THE MAGNAVOX CO., INC.

F.M. TUNER
1.F. - 4.3 MC

VOLTAGE TABLE

<table>
<thead>
<tr>
<th>BAND RANGE</th>
<th>PRIMARY VOLTAGE</th>
<th>POWER CONSUMPTION</th>
<th>TUNING RANGE</th>
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<td>41.7 - 50.4 MC</td>
<td>117 v. 50-60 cycles</td>
<td>70 watts</td>
<td>41.7 - 50.4 MC</td>
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<tr>
<td>4.3 MC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ALIGNMENT PROCEDURE

Although it is most convenient to align this receiver with a frequency-modulated oscillator, a satisfactory job can also be done with an accurately-calibrated signal generator or oscillator covering a range in the vicinity of 4.3 megacycles. The object of alignment is to adjust the I.F. trimmers so that the I.F. system has a pass band from 4.3 to 4.4 megacycles, and then to adjust the discriminator transformer to cover exactly the same band. Proceed as follows:

1. Connect the "high" side of the generator output to the grid (63) of the 6SA7 converter, and the "low" side of the generator to the ground of the chassis. The connection to the grid is most easily made by connecting it to the grid resistor or middle condenser in the tuning gang. If it is found that the generator does not furnish enough signal, it will be necessary to make this connection directly to the center grid of the 6SA7 tube and to disconnect the grid of this tube. This point is indicated at "D" on the schematic diagram.

2. Connect a 0-50 or 0-200 microammeter in series with the "ground" end of the 100,000 ohm resistor (44). This is point "M" on the diagram. Connect the positive terminal of the meter to ground. This will measure the grid current of the 6AC7 tube. A reading of 30 to 100 microamperes is normal. If a 100,000 ohm resistor is available, it can be connected directly across this 100,000 ohm resistor (44) without disconnecting the resistor. This measures the limiter grid bias voltage. A reading of 3 to 10 volts should be considered normal.

3. Set the generator at 4300 kc., and align the I.F. trimmers for maximum grid current in the 6AC7 tube as indicated by the microammeter or voltmeter.

4. The I.F. stages are now aligned, remove the microammeter and re-connect the 100,000 ohm resistor (44) as it was before.
5. The discriminator will be adjusted next. Connect the microammeter in parallel with the 40,000 ohm resistor (40). This is indicated as point "4" on the diagram. The positive side of the meter is connected to ground. Instead of this, a high impedance electronic voltmeter, such as an Analyst or similar device, can be connected across this resistor. This measures the detector output current or voltage.

6. Adjust the test generator to 4375 kc. Adjust both trimmers on the discriminator transformer (7) for a peak. Adjust the output of the generator so that the meter reads at least 60 microamperes or 2.4 volts. Adjust the oscillator to 4300 kc. Adjust the trimmer nearest the G8 tube until the current or voltage is zero. A non-metallic screwdriver is essential; this is an extremely important operation. Reset the oscillator to 4375 kc, and note the meter reading.

Now reverse the meter connections so that the negative terminal is connected to ground. Set the generator to 4225 kc, and the meter reading should be within 10% of being the same. If not, the tuning of the discriminator transformer was not done carefully enough and must be repeated. This completes the adjustment of the discriminator. Remove the meter from the circuit.

7. Re-connect the control grid of the 6SA7 to the mixer coil if this connection had been removed and disconnect the generator from this point.

8. The antenna, mixer, and oscillator coils are now ready to be aligned. Check to see that the dial pointer is at the end of the dial calibration (41.7 mc) when the tuning gang is fully meshed.

9. Prepare to measure the limiter grid current by again connecting the microammeter as described in paragraph 2.

10. If an extremely accurate signal generator is available, it may be used for setting the oscillator to the dial calibration. The generator is connected to the antenna post through a 70 ohm resistor. Otherwise it will be necessary to connect an antenna to the receiver and use a F.M. transmitter for the frequency standard, preferably one between 47 mc, and 50 mc.

11. Set the dial to the known frequency of the transmitter and adjust the oscillator air trimmer "4" until the signal produces a maximum reading on the microammeter. Then adjust the trimmers "2" and "5" on the antenna and R.F., coils for maximum reading. If too much signal is fed to the receiver, it will appear at several settings of the dial and confuse the adjusting. These trimmers should align rather loosely. If they are tightened so that the frequency of the R.F. circuit equals the oscillator frequency, spurious oscillations and responses are produced. The oscillator frequency is normally 4500 kc, lower than the signal frequency. When the above adjustments are completed and the 100,000 ohm resistor (44) is again grounded, the receiver has been aligned.
Intermediate frequency.....455 KC;
Tuning frequency range:
639 - 1877 KC;
5.7 - 18.1 MC;

CR-171 Used in Chippendale Commode

The Magnavox Co., Inc.

Primary voltage...117 V. 50-60 cycle AC;
Power consumption...............100 watts;
Power output....................12 watts;

Speaker:
Field Coils......................1000 ohms;
Transformer.....................8000 ohms;

Intermediate frequency 455 KC;
Tuning frequency range:
539 - 1677 KC;
5.7 - 18.1 MC;

Back View of Speaker Socket

Voltage Table

NOTE: MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER.
LINE VOLUME 117 V. A.C.
ALL OTHER VOLTAGES 6.3 V. A.C.

Phono Pickup Receptacle

Power Trans 3000 ohms;
Rectifier

Back View of Speaker Socket

John F. Rider
Intermediate frequency......455 KC;
Tuning frequency range:
539 - 1677 KC;
6.7 - 18.1 MC;

THE MAGNAVOX CO., INC.

CR-171 Used in Chippendale Commode

Intermediate frequency......455 KC;
Tuning frequency range:
539 - 1677 KC;
6.7 - 18.1 MC;

BLACK BLUE
ANT.GND

PR.JOINT

OSC-MOD 6K7
IF 6SK7
DET-AVC 6J5
1ST AUDIO 6J5

Cr-171 Used in Chippendale Commode

CR-171 Used in Chippendale Commode

Intermediate frequency......455 KC;
Tuning frequency range:
539 - 1677 KC;
6.7 - 18.1 MC;

BLACK BLUE
ANT.GND

PR.JOINT

OSC-MOD 6K7
IF 6SK7
DET-AVC 6J5
1ST AUDIO 6J5

CR-171 Used in Chippendale Commode

Primary voltage...117 V. 50-60 cycle AC;
Power consumption.......... 100 watts;
Power output................ 12 watts;

Speaker:
Field Coil.................. 1000 ohms;
Transformer............... 8000 ohms;

Speaker:
Field Coil.................. 1000 ohms;
Transformer............... 8000 ohms;

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Primary voltage: 117 V. AC; Intermediate frequency: 455 KC.
Power consumption: 180 watts; Tuning frequency range: 535 - 1720 KC;
1667 - 5680 KC;
Speaker (120131): 250 ohms; Field Coil: 5.6 - 18.4 MC;
Transformer: NONE; Speaker (302): 5.6 - 15.4 MC;
Field Coil: 250 ohms; Transformer: 5 ohms (for dual speakers);
Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. bend expansion, amplified A.V.C., inverse feedback circuit, bass compensation in volume control for phonograph pickup, push button condenser-type tuner temperature stabilized.
Chassis CR-157 is the same as CR-140 (see page 11-7, Rider's Vol.XI) with the exception of the changes shown herewith.

Chassis CR-159 is the same as CR-141 (see page 11-13 Rider's Vol.XI) with the exception of the changes shown herewith.

Chassis CR-157 is used in Chippendale Commode Combination

Chassis CR-159 is used in Concerto Combination and Sheraton Table Combination

Chassis CR-160 is the same as CR-146 with the exception of the change that is shown at the left.

CR-160 used in AC Hepplewhite Combination.
MODELS T101L-A, T101L-X
Tuning range from 540 to 1720 kc. This includes standard broadcast band and police calls in 1600 to 1720 kc range.

MODEL T101L-A, T101L-X
Schematic Diagram Model T101L-A

MODEL T102L-A, T102L-X
Tuning range from 540 to 1720 kc and 5,500 to 18,600 kc. This includes standard broadcast band, police calls 1600 to 1720 kc range, foreign and domestic short wave stations.

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MAJESTIC RADIO & TELEV. CORP.

SCHEMATIC DIAGRAM MODEL T121-A; T121-X; T131-A; T131-X


SCHEMATIC DIAGRAM MODEL T122-A; T122-X, T132-X

MODELS T121-A, T131-A, T121-X, T131-X: Tuning range from 540-1720 kc Includes standard b.c. band and police calls in the 1600-1720 kc range.

MODELS T122-A, T122-X, T132-A, T132-X: Tuning range 540-1720 kc & 6,500-18,600 kc; includes stand. b.c. bands and police calls in 1600-1720 kc range, foreign and domestic short wave stations.

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www.americanradiohistory.com
Model T201-A: Tuning range 540 kc to 1720 kc. This includes standard broadcast band and 1600 kc to 1720 kc police bands.

Model T202-A: Tuning 540 to 1720 kc; includes standard b.c. and police calls in 1600 to 1720 kc spectrum. Also 5,800 to 13,600 kc, American and foreign short wave, ships, planes, transatlantic phone.

Model TP221-A, TP231-A: Tuning range 540 to 1720 kc. This includes standard broadcast and police calls lying in the 1600 to 1720 kc range.

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FOR NEW PRODUCTS 300 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

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This receiver is equipped with a built-in loop antenna and, under normal conditions, should not require an external antenna. Since reception of loops is directional, reception can be improved by orienting the set for best reception of preferred stations. In very difficult locations, an external antenna should be used. This should be connected to the clip on the back of the receiver. No ground should be used on this set.

Model TR321-A operates on 105-125 volts 60 cycles AC only.

Model TR331-A operates on 105-125 volts 50 cycles AC only.

This is a seven tube combination superheterodyne radio receiver, home recorder, phonograph, and public address amplifier.

The tuning range is from 540 to 1720 kilocycles. This includes the standard broadcast band and police calls in 1600 to 1720 kilocycles range.

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SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.

ALIGNMENT FREQUENCIES

I.F. 456 KC.  A_ 1400 KC.  C_ 9.8 MC.  E_ 15.7 MC.
B_ 6.6 MC.  D_ 11.7 MC.  F_ 24 MC.
SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.

ALIGNMENT FREQUENCIES

IF - 456 KC
A - 1400 KC  C - 9.8 MC  E - 15.7 MC
B - 6.6 MC  D - 11.7 MC  F - 24 MC
SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

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ALIGNMENT FREQUENCIES

IF - 456 KC
A - 1400 KC
B - 6.6 MC
C - 9.8 MC
D - 11.7 MC
E - 15.7 MC
F - 24 MC

©John F. Rider
SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.

2. Loosen locking screw about one full turn.

3. With locking screw loose, and button depressed, tune in desired station accurately.

4. Tighten screw and replace moulded cap.

DO NOT LOOSE screw more than 4 turns. Screw may come out and may be hard to replace.

ALIGNMENT FREQUENCIES

IF - 456 KC  A - 1400 KC  C - 9.8 MC  E - 15.7 MC
B - 6.6 MC  D - 11.7 MC  F - 24 MC

©John F. Rider
SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.

2. Loosen locking screw about one full turn.

3. With locking screw loose, and button depressed, tune in desired station accurately.

4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.

ALIGNMENT FREQUENCIES

<table>
<thead>
<tr>
<th>IF</th>
<th>A</th>
<th>C</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>456 KC</td>
<td>1400 KC</td>
<td>9.8 MC</td>
<td>15.7 MC</td>
</tr>
<tr>
<td></td>
<td>6.5 MC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.7 MC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 MC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

©John F. Rider
This receiver has six separate and distinct wave bands. It is designed so that you may easily receive all of the foreign and domestic stations now operating in the radio spectrum. Bands are lettered "A B C D E and F." The "A" band is the usual broadcast band and on it you will receive your favorite U.S. broadcast stations. The tuning range of the other five bands is so designed that you may tune in your favorite short wave stations during the day or night time. For example: in the early morning hours you will find most of the short wave stations on the "B" or "F" bands. As daylight increases you will find that these stations will disappear and reappear again on the "C" and "D" bands. At night you will find that these stations have again changed and will appear on the "B" and "C" bands.

**SETTING PUSH BUTTONS**

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.
This receiver has six separate and distinct wave bands. It is designed so that you may easily receive all of the foreign and domestic stations now operating in the radio spectrum. Bands are lettered "A B C D E and F." The "A" band is the usual broadcast band and on it you will receive your favorite U.S. broadcast stations. The tuning range of the other five bands is so designed that you may tune in your favorite short wave stations during the day or night time. For example: In the early morning hours you will find most of the short wave stations on the "E" or "F" bands. As daylight increases you will find that these stations will disappear and reappear again on the "G" and "D" bands. At night you will find that these stations have again changed and will appear on the "B" and "C" bands.
PUSH BUTTON DATA
SAME AS FOR
MODEL 82 R
PARTIAL SCHEMATIC SHOWING DIFFERENCES BETWEEN MODEL 3818 AND MODEL 3820; FOR BALANCE OF CONNECTIONS FOR MODEL 3820, SEE MODEL 3818 ABOVE.

DESIGNED BY
W.S. HARMON, Chief Engr.  
E.M. MATTSON, Asst. Engr.

MODEL No. 3820  
APRIL 10-1937

MISSION BELL RADIO MFG. CO., INC.

MODEL No. 3818  
APRIL 10-1937
MONTGOMERY WARD & CO.

Prices subject to change without notice

<table>
<thead>
<tr>
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<th>No.</th>
<th>Reference</th>
<th>Description</th>
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<tr>
<td>CONDENSERS</td>
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</tr>
<tr>
<td>BE1001</td>
<td>C19</td>
<td>...1 x 400 Volt Tubular Condenser...</td>
<td>1.12</td>
</tr>
<tr>
<td>BE1009</td>
<td>C20</td>
<td>...0.5 x 200 Volt Tubular Condenser...</td>
<td>1.12</td>
</tr>
<tr>
<td>BE1020</td>
<td>C14</td>
<td>...1 x 200 Volt Tubular Condenser...</td>
<td>1.12</td>
</tr>
<tr>
<td>BE1024</td>
<td>C11</td>
<td>...25 x 400 Volt Tubular Condenser...</td>
<td>1.26</td>
</tr>
<tr>
<td>BE1025</td>
<td>C16</td>
<td>...0.02 x 600 Volt Tubular Condenser...</td>
<td>1.12</td>
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<tr>
<td>BE1026</td>
<td>C13, C18, C21</td>
<td>...0.5 x 400 Volt Tubular Condenser...</td>
<td>3.12</td>
</tr>
<tr>
<td>BE119104</td>
<td>C22, C23, C24</td>
<td>...20 Mfd. x 30 Mfd. x 40 Mfd. Electrolytic Filter Condenser...</td>
<td>1.26</td>
</tr>
<tr>
<td>BE124123</td>
<td>C6, C7, C25</td>
<td>...Trimmer Condenser Strip—3 Gang S.W.—M.W.—B.C. Osc...</td>
<td>1.40</td>
</tr>
<tr>
<td>BE124124</td>
<td>C3, C4, C5</td>
<td>...Trimmer Condenser Strip—3 Gang S.W.—M.W.—B.C. Antenna...</td>
<td>1.40</td>
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<tr>
<td>BE1202</td>
<td>C1, C10, C17</td>
<td>...0.005 Mica Type Condenser—20%...</td>
<td>3.12</td>
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<tr>
<td>BE1295</td>
<td>C12, C15</td>
<td>...0.001 Mica Type Condenser—20%...</td>
<td>2.12</td>
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<tr>
<td>BE129153</td>
<td>C2</td>
<td>...0.006 Compression Type Mica Condenser...</td>
<td>1.10</td>
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<tr>
<td>BE129154</td>
<td>C8</td>
<td>...0.0025 Compression Type Mica Condenser...</td>
<td>0.28</td>
</tr>
<tr>
<td>BE129155</td>
<td>C9</td>
<td>...0.00482 Compression Type Mica Condenser—3%...</td>
<td>0.20</td>
</tr>
</tbody>
</table>

| RESISTORS |
| BE1311 | R1, R9, R12 250M Ohm—1/4 Watt Resistor—25%... | 3.10 |
| BE13019 | R2 | ...1 Megohm—1/4 Watt Resistor—20%... | 1.10 |
| BE13081 | R5 | ...250 Ohm—1/4 Watt Resistor—20%... | 1.10 |
| BE13066 | R12 | ...150 Ohm—1/4 Watt Resistor—10%... | 1.10 |
| BE13070 | R6 | ...3 Megohm—1/4 Watt Resistor—25%... | 1.10 |
| BE13057 | R3 | ...35M Ohm—1/4 Watt Resistor—20%... | 1.10 |
| BE130296 | R15 | ...300 Ohm—1 Watt Resistor—10%... | 1.10 |
| BE130297 | R14 | ...1200 Ohm—1 Watt Resistor—10%... | 1.10 |
| BE130295 | R10 | ...25 Ohm—1 Watt Resistor—10%... | 1.10 |
| BE130327 | R4 | ...10 Ohm—1/4 Watt Resistor—25%... | 1.10 |
| BE130223 | R8 | ...10 Megohm—1/4 Watt Resistor—25%... | 1.10 |
| BE10953 | P2 | ...Ballast Tube—110 and 220 Volts... | 1.60 |

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ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 Mfd., 200 Mmd., 400 Ohms.

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<th>BAND</th>
<th>SIGNAL GENERATOR Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted (in Order Shown)</th>
<th>Trimmer Function</th>
<th>Adjustment</th>
</tr>
</thead>
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<td>I. F.</td>
<td>455 Kc. 1 MFD. Grid of 12S7 1. F. Tube</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top (See Chassis View)</td>
<td>Output I. F.</td>
<td>Adjust to maximum output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. F.</td>
<td>455 Kc. 1 MFD. Grid of 12SA7 (Extreme Left Rotation)</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top (See Chassis View)</td>
<td>Input I. F.</td>
<td>Adjust to maximum output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHORT WAVE BAND</td>
<td>21 Me. 400 ohms Antenna lead Short Wave (Extreme Right Rotation)</td>
<td>Set Dial at 21 MC</td>
<td>Trimmer (C8)</td>
<td>Short wave oscillator</td>
<td>Adjust to maximum output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDIUM WAVE BAND</td>
<td>6 Me. 400 ohms Antenna lead Medium Wave</td>
<td>Set Dial at 6 MC</td>
<td>Trimmers (C7, C4) (See Trimmer View)</td>
<td>Medium wave oscillator and antenna</td>
<td>Adjust to maximum output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDIUM WAVE BAND</td>
<td>2.3 Me. 400 ohms Antenna lead Medium Wave</td>
<td>Set Dial at 2.3 MC</td>
<td>Trimmer (C8) (See Chassis View)</td>
<td>Medium wave osc. series pad</td>
<td>Adjust to maximum rock dial (See note &quot;B&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1730 Kc. 200 mmd. Antenna lead Broadcast (Extreme Left Rotation)</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Trimmer (C25) (See Trimmer View)</td>
<td>Broadcast oscillator</td>
<td>Adjust to maximum output</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>BROADCAST BAND</td>
<td>1990 Kc. 200 mmd. Antenna lead Broadcast</td>
<td>Set Dial at 1500 Kc.</td>
<td>Trimmer (C9) (See Trimmer View)</td>
<td>Broadcast antenna</td>
<td>Adjust to maximum output</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>BROADCAST BAND</td>
<td>600 Kc. 200 mmd. Antenna lead Broadcast</td>
<td>Set Dial at 600 Kc.</td>
<td>Trimmer (C9) (See Chassis View)</td>
<td>Broadcast oscillator series pad</td>
<td>Adjust to maximum rock dial. (See note &quot;B&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

TECHNICAL DATA

<table>
<thead>
<tr>
<th>TEST FREQUENCIES USED</th>
<th>Power Consumption</th>
<th>Power Output</th>
<th>Tuning Frequency Range Broadcast Band</th>
<th>Medium Band</th>
<th>Short Wave Band</th>
<th>Intermediate Frequency</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>K.C.</td>
<td>-</td>
<td>-</td>
<td>110 V. 35 Watts</td>
<td>220 V. 65 Watts</td>
<td>1½ Watts Undistorted</td>
<td>540 to 1735 KC</td>
<td>455 KC</td>
</tr>
<tr>
<td>Meters</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6 in. Electro Dynamic</td>
</tr>
<tr>
<td>I. F.</td>
<td>455</td>
<td>645.1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Short Wave</td>
<td>21000</td>
<td>14.2</td>
<td></td>
<td></td>
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<tr>
<td>Medium Wave</td>
<td>6000</td>
<td>50</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Medium Wave</td>
<td>2300</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcast</td>
<td>1730</td>
<td>173.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcast</td>
<td>1500</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcast</td>
<td>600</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OPERATING THE PHONOGRAPh

Turn radio on. Turn recording switch to Playback position.

Put your record on turntable and start motor. Place playback arm on record and control tone and volume with the radio volume and tone control knobs.

RECORDING RADIO PROGRAMS

Turn the radio on and tune in the program you wish to record. Put recording switch in "Record-Radio" position. The volume will drop. Start motor and then gently lower cutting needle onto blank record, about 1/4" from outer edge.

RECORDING VOICE

Turn the radio volume control nearly full on. Recording switch should be in "Record-Mike" position. Start motor, and set cutting needle gently on start of record. Turn mike switch on and talk.

NOTE: The cutting arm must be raised about three inches to move it freely across the record.
- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna valve in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to “heat up” for several minutes.

The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mfl., 200 mml., 400 ohms.

<table>
<thead>
<tr>
<th>BAND</th>
<th>SIGNAL GENERATOR Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted (in Order Shown)</th>
<th>Trimmer Function</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td>455 Kc. 1 MFD</td>
<td>Grid of 6517</td>
<td>L. F.</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top (See Top View)</td>
<td>Output I. F.</td>
<td>Adjust to maximum output</td>
</tr>
<tr>
<td>I. F.</td>
<td>455 Kc. 1 MFD</td>
<td>Grid of 6SA7</td>
<td>Mixer</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top (See Top View)</td>
<td>Input I. F.</td>
<td>Adjust to maximum output</td>
</tr>
<tr>
<td>SHORT WAVE BAND</td>
<td>17 Mc. 400 Ohms</td>
<td>External Antenna and Ground</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>Trimmer C5</td>
<td>Short Wave oscillator</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
<tr>
<td>SHORT WAVE BAND (See Note A)</td>
<td>17 Mc. 400 Ohms</td>
<td>External Antenna and Ground</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>Trimmer C2</td>
<td>Short Wave antenna</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
<tr>
<td>SHORT WAVE BAND</td>
<td>6 Mc. 400 Ohms</td>
<td>External Antenna and Ground</td>
<td>Short Wave</td>
<td>Set Dial at 6 Mc.</td>
<td>Trimmer C8</td>
<td>Short Wave oscillator series pad</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
<tr>
<td>BROADCAST BAND (See Note A)</td>
<td>1600 Kc. 200 mml.</td>
<td>Grid of 6SA7</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Trimmer C6</td>
<td>Broadcast oscillator series pad</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
<tr>
<td>BROADCAST BAND (See Note A)</td>
<td>555 Kc. 200 mml.</td>
<td>Grid of 6SA7</td>
<td>Broadcast</td>
<td>Rotor full closed</td>
<td>Trimmer C7</td>
<td>Broadcast oscillator series pad</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
<tr>
<td>LOOP ALIGNMENT (See Note B)</td>
<td>1400 Kc. 200 mml.</td>
<td>External Antenna and Ground</td>
<td>Broadcast</td>
<td>Set Dial at 1400 Kc.</td>
<td>Trimmer C1</td>
<td>Broadcast antenna</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
<tr>
<td>LOOP ALIGNMENT (See Note B)</td>
<td>600 Kc. 200 mml.</td>
<td>External Antenna and Ground</td>
<td>Broadcast</td>
<td>Set Dial at 600 Kc.</td>
<td>Trimmer C7</td>
<td>Broadcast osc. Series Pad</td>
<td>Adjust to maximum output</td>
<td></td>
</tr>
</tbody>
</table>

NOTE “A”—The signal generator is connected to the “ANT.” and “GND.” leads when aligning the Short Wave Band and to the grid of the 6SA7 tube and ground terminal when setting the Broadcast Band oscillator end frequencies, (1600 and 555 Kc. C). The loop antenna should be connected to the radio when making these adjustments.

NOTE “B”—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the “ANT.” and “GND.”

Power Consumption
- Radio Only — 70 Watts
- Motor Only — 40 Watts

Power Output — 2.1 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 15 Microvolts Average
Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 535 to 1600 KC
Shortwave Band - 5.46 to 18.3 MC
Intermediate Frequency — 455 KC
Speaker — 6 in. Electro Dynamic

NOTE “C”—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

After the signal from the signal generator to prevent the leveling-off action of the AVC. After each band is completed, repeat the procedure as a final check.
Model 04JP-399D can be used with the following model receivers:
047G-732 04BR-904 04BR-906 04BR-1106 1477G-732 14BR-904 14BR-906 14BR-1106

Fig. 13—Cable Interconnections

Fig. 14—Pre-Amplifier Unit Schematic Circuit Diagram

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Fig. 1.—Phonograph and Recorder Unit

See Rider's "Automatic Record Changers and Recorders" for complete data on Seeburg Jr Record Changer and the Montgomery-Ward Section for similar use of Microphone and Radio for a Public-Address System.

PRE-AMPLIFIER UNIT REPLACEMENT PARTS LIST

GENERAL

<table>
<thead>
<tr>
<th>Bin No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Recording Microphone complete with Stand and 12 ft. Cable</td>
<td>$11.70</td>
</tr>
<tr>
<td>4X390</td>
<td>28A754</td>
<td>Recording Microphone Volume Control</td>
<td></td>
</tr>
<tr>
<td>2A19</td>
<td>4X395</td>
<td>Neon Lamps for Red and White Volume Controls</td>
<td></td>
</tr>
<tr>
<td>15X75</td>
<td>2A197</td>
<td>Celluloid Indicator—Red</td>
<td></td>
</tr>
<tr>
<td>15X76</td>
<td>2A198</td>
<td>Celluloid Indicator—White</td>
<td></td>
</tr>
<tr>
<td>13X08</td>
<td>2A199</td>
<td>Power Cable with Moulded Octal Plug</td>
<td></td>
</tr>
<tr>
<td>13X10</td>
<td>3A202</td>
<td>Amplifier Output Cable with 2 Prong Plug</td>
<td></td>
</tr>
<tr>
<td>3A203</td>
<td>3A205</td>
<td>Tubes and Speaker Sockets—Octal (8 prongs)</td>
<td></td>
</tr>
<tr>
<td>3A204</td>
<td>3A206</td>
<td>Microphone Socket—Single Pin Tip</td>
<td></td>
</tr>
<tr>
<td>2A185</td>
<td></td>
<td>Record Cutter Changeover Switch</td>
<td></td>
</tr>
<tr>
<td>3A209</td>
<td></td>
<td>Trip Arm and Hub Assembly for Changeover Switch</td>
<td></td>
</tr>
<tr>
<td>10A314</td>
<td></td>
<td>Knob for Microphone Volume Control</td>
<td></td>
</tr>
</tbody>
</table>

RESISTORS

<table>
<thead>
<tr>
<th>Bin No.</th>
<th>Part No.</th>
<th>Code</th>
<th>Resistance</th>
<th>Wattage</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>885025</td>
<td>R1</td>
<td>R1</td>
<td>2 Megohm</td>
<td>0.5</td>
<td>$0.06</td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td>R2</td>
<td>5,000 Ohm</td>
<td>0.5</td>
<td>$0.06</td>
</tr>
</tbody>
</table>

CONDENSERS

<table>
<thead>
<tr>
<th>Bin No.</th>
<th>Part No.</th>
<th>Code</th>
<th>Capacitance</th>
<th>Voltage</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>105078</td>
<td>47X41</td>
<td>C1</td>
<td>500 mfd.</td>
<td>Molded</td>
<td>$0.10</td>
</tr>
<tr>
<td>107907</td>
<td>4X257</td>
<td>C2, C5</td>
<td>15 mfd.</td>
<td>Tubular</td>
<td>$0.36</td>
</tr>
<tr>
<td>108884</td>
<td>4X258</td>
<td>C1</td>
<td>500 mfd.</td>
<td>Tubular</td>
<td>$0.36</td>
</tr>
<tr>
<td>108864</td>
<td>4A284</td>
<td>C4</td>
<td>15 mfd.</td>
<td>Tubular</td>
<td>$0.36</td>
</tr>
<tr>
<td>108884</td>
<td>4A286</td>
<td>C5</td>
<td>20 mfd.</td>
<td>Tubular</td>
<td>$0.36</td>
</tr>
<tr>
<td>108884</td>
<td>4A287</td>
<td>C6</td>
<td>50 mfd.</td>
<td>Tubular</td>
<td>$0.36</td>
</tr>
</tbody>
</table>

Use only GENUINE factory tested parts to insure service jobs you can depend on and to obtain original set performance.

Prices Subject to Change Without Notice.

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CHASSIS VIEW showing tube location.
NOTE: Antenna and ground leads at back of chassis.

ANTENNA For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines.

POWER SUPPLY—This radio is equipped with a universal transformer, 40 to 60 cycles which has the following taps: 95-110-130-150-230 volts. A rotary switch mounted on top of the transformer selects the proper voltage tap.

Set the switch for various line voltages to conform with the following table: 95 mark for current of 85 to 105 volts; 110 mark for current of 105 to 125 volts; 130 mark for current of 125 to 145 volts; 150 mark for current of 145 to 165 volts; 230 mark for current of 210 to 250 volts.

To set the switch, unloosen the set screw on the side of the switch and rotate the knob so that the mark desired shows up in the small framed window on the top of the switch. Tighten the set screw.

**ALIGNMENT PROCEDURE**

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

<table>
<thead>
<tr>
<th>BAND</th>
<th>Frequency Setting</th>
<th>SIGNAL GENERATOR</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td>455 Kc</td>
<td>1 MFD</td>
<td>Grid of 6SK7</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>(Plates out of mesh)</td>
<td>Two trimmers on top of Output I. F. (See Chassis View)</td>
</tr>
<tr>
<td></td>
<td>655 Kc</td>
<td>1 MFD</td>
<td>Grid of 6SA7</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>(Plates out of mesh)</td>
<td>Two trimmers on top of Input I. F. (See Chassis View)</td>
</tr>
<tr>
<td>SHORT WAVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAVE</td>
<td>21 Mc</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave (Right Rotation)</td>
<td>Set Dial at 21 MC</td>
<td></td>
<td>Trimmer (C7) Short wave oscillator (See Trimmer View)</td>
</tr>
<tr>
<td>BAND</td>
<td>21 Mc</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave (Right Rotation)</td>
<td>Set Dial at 21 MC</td>
<td></td>
<td>Trimmer (C1) Short wave antenna (See Trimmer View)</td>
</tr>
<tr>
<td>MEDIUM WAVE</td>
<td>6 Mc</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Medium Wave</td>
<td>Set Dial at 6 MC</td>
<td></td>
<td>Trimmers (C8, C2) Medium wave oscillator and antenna (See Trimmer View)</td>
</tr>
<tr>
<td>WAVE</td>
<td>2.3 Mc</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Medium Wave</td>
<td>Set Dial at 23 MC</td>
<td></td>
<td>Trimmer (C9) Medium wave oscillator (See Trimmer View)</td>
</tr>
<tr>
<td>BROADCAST</td>
<td>1370 Kc</td>
<td>200 mmf</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>(Plates out of mesh)</td>
<td>Trimmer (C10) Broadcast oscillator (See Trimmer View)</td>
</tr>
<tr>
<td>BAND</td>
<td>1500 Kc</td>
<td>200 mmf</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1500 Kc</td>
<td></td>
<td>Trimmer (C3) Broadcast antenna (See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>600 Kc</td>
<td>200 mmf</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 600 Kc</td>
<td></td>
<td>Trimmer (C11) Broadcast oscillator (See Trimmer View)</td>
</tr>
</tbody>
</table>

**NOTE** "A"—It is extremely necessary that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

**NOTE** "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. After each range is completed, repeat the procedure as a final check.

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ALIGNMENT

NOTE "A"—The antenna coil assembly is made so that it is
wobbable right or left. When making the adjustment as given
in the alignment procedure move the coil assembly very slowly.
It can be stopped and restarted by pivoting one edge of the blade
of a screwdriver in the hole and engaging the blade in the
grain of the coil form.

- Volume control—Maximize all adjustments.
- Connect B of radio chassis to ground post of signal generator through 1 Mfd. condenser.

BAND

<table>
<thead>
<tr>
<th>F.M. Setting</th>
<th>Dummy Antenna</th>
<th>Position of Iron Cores</th>
<th>Trimmers Adjusted to Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>455 Kc</td>
<td>.1 MFD</td>
<td>Iron Cores</td>
<td>Two trimmers on top of output F.M. (See Chassis View)</td>
</tr>
<tr>
<td>555 Kc</td>
<td>.1 MFD</td>
<td>Iron Cores</td>
<td>Two trimmers on top of output F.M. (See Chassis View)</td>
</tr>
</tbody>
</table>

CHASSIS VIEW—Showing tube location and type. Note External Antenna Lead at back of chassis.

BOTTOM VIEW OF CHASSIS

FOR SEEBURG C Record Changer

RESISTORS

- RL 149 R1  R11  2000 Ohm—5 Watt Resistor—10%—10
- RL 149 R2  R2  2034 Ohm—5 Watt Resistor—10%—10
- RL 149 R3  R3  100 Ohm—5 Watt Resistor—10%—10
- RL 149 R4  R4  1000 Ohm—5 Watt Resistor—10%—10
- RL 149 R5  R5  5 Megohm—5 Watt Resistor—10%—10
- RL 149 R6  R6  5 Megohm—5 Watt Resistor—10%—10
- RL 149 R7  R7  5 Ohm—5 Watt Resistor—10%—10
- RL 149 R8  R8  5 Ohm—5 Watt Resistor—10%—10
- RL 149 R9  R9  5 Ohm—5 Watt Resistor—10%—10
- RL 149 R10 R10  5 Ohm—5 Watt Resistor—10%—10
- RL 149 R11 R11  5 Ohm—5 Watt Resistor—10%—10

MONTGOMERY WARD & CO.

www.americanradiohistory.com
**TUNER DATA**

Make a list of your 5 favorite stations—push out the call letters of these stations from the call letter sheets supplied. Next insert a long slim screwdriver into the hole in front of one of the pushbuttons and unscrew the pushbutton locking screw (to the left) several turns. Now with the screwdriver still engaged in the locking screw slot push it all the way in. Hold it in this position and tune in the station you want with the tuning knob. Now tighten up the pushbutton locking screw by turning it to the right. Tighten firmly. Continue setting each button in the same way. When you have set your stations insert the call letter of each station in the front of the proper button and put one of the celluloid tabs over the station call letter.

To change stations simply repeat the above procedure.

---

**BOTTOM VIEW OF CHASSIS**

All voltages measured with a 1000 ohms per volt voltmeter between terminal indicated & B-7 volt line.

---

**50L6GT REAR OF CHASSIS 35Z5GT**
The following equipment is required for alignment.

- Dummy antenna: 1 mfd. and 200 mfd.

**ALIGNMENT PROCEDURE**

**BAND**

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Dial Setting</th>
<th>Trimmers Adjusted</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>455 Kc. I.F.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Connect to Grid of I.A.</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Input and Output Trimmers on Top of I.F. cans</td>
<td>Maximum output (See Note &quot;A&quot;)</td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1600 Kc.</td>
<td>.1 MFD.</td>
<td>Connect to Grid of I.A.</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Osc. Trimmer on gang (See chassis view)</td>
<td>Maximum output (See Note &quot;B&quot;)</td>
</tr>
<tr>
<td></td>
<td>1600 Kc.</td>
<td>200 MFD.</td>
<td>Connect to Antenna Clip</td>
<td>Set dial at 1400 Kc.</td>
<td>Ant. Trimmer on gang (See chassis view)</td>
<td>Maximum output (See Note &quot;B&quot;)</td>
</tr>
</tbody>
</table>

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1 Mef. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the B- and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the IAGT tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mfd. dummy to the external antenna terminal.
### REPLACEMENT PARTS LIST

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE1071</td>
<td>.004 x 600 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE10313</td>
<td>.006 x 600 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE10320</td>
<td>1 x 200 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE1007</td>
<td>20 x 200 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE1006</td>
<td>25 x 200 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE10022</td>
<td>25 x 200 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE10067</td>
<td>0.1 x 600 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE100133</td>
<td>12 x 600 Volt Tubular Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE10130</td>
<td>Electrolytic Filter Condenser, 10 Mfd.</td>
<td>.26</td>
</tr>
<tr>
<td>BE124171</td>
<td>C2, C3, C5 Triple Unit Trimmer Cond.</td>
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</tr>
<tr>
<td>BE124173</td>
<td>B.C. Osc. Trimmer</td>
<td>.40</td>
</tr>
<tr>
<td>BE1216</td>
<td>.001 Dual Mica Condenser</td>
<td>.14</td>
</tr>
<tr>
<td>BE12115</td>
<td>.004 Mica-S.W. Series Pad</td>
<td>.50</td>
</tr>
<tr>
<td>BE12159</td>
<td>.00008 Mica Type Condenser</td>
<td>.12</td>
</tr>
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<td>BE1218</td>
<td>.01 Mica Type Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE12121</td>
<td>.002 Mica Type Condenser</td>
<td>.12</td>
</tr>
<tr>
<td>BE1306</td>
<td>300 Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE1309</td>
<td>1 Megohm—35 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE13027</td>
<td>5 Megohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE13048</td>
<td>4 Megohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE1018</td>
<td>2 Megohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE1231</td>
<td>50M Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE13065</td>
<td>3M Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE13016</td>
<td>100 Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE13012</td>
<td>50M Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE1307</td>
<td>200M Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
<tr>
<td>BE13046</td>
<td>.56 Ohm—55 Watt Resistor</td>
<td>.10</td>
</tr>
</tbody>
</table>

**PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

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### BATTERIES REQUIRED

The battery pack must contain a 1½ volt "A" battery and 90 volts of "B" battery. Plug the Battery Cable from the radio into the socket on the battery pack. The pack will fit nicely into the back of the cabinet as shown in the battery view.

Replacement batteries may be obtained from Wards Stores or Mail Order Houses. Order battery pack No. 62-5033.

**ECONOMIZER SWITCH** — When the A battery is fresh the economizer switch on the back of the chassis should be pushed down.

After the radio has been in use several weeks and reception becomes weaker push the switch up, (the white dot will show). Leave in this position until new batteries are installed.

**BATTERY VIEW** — When replacing battery, plug cable into battery socket as shown above. Note: Battery can be placed in back of cabinet as shown.
**ALIGNMENT PROCEDURE**

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

<table>
<thead>
<tr>
<th>BAND</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. P.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of IN5G</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Output I. F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 1N5G</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Interstage I. F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 1A7/G</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Input I. F.</td>
</tr>
<tr>
<td>SHORT WAVE BAND</td>
<td>16 Mc.</td>
<td>600 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 16 Mc.</td>
<td>Trimmer C6—S. W. osc. Top of front section of gang</td>
</tr>
<tr>
<td></td>
<td>16 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 40 Mc.</td>
<td>Trimmer C7 S. W. osc. series pad (See note “A”)</td>
</tr>
<tr>
<td></td>
<td>6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 6 Mc.</td>
<td>Trimmer C7 S. W. osc. series pad (See note “A”)</td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1720 Kc.</td>
<td>200 mfl.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Trimmer C8 B. C. osc.</td>
</tr>
<tr>
<td></td>
<td>1500 Kc.</td>
<td>200 mfl.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1500 Mc.</td>
<td>Trimmer C9 B. C. osc.</td>
</tr>
<tr>
<td></td>
<td>600 Kc.</td>
<td>200 mfl.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 600 Mc.</td>
<td>Trimmer C9 B. C. osc.</td>
</tr>
</tbody>
</table>

**NOTE “A”** Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

**ANTENNA**

For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

**SETTING THE PUSHPBUTTONS**

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place. Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.
MONTGOMERY-WARD & CO.

MONTGOMERY-WARD PAGE 13-19

MODEL 14BR-629A

VOLTMETER.

ANTENNA TRIMMER - CANNOT

POWER CONSUMPTION

RADIO CHASSIS 35 WATTS

PHONO MOTOR 35 WATTS

I.F. 435 K.C.

JULY 1941

BOTTOM VIEW OF CHASSIS

ALL VOLTAGES MEASURED BETWEEN B- A TERMINAL INDICATED, WITH A 600 OHMS PER VOLT VOLTOMETER. 1/2 VOLT LINE, PHONO SWITCH IN RADIO POSITION, VOLUME CONTROL AT MINIMUM & ANTENNA LEAD GROUNDED TO CHASSIS.

VOLTAGE CHART

REAR OF CHASSIS

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

FOR GENERAL INDUSTRIES R70 RECORD CHANGER, SEE RIDER’S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

©John F. Rider

FOR ALIGNMENT SEE INDEX

www.americanradiohistory.com
NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1 Mfd. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the D— and the other lead from the signal generator in series with 1 Mfd. dummy to the grid of the IAV7 tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mfd. dummy to the external antenna terminal.
# ALIGNMENT PROCEDURE

The following equipment is required for aligning:
- A high level signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mfd., 35 mmf.

## BAND

<table>
<thead>
<tr>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Remote Tuner Dial Setting</th>
<th>Trimmer Adjusted (in Order Shown)</th>
<th>Trimmer Function</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td></td>
<td>Grid of 6SK7 I. F. Tube</td>
<td>Set dial at 140 Kc.</td>
<td>See Chassis View</td>
<td>Output I. F.</td>
<td>Adjust to maximum output</td>
</tr>
<tr>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SA7 I. F. Tube</td>
<td>Set dial at 140 Kc.</td>
<td>See Chassis View</td>
<td>Input I. F.</td>
<td>Adjust to maximum output</td>
</tr>
</tbody>
</table>

## BROADCAST BAND

<table>
<thead>
<tr>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Remote Tuner Dial Setting</th>
<th>Trimmer Adjusted (in Order Shown)</th>
<th>Trimmer Function</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400 Kc.</td>
<td></td>
<td>Antenna lead</td>
<td>Set dial at 1600 Kc.</td>
<td>Trimmer C9, C8, C1</td>
<td>Oscillator</td>
<td>Adjust to maximum output</td>
</tr>
<tr>
<td>1400 Kc.</td>
<td></td>
<td>Antenna lead</td>
<td>Set dial at 1600 Kc.</td>
<td>Rotate cores of antenna and R. F. coils</td>
<td>Antenna and R. F.</td>
<td>Adjust to maximum output</td>
</tr>
</tbody>
</table>

---

**Battery Drain** - 7 Amps.

**Power Output** - 1.8 Watts Undistorted

**Sensitivity for 1 Watt Output** - 6 Microvolt Average

**Selectivity - 38 KC Broad at 1000 Times Signal at 1000 KC**

**Tuning Frequency Range** - 540 to 1600 KC

**Intermediate Frequency** - 455 KC

**Speaker** - 6 in. Electro Dynamic

---

### CALIBRATING THE DIAL

Tune set to some station of a known frequency (between 800 and 1200 Kc.), hold selector knob, then remove pilot light assembly from back of remote head and with a screwdriver adjust the slotted screw through this opening and in this way adjust the dial pointer to the correct frequency setting.

### GENERATOR CONDENSER

A Generator Condenser must be connected in all cases from the battery terminal of the generator to the Generator frame.

This condenser must not be connected across the field winding terminal on late cars which use Automatic Cutouts.

It is advisable that you find out from your local car dealers where the manufacturer recommends the condenser be connected for each make of car.

---

### ADJUSTING THE ANTENNA TRIMMER

The antenna lead supplied with the radio should not be shortened or otherwise altered.

It is important that the grounding lead on the end of the antenna cable be carefully grounded to the car body, otherwise it may prove difficult to eliminate ignition noise.

Tune in a station on the high frequency end of the dial and adjust the antenna trimmer for maximum volume. A weak station which does not fade is best for this adjustment.

### HIGH AND LOW TENSION LEADS

In many cars the low tension battery leads, etc., are grouped together with the high tension wires. These leads will very often pick up motor noise and feed it into the receiver through the battery circuit. In cases such as these it will be necessary to separate the low tension from the high tension wires and run them through another hole if they run from the engine compartment up to the instrument panel. This condition is particularly true on the V-8 Ford as the battery and primary leads run through a special tube which also houses the high tension leads. Shield and ground these leads.

### AMMETER CONDENSER

A .5 Mfd. by pass condenser should be connected from one ammeter terminal to a good ground on the instrument panel. Usually this condenser plus the generator condenser and distributor suppressor will remove all objectionable ignition noise.
SETTING UP THE AUTOMATIC TUNING

NOTE: Stations may be set up on the bench, before installing radio.

There are three major steps in setting up the automatic. Take these steps in order. After you become familiar with them, you may vary the routine, but you will then know the operations needed.

1st—To Synchronize the word “Dial” on the dial scale with the “Dial” position in the Chassis Tuner.

Note—The word “dial” is short for manual tuning.

2nd—To select one station and put it on the first automatic position.

3rd—To put the call letter on the dial.

The synchronization must be done only once, but items two and three are repeated until 5 Automatic Positions are set up.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 ml, 15 mml.

**Synchronizing (Step 1)**

With the Tuning Knob in “Dial”, press the tuning knob once. Let it come back—and then see if it sticks. It is now in the first automatic position. Insert a long screwdriver in the hole to turn up the volume control. Repeat the automatic tuner set up hole and turn this until the radio can be tuned with the screw until you hear the station you want. The tuning knob is now in the wanted position.

**Select One Station**

There are two methods for finding the station quickly. One—tune it in on the “Synchronizer” Switch on the chassis case is closed (white dot showing). Press the tuning knob once. Let it come back—and then see if it sticks. It is now in the first automatic position. Insert a long screwdriver in the hole to turn up the volume control. Repeat the automatic tuner set up hole and turn this until the radio can be tuned with the screw until you hear the station you want. The tuning knob is now in the wanted position.

**Call Letter on the Dial**

Having set up the first station proceed to repeat steps one and two except that you will press the tuning knob into the station in the car and then adjust to the 2nd Automatic Position.

Continue the same operation thru the 3rd, 4th and 5th automatic positions.

**ADJUSTING THE ANTENNA TRIMMER**

The input circuit has been especially designed to be used with a low capacity antenna of the dipole or whip type.

It is important that the grounding lead on the end of the antenna cable be carefully grounded to the car body, otherwise it may prove difficult to eliminate ignition noise.

Tune in a station on the high frequency end of the dial and adjust the antenna trimmer for maximum volume. A weak station which does not fade is best for this adjustment.
replacement parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Reference</th>
<th>Description</th>
<th>No. Selling</th>
<th>Price Used</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE102133</td>
<td>C</td>
<td>Two Gang Variable Condenser</td>
<td>1</td>
<td>1.88</td>
<td></td>
</tr>
<tr>
<td>BE10309</td>
<td>C1, C23</td>
<td>.1 x 200 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10533</td>
<td>C11</td>
<td>.05 x 200 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10319</td>
<td>C14</td>
<td>.006 x 600 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10526</td>
<td>C21</td>
<td>.02 x 400 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10525</td>
<td>C22</td>
<td>.002 x 600 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10513</td>
<td>C13</td>
<td>Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10301</td>
<td>C14, C15, C16</td>
<td>.5 x 120 Volt Tubular Condenser</td>
<td>1</td>
<td>.36</td>
<td></td>
</tr>
<tr>
<td>BE10106</td>
<td>C22</td>
<td>.004 x 600 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE10068</td>
<td>C10</td>
<td>25 x 200 Volt Tubular Condenser</td>
<td>1</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>BE11911</td>
<td>C5, C6, C7, C8</td>
<td>Electrolytic Filter Condenser</td>
<td>20</td>
<td>.30</td>
<td></td>
</tr>
</tbody>
</table>

prices subject to change without notice

Power Supply—Unless marked otherwise, this radio will operate on either a 6 volt storage battery or on 105 to 125 volts A.C. 50 to 60 cycle line. Two power cords are supplied one for battery and one for electric operation. Whichever cord is required should be plugged into the back of the chassis. When using a battery be sure A+ lead is connected to + battery terminal. Do not lengthen battery cable. Keep antenna lead away from battery cable.
### Alignment Procedure

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

<table>
<thead>
<tr>
<th>BAND</th>
<th>SIGNAL GENERATOR</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6S7 L. F.</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>Two trimmers on top of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6S7 Mixer</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>Two trimmers on top of</td>
</tr>
<tr>
<td>SHORT</td>
<td></td>
<td>17 Mc.</td>
<td>400 Ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc</td>
<td>Trimmer C—S. W. osc.</td>
</tr>
<tr>
<td>WAVE</td>
<td></td>
<td>17 Mc.</td>
<td>400 Ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc</td>
<td>Trimmer C2</td>
</tr>
<tr>
<td>BAND</td>
<td></td>
<td>6 Mc.</td>
<td>400 Ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 6 Mc</td>
<td>Trimmer C6 S. W. osc.</td>
</tr>
<tr>
<td>BAND</td>
<td></td>
<td>1500 Kc.</td>
<td>200 mmf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1500 Kc</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>600 Kc.</td>
<td>200 mmf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 600 Kc</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Turn th. dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

### Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come. Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place. Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.

### Antenna

For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is necessary. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.
On sets which have an electrodynamic speaker, R12 is eliminated and the hot side of C22 is connected in parallel with C23. R14 is replaced by the speaker field.

**IS YOUR LINE VOLTAGE CORRECT?**

Unless your radio is marked otherwise, it must be operated from 10 to 125 volts, 50 to 60 cycle current or the same D.C. Voltage. It in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly. When using your radio on A.C. current, reversing the plug may reduce station hum. If set does not operate in one minute on direct current reverse the plug.

**ALIGNMENT PROCEDURE**

- Volume control—Maximum all adjustments.
- Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BAND</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.F.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 12SK7</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Output I.F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 12SJ7</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Input I.F.</td>
</tr>
<tr>
<td><strong>SHORT WAVE BAND</strong></td>
<td>12 Mc.</td>
<td>400 Ohms</td>
<td>External Antenna and B—</td>
<td>Short Wave</td>
<td>Set Dial at 12 Mc.</td>
<td>S.W. Osc. trimmer C10</td>
</tr>
<tr>
<td><strong>BROADCAST BAND</strong></td>
<td>1600 Kc.</td>
<td>.1 mmf.</td>
<td>Grid of 12SJ7</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>B.C. Osc. trimmer C12 on Gang</td>
</tr>
<tr>
<td></td>
<td>1400 Kc.</td>
<td>200 mmf.</td>
<td>External Antenna and B—</td>
<td>Broadcast</td>
<td>Set Dial at 1400 K.C.</td>
<td>B.C. Ant. trimmer C6</td>
</tr>
</tbody>
</table>

**NOTE:** The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly. The loop antenna should be connected to the radio when making all adjustments.
SETTING THE PUSHBUTTONS

Make a list of your 6 favorite stations—push out the call letters of these stations from the call letter sheets supplied. Next insert a long slim screw driver into the hole in front of one of the pushbuttons and unscrew the pushbutton locking screw (to the left) several turns. Now with the screw driver still engaged in the locking screw slot push it all the way in. Hold it in this position and tune in the station you want with the tuning knob. Now tighten up the pushbutton locking screw by turning it to the right. Tighten firmly. Continue setting each button in the same way. When you have set your stations insert the call letter of each station in the front of the proper button and put one of the celluloid tabs over the station call letter.

To change stations simply repeat the above procedure.

If you are unable to set a station on any particular button it is probably because the pushbutton locking screw has not been fully unloosened (turned to the left).

![Chassis View, showing Tube Location and the Outside Antenna Clip.](image)

### REPLACEMENT PARTS LIST

| Part No. | Schematic No. | Description | Price
|----------|---------------|-------------|-----|
| BE1009   |               | .05 x 200 Volt Tubular Condenser | .12
| BE1009   |               | .006 x 600 Volt Tubular Condenser | .12
| BE1009   |               | .120 Volt Tubular Condenser | .12
| BE1009   |               | .02 x 400 Volt Tubular Condenser | .12
| BE1009   |               | .003 x 600 Volt Tubular Condenser | .12
| BE10019  |               | .120 Volt Tubular Condenser | .12
| BE10027  |               | .01 x 120 Volt Tubular Condenser | .12
| BE10018  |               | .05 x 120 Volt Tubular Condenser | .12
| BE10018  |               | .03 x 400 Volt Tubular Condenser | .12
| BE10128  |               | Electrolytic Filter Cond., added for 25 cycle only. 40 mfd. x 150 Volts across C22 and 20 Mfd. x 150 Volts across C23 | .20
| BE12119  |               | S.W. Antenna and Oscillator Trimmer Condenser | .16
| BE1295   |               | .0025 Mica Type Condenser | .12
| BE1295   |               | .0020 Mica Type Condenser | .12
| BE1295   |               | 10 Mfd. Mica Type Condenser | .12
| BE12931  |               | .0020 Mica Type Condenser | .12
| BE12931  |               | .0015 Mica Type Condenser | .12
| BE12931  |               | .0011 Mica Type Condenser | .12
| BE12931  |               | .0005 Mica Type Condenser | .12
| BE1319   |               | .020 Mfd. 1500 Ohm-55 Watt Resistor | .10
| BE13012  |               | .050 Mfd. 680 Ohm-20 Watt Resistor | .10
| BE13033  |               | 20,000 Ohm-20 Watt Resistor | .10
| BE13012  |               | 200 Ohm-20 Watt Resistor | .10
| BE13012  |               | 500 Ohm-20 Watt Resistor | .10
| BE13012  |               | 1000 Ohm-20 Watt Resistor | .10
| BE13012  |               | 4700 Ohm-20 Watt Resistor | .10
| BE13012  |               | 10,000 Ohm-20 Watt Resistor | .10
| BE13012  |               | 30,000 Ohm-20 Watt Resistor | .10
| BE13012  |               | 100,000 Ohm-20 Watt Resistor | .10
| BE13012  |               | 3, 2 Megohm-55 Watt Resistor | .10
| BE13030  |               | .002 Mica Type Condenser | .12
| BE12119  |               | Eight Prong Molded Octal Socket | .10
| BE12123  |               | Eight Prong Wafer Octal Socket—with Shield for Guide Pin | .10
| BE114427 |               | Six Inch P. M. Dynamic Speaker (less Output Transformer) | .25
| BE114427 |               | Six Inch Electro Dynamic Speaker. Less Output Transformer | .25
| BE00534  |               | Output Transformer for Speaker | .50
| BE10206  |               | Input I. F. Coil Complete in Can | .75
| BE10205  |               | Output I. F. Coil Complete in Can | .75
| BE11034  |               | B. C. - S. W. Oscillator Coil | .10
| BE11139  |               | S. W. Antenna Coil | .10
| BE11250  |               | Loop Antenna Assembly | .10
| BE12151  |               | Choke Coil | .18

**ANTENNA**

This radio is designed to pick up strong local stations without requiring an outside antenna. For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity.

A ground is not required.

Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

**BOTTOM VIEW OF CHASSIS**

Voltage Chart

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www.americanradiohistory.com
SETTING THE PUSHBUTTONS

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come. Now turn in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place. Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.

TRIMMER VIEW
Looking at front of chassis.

BOTTOM VIEW OF CHASSIS

SIGNAL GENERATOR

<table>
<thead>
<tr>
<th>BAND</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td>455 Kc. 1 MFD.</td>
<td>Grid of IN5G 2nd I. F.</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Output I. F.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>455 Kc. 1 MFD.</td>
<td>Grid of 1AG7 Micer</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top of Interstage I. F.</td>
<td></td>
</tr>
<tr>
<td>SHORT WAVE</td>
<td>16 Mc. 400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 16 Mc.</td>
<td>Trimmer C9 S. W. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 Mc. 400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 16 Mc.</td>
<td>Trimmer C7 S. W. osc. series pad (See note &quot;A&quot;)</td>
<td></td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1720 Kc. 20 mnf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Trimmer C8 B. C. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500 Kc. 200 mnf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1500 Kc.</td>
<td>Trimmer C9 B. C. osc.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.
ALIGNMENT PROCEDURE

Connect B of radio chassis to ground post of signal generator through .1 Mfd. capacitor.

<table>
<thead>
<tr>
<th>BAND</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 12S17</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>Two trimmers on top of Output I. F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 12S17</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>Two trimmers on top of Input I. F.</td>
</tr>
<tr>
<td>SHORT WAVE BAND</td>
<td>12 Mc.</td>
<td>400 Ohms</td>
<td>External Antenna and B</td>
<td>Short Wave</td>
<td>Set Dial at 12 Mc.</td>
<td>S.W. Osc. trimmer C10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S.W. Ant. trimmer C3</td>
</tr>
<tr>
<td>BROADCAST</td>
<td>1500 Kc.</td>
<td>.1 mfd.</td>
<td>Grid of 12S17</td>
<td>Broadcast</td>
<td>Rotor full open</td>
<td>E.C. Osc. trimmer C12 on Gang</td>
</tr>
<tr>
<td>BAND</td>
<td>4000 Kc.</td>
<td>200 mfd.</td>
<td>External Antenna and B</td>
<td>Broadcast</td>
<td>Set Dial at 1400 Kc.</td>
<td>B.C. Ant. trimmer C6</td>
</tr>
</tbody>
</table>

NOTE: The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly. The loop antenna should be connected to the radio when making all adjustments.

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Schematic REPLACEMENT PARTS LIST

Part No. Reference Description In Set Each

CONDENSERS
BE1001 C6, C7 1 x 400 Volt Tubular Condenser 2 .12
BE1001 C6, C7, C11, C12, C14 .01 x 400 Volt Tubular Condenser 5 .12
BE1001 C3, C13 .05 x 400 Volt Tubular Condenser 2 .12
BE1001 C1 4 x 200 Volt Tubular Condenser 1 .12
BE1001 C2, C28 .02 x 200 Volt Tubular Condenser 1 .12
BE1001 C9 2 x 200 Volt Tubular Condenser 1 .12
BE1002 C23 2 x 400 Volt Tubular Condenser 1 .12
BE1003 C24, C25 5 x 120 Volt Tubular Condenser 2 .16
BE1001 C1 4 x 600 Volt Tubular Condenser 1 .12
BE1001 C10 3 x 1600 Volt Tubular Condenser 1 .12
BE1001 C12 2.5 x 600 Volt Tubular Condenser with Bracket 1 .20
BE119127 C16, C18, C19, C6 Electrolytic Filter Condenser, 60 Mfd. 125 V. 40 Mfd. 300 V. 1 .10
BE124169 C9, C10, C11 S.W.-M.W.-B.C.-Triple Unit R. F. Condenser, Trimmer Condenser Strip 1 .48
BE124170 C1, C2, C3 S.W.-M.W.-B.C.-Triple Unit Antenna Trimmer Strip 1 .48
BE124171 C16, C18, C20 S.W.-M.W.-B.C.-Triple Unit Antenna Trimmer Strip 1 .48
BE129178 C19 B.C. Osc. Series Pad Condenser 1 .16
BE129179 C17 M.W. Osc. Series Pad Condenser 1 .16
BE129180 C15 S.W. Osc. Series Pad Condenser 1 .14
BE1291 C21, C28 .0005 Mica Type Condenser-20% 1 .12
BE1292 C30 .0005 Mica Type Condenser-20% 1 .12
BE1294 C7 .0001 Mica Type Condenser-10% 1 .12

RESISTORS
BE1304 R12 3 Megohm - 10 Watt Resistor-20% 1 .12
BE1304 R17 200M Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R18 50M Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R1 1 Megohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R20 100M Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R27 50 Ohm - 1 Watt Resistor-20% 1 .10
BE1304 R3 50 Ohm - 1 Watt Resistor-20% 1 .10
BE1304 R6 1500 Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R7 50M Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R8 50M Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R11, R21 200 Ohm - 1 Watt Resistor-20% 2 .10
BE1304 R32 300 Ohm - 1/2 Watt Resistor-20% 1 .10
BE1304 R19 1500 Ohm - 1 Watt Resistor-10% 1 .10
BE1304 R22 1500 Ohm - 1 Watt Resistor-10% 1 .10
BE1304 R25 1500 Ohm - 1 Watt Resistor-10% 1 .10
BE1304 R16 5 Megohm - 1 Watt Resistor-10% 1 .10
BE1304 R4 12M Ohm - 1/2 Watt Resistor-10% 1 .10
BE1304 R10 1M Ohm - 1/2 Watt Resistor-10% 1 .10
BE1304 R13 2M Ohm - 1/2 Watt Resistor-10% 1 .10
BE1304 R19 1500 Ohm - 1/2 Watt Resistor-10% 1 .10
BE1304 R23 5M Ohm - 1/2 Watt Resistor-10% 1 .10
BE1304 R3 10 Ohm - 1/2 Watt Resistor-10% 1 .10

TRIMMER VIEW—Looking at front of chassis.

ANTENNA

For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

SPEAKER
BE114250 T8 Eight Inch P.M. Dynamic Speaker Less Output Transformer 1 4.00

COILS
BE1039 T4 Input I.F. Coil Complete in Can 1 .1.00
BE1059 T5 Output I.F. Coil Complete in Can 1 .1.00
BE1081 T3 B.C.-R.F. Coil Complete in Can 1 .1.00
BE11246 T1 B.C.- M.W.-S.W. Oscillator Coil in Can 1 .72

TRANSFORMERS
BE104265 T9 Power Transformer 1 2.50
BE105101 B6 Input A.M. Transformer 1 1.32
BE105133 T7 Output Transformer for Speaker 1 1.99

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**POWER SUPPLY**

Unless your radio is marked otherwise it is designed to operate on the following power supplies:

- 6 volt storage battery
- 105 to 125 volts 40 to 60 cycles (A.C.)
- 200 to 250 volts 40 to 60 cycles (A.C.)

For 6 Volt Battery Operation—The Batt-A.C. switch (see chassis view) must be in battery position and battery cables connected to battery.

**ALIGNMENT PROCEDURE**

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>BAND</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted to Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MF.D.</td>
<td>Grid of 6S7</td>
<td>Broadcast</td>
<td>Tuning &amp; Bandspread</td>
<td>Two trimmers on top of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MF.D.</td>
<td>Grid of 6SA7</td>
<td>Broadcast</td>
<td>Tuning &amp; Bandspread</td>
<td>Two trimmers on top of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHORT WAVE BAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>Trimmer C16-S. W. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>Trimmer C16-S. W. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Short Wave</td>
<td>Set Dial at 8 Mc.</td>
<td>Trimmer C15 S. W. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MEDIUM WAVE BAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Medium Wave</td>
<td>Set Dial at 6 Mc.</td>
<td>Trimmer C18 M. W. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Medium Wave</td>
<td>Set Dial at 6 Mc.</td>
<td>Trimmer C18 M. W. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>Medium Wave</td>
<td>Set Dial at 2.5 Mc.</td>
<td>Trimmer C17 osc. series pad (See note “B”)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BROADCAST BAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1720 Kc.</td>
<td>200 mml.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Tuning &amp; Bandspread</td>
<td>Trimmer C20 B. C. osc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1400 Kc.</td>
<td>200 mml.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1400 Kc.</td>
<td>Trimmer Cl-C1          B. C. ant. R. F.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>600 Kc.</td>
<td>200 mml.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 600 Kc.</td>
<td>Trimmer C19 B. C. osc. series pad (See note “B”)</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE “A”**—It is extremely necessary that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

**NOTE “B”**—Turn the dial back and forth slightly (rock) and adjust trimmers until the peak of greatest intensity is obtained. After each range is completed, repeat the procedure as a final check.
MODEL 14BR-911A
MONTGOMERY-WARD & CO.

MODELS 14WG-808M, 14WG-808W

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Dial Pointer Setting</th>
<th>Trimmers Adjusted to Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SK7 (I.F.)</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>On Top of Output I.F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SA7</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>On Top of Input I.F.</td>
</tr>
<tr>
<td>31 METER BAND</td>
<td>9.6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>31M</td>
<td>Set Dial at 9.6 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>9.6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>31M</td>
<td>Set Dial at 9.6 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td>49 METER BAND</td>
<td>6.1 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>49M</td>
<td>Set Dial at 6.1 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>6.1 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>49M</td>
<td>Set Dial at 6.1 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td>25 METER BAND</td>
<td>11.8 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>25M</td>
<td>Set Dial at 11.8 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>11.8 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>25M</td>
<td>Set Dial at 11.8 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td>19 METER BAND</td>
<td>15.2 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>19M</td>
<td>Set Dial at 15.2 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>15.2 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>19M</td>
<td>Set Dial at 15.2 Mc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td>BROAD-CAST BAND</td>
<td>1600 Kc.</td>
<td>200 mmf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>1600 Kc.</td>
<td>200 mmf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>(See Trimmer View)</td>
</tr>
<tr>
<td></td>
<td>1400 Kc.</td>
<td>200 mmf.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1400 Kc.</td>
<td>(See Trimmer View)</td>
</tr>
</tbody>
</table>

### ALIGNMENT PROCEDURE

- Tone control—Treble
- Volume control—Maximum all adjustments
- Use an all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.

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ALIGNING INSTRUCTIONS

CAUTION:—No Aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this radio, the chassis should be removed from the cabinet. Although the short wave bands on this radio are of the band spread type the Alignment Procedure is not difficult. However because each short wave scale covers only a small portion of the short wave spectrum you must do the work carefully and your oscillator must be accurate.

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

Tune set to high frequency end of dial scale on any band.

Rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

### ALIGNMENT PROCEDURE

- Use an all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.

### VOLTAGE CHART

- Tone control—Treble.
- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.

#### BAND

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>SIGNAL GENERATOR</th>
<th>DUMMY ANTENNA</th>
<th>CONNECTION TO RADIO</th>
<th>POSITION OF BAND SWITCH</th>
<th>DIAL POINTER SETTING</th>
<th>TRIMMERS ADJUSTED TO MAXIMUM IN ORDER SHOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F.</td>
<td>455 Kc.</td>
<td>1 MFD</td>
<td>Grid of 6SK7 (L.F.)</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>On Top of Output L.F.</td>
</tr>
<tr>
<td>I.F.</td>
<td>455 Kc.</td>
<td>1 MFD</td>
<td>Grid of 6SK7 (L.F.)</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>On Top of Input L.F.</td>
</tr>
<tr>
<td>31 METER BAND</td>
<td>9.6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>31M</td>
<td>Set Dial at 9.6 Mc.</td>
<td>(See Trimmer View) CI—R.F.</td>
</tr>
<tr>
<td>49 METER BAND</td>
<td>6.1 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>49M</td>
<td>Set Dial at 6.1 Mc.</td>
<td>(See Trimmer View) CI—R.F.</td>
</tr>
<tr>
<td>25 METER BAND</td>
<td>11.8 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>25M</td>
<td>Set Dial at 11.8 Mc.</td>
<td>(See Trimmer View) CI—R.F.</td>
</tr>
<tr>
<td>19 METER BAND</td>
<td>15.2 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>19M</td>
<td>Set Dial at 15.2 Mc.</td>
<td>(See Trimmer View) CI—R.F.</td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1600 Kc.</td>
<td>200 mfd</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>(See Trimmer View) CI—R.F.</td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1400 Kc.</td>
<td>200 mfd</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1400 Kc.</td>
<td>Rotate Core T11—R.F. (See Core Adjustments View)</td>
</tr>
</tbody>
</table>

©John F. Rider
ALIGNMENT PROCEDURE

- Tone control—Treble
- Volume control—Maximum all adjustments.

<table>
<thead>
<tr>
<th>BAND</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Dial Pointer Setting</th>
<th>Trimmers Adjusted To Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SK7 (I.F.)</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>On Top of Output I.F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SA7</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>On Top of Input I.F.</td>
</tr>
<tr>
<td>31 METER BAND</td>
<td>9.6 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>31M</td>
<td>Set Dial at 9.6 Mc.</td>
<td>(See Trimmer View) C20-Osc.</td>
</tr>
<tr>
<td>25 METER BAND</td>
<td>11.8 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>25M</td>
<td>Set Dial at 11.8 Mc.</td>
<td>(See Trimmer View) T12-Osc.</td>
</tr>
<tr>
<td>19 METER BAND</td>
<td>15.2 Mc.</td>
<td>400 ohms</td>
<td>Antenna lead</td>
<td>19M</td>
<td>Set Dial at 15.2 Mc.</td>
<td>(See Trimmer View) T13-Osc.</td>
</tr>
<tr>
<td>BROADCAST BAND</td>
<td>1600 Kc.</td>
<td>200 mml.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1600 Kc.</td>
<td>(See Trimmer View) C16-Osc.</td>
</tr>
<tr>
<td></td>
<td>1400 Kc.</td>
<td>200 mml.</td>
<td>Antenna lead</td>
<td>Broadcast</td>
<td>Set Dial at 1400 Kc.</td>
<td>(See Trimmer View) C3-Ant.</td>
</tr>
</tbody>
</table>

TRIMMER VIEW

ANTENNA

This radio is designed to pick up strong local stations without requiring an outside antenna. The built-in aerial may be slightly directional therefore try the radio in several positions. For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

IRON CORE ADJUSTMENT VIEW

PHONOGRAPH-TELEVISION AND FM. JACK

Should you wish to use an external phonograph it should be plugged into the phono jack shown in the chassis view. The radio-phonograph-on-off knob on the front panel will then switch from radio to phonograph operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-jack plug in in the chassis view will accommodate either the Phono or a television or FM converter.
**ALIGNMENT PROCEDURE**

- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.

<table>
<thead>
<tr>
<th>BAND</th>
<th>Frequency Setting</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Condenser Setting</th>
<th>Trimmers Adjusted (in Order Shown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F.</td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SK7 F.T.</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top Output I.F.</td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD.</td>
<td>Grid of 6SA7 Mixer</td>
<td>Broadcast</td>
<td>Rotor full open (Plates out of mesh)</td>
<td>Two trimmers on top Input I.F.</td>
</tr>
<tr>
<td>SHORT WAVE BAND</td>
<td>17 Mc.</td>
<td>400 Ohms</td>
<td>External Antenna and Ground</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>C13, S.W. Osc.</td>
</tr>
<tr>
<td></td>
<td>17 Mc.</td>
<td>400 Ohms</td>
<td>External Antenna and Ground</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>C18, S.W. R.F., C2 S.W. Antenna</td>
</tr>
<tr>
<td></td>
<td>6 Mc.</td>
<td>400 Ohms</td>
<td>External Antenna and Ground</td>
<td>Short Wave</td>
<td>Set Dial at 17 Mc.</td>
<td>C11 S.W. Osc. Series, Pad See Note “A”</td>
</tr>
<tr>
<td></td>
<td>1600 Kc.</td>
<td>200 m.mf.</td>
<td>Grid of 6SK7 R.F. Tube</td>
<td>Broadcast</td>
<td>Set Dial at 1200 Kc.</td>
<td>C9 B.C. R.F.</td>
</tr>
<tr>
<td>LOOP ALIGNMENT</td>
<td>1400 Kc.</td>
<td>200 m.mf.</td>
<td>External Antenna and Ground</td>
<td>Broadcast</td>
<td>Set Dial at 1200 Kc.</td>
<td>C1 B.C. Ami.</td>
</tr>
<tr>
<td></td>
<td>600 Kc.</td>
<td>200 m.mf.</td>
<td>External Antenna and Ground</td>
<td>Broadcast</td>
<td>Set Dial at 1200 Kc.</td>
<td>T2 Iron Core Tracking Coil</td>
</tr>
</tbody>
</table>

**NOTE “A”**—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

After each band is completed, repeat the procedure as a final check.

**ANTENNA**

This radio is designed to pick up strong local stations without requiring an outside antenna. The built-in aerial may be slightly directional therefore try the radio in several positions. For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

**POWER SUPPLY**—Unless your radio is marked otherwise, it must be operated from 105 to 125 volts, 50 to 60 cycle A.C. If in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly.
NOTE A—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 2 feet (6" for i.F. adjustment) from loop.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

ALIGNMENT PROCEDURE
Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to “Heat Up” for several minutes.

The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed. Output Indicating Meter—Non-Metallic Screwdriver.

SPECIFICATIONS
Input Voltages and Currents
“A” Battery — 1.5 Volts—25 Amperes
“B” Battery — — 58% Volts—8 Ma.
Power Output — 55 Milliwatts Undistorted
Selectivity — 40 KC Broad at 1000 Times Signal
Intermediate Frequency — 465 KC
Speaker — — 2 — 4" P.M. Dynamic
Tuning Frequency Range — 520 to 1610 KC
Sensitivity — 400 Microvolts per Meter Average
(For 0.5 Watt Output)

ALWAYS READ TO GROUND
VOLUME CONTROL MAX. READINGS TAKEN WITH 1000 OHM PER-VOLT METER

TUBES
The tube types and position of the tubes and tube shields are shown in the illustration below.

Use Loop for All Adjustments—See Note “A”

<table>
<thead>
<tr>
<th>Signal Gen. Frequency Setting</th>
<th>Condenser</th>
<th>Adjust Trimmers to Maximum (See Trimmer Illustration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>456 KC</td>
<td>Turn Rotor to Full Open</td>
<td>1st I.F. (C7) &amp; (C8)</td>
</tr>
<tr>
<td>1610 KC</td>
<td>Turn Rotor to Full Open</td>
<td>Oscillator (C2)</td>
</tr>
<tr>
<td>1500 KC</td>
<td>Set Knob to 1500 KC</td>
<td>Antenna (C3)</td>
</tr>
<tr>
<td>600 KC</td>
<td>Turn Rotor to Max. Output</td>
<td>600 KC (C5)</td>
</tr>
<tr>
<td>1500 KC</td>
<td>Turn Rotor to Max. Output</td>
<td>Rock Rotor—See Note B</td>
</tr>
</tbody>
</table>

APRIL 1941
ALIGNMENT PROCEDURE, MODELS 14BR-521A, 14BR-522A

- Volume control—Maximum all adjustments.
- Connect B-of radio chassis to ground post of signal generator through .1 Mfd. condenser.

<table>
<thead>
<tr>
<th>BAND</th>
<th>SIGNAL GENERATOR Frequency Setting to Radio</th>
<th>Dummy Antenna</th>
<th>Connection to Radio</th>
<th>Antenna Backplate</th>
<th>Position of Iron Cores</th>
<th>Adjust Trimmers to Maximum (in Order Shown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td>455 Kc.</td>
<td>.1 MFD</td>
<td>Connect to Iron Cores</td>
<td>All the way out</td>
<td>Two trimmers on top of I. F. can</td>
<td></td>
</tr>
<tr>
<td></td>
<td>455 Kc.</td>
<td>.1 MFD</td>
<td>Connect to Iron Cores</td>
<td>All the way out</td>
<td>Two trimmers on top of I. F. can</td>
<td></td>
</tr>
<tr>
<td>1720 Kc.</td>
<td>.1 MFD</td>
<td>Connect to Iron Cores</td>
<td>All the way out</td>
<td>Osc. Trimmer (C7)</td>
<td>(See voltage chart)</td>
<td></td>
</tr>
<tr>
<td>1720 Kc.</td>
<td>200 MFD</td>
<td>Connect to Outside Antenna Clip</td>
<td>All the way out</td>
<td>Ant. Trimmer (C3)</td>
<td>(See voltage chart)</td>
<td></td>
</tr>
<tr>
<td>1400 Kc.</td>
<td>200 MFD</td>
<td>Connect to Outside Antenna Clip</td>
<td>Turn Dial to 1400 Kc.</td>
<td>Adjust position of antenna coil (See coil assembly view)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1720 Kc.</td>
<td>200 MFD</td>
<td>Connect to Outside Antenna Clip</td>
<td>Turn Dial to 1720 Kc.</td>
<td>Adjust trimmer (C3)</td>
<td>(See voltage chart)</td>
<td></td>
</tr>
</tbody>
</table>

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track. If the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

SPECIFICATIONS

Input Voltages and Currents

"A" Battery - 1.5 Volts - 2 Amperes
"B" Battery - 90 Volts - 6 Amperes

Power Output - 70 Milliwatts Undistorted
160 Milliwatts Maximum

Selectivity - 40 KC Broad at 1000 Times Signal

Intermediate Frequency - 450 KC

Speaker - 5" P.M. Dynamic

Tuning Frequency Range - 520 to 1730 KC

Sensitivity - .05 Microvolts Average
(for .05 Watt Output)

DRIVE CORD REPLACEMENT

Use a new drive cord approximately 38 inches in length. Tie one end to tension spring. Secure other end of spring to hook on gang condenser drive pulley. Thread free end of cord through hole in pulley rim. Turn gang condenser to full open position—See illustration.

ALIGNMENT PROCEDURE Volume Control—Maximum All Adjustments. Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead. Allow Chassis and Signal Generator to "Heat Up" for several minutes. The following equipment is required for aligning: A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed. Output Indicating Meter—Non-Metallic Screwdriver, Dummy Antennas—.1 m. & .200 mV.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR Frequency Connection Setting at Radio</th>
<th>Dummy Antenna</th>
<th>Condenser Setting</th>
<th>Adjust Trimmers to Maximum (See Trimmer Illustration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>456 KC Signal Grid of 1st Dial (Top Cap)</td>
<td>.1 mF</td>
<td>Turn rotor to full open</td>
<td>1st I. F. (C7) &amp; (C8) 2nd I. F. (C10) &amp; (C11)</td>
</tr>
<tr>
<td>1720 KC Signal Grid of 1st Dial</td>
<td>.1 mF</td>
<td>Turn rotor to full open</td>
<td>Oscillator (C2)</td>
</tr>
<tr>
<td>1400 KC Antenna Lead</td>
<td>200 mV</td>
<td>Turn Rotor to Max. Output</td>
<td>Set Indicator to 1400 KC—Antenna (C1)</td>
</tr>
</tbody>
</table>

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

Wind cord ¼ turn counter-clockwise (from gang condenser and of chassis) around drive pulley. Wind cord 3½ turns counter-clockwise (from rear of chassis) around tuning control shaft. Pass cord over idle paths A and B as shown in illistration. Wind cord 5 turns counter-clockwise (from gang condenser and of chassis) around drive pulley. Turn should be on right side (from rear of chassis) Set the pointer at this frequency on the dial scale. Attach pointer to cord of pulley groove.
ISSUE "C" June 12, 1941

When the 4" Electro-Dynamic Speaker replaces the 4" P.M. Speaker on the above chassis, the issue letter advances to "C". The speaker field replaces the 1500 ohm B+ filter resistor with additional changes in the B+ circuit connections to the 35L68T output tube. A 20 mF, 25 volt electrolytic condenser is placed across the 170 ohm 35L68T cathode resistor. A 60 ohm 1.5 watt resistor is inserted in the heater circuit between the 12SK7 and 12SA7 tube heaters.

Part No. Description

The following NEW PARTS are used on the issue "C" chassis:

12A408 4" Electro-Dynamic Speaker............... $ 1.76
45X317 C17 20 mF, 25 Volt Dry Electrolytic.......... .24
D95600 R13 60 ohm 1.5 Watt Carbon Resistor....... .12

The following parts are used on issues "A" and "B" chassis only:

12A380 4" P.M. Speaker.................................. 1.46
C95152 R11 1500 Ohm 1.0 Watt Carbon Resistor... .06

Issues "A", "B" and "C" chassis of the above models used an antenna trimmer (C3) mounted on the loop aerial assembly. On issue "D" chassis, the antenna trimmer (C3) has been replaced by a "Gizmick" fixed capacitance, consisting of 2 wires, one wrapped around the other. The 1400 KC adjustment is made at the factory and need not be made in the field.

The following part is used on issues "A", "B" and "C" chassis only:

17A116 C3 2.5-23 mmf. antenna trimmer $0.06

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several minutes. The equipment in column at right is required for aligning:

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR FREQUENCY</th>
<th>SIGNAL GENERATOR CONNECTION</th>
<th>DUMMY ANTENNA CONNECTION</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM (See Trimmer Setting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>456 KC Control Grid 12SK7—1st I.F. (Prong No. 3)</td>
<td>Point &quot;X&quot; 12SK7—1st I.F.</td>
<td>.1 mF.</td>
<td>Turn Rotor to full open</td>
<td>2nd I.F. (C9) &amp; (C10)</td>
</tr>
<tr>
<td>456 KC Control Grid 12SA7—1st Det. Above</td>
<td>Same As Above</td>
<td>.1 mF.</td>
<td>Turn Rotor to full open</td>
<td>1st I.F. (C7) &amp; (C8)</td>
</tr>
<tr>
<td>1600 KC Control Grid 12SA7—1st Det. Above</td>
<td>Same As Above</td>
<td>.1 mF.</td>
<td>Turn Rotor to full open</td>
<td>Oscillator (C2)</td>
</tr>
<tr>
<td>1400 KC External Antenna Clip On Loop</td>
<td>External Ground Clip</td>
<td>50 mF.</td>
<td>Turn Rotor to Max. Output</td>
<td>Antenna (C3)</td>
</tr>
</tbody>
</table>

NOTE A—Reassemble chassis in cabinet. Replace back on cabinet.

NOTE B—Tune in a 1400 KC signal. If pointer is not at the 1400 KC mark on the dial scale, remove chassis and pull pointer off shaft. Set pointer at the 1400 KC mark and push back on shaft.
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Use Loop for All Adjustments—See Note "A".

<table>
<thead>
<tr>
<th>Signal Gen. Frequency</th>
<th>Condenser</th>
<th>Adjust Trimmers to Maximum (See Trimmer Illustration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>455 KC Turn Rotor to Full Open</td>
<td>1st I.F. (C7) &amp; (C8)</td>
<td>2nd I.F. (C9) &amp; (C10)</td>
</tr>
<tr>
<td>1610 KC Turn Rotor to Full Open</td>
<td>Oscillator (C1)</td>
<td></td>
</tr>
<tr>
<td>1500 KC Turn Rotor to Max. Output</td>
<td>Set Knob to 1500 KC</td>
<td>Antenna (C3)</td>
</tr>
<tr>
<td>1500 KC</td>
<td>600 KC (C5)</td>
<td></td>
</tr>
<tr>
<td>600 KC Turn Rotor to Max. Output</td>
<td>Rock Rotor—See Note B</td>
<td></td>
</tr>
<tr>
<td>1500 KC Turn Rotor to Max. Output</td>
<td>Antenna (C3)</td>
<td></td>
</tr>
</tbody>
</table>

NOTE A—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 2 feet from loop (6" for I.F. adjustment) from loop.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

ANTENNA

An Airwave Loop Aerial is built inside the front cover of this radio.

With the built-in loop aerial, directional effects are obtained. The signal pickup may be increased and interference from nearby stations can be reduced by rotating the radio until the signal is at a maximum.

BATTERY OPERATION

The following battery pack is required:
Battery Pack Catalog No. 62-5032.

To install battery pack, grasp case handle and pull open back cover at handle side of case. Note position of prongs on battery cable plug and holes in socket on battery. Then insert plug in socket. Install battery pack in case as shown in illustration on page 2. Close back cover tightly, first getting bottom hooks in place in slots.

AC-DC OPERATION

Line Cord—Plug 3 hole socket on line cord into 3 prong plug which can be seen through a hole in the side of the case.

Check Your Line Voltage—Unless otherwise marked, this radio must be operated on a power supply of 105-125 volts AC, 50 to 60 cycles only, or 105-125 volts DC.

Radios for 25 cycle AC operation are stuck.

When using the radio on AC, if there appears to be excessive hum, reverse the plug. Leave the plug inserted the way which gives the least hum.

110 Volt DC Operation—Insert plug so that red mark is on positive side of the line.

CAUTION—If polarity of line is not known, insert plug; if set does not operate after one minute, reverse plug.

SPECIFICATIONS

Input Voltages and Currents—Battery Operation

"A" Battery 1¼ Volts—25 Amp.

"B" Battery 1½ Volts—8 Ma.

Power Consumption 30 Watts (At 117 Volts AC Supply)

Power Output

Battery Operation 55 W. Undistorted

110 W. Maximum

AC Operation 80 W. Undistorted

170 W. Maximum

Selectivity 40 KC Broad at 1000 Times Signal

Intermediate Frequency 456 KC

Speaker 456 KC

Dynamic Tuning Frequency Range 520 to 1610 KC

Sensitivity 400 Microvolts per Meter Average

(For .05 Watt Output)

TUBES

The tube types and position of the tubes and tube shields are shown in the illustration.

To replace the 3525GT rectifier tube, pull line cord plug out of case. Carefully pry off the 2 control knobs. Then take out the 3 chassis screws (shown in illustration) with a ¾ inch socket wrench. Carefully lift chassis, tilting it at the same time, as far as connecting wires permit. Insert a screwdriver between rectifier tube and socket and pry tube out of socket.
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf. & 200 mmf.

| SIGNAL GENERATOR FREQUENCY | CONNECTION AT RADIO | DUMMY ANTENNA | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM
|-----------------------------|---------------------|---------------|-------------------|---------------------------
| 456 KC                      | Signal Grid of 1st Det. | .1 mf. | Turn rotor to full open | 1st I.F. (C6) & (C7)      |
| 1730 KC                     | Signal Grid of 1st Det. | .1 mf. | Turn rotor to full open | 2nd I.F. (C6) & (C7)      |
| 1400 KC                     | Antenna Lead        | 200 mmf. | Turn Rotor to Max. Output Antenna (C1) See Note A | 3rd I.F. (C11) & (C12)    |

Models having a new drive cord stringing arrangement in which the drive cord has been shortened to 23 1/8 inches and the drive drum has been rotated 90 degrees from its previous position, should have the issue letter advanced to "P".

SPECIFICATIONS

Input Voltages and Currents
"A" Battery........................1.5 Volts—25 Amperes
"B" Battery .........................90 Volts—11 Ma.
Power Output.......................70 Milliwatts Undistorted
Selectivity.......................40 KC Broad at 1000 Times Signal

Intermediate Frequency..................456 KC
Speaker................................5" P.M. Dynamic
Tuning Frequency Range.............528 to 1730 KC
Sensitivity (For .05 Watt Output)....14 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

| SIGNAL GENERATOR FREQUENCY | CONNECTION AT RADIO | DUMMY ANTENNA | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM
|-----------------------------|---------------------|---------------|-------------------|---------------------------
| 456 KC                      | Signal Grid of 1st Det. | .1 mf. | Turn rotor to full open | 1st I.F. (C6) & (C7)      |
| 1730 KC                     | Grid of 1st Det.    | .1 mf. | Turn rotor to full open | 2nd I.F. (C6) & (C7)      |
| 1500 KC                     | Antenna Lead       | 200 mmf. | Turn Rotor to Max. Output Antenna (C1) | 3rd I.F. (C11) & (C12)    |

The following equipment is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf. and 200 mmf.
CALIBRATION—If it is necessary to calibrate the radio, tune in an 800 KC signal. If the pointer is not at the 800 KC mark on the dial, remove it from drive cord and set it at the 800 KC mark.
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.
The equipment in column at right is required for aligning:

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>DUMMY ANTENNA</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY SETTING</td>
<td>ANTENNA CONN.</td>
<td>GROUND CONNECTION</td>
<td></td>
</tr>
<tr>
<td>456 KC</td>
<td>Control Grid</td>
<td>Point &quot;X&quot;</td>
<td>.1 mf.</td>
</tr>
<tr>
<td></td>
<td>12SK7—l.F.</td>
<td></td>
<td>Turn Rotor to full open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prong No. 3</td>
<td>2nd l.F. (C9) &amp; (C10)</td>
</tr>
<tr>
<td>456 KC</td>
<td>Control Grid</td>
<td>Same As Above</td>
<td>.1 mf.</td>
</tr>
<tr>
<td></td>
<td>12SA7—1st Det.</td>
<td></td>
<td>Turn Rotor to full open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Above</td>
<td>1st l.F. (C7) &amp; (C8)</td>
</tr>
<tr>
<td>1600 KC</td>
<td>Control Grid</td>
<td>Same As Above</td>
<td>.1 mf.</td>
</tr>
<tr>
<td></td>
<td>12SA7—1st Det.</td>
<td></td>
<td>Turn Rotor to full open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Above</td>
<td>Oscillator (C3)</td>
</tr>
<tr>
<td>1400 KC</td>
<td>External Ant.</td>
<td>External</td>
<td>50 mmf.</td>
</tr>
<tr>
<td></td>
<td>Clip On Loop</td>
<td>Ground Clip</td>
<td>Turn Rotor to Max. Output</td>
</tr>
<tr>
<td></td>
<td>—See Note A</td>
<td>On Loop</td>
<td>Set Indicator to 1400 KC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Antenna (C2)</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

Power Consumption - 28 Watts (At 117 volts AC Supply) Speaker —— 5" Electro Dynamic
Power Output —— 8 Watt Distorted Tuning Frequency Range —— 528 to 1600 KC
Selectivity —— 50 KC Broad at 1000 times Signal Sensitivity (For .05 Watt Output)
Intermediate Frequency —— 456 KC External Antenna —— 10 Microvolts Average

NOTE A—Re-assemble chassis in cabinet, pointer is not at the 1400 KC mark on the
Fasten loop assembly to back of cabinet, dial scale, pull pointer off shaft, Set pointer
NOTE B—Tune in a 1400 KC signal. If at the 1400 KC mark and push back on shaft.

ANTENNA

An Air Wave Loop Aerial
is built on the inside of the back cover of the cabinet of this radio. For reception of
local or powerful nearby stations then antenna or ground is usually required.

However, more stations will be heard and noise will often be reduced by using an outside antenna
and a good ground. For locations in the city or close to the broadcasting
stations, the antenna should be 20 to 60 feet in length while for locations in the country or at a distance
from the broadcasting stations, use a 35 to 60 foot antenna.

A GROUND CONNECTION IS REQUIRED if an external antenna
is used. A ground connection may
be obtained by connecting to a water pipe, radiator, or a pipe driven into the
ground.

The antenna and ground connections are made at the clips marked "External Antenna" and "External
Ground" on the cabinet back.

When using the radio on AC, if there appears to be excessive hum, reverse the plug. Leave the plug inserted the way
which gives the least hum.

Radios for 25 cycle AC operation are so marked.

110 Volt D.C. Operation—Insert plug so that prong on same side as ribbed side of
cord is on the positive side of the line. CAUTION—If polarity of line is not
known, insert plug. If set does not operate after one minute, reverse plug.

CHECK YOUR LINE VOLTAGE

Unless otherwise marked, this radio must be operated on a power
supply of 105-125 Volts AC, 50 to 60 cycles only,
or 105-125 Volts D.C.
CHANGES MADE FOR ISSUE "D"

Starting with Issue "D", chassis of the above series will use a plug-in resistor to replace the former dual wire wound type. In addition a new oscillator coil and 2 section dry electrolytic are used with this issue chassis. Listed below are the parts changes:

Date  2/21/41

New Parts used on "D" Issue Chassis:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>9A1396</td>
<td>T1 Oscillator Coil Assembly</td>
<td>.76</td>
</tr>
<tr>
<td>45X301</td>
<td>(C12A  40 mf, 35 V.) Dry Electrolytic</td>
<td>.34</td>
</tr>
<tr>
<td>43X106</td>
<td>(R12  2200 Ohm 5 Watts) Plug-in Resistor</td>
<td>.34</td>
</tr>
<tr>
<td>45X284</td>
<td>(C12B  200 mf, 35 V.) Dry Electrolytic</td>
<td>.36</td>
</tr>
<tr>
<td>43X105</td>
<td>(R13  515 Ohm 12 Watts) Wire Wound Resistor</td>
<td>.42</td>
</tr>
</tbody>
</table>

The following Parts are used on "C" Issue Chassis only:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>32X217</td>
<td>Tubular Shield for Wire Wound Resistor</td>
<td>.12</td>
</tr>
<tr>
<td>9A1375</td>
<td>T1 Oscillator Coil Assembly</td>
<td>.22</td>
</tr>
<tr>
<td>45X284</td>
<td>(C12A  40 mf, 35 V.) Dry Electrolytic</td>
<td>.36</td>
</tr>
<tr>
<td>43X105</td>
<td>(R12  2200 Ohm 5 Watts) Wire Wound Resistor</td>
<td>.42</td>
</tr>
<tr>
<td>43X105</td>
<td>(R13  515 Ohm 12 Watts) Wire Wound Resistor</td>
<td>.42</td>
</tr>
</tbody>
</table>

ALIGNMENT PROCEDURE

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>FREQUENCY SETTING</th>
<th>ANTENNA CONNECTION</th>
<th>GROUND CONNECTION</th>
<th>DUMMY ANTENNA</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>456 KC</td>
<td>External Antenna Clip on Loop</td>
<td>External Ground Clip on Loop</td>
<td>.1 mf.</td>
<td>Turn Rotor to full open</td>
<td>1st I.F. (C6) &amp; (C7)</td>
</tr>
<tr>
<td></td>
<td>1600 KC</td>
<td>External Antenna Clip on Loop</td>
<td>External Ground Clip on Loop</td>
<td>.1 mf.</td>
<td>Turn Rotor to full open</td>
<td>3rd I.F. (C13) &amp; (C14)</td>
</tr>
<tr>
<td></td>
<td>1400 KC</td>
<td>External Antenna Clip on Loop</td>
<td>External Ground Clip on Loop</td>
<td>.1 mf.</td>
<td>Turn Rotor to full open</td>
<td>Oscillator (C1)</td>
</tr>
</tbody>
</table>

Selectivity - 50 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - 456 KC
Speaker - - - - - - 6" P.M. Dynamic
Tuning Frequency Range - - 540 to 1600 KC
Sensitivity (For .05 Watt Output) External Antenna - - 10 Microvolts Average
SPECIFICATIONS

Input Voltages and Currents—Battery Operation

"A" Battery .................................. 9 Volts—50 Ma.
"B" Battery .................................. 90 Volts—11.5 Ma.

Power Consumption (At 117 volts AC Supply) 28 Watts

Power Output

Battery Operation .......................... 150 Mw. Undistorted
.................................. 350 Mw. Maximum
AC Operation ............................... 200 Mw. Undistorted
.................................. 400 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal
Intermediate Frequency .......................... 456 KC
Speaker ................................. 6" P.M. Dynamic
Tuning Frequency Range .......................... 540 to 1600 KC
Sensitivity (For .05 Watt Output)

External Antenna .......................... 10 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., .50 mmf.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>FREQUENCY SETTING</th>
<th>ANTENNA CONNECTION</th>
<th>GROUND CONNECTION</th>
<th>DUMMY ANTENNA</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(See Trimmer Illustration below)</td>
</tr>
<tr>
<td></td>
<td>456 KC</td>
<td>External Antenna Clip</td>
<td>Ground Clip on Loop</td>
<td></td>
<td>Turn Rotor to full open</td>
<td>1st I.F. (C6) &amp; (C7)</td>
</tr>
<tr>
<td></td>
<td>1600 KC</td>
<td>External Antenna Clip</td>
<td>Ground Clip .1 mf.</td>
<td></td>
<td>Turn Rotor to full open</td>
<td>3rd I.F. (C12) &amp; (C14)</td>
</tr>
<tr>
<td></td>
<td>1400 KC</td>
<td>External Antenna Clip</td>
<td>Ground Clip</td>
<td></td>
<td>Turn Rotor to max. output</td>
<td>Antenna (C2)</td>
</tr>
</tbody>
</table>

Car Antenna Adjustment—Tune in weak signal near 1400 KC—Adjust Car Antenna Trimmer C25 for maximum output. This trimmer is in special antenna coil on left side of chassis (See illustration in Auto Installation Sheet).

Dial Pointer Attachment—Tune in a signal of known frequency. Set pointer to this frequency mark on dial scale. Attach pointer to drive cord—See illustration.

NOTE A—Re-assemble chassis in cabinet.
Close back on cabinet.

CALIBRATION—To obtain dial scale calibration, tune in on 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark.
### SERVICE DATA (For Professional Service Men)

**ISSUE “B” SERVICE MANUAL SUPPLEMENT**

In the issue “B” chassis, a loading coil with an adjustable iron core is connected across the secondary winding of the shortwave loop aerial—See partial schematic circuit diagram below.

The interstage range “D” and interstage range “B” trimmers have been relocated—See trimmer illustrations below.

**JUNE 1941**

**ADDITIONAL ALIGNMENT PROCEDURE**

First complete the alignment procedure through Loop Range “B” as given in the instruction manual. Then make the following adjustment:

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>FREQUENCY SETTING</th>
<th>ANTENNA CONNECTION</th>
<th>GROUND CONNECTION</th>
<th>DUMMY ANTENNA</th>
<th>BAND SWITCH</th>
<th>CONDENSER OR DIAL SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOOP RANGE D</td>
<td>External Antenna Clip</td>
<td>External Ground Clip</td>
<td>400 Ohm D</td>
<td>Range Turn Rotor to Max. Output</td>
<td>Ant. Range D (C11) Loading Coil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loop Range D</td>
<td>External Antenna Clip</td>
<td>External Ground Clip</td>
<td>400 Ohm D</td>
<td>Range Turn Rotor to Max. Output</td>
<td>Ant. Range D (C11) Loading Coil</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following NEW PARTS are used in issue “B” models:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>9A1437</td>
<td>L2 Loading Coil Assembly</td>
<td>$0.36</td>
</tr>
<tr>
<td>17A116</td>
<td>C4 Trimmer Condenser</td>
<td>$0.10</td>
</tr>
</tbody>
</table>

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**SPECIFICATIONS**

Input Voltages and Currents—Battery Operation:

- "A" Battery: 9 Volts—50 Ma.
- "B" Battery: 90 Volts—11.5 Ma.

Power Consumption: 28 Watts (At 17 volts AC Supply)

Power Output:

- Battery Operation: 150 Mw, Undistorted 350 Mw, Maximum
- AC Operation: 200 Mw, Undistorted 400 Mw, Maximum

Selectivity: 50 kc Broad at 1000 Times Signal Intermediate Frequency: -450 kc

- Speaker: 5/4" P.M. Dynamic
- Tuning Frequency Range: 540 to 1600 KC
- Sensitivity (For .05 Watt Output): External Antenna: 10 Microvolts Average

**ALIGNMENT PROCEDURE**

<table>
<thead>
<tr>
<th>Signal Gen.</th>
<th>Frequency</th>
<th>Antenna Connection</th>
<th>Ground Connection</th>
<th>Dummy Antenna</th>
<th>Condenser Setting</th>
<th>Adjust Trimmers to Maximum (See Trimmer Illustration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Antenna Clip</td>
<td>External Antenna Clip</td>
<td>External Ground Clip</td>
<td>on Loop</td>
<td>1 mf.</td>
<td>Turn Rotor to full open</td>
<td>Ist I.F. (C7) &amp; (C8)</td>
</tr>
<tr>
<td>456 KC</td>
<td>456 KC</td>
<td>456 KC</td>
<td>456 KC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Antenna Clip</td>
<td>External Antenna Clip</td>
<td>External Ground Clip</td>
<td>on Loop</td>
<td>1 mf.</td>
<td>Turn Rotor to full open</td>
<td>Oscillator (C4)</td>
</tr>
<tr>
<td>1600 KC</td>
<td>1600 KC</td>
<td>1600 KC</td>
<td>1600 KC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE A**—Reassemble chassis in Cabinet. Close back on cabinet.

**CALIBRATION**—To obtain dial scale calibration, tune in 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark.

**ANTENNA**

This radio is equipped with a built-in Airwave Loop Aerial. For reception of local or powerful nearby stations, no other antenna or ground is usually required. Directional effects are obtained when using the loop aerial. Rotate the radio until signal pickup is at a maximum and there is least interference from nearby stations.

More stations will be heard and noise will often be reduced by using an outside antenna and a good ground.

For locations in the city or close to broadcasting stations, the antenna should be 20 to 35 feet in length while for locations in the country or at a distance from the broadcasting stations, use a 35 to 60 foot antenna.

A GROUND CONNECTION IS REQUIRED if an external antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or pipe driven into the ground.

The antenna and ground connections are made at the clips on the loop aerial. Open the cabinet back and pass the antenna and ground leads through the holes in the cabinet back—See illustration. Connect the antenna lead to either clip and the ground lead to the other clip.

**DRIVE CORD REPLACEMENT**

Turn gang condenser to completely closed position—See illustration. Use a new drive cord 35 inches in length. Tie a knot with small loop at one end of drive cord. Secure loop to hook on drive pulley. Thread cord through hole in rim of drive pulley. Pass cord clockwise (from pulley side of chassis) around drive pulley and around pulleys A, B, C, and D as shown.

Wind cord 3½ turns clockwise (from rear of chassis) around tuning control shaft. Turns should progress toward back of chassis. Continue cord around pulley E and around gang condenser drive pulley as shown. Thread cord through hole in pulley rim and tie to tension spring. Fasten other end of spring to hook on pulley.
PHONOGRAPH CONNECTIONS

Phonograph records may be played through this radio. On the back of the chassis base is a socket for a single shielded pin tip at which connections are made—See illustration. The connector on the cable from any standard phono pickup can be inserted in the socket.
ALIGNMENT PROCEDURE

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the last frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver, Dummy Antennas—1 m, 100 mm, and 400 cm.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>BAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY SETTING</td>
<td>CONNECTION AT RADIO</td>
</tr>
<tr>
<td>I.F.</td>
<td>456 KC</td>
</tr>
<tr>
<td>RANGE</td>
<td>1600 KC</td>
</tr>
<tr>
<td></td>
<td>1400 KC</td>
</tr>
<tr>
<td></td>
<td>400 KC</td>
</tr>
<tr>
<td></td>
<td>600 KC</td>
</tr>
<tr>
<td>LOOP</td>
<td>17,000 KC</td>
</tr>
<tr>
<td>RANGE</td>
<td>1400 KC</td>
</tr>
</tbody>
</table>

After each range is completed, repeat the procedure as a final check.
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord.
Set pointer at the 1600 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

TELEVISION SOUND AND FREQUENCY MODULATION CONNECTIONS

If Television or Frequency Modulation programs become available in your community, this radio may be used in conjunction with a Television Picture Receiver and Sound Converter, or a Frequency Modulation Converter to reproduce these programs.

On the back of the chassis base is a single pin tip socket. The connector on the cable from a television receiver or a frequency modulation converter can be inserted in this socket.

DIAL AND DRIVE ASSEMBLY

26A317 Pulley Mounting Plate Assembly complete with Idler Pulleys, Idler Studs, and Brake Bracket. | 28 | Dial Scale Glass.
59X539 Cardboard Background for Dial Scale Glass. | .04 | Snap Fin to hold Background to Mounting Plate.
59X54 Phillips 0.2" x .5" Flat Head. | .04 | Bezel Edge Trim Plate.
30X184 Clamps for Dial Scale Glass. | .04 | Escutcheon for Dial Scale Glass.
4X62 6 Escutcheon Screws—No. 2 x 6" Phillips. | .06 | Oval Hole.
4X6 Phillips Flat Head. | .06 | Station Number.
4X710 Lucite Light Intensifier (on Escutcheon). | .04 | Pointer for Dial Scale.
22X44 Drive Cord (10 lb. Test). | .02 | Tension Spring for Drive Cord.
22X690 Tune Shaft. | .04 | "C" Washers for Above Shaft.
19X1/2 | .06 | 7A142 Dial Lamp Socket and Cable Assembly. | .04 |
7A37 7A Dial Lamp (No. 51). | 1n | DIAL DRIVE ASSEMBLY

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SPECIFICATIONS

Power Consumption
60 Watts (At 117 volts 60 cycles) 80 Watts (Photograph Operating)

Power Output
2.5 Watts Undistorted 1.5 Watts Maximum

Selectivity
40 KC Broad at 1000 Times Signal
456 KC

Intermediate Frequency
6 Watts

Speaker
6 Watts

Electro-Dynamic

Tuning Frequency Range
B Range
528 to 1400 KC
D Range
5700 to 18000 KC

Sensitivity—External Antenna
100 Ohm input

B Range
3 Microvolts Average
D Range
5 Microvolts Average

After each range is completed, repeat the procedure as a final check.
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord.
Set pointer at the 1600 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 43" in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in drive pulley rim and continue ¾ turn around drive pulley toward front of chassis. Continue cord around idler pulleys "A"—See illustration. Wind 3½ turns clockwise (from front of chassis) around tension shaft. Turns should progress toward rear of chassis.

Pass cord through string guide, around idler pulleys "A" and "C" and idler stud "D."—See illustration. Continue cord ¾ turn counter-clockwise (from gang end of chassis) around drive pulley. Cord should be on left side of pulley groove (from front of chassis).

Pass cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.
DRIVE CORD REPLACEMENT

Turn gang condenser to full open position—See illustration. Use a new drive cord 37 inches in length.

Tie one end of cord to tension spring. Pass other end of cord up through hole in groove of drive pulley. Pull cord through hole until spring is flush against inside of pulley rim.

Wind cord 1/4 turn counter-clockwise (from gang end of chassis), around drive pulley. Then wind 3 1/2 turns clockwise (from front of chassis) around tuning control shaft. These turns should progress away from chassis. Pass cord through wire string guide and over idler studs A and B as shown, then wind cord 1/4 turn counter-clockwise (from gang end of chassis) around drive pulley. This turn should be on right side (from front of chassis) of pulley groove.

Pass cord through hole in groove of drive pulley. Tie cord to tension spring. Fasten other end of spring to hook on drive pulley.

SIGNAL GENERATOR BAND

<table>
<thead>
<tr>
<th>FREQUENCY COORDINATION DUMMY SWITCH</th>
<th>DUMMY SWITCH AT RADIO ANTENNA SETTING</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 1600 KC Antenna Lead 100 mmf. B Range Turn Rotor to Full Open</td>
<td>1400 KC Antenna Lead 100 mmf. B Range Ant. Range B (C2)</td>
<td>400 KC Antenna Lead 100 mmf. B Range</td>
<td>600 KC (C4)</td>
</tr>
<tr>
<td>18,300 KC Antenna Lead 400 Ohm D Range Turn Rotor to Max. Output Ant. Range D (C1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LOOP Resonant chassis in cabinet.

BAND

B RANGE 1400 KC Antenna Lead 100 mmf. B Range Turn Rotor to Max. Output Ant. Range B (C2)

FOR RECORD CHANGER SIMILAR TO SEEBURG C

SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Power</th>
<th>60 Watts (At 117 volts 60 cycles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Watts (At 117 volts 60 cycles)</td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td>80 Watts (Phonograph Operating)</td>
</tr>
<tr>
<td>2.5 Watts Undistorted</td>
<td></td>
</tr>
<tr>
<td>3.5 Watts Maximum</td>
<td></td>
</tr>
<tr>
<td>Selectivity</td>
<td>-40 KC Broad at 1000 times Signal</td>
</tr>
<tr>
<td>Intermediate Frequency</td>
<td>-456 KC</td>
</tr>
<tr>
<td>Speaker</td>
<td>6&quot; Electro-Dynamic</td>
</tr>
<tr>
<td>Tuning Frequency Range</td>
<td>B Range - 528 to 1600 KC</td>
</tr>
<tr>
<td>D Range - 575 to 1830 KC</td>
<td></td>
</tr>
<tr>
<td>Sensitivity—External Antenna (For 0.5 Watt output)</td>
<td>B Range - 3 Microvolts Average</td>
</tr>
<tr>
<td>D Range - 5 Microvolts Average</td>
<td></td>
</tr>
</tbody>
</table>

VOLTAGES AT SOCKETS

UNLESS OTHERWISE INDICATED, THE VOLTAGES SHOWN IS BETWEEN SOCKET TERMINAL & GROUND. THESE VOLTAGES ARE READ UNDER THE FOLLOWING CONDITIONS:

1. VOLTAGE—117 VOLT AC;
2. VOLUME CONTROL—MAXIMUM;
3. REAR-CONNECTED BULBS TURNED.ON;
4. SCREEN VOLTAGES ARE READ ON 500 VOLTS SCALE; ANY LEAD SHORTED TO GROUND.

UNLESS OTHERWISE MARKED, THIS RADIO MUST BE OPERATED ON 105 TO 125 VOLT, 60 CYCLE AC SUPPLY ONLY. IF THERE IS ANY DOUBT, CONSULT THE LOCAL POWER COMPANY BEFORE INSERTING THE PLUG. RADIOS OF THIS MODEL WHICH ARE TO BE USED ON 25 CYCLE, 230 VOLT, OR OTHER SERVICE ARE SO MARKED.

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MONTGOMERY-WARD & CO.

MODEL 14WG-740
Series A, B

FOR RECORD CHANGERS AND RECORDERS, MODEL "B" IS IDENTICAL TO MODEL "A", EXCEPT FOR MECHANICAL BASE PLATE, MOTOR PULLEYS AND TURNTABLES.
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>60 Watts (54 117 volts 60 cycles)</td>
</tr>
<tr>
<td>Power Output</td>
<td>3.6 Watts Unmodulated</td>
</tr>
<tr>
<td>Selectivity</td>
<td>40 Kc Broad at 1500 times Signal</td>
</tr>
<tr>
<td>Intermediate Frequency</td>
<td>456 Kc</td>
</tr>
<tr>
<td>Speaker</td>
<td>8&quot; Electro-Dynamic</td>
</tr>
<tr>
<td>Tuning Frequency Range</td>
<td>B Range: 520 to 1300 Kc</td>
</tr>
<tr>
<td>Sensitivity—External Antennas</td>
<td>For 0.5 Watt output</td>
</tr>
<tr>
<td>In general, however, more stations will be heard by using an outside antenna and ground. To receive distant short wave stations, an outside antenna is essential.</td>
<td></td>
</tr>
</tbody>
</table>

**TELEVISION SOUND AND FREQUENCY MODULATION CONNECTIONS**

<table>
<thead>
<tr>
<th>Connection</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C10—OSC. RANGE &quot;B&quot;</td>
<td></td>
</tr>
<tr>
<td>C1—ANT. RANGE &quot;D&quot; (TOP)</td>
<td></td>
</tr>
<tr>
<td>C3—OSC. RANGE &quot;D&quot; (BOTTOM)</td>
<td></td>
</tr>
<tr>
<td>C6—600 Kc</td>
<td></td>
</tr>
<tr>
<td>C2 ANT. RANGE &quot;B&quot;</td>
<td></td>
</tr>
<tr>
<td>T3—1ST. I.F. TRANS.</td>
<td></td>
</tr>
<tr>
<td>T4—3RD. I.F. TRANS.</td>
<td></td>
</tr>
<tr>
<td>C17 &amp; C18—3RD I.F.</td>
<td></td>
</tr>
<tr>
<td>A51-843</td>
<td></td>
</tr>
</tbody>
</table>

**ALIGNMENT PROCEDURE**

After each range is completed, repeat the procedure as a final check.

**DRIVE CORD REPLACEMENT**

Turn gang condenser to full open position. Using a new drive cord 43" in length, tie one end to tension spring. Fasten the other end of tension spring to hook on drive pulley. Pass cord through slot in drive pulley rim and continue 3/4 turn around drive pulley toward front of chassis. Continue cord around idler stud "A." Wind 3/4 turn clockwise (from front of chassis) around tuning shaft. Tuns should begin at the rear of chassis.

Pass cord through string guide, around idler pulleys "B" and "D" and idler stud "D."—See Illustration. Continue cord 3/4 turn clockwise (from gang end of chassis) around drive pulley. Cord should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.

On the back of the chassis base is a socket to which is connected the phono cable shielded pin tip. Upon removal of this pin tip, the connector on the cable from a television receiver or a frequency modulation converter can be inserted in the socket.
CHECK YOUR LINE VOLTAGE

unless otherwise marked, this radio must be operated on 105 to 125 volt, 60 cycle AC supply.
ALIGNMENT PROCEDURE

The following equipment is required for aligning:

- An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output Indicating Meter—Non-Metallelic Screwdriver.
- Dummy Antennas—1 ft., 100 mmf., and 400 ohms.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR FREQUENCY SETTING</th>
<th>CONNECTION AT RADIO DUMMY SWITCH</th>
<th>ANTENNA SETTING</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F. 456 KC</td>
<td>Grid of 1st Det. .1 mf. B Range</td>
<td>Turn Rotor to Full Open 1st I.F.</td>
<td>(C17) &amp; (C18)</td>
<td></td>
</tr>
<tr>
<td>RANGE B</td>
<td>1400 KC Antenna Lead 100 mmf. B Range</td>
<td>Turn Rotor to Full Open 3rd I.F.</td>
<td>(C17) &amp; (C18)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1400 KC Antenna Lead 100 mmf. B Range</td>
<td>Oscillator Range B (C19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>600 KC Antenna Lead 100 mmf. B Range</td>
<td>Turn Rotor to Max. Output (Top)</td>
<td>Ant. Range D (C17)</td>
<td></td>
</tr>
<tr>
<td>RANGE D</td>
<td>18,300 KC Antenna Lead 400 Ohm D Range</td>
<td>Turn Rotor to Full Open Oscillator Range D (C3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17,000 KC Antenna Lead 400 Ohm D Range</td>
<td>Turn Rotor to Max. Output Rock Rotor—See Note B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOOP RANGE B</td>
<td>1400 KC Antenna Lead 100 mmf. B Range</td>
<td>Turn Rotor to Max. Output Ant. Range B (C17)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 43\(^\circ\) in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in drive pulley rim and continue \(\frac{3}{8}\) turn around drive pulley toward front of chassis. Continue cord around idler stud "A." Wind \(\frac{3}{8}\) turn clockwise (from front of chassis) around tuning shaft. Turns should progress toward rear of chassis.

Pass cord through string guide, around idler pulleys "B" and "C," and idler stud "D."—See illustration. Continue cord \(\frac{3}{8}\) turn counter-clockwise (from gang end of chassis) around drive pulley. Cord should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.

A white wire with black tracer and an antenna marker will be found coming out of the chassis. If it is desired to operate the radio using the loop and counterpoise foil antennas, do not connect this wire to anything. If it is desired to operate the radio using an outside antenna, connect this wire to the lead from the outside antenna.

The wire which is connected to the counterpoise foil antenna should never be disconnected.

FOR SEEBURG MODEL J RECORD CHANGER

SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

SPECIFICATIONS

- **Power Consumption**: 60 Watts (At 117 volts 60 cycles)
- **80 Watts (Phonograph Operating)**
- **Power Output**: 2.5 Watts Undistorted
- **3.5 Watts Maximum**
- **Selectivity**: 40 KC Broad at 1000 times Signal
- **Intermediate Frequency**: 455 KC
- **Speaker**: 8" Electro-Dynamic
- **Tuning Frequency Range**
  - **B Range**: 528 to 1200 KC
  - **D Range**: 5750 to 18000 KC
- **Sensitivity—External Antenna**
  - **B Range**: 3 Microvolts Average
  - **D Range**: 5 Microvolts Average

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ANTENNA AND GROUND

For best results, an outside antenna 50 to 60 feet long, including the lead-in, should be used. An inside antenna is not satisfactory for this radio. The antenna should be as high and as far from surrounding objects as possible.

Run the antenna at right angles to any 32 volt lines and keep it as far away from these lines as possible in order to avoid line noise being carried into the radio via the antenna.

A good ground connection is required. A ground connection may be obtained by connecting to a water pipe, a pipe driven into the ground, or to the metal jacket of a water pump. Do not ground the radio to the 32 volt system conduit or fittings at any point.

Two wires will be found coming out of the chassis. Connect the wire with the antenna marker to the antenna lead and the wire with the ground marker to the ground lead.

32 VOLT POWER SUPPLY

This radio is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The radio may not be satisfactory on plants which do not use storage batteries.

Polarity of 32 Volt Power Supply—Insert plug so that prong on same side as ribbed side of cord is on the positive side of the line.

If the polarity of the line is not known, insert plug. If the tubes light but no sounds are heard from the speaker after the plug has been in one minute, reverse the plug.

LINE VOLTAGE RANGE

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts. If the line voltage is higher than 42, it will be necessary to use a series resistor to cut it down. If the voltage varies, a variable resistor may be required.

SPECIFICATIONS

| Power Consumption | 1.60 Amperes at 36 Volts DC |
| Power Output | 0.17 Watt Undistorted |
| Selectivity | 30 KC Broad at 1000 times Signal |
| Sensitivity (For .05 watt output) | 6.0 Microvolts Average |

Intermediate Frequency: 456 KC

Speaker: 6" or 8" Electro-Dynamic

Tuning Frequency Range

B Range: 525 to 1610 KC (Kilocycles)
D Range: 5750 to 18300 KC (Kilocycles)

After each range is completed, repeat the procedure as a final check.

NOTE 8—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Set pointer at the 1500 KC mark on the dial scale, attach pointer to drive cord.

NOTE 9—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

ALIGNMENT PROCEDURE

Volume Control—Maximize All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—1 mf., 200 mmf., and 400 ohms.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR FREQUENCY</th>
<th>CONNECTION DUMMY BAND Switch CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st I.F. (C13) &amp; (C14)</td>
<td>Grid of 1st Det. 1 mf. B Range</td>
<td>1st I.F. (C13) &amp; (C14)</td>
</tr>
<tr>
<td>2nd I.F. (C15) &amp; (C16)</td>
<td>Turn Rotor to Max. Output</td>
<td>2nd I.F. (C15) &amp; (C16)</td>
</tr>
<tr>
<td>3rd I.F. (C22)</td>
<td>Oscillator B (C8)</td>
<td>3rd I.F. (C22)</td>
</tr>
<tr>
<td>1st Ant. Range B (C11)</td>
<td>Turn Rotor to Max. Output</td>
<td>1st Ant. Range B (C11)</td>
</tr>
<tr>
<td>2nd Ant. Range B (C12)</td>
<td>Oscillator Range D (C7)</td>
<td>2nd Ant. Range B (C12)</td>
</tr>
<tr>
<td>3rd Ant. Range D (C9)</td>
<td>Rock Rotor—See Note B</td>
<td>3rd Ant. Range D (C9)</td>
</tr>
<tr>
<td>4th Ant. Range D (C9)</td>
<td>Rock Rotor—See Note B</td>
<td>4th Ant. Range D (C9)</td>
</tr>
<tr>
<td>500 KC (C5)</td>
<td>Oscillator Range D (C7)</td>
<td>500 KC (C5)</td>
</tr>
<tr>
<td>1820 KC Antenna Lead</td>
<td>Antenna Lead 450 Ohm</td>
<td>1820 KC Antenna Lead</td>
</tr>
<tr>
<td>16,000 KC Antenna Lead</td>
<td>Antenna Lead 450 Ohm</td>
<td>16,000 KC Antenna Lead</td>
</tr>
<tr>
<td>10,000 KC Antenna Lead</td>
<td>Antenna Lead 450 Ohm</td>
<td>10,000 KC Antenna Lead</td>
</tr>
</tbody>
</table>
MONTGOMERY-WARD & CO.

MODEL 14WG-690

MODEL 14WC-606

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning: A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed, and a Signal Generator to Non-Metallic Screwdriver. Dummy Antennas—1 mf., 50 mmf.

Input Voltages and Currents—Battery Operation

"A" Battery ... 9 Volts—50 Ma.
"B" Battery ... 90 Volts—11.5 Ma.

Power Consumption ... 28 Watts
(At 117 volts AC Supply)

Power Output

Battery Operation ... 150 Watts, Undistorted
AC Operation ... 200 Watts, Undistorted

Selectivity—50 KC Broad at 1000 Times Signal ... 456 KC
Intermediate Frequency ... 456 KC
Speaker ... 5¼" P. M. Dynamic

Tuning Frequency Range ... 540 to 1600 KC
Sensitivity (For .05 Watt Output) ... External Antenna ... 10 Microvolts Average

NOTE A—Reassemble chassis in Cabinet. Close back on cabinet.

CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark.

MODEL 14WG-606

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning: Dummy Antennas—1 mf., 100 mmf., and 400 ohms.

SIGNAL GENERATOR

BAND FREQUENCY CONNECTION SETTING AT RADIO DUMMY ANTENNA SETTING CONDENSER SETTING ADJUST TRIMMERS TO MAXIMUM

I.F.

456 KC Grid of 1st Det. .1 mf., B Range Turn Rotor to Full Open

15.100 KC External Antenna Condenser—Lead. 400 Ohm D Range Turn Rotor to Full Open Ant. Rotor See Note B

17.900 KC External Antenna Condenser—Lead. 400 Ohm D Range Turn Rotor to Max. Output Rock Rotor See Note B

Reassemble chassis in cabinet.

Loosen chassis mounting bolts and swing chassis back a sufficient amount to get at the trimmers.

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ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead. Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
- An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output Indicating Meter—Non-Metallic Screwdriver. Dummy Antennas—1 mt., 100 mmf., and 400 ohms.

SIGNAL GENERATOR

<table>
<thead>
<tr>
<th>FREQUENCY CONNECTION</th>
<th>DUMMY ANTENNA SETTINGS</th>
<th>BAND SWITCH SETTINGS</th>
<th>CONDENSER SETTINGS</th>
<th>ADJUST TRIMMERS TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>456 KC</td>
<td>1610 KC</td>
<td>400 KY</td>
<td>9700 KE</td>
<td>1400 KE</td>
</tr>
<tr>
<td>Grid of 1st Det.</td>
<td>Antenna Lead 100 mmf.</td>
<td>ANTENNA Lead 100 mmf.</td>
<td>31 Mtr. at 9.75 MC</td>
<td>31 Mtr. as above</td>
</tr>
<tr>
<td>B Range Turn Rotor to Full Open</td>
<td>B Range Turn Rotor to Full Open</td>
<td>B Range Turn Rotor to Full Open</td>
<td>100 mmf.</td>
<td>100 mmf.</td>
</tr>
<tr>
<td>Oscillator Range B (C2)</td>
<td>Ant. Range B (C10)</td>
<td>600 KC (C4)</td>
<td>Antenna Band Spread (C9)</td>
<td></td>
</tr>
<tr>
<td>1st I.F. (C15) &amp; (C16)</td>
<td>2nd I.F. (C19) &amp; (C20)</td>
<td>600 KC (C4)</td>
<td>600 KC (C4)</td>
<td>600 KC (C4)</td>
</tr>
</tbody>
</table>

Remove chassis from cabinet but do not disconnect leads to loop aerial.

SHORT WAVE BANDS

<table>
<thead>
<tr>
<th>9700 KE</th>
<th>1400 KC</th>
<th>600 KC (C4)</th>
<th>600 KC (C4)</th>
<th>600 KC (C4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 Ohm</td>
<td>31 Mtr. at 9.75 MC</td>
<td>31 Mtr. as above</td>
<td>31 Mtr. as above</td>
<td>31 Mtr. as above</td>
</tr>
</tbody>
</table>

CAUTION—Two of the coils in the band spread coil assembly, the 19 Meter Antenna and Oscillator coils, have adjustable iron cores. One of the adjusting screws extends out from the front panel of the chassis base at the left of the band switch. The other adjusting screw extends up from the chassis base in front of the 1st I.F. Transformer.

DO NOT CHANGE THE POSITION OF THESE ADJUSTING SCREWS as they have been properly set at the factory and cannot be satisfactorily re-adjusted in the field.

REPLACING BAND SPREAD COILS

It is not practicable to make field replacements of the individual antenna and oscillator coils in the Band Spread Assembly Unit. Should one of these coils be damaged in any way, remove the Band Spread Assembly Unit (consisting of the 3 antenna and 4 oscillator coils, the right-angle mounting plate, and the band switch) from the chassis and return to the factory for replacement.

BAND SPREAD COILS

6SA7 1st DET & OSC
5Y3G RECT
6SK7 LF
6K6GT OUTPUT
6S07 2ND DET & 1ST AF
6S07 BALANCING EXCITER
6S07 OUTPUT
6S07 EXT. ANT.}

SPECIFICATIONS

Power Output

- 3.0 Watts Undistorted
- 4.5 Watts Maximum

Selectivity—38 KC Broad at 1000 Times Signal
Intermediate Frequency—456 KC
Speaker—10" Electro-Dynamic Unit

Tuning Frequency Range

- 8 Range.. 535 to 1610 KC.. 15 Microvolts Aver.
- 19 Meter.. 14.6 to 15.8 MC.. 26 Microvolts Aver.
- 25 Meter.. 11.1 to 12.0 MC.. 25 Microvolts Aver.
- 31 Meter.. 9.3 to 10.05 MC.. 22 Microvolts Aver.

Consumption

- 57 Watts (At 117 volts 60 cycles)

External Antenna (For 0.5 Watt Output)

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency Range</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Range</td>
<td>535 to 1610 KC</td>
<td>15 Microvolts Aver.</td>
</tr>
<tr>
<td>19 Meter</td>
<td>14.6 to 15.8 MC</td>
<td>26 Microvolts Aver.</td>
</tr>
<tr>
<td>25 Meter</td>
<td>11.1 to 12.0 MC</td>
<td>25 Microvolts Aver.</td>
</tr>
<tr>
<td>31 Meter</td>
<td>9.3 to 10.05 MC</td>
<td>22 Microvolts Aver.</td>
</tr>
</tbody>
</table>
MONTGOMERY-WARD & CO. MODELS 14WG-1202B, 14WG-1203B, 14WG-1203M, 14WG-1203W

Partial Schematic for models 14WG-1202B and 14WG-1203B. Otherwise same as 14WG-1202B.

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REPLACING BAND SPREAD COILS

It is not practicable to make field replacements of the Individual Antenna, R.F. Interstage and Oscillator coils in the Band Spread Assembly Unit.

Should one of these coils be damaged in any way, remove the Band Spread Assembly Unit (consisting of the Antenna, R.F. Interstage and Oscillator Coils, the right-angle mounting plate, and the band switch) from the chassis and return to the factory for replacement.

DRIVE CORD REPLACEMENT

Tie the 57" drive cord to the spring. Thread other end thru hole in drive pulley, pull flush with inside pulley rim. Gang cord in open pass-pass cord around idler pulley A-B-C, and D, and thru string guide. Wind 21/2 turns counterclockwise around tuning shaft spool, around E. Wind 1 turn clockwise around drive pulley.

PROCEDURE FOR SETTING THE STATION BUTTONS

Make a list of your six favorite stations, those which you tune in regularly. It is better to list the station with the highest kilicycle number first, the station with the next lower kilicycle number next, and so on.

The selectivity control should be set in the Sharp Position.

Grasp the left-hand button at the sides (depress the adjacent button) and pull it out as far as it will go. A click will be heard. If it is impossible to depress the button which is adjacent to the button you are setting, rotate the tuning knob a few turns.

Select the first station from the list you have prepared. Carefully tune in this station by means of the manual tuning knob until the dark sector in the tuning eye is narrowest.

Now lock the mechanism by pushing the button all the way in until it is felt to lock into place.

Proceed in the same manner to set stations on any of the remaining buttons. Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilicycle numbers decrease from left to right.

EACH MODEL EXCEPT 14WG-12023, HAS A SEEBURG B-3A RECORD CHANGER INCORPORATED. FOR DATA ON THIS SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

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Removing Chassis from Cabinet

Take out the 2 screws, one at each rear corner of the chassis shelf. Grasp the chassis shelf at each rear corner and edge it away from the 2 screws at the bottom of the shelf. To remove the shelf from the chassis, take out the bolt and the cabinet front until the chassis shelf and chassis slide easily out of the cabinet.

CAUTION—When operated on AC or DC Power. As the chassis is connected to one side of the line, in any service work, keep the chassis on a wood or other insulated surface to avoid contacts with ground.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The chassis may be aligned on either AC-DC or Battery power. If AC-DC power is used, see precaution above about avoiding external grounds. Also do not connect the signal generator to any outside ground as the ground terminal of the generator will be connected to the chassis.

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>FREQUENCY SETTING</th>
<th>CONNECTION AT RADIO</th>
<th>DUMMY ANTENNA</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>456 KC</td>
<td>Signal Grid of 1st Det. (Top Cap)</td>
<td>.1 mf.</td>
<td>Turn Rotor to full open</td>
<td>1st I.F. (C6) &amp; (C7)</td>
</tr>
<tr>
<td></td>
<td>1600 KC</td>
<td>Signal Grid of 1st Det.</td>
<td>.1 mf.</td>
<td>Turn Rotor to full open</td>
<td>2nd I.F. (C13) &amp; (C14)</td>
</tr>
<tr>
<td></td>
<td>1500 KC</td>
<td>None—See Note A</td>
<td>Turn Rotor to max. output</td>
<td>Antenna (C3)</td>
<td></td>
</tr>
</tbody>
</table>

NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, hold the pulley at the back of the dial and loosen the pointer screw. Set the pointer at the 800 KC mark. Hold the pointer and retighten the pointer screw.
ANTENNA:

The receiver is supplied with 30 ft. of aerial wire fixed to the chassis. This wire is in the form of a tightly wrapped bundle and should be stretched out full length under a rug or around the edge of the room, for best operation of the receiver. When practical, although not necessary, even better results will be obtained if a small outside aerial is used.

In rural areas, or in areas where signal strengths are low, use of a small outside antenna will result in better reception.

**GENERAL: 35Z4GT or 35Z5GT**

This carton contains one superheterodyne radio receiver.

It is designed for operation on 115 volts AC or DC. Power consumption is 30 watts.

This receiver is complete and ready to operate when installed as described in the following paragraphs.
ARVIN HOME RADIO  CHASSIS RE-76

12SA7  12SK7  12SQ7  50L6GT

35Z5GT

designed for operation on 115 volts AC or DC. Power consumption is 30 watts.

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NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN PAGE 13-5
MODELS 522,522A

ARVIN PAGE 13-5
MODELS 522,522A

NOBLITT-SPARKS INDUSTRIES, INC.

COLUMBUS, INDIANA

RESISTORS  PART NO.
10 OHM  10106
5000  4072
220  4070
100  4070
22  4070
15  4070
5  4070
1  4070

CAPACITORS  PART NO.
5000  K7  8667
2200  4072
100  4070
22  4070
15  4070
5  4070
1  4070

TRANSFORMERS  PART NO.
1  4072
2  4072
3  4072
4  4072
5  4072

ANTENNA  LOOF  17 664
1  4072
2  4072
3  4072
4  4072
5  4072

IF PEAK  455 K.C.
BALANCE  1400 K.C. - CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

MICROPHONE  PART NO.
1  4072
2  4072
3  4072
4  4072
5  4072

SPEAKER  PART NO.
1  4072
2  4072
3  4072
4  4072
5  4072

SYMBOL  DESCRIPTION  PART NO.
D  DIAL LIGHT  7 6647
E  LINE CORD & PLUG ASSY  7 6644
F  SPEAKER ASSY  7 6643
G  BRASS MOTOR  7 6644
MODELS 524, 524A
Chassis RE-99
MODELS 616, 616A
Chassis RE-96

NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN HOME RADIO - CHASSIS RE-98

12SK7 12SA7 12SK7 12SQ7 35L8GT

GROUND TO CHASSIS BASE

12SA7 12SK7 12SQ7 50L6GT

CHASSIS RE-99

35Z5GT

designed for operation on 115 volts AC or DC. Power consumption is 30 watts.

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www.americanradiohistory.com
DESCRIPTION:

The Arvin Model 620 is a five tube combination dial and push button single unit Car Radio Receiver. This receiver is designed to mount under the lower edge of the instrument panel on most models of cars.

The radio may be tuned either by rotating the calibrated thumb wheel on the lower front of the radio, or by pressing any one of the four push buttons which are disposed vertically along the left front of the radio.

BALANCING INSTRUCTIONS:

All sensitivities given for 1/4 watt output = 1.4 across Voice Coil

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5S47 Grid</td>
<td>455</td>
<td>1,2,3 &amp; 4</td>
<td>550 Kc</td>
<td>50 uv</td>
</tr>
<tr>
<td>2</td>
<td>Ant. Coupler</td>
<td>1400</td>
<td>5</td>
<td>1100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Through 20 uuf</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>1400</td>
<td>6</td>
<td>1400</td>
<td>10 uv</td>
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RESISTORS

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5</td>
<td>17-2070</td>
<td>500,000 ohm</td>
<td>.20</td>
</tr>
<tr>
<td>R9</td>
<td>17-2080</td>
<td>1,000,000 ohm</td>
<td>.20</td>
</tr>
<tr>
<td>R171</td>
<td>17-14288</td>
<td>15,000,000 ohm</td>
<td>.20</td>
</tr>
<tr>
<td>R172</td>
<td>17-14290</td>
<td>100 ohm</td>
<td>.20</td>
</tr>
<tr>
<td>R174</td>
<td>17-14291</td>
<td>20,000 ohm</td>
<td>.20</td>
</tr>
<tr>
<td>R177</td>
<td>17-14296</td>
<td>650 ohm</td>
<td>.20</td>
</tr>
<tr>
<td>R202</td>
<td>17-16488</td>
<td>1,000,000 Vol.Con.</td>
<td>1.00</td>
</tr>
<tr>
<td>R204</td>
<td>17-14340</td>
<td>500 ohm 1W</td>
<td>.30</td>
</tr>
<tr>
<td>R207</td>
<td>17-14361</td>
<td>300 ohm 1W</td>
<td>.20</td>
</tr>
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</table>

CONDENSERS

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1-2</td>
<td>17-16471</td>
<td>Tuner Unit</td>
<td>4.00</td>
</tr>
<tr>
<td>C155</td>
<td>17-14217</td>
<td>.0002 mfd.200V</td>
<td>.25</td>
</tr>
<tr>
<td>C227</td>
<td>17-14345</td>
<td>.005 mfd.1200V</td>
<td>.50</td>
</tr>
<tr>
<td>C206</td>
<td>17-14297</td>
<td>10-10 mfd.600V</td>
<td>.25</td>
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<tr>
<td>C191</td>
<td>17-14272</td>
<td>.01 mfd 400V</td>
<td>.35</td>
</tr>
<tr>
<td>C192</td>
<td>17-14273</td>
<td>.00025 mfd. 600V</td>
<td>.25</td>
</tr>
<tr>
<td>C195</td>
<td>17-14276</td>
<td>.05 mfd. 400V</td>
<td>.35</td>
</tr>
<tr>
<td>C196</td>
<td>17-14277</td>
<td>.1 mfd 200V</td>
<td>.35</td>
</tr>
<tr>
<td>C197</td>
<td>17-14278</td>
<td>.001 mfd.600V</td>
<td>.25</td>
</tr>
<tr>
<td>C238</td>
<td>17-14346</td>
<td>5 mfd. 150V</td>
<td>.10</td>
</tr>
<tr>
<td>C222</td>
<td>17-14220</td>
<td>.05 mfd. 200V</td>
<td>.30</td>
</tr>
<tr>
<td>C258'</td>
<td>17-14381</td>
<td>.004 mfd. 600V</td>
<td>.30</td>
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</table>

PUSH BUTTON ADJUSTMENT:

Any button may be set to any station desired. First, tune in the desired station by means of the thumb wheel. Second, turn the push button counterclockwise two full turns. Then depress this button to full length of its stroke, and while depressed, tighten the button again by turning it clockwise.

The button may now be released. To check the correct setting for this button, turn the thumb wheel to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence of operations more carefully. Each of the remaining buttons may be set to other stations in a like manner.
ARVIN HOME RADIO – CHASSIS RE-79

12SA7  12SK7  12SQ7  50L6GT

DESIGNED FOR OPERATION ON 115 volts
AC OR DC. CONSUMPTION IS 30 watts.

RESISTORS

<table>
<thead>
<tr>
<th>#</th>
<th>OHM</th>
<th>PART NO</th>
<th>RESISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>M</td>
<td>C7-16895</td>
<td>1 TWO GANG</td>
</tr>
<tr>
<td>3</td>
<td>500K</td>
<td>C4-17070</td>
<td>2 VARIABLE</td>
</tr>
<tr>
<td>33</td>
<td>10</td>
<td>C6-16892</td>
<td>3 POT.</td>
</tr>
<tr>
<td>74</td>
<td>20K</td>
<td>C8-16892</td>
<td>4 SECOND IF COIL</td>
</tr>
<tr>
<td>72</td>
<td>100</td>
<td>C9-16889</td>
<td>5 OUTPUT TRANS.</td>
</tr>
<tr>
<td>9</td>
<td>1M</td>
<td>C0-16889</td>
<td>6 S. C. FILTER</td>
</tr>
</tbody>
</table>

CONDENSERS

<table>
<thead>
<tr>
<th>#</th>
<th>CAPACITY</th>
<th>PART NO</th>
<th>VOLT</th>
</tr>
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<tbody>
<tr>
<td>23</td>
<td>12,000</td>
<td>C7-16895</td>
<td>12000</td>
</tr>
<tr>
<td>3</td>
<td>12,000</td>
<td>C4-17070</td>
<td>12000</td>
</tr>
<tr>
<td>33</td>
<td>1000</td>
<td>C6-16892</td>
<td>1000</td>
</tr>
<tr>
<td>74</td>
<td>10,000</td>
<td>C8-16892</td>
<td>10000</td>
</tr>
<tr>
<td>72</td>
<td>1000</td>
<td>C9-16889</td>
<td>1000</td>
</tr>
<tr>
<td>9</td>
<td>10,000</td>
<td>C0-16889</td>
<td>10000</td>
</tr>
</tbody>
</table>

TRANSFORMERS

<table>
<thead>
<tr>
<th>#</th>
<th>PART NO</th>
<th>VOLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>C7-16895</td>
<td>1 ANTENNA LOOP</td>
</tr>
<tr>
<td>3</td>
<td>C4-17070</td>
<td>2 OSCILLATOR coil</td>
</tr>
<tr>
<td>33</td>
<td>C6-16892</td>
<td>3 IF COIL</td>
</tr>
<tr>
<td>74</td>
<td>C8-16892</td>
<td>4 SECOND IF COIL</td>
</tr>
<tr>
<td>72</td>
<td>C9-16889</td>
<td>5 OUTPUT TRANS.</td>
</tr>
<tr>
<td>9</td>
<td>C0-16889</td>
<td>6 S. C. FILTER</td>
</tr>
</tbody>
</table>

MISCELLANEOUS UNITS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>DRL. LIGHT BULB</td>
</tr>
<tr>
<td>P</td>
<td>LINE CORD &amp; PLUG ASST</td>
</tr>
<tr>
<td>S</td>
<td>SPEAKER ASST</td>
</tr>
</tbody>
</table>

IF PEAK 455 KC
BALANCE 1400 KC – CHECK AT 600 KC
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA
Full button out - turn counter-clockwise until definite latching is observed.

Loosen two turns - Tune in desired station manually - Depress loosened

button - Pull button out again and tighten by turning clockwise - Return to

normal position
TUNER UNIT

TUBES - Seven
SPEAKER - 8" Electro Dynamic
Power Supply

TUNING - Manual & 5 P.B. - Solenoid
TUNING RANGE - 540 KC - 1610 KC
**CAR ANTENNA CAPACITY** - 75 mmfd.

**FOR COMPLETE ALIGNMENT PROCEDURE**

SEE UNITED MOTORS SERVICE

MODEL R-698

**ALIGNMENT PROCEDURE**

Volume Control Maximum

Signal Generator Output minimum for satisfactory output indication

<table>
<thead>
<tr>
<th>Series Condenser Or Dummy Antenna</th>
<th>Connect To</th>
<th>Signal Generator Frequency</th>
<th>Adjust, Screws In Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 mfd.</td>
<td>Terminal X</td>
<td>260 KC</td>
<td>A-B-C-D</td>
</tr>
<tr>
<td>.000075 mfd.</td>
<td>Antenna Terminal</td>
<td>1610 KC</td>
<td>E-F-H</td>
</tr>
<tr>
<td>.000075 mfd.</td>
<td>Antenna Terminal</td>
<td>260 KC</td>
<td>G *</td>
</tr>
</tbody>
</table>

* Adjust for minimum output indication.

Low frequency alignment not required.

Adjust Trimmer E to match car antenna (1400 KC) when radio is installed.
ALIGNMENT PROCEDURE

Volume Control Maximum-Tone Control on treble.

Signal Generator minimum for satisfactory output indication.

<table>
<thead>
<tr>
<th>Series Condenser Or Dummy Antenna</th>
<th>Connect To</th>
<th>Signal Generator Frequency</th>
<th>Adjust Screws In Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 MFD</td>
<td>Grid side of Trimmer F</td>
<td>262 KC</td>
<td>A B C D</td>
</tr>
<tr>
<td>.000070 MFD</td>
<td>Antenna Terminal</td>
<td>1615 KC</td>
<td>E</td>
</tr>
<tr>
<td>.000070 MFD</td>
<td>Antenna Terminal</td>
<td>1400 KC</td>
<td>F G</td>
</tr>
</tbody>
</table>

Adjust trimmer G to match car antenna (1400 KC) when radio is installed. For complete alignment procedure see United Motors Service Model R698

SPECIAL INSTRUCTIONS

Mechanical alignment of iron cores. Tune to stop at H.F. end of dial. Adjust cores H, J, & K to extend 1-5/32" out from end of coil form. Adjust trimmer E, F, & G, (1615 KC). Adjust cores H & J for maximum output at 1400 KC. Repeat alignment of trimmers E, F, & G at 1615 KC. Repeat alignment of cores H & J at 1400 KC. Align trimmers F & G at 1400 KC.

TUNER MECHANICAL PARTS

Illus. No. Part No. Part Name Description
65 7241046 Baffle Light Shield
66 7241029 Bar Parallel Guide
67 7241957 Bearing Face Worm
68 7240303 Bracket Outrigger Assy.
69 7241255 Bracket Slide Assy.
70 7242420 Bumper Button Shock Absorber
71 7240998 Bushing Man Drive
72 7242456 Button P.B. Assy.
73 7242847 Clutch Core
74 7240893 Clutch Assy.
75 7241227 Collar Man. Shaft
76 7241655 Cord Pointer
77 7242126 Core Antennas, & Oscillator
78 7241239 Core R.F. Coil Tuning
79 7240921 Coupling Core
80 7242340 Dial Calibrated
81 7242774 Escutcheon
82 7241628 Extension Control Shafts
83 7241370 Lever String Drive
84 7240922 Link Connecting
85 7242516 Nut Spacer
86 7241256 Plate Tuner Mounting
87 7242441 Plate Dial Back Plate
88 7242845 Plate Pointer Back Plate
89 7242214 Pointer Assy. Comp.
90 7241657 Screw Shaft Extension
91 7241276 Shaft Man. Drive Assy.
92 7242662 Spacer Shoulder Spacing Slide
93 7241044 Spring Button Return
94 7240915 Spring Clutch Shaft Tension
95 7241042 Spring Connecting Link-Also
96 7244045 Spring Core Coupling
97 7240947 Spring Dial Retainer
98 7241178 Spring Pointer Return
99 7242216 Tuner Assy. Includes items 106-111
100 7240548 Yoke Tuning Nut Yoke
101 7241045 Screw Push Button Screws
102 7240947 Screw Latch Bar
103 7242416 Screw P.B. Screw Return
104 7242426 Tip Tuning Nut Yoke
105 7242475 Tuner Ass'y. Includes 106-111
106 7242487 Yoke Latching Button

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TUBES--Six

VIBRATOR

RECTIFIER

IF PEAK 262 KC

CAR ANTENNA CAPACITY--.000055 to .000080 MFD

TUNING RANGE--540-1600 K.C.

TUNING--Manual & 5 P.B. Mechanical

MOUNTING--All 1942 Oldsmobile Cars

Push button in and latch. Allow to return to normal position. Turn button until desired station is brought in. Do not hold button in while adjusting.