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Easy Way to Learn Radio Telegraph Code

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DIAGRAM for ANTENNA

MATERIALS REQUIRED

1 PULLEY
1 CLEAT
50 FT. CLOTHESLINE
2 SCREW HOOKS
1 PORCELAIN TUBE
100 FT. #22 B.S.T.STRAND COPPER WIRE
2 Porcelain Insulators
2 Screw Hooks
100 FT. #14 HARD DRAWN COPPER WIRE

MATERIALS REQUIRED

CLOTHESLINE
PULLEY
INSULATOR
SPREADER

TWO WIRE AERIAL

WATER PIPE
GROUND CLAMP
GROUND
GFI

TO GROUND
PORCELAIN TUBE
TO SET

LEAD I N
LOW ANGLE
LOW ANGLE
LOW ANGLE

100 FT. #22 B.S.T.STRAND COPPER WIRE
1 PORCELAIN TUBE
2 Porcelain Insulators
2 Screw Hooks
100 FT. #14 HARD DRAWN COPPER WIRE
ARTICLE 1

HOW TO MAKE
A CIGAR BOX
CRYSTAL DETECTOR
RADIOPHONE RECEIVER

Rear View
Detail of Panel B

Detail of Panel A

tNote: First fasten Panel A to Panel B as indicated, solders all connections and then fasten Panels to Cigar Box by means of small Wood Screws.

Detail of Detector Parts

Full Size Assembly of Detector

Side View of Clip

Detail of Slider

Aerial

No. 8 B.S.S. Gauge Single Cotton Covered Wire

Cut Mailing Tube so that it will fit tightly into Cigar Box

Detail of Tuning Coil

A Complete List of Other Materials and Parts Which Must Be Obtained in Order to Start Receiving the Broadcast Concerts Etc.

List of Materials

<table>
<thead>
<tr>
<th>No/Ref.</th>
<th>Description</th>
<th>Size</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cigar Box</td>
<td>8 x 4 x 2 / 3</td>
<td>Wood</td>
</tr>
<tr>
<td>2</td>
<td>Panel A</td>
<td>2 x 2 1 / 2 x 3</td>
<td>Wood</td>
</tr>
<tr>
<td>3</td>
<td>Panel B</td>
<td>3 x 4 1 / 2 x 3</td>
<td>Wood or fiber</td>
</tr>
<tr>
<td>4</td>
<td>Halling Tube</td>
<td>2 x 2 1 / 2 x 3</td>
<td>Comp or fiber</td>
</tr>
<tr>
<td>5</td>
<td>S.C. Wire</td>
<td>6 x 2 1 / 2 x 3</td>
<td>Copper</td>
</tr>
<tr>
<td>6</td>
<td>Slider Rod</td>
<td>2 x 4 1 / 2 x 3</td>
<td>Steel or brass</td>
</tr>
<tr>
<td>7</td>
<td>Rod</td>
<td>4 x 4 1 / 2 x 3</td>
<td>Steel</td>
</tr>
<tr>
<td>8</td>
<td>Aerial</td>
<td>4 x 4 1 / 2 x 3</td>
<td>Steel</td>
</tr>
<tr>
<td>9</td>
<td>Phone Condenser</td>
<td>001 M.F.</td>
<td>Galena</td>
</tr>
<tr>
<td>10</td>
<td>Crystal Clip</td>
<td>6 x 3 1 / 2 x 3</td>
<td>Brass</td>
</tr>
<tr>
<td>11</td>
<td>Machine Screws</td>
<td>4 x 3 1 / 2</td>
<td>Brass</td>
</tr>
<tr>
<td>12</td>
<td>Nuts for Clip Screws</td>
<td>4 x 3 1 / 2</td>
<td>Brass</td>
</tr>
<tr>
<td>13</td>
<td>Bonding Posts</td>
<td>2 x 2 1 / 2 x 3</td>
<td>Nickel finish</td>
</tr>
<tr>
<td>14</td>
<td>Ball Bearing</td>
<td>3 x 3 1 / 2 x 3</td>
<td>Steel</td>
</tr>
<tr>
<td>15</td>
<td>Round Rod</td>
<td>2 x 2 1 / 2 x 3</td>
<td>Steel</td>
</tr>
<tr>
<td>16</td>
<td>Cr Whisker</td>
<td>3 x 3 1 / 2 x 3</td>
<td>Steel</td>
</tr>
<tr>
<td>17</td>
<td>End Binding Post</td>
<td>4 x 3 1 / 2</td>
<td>Composition</td>
</tr>
<tr>
<td>18</td>
<td>Aerial Catch</td>
<td>4 x 3 1 / 2 x 3</td>
<td>Brass</td>
</tr>
</tbody>
</table>

DIAGRAMMATIC Hook-up of Set

Head Set

Instructions:

In installing the aerial great care should be taken to have all parts well insulated. All permanent connections within the cigar box should be soldered. In connecting the ground wire to the water pipe or other grounded pipe it is best to use a copper ground clamp. If no clamp is available the bare wire can be wound tightly around the pipe and then be soldered directly to the pipe. To obtain best results with a crystal detector radiophone set, two things are absolutely essential. First, a sensitive crystal and second a sensitive head set. Be sure both the articles have been thoroughly tested before purchasing them. A good crystal can be spoiled by careless handling. Keep the fingers off the surface of the crystal. The crystal can be cleaned by washing it with benzine or methyl alcohol. The galena crystal works best when the cat whisker makes LIGHT contact.

Note: In general it will be cheaper to purchase the phone condenser, mounted crystal, crystal box, slider etc., rather than to attempt to construct them.
TWO SLIDE TUNING COIL WIRING DIAGRAM

REQUIRED MATERIALS.

1 BOTTOM BOARD
2 END BLOCKS
1 PAPER TUBE 3½x7
3 SPOOLs NO. 22 ENAM. WIRE
2 SLIDE RODS
2 SLIDERS.
4 SCREWS FOR SLIDER RODS
4 SCREWS FOR 2 END BLOCKS

2 SMALL SINGLE BINDING POSTS
2 MEDIUM DOUBLE BINDING POSTS
1 FIXED PHONE CONDENSER.
1 CRYSTAL DETECTOR
1 CRYSTAL GALENA MOUNTED
4 PHONE POINTS
6 RUBBER BUMPERS.

HOOK UP FOR A DETECTOR AND ONE STEP AMPLIFIER
LOOSE COUPLER WIRING DIAGRAM

Cross-Section of Coupler

Secondary

Primary

Shows method of tapping

Connect to A. and B. as in fig. 2.

Condenser and detector connected to coupler.

Phone condenser

Phones

Detector

To Ground

To Aerial

REQUIREDFI MATERIALS.

SECONDARY COIL

1 CRYSTAL GALENA - MOUNTED
4 PHONE POINTS
12# OF PHONE WIRE - TWISTED
6 RUBBER BUMPERS
4 LARGE SINGLE BINDING POSTS
2 LARGE DOUBLE BINDING POSTS
1 FIXED PHONE CONDENSER
1 CRYSTAL DETECTOR

PRIMARY COIL

1 SLIDE ROD
1 SLIDER
2 SCREWS FOR SLIDER ROD
4 SCREWS FOR END BLOCKS
1 BOTTOM BOARD WITH FIXED END
1 CLOSED END BLOCK
1 OPEN END BLOCK
1 PAPER TUBE 3½ x 7½
3 SPOLS *22 ENAM WIRE
HOW TO MAKE A SUPERSENSITIVE REGENERATIVE RECEIVING TUNER

HOO-K-UP OF SUPER-SENSITIVE REGENERATIVE RECEIVING TUNER WITH VACUUM TUBE DETECTOR

FRONT VIEW OF PANEL

REAR VIEW OF PANEL

DIRECTIONS
This short wave regenerative tuner is especially designed for connection to a vacuum tube detector. The variometers are used for tuning and the circuits are inductively coupled. Broadcasting received with this circuit will come in very loud and extremely sharp tuning is also obtainable. In constructing this tuner, a pattern the exact size of the panel should be laid out on a sheet of paper. The position of the various switch points, binding posts, center shafts of variometers and vario coupler, attachment screws, etc., should then be marked on the paper and this can be used as a template in locating the positions of the holes to be drilled in the panel. The variometers and vario couplers should be screwed to the wooden base. The variometers should be rotatable through 180 degrees.

The wiring should be of the bus bar type, using No.16 bare copper wire in order to get necessary rigidity. All connections should be carefully soldered using resin as a flux in preference to other kinds of flux.

LIST OF MATERIALS

<table>
<thead>
<tr>
<th>No. Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Variometers</td>
</tr>
<tr>
<td>2</td>
<td>Variometer Knobs</td>
</tr>
<tr>
<td>2</td>
<td>Variometer Dials</td>
</tr>
<tr>
<td>1</td>
<td>Vario coupler</td>
</tr>
<tr>
<td>1</td>
<td>Vario coupler Knob</td>
</tr>
<tr>
<td>1</td>
<td>Vario coupler Dial</td>
</tr>
<tr>
<td>1</td>
<td>Switch Lever</td>
</tr>
<tr>
<td>10</td>
<td>Switch Points</td>
</tr>
<tr>
<td>2</td>
<td>Switch Stops</td>
</tr>
<tr>
<td>1</td>
<td>Composition (Bakelite, etc.) or Hard Rubber Panel 18 x 7 x 3/8</td>
</tr>
<tr>
<td>1</td>
<td>Wood Base 18 x 7 x 3/8</td>
</tr>
<tr>
<td>6</td>
<td>Binding Posts</td>
</tr>
<tr>
<td>1</td>
<td>Wood Screws</td>
</tr>
<tr>
<td></td>
<td>Wire for Connections, No.16 B.S.</td>
</tr>
</tbody>
</table>
**DIRECTIONS**

These detector and amplifiers may be used with any type of Tuna. If regenerative effect is to be had the binding posts for the rectifier should be connected together. The coupling of the units described above is a 6 Volt storage battery of the units described above is a 6 Volt storage battery. The storage batteries may be 10 volts or more. The wiring of the units described above is a 6 Volt storage battery. The storage batteries may be 10 volts or more.

**LIST OF PARTS**

<table>
<thead>
<tr>
<th>No.</th>
<th>DESCRIPTION</th>
<th>REQ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vacuum Tube Detector</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Amplifier Jacks</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Double Circuit or Inner</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Single Circuit or Outer</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Amplifier Transformer</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Storage Battery</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>or more 6 Volt Batteries</td>
<td></td>
</tr>
</tbody>
</table>
BACK VIEW OF PANEL & TOP VIEW OF BASE OF A DETECTOR AND ONE STEP AMPLIFIER

LIST OF PARTS

<table>
<thead>
<tr>
<th>DETECTOR AND ONE STEP AMPLIFIER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Req 1</td>
<td>Panel about 6&quot; x 6&quot;</td>
</tr>
<tr>
<td>Req 2</td>
<td>Rheostats</td>
</tr>
<tr>
<td>Req 10</td>
<td>Binding Posts</td>
</tr>
<tr>
<td>Req 2</td>
<td>Sockets</td>
</tr>
<tr>
<td>Req 1</td>
<td>Grid Leak</td>
</tr>
<tr>
<td>Req 1</td>
<td>Grid Condenser</td>
</tr>
<tr>
<td>Req 1</td>
<td>Bypass Condenser</td>
</tr>
<tr>
<td>Req 1</td>
<td>Vacuum Tube Detector</td>
</tr>
<tr>
<td>Req 1</td>
<td>Double Circuit Jack</td>
</tr>
<tr>
<td>Req 1</td>
<td>Single Circuit Transformer</td>
</tr>
<tr>
<td>Req 2</td>
<td>6 Volt &quot;B&quot; Storage Battery</td>
</tr>
<tr>
<td>Req 2</td>
<td>or more &quot;B&quot; Batteries</td>
</tr>
</tbody>
</table>
DIRECTIONS FOR OPERATING AND TUNING THE RECEIVER

Wire the set up and put a 1500 coil in the secondary and 1000 coil in the tickler, then before you connect the aerial up turn on the "A" battery, adjust the "B" battery, and slowly close the coupling between the tickler and secondary until you get a howl or bubbling sound in the phones. If not, REVERSE the tickler connections until you do.

Then, without connecting the aerial to the set, connect the ground and put a coil in the primary with the primary condenser in parallel. Vary the primary condenser until you get a decided click in the phones. If not, try another coil until you do. Until this thud or click is heard at some point on condenser scale you cannot hope for STRONG SIGNALS.

The secondary condenser should be set near zero and the coupling between primary and secondary coils should be about 45 degrees during this test. When you get the set balanced in this manner, a slight movement of either primary or secondary condenser should give the click.

Then connect the aerial to the set and use coil 1000 in the secondary for waves from 3600 to 6000 and coil 1500 for waves of 6000 and over.

In tuning, move the secondary condenser VERY SLOW, as it determines the wavelengths, and all other adjustments must be made to correspond. When you hear a station vary the secondary condenser until it is loudest and move tickler coil until louder, then vary primary condenser. Just a slight movement of each coil will result in HIGH AMPLIFICATIONS.

The louder the click in the primary circuit the more sharply the set is tuned. Loose coupling is very important, for without it, it is impossible to tune the set as it should be. An average of about 45 degrees is right for loudest signals.

It is impossible to tell what coils to use in the primary for a given wave except by experiment.

Success can only be obtained by tuning properly, and the bubble and click method is the only way to determine if all the circuits are really in tune or not.

Decreasing the capacity of the secondary condenser decreases the wavelength and calls for decrease in the primary condenser.

Increasing the secondary condenser increases the wavelength and calls for an increase in the primary condenser; or, if the condenser is as high as it will go, a larger primary coil is necessary.

The important thing to remember is to move the condensers SLOWLY and keep the set balanced at all times by the clicks.

Radio Broadcasting Guide of North America

The only complete station guide published. Sent to any address upon receipt of 12 cts. in stamps. Address direct to Wm. E. HUBBS - 600 Fisher Ave. - N. Bergen, New Jersey
The secondary coil is shunted by a variable condenser of .001 mfd. maximum capacity, and one with a vernier will be a great help in telephone work.

The grid condenser may be fixed or variable. A variable one of .0005 mfd. will be the most satisfactory, if using different tubes from time to time.

The bridging condenser may be fixed or variable and should have a capacity of .002 mfd.

The "A" battery should be a 6 volt storage battery.

The "B" battery should be at least 22½ volts for the most successful operation.

No primary load coil is required with honeycomb coils.
INSTRUCTIONS FOR WIRING THE RECEIVER

In our receiver we use DeForest Duo Lateral Honeycomb Coils for all wavelengths and they give us remarkable results. They are superior to anything we have ever tried in our experience of over eight years in the Radio game.

We hear amateurs as far West as Kansas and New Mexico; also Honolulu, California, British Guiana, South America, German, French and British stations, and Chicago, Detroit, Cincinnati, New York, Newark and other telephone stations.

The following combination of coils are what we use, and while it is not so easy to choose the primary coils—as the size depends on the capacity of the aerial and primary condenser—once the secondary and plate coils are known it is easy to find the right primary coil.

Our aerial is 4 wires, 60 feet high, 165 feet long, and has a capacity of .0006 Microfarads. Our primary condenser is a .003 mfd. A one or two wire aerial, 100 feet long and 30 or 40 feet high, will be found very satisfactory for phone work, with a .0015 primary condenser.

<table>
<thead>
<tr>
<th>Type of Station</th>
<th>Wave Lengths in Meters</th>
<th>Primary Coil Number</th>
<th>Secondary Coil No.</th>
<th>Tickler Coil Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>KDKA, WJZ, KYW.</td>
<td>150 to 400</td>
<td>25</td>
<td>50</td>
<td>35 or 50</td>
</tr>
<tr>
<td>Amateur</td>
<td>330 to 375</td>
<td>25, 35 or 50</td>
<td>50</td>
<td>35, 50 or 75</td>
</tr>
<tr>
<td>Commercial</td>
<td>550 to 700</td>
<td>25</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Arlington</td>
<td>2500</td>
<td>100</td>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>Foreign</td>
<td>3600 to 6000</td>
<td>300, 400 and 600</td>
<td>1000</td>
<td>750</td>
</tr>
<tr>
<td>Foreign</td>
<td>6000 to 20000</td>
<td>400, 600 and 750</td>
<td>1500</td>
<td>1000</td>
</tr>
</tbody>
</table>

In the diagram the grid leak is connected to the negative (—) terminal of the "A" battery, but we recommend connecting it to the positive (+) for trial and to leave it where it gives the best results. It may easily be made with a few lead pencil marks on cardboard between two binding posts; or, if a tubular Audiotron, UV200 Radiotron or Electron Relay Tube be used, a Remler grid leak and fixed condenser may be purchased for 90 cents and will be satisfactory.

It is important that the leads to the tickler coil be reversed and left where the valve circuit oscillates steadily. The correct connection is readily determined when an undamped station is sending.

The diagram shows the proper connections, and it is important they should be duplicated in detail. We recommend that the "B" battery be varied with a Clapp-Eastham 5000 OHM Graphite Potentiometer, but should you prefer to use a 22½ volt variable "B" battery with Radiotron UV200 Tube, connect wire from plus "B" battery post to right hand phone post and do not buy potentiometer.

All connections must be SOLDERED and the set wired with No. 18, or larger, annunciator wire.

The diagram shows a series condenser in the primary circuit, but we get the best results with it shunted around the primary coils. It is desirable to have a series parallel switch so it can be used either way. If possible, get a .003 for the primary circuit. It is of more real value to the set than an amplifier, when used with a large aerial and long wave lengths.

To use loose coupler with this set, plug primary and ground in No. 4, secondary in No. 5, and short No. 6 with a piece of wire.

Dealers

Drawings of Amplifier copied from Radio plans published by

S. NEWMAN & CO.
RADIO DESIGNING & ILLUSTRATING
74 Dey Street, Dep't H New York City

The following plans ready for delivery, ask for our interesting proposition.

1-Crystal Receiving Set
2-Super Selective Regenerative Tuner
3-V.T. Detector with 1 or 2 Step Amplifiers
4-Loop Aerial
5-Short Wave Regenerative Set
6-Medium Wave Tuner 180 to 3500 Meters
7-Amplifier
8-Radio Frequency Amplifier
9-Armstrong's Super Regenerative Tuner