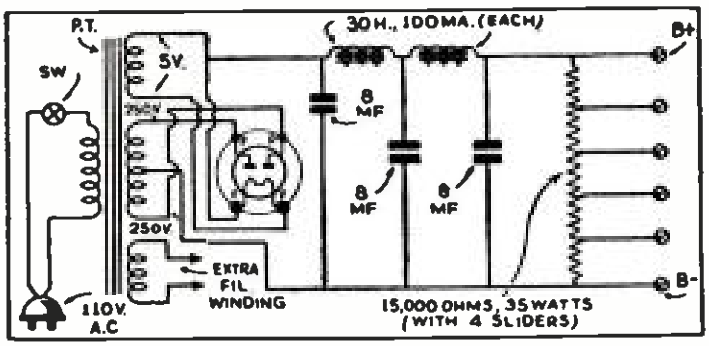


400 Volt Power Supply

CONVERTING TERMS

Homer Hartley, Morgantown, W. Va.

(A) One megohm is a million ohms; .5 megohm will naturally be ½ million. The number being too large to write, it is designated as a decimal or part of a megohm. 1/10th megohm is 100,000 ohms, etc. If we had a condenser value indicated as 100 mmf. we merely place a decimal six places to the left of this number. We would then have a .000100 or .0001 mf. Zeros to the right of the number are, of course, of no consequence. The reverse procedure is followed in converting the decimal back into a whole number. Moving the decimal six places to the right we again have 100 mmf.



Power Supply Diagram for S-W Receivers

POWER SUPPLY FOR S.G.3 TRANSMITTER

John Walsh, Oak Lane, Phila., Penn.

(Q) I would like to have you print the diagram of a power-supply which could be used with the "S.G. 3" Transmitter

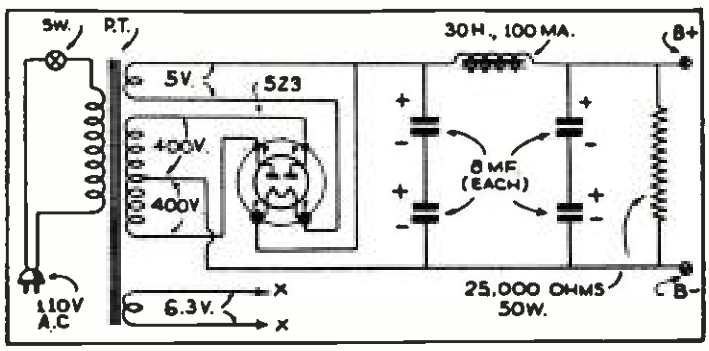
(A) We have shown a diagram of a power-supply suitable for the "S.G. 3" Transmitter and any reliable radio parts house can furnish a satisfactory transformer. With condenser input in the filter, the transformer should be rated at about 400 volts and be capable of supplying around 200 milliamperes.

POWER SUPPLY DIAGRAM

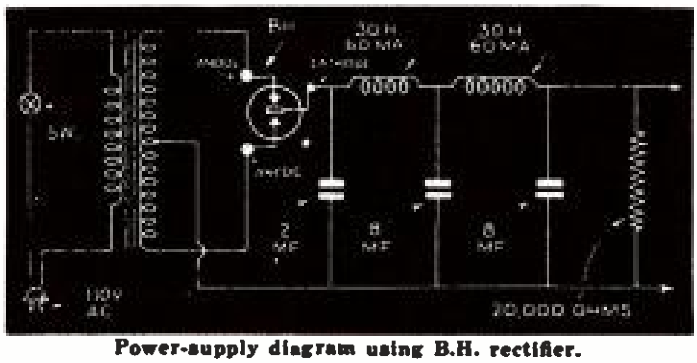
L. E. Sandidge, Jr., Pocahontas, Miss.

(Q) I intend to construct a power supply which will operate on 110 volts, 60 cycle A.C. The output voltages should be as follows; 45, 90, 135, 180, 250 volts. Would you be kind enough to print the diagram in a coming issue of the Question Box?

(A) In the diagram shown we have indicated a 15,000 ohm, 35 watt voltage divider with 4 sliders. These 4 sliding contactors should be adjusted with the aid of a D.C. voltmeter in order to obtain proper output voltages. The rectifier tube shown is an 83V, although an 80 may be used satisfactorily.



Power supply for the SG-3 transmitter.



Power-supply diagram using B.H. rectifier.

POWER SUPPLY WITH BH RECTIFIER

Carl Charles, Merriam, Kans.

(Q) I have a type BH rectifier tube and would appreciate it if you would publish a diagram for it when used in a power-supply.

(A) A diagram for the BH rectifier is shown. The BH tube is one of the gaseous type, not requiring a filament. Therefore, the transformer need not have the usual 5-volt filament winding. If it has, this winding may be used for some other purpose.

POWER SUPPLY DIAGRAM

John Loughlin, San Francisco, Cal.

(Q) Would you please print a diagram for a power supply in your *Question Box*. It must supply a "B" voltage of 250 volts; filament voltage of 1.5 volts, 3 volts, 4.5 volts, and 6 volts. Also, it should use a type 80 tube.

(A) We have shown the diagram of the power supply. However, we have only indicated a single 2½-volt winding. The odd voltages you require, such as 3, 4.5, and 6, we do not believe are readily obtainable on standard manufactured transformers. We suggest that you get in touch with transformer manufacturers.

POWER SUPPLY QUERY

Daniel Murray, New Rochelle, N.Y.

(Q) In one of the diagrams in a past issue of the *Question Box* I see that you have a 250-volt transformer and the output of the power-pack is also rated at 250 volts. No allowance seems to have been made for a voltage drop in the chokes, which I presume would have a resistance of around 400 ohms. Would this not reduce the output voltage?

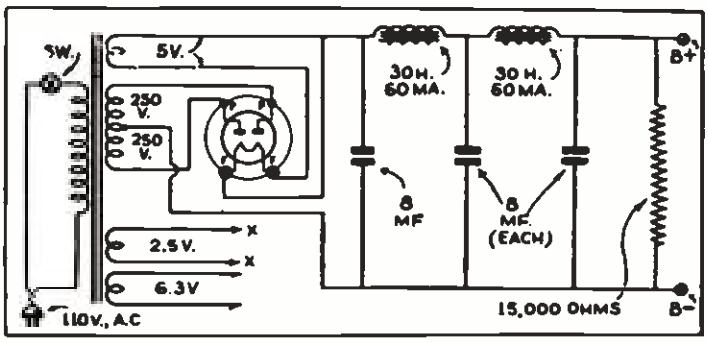
(A) Offhand, it may seem peculiar that the output of the power-pack is designated as 250 volts with a 250-volt transformer, but remember, we have *condenser-input* which boosts the voltage considerably above 250. The two chokes do provide a voltage drop but even this is not sufficient to drop the voltage below 250. In fact, the voltage under operating conditions may be greater than 250 volts. For instance, as a specific example, a transformer having around 550 volts output, when fed through a rectifier and a condenser input filter delivered 600 volts with a 200 ma. load. The voltage of course without the 200 ma. load was well over 700.

POWER SUPPLY DIAGRAM

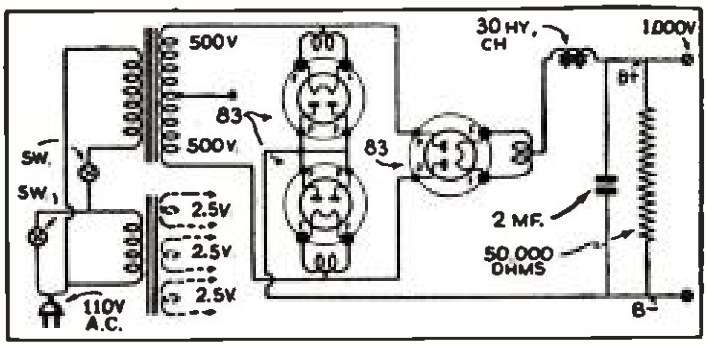
Walter H. Burden, Chicago, Ill.

(Q) I have constructed several simple receivers described in past issues of *Short Wave Craft*, and would like to build a power-supply to operate them. Would you be kind enough to print the necessary diagram?

(A) We have printed the diagram you request, and we might add that if you have not already purchased a power transformer, you endeavor to obtain one having both 2.5 and 6.3 volt filament windings, because this will permit the use of either type tubes.



Power supply diagram for any S-W receiver.



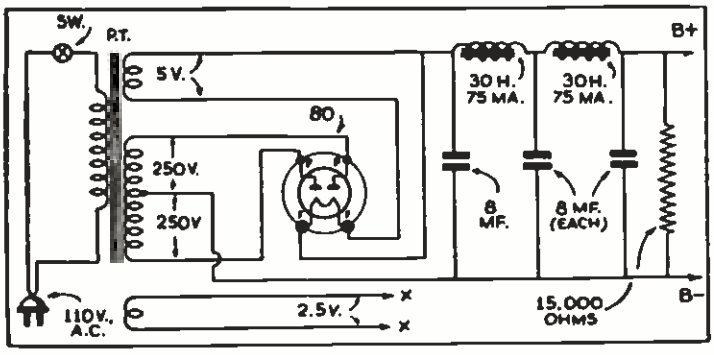
High Voltage Bridge Rectifier

BRIDGE RECTIFIER

Alvin Nichols, Pawtucket, R. I.

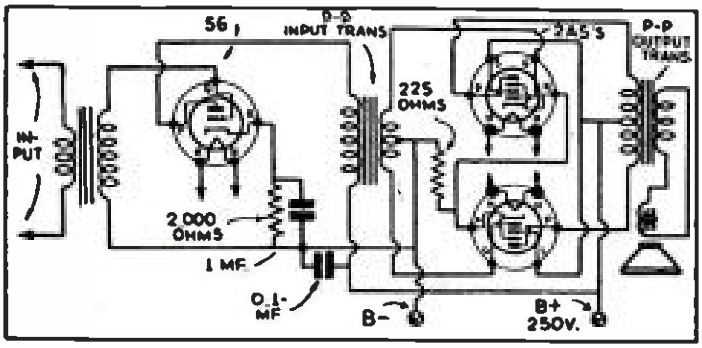
(Q.) I have a power-supply which, at the present time delivers 500 volts. The transformer used is a center-tap affair and has 500 volts each side of the center-tap. I would like to use a bridge rectifier arrangement whereby I could obtain 1,000 volts from the same transformer. Will you please print the necessary diagram in the Question Box?

(A.) We have shown the diagram of a power-supply employing three type 83 rectifiers. The filament transformer must have three separate 2.5 volt windings. If your transformer is rated at 500 volts at 250 ma. with a full-wave rectifier system, the output of the new system will then be rated at 1,000 volts at approximately 125 ma.



Power-supply diagram for 250 volt output.

Audio Amplifiers



2-STAGE A.F. AMPLIFIER

Frank Caggiano, Bronx, N.Y.

(Q) Please print in your Question Box the diagram of an audio amplifier consisting of a 56, driving a pair of 2A5's in push-pull. I would like to connect this to my 2 tube regenerative set.

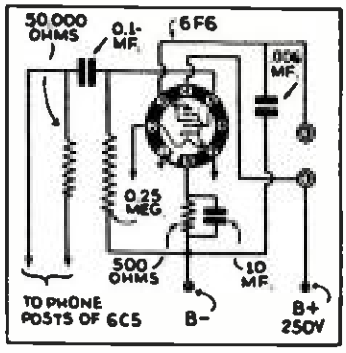
(A) In the diagram the 56 and 2A5's are shown, transformer coupling in the input circuit is indicated. This will serve satisfactorily if the output tube of the receiver is a triode such as a 56, 37, or 76.

6F6 AMPLIFIER

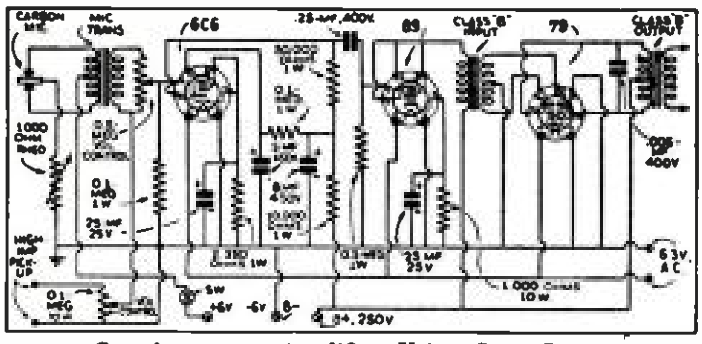
Edward Ancell, Higbee, Missouri.

(Q) I intend to build the high-gain "Metal 2" receiver described in the August, 1936 issue. Would you please be kind enough to print in the "Question Box" a diagram of a pentode amplifier using a metal tube, which would be added to the above receiver? This must be simple and inexpensive.

(A) The pentode amplifier which may be added to the high-gain "Metal 2" receiver is shown. Resistance coupling is employed. This should permit speaker operation when used with the 2-tube receiver.



Pentode A.F. Amplifier



Complete Audio Amplifier, Using Class B 79.

A. F. AMPLIFIER

F. G. Fong, Sacramento, Calif.

(Q) I would like to build an audio amplifier employing a 56-2A5 resistance-coupled combination. Will you please show the diagram and the necessary parts and their values in the *Question Box*. I would also appreciate a power-supply diagram for this amplifier. The power-supply should use a type 80-tube.

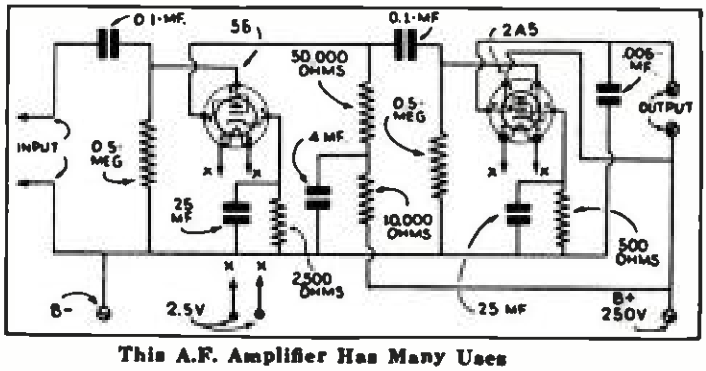
(A) We have shown the diagram requested and have carefully indicated all the values and shown all the connections. If care is used in laying out this amplifier, it should give excellent results. However crowded or "bunched" connections may result in serious feedback or motorboating. Lay out the parts so that wiring is as *direct* as possible. Also grid and plate leads should be kept *short!* The power-supply diagram connections will be the same as that shown for the 57, 56 receiver, elsewhere on this page.

AUDIO AMPLIFIER

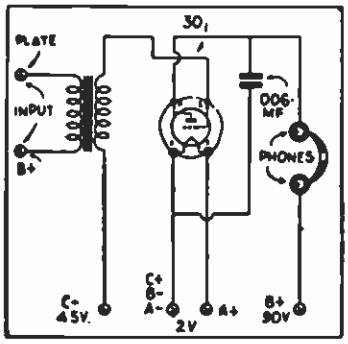
Glen Attrill, Puente, Calif.

(Q) Please print in your *Question Box* a hookup of an amplifier using four or five glass tubes. The output should be five to seven watts. There should be separate controls for mike and phonograph pick-up so they can be blended. The distortion should be as low as possible. The quality should be the best possible.

(A) We have shown in diagram a very useful amplifier. This will have an output of seven or eight watts and can be built in very compact form. Choose the proper "output" transformer for the particular condition under which the amplifier is to be operated.



This A.F. Amplifier Has Many Uses



Easily made audio amplifier stage for the "DX-ER."

A.F. AMPLIFIER FOR "DX-ER"

Clifton Coleman, Owens, W.Va.

(Q) Please show a diagram of an A.F. amplifier consisting of a type 30 and an audio transformer which may be added to the "DX-ER."

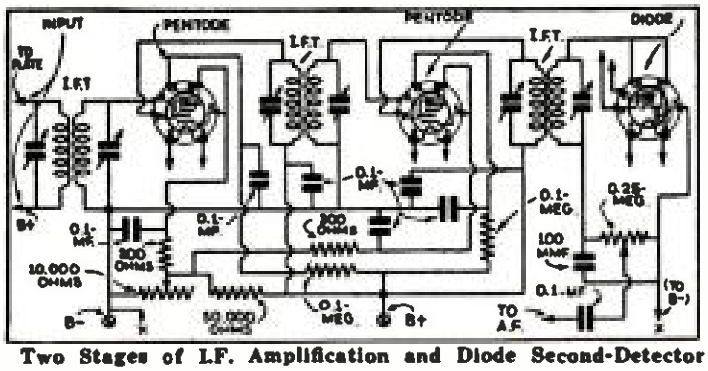
(A) The type 30 A.F. amplifier requested is shown in the diagram and should increase the volume of the "DX-ER" considerably.

2-STAGE AUDIO AMPLIFIER

Robert Skar, Cedar Falls, Iowa.

(Q) Kindly publish a diagram in the *Question Box* of a 2-stage audio amplifier using a 76 and a 42. This should be resistance-coupled in both stages.

(A) The 2-stage amplifier shown should make an excellent accessory for the short-wave experimenter's shop, inasmuch as it can be used as an amplifier for a receiver or other experiments such as phonograph reproductions and public-address experiments.



Two Stages of I.F. Amplification and Diode Second-Detector

COMPLETE I.F. AMPLIFIER

Morton Nelson, Cedar Falls, Iowa.

(Q) I should appreciate it very much if you would publish a diagram of two I.F. stages using 6K7s. This should be suitable for the Victor 2-tube superhet, described in one of your preceding issues.

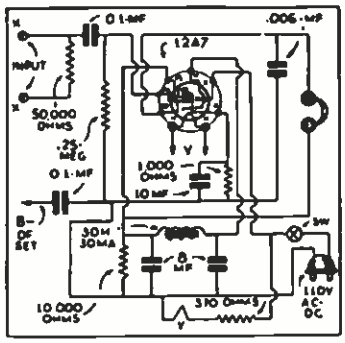
(A) We have shown a complete diagram of the two stages of intermediate frequency amplification, together with the diode second detector. The input to the I.F. amplifier, of course, is connected to the plate of the first detector, while the output from the diode goes to the audio amplifier, as indicated in the diagram. Any variable-mu pentodes can be used in the I.F. portion, and the second detector may consist of a combination diode and triode.

1-TUBE AMPLIFIER

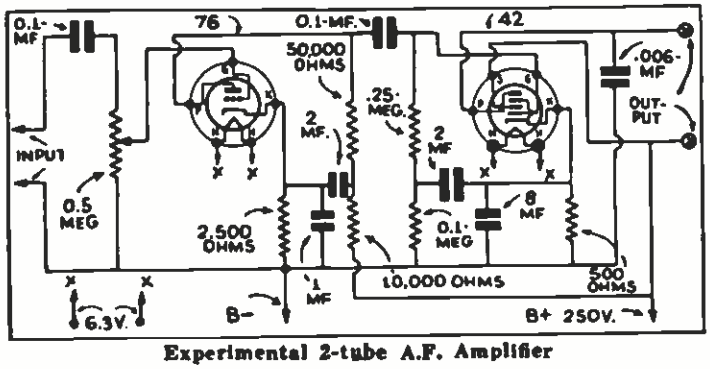
Wm. McConnell, Washington, Pa.

(Q) I would like to add a pentode amplifier to a short-wave receiver.

(A) We have shown the diagram of a 12A7 which is a combination pentode and rectifier, both in a single glass envelope. This may be connected to the output of any short-wave receiver which does not already have a power pentode output stage. The input circuit consists of two .1 mf. condensers. These are both necessary because the B negative side of the circuit connects directly to the lighting circuit, and if a ground were used on the receiver, the house fuses would very likely "blow." Resistor R for the ordinary triode should be about 50,000 ohms. The two terminals "X" connect to the receiver phone posts.



Above—diagram for an audio amplifier stage with a 12A7.



Experimental 2-tube A.F. Amplifier

PUSH-PULL A.F. AMPLIFIER

Edward DiPaulo, Greensburg, Pa.

(Q) I would be very grateful if you would print a 4-tube amplifier in your *Question Box*. This amplifier should use two type 27's transformer-coupled to a pair of 45's in push-pull.

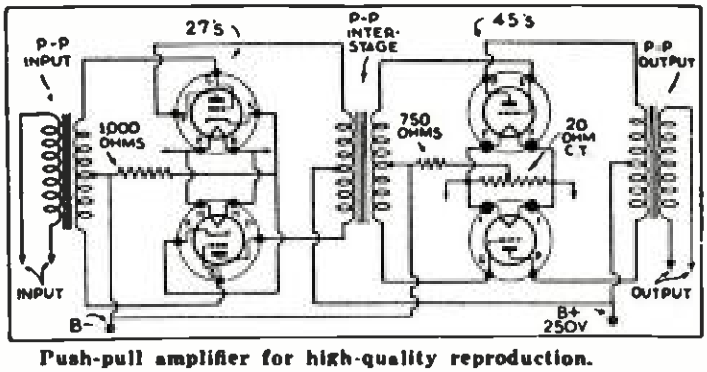
(A) We have shown the diagram of an amplifier which includes two type 27's in push-pull, transformer-coupled to a pair of 45's. If high-quality transformers are used, real high-fidelity should be obtained with this amplifier. The out-put transformer should be designed to couple the two 45's in Class "A" to the speaker you intend to use.

HIDDEN MUSIC

Leslie Clay, Warwick, Mass.

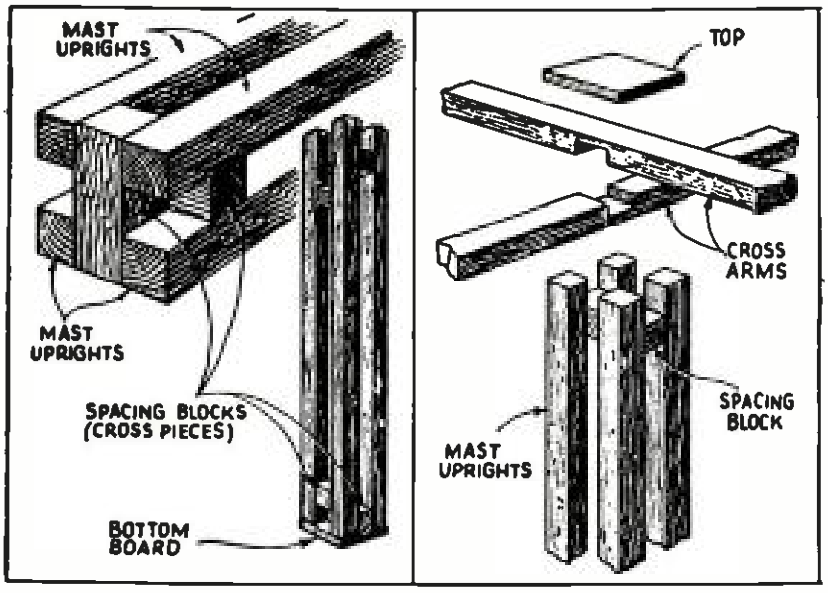
(Q) I recently installed a well-known commercial receiver and find that when the speaker is disconnected the music can still be heard.

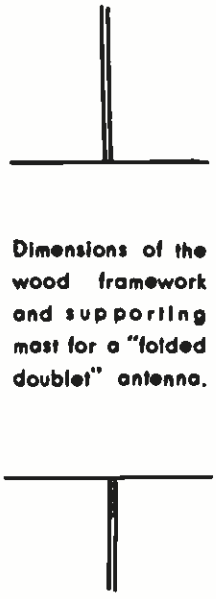
(A) There is nothing unusual in your particular case. This may be caused by loose elements in the tubes, or some other part in the receiver which is carrying audio frequency current, and which are capable of vibrating such as loose laminations or windings in an audio transformer, or even a fixed condenser may be causing the program to be heard, even though the speaker is disconnected.



Push-pull amplifier for high-quality reproduction.

A "Folded Doublet" Saves Space





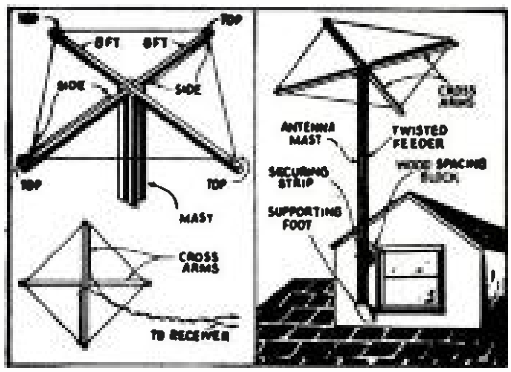
Dimensions of the wood framework and supporting mast for a "folded doublet" antenna.

● IT is a well-known fact that if properly constructed and mounted, the *doublet* antenna will greatly reduce general background noise and "hash" caused by various electrical apparatus in the immediate vicinity of the receiver.

In the drawings we find that two Englishmen G2IS and G6DT have constructed a folded doublet. The reason for the peculiar shape of the antenna was the lack of available mounting space for the usual doublet. We can not vouch for the technical assets of this antenna. However, the claims of the designers of this folded doublet are substantial arguments in its favor.

The four drawings show the various mechanical details and its construction is very simple. Of course, the usual rules applying to doublet antennas apply to this one. The antenna proper, or the folded section, should be located outside the field of the noise, and the signal from the antenna thus conducted through the field with a twisted feed-line. If, for any reason, it is impossible to locate the antenna outside of the range of the noise its benefits will be very few in number.

Coupling between the receiver and the feed-line consists of the usual coil. The coupling between the two coils, that is the coil at the receiving end of the feed-line, and the tuned input coil of the receiver should be variable; if one wants to go to the trouble, a further precaution against noise can be brought about by the use of a Faraday shield placed between the two



coils. The material used for the construction of the mast which supports the antenna are reasonably low-priced and easily obtainable. The mast is made up of 15 ft. lengths of 1-inch square straight grain pine. A length of this material is used to form each of the 4 corners of the mast. cross-pieces of this same material are placed every 2 ft. as bracing in order to strengthen the mast and even the spacing, as shown in *Television and Short Wave World* (London).

The physical dimensions of the antenna allow most efficient operation on 20 meters, however, its dimensions may be changed so that efficient operation may be obtained on any particular frequency.

How to Get Best "DX"

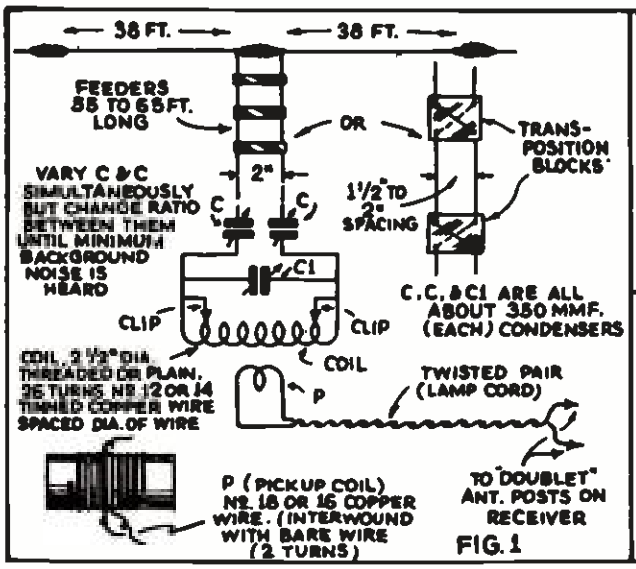


FIG. 1

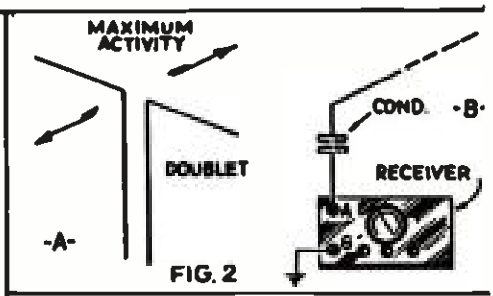


FIG. 2

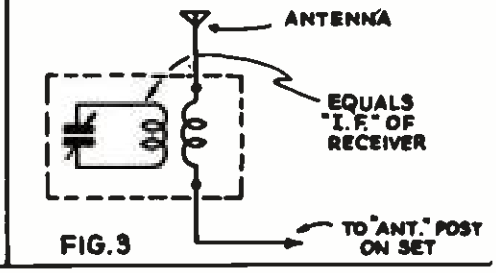


FIG. 3

The writer has heard many favorable reports on the special antenna tuning system shown in Fig. 1. This method of tuning out interfering stations was devised by G. W. Shuart, W2AMN. Reports on this antenna showed far greater sensitivity afforded by this circuit, the strength of distant weak signals being boosted considerably.

maximum activity or reception range for a doublet aerial, is at right-angles to the arms of the doublet as shown in Fig. 2. This is important where the maximum receiving range is desired. Some listeners experience difficulty in poor selectivity and here, providing the receiver has a fairly large number of tubes and satisfactory amplification, the length of the aerial may be reduced, and in fact stations several thousands of miles away can be picked up on an aerial but a few feet in length, on a good receiver of the modern super-het type. First, the experiment may be tried of connecting a small fixed condenser of about .001 mf. in series with the aerial, where it connects onto the antenna post on the set. Some prefer to connect a small variable condenser of about 30 to 50 mmf. in series with the antenna, so that the degree of selectivity may be changed. If interfering stations still bother you after cutting down the length of the antenna, try disconnecting the ground connection. This will sharpen up the selectivity considerably.

Eliminating "Code" Interference

In some locations trouble is experienced with *code* interference. One of the remedies for this is to connect a filter or *trap* circuit in series with the receiving set as shown in Fig. 3, and several different makes of these *code eliminator* receivers are available on the market. They usually consisted of an I.F. transformer of about 465 kc. rating arranged as a wave trap.

Pre-Amplifiers to Boost "Weak" Signals

Diagram Fig. 4, shows the principle of connecting a pre-amplifier. The pre-amplifier picks up the weak signals from the antenna circuit and amplifies or strengthens them before they are fed into the receiving set proper, where they are rectified.

To Hear 5 and 10 Meter "Sigs"

The real DX "Fan" will therefore be interested in the 10 meter band, and a simple way to hear the stations on this region is to connect a 10 meter converter ahead of the ordinary S-W receiver which does not tune this low.

Headphones—How to Connect

The short-wave listener frequently desires to operate head-phones from a loud-speaker set, and one method of doing this is shown in the diagram Fig. 5.

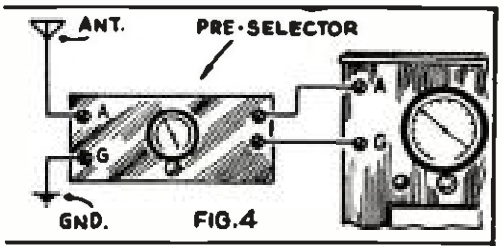


FIG. 4

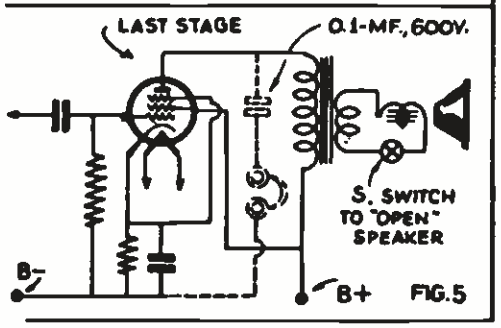


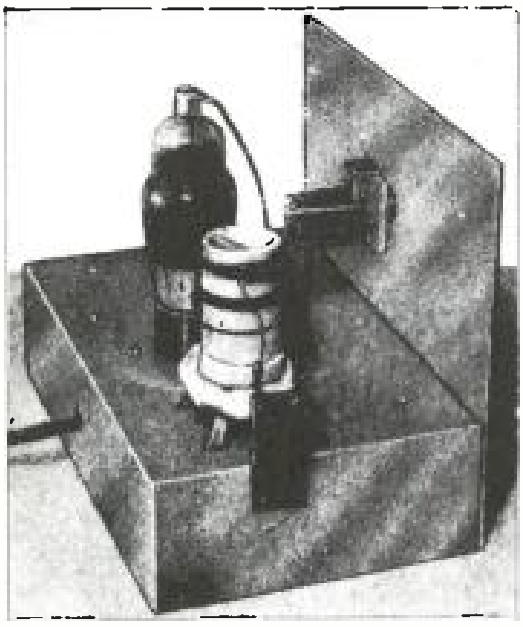
FIG. 5

SIMPLE 1-TUBE BOOSTER AIDS "DX" FAN

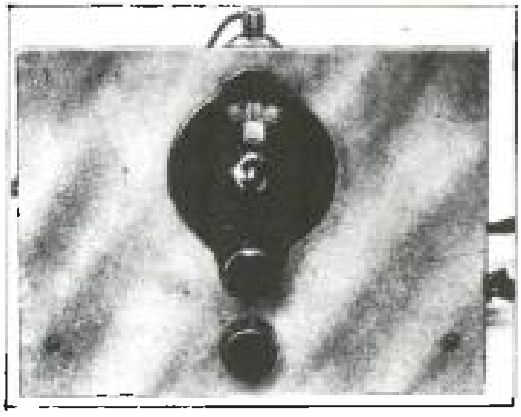
By George W. Shuart, W2AMN

Did you ever attempt to tune in a distant short-wave station, and finally give up in disgust, because your set could not bring in the voice loud enough? This very simple 1-tube booster will solve the problem for you, and greatly increase the range of the average short-wave receiver.

● THERE are undoubtedly many short-wave "fans," amateurs, or experimenters who now possess receivers which can well make use of additional amplification. The booster or preamplifier about which we are presently concerned offers a method of improving the operation of certain types of receivers in many ways. For instance, the main advantage is in the additional amplification made possible through its use. The greatest difference will be noticed in the strength of the very weak signals. Also there will be a somewhat better ratio of signal-to-noise. In certain types of superheterodynes the addition of the preselector of this type goes a long way toward reducing, or eliminating images. Then again, receivers not provided with coupling arrangements suitable for doublet antennas will benefit in that a doublet may easily be used with this instrument.



A rear view of the "weak signal" booster.



The 1-tube R.F. booster viewed from the front.

The main consideration was whether or not *regeneration* should be used in the booster. The addition of regeneration provides an extra control, however, its cost is very small and its addition provides greatly increased selectivity and sensitivity. In fact, the regeneration control may be set at a point where it need not be changed over the entire tuning range of the booster or it may be adjusted to a more critical point for maximum sensitivity. The flexibility in this regard favored its being incorporated. The method of obtaining regeneration is via the conventional cathode tap commonly referred to as *electron coupling.*

In the photograph we note that the antenna coupling coil is mounted so that it may be varied with respect to the grid coil. This adjustable coupling is really essential for maximum efficiency. In the diagram we find that there are two methods of coupling this booster to the present receiver, that is, the one

with which it is to be used. Most receivers of later design employ a separate antenna coil in the input stage, while others employ the capacitive method which means that the antennas are coupled through a very small capacity connected directly to the grid side of the input circuit. In either case, the connection "A" from the converter will go to the antenna position on the receiver, and the "B" negative side of the converter should go to the ground position. In the case of a receiver having doublet input connections, one side of the antenna coil should be grounded when the booster is employed. This connection will be the same when a common antenna and ground are used with the original receiver.

There are a number of antenna systems which may be used with this booster, four of the most prominent and effective ones are shown in the diagram; one is a half-wave doublet with *spaced* feeders. The other employs a *twisted pair* for feeders or lead-in. The twisted lead-in arrangement is more convenient, although its electrical operation is not as flexible as the other.

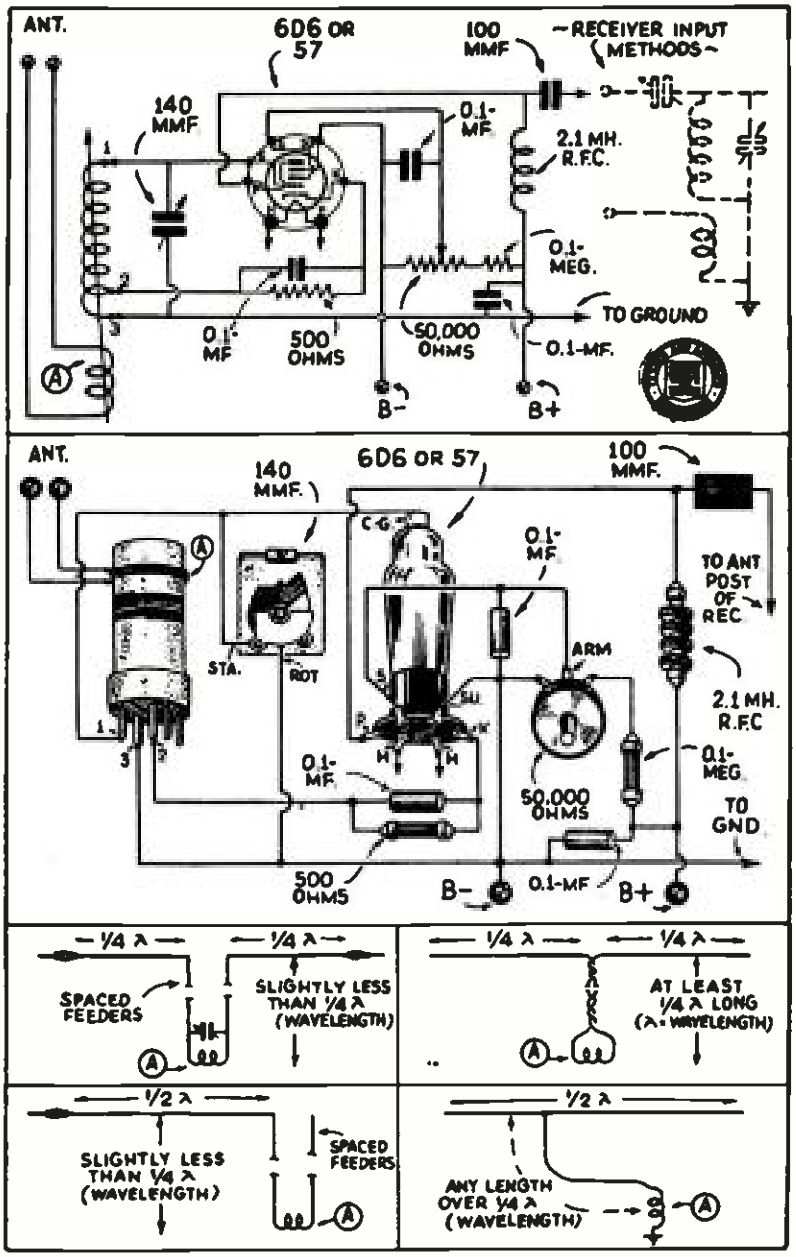


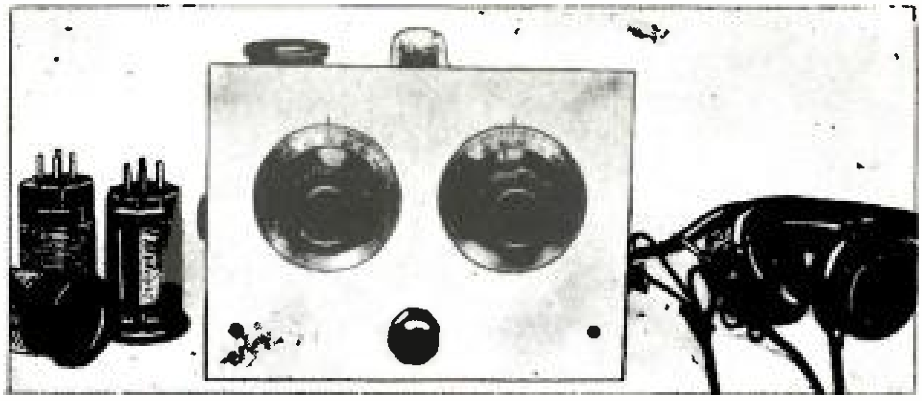
Diagram of pre-amplifier and improved antenna connections.

In another sketch, we have shown the Zeppelin or single wire with antenna having spaced feeders at the end. Twisted feeders should *not* be used with this type of antenna. While they will work to some extent, they will not provide as efficient operation as the spaced pair. The spacing on either type of antenna may be from two to six inches. The two-inch type insulator or transposition block would seem to be the best arrangement. The remaining antenna shown in the diagram is a half-wave antenna with a single-wire feed system. The distance between the center of the antenna and the point at which the lead-in is attached should be equal to 14% of the total length of the antenna.

COIL DATA

No. 1— 5 turns No. 24 osc. close wound, tap at 1 turn
No. 2—10 turns No. 24 osc. close wound, tap at 1 turn
No. 3—24 turns No. 24 osc. close wound, tap at 2 turns
No. 4—45 turns No. 24 osc. close wound, tap at 2 turns

The antenna coil is not critical and may consist of 2-5 turns, the smaller number used with the twisted feeders and the larger with the spaced feeders.



For the BEGINNER

A Twin-Pentode Receiver

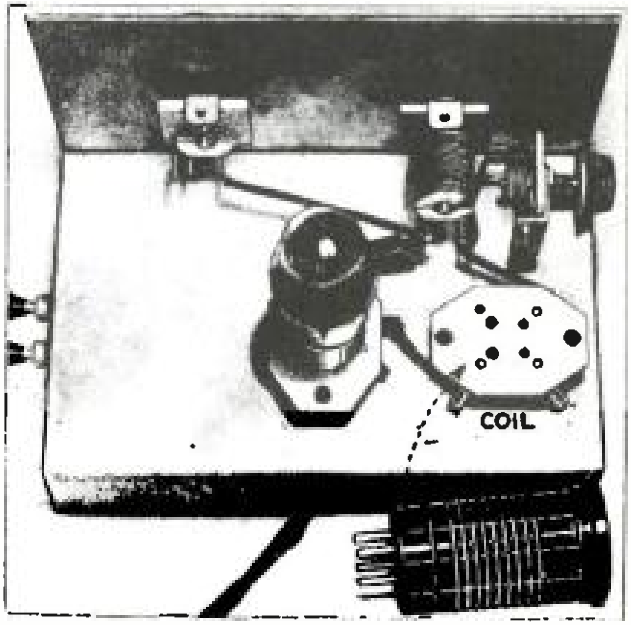
G. W. Shuart, W2AMN

● WE have had twin diodes, twin triodes, and many other types of twin combinations of tubes, around which various receivers have been built by the short-wave experimenter. The tube engineers have now presented us with the 1E7G which is a twin-pentode battery type tube. This tube is similar to the type 33, except that there are two sets of pentode elements in the one couple.

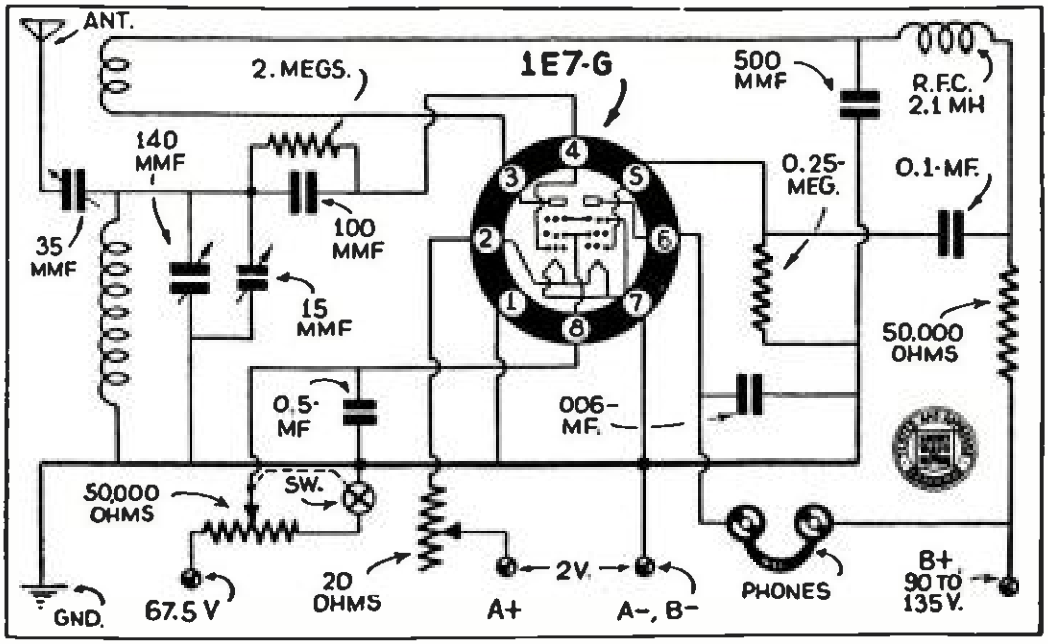
Bearing in mind the excellent results thousands of readers obtained with the Twinplex receiver using the type 19 tube, we believe this set will be destined to attain great popularity, inasmuch as it provides considerably more volume than the one using the type 19.

The circuit diagram of the new twin-pentode receiver is essentially the same as the Twinplex, and should offer no difficulty in construction or operation tc even the most inexperienced beginner.

Referring to the diagram we find that the conventional pentode detector circuit is employed, with plate feed-back for regeneration and a screen-grid potentiometer for controlling regeneration. The audio stage is resistance-coupled to the detector. However, should the experimenter desire to employ transformer



A rear view of the Twin-Pentode receiver showing "band-setting" and "band-spread" tuning condensers, as well as the "antenna tuner" at the right.



Wiring diagram of the Twin-Pentode receiver. It uses but one tube, but has a number of valuable features including an extremely smooth regeneration control.

coupling, one may be incorporated with a slight increase in over-all volume. The screen-grid regeneration control provides the smoothest operation, although it necessitated the use of quite a low voltage on the screen of the audio stage, due to the fact that the screen-grids of the two-tubes are connected in parallel within the tube, and are represented by a *single prong* in the base.

By employing 15 mm f. conds. for *band-spread*, it is possible to use a straight dial which has no vernier attachment. When wiring up this condenser the rotors should be grounded independent of the chassis; do not depend upon the chassis for connections in the R.F. circuit. All connections in the diagram which go to the B negative or A negative side of the circuit should be connected to one point, preferably to a lug on one of the screws holding the tube socket. This will eliminate all signs of body-capacity and will improve the stability of the receiver.

Standard Hammarlund plug-in coils are employed, and for the benefit of those who wish to construct their own coils, we refer them to the February 1937 issue of the *Question Box*.

The antenna employed with this receiver should be one preferably 75 ft. long, that is the over-all length from the receiver to the far end. However, if a long lead-in is used, it should be as much in the clear as possible, for remember this also counts as part of the antenna. For those interested in extreme DXing in a certain direction, we might offer the suggestion that they employ a long antenna, one 150 to 200 ft. long or even longer providing space is available; point this antenna right at the section of the globe from which reception is desired. This is the simplest form of directional antenna that one can erect and it has proved to be surprisingly effective.

Parts List

HAMMARLUND

1—35 mmf. condenser, HF style
1—140 mmf. condenser, HF style
1—15 mmf. condenser, HF style
1—2.1 mh. R.F. choke
1—octal socket, isolantite
1—4-prong socket, isolantite
1—set of plug-in coils

CORNELL-DUBILIER

1—.0001 mf. mica condenser
1—.0005 mf. mica condenser
1—.5 mf. by-pass condenser 100 or 200 V. rating
1—.1 mmf. by-pass condenser 100 or 200 V. rating
1—.006 mf. mica condenser

I.R.C.

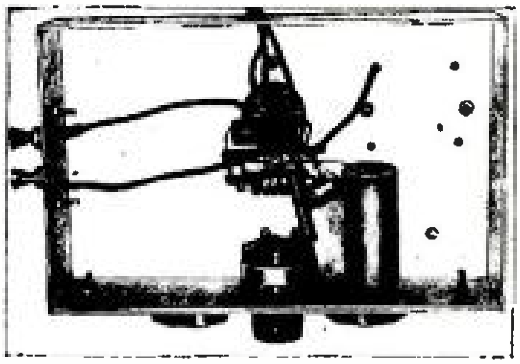
1—2 meg. ½-watt resistor
1—50,000 ohm potentiometer with switch
1—¼ meg. ½-watt resistor
1—50,000 ohm ½-watt resistor.

RAYTHEON

1—1E7G Twin-Pentode tube

MISCELLANEOUS

The set was constructed on a 5"x8"x2" chassis, with a 6"x8" panel. There are two dials, plain non-vernier type and one twin-binding post assembly for earphones.
1—20 ohm rheostat.

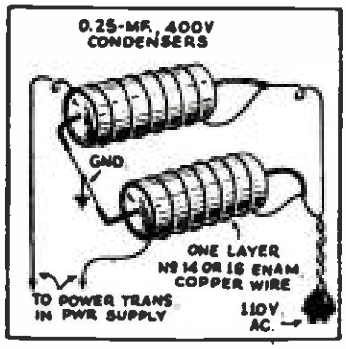


Under-side of the Twin-Pentode 1-tube receiver.

KINKS for the S-W "FAN"

HOME-MADE LINE FILTER

I am submitting the following "kink" for your very interesting page. Living in the neighborhood where line-noise interference is exceptionally high, I tried the following in order to eliminate the trouble. I was very much surprised to find that it overcame the majority of the noise and made reception more satisfactory. As the drawing shows, two ¼ mf. 400-volt condensers are connected in series across the line and the center-tap grounded. Over each of these tubular condensers a layer of No. 14 or 16 enamelled wire is wound; these windings form the chokes. Any one trying this will undoubtedly experience fine results as I have.—Clair C. Gould.



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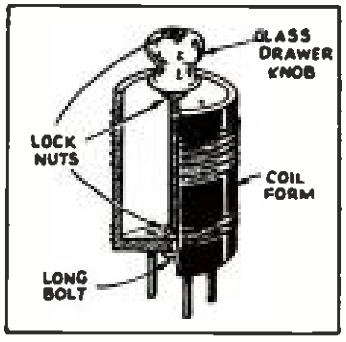
COIL HANDLE

I wound coils on tube bases and in order to provide a handle for them, selected a glass knob. A long screw holds the glass knob to the tube base. Of course, there may be some slight losses due to the screw running through the coil. However, practical tests showed no appreciable difference with or without the screw.—John Douglis.



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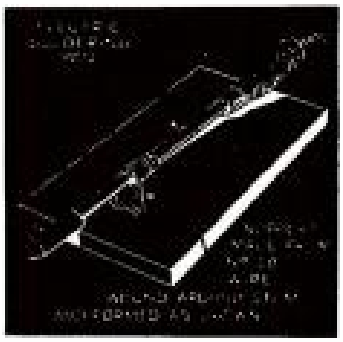
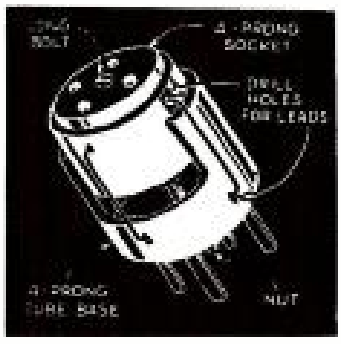
PERMANENT IRON HOLDER

During my experimental set construction, I found that this soldering iron holder gave the greatest satisfaction. As can be seen in the drawing, I merely form No. 12 bus-bar loosely around the iron. This will fall downward and always be in the correct position when you lay the iron down.—J. Esterhuizen.



COIL ADAPTER

The experimenter may have coils that are not wired for the particular set in which he wants to use them. By making a simple adapter, as shown in the drawing, and having one for each set of coils that are wired differently, no changes in the wiring of the receiver will be necessary.—Harold Johnson.



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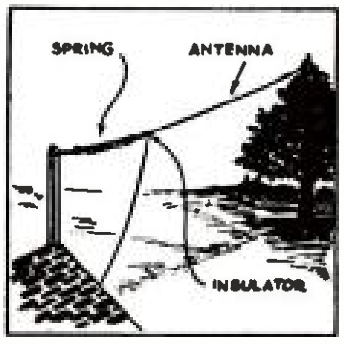
ANTENNA SPRING

While this "Kink" is not original or new, by any means, I have not seen it printed for a long time, and feel that reprinting it would do no harm. I use a large coil spring connected to one end of my antenna, to allow for swaying of a tree, to which the other end of an antenna is connected. This allows the antenna to be taut at all times, reduces stretching of the antenna wire and prevents breaking during a wind-storm when the tree usually swings considerably.—A. D. Nargent.



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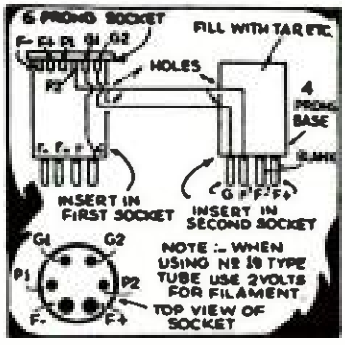

USING 19 IN PLACE OF TWO 30'S

In the drawing I have endeavored to clearly show just how I used a single 19 to replace two type 30 tubes without changing any wiring in the receiver. A 4-prong tube base is cemented to a socket into which the 19 sits. This serves as one triode connector. Then two wires are connected to another 4-prong tube base connecting the grid and plates to the grid and plates of the second triode. The second socket is plugged into the audio stage of the receiver.—Edwin Stellhorn.

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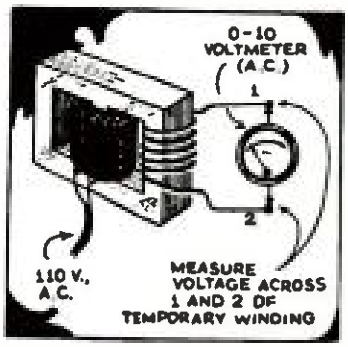

REVAMPING POWER TRANSFORMER

To determine the number of turns required for a new winding, use a small A.C. voltmeter of about 0-10 volts. Wind about 15 or 20 turns of thin ena sel or cotton-covered wire around one leg of the core, as shown, and count the turns carefully as they are put on. Now connect the primary of the transformer to the 110-volt A.C. line and with the A.C. voltmeter, measure as accurately as possible the voltage developed in the temporary 15 or 20 turn winding. Suppose our winding consists of 21 turns and the voltage as read on the voltmeter is 7, then the turns per volt would be 3. Thus for a 6.3 volt winding in the same place on the transformer core, approximately 18.9 turns will be required.—Harry D. Hooton, W8KPX.

▼ ▼ ▼

TESTER WITH HEAD-LIGHT

Here is a kink which I find much more useful than a regular work-bench lamp. With an old Christmas tree light-socket (small size), a thin strip of metal, a small nut and bolt, a few feet of wire, one can make a very useful test-prod light. The

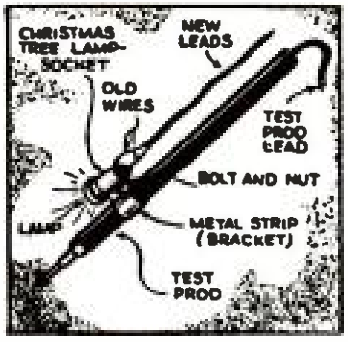

diagram shows clearly how this is done. The bulb used may be from a flashlight, with batteries as the source of current. If a brighter light is desired, a white Christmas tree bulb and a 15 volt transformer may be used.—Wm. Latta, Jr.

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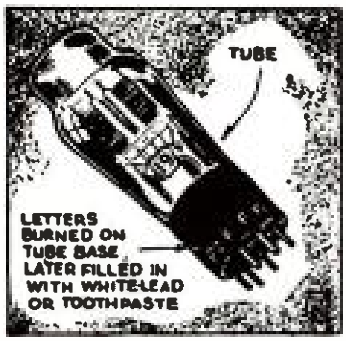
TIME SAVER

An ideal prong marker. Many experimenters have difficulty in remembering the tube base connections. Get your set of metal alphabet and numbers and take out



these letters: "F", for filaments; "H", for heaters; "G", "P", "K", "S", "D", "1-2-3-4" for G1, P2, etc. Heat one letter, such as "F". When it is quite hot hold it above the prong you want marked, put all the impressions in their respective places, and later smooth off and fill the impressions with white lead or tooth-paste. You will find that you will have a fine, handy looking job. These markings can be put on any tubes desired except metal tubes.—Louis Bupek, Jr.

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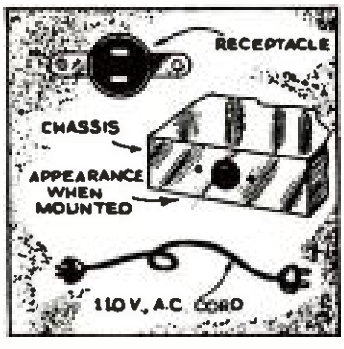
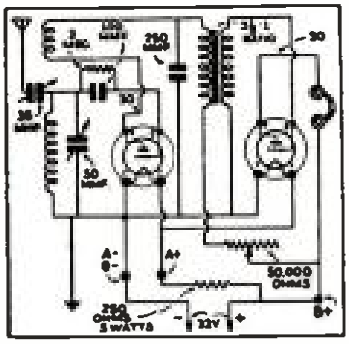


CONNECTING CORDS

Here is a kink which I am sure will be appreciated by all who build short-wave receivers. Instead of running the wires which carry the 110 volts through a hole in the side of the chassis, I enlarge the hole to fit a receptacle similar to the type used in wall outlets. Then I fit a similar cord with a male plug on both ends. In this way I eliminated the trouble of having to fix the 110-volt cord every time the insulation rubbed off.—G. N. Boetes.

32 VOLT RECEIVER

Many rural radio fans still depend on battery power for their small home-made receivers, even though they may have access to 32-volt D.C. electricity. By using one 250-ohm 5-watt resistor, the 2-tube set using two type 30 tubes can be electrified. With a set such as this and an old pair of headphones, I have heard several foreign stations excellently, including two of the Daventry stations, EAQ—Madrid; 12RO—Rome; COCH, Holland, and three in South America.—Clayton Harper.



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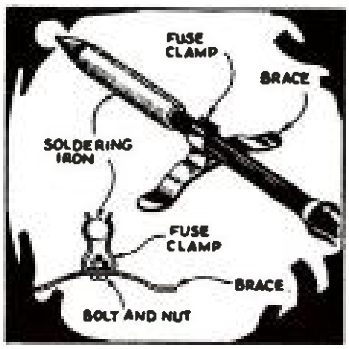
WAVE TRAP

Every wave trap I have used for the purpose of eliminating interference caused by a neighboring "Ham's" transmitter, also reduced the volume of reception of certain stations as much. Here is a "Kink" which solves this problem. Somewhere in the vicinity of receiving antennas put up another

antenna similar to the others. With a coil and condenser you can tune this antenna to the frequency of the interference, thus reducing it almost completely without an additional reduction in the desired signals, even though they be on the same frequency. The diagram will give the reader a clearer insight into just how this is accomplished.—Wm. F. Dickinson.

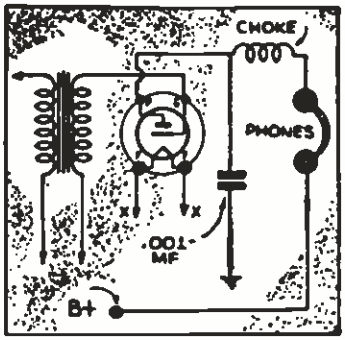


IRON HOLDER

It consists of a large fuse-clip bolted to a narrow strip of metal. This will cling to the iron and when the iron is not in use it can be rested on the bench without burning a hole in it. In this manner the holder is always attached to the iron.—L. Toman.

A CURE FOR "BODY CAPACITY"

This idea may not be original but nevertheless I am sure few radio "Fans" know of it. The idea is to eliminate the ca-



pacity effects from the phones present in most of the S-W sets of "home-built" variety particularly. Put an R.F. choke from the plate of the tube (in the last stage of audio) to the phones. Then place a condenser of approximately .001 MF capacity from the plate to the ground. The diagram fully explains the necessary changes.—I. Colloff.

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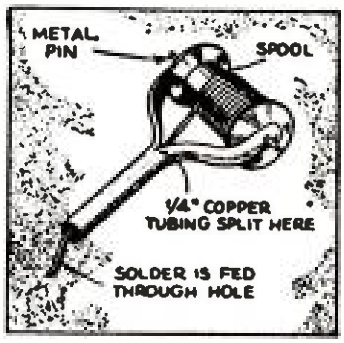
SPOOL HOLDER

Solder wound on spools is crude to handle, unless it is set on some type of rack. The one illustrated is a very easy one to make and proves very handy. Take a piece of tubing about 9 inches long and split it down the center with a hacksaw for about 4



inches. Open this up and drill two small holes, one in each end. Insert the spool of solder and push a metal pin through the holes in the fork and the spool. Run the solder through the tubing and there you have a very handy solder-spool holder.—Alfred Adler.

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CIGAR BOX CHASSIS AND PANEL

Here is a "kink" that should be of in-

terest to the "1 and 2-tube" "Fans" who do not like to spend money for a metal chassis every time they try a new circuit. This chassis is made from a cigar box. The lid is bent back and used as a panel.—Lelmar Derk.

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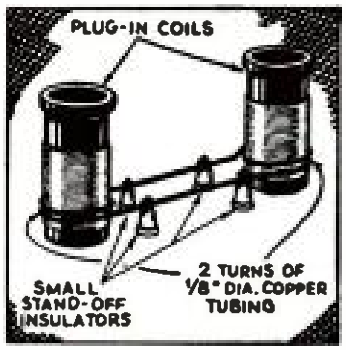
MOUNTING THE "LINK"

Here is a kink that will save time and patience for Hams building Xmitters using link-coupling where the R.F. stages are on the same sub-panel or base. The coupling is accomplished by means of 2 turns of ¼" copper tubing held up by small stand-off insulators about 1" to 1¼" apart. The coil of tubing should be large enough to allow about ⅛" between itself and the plug-in coil all around. The sketch explains it much better.—Howard Jones.



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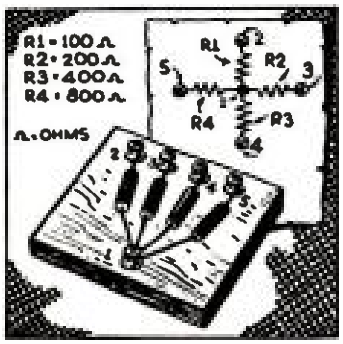
A SIMPLE RESISTOR BOARD

This resistor board is a very handy unit for the bench, as 35 different values between 57 and 1200 ohms can be obtained. For example, for 233 ohms, one connection is fixed to terminal 2 and the other to terminals 3 and 4.—L. Knight.



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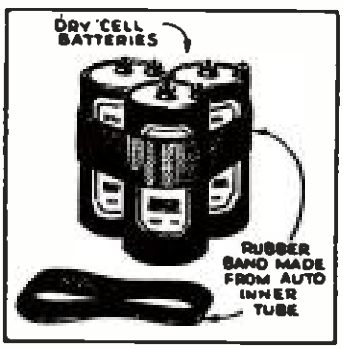
BATTERY "WRINKLE"

Those who use dry cells can readily appreciate the value of this idea. It consists of a narrow band cut from an old automobile inner-tube and placed around the batteries. With this arrangement the batteries may be tipped over accidently and still the connections will not tear apart. In fact, it is rather difficult to tip the batteries over when they are securely bound with this heavy rubber band. This is a simple kink, but it should find favor among the battery set owners.—John Nelson, NØFU, URNE.



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BUR REMOVER

This tool is made from an ordinary common screw-driver, with the end filed down on one side, only it is filed on a slant.

I invented this tool for removing the burs that are found around a hole after being drilled, especially in aluminum. If the small end is put down in the hole and pressed tightly, then turned around two or three times, it will take the burs off as clean as a whistle. This is a simple tool made from a common screw-driver which may be found anywhere. To give my own private opinion of this, I think it is one of the "most useful" radio tools I ever had around when drilling holes in panels for radios.—Frank West.

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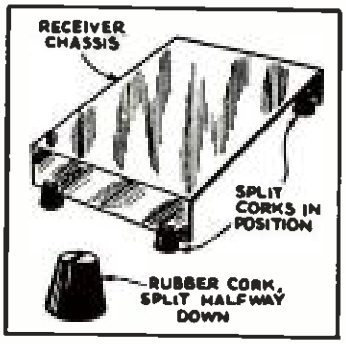

PRESERVING THE DESK TOP

I am submitting a kink which I have found very useful in regard to small 1 and 2 tube receivers mounted on sheet metal chassis. I take four small rubber bottle stoppers and cut a slot about half-way down from the small end of each cork. Then I place one of these corks on each corner of the receiver chassis.—Harry C. Young.

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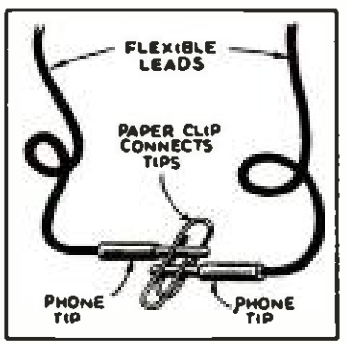
JIFFY CONNECTOR

It seems that there are no end to uses for the "old faithful" paper clip. I found that it serves excellently as a connector



where temporary test connections are to be made. While the drawing shows two phone tips held together with a paper clip, almost any connection may be made in a similar manner. Flexible wires of course, as well as solid wires may be joined together without the trouble of twisting them.

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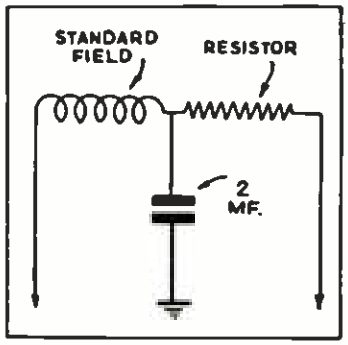
SPEAKER HINT

I have been confronted with the problem of replacing the dynamic speaker with one that would not have quite the same field resistance. This was easily overcome by inserting a resistor in series with the field. The resistor, of course, should be equal to the difference between the two fields. This only works when the field resistance of the new speaker is less than the old one.

The diagram clearly illustrates the idea. This procedure will result in applying the same voltages to the tubes as with the original speaker.—J. E. Riley.



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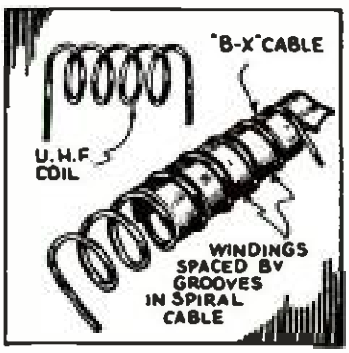
FORMING SMALL COILS

I wish to submit a Kink that should interest the short-wave experimenters that wind their own coils. I find this method very useful on the ultra-high frequencies. Obtain a piece of scrap spiral tubing (BX)



such as that used by electricians in house wiring. Wind the coil wire in the grooves of the spiral. After the desired number of turns have been wound, the coil is unscrewed from the tubing and the coil squeezed together for the scraper spacing. —Robert K. Benson.

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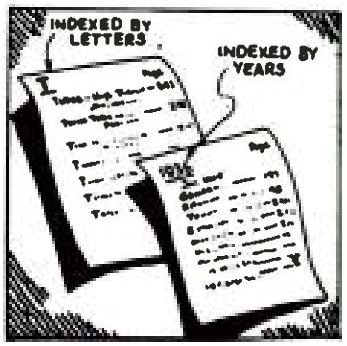
CROSS INDEX FOR SW&T'S

Yours is absolutely the best radio magazine ever to enter this country. I have a complete list up-to-date, from January 1934, bound in yearly volumes. I have just completed "indexing" the last set. Each copy is separately indexed in a special book, then again in another section the whole lot for the year is alphabetically set out. This is surely worthy of a space in your wonderful "Kink" page.—R. L. LeMaine.



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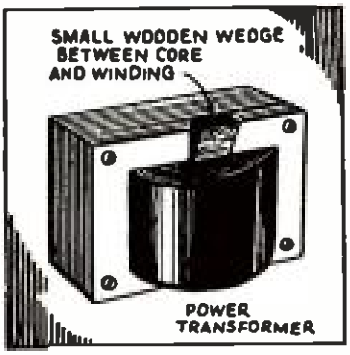

STOPPING TRANSFORMER HUM

I believe many short-wave "Fans" will be interested in knowing that it is possible to quiet a "noisy" transformer or choke; the method is very simple, especially in instances where the transformer is not sealed in some sort of compound. A wedge is made of a small piece of wood and is placed between the core and the winding of the transformer. This should be hammered tightly into the space until all signs of hum have been eliminated. This hum, incidentally is core vibration. Other hums cannot be eliminated in this manner. —Harold Bruce Jr..

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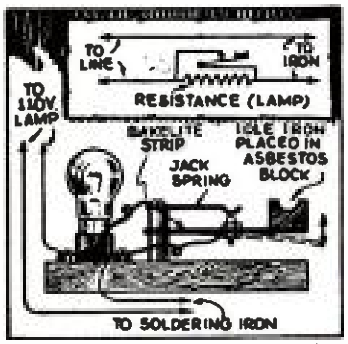
IRON HEAT CONTROLLED BY HOLDER

Here is a simple soldering iron rest that not only holds the iron safely, but automatically cuts in the resistance of a lamp when the iron is laid on it. Thus the iron is kept hot enough for instant use, yet overheating is avoided and power is saved. The size of the lamp to use is determined by the wattage of your particular iron. The wiring of the holder is shown and can easily be followed. The upper contact is a spring leaf taken from an old radio jack and the lower contact is a screw through a strip of bakelite 1/16-inch in thickness and ½-inch wide; the length is determined by the weight of the iron. The stiffness of the bakelite holds the contacts of the



switch closed until the iron is placed on the rest.—W. T. D. Murray.

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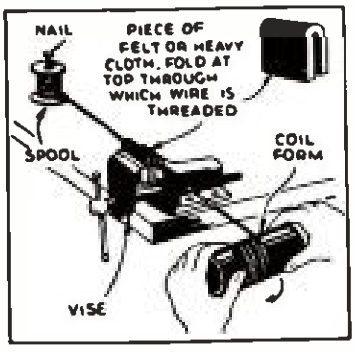
COIL-WINDING KINK

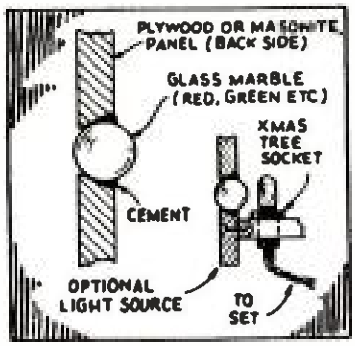
It is always difficult to prevent the wire from kinking when winding a coil. Usually three hands are needed. The arrangement shown in the drawing simplifies matters considerably.—H. W. Crowder.



JEWEL LIGHT SUBSTITUTE

Use ordinary colored glass marbles in place of the jewel; panel must be of some material other than metal.

A hole about ¼ inch in dia. is drilled in the panel, then enlarged with a reamer to accommodate the marble. The reamer leaves the hole slightly conical in shape, allowing the marble to fit in on only one side. The marble is then fastened with ordinary household or "china" cement. Any source of light can be used. Sockets from Xmas tree strings make convenient mountings. Marbles of one solid color make the best "jewels," although those of a mottled structure are not displeasing in appearance. —James F. Rannel, W8QJ.



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WORKSHOP KINK

It is always a problem, finding a place for jars and containers of screws, bolts, lugs, and many other items found around the work bench. I use a small jar with a

metal screw-top and fasten it to the underside of the shelf as shown in the drawing. In this way they're always kept in place and out of the way.—Eugene Paputs.

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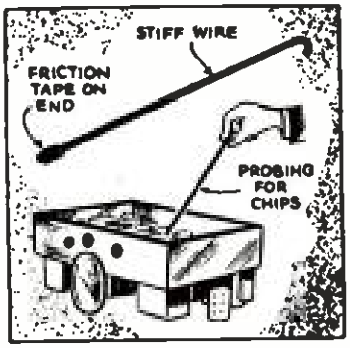
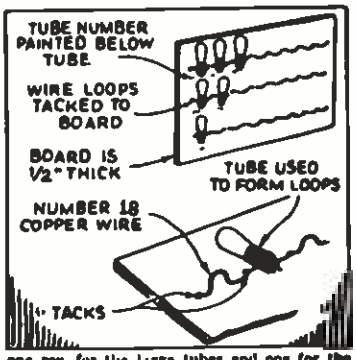
A RETRIEVER

One sometimes tries in vain to remove stray pieces of solder from the chassis with either a sharp pick or a pair of long-nose



pliers. Especially is this a nuisance when the solder is hardly visible through a network of wires. He finally may have to resort to turning the chassis upside down and shaking it. A short length of friction tape wrapped around the tip of a stiff wire will do the work better and faster.—M. C. Ledesma.



one row for the large tubes and one for the small ones.—Donald Greeley.

▼ ▼ ▼

TUBE RACK

This tube rack is easy to make and very useful. My rack is thirty inches square and can accommodate fifty tubes. In making the wire loops, I used only one piece of No. eighteen wire for each row. To do this, first tack the wire at one edge of the board near the top. Then place a tube under the wire and bend the wire around the base of the tube. Leave some slack in the wire so that the loop is slightly larger than the tube base. Now, while holding the wire loop in place, remove the tube and tack the wire to the board. If you use an old tube, you don't have to remove it while tacking the wire. The next loop is formed in the same way. Don't forget that some tubes have large bases and some small, so make

PHONE CORD KINK

Many "Fans" and amateurs have spent a good part of their valuable time untwisting the phone cords. Three pieces of rubber hose (smallest diameter that will fit over the cords) will very nicely overcome this bothersome tangling. In the diagram I have illustrated how each leg of the phone cord is run through the hose and all three are bound together with adhesive tape. Try this when you are tired of untwisting your phone cords.—Harry Pasquave.

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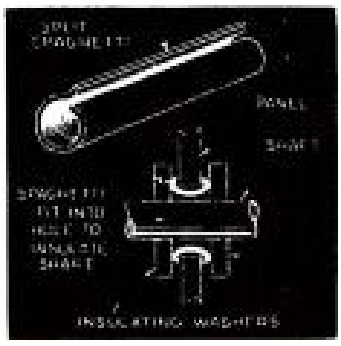
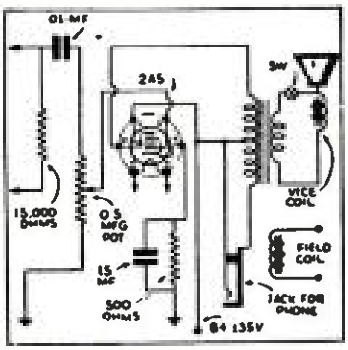


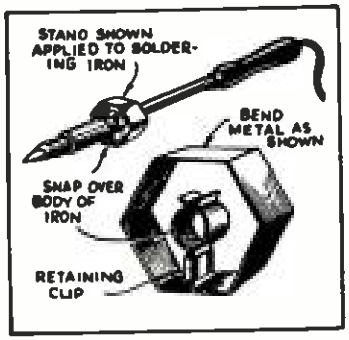
INSULATOR GROMMET

Many short-wave set constructors have found the need for an insulating grommet, just at a time when none were available. By cutting a piece of spaghetti tubing, as indicated in the diagram, a simple and effective insulator may be made. This is placed around the inside of the hole in a metal chassis, so that the ends just meet. Complete details are shown in the sketch.—Robert Wyatt.

HEADPHONE CONNECTION

I am submitting my "favorite Kink" for the benefit of those who desire to connect earphones to a receiver while a loudspeaker is operating. As most speakers have transformers which are center-tapped, I merely connect the earphones to one side of the transformer input winding. This is, of course, where single-ended audio amplifiers are used. In this manner, there is no direct current flowing through the earphones. If one does not want the phones to connect directly to the B plus, as in this diagram, then a .1 mf. condenser could be connected in series with each lead. This will isolate them and prevent any danger of shock. Another method which could be used would employ a .1 mf. condenser connected in series with one leg of the phones going to the coil on the transformer, and the other side of the phones could be connected directly to the B minus. —DeWitt F. Harvey.



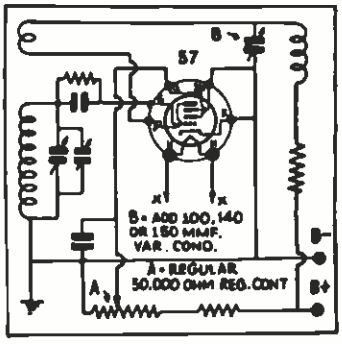


SOLDERING IRON STAND

This idea is not original but it is practical. The stand is made from metal stripping such as found on packing cases. It is easily made and costs nothing. This arrangement permits the soldering iron to rest on any particular one of the sides of the hexagonal stand. The diameter of the stand should be sufficiently great to permit the iron to be snapped out of the grip and easily removed. For getting into tight places the holder is slid back toward the handle.—Carl Bonso, Jr.

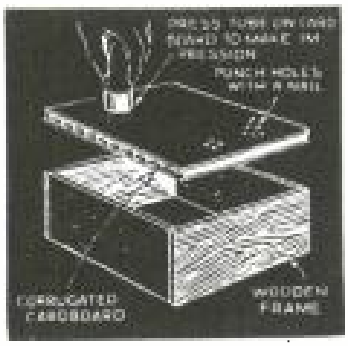
REGENERATION AID

The diagram below shows how your regeneration can be made much smoother. Condenser B. should be set so that the tube oscillates with the correct screen voltage.



PLACE FOR UNUSED TUBES

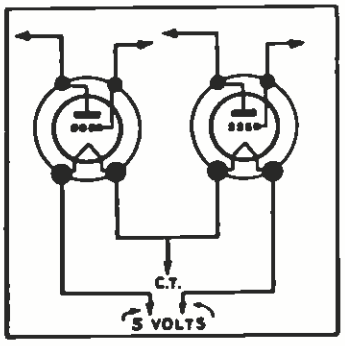
Finding a place for tubes around the work shop has always been quite a problem. I would like to submit a method which I use to safely place the unused tubes. A heavy piece of corrugated cardboard is placed over a wood frame, as shown in the diagram. Then the tubes are pressed gently

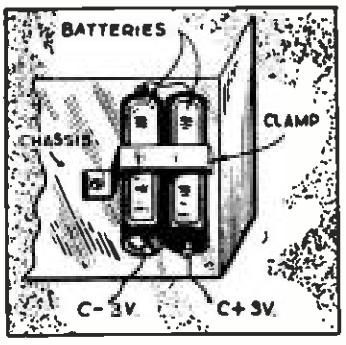


against the cardboard, making marks. After the cardboard is thus marked, holes are punched and tubes inserted in the proper places. This method always holds them firmly in place and the result is a lot of tubes which are always in place and which have "one-piece" glass envelopes.—Robert Doyo Norman.

SUBSTITUTE FOR C.T. RESISTOR

A 5-volt filament transformer may be used with two 2.5 volt tubes with the filaments in series. The center-tap filament resistor may be eliminated as illustrated. The drawing clearly shows how this is done.—Melvin Herlin, W6NNZ.





A GOOD IDEA

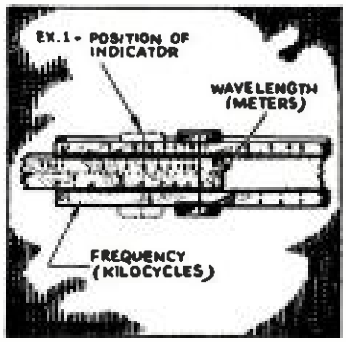
In battery-operated radios, I use the pencil-type flashlight cells as "C" batteries. These are mounted underneath the chassis with suitable clamps to hold them in place; this method eliminates extra battery leads. The ends of the batteries should be taped so as to avoid unwanted contact with the metal chassis. I am enclosing diagram showing how they can be fastened to the chassis.—Frank Anderson.

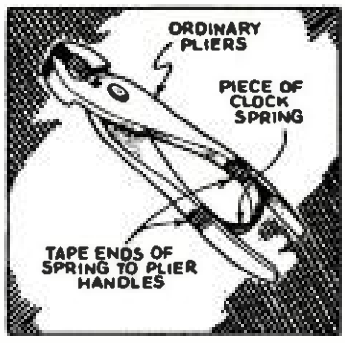
"SLIPSTICK" TRICK

Any slide rule may be used for this purpose. If the rule has no CI scale, reverse the slide and use the C scale in the reversed position. Opposite a D scale index, place 3 on the CI scale. See figure. The choice of the D scale index depends upon which half of the scale the known frequency or wavelength lies. These next two examples clearly show how the desired conversion is made. (Q.) What is the wavelength of 1860 kc.? Opposite 186 on D scale is 16 on CI. (A.) 160 meters. (Q.) What is the frequency of a five meter transmitter? Opposite 5 on CI find 6 on D. (A.) 60,000 kc. The following equivalents will be helpful in determining the location of the decimal point in your answer.

Kilocycles	Meters
600	500
3,000	100
25,000	12
60,000	5

—Frederick A. Mason.



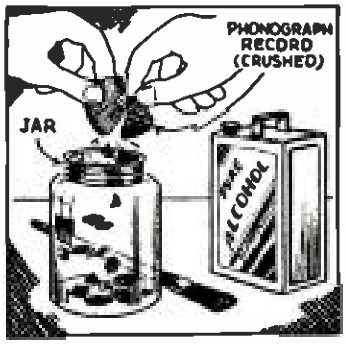


AUTOMATIC PLIER OPENER

Here is my pet time and temper saver. The automatic plier opener is simply an old piece of clock-spring taped in place as shown. When pliers are being used steadily, this will be found to be very convenient.—Gordon Sadler.

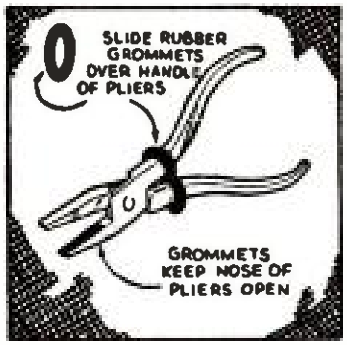
INSULATING PAINT

I have not seen this Kink in print before so I pass it on to the "Ham" fraternity. Obtain a black (or brown, if brown paint is desired) phonograph record and remove all the paper. Then crush it until it is in the smallest pieces possible and cover with alcohol. Let it stand over night then stir and thin with more alcohol and it is ready to use. It makes a nice, commercial-like finish.—Ropp Triplett.



A GREAT HELP

Many experimenters, hams, and shop-workers who use pliers consistently, will find that this kink speeds up work as well as making it far easier. It keeps the pliers' jaws apart.—R. Johnson.



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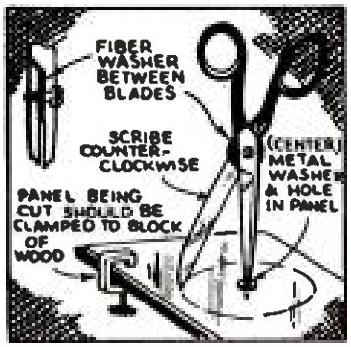
CUT HOLES WITH SCISSORS

An old pair of scissors will come in handy when a regular circle cutter is not available. Simply remove machine screw, place large fibre washer between the two blades, then replace the screw and set points of scissors to the desired radius and tighten firmly. Drill small hole to act as center through



the material to be cut, then place suitable metal washer over point of narrow blade, insert in center hole and "scribe," bearing down on cutting blade. This works best with soft metals such as aluminum.—Walter Grossheim.

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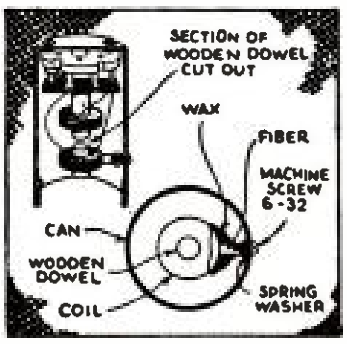
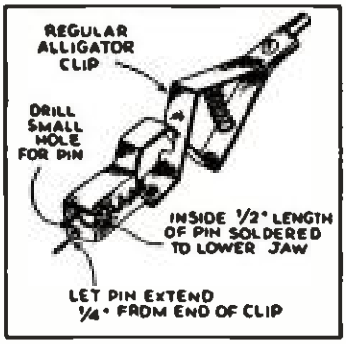
VARIABLE SELECTIVITY

On the high frequencies I usually find that standard I.F. transformers, for 10 k.c. separation, are rather broad. So I cut a section out of the wooden dowel between the coils, which leaves one coil without support. This coil is then supported by a short piece of fiber or bakelite to which it is fastened by wax. The other end of the fiber is drilled and tapped to admit the end of a 6-32 machine screw. This machine screw passes through a hole in the side of the can, with a spring washer and nut on the inside. This assembly is clearly shown in the accompanying sketch. By turning the screw on the outside of the can, the coupling between the two coils can be varied.—Clarence H. Cramer.



HOME-MADE TEST PRODS

I am an experimenter and consequently have much use for test prods. I am submitting to you my favorite and most useful kink; a combination test prod. The test prod is a combination of a straight pin and an alligator test prod. To make this you merely drill a small hole in the lower jaw of an alligator clip, and cut off the end of a pin, leaving it about three-quarters of an inch long. Now let the pin-point protrude through the hole about ⅛-inch, place a drop of solder on the rest of the pin to hold it in place, and you now have a novel test prod. The diagram illustrated will help to explain although it is simple. I believe the pin point and alligator test prods are used the most in testing. I believe this is original and I know it is very useful.—M. G. Kunkel.



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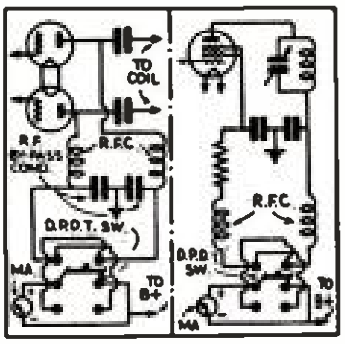
METER SWITCH

This kink employs one D.P. D. T. switch, and a milliammeter. It is to be used in a push-pull circuit to measure the plate current on each tube, by the use of the single meter and the D.P.D.T. switch. It will be



noticed that the polarity of the voltage must be the same when the switch is in either of the two positions. This is to be used in an R.F. amplifier circuit of course. This may also be used to measure the plate and the screen currents, where the screen gets its voltage from the same source as the plate.—W. L. Brown, KWTO Studios.

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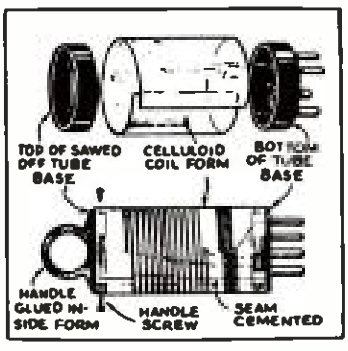

LOW-LOSS COIL

I construct my own low-loss coil forms with material frequently found in the average junk-box. All that is needed is some old tube bases, some celluloid, and a bottle of acetone or collodion. Saw a ⅛ inch ring from the top of the tube-base; this will form the upper ring of the coil. The bottom of the tube-base is then cut down to ⅝ inch and used as the base of the coil. The illustration clearly shows the general assembly.—John D. Hockman.

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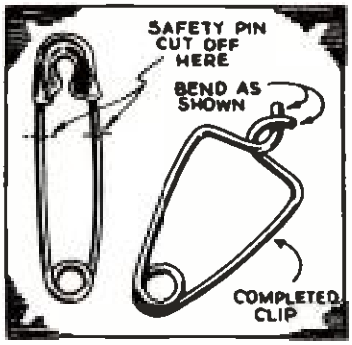
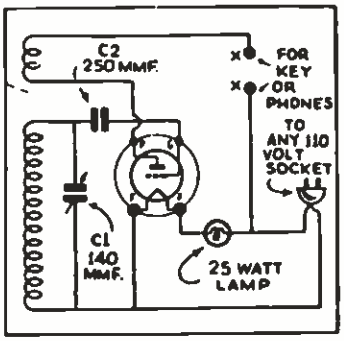


CLIP MADE FROM SAFETY PIN

While experimenters often run out of small clips it is almost certain that safety pins can be found around the home. The accompanying drawing clearly shows how a clip may be made from a safety pin. The snaphead is removed and the ends bent and twisted as per diagram. At a first glance one might not appreciate the effectiveness of such a clip, however, it is surprising how well it works. It can be fastened to almost any size article from the smallest wire to a large screw.—Edward McQuade, W1EOO.

A.C. OSCILLATOR

The diagram depicts the hook-up for an A.C. oscillator, thus providing another use for old 201A's. The 201A can be used to "log" stations by employing a vernier dial with condenser C. It is also possible to use it for tuning various stages. The 25-watt bulb lights the 201A nicely and plug-in coils are used.—Alan Harris.



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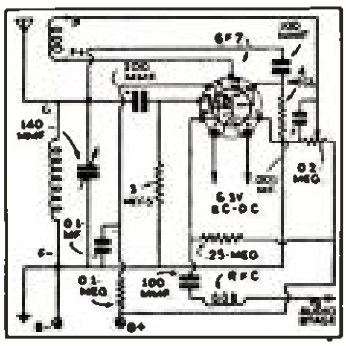
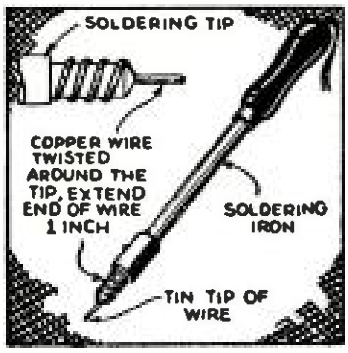
A GOOD DETECTOR

Although the use of a separate tube as the regeneration tube is not new, I believe the use of the 6F7 tube to take the place of the detector and regeneration tubes provides a very satisfactory arrangement. The pentode section of the 6F7 is used as the usual screen-grid detector, while the triode section is used as a separate regeneration tube.—Bob Thorburn.



A VERY USEFUL IDEA

I have found this kink very useful for soldering in "tight places" where the soldering iron tip will not enter, such as broken voice coil leads on speaker cones. This will save the time of taking off the speaker cone. The sleeve is a copper wire twisted around the tip and then extended out about 1 inch or whatever length needed. Flow solder on end of tip so it will flow around extra wire, the tin tip of wire preparatory to soldering the connection—Anton Wolken.



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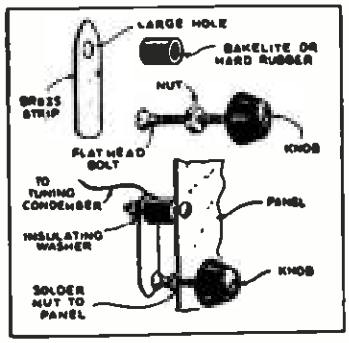
VERNIER KINK

I found this to be a handy "Kink" and a simple one to make. The brass strip can be cut from an old condenser plate. This is connected by means of a wire to the grid side of the main tuning condenser. The screw used for the movable plate is an 8-32 flat-head and is made variable by threading it through a nut which is soldered to the panel. This plate is connected to "ground" through the panel. The brass strip should be insulated from the panel to avoid a "short-circuit."—Donald Greely.



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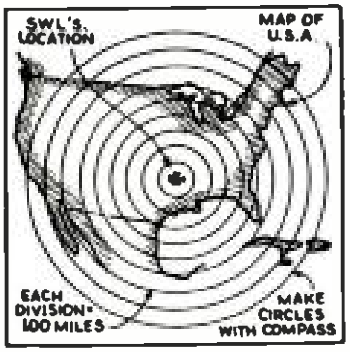
IMPROVING MAP

Here is a kink that I find very useful and so will many other Amateurs & Fans. Procure a map of the United States, then with a compass, draw a circle with a radius of



100 miles with the Amateurs or SWL'S location as the center. The next circle will then have a radius of 200 miles, the next 300 miles, and so on until the map is covered. The circles can be marked as 100 miles, 200 miles, etc., then the amateur or SWL can tell at a glance how far away the station to which he is listening is. I also have a map of the world fixed this way, with circles swung with a radius of every 1000 miles.—Kenneth Tyler.

SAVE OLD CONDENSER PLATES

A use for old condenser plates is to make holders (or brackets) in which a card is placed, designating the contents of drawer or container. I have them on the front of all my drawers, cupboards, and sliding boxes in my "shack." I have my parts segregated and labeled, which eliminates lots of hunting and saves time.—John T. Kelly.

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PHONE JACK

The sketch shows a method which automatically connects the ear-phones to the speaker output. This is an addition to your

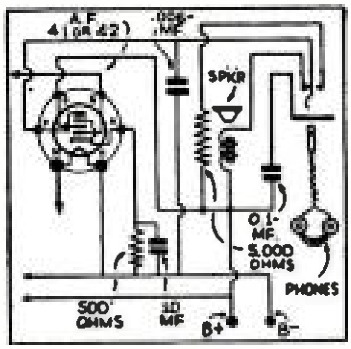

diagram of the "Multi-Band 2" receiver shown in the May issue of Short Wave & Television. When the phone plug is inserted in the three-circuit jack (which is insulated from the chassis) it disconnects the speaker from the circuit and, at the same time, connects the 5,000 ohm resistance across the speaker terminals; and the 0.1 mf. condenser in series with the phones. I have built the "Multi-Band 2" and it surely works fine.—L. G. Saunders.

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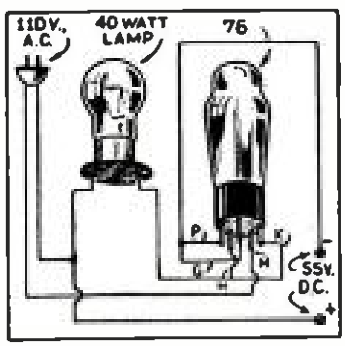
SIMPLE HALF-WAVE RECTIFIER

I am submitting a simple half-wave rectifier which I find quite useful for experimental work. The following description will explain it. Connect a 40-watt light in series with the cathode and filament of a 76 tube, connect the grid and plate together as shown in sketch. Shunt a 6 mf. condenser across the D.C. output and the rectifier will deliver about 70 volts and not exceed 20 milliamperes; try shunting condensers of different values for different



voltage and current flow.—M. F. Fleischman.

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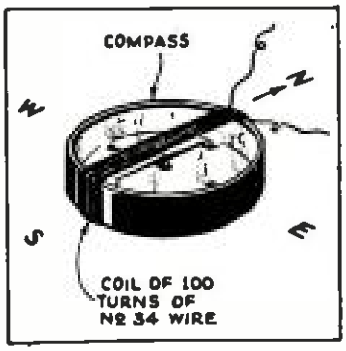
HOME-MADE GALVANOMETER

Although this "kink" is not original by any means, though there are undoubtedly a great number of new-comers to radio who are not familiar with this idea, and therefore, I think it should be published in the "kink" department.

It consists merely of winding wire around a small compass. It will serve to check continuity. It is only necessary to use a small battery for operating the meter. When current passes through the coil, the needle will show a deflection depending upon the amount of that current.—Jack Chancellor.



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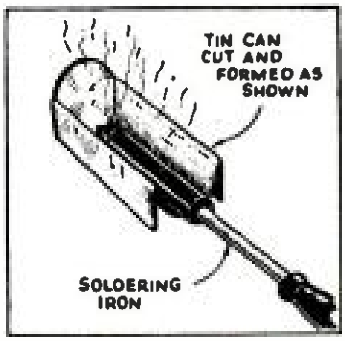
SOLDERING IRON

It is a simple matter to construct an efficient soldering iron holder from a discarded tin-can. The drawing clearly illustrates just how the holder is formed. This is a very simple arrangement and easy to construct and will provide a convenient rack for the soldering iron, which is the most permanent tool used by a short-wave "Fan." This holder may be mounted in some out of the way place underneath a bench, which means that the iron will always be handy, but not in the way when not being used.—John Berner.



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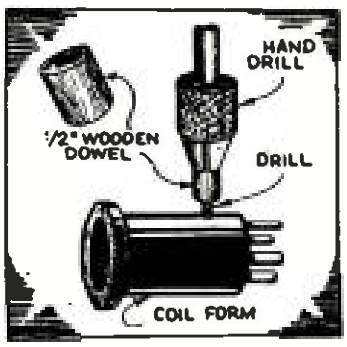
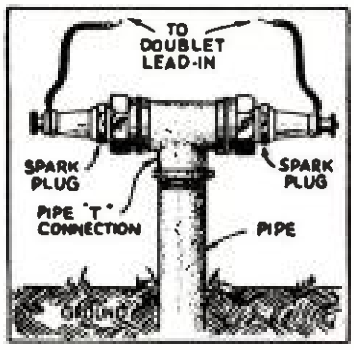
COIL WINDING KINK

To prevent the drill from going through the coil form too forcefully and damaging the form, make a hole in a ½" dowel just large enough for the drill to go through. The drill should protrude about ½". I hope these hints will prove of some use to your readers.—Art Craig.



DOUBLET LIGHTNING ARRESTOR

Many "Fans" have attempted to construct their own "doublet" antenna lightning arrestors and have not been successful. Therefore I am passing along my idea which has worked out very nicely. It consists of two discarded spark-plugs, which should be thoroughly cleaned, eliminating all traces of carbon and corrosion. These are then placed into the two ends of a "T" connection which in turn is screwed into the ground pipe. In my particular case a ground pipe 5 ft. long proved to be sufficient. However, the length of this pipe will depend upon the type of earth it is embedded in, and in some cases a pipe as long as 10 feet may be required.—Steve Gorskowski.



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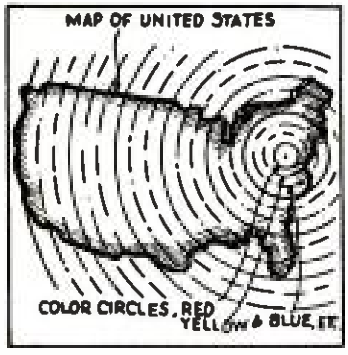
ADDING COLOR TO MAP

I am a regular reader of Short Wave & Television and have read Kenneth Tyler's kink for improving a map. Why not use several colors, which will save considerable line counting. In the accompanying diagram I have illustrated my idea.—Alfred Wolfer.



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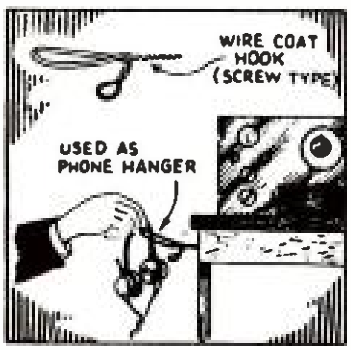
PAGE THE COAT HOOK!

Once more the old wire coat hook goes to work for the radio "Fan." I have used it as a mounting place for the earphones, in order to keep them off the operating desk or table. This ordinary coat hook is screwed into the side of the desk in some position where it will not be brushed against. The illustration shows how this is done.—D. A. Watkins.



IRON HOLDER

I wish to submit the following kink to your column. This consists of a simple hook that is to be found in almost any home and used for supporting clothes hangers. Due to the shape of the hook it is possible to use it in various positions and at different angles by merely screwing the threaded section into a work bench, or, any other location desired. Examination of one of these hooks will readily show its adaptability to the above use.—Joseph Schrot.

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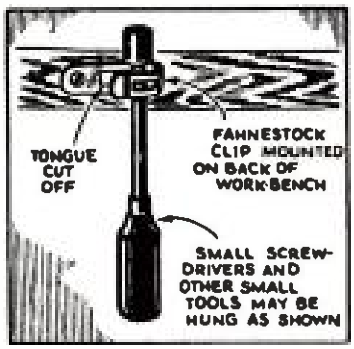
NEW USE FOR WIRE CLIP

Here is another use for the old standby, the Fahnestock clip of which every experimenter has quite a collection. As the accompanying sketch shows they may be used



to keep the usual arrangement of socket wrenches and other small tools off the bench and within easy grasp.—Jack Hall.

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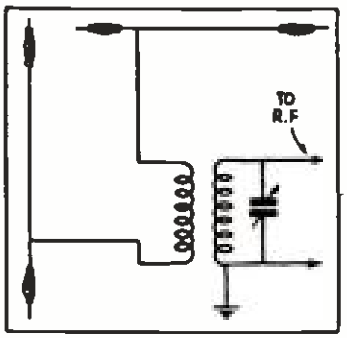


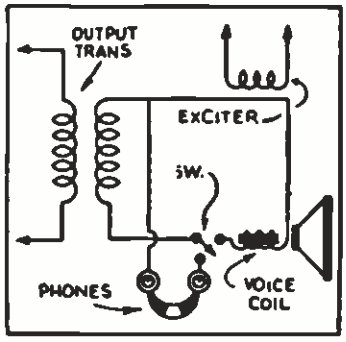
SHORT-WAVE ANTENNA

Here is a kink that ought to be of use to some of your readers. In experimenting with two antennas, I found that the long one worked best on the 49 meter band, and the short one gave greater signal strength on the 20 meter band. Still better results were obtained by using them as a "doublet." This was due to the non-directional effect as the antennas are almost at right-angles. The use of a doublet resulted in greater input selectivity, even with close coupling. This arrangement can be used when there is not enough space for an actual doublet.—John Mattern.

▼ ▼ ▼

"PHONES-TO-SPEAKER" SWITCH

Here is a kink which I am sure will come in handy to anyone wishing to install phones on any commercial type receiver having a dynamic speaker. Although the phones may be of much higher ohmage than the voice coil, the output transformer furnishes plenty of volume. A "so-called" automatic phone jack should be used, as this completely silences the speaker when the phones are plugged in. This also avoids tearing into the chassis of the radio.—Claudie Hull.



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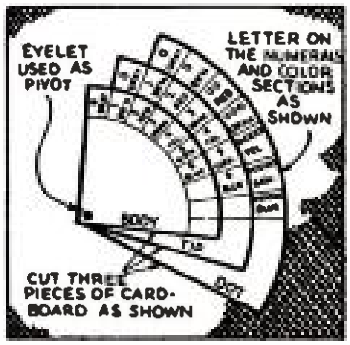
COLOR CODE CHART

Although this isn't original, I feel that few know about it. It is a chart for identifying color-coded resistors. Three pieces of cardboard, when made and painted in the colors indicated in the sketch, make the handy chart. The three pieces of cardboard are fastened with an eyelet or by some convenient means so that they can be lined up in accordance with the colors on the resistor. —Wyman Soule.



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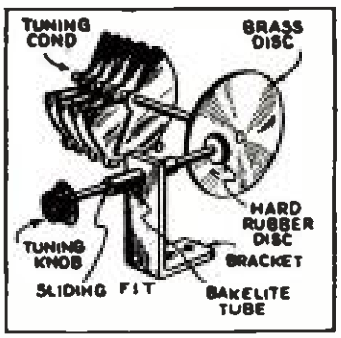

BANDSPREAD

"A 6" dia. brass disc is soldered to the end of the condenser shaft. The tuning knob is fastened to an ¼" shaft, which passes with a sliding fit through a piece of bakelite tubing mounted on the panel. To the end of this shaft a ½" dia., hard rubber disc is cemented, which presses against the side of the brass disc, and by friction turns the condenser when the tuning knob is turned. By pulling out the tuning knob the amount of bandspread may be increased from 2-1, to 16-1.—J. Esterhuizen.

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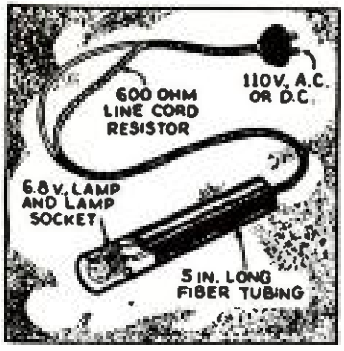
HANDY LIGHT

I hope some of your readers will get some use out of my kink. It is very simple to construct and will prove very useful. I have been a constant reader of your kink page and have finally decided to submit one of my own. The drawing clearly shows the necessary constructional details.—Philip G. Petermann.



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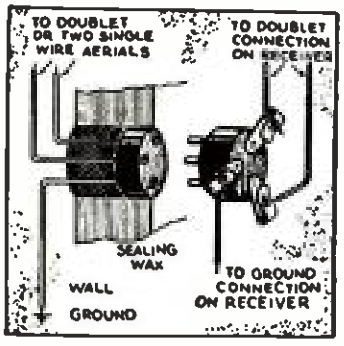
LEAD-IN PLUG

A neat and convenient antenna lead-in may be made by screwing a socket and plug from a discarded plug-in type battery. A hole is drilled into the wall the size of the socket. The socket is then made to fit flush with the wall. The leads from the back side of the socket are soldered to rubber covered wire and run through the wall. The diagram renders a better explanation of this system.—Byrum Huddleston.



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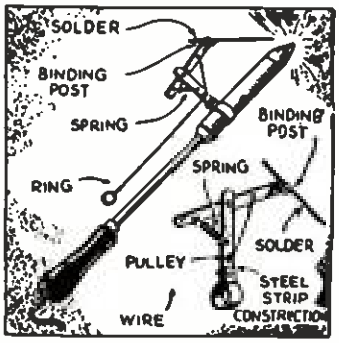
PAGE RUBE GOLDBERG!

I believed that I have solved one of the biggest problems in radio. That is—what to do with the solder when you have the iron in one hand and wire in the other? When the ring is pulled the solder touches the point and is melted. It is best to use steel strip for the construction, as it doesn't conduct the heat as readily as copper or brass.—Olrin K. Bismarck.



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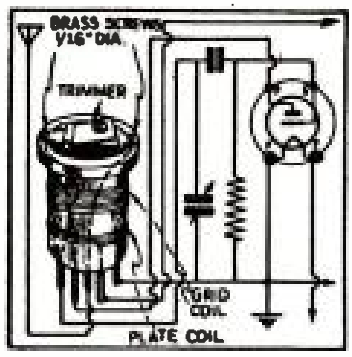
PLUG-IN ANTENNA CONDENSER

In my opinion much time can be saved with this Kink, so I am passing it along



to your readers. I mount the antenna trimmers on the plug-in coils. (I use 5 prong coils, the extra prong for the antenna connection.) After the coils are wound and the trimmers are mounted, coils should be plugged in one by one and the trimmers adjusted. I got tired of hunting up the old screw driver every time I adjusted the trimmers, so I hit upon this method of getting away from it.—Norman V. Barr.

▼ ▼ ▼

TIME SAVER

I wish to submit the following Kink. The most ordinary things are worthwhile as I found out the other day when I found a serviceman trying to manipulate the pilot light in a set with two very chubby fingers. It was in crowded quarters and after several tries he said: "Guess I'll have to pull the chassis." I suggested that it was unnecessary. I took a piece of gummed paper such as they use in sealing cartons and twisted it into a spiral tube, thin enough to fit over the pilot light. The old light came out with no trouble at all, and the new one was put in the same way. I got the idea from one of those trick finger traps that—the more you pull, the tighter they get.—Donald Wade.

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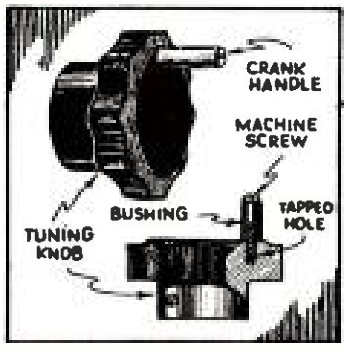

TUNING AID

Here is my favorite tuning aid Kink. I have found it very helpful in tuning from one band to another, in that it speeds the tuning up and saves the wrist (also temper). The drawing is self-explanatory, and there is no great deal of work involved. An ⅛" hole should be drilled a ⅜" from the edge of the main tuning knob. This should be about a ⅜" deep depending on the knob. This hole should then be tapped 6-32. A ⅜" bushing was placed on a 1" screw and the assembly was screwed on the knob. This assembly has taken the place of the broken fast speed on my receiver. I hope that you will find this acceptable.—Jemaines David.

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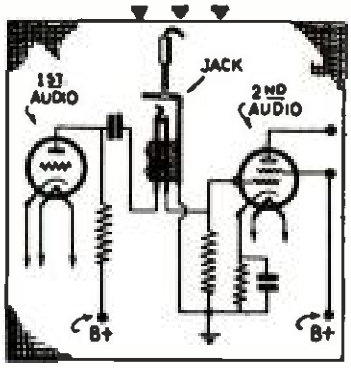

PHONE JACK

Recently I have made use of two kinks that I think are worth passing on to other experimenters. The first is an earphone jack to be used between two stages of an audio amplifier. Its advantages are: a "dead" jack frame; and elimination of "B" current from the earphone circuit. Previously, it has not been very safe to have an earphone jack on a grounded panel. Crystal earphones can be used in this circuit.

The second concerns a way of connecting a "stand by" or "send-receive" switch in a receiver. If this switch cuts out only the detector and R.F. stages (if any) it is a lot easier on the eardrums. Also, if the power-supply has no bleeder resister, it lessens chances of condenser breakdown.—Guy Black.

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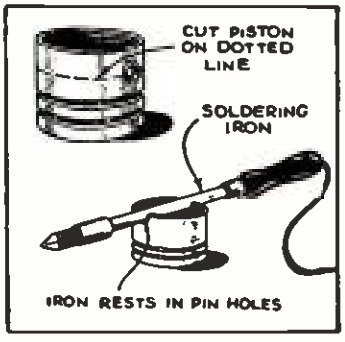
. . . AND STILL THEY COME!

A piston from a gasoline motor is cut in half at the center of the wrist-pin holes. The illustration clearly shows how it is employed.—Jesse M. Large.



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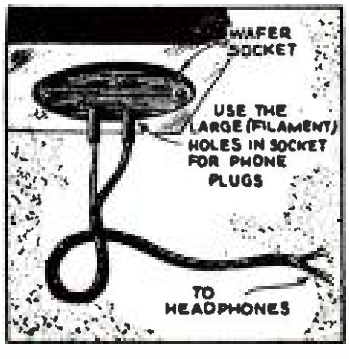
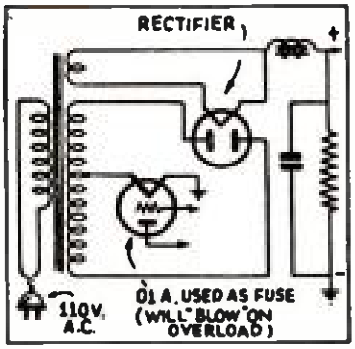
NEW USE FOR SOCKET

I am submitting a kink which I have found very useful when building sets. The parts consist of a tube wafer socket and two nuts and bolts. This will serve as a headphone jack and costs only a few cents. The sockets may be either 4, 6 or 7 prong. I am sure that many set-builders and "Hams" can use this little kink.—Morton Gottlieb.



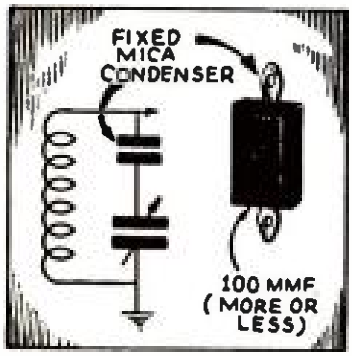
PREVENT BLOW-UPS!

Here is a kink that I have used with great success in building low-power power supplies. In case of an accidental "short," unless a protective device is used, the power-supply will most likely "blow up." A stunt that I have found to be useful is to connect an 01-A tube filament between the center tap of the transformer and the ground. The drawing clearly shows this. —R. Woodward, W6LUN.



BETTER BAND-SPREAD

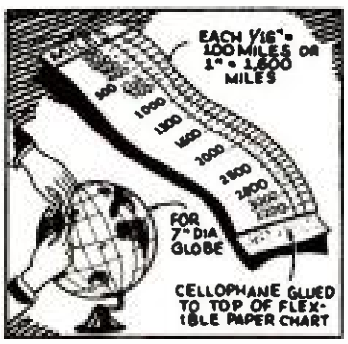
Instead of purchasing a special band-spread condenser, or removing some plates, which often ruins a condenser, one can

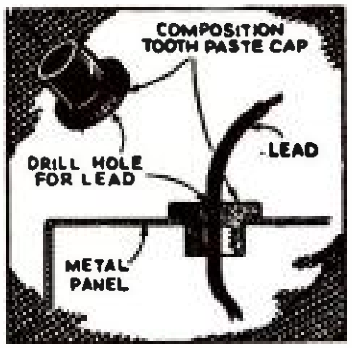


obtain better band-spread, and most conveniently too, by connecting a fixed mica condenser in series, usually about 100 mmf., with the stator. Thus any variable condenser may be employed, even a 365 mmf. unit.—Engelbert Bartosch.

MEASURING TAPE FOR WORLD GLOBE

This chart is made accordingly. To a 7-inch globe, each 1/16-inch=100 miles or 1-inch=1,600 miles, etc. It is a very simple matter to measure distance to any city with a chart made like this one. You see the idea of using paper is that it is flexible; it will bend according to the globe. Obtain a strip of cellophane with thin glued on over the writing on the chart. This prevents the reading being rubbed off and it is flexible at the same time. For larger globes, the distance may be figured on the chart the same way, except first you must make sure to see the legend on the globe, then measure the legend distance on the globe exactly. After this make the chart. For a 7-inch globe a chart has to be about 9½ to 10-inches long, in order to measure half-way around.—Martin O. Axland.



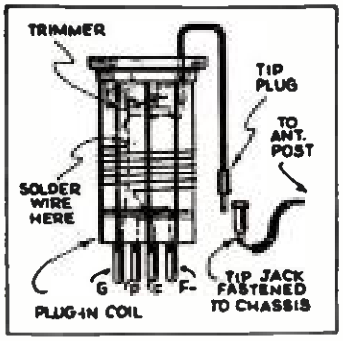


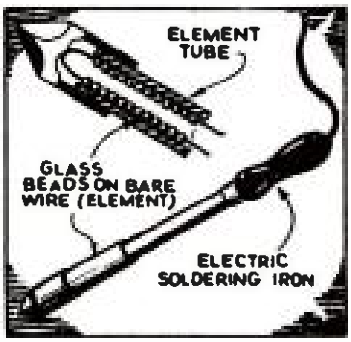
HOME-MADE BUSHING

The following is a method of running high-tension leads through a metal chassis. The insulators are the composition caps from tubes of tooth-paste and the like. My diagrams aren't wonderful, but I hope that they're understandable.—Warren Preeshl.

FIXED TRIMMERS

Here is a scheme that will enable you to connect a trimmer condenser in a 4-prong coil form. Merely insert your condenser, then solder a wire from the trimmer to the grid wire in the coil. Also, solder a wire about 4" to 5" long to the trimmer and bring it out of the coil form. Next solder the wire to the tip plug, connect up the tip jacks to the antenna and you will have a very useful scheme completed.—Edward Wagner.



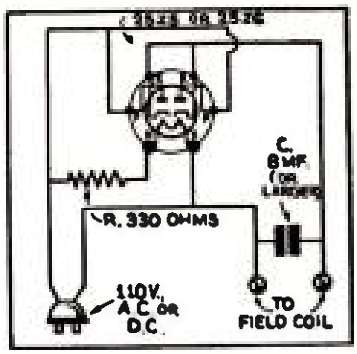


REPAIRING SOLDERING IRON

Many times soldering irons are discarded when they blow fuses. In the majority of cases the only fault with the iron is the deteriorated or broken insulation. I have repaired my own iron in the fashion shown in the drawing. Small glass beads are threaded on the bare wire element and provide excellent insulation; the iron is then good for many more years of service.—O. J. Harman.

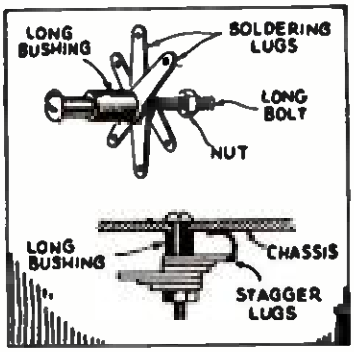
POWER SUPPLY FOR SPEAKER

This kink is very useful, and I believe your readers would benefit by it. It is, as you see, a small A.C. power supply, capable of giving 130 volts. The above figure was obtained by measurement while in operation. It is composed of 6-prong tube socket, tube, 8mf. condenser and a 330 ohm resistor, or resistance in line cord. The tube may be a 2525 or metal type 2526. The output is increased by increasing the condenser size. This small power supply may be used as a field supply for a dynamic speaker.—Robert McKinley, Jr.



THE COMMON GROUND

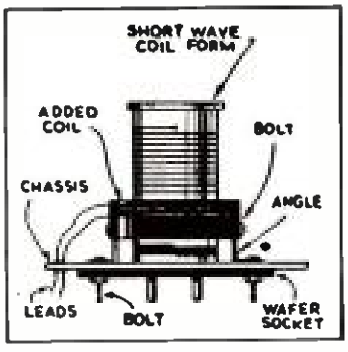
When a number of leads are to be grounded, a neater job is made by using a common post consisting of soldering lugs



mounted in staggered positions on a screw which is grounded to the chassis. The wires are then easily removable. If an insulated post is desired, the screw may be mounted in a rubber grommet or in a piece of fiber.—Edward Wooten.

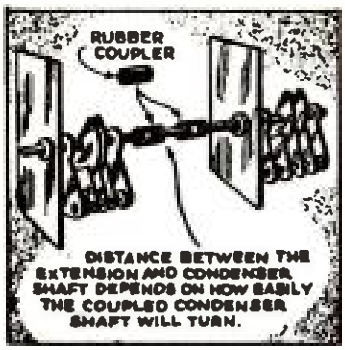
INDUCTIVE ANTENNA COUPLING

I am submitting the following kink which I believe will be most helpful to radio amateurs and experimenters. The position of the added coil shown in the diagram can be varied until satisfactory adjustment is made by the aid of the small bolts which support the wafer socket. This coil may either serve as a tickler winding or primary added to coils which contain two windings of the short-wave type. The diagram is self-explanatory. Those who wish to make use of the doublet antenna will find this arrangement extremely satisfactory. If properly adjusted for any given wave-band, the doublet connected to this coupled coil will provide a tremendous improvement in reception.—Murray Richmond.



CONDENSER COUPLING

Here is a sketch of a condenser coupler which you may be interested in. It may be used temporarily or permanently. The condenser coupler is a rubber tube. The inside diameter of the rubber tube should



be a little smaller than the condenser shaft, so that when the condenser shaft is inserted in the rubber tube it will fit snugly. The wall of the rubber tube should be about 1/16th of an inch. The condenser shafts need not be perfectly in line. I used a small piece from a rubber siphon for my coupler.—Ryoso Masuda.

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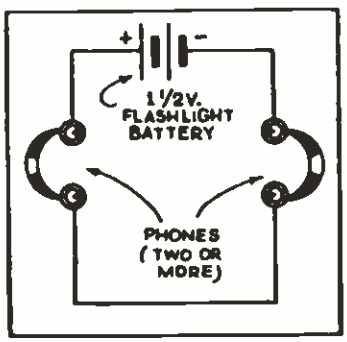
CUTS DOWN BOOT-LEGGING

I have been experimenting with a great many telephone circuits, but found this one to be the simplest and the most efficient. In fact they worked so well for me that I am installing several in my home. The circuit contains two pairs of earphones, or as many as you wish, and one battery. This kink ought to help the 5-meter boot-legging problem a little.—Latham Clarke. (Well said, m'lad—Ed.)



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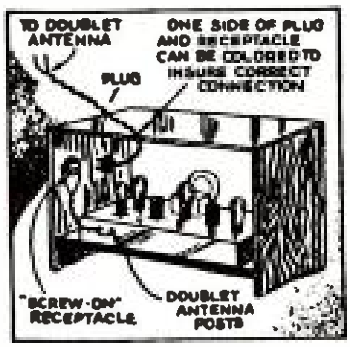
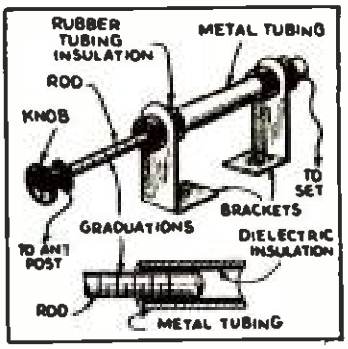
PLUG FOR ANTENNA

Herewith is a kink which I have found very helpful whenever it became necessary or convenient to remove the doublet antenna from my set. On most sets this seems to involve untwisting the wires from around a pair of screws which is not only bothersome, but often causes the wires to break off. With this inexpensive "plug receptacle" arrangement, one can quickly and conveniently disconnect the antenna from the set for any purpose, such as moving the set or isolating it during a severe thunderstorm, etc.—William F. Boyle.





NOVEL ANTENNA CONDENSER

My kink consists of a novel antenna condenser. As can be seen from the diagram, the affair is made of a piece of bright copper tubing which represents one plate, and a spike or any rod which can be used for the other plate. The two plates are insulated from each other by a piece of paper, which is rolled into a cylinder and glued to the inside of the tubing. The rotor fits snugly and can be marked with graduations to suit the various bands. When the condenser is "All in," the washer "shorts" the tubing, thereby rendering the aerial suitable for broadcast reception. To make manipulation easier, the rotor is fitted with a small knob.—Joseph Christian.

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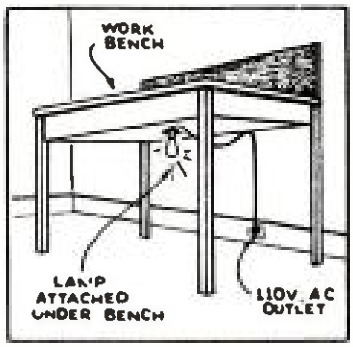

TIME SAVER

Placing a light underneath the work bench may seem off-hand like a foolish idea; however, when one stops to consider the great number of small objects that are dropped on the floor, the value of such a light can readily be appreciated. The illustration will give a fair idea as to just how it can be arranged. We don't mean to infer that the only light in the workshop should be placed under the table. Hi!—Bob Hicks.

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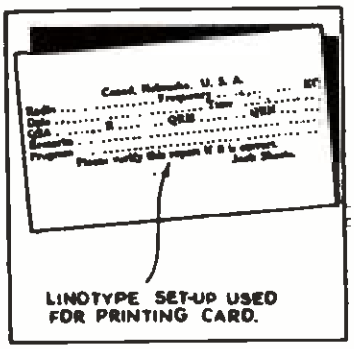
MAKE YOUR OWN QSL's



This kink ought to be welcomed by financially embarrassed "Hams" and SWLs. Very inexpensive QSL's can be made as follows: First a simple printed card must be designed. Second, have your job printer or local newspaper set up the printing on the linotype (this shouldn't cost over 50c). The type will consist of bars of metal, one bar to a line. Third, place these "slugs" in a hand clamp. Fourth re-ink your stamp pad (a bottle of stamp pad ink costs 15c). Fifth, after practicing on some old paper you are ready to start printing your cards (ie postal cards are fine).—Jack Sheets.

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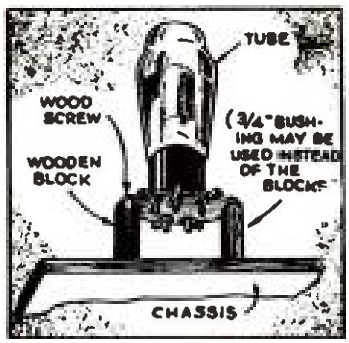
CONSTRUCTION HINT

Recently while constructing a set with a breadboard chassis, I did not have the right type of tube sockets, only the wafer socket. In order to use them, I cut small blocks of wood about one inch long and mounted the socket with a screw through these blocks to the board.—Walter Perelman.



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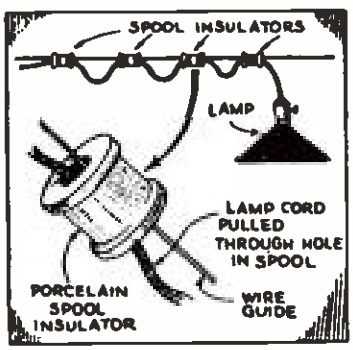
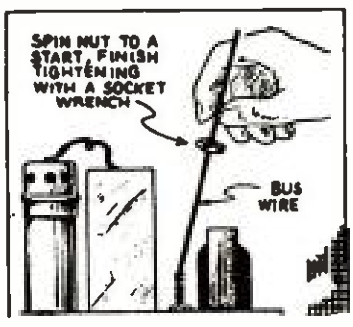
BENCH-LIGHT KINK

Those experimenters confronted with the problem of lighting a large work-bench will find this kink the solution to their problem. While the drawing shows porcelain spool insulators, ordinary thread-spools may be used, of course. The arrangement is extremely simple and the drawing illustrates just how the extension cord is arranged. After you have once used an adjustable light of this kind you'll never be without it.—H. W. Crowder.



"NUT-STARTER"

This kink is for starting nuts in the most difficult places; we have used this method for some time and find it highly satisfactory. First procure a length of No. 14 bus wire and slide nut on same. Hold the nut with the index finger, while placing end of bus wire on end of bolt on which nut is to be started. Retain this portion with wire while you spin nut around, using another piece of bus wire or a small shank screw-driver. The diagram illustrates operation.—Roscoe Walther.



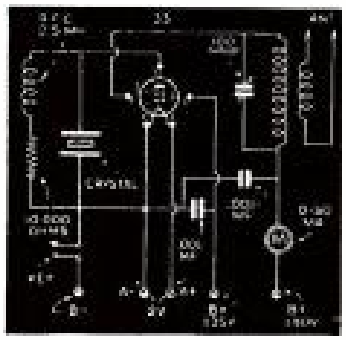
Easy - to - build Short - Wave Transmitters

1-TUBE CRYSTAL XMITTER

Leland Fossen, Terris, Minn.

(Q) Is it possible to construct a low-powered transmitter using a 33 tube and a crystal? This is to be used for C. W. operation on the amateur bands. If such an arrangement is practicable kindly print the diagram in the *Question Box*.

(A) If you live in a rural district where A.C. is not available, the low-powered crystal transmitter such as shown in the diagram



Simplest transmitter.

should work out very nicely. On the 80 and 40-meter bands, of course, you will have to contend with the higher powered stations, but in the early hours of the morning when few are on and during the day, DX may be quite easily accomplished. With the new 20-meter crystals now being available, operation on 20 meters with a 1-tube crystal controlled transmitter proves very satisfactory.

SIMPLE 6L6 TRANSMITTER

Frank Little, Jr., Greybull, Wyo.

(Q.) I would like to use a single 6L6 transmitter, crystal controlled, of course. Will you please print the diagram together with values of the parts.

(A.) We have shown the conventional circuit employing the beam type tube. It is keyed in the cathode circuit and it becomes necessary to employ a voltage divider to obtain screen voltage. Do not use a single series dropping resistor for screen voltage when keying the oscillator.

LICENSE FOR 5 METERS?

Ed. Douglas, Cincinnati, Ohio

(Q) I am under the impression that a license is not needed for 5-meter transmission.

(A) As we have said over and over again, a license is necessary to operate *any* type of transmitter.

160-METER TRANSMITTER

Sam Tarantino, Chicago, Ill.

(Q.) I would like to build a small transmitter, something fairly simple with an output of around 15 to 20 watts. This should be crystal control and operated on 160 meters. Would you be kind enough to print the necessary details together with coil data.

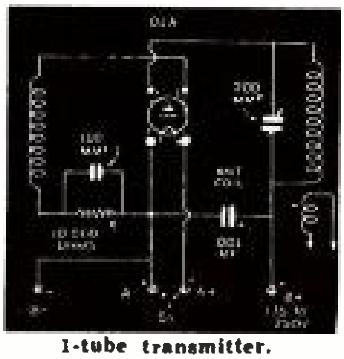
(A.) In the diagram we have shown a 41 pentode crystal oscillator and a 6L6 beam tube amplifier. Various types of tubes may be employed in the final amplifier as well as the oscillator. For instance the 6F6, 6V6G, or the 42 may be substituted for the 41. The 6L6G, 807 or RK39 may be substituted for the 6L6 amplifier. The oscillator plate coil L1 should be wound on a ½" diameter form and consists of 50 turns of No. 24 wire close wound, and tapped at ⅓ the total number of turns from the B end. L2 should be identical to L1. The antenna coil L3, will depend upon the particular antenna system employed.

1-TUBE TRANSMITTER USING 01A

Bud Brady, Seneca, Mo.

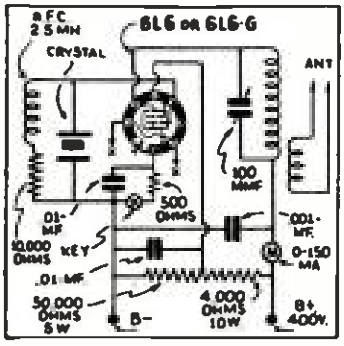
(Q) I would like to build a transmitter using a type 201A tube. Will you be kind enough to print a simple diagram?

(A) We are showing the circuit diagram of a T.N.T. oscillator using an 01A tube. Remember, of course, that a license is necessary in order to operate *any* type of transmitter. Many of the uninitiated are under the impression that

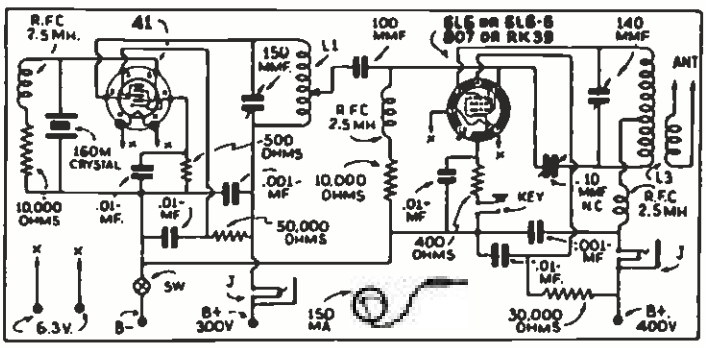


1-tube transmitter.

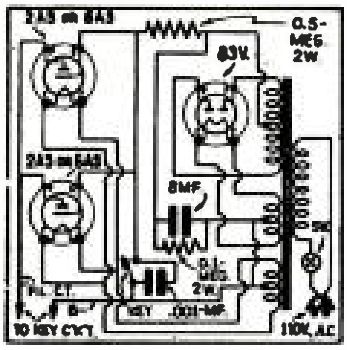
for very low power a license is not necessary. As we have stated many times, this is not true, and we endeavor to discourage our readers in entertaining any such idea that it may be permissable to operate a very low-powered transmitter without a license.



6L6 Transmitter



160-Meter M.O.P.A.

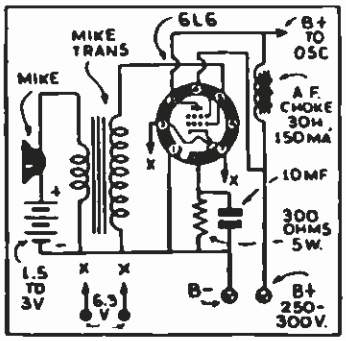


ELECTRONIC KEYING

Paul Robinson, San Francisco, Calif.

(Q.) I am interested in a really *fool-proof* method of eliminating key-clicks in a transmitter; I have heard much of the electronic method of keying. Would you kindly print what you feel would be the most suitable arrangement.

(A.) Electronic or vacuum tube keying works out exceptionally well and in most cases key clicks are entirely absent. The method shown makes use of 2 type A3 triodes connected in parallel. We suggest building this into a complete separate unit employing its own power-supply, and we have shown the complete diagram. The two leads marked "to key circuit" connect as shown in the diagram; this method is used when keying is employed in the cathode or filament return lead. When the key is closed, the grids are at zero potential, permitting the tubes to pass current and turn the transmitter on. When the key is open, bias is applied to the grids through the ½ meg. 2-watt resistor. The output voltage of the transformer-rectifier system should be approximately 400 volts for use with small transmitters. Remember that the voltage drop across this keying circuit forms a grid bias for your keyed stage. Therefore, the external bias which is employed should be cut down. If a grid-leak is used, its size should be reduced until the grid current of the keyed amplifier reaches the same value as before the new keying system was installed. The plate current will be slightly less than without the keying tubes, because in reality the tubes are in series with the B circuit. The voltage drop across the keying tubes should be subtracted from the plate supply voltage in order to determine the voltage being applied to the amplifier.



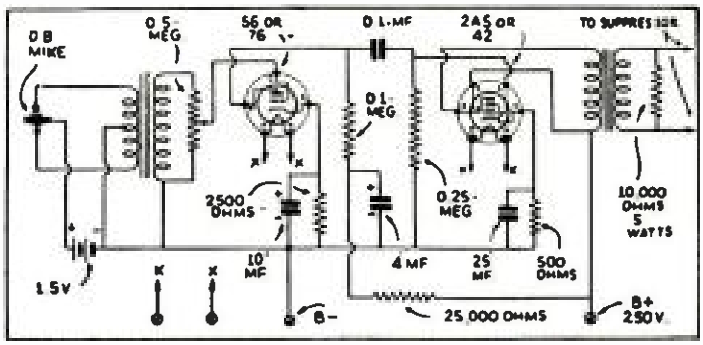
Modulator

1-TUBE MODULATOR

Francis Monahan, Nashville, Tenn.

(Q) Kindly print in the Question Box a diagram of a 1-tube modulator for a 5 meter oscillator. I understand that a single 6L6 tube may be employed satisfactorily.

(A) We have shown a diagram using a single 6L6. The output of this modulator will be approximately 7 watts and will modulate an oscillator having an input of 14 or 15 watts. A sensitive, single-button carbon microphone should be used.

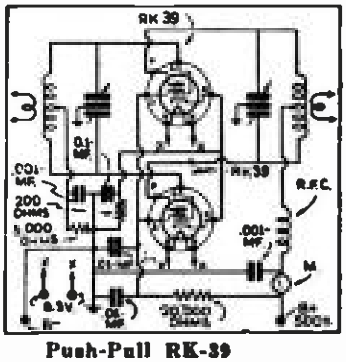


Suppressor Grid Modulator

RK-39's IN PUSH-PULL

David Kreismann, New York City.

(Q.) I am interested in a push-pull R.F. amplifier for an all-band transmitter. This amplifier should have approximately 50-watts output and be of very simple construction. Will you kindly provide the necessary advice through your *Question Box*.



Push-Pull RK-39

(A.) The new beam-type screen-grid tube offers the simplest type of R.F. amplifier. Inasmuch as neutralization is not needed and very little excitation or driving power is required. Two of the RK-39's or 807's will provide an output of at least 50 watts, and the excitation requirement will be low enough so that any type of oscillator, even though using receiving type tubes, will be sufficient. Link coupling is shown in both the input and output circuits; however, any conventional method may be employed.

LICENSE NEEDED

Nearly every mail brings a request from someone desiring to know whether a license is needed for this or that particular type of transmitter. For instance, a number of inquiries have been received from persons wishing to perform feats of magic on the stage or before a gathering of friends.

Regardless of whether the transmitter is used to cover a distance of a few feet, or a distance of a thousand miles, a license is necessary.

SUPPRESSOR GRID MODULATOR

Alfred Winton, Pawtucket, R.I.

(Q.) I am using a RK-20 in the final amplifier of my transmitter and have been using it for CW operation. I now desire to switch over to phone and would like to have data on a suitable modulator which can be used in conjunction with a double-button carbon microphone. Of course, I intend to use suppressor grid modulation.

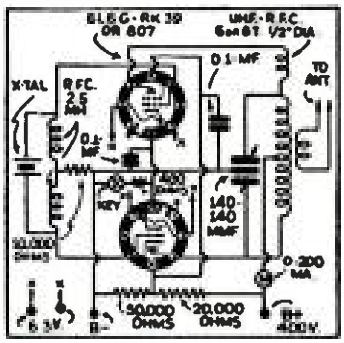
(A.) We have shown the diagram of a two-stage amplifier consisting of a triode and pentode. Either the 2.5 or 6.3 volt type tubes may be employed, and of course either metal or glass tubes may be used. In the input-circuit of the triode we have a *gain control* as this is quite necessary, in order to obtain proper percentage of modulation. The output transformer is one designed to match a pentode into a suppressor grid. These are readily obtainable from any radio supply house.

"PUSH-PULL" BEAM-TUBE TRANSMITTER

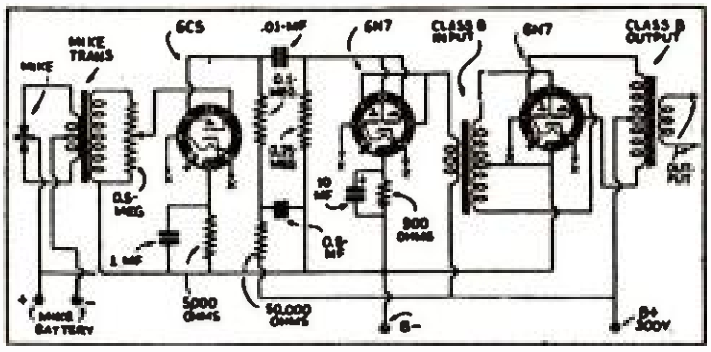
Roger Parsons, Massillon, Ohio.

(Q.) I would like to build a simple crystal control transmitter using two beam tubes. Would you be kind enough to show the diagram of such a transmitter.

(A.) If only one-band operation is desired with a single crystal, the most efficient arrangement would be one employing two tubes in push-pull. It should be comparatively easy to obtain 40 or 50 watts from such a transmitter. In some cases there may be a tendency toward high-frequency parasitic oscillation and therefore we recommend a 6 or 8 turn coil be placed in series with one of the plate leads. While this coil will not affect the circuit appreciably, it will in a majority of cases eliminate all tendencies toward ultra high frequency oscillation.



Simple Transmitter



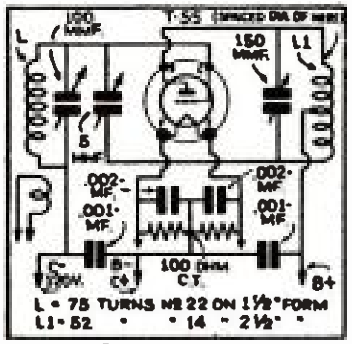
Low Power Modulation

LOW-POWER MODULATOR

Richard Gulatai, Jr., Mt. Vernon, N.Y.

(Q.) Kindly print in the coming issue of the Question Box a diagram of a suitable modulator for the "W2AMN 5-Meter Mopa" described in the September, 1936, issue of *Short Wave & Television*. A double-button carbon microphone will be used, so please show input connections for this mike. This modulator should have an audio output of at least 18 watts. I leave the choice of tubes to you.

(A.) We have shown a diagram of a simple modulator which may be used with the "5-Meter Mopa." This modulator will have an output of slightly over 10 watts and will be thoroughly capable of modulating the 5-meter transmitter. All metal tubes are used. The design of the amplifier is extremely simple; its cost should be quite nominal. The gain control is located in the first tube, this control should be adjusted for best quality as indicated by the sound of the transmitted signal. The output winding of the class "B" transformer should be designed to work into an impedance of approximately 6,000 ohms, although anywhere from 5,000 to 6,000 ohms will work satisfactorily.



A Single-Ended Amplifier using a T-55 Link Coupling is shown.

T-55 AMPLIFIER

John Novel, Cincinnati, Ohio.

(Q) I would like to build an amplifier for my 160 meter transmitter, employing a Taylor T-55 tube. The tube is to be used with the maximum 1500 volts on the plate. As I do not have data on this particular tube, I would like you to print the diagram showing the tuning capacities and the coil data.

(A) We have shown the diagram of the single T-55 in a plate neutralized amplifier. The amplifier should be link coupled to the driving stage. Data for the coils will be found in the drawing

TUNING TRANSMITTER

R. Johnson, New York City, N. Y.

(Q) Would you kindly explain the procedure for tuning a crystal-controlled MOPA transmitter, including neutralization; some simple method which can be easily followed and is sure to work out properly.

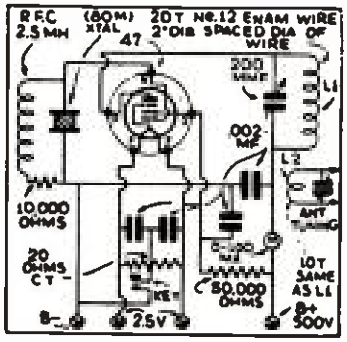
(A.) Assuming a transmitter to have a 47 pentode crystal-controlled oscillator and a 210 amplifier, the proper procedure would be (with the filaments already heated) to apply plate voltage to the oscillator only. Rotate the oscillator tuning dial until a dip occurs in the plate current. The condenser should be set slightly toward the low capacity side of this dip, we assume here also that grid-leak bias is employed in the 47 circuit. The next procedure is to measure the grid current in the final amplifier, without the plate voltage applied, but with the keying circuits closed. If capacity coupling is employed between the output of the oscillator and the grid of the amplifier, the grid current would be already heated) to apply plate voltage to the oscillator only. Rotate the oscillator tuning dial until a dip occurs in the plate current. The condenser should be set slightly toward the low capacity side of this dip, we assume here also that grid-leak bias is employed in the 47 circuit. The next procedure is to measure the grid current in the final amplifier, without the plate voltage applied, but with the keying circuits closed. If capacity coupling is employed between the output of the oscillator and the grid of the amplifier, the grid current would be already indicated by the meter, however, if link coupling is employed then the amplifier grid condenser should be adjusted for maximum grid current. If at this point the oscillator plate current rises too high or the oscillator stops functioning, coupling should be reduced by spacing the link coil farther away from either the grid or plate coil. In the case of capacity coupling the connection from the oscillator to the amplifier should be at a point ⅓ the total number of turns from the B+ or cold end of the oscillator plate coil. For neutralising merely rotate the amplifier tank condenser until a change in grid current is noted. Then adjust the neutralizing condenser, starting at minimum capacity, until the amplifier condenser can be tuned to resonance

1-TUBE XTAL TRANSMITTER

Bob Langley, Larkspur, Calif.

(Q) I would like to build a 1-tube crystal controlled transmitter using a type 10 tube. Would this be suitable for CW operation on the 80-meter band? Please print the diagram if it will work out o.k.

(A) We recommend that you use a 47 in place of the 10; although this is a receiving tube and considerably lower priced than a 10, it will make a very much better oscillator. The diagram is shown together with all data which are necessary for operation on the 80-meter band. The crystal, of course, would be resonant in that band.



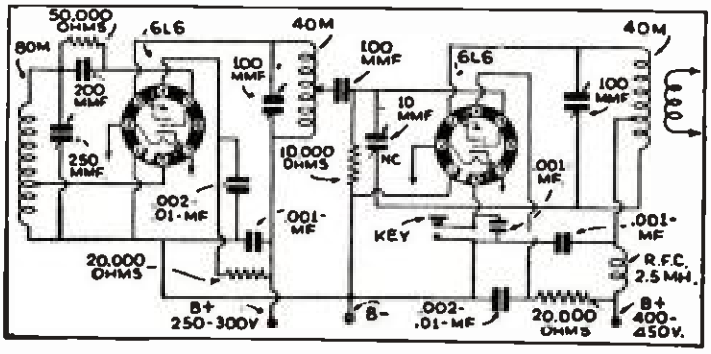
1-Tube xtal transmitter

6L6 MOPA FOR C.W.

W11YM, Fairfield, Conn.

(Q) Please print a circuit in your *Question Box* of a MOPA utilising the new 6L6 metal tubes. The oscillator must be electron-coupled as an xtal is not available. I would appreciate this data and any further information you could give me regarding a 6L6 as E.C. oscillator, or what have you, will be appreciated.

(A) Although we encourage the use of crystal-controlled transmitters for the C.W. bands, we are complying with your request and showing a 6L6 MOPA employing two tubes. In all cases, the oscillator should be used as a combination oscillator and doubler. Results will not be satisfactory if the plate and grid circuits are tuned to the same frequency in the oscillator stage. We have indicated, as an example, the grid circuit tuned to 80 meters, the plate circuit to 40, and the final amplifier to 40. We have also shown a neutralizing circuit in the final amplifier. In most cases, this has not been found necessary but may be incorporated as a precautionary measure, by tapping the B plus on the plate coil approximately 1/4 of the total number of turns.

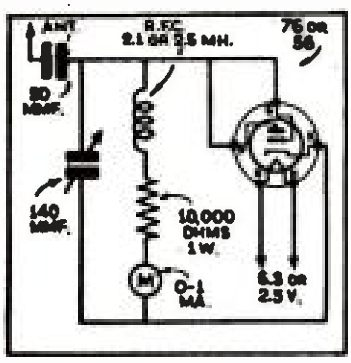


6L6 MOPA for C.W. transmission.

CARRIER SHIFT METER

Edward Anderson, Springfield, Mass.

(Q) I would like to build an instrument to check my phone transmitter. I want to make sure that there is no *carrier shift* or *over-modulation* present. Would you please print the necessary diagram in the *Question Box*.



Carrier Shift Indicator.

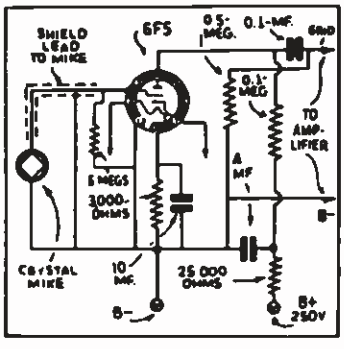
(A) We have shown a diagram of a suitable checking instrument for indicating over-modulation or frequency modulation. The method of operation is very simple. Place the wire "A" in a position so that it will pick up R.F. from the antenna of the transmitter. The meter M, will show some reading, the value depending upon the coupling between the wire "A" and the transmitter. During modulation no change in the meter reading should be noticeable. A variation in the reading will indicate frequency shift or over-modulation. This instrument can also be used for tuning the transmitter, the highest reading of the meter indicating the greatest amount of output.

PRE-AMPLIFIER FOR MICROPHONE

Joseph Cameron, Fort Worth, Tex.

(Q.) I have an audio amplifier which is designed for the usual carbon microphone. For better quality I intend to use a crystal microphone and find that I must increase the amplification in order to obtain proper results.

(A.) We have shown the diagram of a single resistance coupled amplifier stage which may be coupled to the grid circuit of your present amplifier. Of course, if a mike transformer is already incorporated in the amplifier this will have to be disconnected.



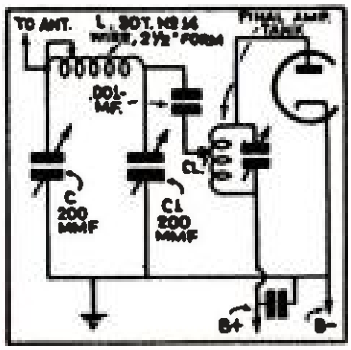
Pre-Amplifier for Crystal Microphone

SINGLE WIRE ANTENNA

Harry Prescott, Indianapolis, Ind.

(Q) I live in a dwelling which will not permit the erection of a conventional antenna system and can at best only erect a small antenna consisting of a single wire around 40 or 50 feet long. Will you please illustrate in your *Question Box* just how this might be used as a transmitting antenna.

(A) We have shown the familiar impedance matching network consisting of a coil and 2 condensers. The method of adjusting is quite simple if you follow instructions. For instance, the amplifier tuning condenser should be adjusted to resonance as indicated by a minimum of plate current with the antenna clip "CL" disconnected. After this is done attach the clip to the final amplifier tank coil about ⅝-way from the cold end. With condenser C set about mid-scale, adjust condenser C1 for minimum plate current of the amplifier. If the plate current is too high or too low, re-adjust condensers C and C1.



Matching Network for Single Wire Antenna.

The last adjustment should be made with C1 for the lowest plate current which indicates resonance. The final amplifier tuning condenser should not be touched after the first adjustment.

RADIO LAWS

K. Mori, Sanger, Calif.

(Q.) The rule No. 380 states—An amateur radio station shall not be located upon premises controlled by an alien. This is the rule which appeared on the F. C. C. pamphlet; regarding this rule, is it lawful to buy a premise of my own from an alien and build a station on it, or is it lawful to build a station on a premise of a citizen?

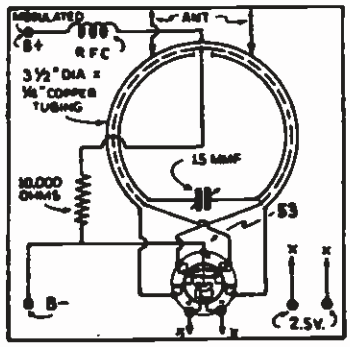
(A.) You practically answered you own question when you stated that you're buying premises from an alien. Although we are not lawyers, we believe that so long as you, being a citizen, remain in control of the property, and being the rightful owner, that the alien proposition is no longer considered. We imagine the law refers to cases wherein aliens own the property or have a controlling interest in it in the form of a lease which would, of course, violate rule No. 380.

UNITY-COUPLED OSCILLATOR

Cornelius Sarosdy, Pittsburgh, Pa.

(Q.) I have on hand the type 53 tube and would like to construct a unity-coupled oscillator. I would greatly appreciate your printing the diagram together with the values. This is for 5 meter operation.

(A.) The popular unity-coupled



Simple Oscillator

oscillator diagram is shown. This is one of the easiest oscillators to get going that anyone can choose. The large coil is a single turned affair, 3½" in diameter. It is constructed of ¼" copper tubing. The grid coil is threaded inside this copper tube and the grid return lead is taken from the center of the grid coil through a hole filed in the copper tubing. Make sure the grid wire of one tube enters the copper coil at the plate terminal of the other tube. This cross-over connection is necessary for proper operation. No power supply diagram or modulator unit is shown; these can be found in past issues of the Question Box.

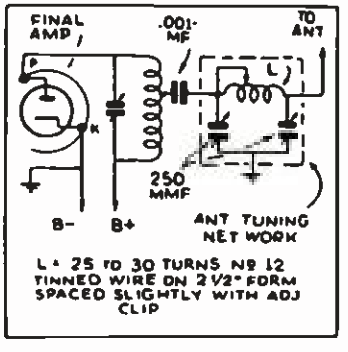
ANTENNA NETWORK

Buddy Yerkow, New York, N.Y.

(Q) I would like to have information on an antenna coupling arrangement which may be used to couple any antenna to a transmitter. I understand this eliminates the necessity of putting up a special aerial.

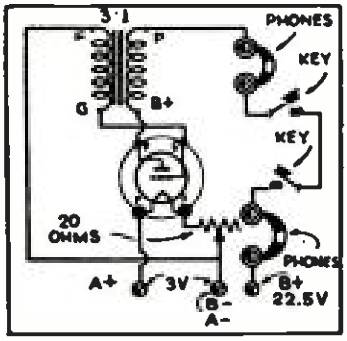
(A) It is quite true that with the impedence matching network, shown in the diagram, any type of antenna may be coupled to a transmitter and a fairly efficient match obtained. However, better results may be experienced if a conventional antenna is used in conjunction with this network.

For push-pull amplifier circuits two coils will be used with the condensers in the same positions. By using the two coil arrangement with the push-pull stage, it is much easier to feed antennas with two wire R.F. transmission lines or feeders such as the Zeppelin or 2-wire matched impedance coil. With the two-coil method, the condensers may have split stators with the rotors grounded.



Antenna-matching "network for the "Ham."

Code Practice Oscillators



Code Set

2-WAY CODE PRACTICE SET

Edward Kuiwitz, Chicago, Ill.

(Q) I would like to construct a code practice set which can be used in the same manner as the regular telegraph circuits, 2-way communication with "break-in."

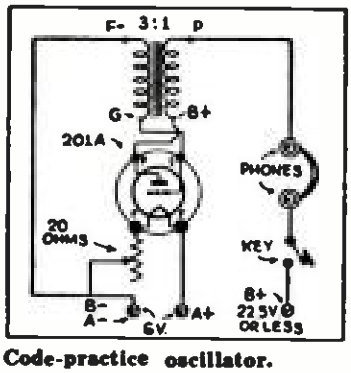
(A) We have shown a diagram using a conventional one-tube audio oscillator. By employing two sets of earphones and two keys, two-way communication and break-in may be had. The operator *standing by* should *close* his key, the message will then be heard by both operators. Should the operator *standing by* wish to *break* the other operator, it is only necessary to open his key, then nothing will be heard in either set of earphones and the transmitting operator will know that the receiving operator has opened the circuit in order to *break* him.

"CODE-PRACTICE" OSCILLATOR

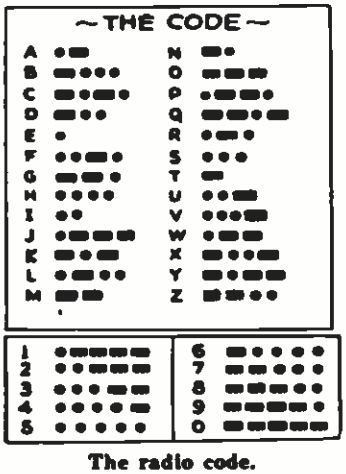
Thomas O'Connell, Chicago, Ill.

(Q) I would appreciate it very much if you would print a diagram of a *code-practice* oscillator using a 201A, an audio transformer and a rheostat to control the pitch.

(A) We constantly receive requests for diagrams of *code-practice* oscillators, and we trust the one shown will satisfy the great number of inquiries. Any type tube may be used. For type 30, for instance, the filament voltage should be 8 volts and adjusted to the proper value by the rheostat. Adjustment of this rheostat will also change the tone to a considerable extent.



Code-practice oscillator.

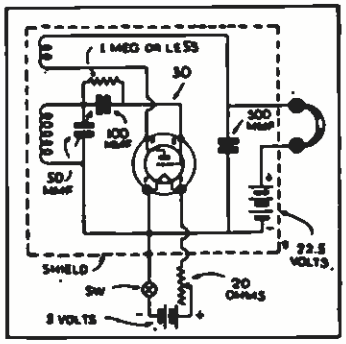


The radio code.

SIMPLE MONITOR

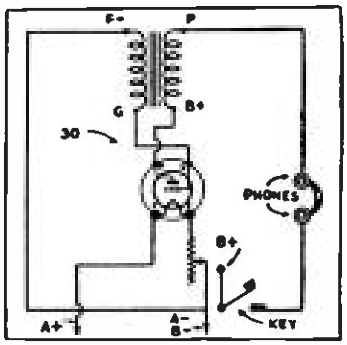
John Evans, Nome, Alaska.

(Q) I would like to build a simple monitor in order to check my CW signals. Would you be kind enough to print the diagram in your *Question Box*? I would like to have this self-contained in a metal can.



Here is a simple Monitor circuit, using a single 30 tube.

(A) The conventional type 30 monitor diagram is shown. The batteries, together with the tube, and other circuit components, are housed in a metal shielded can.



Code-practice oscillator.

CODE PRACTICE

John Sulimowicz, Philadelphia, Pa.

(Q) Recently I had plans for building a code-practice oscillator using a type 30 tube. After obtaining the necessary parts, I find that I have misplaced the diagram.

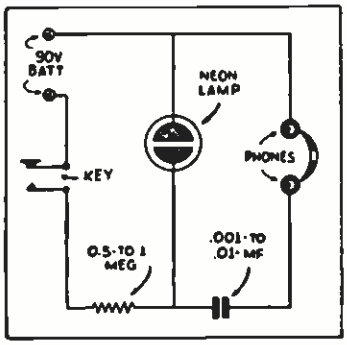
(A) We have had a number of requests for a code practice oscillator diagram and the one shown is the old standby. It consists of a type 30 tube and an audio transformer.

NEON CODE OSCILLATOR

John Kveton, New York, N.Y.

(Q) I would like to know how to construct a Neon tube oscillator for learning the code. Will you please show the diagram and values of the various parts in a coming issue of the *Question Box*.

(A) The Neon tube oscillator is quite economical, inasmuch as the only requirement is a high-voltage supply. In the diagram we have shown the method of connecting it. The value of the resistor and condenser greatly effect the tone heard in the earphones. Choose the values which give the most pleasing tone.



A Neon tube may be used to make the "code practice" oscillator shown above.

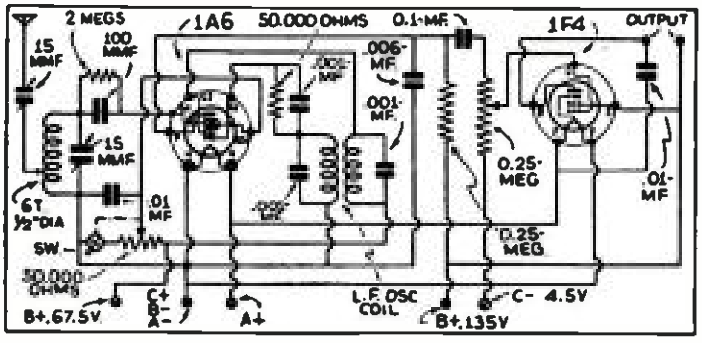
5 - Meter Receivers

PORTABLE 5-METER RECEIVER

Kenneth Richfield, Olympia, Wash.

(Q.) I would like to build a portable 5-meter receiver using 2 tubes, something that will give fairly good results and still not be too complicated. I would like to use a 1A6 and a 1F4. Kindly print the diagram showing the values of parts.

(A.) We have shown the diagram of the simple super-regenerator, employing an 1A6 combination high frequency oscillator. The output of this arrangement should be sufficient to operate a small speaker, if one is desired. For earphone operation a volume control must be employed. This has been shown in the diagram. Some juggling of the grid coil may be necessary in order to place the tuning range of the receiver in the 5-meter band; this can be accomplished by merely compressing or spreading the turns.



Ultra Short-Wave Receiver

BEST SET FOR FIVE METERS

V. J. Pilvelatis, Cambridge, Mass.

(Q) I would like to know if it is possible to use a straight regenerative receiver for 5 meter operation. If so, will satisfactory results be obtained.

(A) In the early stages of 5 meter radio straight regenerative receivers were used but were replaced by the super-regenerator because of the greater stability. A straight regenerative detector is not recommended for five meters.

WHAT VOLTAGE CONDENSERS?

Joe Bononi, Greensburg, Pa.

(Q) I have three 8 mf. electrolytic condensers rated at 450 volts each. I would like to know if I could use a 700-volt center-tapped transformer with these condensers. Also, should the filter chokes be mounted at right-angles to each other?

(A) With a 15,000 ohm bleeder resistor on the output of your power supply, the 450-volt condensers should work satisfactorily. It might be advisable to use *choke input* to the filter rather than condenser input. It is not necessary to mount the chokes at right angles to each other.

5 METER RECEIVER

William L. Cox, Youngstown, Ohio.

(Q) Would you please print in the Question Box a diagram of a 5-meter super-regenerator using a 56 detector, a 56 first stage of audio, and a 2A5 pentode output amplifier. Regeneration is to be controlled with a potentiometer.

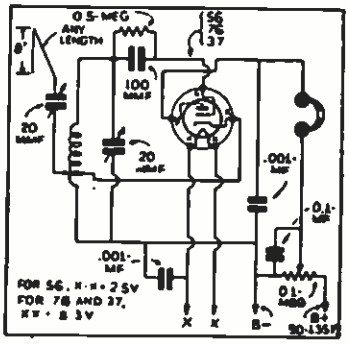
(A) We have shown the famous 56-2A5, 5 meter receiver and have omitted the 56 audio amplifier as it has been found entirely unnecessary because enough volume can be obtained with the single 2A5. We have shown a 500,000 ohm potentiometer in the grid circuit of the 2A5 for A.F. gain control. This will be found very useful.

1-TUBE 5-METER RECEIVER

Jack Carberry, Buffalo, N.Y.

(Q) I have heard much of the 56-U.S.W. receiver and would like you to print a diagram of the detector which could be used as a 1-tube, 5-meter set.

(A) We are showing the diagram of a 56 super-regenerative detector as requested.



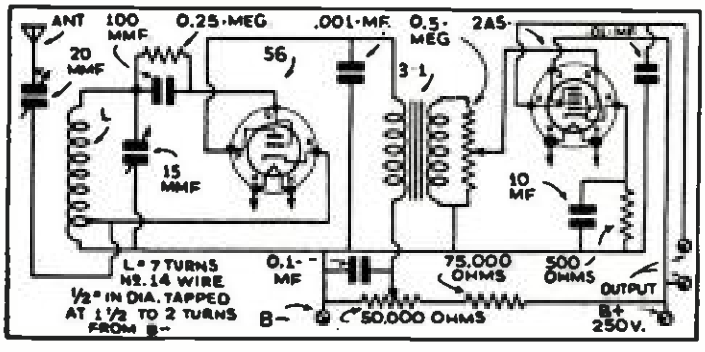
Hookup above shows a 5-meter receiver, using a 56 or equivalent type tube.

BEST SET FOR FIVE METERS

V. J. Pilvelatis, Cambridge, Mass.

(Q) I would like to know if it is possible to use a straight regenerative receiver for 5 meter operation. If so, will satisfactory results be obtained.

(A) In the early stages of 5 meter radio straight regenerative receivers were used but were replaced by the super-regenerator because of the greater stability. A straight regenerative detector is not recommended for five meters.

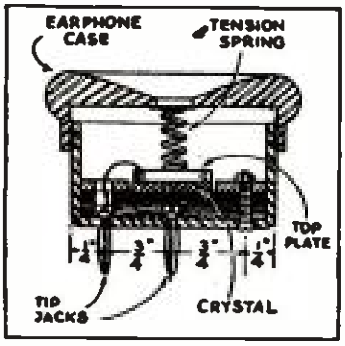


One of the Best Five Meter Receivers

"HAM" KINKS

CRYSTAL HOLDER FROM EARPHONE

Recently, needing a crystal holder, I constructed one from an old earphone casing. It is only necessary to remove the "works" from the earphone and follow the suggestions set forth in the drawing. The electrodes of the holder must be ground perfectly even on a glass base, using carborundum as the abrasive.—Bob Miller.



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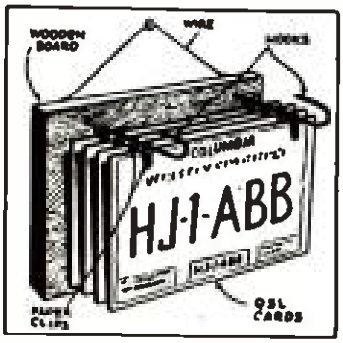
MOUNTING-RACK FOR VERIS

Providing a place for the great number of "veri" cards received has always presented quite a problem. Also, a number of good suggestions have been given in your "Kink" Department. Mine consists of a neatly finished board, shaped as shown in the drawing, with two large hooks. On these hooks I have placed a number of ordinary paper clips which are used to support the veri cards. At any time a card may be removed without disturbing the entire group. This idea has worked very satisfactory and I am passing it along to other readers of the "Kink" page.—Frank Stein, Jr.



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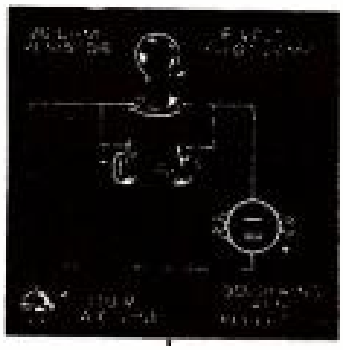
SOLDERING IRON "PILOT"

I have originated a simple reminder for turning off my soldering iron. All that is necessary is to connect a 6-volt pilot lamp to your iron. A 20-ohm rheostat is connected between one side of the line and one side of the iron receptacle. A 6-volt pilot lamp is shunted across the resistor. —Robert F. Shugart, Jr.



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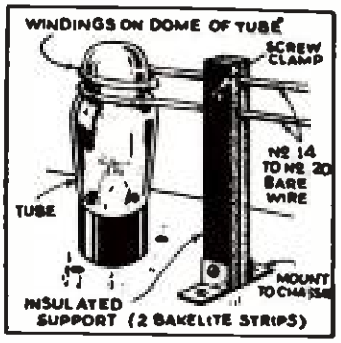


5 METER KINK

Antenna coupling to the super-regenerative receiver must be properly made in order to realize the greatest volume in signal strength. Experiments along this line led me to try to couple the antenna to the receiver by wrapping turns around the dome of the tube. The number of turns may be one or more, depending upon the amount of coupling desired. The sketch should be self-explanatory.—Harold J. Clark.

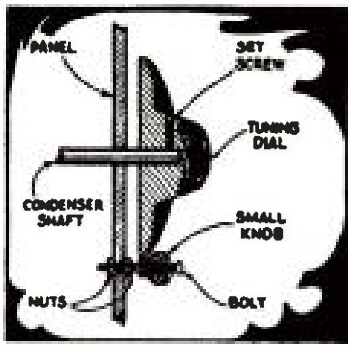
▼ ▼ ▼

COIL HINT

After much difficulty in constructing plug-in coils, I found that it is far easier to use a separate piece of wire to thread the coil lead through the prong. In most cases it is almost impossible to get the fingers into a coil form.—Robert C. Mear.

VERNIER FOR S-W SET

Vernier tuning may be easily installed on a receiver equipped with a large circular tuning dial. By running a bolt through a small knob, as shown in the diagram (a cork works out very well for this purpose), and fasten it to the panel beside the large dial so that the knob will bear firmly against the edge of the dial.—Keith Wright.



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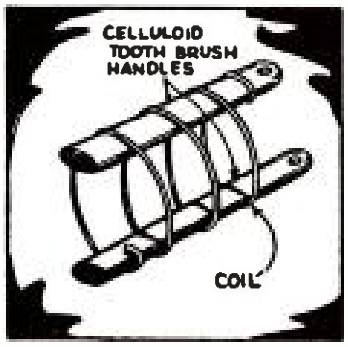
NEW USE FOR TOOTH-BRUSH

In building a low-loss plate tank coil for my transmitter, I encountered difficulty in procuring material for the celluloid strips which support the coil. Finally, I decided to use the celluloid tooth-brush handle which served the purpose excellently. I used celluloid to secure the wire to the celluloid and after construction, this made a very nice-looking piece of apparatus. If the tooth-brush is bent it may be straightened by soaking in hot water until pliable, then left to cool between weighted flat surfaces. —Sidney Slotnick.



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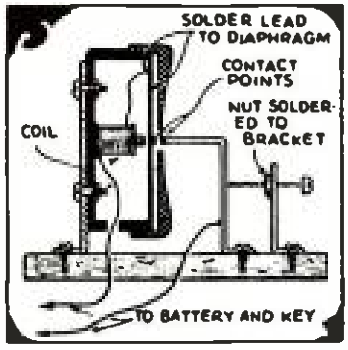
REDUCING TUNABLE HUM

I was troubled with a low-frequency hum of great intensity of the tunable beam variety in my receiver. This only occurred between 40 and 80-meters. I had tried everything I could think of to eliminate this difficulty, and finally overcame it by connecting two by-pass condensers across the power line and grounding the center connection, as shown in the diagram. This worked out remarkably well and for those who cannot eliminate the trouble by the usual methods should find this one satisfactory.—Don Lively.

HOME-MADE HIGH-FREQUENCY BUZZER

A high-frequency buzzer can be easily made from an old earphone and a few scrap parts. The earphone is mounted in a vertical position with a very heavy bracket. A contact point is soldered to the diaphragm. The other contact point is mounted on another bracket in front of the earphone. Directly behind this bracket is another, in which there is a bolt to adjust the pitch of the buzzer. To insure the best results the buzzer must be made very substantially and the diaphragm kept as light as possible. The tone closely resembles that of the buzzers on the market.—Gerald Huntzinger.



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ASHTRAY HOLDER

I believe this kink will solve the amateurs' problem as far as holders for soldering irons are concerned. I just rest my iron on an ashtray as the illustration indicates. Needless to say a glass or metal ashtray should be used; composition rubber and other inflammable materials will not stand the heat of the iron.—Sanford Hershfield.

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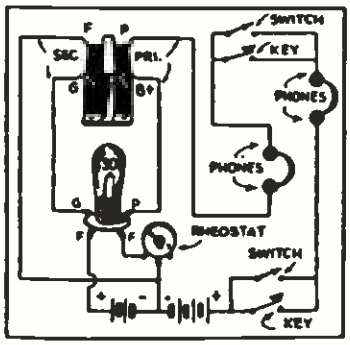
DUAL CODE PRACTICE SET

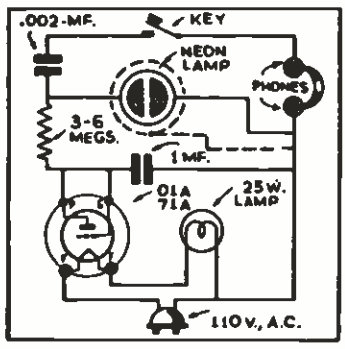
It is much easier to learn the code if you are communicating with some one. I have arranged this by connecting two keys and



two pair of phones with one oscillator, as shown in the diagram. Break-in system is used the same as in the telegraph circuits. One key must be closed in order that the system may function. If the sending operator makes a mistake, or if you miss a word, merely open the key and the line goes "dead." Not hearing the tone in the phones, he will inquire as to the error.—Vernon Clark.

ELECTRIC CODE SET

As I haven't seen an A.C. Neon Code Oscillator published here yet, I am submitting the following circuit with the hopes that it will be accepted. The diagram is self-explanatory. It might be added, however, that if the tone is "fuzzy" it is advisable to reverse the line plug if the tone still has a slight ripple, wind one turn of insulated wire around the top of the neon tube, connected as shown by the dotted line, should solve this difficulty. I mounted my outfit on a piece of ply-wood 5 x 11", and therefore assume that the slight ripple in the tone, without the neutralizing wire, is due to the close proximity of the 25 watt bulb. The power-plant and neon may be covered by a square tin, leaving only the phone clips and key exposed. —Herbert R. Roach.



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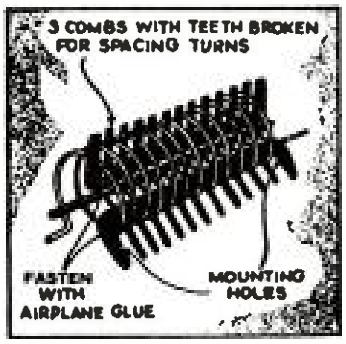
COIL MOUNTING

This is my favorite kink. To make this kink you obtain three combs which you think will fit your transmitting coil. In this case, I broke every other pin and the coil plus combs fitted perfectly. To hold the combs in place, I used airplane glue. To mount the coil in my case I used "stand-off" which looks like this. The comb of course is a natural insulator for the coil.—Thomas Bailey.



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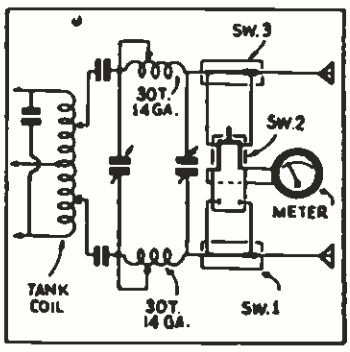
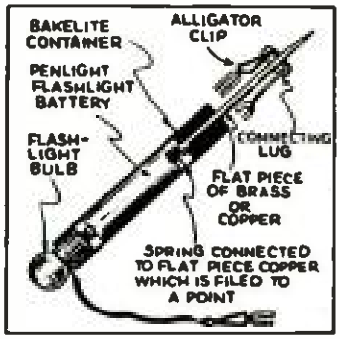
R. F. METER SWITCH

For those who cannot afford to have on hand two meters for measuring current in the feeder system of the antenna, I offer the following kink. A single pole single-throw switch is employed in each leg of the feeder system, and across each of these switches are leads running to a double-pole, double-throw switch.
—F. R. Harlow.



UNIVERSAL PROD

I found this kink very valuable to me when I wanted to make different tests quickly. The picture of the test prod will explain the construction of it. This prod can be used in any test with the alligator clip, the connecting lug or the pin which may be opened, used, then folded away so that something else can be used.—Edward Podgorski.



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NEW CLOCK IDEA

As you know, most all magazines give schedules of programs in Eastern standard time only. So here is an idea! Just add an extra hand to your present clock, a piece of black wire or anything handy will do, then set it to the zone you live in. Example:—If 5 p.m. P.S.T. set extra hand three hours ahead and it will be 8 p.m. E.S.T. Both hour hands should be soldered together. In this way you don't have to guess at the time the program will be on or look at the clock twice.—Herold A. Vance.

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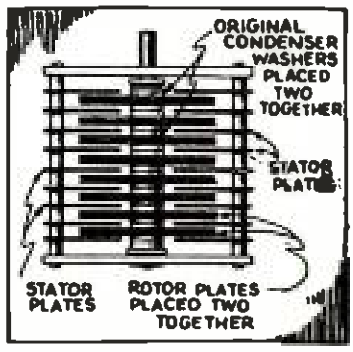
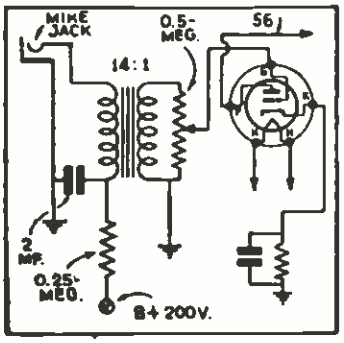
FOR BETTER DOUBLE-SPACING

Ordinarily, when a variable condenser is double-spaced, one has great difficulty in centering the rotor in relation to the stator plates. A great deal of time is spent procuring washers, etc., to space the stator plates so the rotor will center. Sometimes the un-used rotor plates are laboriously cut and filed into the shape of a washer for this use. All the trouble and labor can be saved by simply not discarding the unused rotor plates, but utilizing the extra rotor plates by placing them two together. The accompanying diagram will show this clearly.—Floyd R. Penning, W8FOF.



MIKE CURRENT FROM PLATE SUPPLY

Many readers will be interested in learning the method I use to obtain mike current directly from my power-supply. The method is very simple. A 250,000 ohm resistor is connected in series with the B plus and mike. The other side of the mike is grounded. The 2 m.f. by-pass condensers shown in the drawing, together with the resistor, insures a minimum of

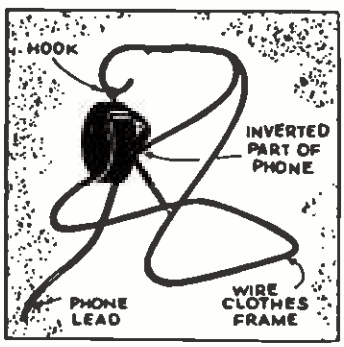


hum. The mike current in this case will be approximately 1 ma., depending of course upon the resistance of the microphone.—George Wadey.

▼ ▼ ▼

MIKE STAND

My kink is a single-button mike taken from a French phone. First take the mike out of its two shells. The one which was on the front of the mike is inverted and four holes are drilled to hold screws so that it may be mounted on a frame of some kind. The frame which I am using at the present time is a steel clothing hanger bent so that the mike can be mounted on it. Refer to the drawing for further details.—Howard Millar.



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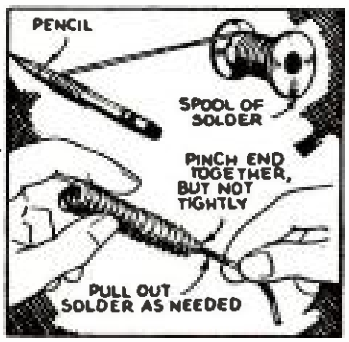
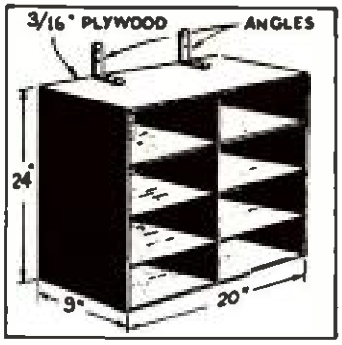
A GREAT IDEA FOR SOLDER

I am sure that the following idea will be found useful by amateurs, experimenters and servicemen. You proceed by obtaining a ¼-inch rod or lead pencil and winding the wire solder to whatever length you want the handle; then pull the solder off the rod. Push one end of the solder inside the coil. With a pair of pliers clamp the other end around the straight piece of solder and it is finished. Draw the solder out as you use it.—Elbert Cline.





A PLACE FOR THOSE LOOSE PARTS

I have constructed three of these and have them hanging on the walls in convenient places. Drawers may be fitted to these but are not necessary.—Philip Greco.

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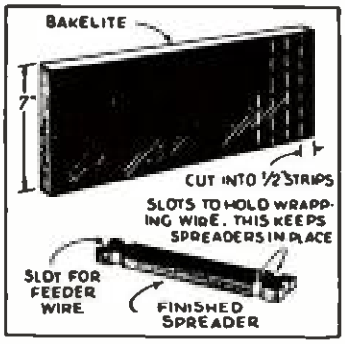

ANTENNA SPREADERS

I made a number of antenna feeder spreaders from an old bakelite panel by connecting ½ in. strips and shaping the ends in the manner shown in the drawing. The main advantage of this type of spreader, of course, is in its light weight and good insulating qualities. Bakelite stands the weather much better than hard rubber.—L. Casto.

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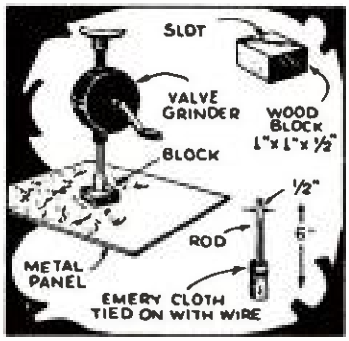


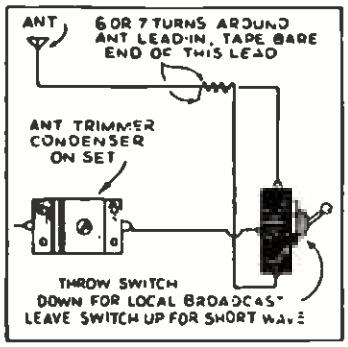
ATTRACTIVE PANEL FINISH

I use a valve grinding machine. By cutting a slot into a square block of wood and gluing a small piece of cloth to the bottom of the wood, the "whirl effect" can be accomplished in a few moments.—John Wentworth.

▼ ▼ ▼

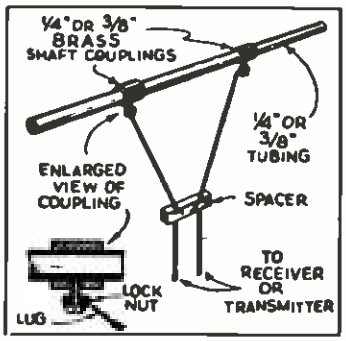
ANTENNA SWITCH

It is well known that the average short-wave receiver of the regenerative type is not selective enough to cope with the crowded conditions in the broadcast band; especially when operated in the vicinity of strong local stations. This difficulty is overcome in many cases by the simple kink shown in the drawing. The idea, of course, is to employ extremely loose antenna coupling on the broadcast band and the conventional capacitive coupling on the short-waves. For the broadcast-band the switch is thrown in such a position that the 6 or 7 turns of insulated wire wrapped around the antenna lead from the coupling capacity, which is in series with the regular antenna condenser. When the switch is thrown in the other position, the antenna is connected directly to the usual trimmer.—Joseph Ray.



5-METER ANTENNA CONNECTOR

Obtain two brass couplings of the type used for connecting variable condenser rotors together, cut both in two with a hack-saw, take the bolt out of each coupling part, put a solder lug on two of them and then lock them with a bolt. Get a stand-off insulator and screw it into the other half coupling. The copper tubing can be mounted by slipping the standoff with the half coupling onto the tubing right in the exact center; tighten it by turning the stand-off insulator. The lead-in wires can be soldered to the other two coupling bolt solder lugs after the coupling is slipped on the copper tubing where they should be. The lead-in coupling can be easily adjusted by merely unloosening the bolts. ⅜ inch tubing and couplings work better as they are more sturdy. Consult the drawing for details.—Gordon Mastalio.



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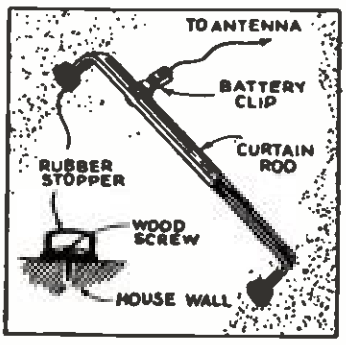
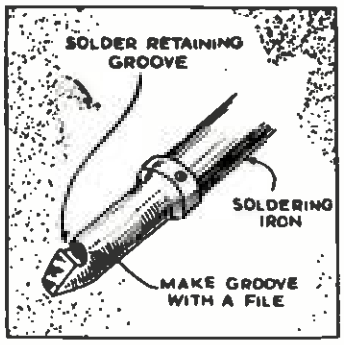
INDOOR ANTENNA

Here is my kink that should interest 5- and 10-meter fans. In the sketch is shown my novel curtain rod antenna on which I have received the 6th and 7th districts on 10 and 20 meters—very often my 1-tube super-regenerative receiver with good volume. The antenna is made of two curtain rods (four lengths) that are tubular. Two of the lengths that have curves on one end must each have the curve cut off, thus eliminating the curves merely using the straight pieces.



WIRE-TINNING TIP FOR FOR IRON

Recently, I had a task requiring the use of a great deal of tinned wire. I hit upon an idea which I consider very practical and it certainly is a time-saver. I am submitting the kink for those who would like to try it, and you will be amply repaid for the little trouble you have in making the tip. I made my tip from a brass rod, having the same diameter as the other tips of my iron. The design is wide faced as you can see from the sketch. Make the tip as shown, and when complete use a small rat-tail file to make the groove, as indicated. When finished, tin the tip, including the groove and allow the groove

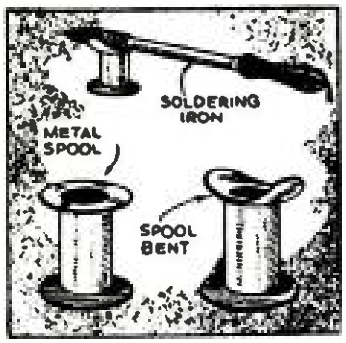


to fill with solder. To tin your wire, have it thoroughly cleaned and lightly coated with a small amount of soldering paste.—Alfred M. Turner.

▼ ▼ ▼

ANOTHER IRON HOLDER

Many "Fans" and experimenters purchase solder in one pound spools and probably discard each of the spools when empty. By saving these spools and bending as shown in the drawing, an efficient iron stand may be had. One or two of these kept on the work bench will provide convenient iron rests. They may be permanently



anchored to the bench with small nails or screws.—Nicholas G. Kenos.

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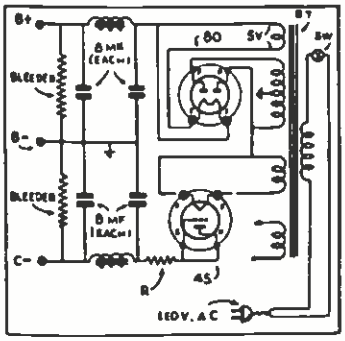
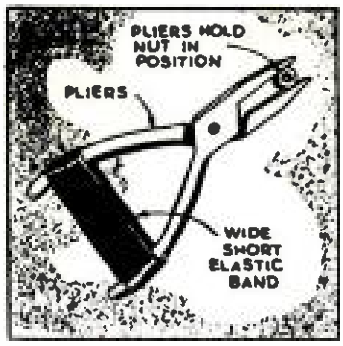
BIAS FOR TRANSMITTER

By adding an extra tube and filter system to the power-supply, a source of "C" bias can be had and still retain full-wave rectification for the "B" supply. Resistor "R" will determine the amount of "C" voltage.—Morton Benson





PATIENCE SAVER

This is my favorite radio "kink." Around a pair of pliers I slip a wide, short elastic band. Whenever I need something small soldered or fixed and find I need three hands for the job, I use this "kink" and save myself a great deal of trouble. When not in use, the band can be slipped down to the neck of the pliers where it will not interfere.—George Murray.

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KINK FOR PHONE MEN —HI!

I suppose that every one knows this one, but here it is again. A good way to get the solder from the prongs of plug-in coils is to melt the solder and quickly blow it out, as illustrated. Some of these phone men who like to gas away for hours can practice this kink with no extra strain on the old gas bag. HI!—Maynard Taylor, W8NLI.

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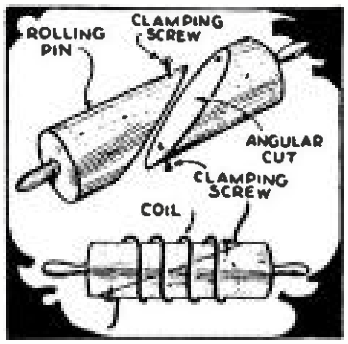
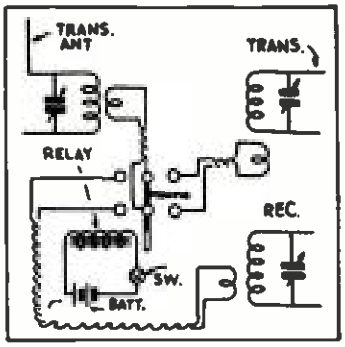


NEW USE FOR "ROLLING PIN"

I have found this coil winding kink very useful when winding transmitter or receiver coils. The coil is wound on the "rolling pin" to the desired length. The two screws are then removed and the form can be taken away from inside of the coil, without damaging the coil in any way. The "rolling pin" is cut through, as shown in the drawing, from end to end with a saw.—T. Page.

ANTENNA CHANGE-OVER RELAY

Many short-wave "hams" will find this scheme useful where "link coupling" is employed between the antenna tuning unit and the transmitter tank circuit. A double-pole, double-throw relay is connected in the circuit so as to connect the link to the receiver during reception, and to the transmitter during transmission. The diagram shows a separate switch for operating the relay; however, many other arrangements may be employed, such as using a small transformer which is operated with the on-off switch in the transmitter. Thus the antenna is changed over and the transmitter turned on and off with one operation, thus greatly facilitating "break-in."—Paul Henderson.



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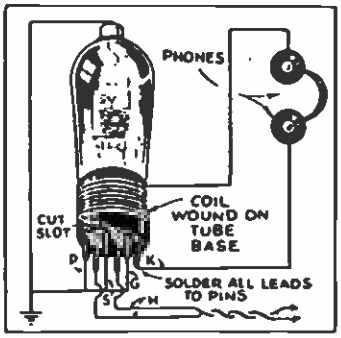
PHONE MONITOR

I would like to submit this idea for a "ham" phone monitor. To operate, merely place the base of the tube in the vicinity of the modulated amplifier of the transmitter or the antenna. In most cases sufficient pickup will be obtained at considerable distances from the antenna or transmitter. A small antenna, two or three feet



in length attached to one side of the coil, will aid considerably in picking up weak signals from the transmitter. Any type tube with a cathode may be used, and the filament of the tube is all that needs to be fed. Every phone man should have a monitor of this type in his shack.—W. R. Edelsten.

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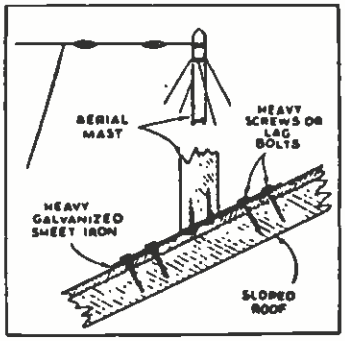
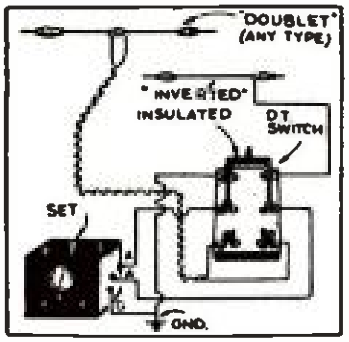
MAST ANCHOR

The following "Kink" will save considerable time when fastening aerial masts to buildings with slanting roofs. The base of the mast is cut on the proper angle to fit the roof. To this a galvanized plate sufficiently large is cut and fastened to the bottom of the mast with long screws. When the mast is erected the base may be fastened to the roof with screws or nails. Naturally, the screws or nails should also be galvanized. This mounting is by far the best I have found, and it provides a permanent structure.—Richard B. Butler.



ANTENNA CHANGE OVER SWITCH

Most short-wave "Fans" have found that for best results two antennas are needed—one for the broadcast and one for the short wave bands. In the broadcast band the "L" type antenna works best, while the doublet performs good for the shorter waves. The diagram clearly shows a method of connecting a double pole double throw switch for changing from one antenna to the other. In one position the "L" type antenna is connected to one side of a receiver, while the ground is connected to the ground posts



on the receiver and the other side of the doublet connection. When in the other position the doublet is connected to the two doublet posts and the ground to the ground post receiver. This system works out very well.—Glenn Crabb.

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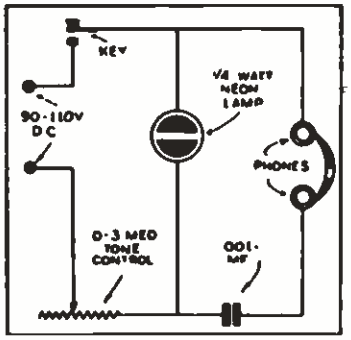
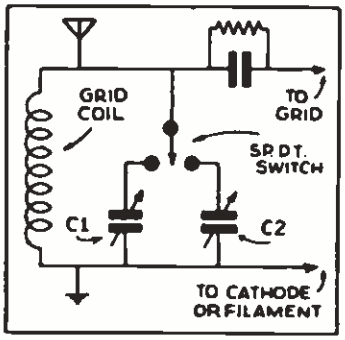
NEON TUBE OSCILLATOR

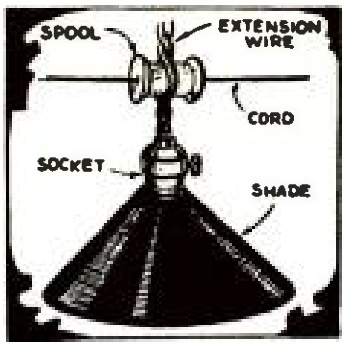
This Kink may not be original but I have not seen it printed in Short Wave Craft. It makes an excellent "code-practice" oscillator and can be constructed for about $1.00. The current flow through the circuit is around 1/10 ma. Therefore, the battery will last a long time and the tone can be controlled conveniently and effectively with a 0 to 3 megohm variable resistor. The bulb must have enough voltage on it to make it glow before it will oscillate.—Dick Schramm.





A 2A5 RECEIVER KINK

Many "Fans" are interested in listening to both sides of a radio conversation, and the following kink is one method of doing this. By using two condensers connected as shown in the diagram, together with a single pole double throw switch either side of the conversation may be conveniently tuned in.—John Prsha, Jr.



LIGHT WHERE WANTED

If you wish to have light over your entire work-bench and you can only burn one light, you will find the following kink very practical. All that is needed is a piece of cord, which is fastened between two walls over the work-bench, a spool which is slipped over this cord, and an extension wire which is fastened to the spool. This illustration will give you some idea of how it is constructed.—Carl Schwarzenburg.

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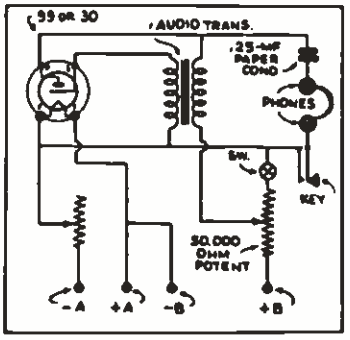

F.B. OSCILLATOR

Herewith you will find the circuit of a code practice oscillator which I have used for quite some time. The tube used is a type 24 with the grid and cathode tied together. Different tubes may have to be tried. I used a "B" eliminator on this oscillator, with about 45 volts on the plate and 180 volts on the screen. The tone control is a 7 point octave control or a fixed condenser may be used; with the control the pitch can be varied over a wide range. The control in the screen voltage is not absolutely necessary, but I used it to control the volume.—William Falls.

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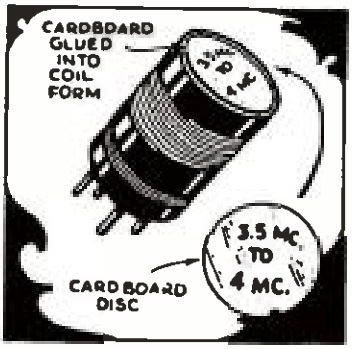
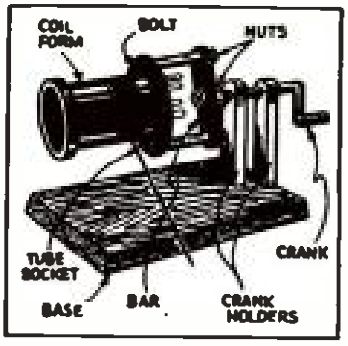


COIL MARKER

The kink which I am submitting comes in handy with tube-base coils which are not color-coded. Simply cut a circular piece of white cardboard to fit the inside diameter of the coil, or slightly larger. Print the frequency range on the cardboard and glue it to the coil, as indicated in the drawing.—L. Rodney Bradshaw.

COIL WINDER

I am submitting the following wrinkle which I believe will be helpful to radio amateurs and experimenters. It shows a way to hold plug-in coils while winding them. I first took a wafer socket and fastened it to an iron bar and put a space between bar and socket by means of bushings. I made a crank out of heavy wire, and then threaded the end of it. I made a small base with two small triangular shaped crank-holders near the end. I drilled a hole in the iron bar, inserted the crank in the holders and fastened the tube socket to the crank as shown in the diagram.—Frank I. Douglas.



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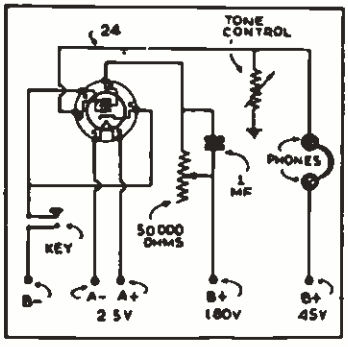
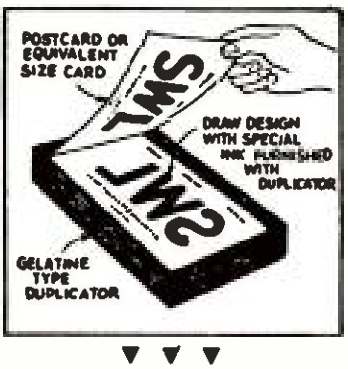
CHANGING PITCH OF A.F. OSCILLATOR

The use of a single audio frequency tone when practicing code is extremely tiresome to say the least. A simple method of varying the tone of the code oscillator over two octaves of the musical scale is illustrated. The exact tone will depend upon the voltage applied across the potentiometer and the adjustment of the arm. The pitch increases at low voltage and decreases when the arm is turned toward the positive side of the circuit. A 45-volt "B" battery and a good quality transformer will give 1000 cycle note when the control is "full-on." This arrangement can be used with either an ordinary hand-key or a code machine. A calibrated dial plate under the knob will enable any desired tone to be selected at will.—Harry D. Hooton, W8KPX.



QSL KINK FROM YL

I am entering the following kink in your contest. To make inexpensive and individual QSL's procure a post-card size duplicator, one of the type which uses a gelatine substance, and drew off a pattern using the special ink furnished with duplicator. Place the pattern, ink-side down on the gelatine, and leave for a few minutes. Take off pattern and it is then possible to take a large number of prints off the gelatine. These may be made on post-cards or any other kind of cardboard or paper.—Miss M. E. Burke.



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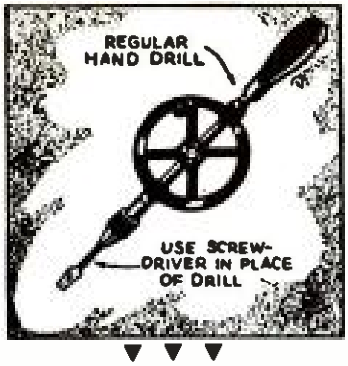
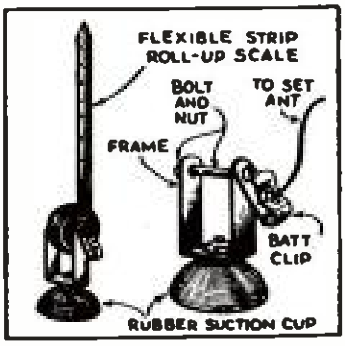
HIGH-SPEED SCREW-DRIVER

This is the kink I use for experimental work on my radio. After drilling holes in the chassis or panel, I use a screw driver to tighten the screws. A set of all-sized screw drivers is very handy and cuts your time in half.—Howard Clawges.



PORTABLE ANTENNA

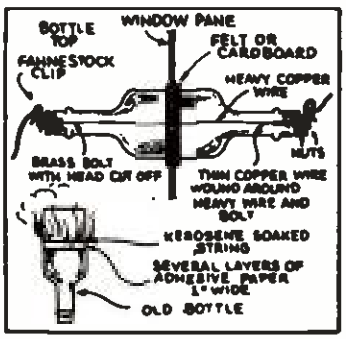
Perhaps this kink isn't exactly a new wrinkle, but it is still a good idea. This is a portable antenna constructed of flexible steel rule. When not in use, it can be



rolled up into a light, inconspicuous bundle. This is a particularly attractive feature for portable sets used out of doors. The drawing will illustrate the idea and its adaptability.—Ralph Scott.

LEAD-IN INSULATORS

Here is a description of my favorite short-wave stunt, which has found great favor in my vicinity, and I believe that other amateurs in the country would welcome the opportunity to learn how to make a set of cheap antenna lead-in insulators. They consist of upper portions of bottles with small holes in the necks, perfume or shampoo bottles are preferable; these may be cut by wrapping several turns of 1-inch wide adhesive paper on them, then winding a kerosene-soaked string above the paper and igniting it. When the glass is hot, dip into cold water and the glass will snap off, due to the contraction caused by the cold water. If it is desired to bore holes through window glass, use a high-speed carbon drill and lubricate the point with oil of turpentine. For details consult the drawing.—G. Villafen.

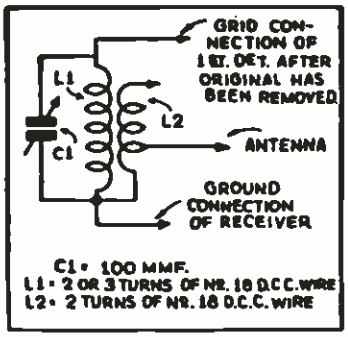


ANTENNA COUPLING

Here is a method of obtaining automatic antenna coupling. The vane should be of brass, one inch square, and should be placed approximately one-eighth inch from the coil. Once adjusted, it is automatic, due to the fact that the grid coil decreases with the wavelength and so varies the capacity of the condenser as each coil is used. —H. Hoffman.

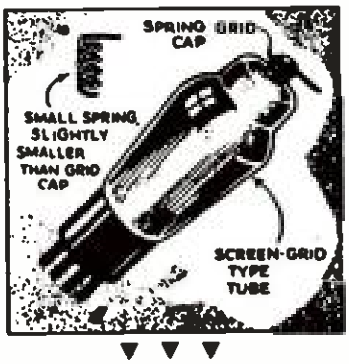
CONVERT YOUR SUPER TO 10 METERS

Herewith is a kink which enables owners of band-switching superhets to put their receivers on 10 meters. This kink enables a person to "listen on 10" with only a slight reduction in volume over that on 20 meters. With the bandswitch on the 20-meter band and the grid connection on the converter made and with the converter ground on the receiver ground and the antenna on the antenna coil. Tune the set the same way as on 20 meters, only the 10-meter band will fall on some other part of the dial. Also, tune the converter grid condenser until the minimum noise level is obtained. You are then ready for 10 meter reception.—Lloyd M. Isaacson.



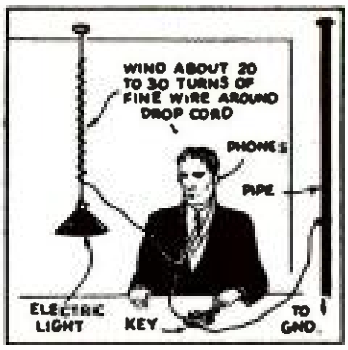
F.B. GRID CLIP

The sketch herewith shows my emergency grid clip and it works so well that I use it most of the time. The spring should be slightly smaller than the grid cap on the tube so that it will fit tightly. When putting the spring on, twist it slightly and it will go on easily and fit tightly. This clip can be made part of the grid lead, thus eliminating the necessity for a soldered connection.—Billy Green.



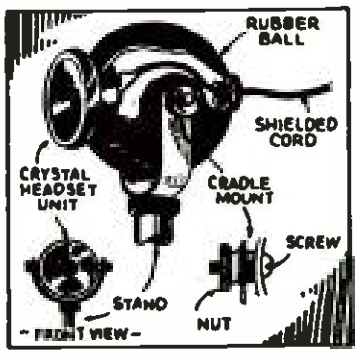
CODE PRACTICE TRICK

It is not necessary to go to all the trouble of building a special code oscillator if one is satisfied with a low frequency tone. Merely wrap one wire around the outside of the drop cord, attaching it to earphones, and then between the other connection of the earphones on the ground, insert the key. The light does not need to be lit during operation, but will strengthen the signal.—Ferrell Turner.



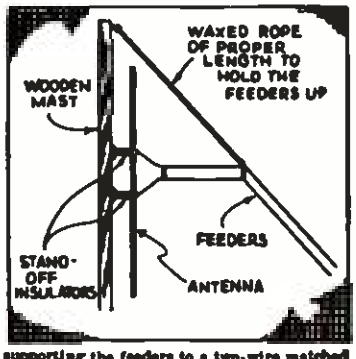
ATTENTION "HAMS"!

Here's my idea for getting that Xtal "mike" you've always wanted! Besides, when on CW (usually one uses phones for CW and speaker for phone work) you've got a pair of earphones you can't beat! One unit removed and mounted as shown makes not only a nail type "mike" for your phone rig, but gives Xtal clear "T" reports. Direct to grid economy, plus the flexibility of such an investment, is bound to satisfy any "ham."—Fred C. Hoffman, W9VVI.



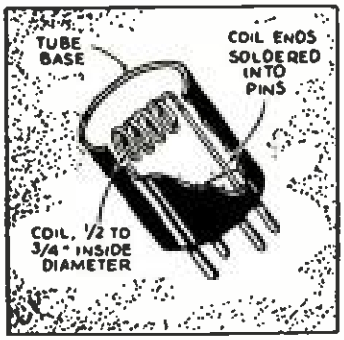
SIMPLIFYING ANTENNA CONSTRUCTION

The following kink may be of interest to five-meter "hams." It is a method of supporting the feeders to a two-wire matched impedance antenna of the vertical type. Those of us who have had any experience with such feeder systems know the difficulty of supporting the customary cross-arm on the vertical pole. The diagram will make clear the idea that I have in mind. Since the feeders exert a pull tangent to the mast, the rope is all that is necessary to insure against swinging. I trust that this idea will meet with your approval.—Maxwell Bittle, W8QEN.



PLUG-IN 5-METER COIL

I am submitting the following kink which I believe will prove both economical and helpful. I remove the glass from a burned out tube and then employ it as a 5-meter plug-in coil. I wrap wire around any round object about ½ to ¾ inch in diameter,



placing the end of the wire in the prong. This is best used with transmitters.—Albert Neupaner.

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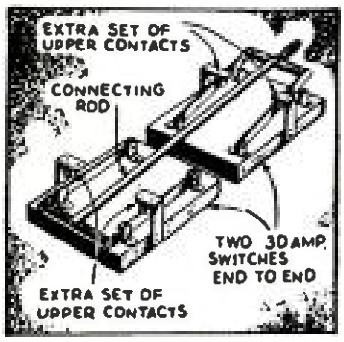
CLEVER SWITCH IDEA

The following kink has proved helpful in my transmitter and equipment at my amateur station. This has been found exceptionally valuable in switching a number of circuits. A 2-position, 4-pole, 30 ampere switch is made by placing two 30 ampere switches end to end and connecting the



handle with a rod. This requires but little space. Two sets of extra contacts are necessary.—Francis Ruse, W7ENH.

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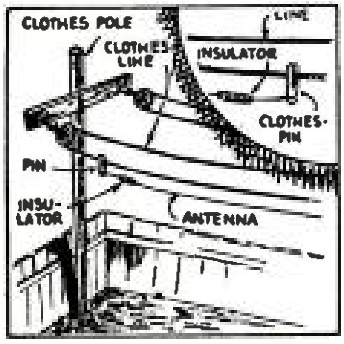
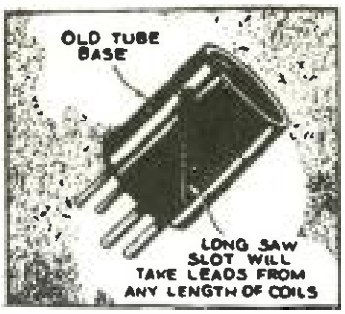
USEFUL ANTENNA KINK

I am sure that the following idea will

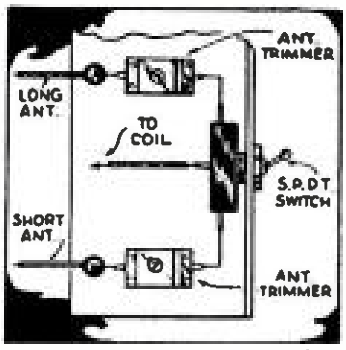


be found useful to all radio amateurs. The materials used for this kink are very simple and inexpensive. They consist of two clothes-pins, a long wire and two insulators. Fasten one end of the wire to the knob-end of a clothes-pin. Fasten the clothes-pin to the clothes-line, (which of course, every home has) and push the line out as far as possible. Then let the wire hang fairly loose and again fasten the other end to the other clothes-pin and again fasten it to the clothes-line. This temporary antenna (which may also be used as a permanent antenna) is very useful when one is needed in a "jiffy." This arrangement can be made to overcome the lightning hazard as the antenna can be hauled in in a few seconds time.



COIL SUGGESTION

Instead of drilling holes in coil forms I find it saves time and is much easier if a slot is cut in the form with a small hack-saw, as shown in the accompanying sketch. Wire ends are brought through the slot.—J. E. Bull.



ANTENNA SWITCH

I have found this system to be one of the best when using two antennas of different lengths. The switch is a single-pole, double-throw toggle type. The center connection goes to where the antenna condenser is connected on your set. When tuning, switch on one antenna and tune its condenser for best receptions, and then do likewise with the other antenna.

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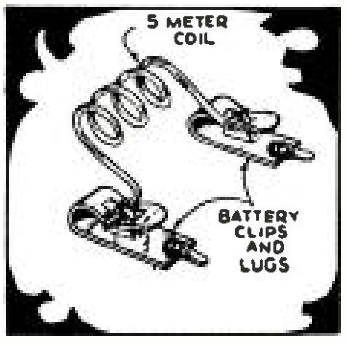

A GOOD IDEA

By this method differing types of coils may be used, simply by clipping them into the battery clips. This same method can be used for the split type coils by employing four clips.—Edward Mineika, W9WIO.

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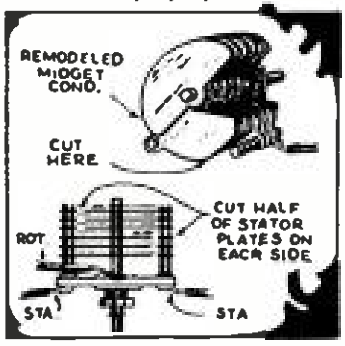

SPLITTING CONDENSER STATOR

I am submitting a kink which shows how to make a split stator trimmer condenser from single bearing midget R-W condensers. Simply alter the stator plates by cutting as indicated in the illustration, and grounding the rotor plate.—Bruce Long.

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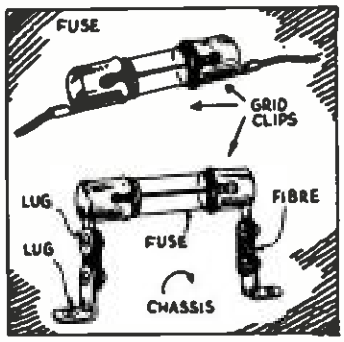

FUSE KINK

Having a need for an efficient fuse holder, not taking up too much space, I hit upon the following idea: The new metal tube grid-clips just fit the ends of small 2 and 8 amp. line fuses and the 10, 15 and 20 amp. auto set type. When clipped on the fuse, they can be soldered as a resistor is soldered to the "one lug" type tie points and bolted to the chassis. I find this fuse holder very handy and will encourage the use of fuses as "safety valves" in short-wave set work.—N. C. Milne.

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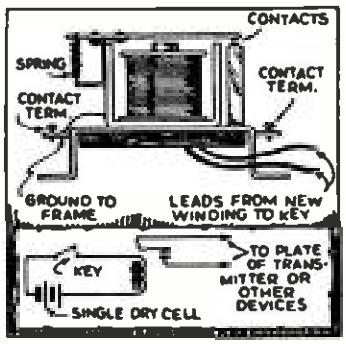

RELAY FROM GENERATOR CUT-OUT

To make a relay from a generator "cut-out," remove the original windings and rewind with about No. 22 magnet wire. The original terminals can be used but it is necessary to ground the one opposite the contacts to the coil frame. These relays may be used for turning circuits "on" and "off," and for keying the transmitter, etc.—Fay Field.

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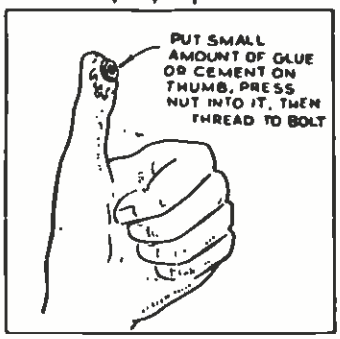
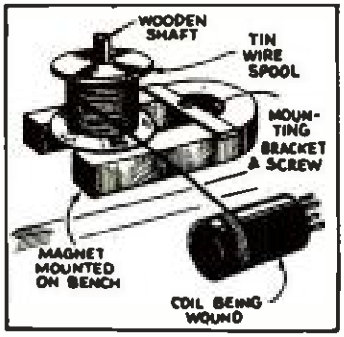


THE NUT—IT STICKS

Here is a solution to the problem of putting a nut on a bolt in a tight place. Place a small amount of glue or cement on your thumb or finger and press the nut into it. You will then be able to put the nut on the bolt very easily. (Don't forget chewing gum also!—Ed.)—Arthur Guy.

SIMPLIFYING COIL WINDING

Although the following kink isn't original, I feel that it is known only to a few. It greatly simplifies coil winding and this I



know will be appreciated by those radio experimenters who "wind their own" coils. Wind the coil wire on a tin spool and slip over a wooden shaft mounted between the poles of a magneto magnet. This magnet provides perfect tension!—Ken Curry.

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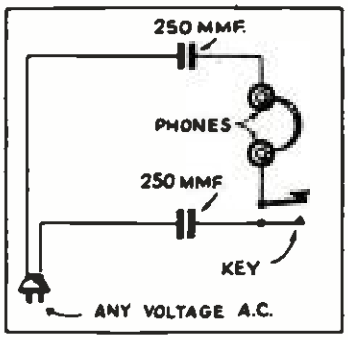
ANOTHER CODE PRACTICE KINK

By joining the earphones a key and two 250 mmf. condensers in series and connect them across the A.C. line, we have a simple code oscillator. However, extreme care should be exercised in order to avoid coming in contact with the A.C. line.—Donald Rose.



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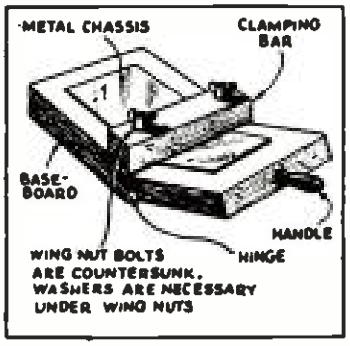
CHASSIS BENDER

For a number of years I have been constructing radio receiving sets and have always experienced considerable difficulty in forming the chassis or bases. The drawing clearly illustrates how I simplified the chassis problem. No dimensions are given, as they will depend upon the dimensions of the chassis to be formed. With an arrangement of this sort, it is a simple matter to make sharp bends. The result is a neat and square chassis.—Cecil Dunsmore.



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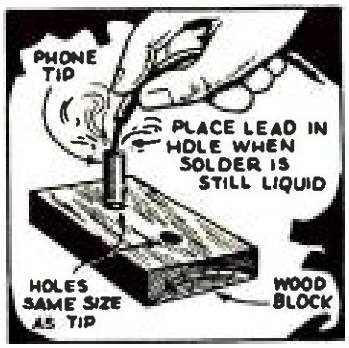

HOW TO SOLDER PHONE TIPS

When soldering phone tips to wires, I find that it is much easier if two holes the size of the tips are bored into a piece of wood, then by putting the tips into these holes they will be held firmly while soldering. Needless to say, the tips should be filled with solder and the wire should be well tinned.—James E. Dailey.

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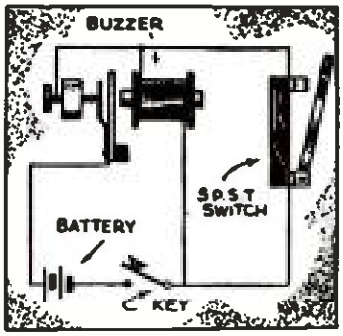
CODE KINK

Many times when learning the code, two "Hams" will construct a telegraph set between their houses. Now and then it is desirable to change from the buzzer system to the "clicker" system used in regular railroad telegraphy. To do this in a hurry the circuit given is very helpful.—Warren Harding Wilson.



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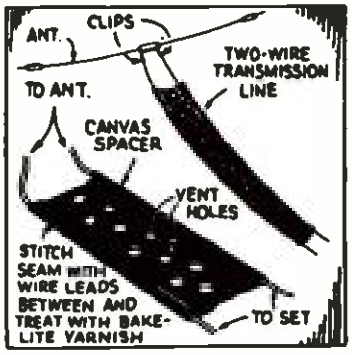
OLD TRICK STILL GOOD

I've found it convenient to use a red hot ice pick to make lead-in coil holes in old tube bases. To protect the fingers use a pick with a wood handle. The holes can be made any size desired, by the pressure applied to the pick. This is a handy method when you haven't a drill.—Dwayne McFadden.

PORTABLE TRANSMITTERS

For portable transmitters that require a two-wire transmission line of a definite impedance this arrangement proves quite efficient. The two wires are spaced according to formulae. A piece of cotton cloth about an inch wider than the space between wires is used as the medium of separation. One half inch of cloth is bent over each wire and sewn into place on a sewing machine. The whole assembly is treated with No. 74 bakelite varnish which is an excellent high-frequency insulation. This transmission line may be rolled up when not used. Other material may be used such as light-weight canvas or leatherette. Holes cut in the cloth serve to lessen wind resistance.—H. F. Beaver.



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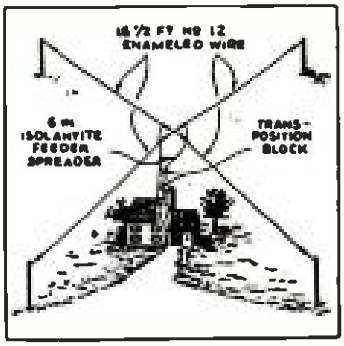

4-SIDED DOUBLET

Here is an "all-direction" doublet antenna which any "Ham" or short-wave listener will find a real boon to reception. It is a combination of an "all-direction" antenna with the addition of a doublet. This eliminates the necessity of switching from one antenna to another to receive stations from certain directions. Stations from all over the world can be tuned in with this system, and the amount of QRM will be appreciably decreased.—Wah How Lee.

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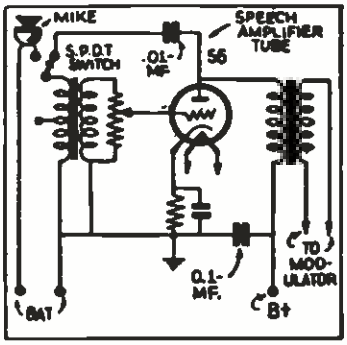
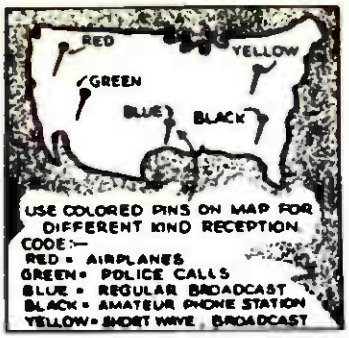


GOOD FOR 5-METER TRANSMITTERS

An Radio Frequency Transmitters employing a microphone and microphone transformer in conjunction with a speech-amplifier tube preceding the modulator, the use of a condenser of suitable size and a S.P.D.T. switch will produce tone-modulated telegraphy, thus making the transmitter versatile without the addition of separate Audio-Oscillators. The variable resistor normally used to control "gain" is also used in the I.C.W. switch position to vary the tone or frequency of the audio oscillations generated. There will be a definite increase in antenna current for different settings of the gain control, due to an approximate impedance match of all components at that particular audio frequency. The diagram shows the wiring for this service.—H. F. Beane, Mountain Lakes, N. J.

MAP LOG

Procure a map of the United States and some small straight pins of varied colors, such as red for the "airplane" stations, green for "police" and so forth. By mounting the map on a sheet of cardboard and sticking the pins in the proper locations, you can tell at a glance by the color of the



pins if you have found a new station or if you have heard it before.—Frank Lev, Jr.

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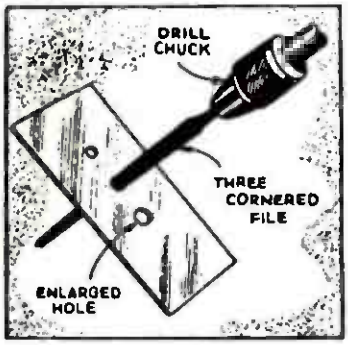
FILE AS REAMER

Here is a kink for all who often have use for a hole enlarger. After you have drilled the hole to be enlarged, replace the drill with a three-cornered or round file. Then continue to drill with the file until the desired hole has been made. The size of the file will depend upon the hole to be enlarged.—Richard McIntyre.



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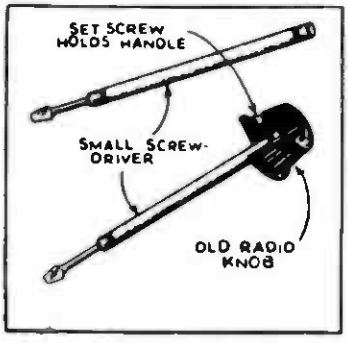
GOOD USE FOR OLD KNOBS

I am a radio "fan" and build a great number of radio sets and find the following kink helpful. I have a small screwdriver with a handle about ⅛-inch in diameter and I use an old knob with ⅛-inch



core as a handle on the top of it. This has proven very helpful and I have given a drawing of it which I wish to enter in the Kink contest.—Paul Maybury.

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PRESERVING QSL CARDS

Here is a "kink" which keeps my QSL cards clean and free from dust. This will also prevent the edges from becoming frayed and the lettering illegible, thus improving the appearance of your listening den.

The QSL card is placed face downward on a sheet of cellophane, leaving a one inch border on each of the four sides. You then lap the borders over the reverse side of the card and paste them down. The drawing clearly illustrates the stages explained above.—Arnold Goldberg.

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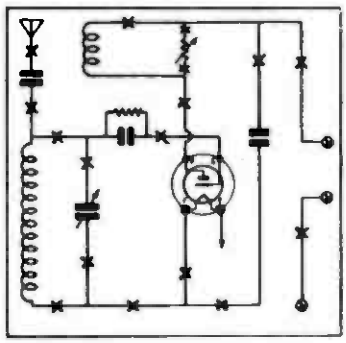

KINK FOR SET-BUILDERS

Many beginners in building radio sets misplace wires or leave them out entirely. It is this difficulty which has prompted me to submit the "Kink" which is illustrated. By drawing the diagram on a piece of paper and checking the lines as you place the wires in their proper places, this trouble will be very easily overcome.—Alfred Steckevics.

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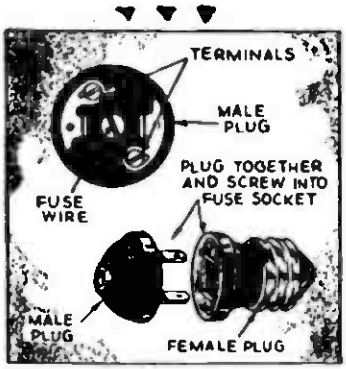

FUSE KINK

Because of the many fuses which are constantly blowing in my "lab.", I had to devise a new and more economical method of replacing one that was burned out. By taking the lamp cord out of a male plug and inserting a piece of fuse wire between the two terminals, we have a perfect fuse. Insert the male plug into the female plug and screw this into your fuse socket.—Julius Kotke.

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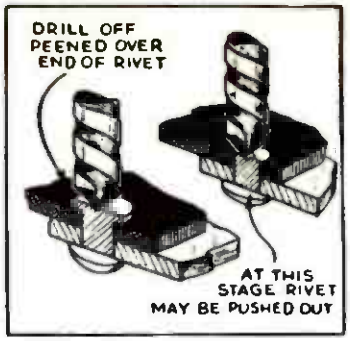
RIVET REMOVER

Occasionally I have found it necessary to remove some tightly riveted bakelite condenser bases from the chassis. In order to accomplish this feat without scratching or marring either the bakelite or the frame, I used this kink to advantage. Select a drill that has a metal-cutting bit with a diameter slightly larger than that of the rivet. Place the cutting end squarely on the hole in the rivet and carefully shave the rivet down to the frame. The rivet may then be easily removed as the illustration shows.—Jack Miller.



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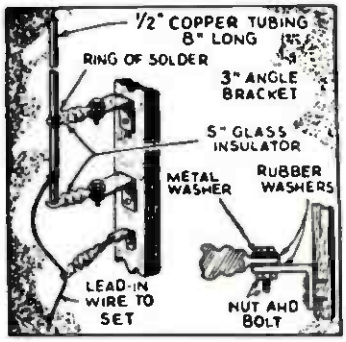
ANTENNA MOUNTING

While trying to find a good way to insulate my 5-meter antenna, I hit upon the idea of using glass insulators. Two 3-inch angle brackets are used and are spaced about 20 in. apart. Two glass insulators are then fastened to the bracket by means of machine screws which have a



number of rubber washers cut from an inner tube. The ½ in. copper tubing may be too large to pass through the holes of the insulators; if such is the case, they should be filed to enable the tubing to pass through it. To prevent the tubing from sliding through the insulators a ring of solder should be placed above the top insulator.—Charles Zak.

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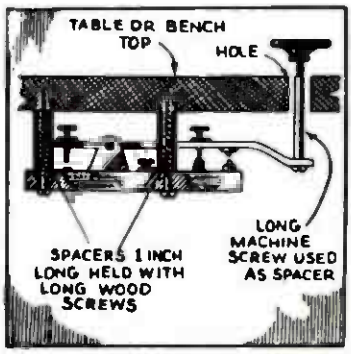
CLEVER KEY MOUNTING

In answer to your call for kinks I submit the following which I have used with success. First, adjust key to exact position wanted, then secure two one-inch spacers and place between under sides of bench and key screw key in place with wood screws through both mounting holes. Remove bakelite knob on key and screw threaded spacer to key arm with single machine screw. The knob can be turned off after operation is complete. The diagram will explain more fully.—Ralph Pressman.



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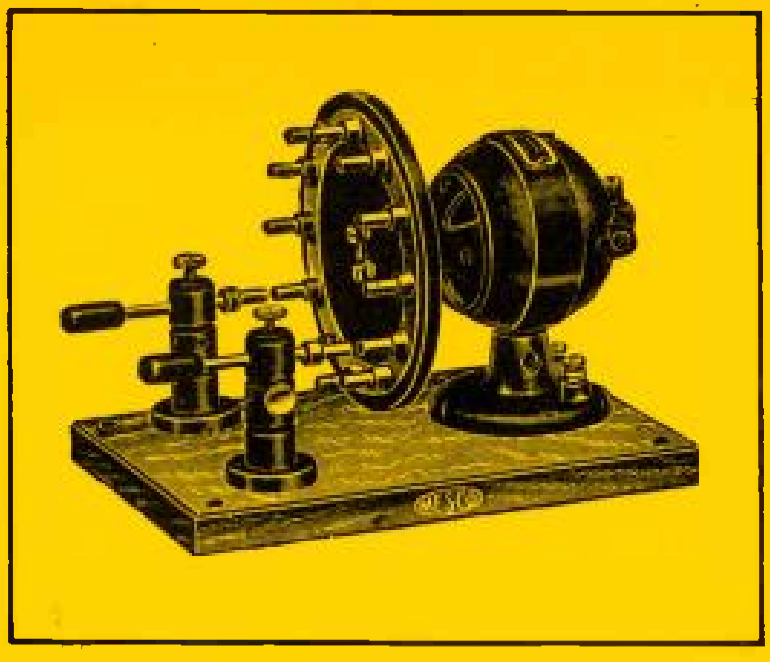

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