VOLUME IX

PERPETUAL TROUBLESHOOTER'S MANUAL

JOHN F. RIDER

www.americanradiohistory.com
This receiver operates on alternating current of 110 volts 60 cycles. Where only 50 cycles current is available, the receiver can be altered for that frequency at the factory. It is a 6 tube superheterodyne. Its frequency ranges are 538 to 1750 KCS and 5.8 to 18.6 megacycles. This includes standard American broadcast, most city police, foreign and American short wave broadcast. The receiver is equipped with automatic volume control and mechanical push button tuning.

The tubes used are:

- 16A7: First detector
- 176: Oscillator
- 16D6: I. F. Amplifier
- 175: Second detector

Automatic volume control, and first audio amplifier

Operations For Setting Up Of Buttons

1. Decide which station you desire to hear on any one button.
2. Loosen this button by turning it to the left.
3. Tune in your desired station manually until it is heard with best quality.
4. Push in the button while holding the manual tuning knob fixed on the station.
5. Tighten the button by turning it to the right while the button is pushed all the way in.
6. Repeat this procedure to set up the other buttons.

To change any one setting at any time repeat the above procedure.

Push button should be used in the same position of the tone control in which they were adjusted. Thus, if the buttons were set up in the mellow tone position of the tone control, they should be used in that position. If this is not done, turning the tone control may detune the set slightly at frequencies higher than 1200 kilocycles.
MAJESTIC RADIO & TELEV. CO.

Models 511-511A-519P

PARTS FOR MAJESTIC MODEL 511

<table>
<thead>
<tr>
<th>Location</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL, C4</td>
<td>Y-C717</td>
<td>Variable gang condenser</td>
</tr>
<tr>
<td>CD1, CD2</td>
<td>C-15712</td>
<td>Tubular cond. 0.1 mfd 200 V</td>
</tr>
<tr>
<td>CD1, CD3</td>
<td>C-15714</td>
<td>Tubular cond. 0.5 mfd 400 V</td>
</tr>
<tr>
<td>CD1, C5</td>
<td>C-15716</td>
<td>Tubular cond. 0.1 mfd 1000 V</td>
</tr>
<tr>
<td>C20</td>
<td>CM-15918</td>
<td>Mica cond. 100 mfd 20%</td>
</tr>
<tr>
<td>C21, C22</td>
<td>CM-15916</td>
<td>Mica cond. 50 mfd 20%</td>
</tr>
<tr>
<td>C8, C14</td>
<td>CE-34</td>
<td>Tubular dry elec. cond. 8 mfd 300 V</td>
</tr>
<tr>
<td>C5, C6</td>
<td>Y-C1</td>
<td>1st P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C9, C10</td>
<td>Y-C71</td>
<td>2nd P.F. Trimmer cond.</td>
</tr>
<tr>
<td>R1</td>
<td>R-15511</td>
<td>Carbon resistor 30K 1/4 W 20%</td>
</tr>
<tr>
<td>R2</td>
<td>R-15544</td>
<td>Carbon resistor 15K 1/4 W 20%</td>
</tr>
<tr>
<td>R4</td>
<td>R-15500</td>
<td>Carbon resistor 3 mfd 1/4 W 20%</td>
</tr>
<tr>
<td>R8</td>
<td>R-15520</td>
<td>Carbon resistor 50K 1/4 W 20%</td>
</tr>
<tr>
<td>R3</td>
<td>Y-VC-17</td>
<td>Volume control 500K</td>
</tr>
</tbody>
</table>

This receiver operates on alternating current of 105 or 125 Volts—60 cycles. It is also available in 50 cycles. It is a full 5 tube superheterodyne equipped with automatic volume control. Tuning range 530-1750 KCS. This includes Standard Broadcast and City Police.

The tubes used are:

1-6A7 Converter tube
1-6D6 I.F. Amplifier
1-75 Second detector, automatic volume control and audio amplifier
41 Power output tube
1-80 Rectifier

PHONOGRAPH COMBINATION: To operate on radio, throw switch on motor board to "radio" position. To operate phonograph, throw switch to "phono" position and start motor. TO SET AUTOMATIC STOP ON PHONOGRAPH SWITCH: Place pick-up arm so that needle is in record groove near the end of the recording, then fold upright arm on switch toward pick-up arm so that further movement of pick-up toward center of record will throw switch to shut off motor.

MAJESTIC PAGE 9-3

PARTS LIST — CHASSIS 551

<table>
<thead>
<tr>
<th>Location</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C21</td>
<td>C-15754</td>
<td>Tubular cond. 0.1 mfd 400 V</td>
</tr>
<tr>
<td>C2, C13</td>
<td>C-15712</td>
<td>Tubular cond. 0.5 mfd 400 V</td>
</tr>
<tr>
<td>C3</td>
<td>C-15714</td>
<td>Tubular cond. 0.1 mfd 1000 V</td>
</tr>
<tr>
<td>C4, C16</td>
<td>CM-15920</td>
<td>Mica cond. 10 mfd 20%</td>
</tr>
<tr>
<td>C5, C9</td>
<td>CM-15918</td>
<td>Mica cond. 50 mfd 20%</td>
</tr>
<tr>
<td>C7</td>
<td>CM-15916</td>
<td>Mica cond. 100 mfd 20%</td>
</tr>
<tr>
<td>C18, C19</td>
<td>CE-34</td>
<td>Tubular dry elec. cond. 8 mfd 300 V</td>
</tr>
<tr>
<td>C6</td>
<td>Y-C72</td>
<td>2nd P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C7</td>
<td>Y-C73</td>
<td>1st P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C8</td>
<td>Y-C74</td>
<td>1st P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C9</td>
<td>Y-C75</td>
<td>2nd P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C10</td>
<td>Y-C76</td>
<td>2nd P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C11</td>
<td>Y-C77</td>
<td>3rd P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C12</td>
<td>Y-C78</td>
<td>4th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C13</td>
<td>Y-C79</td>
<td>5th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C14</td>
<td>Y-C80</td>
<td>6th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C15</td>
<td>Y-C81</td>
<td>7th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C16</td>
<td>Y-C82</td>
<td>8th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C17</td>
<td>Y-C83</td>
<td>9th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C18</td>
<td>Y-C84</td>
<td>10th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C19</td>
<td>Y-C85</td>
<td>11th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C20</td>
<td>Y-C86</td>
<td>12th P.F. Trimmer cond.</td>
</tr>
<tr>
<td>C21</td>
<td>Y-C87</td>
<td>13th P.F. Trimmer cond.</td>
</tr>
</tbody>
</table>

This receiver operates on alternating current of 60 cycles, 105 to 125 Volts. Where only 50 cycles is available, it can be altered at the factory by so specifying. It is a 5 tube superheterodyne. Its frequency ranges are 530 to 1750 KCS and 5.8 to 16.8 megacycles.

The tubes used are:

1-6A7 First detector and oscillator
1-6D6 I. F. Amplifier
1-75 Second detector, automatic vol cont and first audio amplifier
1-80 Output
1-80 Rectifier

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MAJESTIC RADIO & TELEV. CO.

SCHEMATIC DIAGRAM MODEL 739

Schematic, Socket Trimmers, Parts, Voltage

REPLACEMENTS PARTS LIST — MODEL 739

<table>
<thead>
<tr>
<th>Schematic Location</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2, C4, C6, C7, C11, C19</td>
<td>CRT-1</td>
<td>Mica cond. 2550 mfd., 5%</td>
</tr>
<tr>
<td>C1, C10, C17, C18, C19</td>
<td>CRT-6472</td>
<td>Variable gang condenser</td>
</tr>
<tr>
<td>C19, C20, C21</td>
<td>CRT-16424</td>
<td>Electrolytic cond.</td>
</tr>
<tr>
<td>C15, C16, C22</td>
<td>CRT-2</td>
<td>Trimmer cond. ant.</td>
</tr>
<tr>
<td>C15, C16, C22</td>
<td>CRT-2</td>
<td>Trimmer cond. arc</td>
</tr>
<tr>
<td>R12, R15</td>
<td>RC-14</td>
<td>Carbon resistor 25K</td>
</tr>
<tr>
<td>R7</td>
<td>RC-15</td>
<td>Carbon resistor 2K 1W</td>
</tr>
<tr>
<td>R15</td>
<td>RC-15</td>
<td>Carbon resistor 15K 1W</td>
</tr>
<tr>
<td>C15, C16</td>
<td>RC-15</td>
<td>Mica resistor in AUS socket</td>
</tr>
</tbody>
</table>

This receiver operates on alternating currents of 125 volt, 50-60 cycle. It frequency range is 530 to 1750 KC. 115V 1/4W 7MEG to 23MEG. For Operations For Setting Up Of Buttons - See MODEL 639

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ALIGNMENT PROCEDURE MODEL 739

Correct alignment is extremely important. The receiver is properly aligned at the factory and should not be disturbed unless it is absolutely necessary. The procedure is as follows: Turn wave change switch to broadcast position (full counter clockwise) and rotate variable condenser until it is about 50% engaged. Apply a 455 KC signal to the grid of 6K8 mixer tube through a tubular condenser on the order of .1MFD. Referring to chassis layout, adjust C30, C29, C31, and C32 for maximum signal using of course, some sort of indicating device such as an AC volt meter or output meter across the voice coil of the speaker. It may be necessary to apply a very strong signal to "find" the signal until alignment is approached. It is advisable to maintain as low a signal input as conveniently possible in order to minimize the possibility of misalignment resulting from A.V.C. and overload effects. If a squeal is heard while tuning, rotate the gang condenser slightly and it should disappear. Naturally, the ground side of the generator should be connected to the chassis either directly or through the .1MFD condenser.

SHORT WAVE BAND

Rotate the wave band switch to full clockwise position. Connect high side of generator output to antenna lead through a 400 ohm dummy antenna. Completely disengage variable condensers. Apply 23 MEG. signal. UnscREW trimmer C26 to a minimum capacity, slowly turn the screw so that the trimmer capacity increases until the signal is heard. Apply 22 MEG. signal, rotate gang condenser until this signal is heard. Adjust C23 for maximum response. It may be found advisable to 'rock' generator frequency back and forth through signal to offset detuning effect from inter action input and oscillator circuits at high frequencies. Check alignment through medium of sensitivity at 11 meg. and 9 meg. respectively. When aligning at 22 meg., it is well to point out here that the trimmer C23 may indicate two maxima. The maxima obtained with the trimmer tighter is the desired one. This can be checked by leaving the gang condenser set and shifting the generator to a higher frequency viz; 23 megacycles, where the image should appear. If it is properly aligned, it should require about 10 times the signal voltage for the image to give the same output as the real signal.

POLICE BAND

Shift wave band switch to middle position. Apply 7.3 meg. signal. Disengage variable condenser completely. Adjust trimmer C27 to the same manner as previous band until maximum signal is heard. Apply 6 Meg. Signal, rotate gang condenser until same is heard. Adjust trimmer C24 for maximum response is maximum. Check for image in same manner as previous band. Check alignment at 4.5 and 3 megacycles respectively.

BROADCAST BAND

Use a 200 MIF mica condenser for dummy antenna on this band. Shift wave change switch to full counter clockwise position. Adjust trimmer C21 and C25 to medium tight position. Rotate gang until dial pointer indicates 600 KC. Apply 600 KC signal and adjust C28 for same. Apply 1500 KC signal and rotate gang until this frequency is found. Adjust trimmers C21 and C25 for maximum response. Shift gang to 600 KC and apply 600 KC signal. "Rock" gang condenser and adjust C4 for maximum signal. Disengage gang and apply 1750 KC signal, if necessary adjust C28 to bring same in.

PHONOGRAPH

To use the phonograph connection, insert the tips of a phonograph pick-up into the phonograph jacks in the back of the chassis. Throw the phono-radio switch to phone. This switch is located near the phone jacks. If the receiver hums, reverse the two phone tips. To use the radio, throw the switch to the radio position.

ALIGNMENT PROCEDURE MODEL 939

Correct alignment is extremely important. The receiver is properly aligned at the factory and should not be disturbed unless it is absolutely necessary. The procedure is as follows: Turn wave change switch to broadcast position (full counter clockwise) and rotate variable condenser until it is about 50% engaged. Apply a 455 KC signal to the grid of 6K8 mixer tube through a tubular condenser on the order of .1MFD. Referring to chassis layout, adjust trimmers "Trim 455 KC" for maximum signal using of course, some sort of indicating device such as an AC volt meter or output meter across the voice coil of the speaker. It may be necessary to apply a very strong signal to "find" the signal until alignment is approached. It is advisable to maintain as low a signal input as conveniently possible in order to minimize the possibility of misalignment resulting from A.V.C. and overload effects. If a squeal is heard while tuning, rotate the gang condenser slightly and it should disappear. Naturally, the ground side of the generator should be connected to the chassis either directly or through the .1MFD condenser.

SHORT WAVE BAND

Rotate the wave band switch to full clockwise position. Connect high side of generator output to antenna lead through a 400 ohm dummy antenna. Completely disengage variable condensers. Apply 23 MEG. signal. UnscREW trimmer C33 to a minimum capacity, slowly turn the screw so that the trimmer capacity increases until the signal is heard. Apply 22 MEG. signal, rotate gang condenser until this signal is heard. Adjust C23 for maximum response. It may be found advisable to 'rock' generator frequency back and forth through signal to offset detuning effect from inter action input and oscillator circuits at high frequencies. Check alignment through medium of sensitivity at 11 meg. and 9 meg. respectively. When aligning at 22 meg., it is well to point out here that the trimmer C33 may indicate two maxima. The maxima obtained with the trimmer tighter is the desired one. This can be checked by leaving the gang condenser set and shifting the generator to a higher frequency viz; 23 megacycles, where the image should appear. If it is properly aligned, it should require about 10 times the signal voltage for the image to give the same output as the real signal.

POLICE BAND

Shift wave band switch to middle position. Apply 7.3 M.C. signal. Set dial points to 7.3 M.C. Adjust trimmer C32 in the same manner as previous band until maximum signal is heard. Apply 6 Meg. Signal, and adjust trimmers C25 and C22 until response is maximum. Check for image in same manner as previous band. Check alignment at 4.5 and 3 megacycles respectively.

BROADCAST BAND

Use a 200 MIF mica condenser for dummy antenna on this band. Shift wave change switch to full counter clockwise position. Adjust trimmer C26 and C23 to medium tight position. Rotate gang until dial pointer indicates 600 KC. Apply 600 KC signal and adjust C28 for same. Apply 1500 KC signal and rotate gang until this frequency is found. Adjust trimmers C21 and C25 for maximum response. Shift gang to 600 KC and apply 600 KC signal. "Rock" gang condenser and adjust C4 for maximum signal. Disengage gang and adjust 1750 KC signal, if necessary adjust C28 to bring same in.

PHONOGRAPH

To use the phonograph connection, insert the tips of a phonograph pick-up into the phonograph jacks in the back of the chassis. Throw the phono-radio switch to phone. This switch is located near the phone jacks. If the receiver hums, reverse the two phone tips. To use the radio, throw the switch to the radio position.
SCHEMATIC DIAGRAM MODEL 939

**TUBES**
- **6K7** R. F. AMP.
- **6K8** I. F. AMP.
- **6J5G** OSC. MOD.
- **6Q7** PHASE INVERTER.
- **6J5** A. F. AMP., DIODE DET., and A. V. C.
- **2-6K6G** OUTPUT.
- **5Y3G** RECTIFIER.
- **6U5** ELECTRIC EYE.

**PARTS LIST — MODEL 939**

<table>
<thead>
<tr>
<th>Schematic Location</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R20</td>
<td>R-15508</td>
<td>150 ohms 10% W</td>
</tr>
<tr>
<td>R4</td>
<td>R-15594</td>
<td>250 ohms 10% W</td>
</tr>
<tr>
<td>R1</td>
<td>R-15542</td>
<td>1K ohms 20% W</td>
</tr>
<tr>
<td>R3</td>
<td>R-15664</td>
<td>1.5K ohms 20% W</td>
</tr>
<tr>
<td>R12</td>
<td>R-2</td>
<td>9K ohms 20% W</td>
</tr>
<tr>
<td>R18</td>
<td>R-70</td>
<td>7.5K ohms 20% W</td>
</tr>
<tr>
<td>R19</td>
<td>R-15562</td>
<td>30K ohms 20% W</td>
</tr>
<tr>
<td>R15</td>
<td>R-15531</td>
<td>10K ohms 20% W</td>
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<tr>
<td>R8</td>
<td>R-15501</td>
<td>25K ohms 20% W</td>
</tr>
<tr>
<td>R17, R21</td>
<td>R-15511</td>
<td>50K ohms 20% W</td>
</tr>
<tr>
<td>R9, R14</td>
<td>R-15515</td>
<td>100K ohms 20% W</td>
</tr>
<tr>
<td>R6, R11, R22</td>
<td>R-15512</td>
<td>250K ohms 20% W</td>
</tr>
<tr>
<td>R10</td>
<td>R-15549</td>
<td>1M ohms 20% W</td>
</tr>
<tr>
<td>R13</td>
<td>R-15520</td>
<td>10M ohms 20% W</td>
</tr>
<tr>
<td>R1</td>
<td>R-15517</td>
<td>10M ohms 20% W</td>
</tr>
<tr>
<td>R2</td>
<td>R-15581</td>
<td>450 ohms 10% W</td>
</tr>
<tr>
<td>C1</td>
<td>C-15759</td>
<td>.001 mfd. 600V</td>
</tr>
<tr>
<td>C2, C3, C13</td>
<td>C-15754</td>
<td>.01 mfd. 400V</td>
</tr>
<tr>
<td>C14, C9, C36</td>
<td>C-15761</td>
<td>1 mfd. 200V</td>
</tr>
<tr>
<td>C5, C10, C11</td>
<td>C-15757</td>
<td>.01 mfd. 600V</td>
</tr>
<tr>
<td>C12, C13, C11</td>
<td>C-15757</td>
<td>.01 mfd. 400V</td>
</tr>
<tr>
<td>C18, C19, C20</td>
<td>CM-15918</td>
<td>100 mfd.</td>
</tr>
<tr>
<td>C16</td>
<td>CM-15929</td>
<td>30 mfd.</td>
</tr>
<tr>
<td>C15</td>
<td>CM-18</td>
<td>5500 mfd.</td>
</tr>
</tbody>
</table>

This receiver operates on alternating currents of 105 to 125 volts, 50-60 cycle. Its frequency range is 535 to 1750 KC. 2.1 to 7.3 MEG. to 23 MEG. FOR Operations For Setting Up Of Buttons SEE MODEL 639.

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AUTOMATIC ELECTRIC TUNING—MODELS 11056, 11058, 11356, 11656

Push buttons are for use on broadcast reception. The broadcast dial scale reads, from left to right, 1750 to 550 kilocycles. The automatic buttons are similarly disposed in sequence from left to right so that any particular button may be set to a desired station within its range. Two buttons may even be set to the same station if desired. This permits setting to different programs which are very close together on the dial scale. Do not press two buttons in at one time. If this is done by mistake, move manual lever to manual tuning as shown by dial light. This releases both buttons.

Pre-setting For Desired Stations

Determine which broadcasting stations you favor for automatic tuning and set the buttons to the programs coming from the ones you regularly listen to. To do this, first turn set on and tune in one program manually, to desired volume. In tuning, observe “electric eye” which shows its narrowest shadow when receiver is correctly tuned. Program should be listened to several minutes after first turning set on in order that the tubes may warm up fully before the automatic buttons are pre-set. For the first push-button at left, begin with a desired station near left of scale, in range 1750 to 1400 kilocycles.

At the rear of cabinet there is a selector disc which has two rings, each carrying contactors corresponding to the push-buttons. Remove protective cover to expose this disc with its rings to view when pre-settings are made. The selector disc comprises two sectors separated by a visible and narrow insulated gap. When the lower gap registers with a particular contactor carried by either of the two rings the push-button connected to that contactor controls the given station setting. Use the contactor which is nearest to the insulated lower gap on disc. Loosen its support screw just enough so that this contactor can slide on its ring support and move the contactor so that its ball point rests on this gap. Then tighten support screw so that this adjustment will be fixed for repeated use. To test accuracy of pre-setting move the front lever to “electric” tuning position as shown by dial light indicator. Press in the first button at left, the one now pre-set. If correct, the selected program will be heard. If not, repeat pre-setting operation just discussed, moving the correct contactor to position at the lower disc gap. Once set, do not move this contactor.

For indexing other stations proceed similarly with the next push button and its corresponding control contactor, and so on, until all desired buttons are pre-set to the particular stations wanted. To change selection at some later time, repeat the procedure for a particular button, but leave the pre-set buttons held securely by support screws before replacing protective cover over rear disc. Exact pre-settings may be had by carefully moving the contactor connected to each push button and slightly shifting its position if required to register with lower disc gap for the desired station. Settings may be made as desired, and if you wish all or more programs in one range, ask for special instructions. It is recommended that the service man who installs your radio set up the stations you want on your push buttons. Mark each push button with proper call letter tab furnished as directed at top of tab sheet. Once pre-set, you may leave lever in electric tuning position for all broadcast tuning, either manually or automatically.

NOTE: For receivers equipped with automatic frequency control. Most exact pre-settings may be made when lever is in manual position without this control. Do not pre-set to a weak station very close on dial scale to a powerful station, as the control will pull in the strong station when too close. Use your manual control for weak distant stations commonly subject to fading in and fading out of volume, as well for short wave reception. Another convenient way to pre-set stations is to first tune manually to a sequence of desired programs and then (for each station) just move the nearest contactor over to fit on the control disc gap. The stations will repeat as pre-set, so place the proper index letters on each button position.

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SCHEMATIC WIRING DIAGRAM - CHASSIS 11356

IF PEAK 455 KC
FOR TUNER DATA, SEE INDEX

TUNING RANGE—MODEL 11356
The tuning range of this receiver is from 138 KC to 18.5 MC in four convenient bands divided as follows:

Weather-band—138-325 KC—United States weather broadcasts, airplane beacons, and European long wave broadcasts.
A-Band—538-1800 KC—Standard American broadcast and some of the low frequency police stations.
B-Band—1770 KC to 6.0 MC—All police stations, some amateur and practically all airplane communications.
C-Band—5.8 MC-18.5 MC—Foreign and Domestic short wave stations.
# REPLACEMENTS PARTS LIST - CHASSIS 11356

<table>
<thead>
<tr>
<th>Schematic Location</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6, C7, C10</td>
<td>Y-CV-7</td>
<td>Cond. J Gang Variable</td>
</tr>
<tr>
<td>C10, C9, C8, C9, C10</td>
<td>C-7</td>
<td>Cond. Tub. 01 MF 200 V (H.F.)</td>
</tr>
<tr>
<td>C15</td>
<td>C-1550</td>
<td>Cond. Tub. 01 MF 400 V (H.F.)</td>
</tr>
<tr>
<td>C16</td>
<td>C-1570</td>
<td>Cond. Tub. 25 MF 200 V</td>
</tr>
<tr>
<td>C26, C28, C40</td>
<td>C-1571</td>
<td>Cond. Tub. 004 MF 600 V</td>
</tr>
<tr>
<td>C15, C26</td>
<td>C-1572</td>
<td>Cond. Tub. 002 MF 600 V</td>
</tr>
<tr>
<td>C22, C28</td>
<td>C-1573</td>
<td>Cond. Tub. 003 MF 600 V</td>
</tr>
<tr>
<td>C20, C29</td>
<td>C-1574</td>
<td>Cond. Tub. 05 MF 600 V</td>
</tr>
<tr>
<td>C28, C30</td>
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<tr>
<td>C27, C29</td>
<td>C-1576</td>
<td>Cond. Tub. 15 MF 200 V</td>
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<td>C9, C15</td>
<td>C-1577</td>
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<td>C40</td>
<td>C-1579</td>
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<td>C-1582</td>
<td>Cond. Mica 1500 M.F. 5%</td>
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<tr>
<td>C28, C56</td>
<td>C-1583</td>
<td>Cond. Mica 2800 M.F. 5%</td>
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<td>C26, C58</td>
<td>C-1584</td>
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<td>C24, C60</td>
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<td>Cond. Ant. Trim 3-30 M.F.</td>
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<td>Cond. 2nd I.F. Trim</td>
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<td>R-1554</td>
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<td>R-1565</td>
<td>Resistor Carbon 1 Meg Ohms ( \pm 20% )</td>
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<td>R-1566</td>
<td>(Insulated type)</td>
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<tr>
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<td>R-1567</td>
<td>Resistor Carbon 75 K ( \pm 10% )</td>
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<td>R-1570</td>
<td>Resistor Carbon 8000 Ohms ( \pm 10% )</td>
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<td>R1</td>
<td>R-1582</td>
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<tr>
<td>R1</td>
<td>R-1583</td>
<td>Resistor Carbon 1 Meg ( \pm 20% )</td>
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- **Volume Control 1 Meg**
- **Ant. Bass Assembly**
- **R. F. Bank Assembly**
- **Osc. Bank Assembly**
- **1st I.F. Coil Assembly**
- **2nd I.F. Coil Assembly**
- **Band Switch**
- **Tone and High Fidelity Switch**
- **A.B.L.A.V.E. Switch**
- **Manual-Electric Switch**
- **Dynamic Speaker 12**
- **Speaker Voice Coil and Cone**
- **Speaker Transformer**
- **Power Transformer**
- **Diode Crystal (Ceroglass)**
- **A.C. Pilot Light Mazda No. 44 (4)**
- **A.C. Pilot Light Mazda No. 51 (2)**
- **Filter Choke (A.V.E.-A.B.C.)**
The tuning range of this receiver is from 138 KC to 18.5 MC in four convenient bands divided as follows:

- Weather-band—38-325 KC—United States weather broadcasts, airplane beacons, and European long wave broadcasts.
- A-Band—538-1800 KC—Standard American broadcast and some of the low frequency police stations.
- B-Band—1770 KC to 6.0 MC—All police stations, some amateur and practically all airplane communications.
- C-Band—58 MC-18.5 MC—Foreign and Domestic short wave stations.

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## REPLACEMENTS PARTS LIST - CHASSIS 11656

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<tr>
<th>Schematic Location</th>
<th>Part No.</th>
<th>Description</th>
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<td>R12, R17, R23, R35</td>
<td>Y-CV.7</td>
<td>Cond. 3 Gang Variable</td>
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<tr>
<td>R4, R5</td>
<td>C-15772</td>
<td>Cond. Tub. 0.2 MFD. 200 V.</td>
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<td>R7, R13, R6, R21</td>
<td>C-15758</td>
<td>Cond. Tub. 0.05 MFD. 200 V.</td>
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<td>R20, R33, R32</td>
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<th>Part No.</th>
<th>Description</th>
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**NOTE**

RF and mixer trimmers are located on top of condenser gang. For relative positions see top-view.
### 1938 Domestic - 8 Tube Battery Midwest Receiver Operating Voltages

<table>
<thead>
<tr>
<th>TUBE</th>
<th>PLATE</th>
<th>SCREEN</th>
<th>SUPPRESSOR</th>
<th>CATHODE</th>
<th>HEATER</th>
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<tr>
<td>6G6 Mixer-osc.</td>
<td>134</td>
<td>58</td>
<td>1.2</td>
<td>1.2</td>
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<td>637 I.F. Amp.</td>
<td>134</td>
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<td>1.2</td>
<td>1.2</td>
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<td>615 2nd Det.</td>
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<td>5.6</td>
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<td>665 Tuning Eye</td>
<td>134</td>
<td>58</td>
<td>1.2</td>
<td>1.2</td>
<td>5.6</td>
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<tr>
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<td>4 V. drop</td>
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* Plate #2

### 1938 Export - 8 Tube AC-DC Midwest Receiver Operating Voltages

<table>
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<th>TUBE</th>
<th>PLATE</th>
<th>SCREEN</th>
<th>SUPPRESSOR</th>
<th>CATHODE</th>
<th>HEATER</th>
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<td>2585 Output</td>
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* Plate #2

All voltages taken with 110 V. line voltage and 1000 ohm per volt meter.

### Instructions for Alignment of the Midwest 36 Model 5 Tube Automobile Receiver

1. Set signal generator to 455 k.c.s. and connect output grid of G77 tubes. Connect output meter from plate of 6V tube to ground. Ground stator of oscillator section (rear section) of variable condenser. Adjust both grid and plate trimmers of 1st I.F. transformer and 2nd I.F. trimmer, located near speaker, for maximum gain on output meter. This completes the I.F. Alignment of the receiver.

2. Connect signal generator to antenna post on set through a standard dummy antenna. Remove short circuit from condenser. Set generator and dial to 1500 k.c.s. and peak variable condenser trimmer for maximum output on meter. This completes the R.F. Alignment.

**NOTE:** To ensure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.
### 1938 Export - 6 Tube AC-DC Midwest Receiver

#### Operating Voltages

<table>
<thead>
<tr>
<th>Tube</th>
<th>Plate</th>
<th>Screen</th>
<th>Suppressor</th>
<th>Cathode</th>
<th>Heater</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A8 Mixer-Osc.</td>
<td>96</td>
<td>44</td>
<td>2</td>
<td>1.4</td>
<td>5.4</td>
</tr>
<tr>
<td>6K7 I.F. Amp.</td>
<td>90</td>
<td>97</td>
<td>1.4</td>
<td>1.4</td>
<td>5.4</td>
</tr>
<tr>
<td>6G7 Diode Aud.</td>
<td>24</td>
<td>90</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2526 Rectifier</td>
<td>90</td>
<td>94</td>
<td>16</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>L498 Ballast</td>
<td>42 V. drop</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: These voltages were taken with no signal input and with the volume control off.

All voltages taken with 110 V. line voltage and 1000 ohm per volt meter.

---

### 1938 Domestic - 10 Tube AC-DC Midwest Receiver

#### Operating Voltages

<table>
<thead>
<tr>
<th>Tube</th>
<th>Plate</th>
<th>Screen</th>
<th>Suppressor</th>
<th>Cathode</th>
<th>Heater</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A8 Mixer-Osc.</td>
<td>94</td>
<td>50</td>
<td>.2</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>6K7 I.F. Amp.</td>
<td>90</td>
<td>94</td>
<td>1</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>6G7 2nd Det.</td>
<td>30</td>
<td>94</td>
<td>6</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>6G5 Phase Inv.</td>
<td>42</td>
<td>22</td>
<td>16</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>2526 Output</td>
<td>94</td>
<td>94</td>
<td>16</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>2525 Rectifier</td>
<td>94</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K92B Ballast</td>
<td>94</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L498 Ballast</td>
<td>40 V. drop</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6G5 Tuning Eye</td>
<td>94</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: These voltages were taken with no signal input and with the volume control off.

All voltages taken with 110 V. line voltage and 1000 ohm per volt meter.

---

### 1938 Export - 7 Tube Battery Midwest Receiver

#### Operating Voltages

<table>
<thead>
<tr>
<th>Tube</th>
<th>Plate</th>
<th>Screen</th>
<th>Suppressor</th>
<th>Cathode</th>
<th>Heater</th>
</tr>
</thead>
<tbody>
<tr>
<td>608 Mixer-Osc.</td>
<td>134</td>
<td>66</td>
<td>.2</td>
<td>1.2</td>
<td>5.6</td>
</tr>
<tr>
<td>607 I.F. Amp.</td>
<td>134</td>
<td>58</td>
<td>1.2</td>
<td>1.2</td>
<td>5.6</td>
</tr>
<tr>
<td>6L5 1st Audio</td>
<td>134</td>
<td>58</td>
<td>5.4</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>6L5 2nd Det.</td>
<td>50</td>
<td>130</td>
<td>3</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>6L5 Phase Inv.</td>
<td>134</td>
<td>134</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6L6 Output</td>
<td>134</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6B6 Tuning Eye</td>
<td>136</td>
<td>136</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: These voltages were taken with no signal input and with the volume control off.

All voltages taken with 110 V. line voltage and 1000 ohm per volt meter.
INSTRUCTIONS FOR ALIGNING THE 1938 MIDWEST
7-8-9-10 DOMESTIC AC-DC SETS
6-7-8-9- EXPORT AC-DC SETS
7-8 BATTERY SETS

INTERMEDIATE FREQUENCY ALIGNMENT
The I.F.'s should be peaked at 456 kc. for maximum output. Connect signal generator grid of 684 tube leaving grid cap on tube. Use smallest possible input consistent with a readable output.

BAND ALIGNMENT
Inside band "A", covers from 550 to 1700 kc. This band should be padded at 600 kc. and trimmed at 1400 kc. Radio Frequency trimmer should be adjusted at 1400 kc. for maximum gain.

Middle band "L", covers from 1.7 to 5.5 megacycles. This band should be padded at 1.4 mc. and trimmed at 4.3 mc. The R.F. trimmer should be adjusted at 3.3 mc. for maximum gain.

Outside band "H", covers from 5.5 mc. to 18 mc. This band has a fixed peaked cond should be trimmed at 18 mc. Adjust R.F. trimmer at 18 mc. for maximum gain.

Note: When aligning bands a dummy antenna, consisting of a 200 ohm resistance and 10 mf condenser in parallel, should be connected in series with output of signal generator.

1938 DOMESTIC - 9 TUBE AC-DC MIDWEST RECEIVER

<table>
<thead>
<tr>
<th>TUBE</th>
<th>PLATE</th>
<th>SCREEN</th>
<th>SUPPRESS</th>
<th>CATHODE</th>
<th>HEATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A9 Mixer-Osc.</td>
<td>94</td>
<td>90</td>
<td>.2</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>6K7 R.F. Amp.</td>
<td>90</td>
<td>94</td>
<td>1</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>6Q7 2nd Det.</td>
<td>30</td>
<td></td>
<td>.6</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>6C5 Phase Inv.</td>
<td>42</td>
<td></td>
<td>2.2</td>
<td>1.5</td>
<td>5.6</td>
</tr>
<tr>
<td>2SB6 Outputs</td>
<td>90</td>
<td>94</td>
<td>16</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>25Z5 Rectifier</td>
<td>94</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K92B Ballast</td>
<td>85 V. drop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L498 Ballast</td>
<td>40 V. drop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Plate #2
Note: These voltages were taken with no signal input and with the volume control off.

ALL voltages taken with 110 V. line voltage and 1000 ohm per volt meter.

INSTRUCTIONS FOR ALIGNING THE 12AC - 9 MIDWEST RECEIVER

INTERMEDIATE FREQUENCY ALIGNMENT
Remove the oscillator tube. The I.F.'s should be peaked at 656 kc. for maximum gain. The third I.F. transformer must be re-aligned to obtain a.f.o. voltage. Turn tone control to right and insert 5 ma. meter in series with 637 control tube cathode and note reading. Turn tone control switch to left half and adjust diode trimmer of third I.F. so that this reading is again obtained.

BAND ALIGNMENT
The "B" band covers 125 kc. to 350 kc. This band should be padded at 135 kc. and trimmed at 340 kc. Adjust R.F. and mixer trimmers for maximum gain at 340 kc.

The "A" band covers 550 kc. to 1500 kc. This band should be padded at 840 kc. and trimmed at 1400 kc. Adjust R.F. and mixer trimmers for maximum gain at 1400 kc.

The "L" band covers from 1.6 mc. to 4.5 mc. This band should be padded at 1.8 mc. and trimmed at 4.4 mc. The R.F. trimmer should be adjusted at 4.0 mc. for maximum gain.

The "H" band covers from 6.0 mc. to 12 mc. This band has a fixed peaked cond should be trimmed at 11.5 mc. Adjust R.F. and mixer trimmers for maximum gain in at 11.5 mc.

The "N" band covers from 15 mc. to 30 mc. This band has a fixed peaked cond should be trimmed at 26 mc. Adjust R.F. trimmer at 26 mc. for maximum gain.

Note: When aligning bands a dummy antenna, consisting of a 200 ohm resistance and 10 mf condenser in parallel, should be connected in series with output of signal generator.

1938 EXPORT - 9 TUBE AC-DC MIDWEST RECEIVER

<table>
<thead>
<tr>
<th>TUBE</th>
<th>PLATE</th>
<th>SCREEN</th>
<th>SUPRESS</th>
<th>CATHODE</th>
<th>HEATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A9 Mixer-Osc.</td>
<td>94</td>
<td>90</td>
<td>.2</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>6K7 L.F. Amp.</td>
<td>90</td>
<td>100</td>
<td>1</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>6Q7 Diode Audio</td>
<td>30</td>
<td></td>
<td>.6</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>6C5 Phase Inver.</td>
<td>42</td>
<td></td>
<td>2.2</td>
<td>1.5</td>
<td>4.5</td>
</tr>
<tr>
<td>2SB6 Output</td>
<td>90</td>
<td>100</td>
<td>15</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>6G5 Tuning Eye</td>
<td>90</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25Z5 Rectifier</td>
<td>100</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K17 Ballast</td>
<td>40 V. drop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Plate #2
Note: These voltages were taken with no signal input and with the volume control off.

ALL voltages taken with 110 V. line voltage and 1000 ohm per volt meter.
NOTE

Do not adjust unless R.F. oscillator oscillates, then reduce capacity until oscillations stop.

R.F., oscillator and mixer trimmers are located on top of condenser gang. See top view for relative positions.
INSTRUCTIONS FOR ALIGNING THE 18-TUBE, 18-TUBE AND 20-TUBE 1938 MIDWEST RECEIVERS

INTERMEDIATE FREQUENCY ALIGNMENT

Remove the Oscillator tube. I.F. alignment should not be attempted without the use of an Oscilloscope. Align the third I.F. to obtain characteristic response curve across 2nd detector diode lead. Likewise, align 2nd I.F. to obtain response in 2nd I.F. stage. These are taken from an audio voltage. The Discriminator and 1st I.F. transformers are aligned with an A.F. C. voltage. Do not attempt to change A.F.C. alignment unless you are familiar with characteristic curves for correct alignment.

BAND ALIGNMENT

The "American Broadcast Band" covers 540 kc. to 1500 kc. This band should be tuned at 540 kc. and trimmed at 600 kc. R.F. and mixer trimmers should be adjusted for maximum gain at 600 kc.

The "National" band covers from 20 mc. to 10 mc. This band has a fixed trimmer and should be tuned at 50 mc. Adjust R.F. and Mixer trimmers for maximum gain at 50 mc.

The "Night Foreign" band covers 10.4 mc. to 5.2 mc. This band has a fixed trimmer and should be tuned at 50 mc. Adjust R.F. trimmer at 5.5 mc. for maximum gain at 5.5 mc.

The "Aviation" band covers from 5.4 mc. to 2.7 mc. This band should be tuned at 2.9 mc. and trimmed at 2.9 mc. Adjust the R.F. trimmer at 5.5 mc. for maximum gain.

The "Police" band covers from 3.0 mc. to 1.5 mc. This band should be tuned at 1.7 mc. and trimmed at 2.0 mc. Adjust the R.F. trimmer at 2.9 mc. for maximum gain.

The "Weather" band covers from 125 kc. to 350 kc. This band should be tuned at 125 kc. and trimmed at 240 kc. The R.F. trimmer should be adjusted at 340 kc. for maximum gain.

Note: When aligning bands a dummy antenna, consisting of a 2000 ohm resistance and 10 mfd condenser in parallel, should be connected in series with output of signal generator.

1938 - 20-TUBE AC MIDWEST RECEIVER

<table>
<thead>
<tr>
<th>TUBE</th>
<th>PLATE</th>
<th>SCREEN</th>
<th>SUPPRESSOR</th>
<th>CATHODE</th>
<th>HEATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>1.5</td>
<td>1.5</td>
<td>6.5</td>
</tr>
<tr>
<td>6L7</td>
<td>200</td>
<td>65</td>
<td>2</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>6C5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6J7</td>
<td>120</td>
<td>65</td>
<td>3</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>3</td>
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<td>2</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>6H6</td>
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<td></td>
<td></td>
<td></td>
<td>4.5v</td>
</tr>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>3</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>3</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>3</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>6H6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.5v</td>
</tr>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>2</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>6C5</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td>4.5v</td>
</tr>
<tr>
<td>6C7</td>
<td>200</td>
<td>65</td>
<td>3</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>6K7</td>
<td>200</td>
<td>65</td>
<td>3</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>6H6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.5v</td>
</tr>
</tbody>
</table>

Note: These voltages were taken with no signal input and with the volume control off.

All voltages taken with 110 V. line voltage and 1000 ohm per volt meter.
These voltages were taken with no signal input and with the volume control off.

Note:

Operating Voltages

<table>
<thead>
<tr>
<th>TUBE</th>
<th>PLATE</th>
<th>SCREEN</th>
<th>SUPPRESSOR</th>
<th>CATHODE</th>
<th>QUADRUPLEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>6L7</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
</tr>
<tr>
<td>6S7</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
</tr>
</tbody>
</table>

All voltages taken with 110 V line voltage and 1000 ohm per volt meter.

Note:

These voltages were taken with no signal input and with the volume control off.

Midwest AFC circuit 1637 AFC

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**INSTRUCTIONS FOR ALIGNING THE MIDWEST 18 - 37 RECEIVER**

A good signal generator with accurate frequency calibration and an output meter are required. An intermediate frequency of 455 K.C. is used.

1. Set the signal generator to 455 k.c. and connect it from the mixer grid to ground.
2. Remove the oscillator tube from the receiver.
3. Connect the output meter from the plate of the output tube to positive B+ or from the plates of one pair of tubes to the plates of the other pair of tubes.
4. Using a weak signal approximately 40 microvolts, align the I.F. transformers to maximum output.
5. Gradually decrease signal and realign I.F. amplifier.
6. Increase the input from the generator of approximately 100 microvolts. Align the A.V.C. transformer for maximum output.
7. Report using weak signal strengths for the I.F. and stronger signal strengths for the A.V.C. adjustment until an absolute peak is assured.

This completes the alignment of the I.F. amplifier in the 18 - 37 set.

Insert the oscillator tube. Connect the signal generator between antenna and ground. Connect mixer load to grid of mixer tube.

1. Set the wave change switch to the "E" band.
2. Set the signal generator to 335 k.c. and adjust the dial.
3. Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" band R.F. and the "E" band mixer trimmers for maximum gain.
4. Reset the signal generator to 135 k.c. and rotate the receiver dial to 150 k.c.
5. Adjust the "E" band band for maximum signal.

This completes the alignment of the "E" band.

1. Set the wave change switch to the "F" band.
2. Set the signal generator to 1490 k.c.
3. Adjust the "F" oscillator trimmer to maximum gain, then adjust the "F" band R.F. and the "F" band mixer trimmers for maximum gain.
4. Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.
5. Adjust the "F" band band for maximum signal.

6. Repeat the adjustment of trimmers and paddors until the adjustment of one does not affect the adjustment of the other.

This completes the alignment of the "E" band.

1. Set the wave change switch to the "M" band.
2. Set the signal generator to 765 m.c.
3. Adjust the "M" oscillator trimmer to maximum gain, then adjust the "M" band R.F. and the "M" band mixer trimmers for maximum gain.
4. Reset the signal generator to 375 m.c. and rotate the receiver dial to 375 m.c.
5. Adjust the "M" band band for maximum signal.

6. Repeat the adjustment of trimmers and paddors until the adjustment of one does not affect the adjustment of the other.

This completes the alignment of the "M" band.

1. Set the wave change switch to the "U" band.
2. Set the signal generator to 11.5 m.c.
3. Adjust the "U" oscillator trimmer to maximum gain, then adjust the "U" band R.F. and the "U" band mixer trimmers for maximum gain.
4. Tune receiver until signal is received.
5. Adjust the "U" band band for maximum gain.

This completes the alignment of the "U" band.
INSTRUCTIONS FOR ALIGNING THE MIDWEST 18-37 A.F.C. RECEIVER AND A.F.C. REGAL (1937)

A good signal generator with accurate frequency calibration, output meter, and a 0-10 DC milliammeter are required. An intermediate frequency of 456 kc is used.

1. Remove grid cap from mixer tube. Set the signal generator to 456 kc and connect it from the mixer grid to ground.
2. Remove the oscillator tube from the receiver.
3. Connect the output meter from the plate of the output tube to positive B, or from the plates of one pair of tubes to the plates of the other pair of tubes.
4. Turn off A.F.C. by pressing push button. If meter kicks up or down adjust plate trimmer for maximum deflection, either up or down, from the false zero. If no kick is noted turn diode trimmer slightly (about 1/8 turn) and proceed as above.
5. Adjust diode trimmer for false zero.
6. Adjust oscillator trimmer for maximum gain.
7. Set signal generator and dial to 135 kc.
8. Reset signal generator and dial to 1.8 mc.
9. Adjust "L" oscillator trimmer for peak and adjust R.F. and mixer trimmers for maximum gain.
10. Set signal generator and dial to 11.5 mc.
11. Adjust "H" oscillator trimmer for peak and adjust R.F. and mixer trimmers for maximum gain.
12. Set signal generator and dial to 26 mc.
13. Adjust "M" oscillator trimmer to fundamental and adjust R.F. and mixer trimmers for maximum gain.
14. Set signal generator and dial to 135 kc.
15. Set "F" pad for peak.
16. Repeat adjustment of oscillator trimmer and pad for peak.

This completes the alignment of the "L" band.

17. Set wave change switch to "U" band.
18. Set signal generator and dial to 1490 kc.
19. Adjust "A" oscillator trimmer for peak and adjust R.F. and mixer trimmers for maximum gain.
20. Set signal generator and dial to 550 kc.
22. Repeat adjustment of oscillator trimmer and pad for peak.

This completes alignment of the "U" band.

23. Set wave change switch to "H" band.
24. Connect signal generator and dial to 26 mc.
25. Adjust "M" oscillator trimmer and pad for peak.
26. Set signal generator and dial to 26 mc.
27. Adjust "B" oscillator trimmer and pad for peak.
28. Repeat adjustment of oscillator trimmer and pad for peak.

This completes alignment of the "H" band.

29. Connect signal generator and dial to 26 mc.
30. Adjust "B" oscillator trimmer and pad for peak.
31. Repeat adjustment of oscillator trimmer and pad for peak.
32. Connect signal generator and dial to 550 kc.
33. Adjust "A" pad for peak.
34. Repeat adjustment of oscillator trimmer and pad for peak.

This completes alignment of the receiver.

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~NOTE~

When using doublet antenna, remove link.

3 Prong socket for expand chassis.

Dust shield for ymaging cond.

~NOTE~

This chassis is shown equipped with the best tube combination available. All metal, metal-glass, or glass counter-part tubes may be used. For example, the output tubes shown are glass counter-part tubes numbered 6N6-G; metal glass tubes would be numbered 6N6-MG. For metal tubes would be numbered 6N6.

Use only 80 Type Rectifier tubes.

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VOLTAGES AT SOCKETS—LINE VOLTAGE 115 VOLTS

<table>
<thead>
<tr>
<th>Type of Tube</th>
<th>Position of Tube</th>
<th>Function</th>
<th>“A” Volts</th>
<th>“B” Volts</th>
<th>Control Grid “C” Volts</th>
<th>Screen Volts</th>
<th>Screen Current MA</th>
<th>Cathode Voltage</th>
<th>Plate Current MA</th>
<th>Grid Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>235</td>
<td>1</td>
<td>R.F.</td>
<td>2.3</td>
<td>185</td>
<td>4</td>
<td>45</td>
<td>4</td>
<td>2.0</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>235</td>
<td>2</td>
<td>1st Det.</td>
<td>2.3</td>
<td>185</td>
<td>4</td>
<td>47</td>
<td>4</td>
<td>2.4</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>235</td>
<td>4</td>
<td>Osc.</td>
<td>2.3</td>
<td>185</td>
<td>10-25 (1)</td>
<td>45</td>
<td>4</td>
<td>2.0</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>235</td>
<td>4</td>
<td>I.F.</td>
<td>2.3</td>
<td>185</td>
<td>4</td>
<td>45</td>
<td>4</td>
<td>2.0</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>227</td>
<td>5</td>
<td>2nd Det.</td>
<td>2.35</td>
<td>145</td>
<td>10</td>
<td>45</td>
<td>4</td>
<td>2.0</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>227</td>
<td>6</td>
<td>A.V.C.</td>
<td>2.25</td>
<td>70 (1)</td>
<td>45</td>
<td>90 (1)</td>
<td>390</td>
<td>5</td>
<td>42</td>
<td>32</td>
</tr>
<tr>
<td>247</td>
<td>7</td>
<td>Power</td>
<td>2.45</td>
<td>265</td>
<td></td>
<td>45</td>
<td>4</td>
<td>2.0</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>780</td>
<td>8</td>
<td>Rect.</td>
<td>5.0</td>
<td>0</td>
<td></td>
<td>45</td>
<td>4</td>
<td>2.0</td>
<td>4</td>
<td>1.4</td>
</tr>
</tbody>
</table>

(1) Measured across 500 M ohm osc. bias resistor. Bias voltage varies from 10—25 volts between 1500 and 550 K. C.
(2) Measured from B— to A.V.C. plate.
(3) Measured from B— to A.V.C. cathode.
(4) Measured from B— to X fil. across 550 ohm resistor.

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ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and with external oscillator set at 465 K.C. connected in series with a .1 mfd condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 168-67 and 168-68, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).

Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 505 output tube. Maximum deflection of the volt meter indicates resonance.

Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

1. Set external oscillator to 1720 K.C. and connect it in series with a 200 mfd. condenser to the antenna and ground posts.

(a) With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.

(b) Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.

(c) Re-set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 134-14 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.

(d) Check for sensitivity at 1400, 1000, 600 K.C. DO NOT BEND PLATES.
SERVII E NOTES: 

Voltages taken from different points of circuit to chassis are measured with voltmeter readings. All tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

ALIGNING I.F. TRANSFORMERS: (465 K.C.)

Part No. 108-90. Output I.F. Transformer 
Part No. 108-89. Input I.F. Transformer 

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view—Fig. 1, page 2).

1. With volume control full on (at the extreme right of its rotation), and with the variable condenser set to minimum capacity position, make the following adjustments:

(a) Connect external oscillator set at 465 kilocycles, in series with " Dummy 1," to the control grid cap of the type IA4 tube, and adjust the output I.F. transformer No. 108-90 to resonance.

(b) Move oscillator output clip from grid of IA4 to grid cap of IA6 and adjust input I.F. transformer (No. 108-89) to resonance.

(c) With oscillator still connected to IA4, readjust output I.F. transformer (108-90) if necessary.

R. F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with " Dummy 2," to tan antenna and black ground leads and make the following adjustments:

(a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear section of gang condenser).

(b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).

(c) Check sensitivity at 600 and 1000 kilocycles.
MODELS 62-261, 62-311, 62-411

Tuning Frequency Range

- **B Range**... 528 to 1730 KC.
- **C Range**... 1715 to 5800 KC.
- **D Range**... 5750 to 18300 KC.

**Tube Element Legend**

- **SH. SHELL**
- **H. HEATER**
- **K. CATHODE**
- **P. PLATE**
- **G. SUPPRESSOR GRID**
- **G1. CONTROL GRID**

Note: Resistances below .1 ohm are not shown.

August 1936

**Fig. 2—Schematic Circuit Diagram**

- Sensitivity
  - **B Range**... 1.0 Microvolts Absolute
  - **C Range**... 1.0 to 2 Microvolts Absolute
  - **D Range**... 1.0 to 3 Microvolts Absolute
### Table: Voltage Between Socket Prongs and Ground

<table>
<thead>
<tr>
<th>TUBE</th>
<th>FUNCTION</th>
<th>VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6K7</td>
<td>R.F.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 250, Prong No. 4: 100, Prong No. 5: 2.5, Prong No. 6: 6.1(1), Prong No. 7: 2.5</td>
</tr>
<tr>
<td>6K7</td>
<td>1st Det.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 250, Prong No. 4: 120, Prong No. 5: 0, Prong No. 6: 6.1(1), Prong No. 7: 9</td>
</tr>
<tr>
<td>6C5</td>
<td>Osc.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 120, Prong No. 4: 0, Prong No. 5: 0, Prong No. 6: 6.1(1), Prong No. 7: 0</td>
</tr>
<tr>
<td>6K7</td>
<td>1st I.F.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 250, Prong No. 4: 100, Prong No. 5: 2.5, Prong No. 6: 6.1(1), Prong No. 7: 2.5</td>
</tr>
<tr>
<td>6K7</td>
<td>2nd I.F.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 250, Prong No. 4: 100, Prong No. 5: 3, Prong No. 6: 6.1(1), Prong No. 7: 3</td>
</tr>
<tr>
<td>6C5</td>
<td>2nd Det.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 0, Prong No. 4: 0, Prong No. 5: 0, Prong No. 6: 6.1(1), Prong No. 7: 0</td>
</tr>
<tr>
<td>6C5</td>
<td>1st A.F.</td>
<td>Prong No. 1: 0, Prong No. 2: 6.1(1), Prong No. 3: 110, Prong No. 4: 0, Prong No. 5: 4.5, Prong No. 6: 6.1(1), Prong No. 7: 0</td>
</tr>
<tr>
<td>5Z4MG</td>
<td>Rect.</td>
<td>Prong No. 1: 0, Prong No. 2: 4.8(3), Prong No. 3: 640(4), Prong No. 4: 640(4), Prong No. 5: 4.8(1)</td>
</tr>
</tbody>
</table>

### Notes:

1. A.C. voltage as read across heater terminals 2 and 7.
2. A.C. voltage as read across terminals 4 and 6.
3. A.C. voltage as read across resistor R24.
4. As read with 500,000 ohm meter.
5. A.C. voltage as read across heater terminals 2 and 8.
Notes, Parts

Referring to the 1st and 2nd I.F. transformers T3 and T4 in Fig. 2, it will be noted that there are coupling windings shown below the primaries in the illustration.

When the selectivity control is in the sharp position, the coupling windings are open circuited and the loose coupling which exists between the primary and secondary of these transformers results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

Across the volume control resistor R12 is a filter composed of condensers C33 and C34 and resistor R13. A tap connection near the low potential end of the volume control is connected between the two condensers. At high volume settings, the filter is not effective. At low volume settings, as the movable arm of the control is moved, the higher frequencies are by-passed through condenser C34. Very high frequencies are transmitted through condenser C33 to compensate for the reduction of these frequencies. At low volume settings the low frequency amplitudes are increased as a result.

Transformer coupling is used between the first audio stage and the output stage which employs two type 6F6 output pentode tubes in a stage of push-pull amplification. A type YZAMG (metal glass tube) full wave rectifier is used in the power unit.

The 6G5 tuning indicator tube is wired as shown in the schematic. This tube contains a triode and cathode ray section in one envelope.

The cathode ray is produced by the attraction of electrons from the upper end of the cathode to the coated target or anode, which is operated at a high positive potential. When this electron stream strikes the target the coating glows. The electron stream is controlled by an additional element, or control electrode, in the tube.

As a signal is tuned in, the control grid of the triode section of the 6G5 cathode ray tube becomes increasingly negative, the negative bias voltage being taken from the AVC line. The AVC voltage is reduced to a suitable value by the potentiometer arrangement of the 1 and 2 megohm resistors. The increased bias voltage reduces the triode plate current. This reduces the voltage drop across the 1 megohm plate resistor and raises the triode plate voltage. The triode plate is connected to the control electrode of the cathode ray section of the tube.

The shape and size of the area on the target struck by the cathode ray is governed by the voltage of the control electrode. When the signal is tuned to resonance, practically no plate current flows and the voltage of the control electrode is the same as that of the target. There is no opposition to the flow of electrons to the target. Tuning off resonance decreases the control electrode voltage and causes the darkened sector of the target to widen, because of the opposition to the flow of electrons in the direction of the control electrode.

NOTICE—There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts, please be sure to mention the series number and this large letter.

Prices subject to change without notice

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Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS: ISSUES "A" AND "B"

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 voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

RESONANCE INDICATOR:
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6K6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):
Part No. 108-83D Output I.F. Transformer
Part No. 108-82D Input I.F. Transformer
These I.F. transformers have two adjustments, both of which are accessible from the top of the chassis (see Fig. 1). 1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
(a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-83D) to resonance.
(b) Move oscillator output clip from grid of 6K7 to grid of 6A8G and adjust input I.F. transformer (No. 108-82D) to resonance.
(c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83D) if necessary.

R.F. ALIGNMENT: (555-1720 K.C.)
1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
(a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
(b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
(c) Check sensitivity at 600 and 1000 kilocycles.
PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are four levers on the dial by means of which four stations may be selected. (See "B", Fig. 2).

Press down any one of the levers. Holding it down, tune in by means of tuning knob No. 2 any one of your favorite stations. Turn the tuning knob very slowly back and forth until signal is clearest. The station will then be accurately tuned. Adjust the volume by means of the volume control knob to the desired intensity.

Release this lever and press down any other lever. Hold this lever down and tune in by means of knob No. 2 another favorite station.

Follow this procedure until stations have been set on all the levers. Hold tuning knob securely with left hand to prevent it from turning and with a coin or screw driver, tighten the special locking screw ("C") in the center of the tuning knob.

This screw will lock in place all the stations you have selected on the levers. (Note: Locking Screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob securely and loosen locking screw ("C") one or two turns; select the new station as explained.

BE SURE TO RETIGHTEN THE LOCKING SCREW, otherwise the stations will not stay adjusted to the levers.

Above each lever an opening in the cabinet is provided for inserting station call letters, (See "A", Fig. 2).

Punch the correct station call letter tabs from the set of sheets supplied and insert them into the rectangular openings in the cabinet above each of the levers. One of the small, clear celluloid tabs supplied should be snapped in place over each of the station call letter tabs.

The Automatic Tuner dial is now set for quick tuning. Press down on the lever and your favorite station is selected.

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are six levers on the dial by means of which six stations may be selected. (See "B", Fig. 2).

Press down any one of the six Automatic levers. Holding it down, tune in by means of tuning knob No. 4 any one of your favorite stations. Turn the tuning knob very slowly back and forth noting the width of the shadow indicated on the screen of the cathode-ray tuning eye. Minimum width indicates the ideal tuning position (resonance). The station will then be accurately tuned.

Release this lever and press down any other lever. Hold this lever down and tune in by means of knob No. 4 another favorite station.

Follow this procedure until stations have been set on all the levers. Hold tuning knob securely with left hand to prevent it from turning and with a coin or screw driver, tighten the special locking screw ("C") in the center of the tuning knob. (See Fig. 1).

This screw will lock in place all the stations you have selected on the Automatic levers. (Note: Locking Screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob securely and loosen locking screw ("C") one or two turns; select the new station as explained.

BE SURE TO RETIGHTEN THE LOCKING SCREW, otherwise the stations will not stay adjusted to the levers.

Above each Automatic lever an opening in the cabinet is provided for inserting station call letters. (See "A", Fig. 2).

Punch the correct station call letter tabs from the set of sheets supplied and insert them into the rectangular openings in the cabinet above each of the levers. One of the small, clear celluloid tabs supplied should be snapped in place over each of the station call letter tabs.

The Automatic Tuner dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

TO TURN THE RADIO OFF:

Turn the on-off switch and volume control knob No. 3 to the left until a click is heard. The receiver will then be turned off.
SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages are to be measured with 6.3 volts input to receiver.

 Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating which is known to be good, until the defective unit is located.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-83D Output I.F. Transformer
Part No. 108-82C Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 657G tube, and adjust the output I.F. transformer (No. 108-83D) to resonance.

   (b) Move oscillator output clip from grid of 657G to grid of 6DG8 and adjust input I.F. transformer (No. 108-82C) to resonance.

   (c) With oscillator still connected to 6DG8, readjust output I.F. transformer (108-83D) if necessary

R.F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:

   (a) with external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).

   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).

   (c) Check sensitivity at 600 and 1000 kilocycles
Montgomery-Ward & Co.

Model 62-276

Schematic, Voltage
Socket, Trimmers
Parts

Code Part No. | Description
--- | ---
R1 | 120-83 300 ohm - 1/3 w. 10%
R2 | 120-12 50M - 1/3 w. 20%
R3 | 130-17 10M ohm - 1/3 w. 20%
R4 | 130-93 450 ohm - 1/3 w. 10%
R5 | 130-149 15M ohm - 1/3 w. 20%
R6 | 130-156 250M ohm - 1/10 w. 20%
R7 | 130-4 3 megohm - 1/3 w. 20%
R8 | 101-71 1 meg volume control
R9 | 130-176 20M ohm - 1/3 w. 10%
R10 | 130-80 150M ohm - 1/3 w. 10%
R11 | 130-46 800M ohm - 1/3 w. 10%
R12 | 130-4 3 megohm - 1/3 w. 20%
R13 | 130-9 200M ohm - 1/3 w. 20%
R14 | 130-3 500M ohm - 1/3 w. 20%

Resistors

C | 102-43 2 Gang Variable
C1 | 129-5 .0005 Mica 20%
C3 | 100-22 .05 x 300 v. 25%
C4 | 100-30 .1 x 200 v. 25%

In order to prevent signal from acting upon AVC and affecting accuracy of voltage measurements, aerial and ground leads should be short-circuited while making measurements.

To check for open by-pass condenser, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

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BROAD BAND ALIGNMENT: 55 to 225 Kilocycles

1. With band changing switch in the broadcast position, extreme right of its rotation, and with external oscillator connected as "Dummy 1", in its minimum capacity position, plate entirely out of circuit, and with variable condenser in series with "Dummy 2" to antenna and ground posts, make the following adjustments:
   (a) Set external oscillator to 1700 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 1; see bottom view of coil assembly, Fig. 1.)
   (b) Set external oscillator to 3500 K.C., rotate variable condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) to resonance, then readjust oscillator trimmer. (See top view of chassis, Fig. 1, for location of the adjustment.)
   (c) Test for oscillator output to 600 K.C, and adjust broadcast bandspread as previously described by rotating condenser. Readjust trimmer to 1700 K.C. until output as obtained. This adjustment is based on the bottom of the chassis directly under the variable condenser (see bottom view of chassis, Fig. 3.)
   (d) Reset adjustment "a" and "b" until sensitivity is at its maximum.
   (e) Check for tuning and sensitivity at 100 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tuning.

SHORT WAVE BAND ALIGNMENT: 5.5 to 183 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator connected as "Dummy 1", in its minimum capacity position, plate entirely out of circuit, and with variable condenser in series with "Dummy 2" to antenna and ground posts, make the following adjustments:
   (a) Set external oscillator to 17 megacycles and adjust short wave oscillator trimmer (adjustment number 9) and short wave variable condenser (adjustment number 6) to resonance. (See bottom view of chassis, Fig. 1.)
   (b) Test external oscillator to 6 megacycles, and pick up signal by rotating variable condenser and check sensitivity.
   (c) Test external oscillator, pick up signal at 18 megacycles, and check sensitivity.

NOTE: It is extremely necessary in making these adjustments that the fundamental oscillator signal be tuned in and out of the image frequency which will be equal to the difference between the second and the third harmonics of the fundamental (88 megacycles signal). It is therefore necessary to select a second harmonic of the fundamental signal which is sufficiently close to the second harmonic of the fundamental signal. (See bottom view of chassis, Fig. 1.)

2. Check adjustment "a", "b", and "c" until sensitivity is at its maximum.

SHORT WAVE BAND ALIGNMENT: 15 to 181 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 2" to antenna and ground posts, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer to resonance. (Adjustment number 17, Fig. 1.)
   (b) Adjust short wave antenna trimmer (Adjustment number 17, Fig. 1.)

MODEL 62-276

1. Connect external oscillator set at 450 kilocycles, in series with "Dummy 1", to control grid cap of the type 807 tube, and adjust the output I.F. transformer (No. 106-010B) to resonance.

2. With "Dummy 1" still connected, move oscillator output cap from grid of 602G to grid cap of 6AKG and adjust input I.F. transformer (No. 106-010B) to resonance.

3. With "Dummy 1" still connected, move oscillator output cap from grid of 602G to grid cap of 6AKG and adjust input I.F. transformer (No. 106-010B) to resonance.
Power Consumption - 67 Watts (At 117 volts 60 cycles)

Power Output - 2.5 Watts Undistorted
2.5 Watts Distorted
4.5 Watts Maximum

Selectivity - 28 KC Broad at 1000 times Signal (Sharp)

Intermediate Frequency - 456 KC.

Speaker - 6" Dynamic - Mantel Models

Sensitivity
B Range - 7 Microvolts Average
D Range - 9 Microvolts Average

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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.

NOTE A—Six sets using the finger tip tuning dial, remove the retaining ring which holds the dial scale in position. Readjust rotor to maximum output. Hold the station selector ring and turn the dial scale until the pointer is at the 1500 KC mark. Replace the retaining ring.

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

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

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**Twelve-Five Cycle Models**

The twelve-five cycle receiver differs from the more conventional type in that it is a different type of preamplifier. The twelve-five cycle receiver can be operated by the source from a twelve-cycle power supply. Lineman's number two, a twelve-cycle power supply, can be operated from the twelve-cycle power of a low frequency. The twelve-five cycle receiver is very sensitive and can be operated from a twelve-cycle power supply.
Description

The control consists of three main units, namely, the Remote Push-Button Assembly, the Magnet Assembly and the Relay Assembly.

Fig. 1 shows the three units with their proper names indicated. Attention is directed to various parts of each unit in which names have been assigned for the purpose of making reference in the installation procedure which is given step by step for each radio on the following pages.

To attach the units to any of the radio models listed above, proceed in accordance with the instructions given for each model. Read over very carefully the procedure and study the illustrations to become familiar with the few important items of installation, such as the armature arms, plugs, latch bar, locating pins and locating holes.

Any stations which have been set up on the automatic push-button of the radio may be set up at the remote position. Station call letters are supplied for the Remote Push-Button Assembly. Punch out from the sheets of call letter tabs the call letters of the stations which have been set up for the automatic push-buttons on the front of the radio.

Pressing the button on the Remote Push-Button Assembly nearest the end from which the connecting cable comes out will select the extreme right hand automatic push-button on the front of the radio cabinet. The second button from the left end of the Remote Push-Button Assembly will select the second automatic push-button from the right hand side of the radio and so on.

Moisten the back of the station call letter tabs and paste them into the rectangular openings in the Remote Push-Button Assembly alongside their respective buttons.

Location

The location of each unit is plainly shown in the illustrations of the radio models on the following pages of this instruction booklet.

In general, the Magnet Assembly is mounted on the top of the radio chassis over a rectangular hole which is covered with a removable cover plate. The purpose of this unit is to electrically operate the automatic push-buttons on the front of the radio, from a remote location. The Relay Assembly is mounted on the means of two wood screws to the underside of the chassis cabinet shell. (Staple models mount the relay beside the radio chassis). The purpose of this unit is to control the Magnet Assembly.

Caution

Withdraw the A.C. line cord plug for the radio from the house lighting current and do not re-insert it until the A.C. line cord plug for the Remote Control Assembly has been connected, and all of the steps incidental to the actual installation of the Remote Control units to the radio have been completed.

Installation and Operating Suggestions

In this Installation Procedure, you will note certain tubes have been removed. This was done to render the top of the cabinet plainly visible for the actual installation of the Magnet Assembly. Note: If difficulty is encountered installing the Magnet Assembly on the top of the chassis while mounted in the cabinet, remove the radio chassis from the cabinet. Be sure to replace the tubes in their proper sockets and connect the ground wire to the cap of any tubes of this type which were removed.

After the Remote Control units are completely installed and the radio placed in operation, stations may be selected automatically by pressing any one of the buttons of the Remote Control Assembly. The installation of several, of course, must first be set up by adjusting the setting screws on the front of the radio or by turning the knobs in a circular manner, as indicated in the illustrations. See the instructions on the procedure in the Operating Instruction Booklet and supply the radio.

To select a station from the Remote Control Push-Button Assembly, press down on the button. Do not hold the button down at any time. Continual abuse of pushing down more than one button for a longer period of time may result in tube burnout or damage to the coils in the Magnet Assembly.
INSTALLATION PROCEDURE

1. Disconnect the power supply cord for the radio from the house lighting current and do not re-insert the plug until the following procedure for installing the remote control units has been fully completed.

2. Referring to Fig. 5, note that the following two tubes have been removed:
   SF3 Rectifier Tube
   615G Second Detector Tube

3. Remove the cover plate on the top of the chassis by taking out four screws. Fig. 5 is a view of the chassis showing the cover plate removed.

4. Before placing the Magnet Assembly in position, put the four screws which were used to hold the cover plate to the chassis into the mounting holes of the frame of the Magnet Assembly. Four very thin fibre washers are supplied which are used to hold the mounting screws in the mounting holes until the Magnet Assembly is lowered into position. For details on how to use these fibre washers to the best advantage, see drawing Fig. D, Page 8.

5. Pick up the Magnet Assembly (see Fig. 1)—note that there are six armature arms, each of which is slotted.

6. Referring to Fig. 5, place the Magnet Assembly in position as shown, so that the slots in the armatures are directly over the plungers. Now, carefully lower the Magnet Assembly so that the plungers enter the slots in the armatures. A screwdriver will be helpful in lining up any armature which may not be directly over the plungers.

7. The armatures must slip over the plungers in front of the shoulder of the plunger (see Fig. 5); also, refer to drawing (Fig. C, Page 8) which illustrates this point more clearly.

8. Reset the Magnet Assembly on the chassis base and move it slightly toward the back of the radio until the locating pins (see Fig. 1) on each side of the Magnet Assembly frame slip into the locating holes at both sides of the opening in the chassis base (see Fig. 5).

9. Hold the Magnet Assembly in place and fasten it securely to the chassis by means of the four screws.

10. Referring to Fig. 6, mount the relay to the underside of the chassis shelf using the two wood screws and two spacer washers supplied. On mantle radios, mount the relay beside the radio chassis. Place the spacer washers between the base of the Relay Assembly and the cabinet shell; pass the wood screws through the holes in the spacer washers.

11. Arrange the wire connector cables to the Magnet Assembly and Relay Assembly as shown in Fig. 6 and put the two tubes which were removed back into their respective sockets.

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INSTALLATION PROCEDURE

MODELS 62-401 and 62-1100—11 TUBE CONSOLE

1. Disconnect the power supply cord for the radio from the house lighting current and do not re-insert the plug until the following procedure for installing the remote control units has been completed.

2. Referring to Fig. 7 note that the 6UG7 I.F. tube has been removed.

3. Remove the cover plate on the top of the chassis by taking out four screws. Fig. 7 shows the cover plate removed and the Magnet Assembly in position to be lowered into place.

4. Pick up the Magnet Assembly (see Fig. 12) - note that there are six armature rods, each of which is slotted.

5. Before placing the Magnet Assembly in position, put the four screws which were used to hold the cover plate to the chassis into the mounting holes of the frame of the Magnet Assembly. Four very thin fibre washers are supplied which are used to hold the mounting screws in the mounting holes until the Magnet Assembly is lowered into position. For details on how to use these fibre washers to the best advantage see drawing Figs. D, Page 8.

6. Referring to Fig. 7, place the Magnet Assembly in position as shown so that the slots in the armatures are directly over the plungers. Now, carefully lower the Magnet Assembly so that the plungers enter the slots in the armatures. A screwdriver will be helpful in lining up any armature which may not be directly over the plungers.

7. The armatures must slip over the plungers between the latch bar and the shoulder of the plunger (see Fig. 7); also, refer to drawing (Fig. B, Page 8) which illustrates this point more clearly.

8. Rest the Magnet Assembly on the chassis base and move it slightly toward the back of the radio until the locating pins (see Fig. 1) on each side of the Magnet Assembly frame slip into the locating holes at both sides of the opening in the chassis base (see Fig. 7). Place the spacer washers between the base of the Relay Assembly and the cabinet shell, passing the screws through the holes in the spacer washers. Arrange the wire connector cables to the Magnet Assembly and Relay Assembly as shown in Fig. 8 and put the 6UG7 tube back in the socket.

INSTALLATION PROCEDURE

MODELS 62-403—13 TUBE CONSOLE

1. Disconnect the power supply cord for the radio from the house lighting current and do not re-insert the plug until the following procedure for installing the remote control units has been completed.

2. Referring to Fig. 9, note that the following two tubes have been removed:

   6UG7 1st I.F. Tube
   6UG7 2nd I.F. Tube

3. Remove the cover plate on the top of the chassis by taking out four screws. Before placing the Magnet Assembly in position, put the four screws which were used to hold the cover plate to the chassis into the mounting holes of the frame of the Magnet Assembly. Four very thin fibre washers are supplied which are used to hold the mounting screws in the mounting holes until the Magnet Assembly is lowered into position. For details on how to use these fibre washers to the best advantage, see drawing Figs. D, Page 8.

   Fig. 9 shows the cover plate removed and the Magnet Assembly placed to the left of the opening in the chassis, tipped slightly forward to illustrate the method of getting it into proper position under the bracket which supports the movie dial lamp assembly. Precaution should be taken when placing the Magnet Assembly in place—not to scratch the dial film of the movie dial.

4. Pick up the Magnet Assembly and move it to the right so that it is directly over the opening in the chassis. Fig. 10 shows the Magnet Assembly in proper position for lowering. Note that there are six armature rods, each of which is slotted.

5. Hold the Magnet Assembly so that the slots in the armatures are directly over the plungers. Now, carefully lower the Magnet Assembly so that the plungers enter the slots in the armatures. A screwdriver will be helpful in lining up any armature which may not be directly over the plungers.

6. The armatures must slip over the plungers between the latch bar and the shoulder of the plunger (see Fig. 10); also, refer to drawing (Fig. B, Page 8) which illustrates this point more clearly.

7. Rest the Magnet Assembly on the chassis base and move it slightly toward the back of the radio until the locating pins (see Fig. 1) on each side of the Magnet Assembly frame slip into the locating holes at both sides of the opening in the chassis base (see Fig. 10). Place the spacer washers between the base of the Relay Assembly and the cabinet shell, passing the screws through the holes in the spacer washers. Arrange the wire connector cables to the Magnet Assembly and Relay Assembly as shown in Fig. 11 and put the two tubes which were removed back into their respective sockets.
MODELS 62-301, 62-301X

J. WARD

Schematic, Socket, Trimmers

Band Change Switch: Three 550 Short Wave, 550, 1000 kc.

Indicated Voltages are Measured To Ground With Antenna Grounded.

1st Broadcast: 535-1720 K.C.
2nd Middle Wave: 1690-5300 K.C.
3rd Short Wave: 5.2-18.1 M.C.

ANTENNA TAN

GROUND BLACK

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www.americanradiohistory.com
ALIGNING I.F. TRANSFORMERS: (465 K.C.)
Part No. 398-42 Output I.F. Transformer
Part No. 398-44 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see below).

1. With volume control full on, (extreme right of its rotation), the wave adjusting switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the static position (as much right rotation as possible without operating the Hi. Filter switch), and with the variable condenser set in approximately 1400 kilocycles, make the following adjustments:

(a) Connect external oscillator set at 450 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 106-78 to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 631 and adjust input I.F. transformer (106-64) to resonance.

(c) With oscillator still connected to 631, re-adjust output I.F. transformer if necessary.

SHORT WAVE BAND ALIGNMENT:

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 5 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:

(a) Move dial pointer to 5 megacycles and adjust short wave oscillator (adjustment number 2), short wave R.F. (adjustment number 6) and short wave antenna (adjustment number 26) to resonance.

(b) Set external oscillator to 5 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.5 megacycles can be found in not only at 18.5 on the dial, but also at approximately 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 660 kilocycles and connected in series with "Dummy 2" to the antenna and black ground lead, make the following adjustments:

(a) Rotate condenser, pick up signal and adjust middle wave R.F. (adjustment number 10), middle wave antenna (adjustment number 7) and middle wave oscillator (adjustment number 2) to resonance.

(b) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, re-set the 17 K.C. short wave and 5 K.C. middle wave adjustments.

ALIGNING I.F. TRANSFORMERS: (465 K.C.)
Part No. 396-728 Input I.F. Transformer
Part No. 396-729 Intermediate I.F. Transformer
Part No. 396-724 Output I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see below).

(a) Connect external oscillator set at 1800 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6DG1 intermediate I.F. tube, and adjust the output I.F. transformer (No. 106-78) to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6DG1 to grid cap to 6DG1 Input I.F. tube and adjust intermediate I.F. transformer (No. 106-78) to resonance.

(c) Move oscillator to grid cap of 11DG1 oscillator, first detector tube and adjust input I.F. transformer (No. 106-78) to resonance.

SHORT WAVE BAND ALIGNMENT:

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 5 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:

(a) Move dial pointer to 5 megacycles and adjust short wave oscillator trimmer to resonance.

This adjustment is the trimmer mounted on the top of your section of the variable gang condenser (see Fig. 1, top view).

(b) Adjust short wave antenna trimmer (Adjustment Number 27) to resonance (see Fig. 2, bottom view).

BROADCAST BAND ALIGNMENT:

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, placed entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:

(a) Set external oscillator to 1270 K.C and adjust broadcast oscillator trimmer to resonance (Adjustment Number 33), (bottom view of chassis, Fig. 3).

(b) Reset external oscillator to 1400 K.C. and re-adjust variable gang condenser and pick up signal, adjust broadcast antenna trimmer (adjustment number 2), to resonance.

(c) Set reset external oscillator to 600 K.C, and adjust broadcast series pad (adjustment number 4), to resonance by rotating condenser to approximately 600 K.C, rocking it slowly to and the tuned by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

(e) Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.
JULY, 1937

-Electrolytic Condenser
Internal Connections

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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—1/2 mil, 200 mil. and 400 ohms.

### ALIGNMENT PROCEDURE

<table>
<thead>
<tr>
<th>STEP</th>
<th>HAND SWITCH SETTING</th>
<th>DUMMY ANTENNA</th>
<th>SIGNAL GENERATOR CONNECTION AT RADIO</th>
<th>TRIMMERS ADJUSTED</th>
<th>INITIAL STEPS</th>
<th>ADJUSTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Range D 1 mil.</td>
<td>450 KHz</td>
<td>Grid of 1st Det.</td>
<td>1st F. (C4) &amp; (C5) 2nd F. (C1) &amp; (C7)</td>
<td>Turn Rotor to Full Open</td>
<td>Adjust to Maximum Output</td>
</tr>
<tr>
<td>II.</td>
<td>Range 8 200 mfd.</td>
<td>1730 KHz</td>
<td>Antenna Lead</td>
<td>Oscillator Range E (C6)</td>
<td>Turn Rotor to Full Open</td>
<td>Adjust to Maximum Output</td>
</tr>
<tr>
<td>III.</td>
<td>Range B 200 mfd.</td>
<td>1500 KHz</td>
<td>Antenna Lead</td>
<td>1st Ant. Range B (C4) 2nd Ant. Range B (C12)</td>
<td>Turn Rotor to Max. Output</td>
<td>Set Indicator to 1500 KC—See Note A</td>
</tr>
<tr>
<td>IV.</td>
<td>600 KHz</td>
<td>600 KHz</td>
<td>Antenna Lead</td>
<td>600 KC (C6)</td>
<td>Turn Rotor to Max. Output</td>
<td>Adjust to Maximum Output</td>
</tr>
<tr>
<td>V.</td>
<td>Range D 400 Ohm</td>
<td>1830 KHz</td>
<td>Antenna Lead</td>
<td>Oscillator Range D (C7)</td>
<td>Turn Rotor to Full Open</td>
<td>Adjust to Maximum Output</td>
</tr>
<tr>
<td>VI.</td>
<td>Range B 400 Ohm</td>
<td>1500 KHz</td>
<td>Antenna Lead</td>
<td>Oscillator Range D (C7)</td>
<td>Turn Rotor to Max. Output</td>
<td>Adjust to Maximum Output</td>
</tr>
<tr>
<td>VII.</td>
<td>Range D 400 Ohm</td>
<td>6000 KHz</td>
<td>Antenna Lead</td>
<td>6000 KC (C5)</td>
<td>Turn Rotor to Max. Output</td>
<td>Adjust to Maximum Output</td>
</tr>
</tbody>
</table>

### NOTE
- Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is attained.
- If the signal is not at the 800 KC mark another adjustment will be necessary.

### VOLTAGES AT SOCKETS

<table>
<thead>
<tr>
<th>Tube</th>
<th>Function</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1D1</td>
<td>1st Det. Q.C.</td>
<td>0-17 V</td>
</tr>
<tr>
<td>1D9</td>
<td>I.F.</td>
<td>0-17 V</td>
</tr>
<tr>
<td>1G6</td>
<td>2nd Det. I.F. Audio</td>
<td>0-3.5 V</td>
</tr>
<tr>
<td>1FG</td>
<td>Power</td>
<td>0-3.5 V</td>
</tr>
</tbody>
</table>

1. Anode Grid (U2) to ground
2. As read across 6k and 67
3. As read on 100 volt scale (1000 ohm per volt meter). Subcut
4. As read across 67

---

**Fig. 1—Alignment Adjustment**

**Fig. 7—Coil Terminal Arrangement and D.C. Resistance of Windings**

**Fig. 3—Trimmer Location**

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Input Voltages and Currents

- **A** Battery: 2 Volts—3 Amperes
- **B** Battery: 90 Volts—11.5 to 15 Ma.

Power Output: 135 Milliwatts Undistorted

Selectivity: 40 KC Broad at 1000 Times Signal

Intermediate Frequency: 456 KC.

Speaker: 5" Magnetic

Tuning Frequency Range: 528 to 1730 KC.

Sensitivity: 40 Microvolts

---

**Replacing Drive Cord**

Remove the dial pointer disc by unscrewing the center screw.

Remove old drive cord and tension spring.

Turn the gang condenser rotor to the full open position.
MONTGOMERY-WARD & CO.

**LIST OF REPAIR PARTS**  (Serial No. 575000 and up)

Use Only Genuine Factory Replacement Parts

<table>
<thead>
<tr>
<th>Part No. Reference</th>
<th>Description</th>
<th>No. Used in Set</th>
<th>Price Ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONDUCTORS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE100-6</td>
<td>C15</td>
<td>25 x 200 Volt Tubular</td>
<td>1 .16</td>
</tr>
<tr>
<td>BE100-9</td>
<td>C91</td>
<td>.05 x 200 Volt Tubular</td>
<td>1 .10</td>
</tr>
<tr>
<td>BE100-11</td>
<td>C13</td>
<td>.01 x 400 Volt Tubular</td>
<td>1 .09</td>
</tr>
<tr>
<td>BE100-12</td>
<td>C14</td>
<td>.003 x 400 Volt Tubular</td>
<td>1 .11</td>
</tr>
<tr>
<td>BE100-20</td>
<td>C9, C11</td>
<td>1 x 200 Volt Tubular</td>
<td>2 .11</td>
</tr>
<tr>
<td>BE100-22</td>
<td>C12</td>
<td>.05 x 200 Volt Tubular</td>
<td>1 .10</td>
</tr>
<tr>
<td>BE100-24</td>
<td>C13</td>
<td>.02 x 400 Volt Tubular</td>
<td>1 .09</td>
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<tr>
<td>BE100-44</td>
<td>C14</td>
<td>.01 x 200 Volt Tubular</td>
<td>1 .15</td>
</tr>
<tr>
<td>BE101-22</td>
<td>C11</td>
<td>10 mfd x 25 v. Volt Electrolytic</td>
<td>1 .40</td>
</tr>
<tr>
<td>BE126-2</td>
<td>C7</td>
<td>.0005 Mica - Type MT-20%</td>
<td>1 .09</td>
</tr>
<tr>
<td>BE126-3</td>
<td>C8</td>
<td>.0015 Mica - Type MT-20%</td>
<td>2 .09</td>
</tr>
<tr>
<td>BE126-5</td>
<td>C4</td>
<td>.0025 Mica - Type MT-20%</td>
<td>1 .10</td>
</tr>
<tr>
<td>BE126-6</td>
<td>C10</td>
<td>.0035 Mica - Type MT-20%</td>
<td>1 .10</td>
</tr>
<tr>
<td>BE126-23</td>
<td>C6</td>
<td>.0053 Mica - Type MT-20%</td>
<td>2 .20</td>
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<tr>
<td><strong>RESISTORS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE106-39</td>
<td>R1, R12</td>
<td>150 Ohm, 200 Ohm Metal Clad Resistor</td>
<td>1 .20</td>
</tr>
<tr>
<td>BE130-4</td>
<td>R5</td>
<td>3 Meg Ohm -1/3 Watt -20%</td>
<td>1 .08</td>
</tr>
<tr>
<td>BE130-11</td>
<td>H9</td>
<td>250M Ohm -1/3 Watt -20%</td>
<td>1 .10</td>
</tr>
<tr>
<td>BE130-12</td>
<td>R1, R7</td>
<td>50M Ohm -1/3 Watt -20%</td>
<td>2 .08</td>
</tr>
<tr>
<td>BE130-19</td>
<td>R8, R10</td>
<td>1 Meg Ohm -1/3 Watt -20%</td>
<td>1 .08</td>
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<tr>
<td>BE130-20</td>
<td>R9</td>
<td>100M Ohm -1/3 Watt -20%</td>
<td>1 .06</td>
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<tr>
<td>BE130-85</td>
<td>R4</td>
<td>3M Ohm -1/3 Watt -20%</td>
<td>2 .08</td>
</tr>
<tr>
<td>BE130-163</td>
<td>R2</td>
<td>7500 Mfd -1/3 Watt -20%</td>
<td>2 .08</td>
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<tr>
<td><strong>COILS</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>BE106-77B</td>
<td>T3</td>
<td>Input I. F. Coil Assembly complete with can</td>
<td>1 .60</td>
</tr>
<tr>
<td>BE108-781</td>
<td>T4</td>
<td>Interstage I. F. Coil Assembly complete with can</td>
<td>1 .60</td>
</tr>
<tr>
<td>BE104-79H</td>
<td>T5</td>
<td>Output I. F. Coil Assembly complete with can</td>
<td>1 .60</td>
</tr>
<tr>
<td>BE110-60</td>
<td>T2</td>
<td>Oscillator Coil Assembly complete</td>
<td>1 .60</td>
</tr>
<tr>
<td>BE111-75</td>
<td>T1</td>
<td>Antenna Coil Assembly complete with can</td>
<td>1 .60</td>
</tr>
<tr>
<td><strong>SOCKETS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE121-58</td>
<td>L8</td>
<td>Eight Prong Octal Socket - Marked [150]</td>
<td>1 .10</td>
</tr>
<tr>
<td>BE121-59</td>
<td>L9</td>
<td>Seven Prong Octal Socket - Marked [115]</td>
<td>2 .10</td>
</tr>
<tr>
<td>BE121-60</td>
<td>L10</td>
<td>Eight Prong Octal Socket - Marked [115]</td>
<td>2 .10</td>
</tr>
<tr>
<td>BE121-61</td>
<td>L11</td>
<td>Eight Prong Octal Socket - Marked [115]</td>
<td>2 .10</td>
</tr>
<tr>
<td><strong>SPEAKER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE114-76</td>
<td>L2</td>
<td>Six Inch P. M. Dynamic Speaker</td>
<td>1 .30</td>
</tr>
</tbody>
</table>

**FREQUENCY RANGE**

535 to 1720 K.C. (Kilocycles)
2000 to 7000 K.C. (Kilocycles)

© John F. Rider, Publisher
BAND SWITCH P-125-17
3 POSITIONS ROTATION
CLOCKWISE
POSITIONS ARE:
1ST BROADCAST 535-1720 K.C.
2ND MIDDLE WAVE 105-550 K.C.
3RD SHORT WAVE 3.5 M.C.-18.3 M.C.

LIST OF REPAIR PARTS (Serial No. 6E249976 and up)

Use Only Genuine Factory Replacement Parts

CATHODE RAY TUNING INDICATOR PARTS

DIAL PARTS LIST

DIAL PARTS ONLY

Speaker: Be sure to note and list speakers to be repaired.

All resistors and mica condensers are BMA color coded — specify value and/or resistor
or condenser (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent Color of Dot

10% White

20% Brown

30% Red

40% Orange

50% Yellow

60% Green

70% Blue

80% Violet

90% Gray

20% Black

0% No dot

When ordering parts, always specify part and model number as well as serial number of chassis.

When ordering condensers, specify part number, tolerance and/or schematic reference number.

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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 insulation, open or grounded antenna system, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary.

No aligning adjustments should be attempted with the chassis in operation. Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screwdriver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 686 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multimeter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3:"

Dummy 1: (E.F.) — Consists of a 1 mil condenser connected in series with each other and in series with the external oscillator.

Dummy 2: (Broadcast) — Consists of a 200 microfarad condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Waves) — Consists of a 1 mil condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-73 Output I.F. Transformer
Part No. 108-74 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view). 1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

(a) Connect external oscillator set at 450 kilocycles, in series with "Dummy 1," to the control grid cap of the tube 6K7, and adjust the output I.F. transformer (No. 108-73) to resonance.

(b) With "Dummy 1" still connected, move oscillator out of grid cap of tube 6K7. Adjust input I.F. transformer (No. 108-74) to resonance.

(c) With oscillator still connected to 6K7, readjust output I.F. transformer (108-73) if necessary.

MIDDLE WAVE BAND ALIGNMENT: 1650 to 5500 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tap antenna lead and black ground lead, make following adjustments:

(a) Move dial pointer to 5500 kilocycles, and adjust middle wave oscillator (adjustment number 4) and middle wave antenna (adjustment number 3) to resonance.

(b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.

(c) Re-set external oscillator and check set at 540 kilocycles and 1700 kilocycles for band coverage.
**BAND SWITCH P-125-17**

3 POSITIONS ROTATION CLOCKWISE

1ST BROADCAST: 535-1720 K.C.
2ND MIDDLE WAVE: 1695-5500 K.C.
3RD SHORT WAVE: 3.0-13.5 M.C.

---

**DIAL SCALE**

<table>
<thead>
<tr>
<th>Band</th>
<th>Broadcast</th>
<th>Middle Wave</th>
<th>Short Wave</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outer Scale — Blue</td>
<td>Center Scale — Green</td>
<td>Inner Scale — Buff</td>
</tr>
</tbody>
</table>

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**FREQUENCY RANGE**

- Broadcast: 535 to 1720 K.C. (Kilocycles)
- Middle Wave: 1695 to 5500 K.C. (Kilocycles)
- Short Wave: 5.2 to 18.3 M.C. (Megacycles)

---

**LIST OF REPAIR PARTS**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Schematic Reference</th>
<th>Description</th>
<th>No. Used</th>
<th>Selling in Set</th>
<th>Price Ex.</th>
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<tbody>
<tr>
<td>1-101</td>
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<td>Condensers</td>
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<td>1-102</td>
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<td>Transformers</td>
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<td></td>
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<tr>
<td>1-106</td>
<td></td>
<td>SPEAKER</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

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POWER SUPPLY:

Caution: This radio, unless otherwise marked, must be operated from 105-116 volts, 60 cycle A.C. supply only. If you are in doubt as to the voltage and frequency rating of the power supply, consult your local power company before inserting plug. Do not insert plug unless all tubes and speaker plug are in their proper sockets.

POWER SUPPLY:

Caution: This radio, unless otherwise marked, must be operated from 105-116 volts, 60 cycle A.C. supply only. If you are in doubt as to the voltage and frequency rating of the power supply, consult your local power company before inserting plug. Do not insert plug unless all tubes and speaker plug are in their proper sockets.

TUBES:
The tube complement of this chassis consists of two metal type tubes, and four glass type tubes with metal base.

The types of each tube are as follows:

1. Type 6L7 Pentagrid Mixer, First Detector.
2. Type 6CS Oscillator.
3. Type 6X7G Remote Cut-Off Pentode, 1 F. Amplifier (405 X.C. C.)
4. Type 6L7G Diode Triode Second Detector, A.V.C. and First Audio.
5. Type 6F6G Pentode Output Amplifier.
6. Type 813 High Vacuum Rectifier.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycle and 200 volt rms. These transformers have 106 volt primaries, or universal transformers have 120, 150, 200 and 250 volts (see parts list) and also sometimes equipped with 220 cycle transformers with 186-115 volt or 120 volt primaries, but universal.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with voltmeter connected to the voltage source and in the circuit to be measured. Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shut off the receiver, and then check condensers with a voltmeter. If voltage is not as given, check for open by-pass condenser. Resistance of coil windings is indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shut off the receiver, and then check condensers with a voltmeter. If voltage is not as given, check for open by-pass condenser. Resistance of coil windings is indicated in ohms on the schematic circuit diagram.

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 damaged antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary.

MONTGOMERY WARD & CO.

Socket, Trimmers, Notes

Alignment

DUMMY ANTENNAS:

The following dummy antennas are used in aligning power and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)-Consists of a .1 mf condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)-Consists of a 200 mmf condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Waves)-Consists of a .1 mf, condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-75 Output I.F. Transformer
Part No. 108-71 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of the chassis (see top view).

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, extreme left of its rotation, and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

(a) Connect external oscillator at 105 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6X7G tube, and adjust the output I.F. transformer (No. 108-75) to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6X7G to grid cap to 6L7 and adjust input I.F. transformer (No. 108-71) to resonance.

(c) With oscillator still connected to 6L7, readjust output I.F. transformer (108-73) if necessary.

BROADCAST BAND ALIGNMENT:

535 to 1720 kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with a variable condenser in its minimum capacity position, plate entirely out of mesh and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make the following adjustments:

(a) Move dial pointer to 6000 kilocycles and adjust broadcast wave oscillator (Adjustment number 1) to resonance.

(b) Re-set external oscillator to 1650 K.C. and adjust broadcast series aid to resonance by rotating condenser to approximately 600 K.C. rocking it slowly to and fro until by adjusting series aid maximum output is obtained. This adjustment is located on the bottom of the chassis directly under the variable condenser. (See bottom view of chassis, Fig. 3).

(c) Re-set external oscillator to 600 K.C. and adjust broadcast series aid to resonance by rotating condenser to approximately 600 K.C. rocking it slowly to and fro until by adjusting series aid maximum output is obtained. This adjustment is located on the bottom of the chassis directly under the variable condenser. (See bottom view of chassis, Fig. 3).

(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

(e) Check for tracking and sensitivity at 100 kilocycles. Under no circumstances should any of the variable condenser sections be subject to incorrect tracking.

SHORT WAVE BAND ALIGNMENT:

5.2 to 18.3 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 2" in the tan antenna and black ground lead, make the following adjustments:

(a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 1) and short wave antenna (Adjustment number 4) to resonance.

(b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.

(c) Re-set external oscillator and check set at 18.3 megacycles and 15.3 megacycles for band coverage.

NOTE: In adjusting short wave band, make all of these adjustments that the fundamental oscillator signal will be tuned in and out the frequency which will fall below the fundamental on the receiver dial. As an example of this fundamental 18.3 megacycles signal can be tuned in not only at 18.3 on the dial but also at approximately 17.3 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5050 kilocycles

1. With band changing switch in the middle wave position, extreme left of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 2" in the tan antenna and black ground lead, make the following adjustments:

(a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.

(b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.

(c) Re-set external oscillator and check set at 5000 kilocycles and 7700 kilocycles for band coverage.
VOLTAGES AT SOCKETS FOR 117 VOLT AC LINE
See Note Below Regarding Voltages when Operated on DC

Volume Control Maximum—Antenna Lead Grounded—Readings taken with 1000 Ohm-per-volt Meter,

<table>
<thead>
<tr>
<th>TUBE</th>
<th>FUNCTION</th>
<th>Prong No. 1</th>
<th>Prong No. 2</th>
<th>Prong No. 3</th>
<th>Prong No. 4</th>
<th>Prong No. 5</th>
<th>Prong No. 6</th>
<th>Prong No. 7</th>
<th>Prong No. 8</th>
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<tr>
<td>6J7</td>
<td>1st Det. &amp; Osc.</td>
<td>6.3(1)</td>
<td>98</td>
<td></td>
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<td>6.3(1)</td>
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<tr>
<td>6J7</td>
<td>2nd Det.</td>
<td>6.3(1)</td>
<td>10</td>
<td>13</td>
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<td>6.3(1)</td>
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<tr>
<td>25L6G</td>
<td>Output</td>
<td>24(1)</td>
<td>92</td>
<td></td>
<td></td>
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<td>24(1)</td>
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<tr>
<td>25Z6G</td>
<td>Rectifier</td>
<td>24(1)</td>
<td>117(2)</td>
<td>125</td>
<td>117(2)</td>
<td></td>
<td></td>
<td></td>
<td>24(1)</td>
</tr>
</tbody>
</table>

| L55B   | Ballast          | 56(1)       |             |             |             |             |             |             | 56(1)       |


CAUTION—In any service work on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground.

NOTE: To obtain dial calibration turn on the 800 KC signal. The power should be at the 800 KC mark on the dial. If it is not there set the pointer screw of the 800 KC meter to the point. Cut the power supply while setting the pointer.

The following equipment is required for alignment:
1. Signal Generator
2. Dial LAMP
3. 4.0 MEG. Resistors
4. Dummy Antennas
5. 6J7 & 0.1 uf. Capacitors
6. 25Z6G & 0.05 uf. Capacitors
7. 25L6G & 0.05 uf. Capacitors
8. 6J7 & 0.05 uf. Capacitors
9. 6J7 & 0.05 uf. Capacitors
10. 6J7 & 0.05 uf. Capacitors

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Power Consumption - 2.0 Amperes at 6.3 Volts
Power Output - 1.0 Watt Undistorted
Selectivity - 21 KC Broad at 1000 times Signal
(Sharp)
Intermediate Frequency - 456 KC.
Speaker - 8" P.M. Dynamic

Tuning Frequency Range
B Range 528 to 1730 KC.
C Range 1710 to 5100 KC.
D Range 5750 to 18300 KC.

Sensitivity
B Range 1 to 3 Microvolts Absolute
C Range 1 to 4 Microvolts Absolute
D Range 1 to 7 Microvolts Absolute

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Alignment and Calibration

GENERAL

The signal generator is set for 500 KC. The signal will then be heard at 500 KC on the dial of the radio. The image signal, which will be heard at 5000 KC, will also be heard at 5000 + 5000 = 10,000 KC. It may be necessary to increase the output level of the signal generator to hear the image signal.

5800 KC Adjustment

Set the signal generator for 5800 KC. Connect the antenna lead of the receiver through a 5000 ohm resistor to the output of the signal generator. Do not change the setting of the oscillator Range C trimmer (C2) to maximum output. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC. Do not change the setting of the oscillator Range C trimmer (C2) to maximum output. See Fig. 3 for location of this trimmer.

18,000 KC Adjustment

Set the signal generator for 18,000 KC. Do not change the setting of the oscillator Range C trimmer (C2) to maximum output. See Fig. 3 for location of this trimmer.

Range D Alignment

When adjusting the antenna and interstage antenna Range D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained. Do not change the setting of the interstage antenna Range D trimmer (C2) to maximum output.

6000 KC Adjustment

Set the signal generator for 6000 KC. Do not change the setting of the oscillator Range C trimmer (C2) to maximum output. See Fig. 3 for location of this trimmer.
Trimmer Alignment

Coils, Specifications

- Power Consumption: 5.5 Amperes at 6.3 Volts
- Power Output: 0.8 Watt Undistorted
- Sensitivity: 10 Microvolts at 0.5 Watt Output
- Selectivity: 42.5 KC Broad at 1000 Times Signal

Tuning Frequency Range: 528 to 1550 KC

Intermediate Frequency: 456 KC

Speaker: 6" Dynamic

Set s.f.g. at 456 KC and connect O.P. thru O.P. thru 0.1 uF. Set s.f.g. at 1550 KC and connect O.P. thru O.P. thru 0.1 uF. Set s.f.g. at 0.5 uF. Turn tuning cond. rotor to full open pos., and adj. cond. rotor for max. o.p. Set s.f.g. at 1400 KC — Turn tuning cond. rotor to full open pos., and adj. cond. rotor for max. o.p.

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**Antenna**

**Antenna Important** — Inside of the chassis as shown in Fig. 3 is a terminal strip with letters HC and LC on it.

The antenna lead must be properly connected at the terminal strip, depending on whether a high or low antenna is used.

The following tabulation explains what is meant by High Capacity (HC) and Low Capacity (LC) antennas.

- **Antenna Leads**
  - **High Capacity** — 500 mm long (Total capacity of antenna and 60 inch cable)
  - **Low Capacity** — 60 mm long (Total capacity of antenna and shielded cable cut to about 30 inch length)

**Types of Antennas**
- **Running board** — over-the-top types which are mounted close to the metal roof of the car, ordinary built-in rod antennas (metal roof)
- **Antenna Leads** — Door hinge: over-the-top types which are mounted quite a distance from the metal roof of the car.

Most of the 1927 and 1928 cars have used and will be necessary to use a door hinge, fish pole, over-the-top, or running board antennas. In all of the above installations, the antenna should be mounted on the same side of the car, communications radio is mounted on the same side as the antenna socket located.

The shielded antenna cable to the radio must be surrounded on its LC and LC antenna used (See article "Antenna Cables")

**Timer, Notes**

**Antenna Cable**

- 60 inch shielded antenna cable with a capacity of 70 mm, is regularly supplied.

This cable is long enough in practically all cases to reach the pillar post or column to which a roof antenna leads down and also to reach the running board antenna.

**Cable for LC Antenna**

- The 60 inch cable supplied with the radio will be found to be too long for most door hinge, fish pole and over-the-top type antennas installations. Furthermore, the capacity of the cable plus that of either of the above antennas is too large for the HC connection. Therefore, it is necessary to cut the antenna cable to about 30 inches in length. This will be sufficient in length in practically all cases.

To shorten the antenna, pull the wire out of the cable from the plug end. The shielding should be removed from the correct length. Cut the pigtail off the evening piece of cable and solder it to the shield at the end of the shortened cable. Insert the wire in the cable again and cut the wire to the correct length.

**Procedure for Setting the Station Buttons**

There are 4 buttons on the automatic tuning dial by means of which 4 stations may be set.

Any button may be used for any station you receive.

Make a list of your favorite stations, those which you tune in regularly.

It is better to list the station with the highest kilocycle number first, then the station with the next highest kilocycle number next, and so on.

Group the locking knob shown in Fig. 2. In most cases, this knob can be reached with the hand from the right side of the radio. If, due to crowded conditions, the knob cannot be reached with the hand, the metal rod may be inserted in one of the metal rods on the panel, and the knob turned. The locking knob has two fingers in the direction of the knob until the mechanism is then turned.

Select the first station from the list you have made, and carefully tune the button so that the call letters can be heard. The call letter will be heard from the driver's side. Push the tab all the way in the front of the telephone. The radio panel of the call letter tab. Then push the button back on its shaft, making sure the shaft goes into the opening in the button.

Cautiously tune the second station on your list. Then turn the manual tuning knob and push the second button all the way in. Check the automatic tuning and see if the call letter is heard. If not, change your call letter tab.

**Cautions**

- All stations are set, it will be necessary to lock the mechanism so that the call letter will not change.
- A locking knob shown in Fig. 2, or use the metal rod previously mentioned, and rotate the manual tuning knob.
- With one hand, hold the manual tuning knob to prevent it from turning with the other hand, push one of the station buttons shown in Fig. 2 all the way in. It will go as easily as before and then a thumb pressure must be applied to push it in the rest of the way. Start with the right hand button.

Hold this button all the way in. With the other hand, see if this station is still accurately tuned by tuning the manual tuning knob a slight amount back and forth. Be sure to hold the button all the way in.

Release the button after the station is tuned in.

**Remove the correct station call letter tab from the shelf supplied with the set up all the way in.**

Now pull this button off its shaft and notice which side is the top. Slip the call letter tab in the hole at the top of the knob in the direction indicated. Continue to turn the knob until you are certain that it is tight. Otherwise, the station buttons will not remain set for the selected stations.

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons. The old call letter may be removed by pushing the knob off its shaft and slipping the tab out of the slit in the button.

**Wheel or Brake Station**

- Noise from this source is generally experienced only when an under car or antenna is being used. To determine if noise is being caused from this source, set the car in motion, then with the motor shut off and the clutch disengaged, apply the brakes. If the noise stops, the source of the static is in the wheels. The use of a front or rear wheel static eliminator will generally end the trouble. The eliminator should be installed in the wheels, and the use of a front or rear wheel static eliminator will generally end the trouble.

**BYPASS CONDENSERS**

- Try a 3 mfd bypass condenser from the antenna to ground and see if interference is reduced. Install this condenser at the "hot" side of the coil primary to ground.

- The bypass condenser from the antenna to ground is often a source of interference. Install a bypass condenser from the antenna to ground, and see if the interference is reduced. If it is, install this condenser at the "hot" side of the coil primary to ground.

- The bypass condenser from the antenna to ground is often a source of interference. Install a bypass condenser from the antenna to ground, and see if the interference is reduced. If it is, install this condenser at the "hot" side of the coil primary to ground.
SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages are to be measured with 6.3 volts input to receiver.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers, frequently cause oscillation and distorted tone.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-83B Output I.F. Transformer
Part No. 108-82B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set at 465 kilocycles, in series with the grid condenser, to the control grid coil of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.

   (b) Move oscillator output clip from grid of 6S7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82B) to resonance.

   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83B) if necessary.


1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:

   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).

   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condensor).

   (c) Check sensitivity at 600 and 1000 kilocycles.

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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 voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screwdriver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6F6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with voltmeter control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms o the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-81B Output I.F. Transformer
Part No. 108-82B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   a. Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.
   b. Move oscillator output clip from grid of 6K7G to grid of 6AG6 and adjust input I.F. transformer (No. 108-82B) to resonance.
   c. With oscillator still connected to 6AG6, readjust output I.F. transformer (108-83B) if necessary.


1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mfd. condenser to the antenna lead and chassis ground and make the following adjustments:
   a. With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   b. Reset external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   c. Check sensitivity at 600 and 1000 kilocycles.
ALIGNING I.F. TRANSFORMERS: (465 K.C.):
Part No. 108-83E Output I.F. Transformer
Part No. 108-82E Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6L6G tube, and adjust the output i.f. transformer (No. 108-83E) to resonance.
   (b) Move oscillator output clip from grid of 6K7 to grid of 6A8G and adjust input I.F. transformer (No. 108-82E) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83E) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a .200 mfd. condenser to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

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**ALIGNMENT PROCEDURE ISSUE A**

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 antenna—1 in, 200 ohm, and 40 ohms.

**BAND** | **SIGNAL GENERATOR** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
I.F. | 405 kc | 1 MFD | Grid of 467 | Two stages in parallel | Output level (See Fig. 1) | Gain (C)
| 405 kc | 1 MFD | Grid of 468 | Two stages in parallel | Output level (See Fig. 1) | Gain (C)

**SHORT WAVE BAND** | **Signal Generator** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
160 kc | 40 ohms | Antenna lead | Short Wave | Short wave | Gain (C)
160 kc | 40 ohms | Antenna lead | Short wave | Short wave | Gain (C)

**BROAD-CAST BAND** | **Signal Generator** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
1400 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)
1400 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)

**IMAGE REJECTION ADJUSTMENTS** | **Signal Generator** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
300 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)
300 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)

**NOTE:** "A" Turn the dial back and forth slightly (mid) and adjust trimer until the peak of generated output is obtained.

**NOTE:** "B" IS the image frequency of ISBGC. Adjust Trimer (C) until a minimum output is obtained.

**DESCRIPTION:**
- The tube complement of this chassis consists of the following octal tube class: 12AT7.
- The function of each tube is as follows:
  1. Type B48 Pentagrid Mixer, First Detector-oscillator.
  2. Type 6K7 Remote Cut-Off Pentode, I. F. Amplifier (605 C. C.)
  3. Type 6L6 Double Diode Triode Second Detector, A. V. C. and First Audio.
  4. Type 6L6 Dual Triode Audio Amplifier.
  5. Type 5Y3G High Vacuum Rectifier.
  6. Type 6ES Cathode-Ray Tuning Eye.

**SERVICE NOTES:**
- Voltages taken from different points of circuit to chassis are measured with volume control full on. All tubes in their sockets and speaker connected, with a volt meter having a resistance of 500 ohms per volt.
- All voltages as indicated on the volt chart are measured with 115 volts on the primary of the power transformer.
- Resistances of coil windings are indicated in ohms on the schematic circuit diagram.
- To check for open by-pass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the detector unit is locked.
- Excessive hum, buzzing, low volume and a reduction in all D.C. voltages is usually caused by a shorted electronic condenser. Open by-pass condensers frequently cause oscillation and distorted tone.

**ALIGNMENT 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 voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.
- To remove the chassis from the cabinet, remove the four bolts which are used to fasten the chassis to the cabinet bottom, pull the knobs off their shafts and pull off the six bolt reset lever keys on front of dial.
- To remove the chassis from the cabinet, remove the four bolts which are used to fasten the chassis to the cabinet bottom; remove the special locking screw in the lower part of the tuning knob on the cabinet, pull the knobs off their shafts and pull off the six button lever keys on front of dial.

**ALIGNMENT PROCEDURE ISSUE B**

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 antenna—1 in, 200 ohm, and 40 ohms.

**BAND** | **SIGNAL GENERATOR** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
I.F. | 405 kc | 1 MFD | Grid of 467 | Two stages in parallel | Output level (See Fig. 1) | Gain (C)
| 405 kc | 1 MFD | Grid of 468 | Two stages in parallel | Output level (See Fig. 1) | Gain (C)

**SHORT WAVE BAND** | **Signal Generator** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
160 kc | 40 ohms | Antenna lead | Short Wave | Short wave | Gain (C)
160 kc | 40 ohms | Antenna lead | Short wave | Short wave | Gain (C)

**BROAD-CAST BAND** | **Signal Generator** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
1400 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)
1400 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)

**IMAGE REJECTION ADJUSTMENTS** | **Signal Generator** | **Frequency** | **Detector Type** | **Function** | **Adjustment**
--- | --- | --- | --- | --- | ---
300 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)
300 kc | 200 ohms | Antenna lead | Broadcast (C) | Broadcast | Gain (C)

**NOTE:** "A" Turn the dial back and forth slightly (mid) and adjust trimmer until the peak of generated output is obtained.

**NOTE:** "B" IS the image frequency of ISBGC. Adjust Trimer (C) until a minimum output is obtained.

Align the signal from the signal generator to prevent the leveling off action of the AVC. After each change is completed, repeat the procedure as a final check.
MODEL 62-362
Schematic, Voltage Socket, Trimmer, Parts

MONTGOMERY-WARD & CO.

5Y3G
RECT.
6A8G
6017G
6K7
6K6G
OUTPUT
6K6G
OUTPUT
5Y3G
RECT.
6A8G
6017G
6K7
6K6G
OUTPUT

Schematic, Voltage Socket, Trimmer, Parts

- Cannot be measured with voltmeter
- 8-500 kV AC read across terminals 4 & 6
- 9-500 kV AC read across terminals 8 & 6

Voltage readings taken with 1000 ohm per volt DVM, 150 volt line, between terminals and chassis.
Voltage across speaker field is 80 volts.

Antenna grounded.

Speaker.

Regt.

Oscill & 1st. del.

Tuning indicator voltages read by chassis end of cable.
Red: Brown: Green: 6 & 6 AC.

Antenna grounded.

Rear of chassis.

Rear view of chassis shown in position.

Parts.

Conders.

Resistors.

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ALIGNMENT PROCEDURE

**NOTE:** The following equipment is required for alignment:

- An all wave Signal Generator, which will provide accurately calibrated signal at the test frequencies as used.
- Dummy antennas—1/4 in., 200 mm., and 400 ohms.
- Output meter, audio and signal generator to measure output voltage rating, which denser and more accurate than the output meter shown.
- Dummy condenser and Signal Generator with a by-pass condenser to prevent the by-passing of the test signal from the output meter.
- Volume control—maximum all adjustments.
- Connect radio chassis to ground point of signal generator with a short heavy lead.
- Connect dummy antennas where shown GENERATOR with an output meter, as shown in the schematic diagram.
- Adjust control of volume to center position.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

**TRANSISTORS**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**SIGNAL GENERATOR**

- Use a Signal Generator which has a frequency range of 10 to 30 MHz, and a sensitivity of 100 microvolts per division. For operation at 2200 kHz, use a 2200 kHz crystal filter.

**TRANSMITTER ADJUSTMENT**

- Transmitter C (see Fig. 12) for 1000 ohms on each range.
- Transmitter D (see Fig. 12) for 1000 ohms on each range.

**BAND SWITCH**

- Band Switch—300 to 3000 kc. 50 W. with 2000 Hz frequency.

**FREQUENCY RANGE**

- Frequency range: 300 to 3000 kc.
- Maximum output: 50 watts (at 1200 Hz).
- Intermediate frequency: 1150 kc.

**TRANSISTOR REFERENCE**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR VALUES**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR ADJUSTMENTS**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR OUTPUT**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR INPUT**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR CIRCUIT**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR VOLTAGE**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR CURRENT**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR RESISTANCE**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR CAPACITANCE**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR TUNING**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR COUPLING**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR FEEDBACK**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR GAIN**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR OPERATION**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR SPECIFICATIONS**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR TOLERANCE**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR RELIABILITY**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

**TRANSISTOR LIFE**

- Transistor A—1N34A or equivalent.
- Transistor B—1N35C or equivalent.

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MONTGOMERY-WARD & CO.

MODEL 62-392, 62-490 and 62-900

This means that any stations which has a kilocycle number lying between 880 and 1500 Kc. can be set up on either Button P1 or Button P2. Any station which has a kilocycle number lying between 770 and 1150 Kc. can be set up on either Button P3 or Button P4. Any station which has a kilocycle number lying between 660 and 1050 Kc. can be set up on either Button P5 or Button P6.

A typical station list of stations which may be selected in the vicinity of Chicago, for example, is as follows:

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency</th>
<th>Button</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMAQ</td>
<td>650 Kc.</td>
<td>Button P1</td>
</tr>
<tr>
<td>WGN</td>
<td>720 Kc.</td>
<td>Button P1</td>
</tr>
<tr>
<td>WBBM</td>
<td>750 Kc.</td>
<td>Button P1</td>
</tr>
<tr>
<td>WENR</td>
<td>850 Kc.</td>
<td>Button P2</td>
</tr>
<tr>
<td>WJID</td>
<td>1130 Kc.</td>
<td>Button P3</td>
</tr>
<tr>
<td>WRFC</td>
<td>1250 Kc.</td>
<td>Button P3</td>
</tr>
</tbody>
</table>

After you have made up your list of stations, turn manual-automatic switch (Knob No. 1) to manual position "B" and tune in the first station with the manual tuning knob. Then turn the manual-automatic switch (Knob No. 1) to automatic position "A". Push in automatic button P1 and with a small screwdriver turn the adjusting screw (see "A" Fig. 2) above the automatic button (clockwise). Turn the screw until the proper station is tuned in. Check by turning the manual-automatic switch to its manual position to make sure you have the same station.

Switch back to automatic position and by means of the screwdriver very carefully tune in the station watching the cathode-ray tuning eye to indicate perfect tuning.

Turn the manual-automatic switch (Knob No. 1) back to manual position and tune in the second station with the manual tuning knob. Then turn the manual-automatic switch to automatic position. Push in automatic button P2 and with a small screwdriver turn the adjusting screw above Button P2 (right clockwise). Turn the screw until the proper station is tuned in. Check by turning the manual-automatic switch to its manual position to make sure you have the same station.

Over the adjustment screw "A" a rectangular opening in the escutcheon has been provided for the station call letter tabs. Punch out the call letter tabs of the stations you have set up for the automatic buttons from the set of sheets supplied and insert them into the rectangular openings in the escutcheon. One of the small clear celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

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MONTGOMERY-WARD & CO.

VOLTAGES AT SOCKETS

<table>
<thead>
<tr>
<th>Socket</th>
<th>Voltage 1</th>
<th>Voltage 2</th>
<th>Voltage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-33</td>
<td>6.2 V</td>
<td>6.2 V</td>
<td>6.1 V</td>
</tr>
<tr>
<td>6-34</td>
<td>6.0 V</td>
<td>5.9 V</td>
<td>5.8 V</td>
</tr>
<tr>
<td>6-35</td>
<td>6.2 V</td>
<td>6.2 V</td>
<td>6.2 V</td>
</tr>
<tr>
<td>6-36</td>
<td>6.1 V</td>
<td>6.1 V</td>
<td>6.1 V</td>
</tr>
</tbody>
</table>

Fig. 1.—Location of Tubes; Top View of Chassis

FOR ALLignment SEE INDEX

MONTGOMERY-WARD PAGE 9-49
ALIGNMENT PROCEDURE MODEL 62-372

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 m, 200 mm, and 400 ohms.

Procedure:

1. Place the receiver in a suitable position, such as on a table or bench. Make sure the power supply is connected and the receiver is turned off.

2. Adjust the volume control to a comfortable listening level. Turn the tuning knob slowly to the left, listening for any noise or static. When no noise or static is heard, stop the tuning knob and set the dial to the test frequency nearest the middle of the dial.

3. With the dial set to the test frequency, turn on the power supply and adjust the tuning control to the middle of the dial. Adjust the dial to the test frequency and set the tuning control to the middle of the dial. Repeat this procedure for all test frequencies. The dial should be set to the test frequency and the tuning control should be adjusted to the middle of the dial.

4. For all test frequencies, the dial should be set to the test frequency and the tuning control should be adjusted to the middle of the dial.

5. Adjust the tuning control so that the signal is heard at the highest possible level. This will help to align the receiver accurately.

6. Adjust the trimmers for each test frequency to the middle of the dial. This will help to align the receiver accurately.

7. After the trimmers have been adjusted, turn off the power supply and disconnect the test equipment. The receiver is now aligned and ready for use.

CAUTION: When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked by reference. Set the dial to the signal generator. The signal generator is set for 15,000 KC. The signal will then be heard on 15,000 on the dial of the receiver. The image signal, which is a much weaker signal, will be heard at 15,000 plus 912, or 15000 plus 912, or 15000 plus 14000 on the dial. It may be necessary to increase the input signal to the receiver to hear the image signal.


1. With the receiver tuned to a weak signal, adjust the trimmer for the best signal. This will help to align the receiver accurately.

2. Adjust the trimmers for each test frequency to the middle of the dial. This will help to align the receiver accurately.

3. After the trimmers have been adjusted, turn off the power supply and disconnect the test equipment. The receiver is now aligned and ready for use.


1. With the receiver tuned to a weak signal, adjust the trimmer for the best signal. This will help to align the receiver accurately.

2. Adjust the trimmers for each test frequency to the middle of the dial. This will help to align the receiver accurately.

3. After the trimmers have been adjusted, turn off the power supply and disconnect the test equipment. The receiver is now aligned and ready for use.


1. With the receiver tuned to a weak signal, adjust the trimmer for the best signal. This will help to align the receiver accurately.

2. Adjust the trimmers for each test frequency to the middle of the dial. This will help to align the receiver accurately.

3. After the trimmers have been adjusted, turn off the power supply and disconnect the test equipment. The receiver is now aligned and ready for use.


1. With the receiver tuned to a weak signal, adjust the trimmer for the best signal. This will help to align the receiver accurately.

2. Adjust the trimmers for each test frequency to the middle of the dial. This will help to align the receiver accurately.

3. After the trimmers have been adjusted, turn off the power supply and disconnect the test equipment. The receiver is now aligned and ready for use.

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**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-Metallic Screwdriver.
- Dummy Antennas - .1 mf., 200 mmf., and 400 ohms.

**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.

**Adjustment:**
- Note A—In sets using the finger tip tuning dial, replace the signal from the signal generator with a signal from drive drum using a screwdriver.
- If the station selector ring and turn the dial to prevent the leveling-off action of the AVC.
- The signal will then be heard at 15,000 KC or the dial. It may be necessary to increase the input signal to hear the image.

**PROCEDURE**

1. Place Initial Adjustments on the Drive Card.
2. Replace Drive Card and Ground.
3. Rotate the dial to the start of the test frequency.
4. Push the cord through as far as it will go.
5. Note A—In sets using the finger tip tuning dial, replace the signal from the signal generator with a signal from drive drum using a screwdriver.
6. Increase the intensity of the signal by increasing the signal from the drive frequency.
7. Allow the signal to be heard at 15,000 KC.
8. Use a non-metallic screwdriver to adjust the image frequency.
9. Repeat the above procedure on all ranges.

**VOLTAGES AT SOCKETS**

**Volume Control—Maximum All Adjustments.**

Readings taken with 1000 ohms-per-volt meter.

<table>
<thead>
<tr>
<th>Tube</th>
<th>Function</th>
<th>Voltage Between All OK and Gnd.</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>6J5P</td>
<td>Tube 1/2</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 2/3</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 3/4</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 4/5</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 5/6</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 6/7</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 7/8</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 8/9</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 9/10</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 10/11</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 11/12</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 12/13</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
<tr>
<td>6J5P</td>
<td>Tube 13/14</td>
<td>0.00 kV</td>
<td>0.00 kV</td>
</tr>
</tbody>
</table>

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To check for open bypass capacitors, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Extensive tests, indicating low volume and a reduction in all D.C. voltages, is usually caused by a shorted electrolytic condenser. Open bypass condensers frequently cause oscillation and distorted tone.

MODELS 62-390, 62-490 and 62-900

NOTE — On the back of the tuning dial drum a calibrated scale is provided for aligning to the frequencies listed in the alignment procedure. Attach a pointer so that it will indicate the dial setting in respect to the position of the variable condenser.

### ALIGNMENT PROCEDURE

- Time control-to-frequency position.
- Voltage control — Maintain all adjustments.
- Connect radio chassis to ground part of signal generator with a short heavy lead.
- Connect dummy antenna value to series with oscillator output lead.
- Connect output meter across primary of output transformer.
- Allow chance 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 frequencies listed.
- Resistor indicating meter.
- Non-metallic screwdriver.
- Dummy antenna — 1 volt, 200 micro, and 100 micro.

#### BAND SIGNAL GENERATOR FREQUENCY BAND GAIN ANTENNA CONNECTION POSITION OF BAND SWITCH VARIABLE TRIMMERS ADJUSTED TRIMMER FUNCTION FREQUENCY ADJUSTMENT

<table>
<thead>
<tr>
<th>BAND</th>
<th>FREQUENCY RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F.</td>
<td>1.69 MHz</td>
</tr>
<tr>
<td>Broadcast</td>
<td>1500 kHz</td>
</tr>
<tr>
<td>Short Wave Band</td>
<td>400 kHz</td>
</tr>
<tr>
<td>Middle Wave Band</td>
<td>400 kHz</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>2 Watts (350 cycles)</td>
</tr>
<tr>
<td>Power Input</td>
<td>1 Watt (4 cycle)</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>40 K.C. Band at 100 K.C. 1000 Times Signal Strength</td>
</tr>
</tbody>
</table>

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ALIGNING INSTRUCTIONS:

CAUTION:—No alignment 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 voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the two bolts which are used to fasten the chassis. All adjustments should be made with a non-metallic screwdriver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 41 output tube. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range voltmeter should be used.

ALIGNING I. F. TRANSFORMERS: (465 K. C.)

Connect external oscillator which has been adjusted to 465 kilocycles in series with 1 mfd. condenser, to the control grid cap of the type 6A7 tube. Ground the chassis to the oscillator. Adjust output I.F. transformer (No. 108-83) and input I.F. transformer (No. 108-82) to resonance. See label on bottom of cabinet for location of these transformers.

LIST OF REPAIR PARTS (Serial No. 6F275000 and up)

<table>
<thead>
<tr>
<th>CONDENSERS</th>
<th>Schematic Description</th>
<th>Part No.</th>
<th>Reference</th>
<th>No. Used</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 100-11</td>
<td>C-5-C-7 .01 x 400 Volt Tubular</td>
<td>2</td>
<td>$0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE 100-19</td>
<td>C-6 .005 x 500 Volt Tubular</td>
<td>1</td>
<td>$0.99</td>
<td></td>
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<tr>
<td>BE 100-20</td>
<td>C-7 .1 x 200 Volt Tubular</td>
<td>1</td>
<td>$1.11</td>
<td></td>
<td></td>
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<tr>
<td>BE 119-24</td>
<td>C-9-C-10 Dual 5 mfd. x 200 Volt Electrolytic</td>
<td>1</td>
<td>$1.09</td>
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<td></td>
</tr>
<tr>
<td>BE 129-3</td>
<td>C-12 .0001 Mica-Mica Type</td>
<td>1</td>
<td>$0.09</td>
<td></td>
<td></td>
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<tr>
<td>BE 130-12</td>
<td>C-2-C-4 .0002 Mica-Mica Type</td>
<td>2</td>
<td>$1.12</td>
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</table>

<table>
<thead>
<tr>
<th>RESISTORS</th>
<th>Schematic Reference</th>
<th>Part No.</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 106-29</td>
<td>2.9-9.10 (R9, 200 ohms); (R10, 12.5 ohms); (R11, 100</td>
<td>1</td>
<td>$0.16</td>
</tr>
<tr>
<td>BE 130-17</td>
<td>R-2 10 M Ohm-1/2 Watt-20-20 V. Carbon</td>
<td>1</td>
<td>$0.08</td>
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<tr>
<td>BE 130-22</td>
<td>R-3 2 M Ohm-3/4 Watt-10-10 V. Carbon</td>
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<tr>
<td>BE 130-11</td>
<td>R-1 50 M Ohm-1/2 Watt-10-10 V. Carbon</td>
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<td>BE 130-12</td>
<td>R-6 600 M Ohm-1/2 Watt-10-10 V. Carbon</td>
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<tr>
<td>BE 130-12</td>
<td>R-7 12 M Ohm-1/2 Watt-10-10 V. Carbon</td>
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<table>
<thead>
<tr>
<th>COILS</th>
<th>Schematic Reference</th>
<th>Part No.</th>
<th>Selling Price</th>
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<tbody>
<tr>
<td>BE 108-82</td>
<td>T3 Input I.F. Coil Assem. Comp. with Can.</td>
<td>1</td>
<td>$0.60</td>
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<tr>
<td>BE 108-83</td>
<td>T4 Output I.F. Coil Assem. Comp. with Can.</td>
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<tr>
<td>BE 110-46</td>
<td>T2 Oscillator Coil Assembly Complete.</td>
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<tr>
<td>BE 111-38</td>
<td>T1 Antenna Coil Assembly Complete.</td>
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<table>
<thead>
<tr>
<th>SOCCETS</th>
<th>Schematic Reference</th>
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<th>Selling Price</th>
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</thead>
<tbody>
<tr>
<td>BE 121-6</td>
<td>Six Prong Socket—Marked &quot;41&quot;</td>
<td>1</td>
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<tr>
<td>BE 121-6</td>
<td>Six Prong Socket—Marked &quot;121&quot;</td>
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<tr>
<td>BE 121-7</td>
<td>Seven Prong Socket—Marked &quot;6A7&quot;</td>
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<tr>
<td>BE 121-9</td>
<td>Four Prong Socket—Marked &quot;SPIC&quot;</td>
<td>1</td>
<td>$0.08</td>
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<tr>
<td>BE 121-16</td>
<td>Five Prong Socket—Marked &quot;52A&quot; (Octal)</td>
<td>1</td>
<td>$0.08</td>
</tr>
</tbody>
</table>

TUBES:

The Type 6E7—transistor oscillator and four stage detector. Type 614—A.V.C. and A.F. amplifier. Type 6Y7—final audio tube as diode detector.

MODEL 62-425

Frequency Range — 535 - 1720 Kilocycles

R.F. ALIGNMENT: (635-1250 K.C.)

1. With gang condenser in its minimum capacity position, place the variable condenser with a 200 mfd. condenser to an antenna and black cable to chassis.

2. Adjust trimmer condenser (rear section of gang condenser) for lowest signal reading by rotating it clockwise to 90 degrees. Repeat this adjustment assuming a 90 degree trimmer condenser position and a 15 degree trimmer condenser position.

3. With gang condenser in its minimum capacity position, place the variable condenser with a 200 mfd. condenser to an antenna and black cable to chassis.

4. Adjust trimmer condenser (rear section of gang condenser) for highest signal reading by rotating it clockwise to 90 degrees. Repeat this adjustment assuming a 90 degree trimmer condenser position and a 15 degree trimmer condenser position.

5. Check sensitivity at 600 and 1000 kilocycles.

When ordering condensers, specify part number, tolerance and/or schematic reference number.

When ordering parts, always specify part and model number as well as serial number of chassis. Form 5900 1550 B-10

Note: Speakers cannot be ordered, defective speakers must be repaired.

All resistors are in ohms; specify value and resistor or condenser (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent | Color of Dot
---|---
25% | White
15% | Red
10% | Yellow
5% | Blue
3% | Green
1% | Black
More than—10% | None

When ordering condensers, specify part number, tolerance and/or schematic reference number.

When ordering parts, always specify part and model number as well as serial number of chassis.

FORM 5900 1550 B-10
The tube complement of this chassis consists of the following tubes:

- Type 1C7G Pentagrid Mixer, First Detector-oscillator
- Type 1D5G Remote Cut-Off Pentode, 1st I.F. Amplifier (465 K. C.)
- Type 1D5G Remote Cut-Off Pentode, 2nd I.F. Amplifier (465 K. C.)
- Type 1F7G Duplex Diode Pentode Second Detector, A. V. C. and First Audio.
- Type 1G5G Pentode Output Amplifier.

FOR ALIGNMENT AND TUNER, SEE INDEX

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram, are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

The approximate current consumption is as follows: "A"—430 ma, "B"—16 ma.
ALIGNMENT

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.

NOTE A—Hold the tuning knob and turn the dial until there is no noise.

NOTE B—Turn the rotor back and forth and adjust the trimmer until there is a single noise.

NOTE C—At the bottom of the permeability tuning unit, press down the 'W' openings. Insert the end of a pair of long nose pliers or a screwdriver in the 'W' opening of the proper button and adjust the position of the antenna (rear) coil by twisting the pliers or screwdriver until maximum output is obtained.

NOTE D—To prevent the leveling off action, the procedure must be followed. After the attenuator has been adjusted, hold the tuning knob and turn the dial until there is no noise. After each range is completed, repeat the procedure as a final check.

CAUTION:—When aligning the short wave bands, be sure NOT to adjust the image frequency. This can be checked as follows:

- Insert the signal generator into the output jack of the receiver.
- Connect the signal generator to the input jack of the receiver.
- Connect the signal generator to the output jack of the receiver.

NOTE.——Attenuator B.C. is not used in the 13 Tube AC Radio.

13 Tube AC Radio

For Tuner Data

SEE INDEX

VIEW FROM BOTTOM FRONT OF CHASSIS

BAND SWITCH BUTTONS

STATION BUTTONS

WIREMEN'S AMATEUR PRESS PAGE 9-59, 60

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MONTGOMERY-WARD & CO.

MODEL 62-403

Schematic, Voltage

Socket Alignment Notes

Diagram for the 13 Tube AC Radio.
### Condensers

<table>
<thead>
<tr>
<th>No.</th>
<th>Part No.</th>
<th>Description</th>
<th>C10</th>
<th>100-19</th>
<th>006 x 600 v.</th>
<th>25%</th>
<th>R10</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>102-49</td>
<td>2 Gang Variable</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>100-9</td>
<td>.05 x 200 v.</td>
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<td></td>
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<tr>
<td></td>
<td>129-12</td>
<td>.0025 Mica</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100-1</td>
<td>.1 x 400 v. —50 —10%</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>129-2</td>
<td>.0001 Mica</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>100-11</td>
<td>.01 x 400 v.</td>
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<td></td>
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<tr>
<td></td>
<td>119-38</td>
<td>5.0 x 200 wv. Lytic</td>
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<td></td>
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<tr>
<td></td>
<td>119-38</td>
<td>5.0 x 250 wv. Lytic</td>
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</table>

### Resistors

<table>
<thead>
<tr>
<th>No.</th>
<th>Part No.</th>
<th>Description</th>
<th>R1</th>
<th>R11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>130-17</td>
<td>10M ohm</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>130-12</td>
<td>50M ohm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>130-149</td>
<td>15M ohm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>101-77</td>
<td>1 megohm volume control</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>106-35</td>
<td>65 ohm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>106-35</td>
<td>45 ohm</td>
<td></td>
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<tr>
<td></td>
<td>106-35</td>
<td>220 ohm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>130-9</td>
<td>200M ohm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>130-118</td>
<td>600M ohm</td>
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</tr>
</tbody>
</table>

**MODELS 62-445, 62-455, 62-475**

### Schematic, Socket, Voltage, Trimmers, Alignment, Parts

- **MODELS 62-445, 62-455, 62-475**
- **Frequency Range:** 500-1720 Kilocycles

**ALIGNING I.F. TRANSFORMERS:** (465 K.C.)

1. **Part No. 106-82B** Input I.F. Transformer
   - Connect the input I.F. transformer (No. 106-82B) to the output of the variable condenser, trimmer control, and adjust the control grid of the type 6K6 tube (C1) to approximately 4000 kilocycles.
   - With this adjustment, the variable condenser set to approximately 4000 kilocycles, make the following adjustments:
     - (a) Connect the input I.F. transformer (No. 106-82B) to the output of the variable condenser, trimmer control, and adjust the control grid of the type 6K6 tube (C1) to approximately 4000 kilocycles.
     - (b) Move the output I.F. transformer (No. 106-82B) from grid of 6K6 to grid of 6L6, adjust the output I.F. transformer (No. 106-82B) to resonance.
     - (c) With oscillator still connected to 6AG6, adjust all other adjustments.

**R.F. ALIGNMENT:**

1. **Part No. 106-83B** Input I.F. Transformer
   - With the antenna coil set to 455 kilocycles, connect an external oscillator to the antenna lead and adjust the output I.F. transformer (No. 106-83B) to resonance.
   - Adjust all other adjustments.

(c) Check sensitivity at 600 and 1000 kilocycles.

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**MODEL 62-465**

**Schematic**

**Socket, Trimmers**

**Notes**

**Parts**

---

**SERVICES NOTES:**

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages are to be measured with 6.3 volts input to receiver.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers, frequently cause oscillation and distorted tone.
MONTGOMERY WARD & CO.

MODELS 62-473 and 62-701

**EARLY AND LATE MODELS**

**DESCRIPTION:**
- **I. F.**
  - Type 6GQ6 Duplex Diode Triode Second Detector, A. V. C. and First Audio.
  - Type 6FQ6 Driver Stage
  - Two 6ACG Positive Grid Triode Output Amplifiers.
  - Type 5VQG High Vacuum Rectifier.
  - Type 6DS Cathode-Ray Tuning Eye.

**TUBES:**
- The tube complement of this chassis consists of the following metal base glass and metal tubes:
- **I. F.**
  - Type 6AG6 Pentagrid Mixer, First Detector, or oscillator.

**SERVICE NOTES:**
- Voltages taken from different points of circuit to chassis are measured with volume control full on all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

**ALIGNMENT PROCEDURE**
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna wire 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.

**BAND**

<table>
<thead>
<tr>
<th>SIGNAL GENERATOR</th>
<th>Frequency Setting</th>
<th>Antenna Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Conductor Setting</th>
<th>Trimmer Adjustments</th>
<th>Trimmer Function</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. F.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>465 Kc</td>
<td>0.1 MFD</td>
<td>Grid of 567.2</td>
<td>Short Wave (Extreme right rotation) Set Dial at 17 MC</td>
<td>Two trimmers on use of grid shunt (See Fig. 1)</td>
<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
<td></td>
</tr>
<tr>
<td>465 Kc</td>
<td>0.1 MFD</td>
<td>Grid of 66.7</td>
<td>Short Wave (Extreme left rotation) Set Dial at 17 MC</td>
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<tr>
<td>17 Mc</td>
<td>400 ohms</td>
<td>Antenna Lead</td>
<td>Short Wave (Extreme left rotation) Set Dial at 17 MC</td>
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<tr>
<td>17 Mc</td>
<td>400 ohms</td>
<td>Antenna Lead</td>
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**SHORT WAVE BAND**

<table>
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<th>Frequency Setting</th>
<th>Antenna Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Conductor Setting</th>
<th>Trimmer Adjustments</th>
<th>Trimmer Function</th>
<th>Adjustment</th>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Broadcast (Extreme left rotation) Set Dial at 90 Mc on dial</td>
<td>Two trimmers on use of grid shunt (See Fig. 1)</td>
<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
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<td></td>
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<td></td>
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**BAND**

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<tr>
<td></td>
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<td></td>
<td>Broadcast (Extreme right rotation) Set Dial at 45 Mc on dial</td>
<td>Two trimmers on use of grid shunt (See Fig. 1)</td>
<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
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<tr>
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<td></td>
<td>Short Wave (Extreme right rotation) Set Dial at 45 Mc on dial</td>
<td>Two trimmers on use of grid shunt (See Fig. 1)</td>
<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
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<td></td>
</tr>
<tr>
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<td></td>
<td>Short Wave (Extreme left rotation) Set Dial at 45 Mc on dial</td>
<td>Two trimmers on use of grid shunt (See Fig. 1)</td>
<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
<td></td>
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</table>

**IMAGE REJECTION ADJUSTMENTS**

<table>
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<th>SIGNAL GENERATOR</th>
<th>Frequency Setting</th>
<th>Antenna Connection to Radio</th>
<th>Position of Band Switch</th>
<th>Variable Conductor Setting</th>
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<td>Broadcast (Extreme left rotation) Set Dial at 90 Mc on dial</td>
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<td>Short Wave shunt</td>
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<td>Short Wave (Extreme right rotation) Set Dial at 90 Mc on dial</td>
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<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Short Wave (Extreme left rotation) Set Dial at 90 Mc on dial</td>
<td>Two trimmers on use of grid shunt (See Fig. 1)</td>
<td>Short Wave shunt</td>
<td>Adjustable to maximum output</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**:
- Type the dial back and both slightly (neck) and adjust trimmer until the neck of greatest density is obtained.
- **I. F.**
  - Type 6GQ6 Duplex Diode Triode Second Detector, A. V. C. and First Audio.
  - Type 6FQ6 Driver Stage
  - Two 6ACG Positive Grid Triode Output Amplifiers.
  - Type 5VQG High Vacuum Rectifier.
  - Type 6DS Cathode-Ray Tuning Eye.

**C.**
- The image frequency of 100 kc. is the image frequency of 100 kc. Adjust intermediate capacitance (C1) by moving the wire either toward or away from the image and noting until a minimum output is obtained on the output meter.

**D.**
- Adjust the trimmer for maximum output. (See note "A".)

**E.**
- Adjust for minimum output. (See note "A".)

**F.**
- Power Consumption—40 Watts. (At 110 volts 60 cycles.)
- Power Output—2 Watts Undirectional, 4 Watts Maximum.
- Interference Frequency.

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www.americanradiohistory.com
Transformers are available and chassis are sometimes equipped with universal transformers for operation on 220-40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universal.

SERVICE NOTES:
Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

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 voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.
MONTGOMERY WARD & CO.

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-Metallic
  Dummy Antennas—1 mf., 200 mmf., and 400 ohms.

### SIGNAL GENERATOR

<table>
<thead>
<tr>
<th>FREQUENCY SETTING</th>
<th>CONNECTION AT RADIO</th>
<th>DUMMY ANTENNA</th>
<th>BAND SWITCH</th>
<th>CONDENSER SETTING</th>
<th>ADJUST TRIMMERS TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.F. 455 KC</td>
<td>Grid of 1st Det.</td>
<td>1 mf.</td>
<td>B Range</td>
<td>Turn Rotor to Full Open</td>
<td>1st I.F. (C15) &amp; (C16)</td>
</tr>
<tr>
<td>RANGE B</td>
<td>1730 KC</td>
<td>Antenna Lead 200 mmf.</td>
<td>B Range</td>
<td>Turn Rotor to Full Open</td>
<td>Oscillator Range B (C8)</td>
</tr>
<tr>
<td></td>
<td>1500 KC</td>
<td>Antenna Lead 200 mmf.</td>
<td>B Range</td>
<td>Turn Rotor to Max. Output</td>
<td>Set Indicator to 1500 KC—See Note A</td>
</tr>
<tr>
<td></td>
<td>600 KC</td>
<td>Antenna Lead 200 mmf.</td>
<td>B Range</td>
<td>Turn Rotor to Max. Output</td>
<td>600 KC (C9) Rock Rotor—See Note B</td>
</tr>
<tr>
<td>RANGE D</td>
<td>18,300 KC</td>
<td>Antenna Lead 400 Ohm</td>
<td>D Range</td>
<td>Turn Rotor to Full Open</td>
<td>Oscillator Range D (C7)</td>
</tr>
<tr>
<td></td>
<td>15,000 KC</td>
<td>Antenna Lead 400 Ohm</td>
<td>D Range</td>
<td>Turn Rotor to Max. Output</td>
<td>Ant. Range D (C3) Rock Rotor—See Note B</td>
</tr>
</tbody>
</table>

### PERMEABILITY TUNING UNIT

<table>
<thead>
<tr>
<th>FREQUENCY SETTING</th>
<th>CONNECTION AT RADIO</th>
<th>DUMMY ANTENNA</th>
<th>BAND SWITCH</th>
<th>CONDENSER SETTING</th>
<th>ADJUST COIL POSITION TO MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100 KC</td>
<td>Antenna Lead</td>
<td>200 mmf. No. 1</td>
<td>Setting Screw No. 1</td>
<td>Antenna Coil No. 1</td>
<td></td>
</tr>
<tr>
<td>1100 KC</td>
<td>Antenna Lead</td>
<td>200 mmf. No. 2</td>
<td>Setting Screw No. 2</td>
<td>Antenna Coil No. 2</td>
<td></td>
</tr>
<tr>
<td>850 KC</td>
<td>Antenna Lead</td>
<td>200 mmf. No. 3</td>
<td>Setting Screw No. 3</td>
<td>Antenna Coil No. 3</td>
<td></td>
</tr>
<tr>
<td>850 KC</td>
<td>Antenna Lead</td>
<td>200 mmf. No. 4</td>
<td>Setting Screw No. 4</td>
<td>Antenna Coil No. 4</td>
<td></td>
</tr>
<tr>
<td>700 KC</td>
<td>Antenna Lead</td>
<td>200 mmf. No. 5</td>
<td>Setting Screw No. 5</td>
<td>Antenna Coil No. 5</td>
<td></td>
</tr>
<tr>
<td>700 KC</td>
<td>Antenna Lead</td>
<td>200 mmf. No. 6</td>
<td>Setting Screw No. 6</td>
<td>Antenna Coil No. 6</td>
<td></td>
</tr>
</tbody>
</table>

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

**NOTE A**—If the pointer is not at 1500 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1500 KC mark, and tighten the clamps.

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

**NOTE C**—At the top of the permeability tuning unit can be seen six "W" openings, insert the end of a pair of long nose pliers or a screwdriver in the "W" opening of the proper button and adjust the position of the antenna (rear) coil by twisting the pliers or screwdriver until maximum output is obtained.

**CAUTION**—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows:

Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.
Note: Speakers cannot be ordered; defective speakers must be repaired.

All resistors and mica condensers are RMA color coded—specify value and/or resistor or condenser (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

<table>
<thead>
<tr>
<th>Tolerance Percent</th>
<th>Color of Dot</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>White</td>
</tr>
<tr>
<td>5%</td>
<td>Green</td>
</tr>
<tr>
<td>10%</td>
<td>Blue</td>
</tr>
<tr>
<td>15%</td>
<td>Yellow</td>
</tr>
<tr>
<td>20%</td>
<td>Red</td>
</tr>
<tr>
<td>More than 20%</td>
<td>None</td>
</tr>
</tbody>
</table>

When ordering parts, always specify part and model number as well as serial number of chassis.

When ordering condensers, specify part number, tolerance and/or schematic reference number.
**Models 62-506 and 62-516**

1. With volume control fully on, the extreme right of its rotation, the hand changing switch in the broadcast position, extreme left of its rotation, and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set to 405 kilocycles, in series with "Dummy 1," to the control grid cap of the type 12AX7 I.F. tube, and adjust the output I.F. transformer (No. 106-112) to resonance.

   (b) Move oscillator to grid cap of 127G oscillator, first detuner tube and adjust input I.F. transformer (No. 106-111) to resonance.

**Short Wave Band Alignment:**

5.5 to 18.3 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 2" to the antenna and ground leads, make the following adjustments:

   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer to resonance.

   This adjustment is the trimmer mounted on the top rear section of the variable gang condenser (see Fig. 3, top view).

   (b) Adjust short wave antenna trimmer (Adjustment Number 1), to resonance (see Fig. 3, bottom view).

**Broadcast Band Alignment:**

535 to 1725 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:

   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 2), to resonance (see Fig. 3, top view).

   (b) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 2), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

   (c) Repeat adjustments "a" and "b" until sensitivity is maximum.

**Dummy Antennas:**

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

**Dummy 1:** (I.F.)—Consists of a 1 mil. condenser connected in series with the external oscillator.

**Dummy 2:** (Broadcast)—Consists of a 200 mil. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

**Dummy 3:** (Short Wave)—Consists of a 1 mil. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

**Aligning I.F. Transformers:**

Part No. 108-112 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1, top view).

**Description:**

1. With volume control full on, the extreme right of its rotation, the hand changing switch in the broadcast position, extreme left of its rotation, and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set to 405 kilocycles, in series with "Dummy 1," to the control grid cap of the type 12AX7 I.F. tube, and adjust the output I.F. transformer (No. 106-112) to resonance.

   (b) Move oscillator to grid cap of 127G oscillator, first detuner tube and adjust input I.F. transformer (No. 106-111) to resonance.

**Service Notes:**

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated are measured with 115 volts on the primary of the power transformer.

 Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, flutter, low volume and a reduction in all D.C. voltages is usually caused by a chocked electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

**Alignment Instructions:**

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking and monitoring all other possible causes of trouble, such as poor connections, open or grounded antenna, antenna lead, low line voltage, defective tubes, condensers, etc.

The missing condenser (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screwdriver.

**Resonance Indicator:**

Use as a resonance indicator an output meter connected in the primary of the speaker input transformer in such a manner as to be used by means of an adapter between the plate and screen terminals.

The maximum deflection of the A.O. meter indicates the top of the broadcast band.

**Broadcast Band Alignment:**

535 to 1725 Kilocycles

With band changing switch in the broadcast position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 2" to the antenna and ground leads make the following adjustments:

(a) Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer to resonance.

This adjustment is the trimmer mounted on the top of the chassis, to the variable gang condenser (see Fig. 1, top view).

(b) Short wave output clip of grid of 6ES to grid cap of 6LG7 and adjust output I.F. transformer (No. 176-1057) to resonance.

(c) With oscillator still connected to 6LG7, rebalance out I.F. transformer (108-1057) if necessary.

**Short Wave Band Alignment:**

5.5 to 18.3 Megacycles

With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 2" to the antenna and ground leads, make the following adjustments:

(a) Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer to resonance.

This adjustment is the trimmer mounted on the top of the chassis, to the variable gang condenser (see Fig. 1, top view).

(b) Short wave output clip of grid of 6ES to grid cap of 6LG7 and adjust output I.F. transformer (No. 176-1057) to resonance.

(c) With oscillator still connected to 6LG7, rebalance out I.F. transformer (108-1057) if necessary.

**Model 62-506**

Part No. 106-1057 Output I.F. Transformer

Part No. 106-1058 Input I.F. Transformer

These I.F. transformer have two adjustments, both of which are accessible from the top of chassis (see Fig. 1, top view).

**Tubes:**

The tube complement of this chassis consists of the following metal base glass and Metal Glass tubes:

1. Type 6LG7 Pentagrid Mixer, First Detector

2. Type 6LQ7 Remote Cut-Off Pentode, I.F. Amplifier (605 K.C.)

3. Type 6LG5 Double Diode Triode Second Detector, A.V.C. and Rectifier

4. Type 6BG7 Pentode Output Amplifier.

5. Type 5Y3G Rectifier Tube

6. Type 5Q2A Cathode-Ray Tungsten Ray Tube

Tubes are available in all types and are sometimes equipped with universal transformers for output in 25, 40 and 60 volt circuits or in the primary taps for 115, 130, and 230 volts. (See parts list).

**Alignment Instructions:**

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking and monitoring all other possible causes of trouble, such as poor connections, open or grounded antenna, antenna lead, low line voltage, defective tubes, condensers, etc.

The missing condenser (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screwdriver.

**Resonance Indicator:**

Use as a resonance indicator an output meter connected in the primary of the speaker input transformer in such a manner as to be used by means of an adapter between the plate and screen terminals.

The maximum deflection of the A.O. meter indicates the top of the broadcast band.

**Broadcast Band Alignment:**

535 to 1725 Kilocycles

With band changing switch in the broadcast position, extreme right of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, make the following adjustments:

(a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 2), to resonance (see Fig. 3, top view).

(b) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 2), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

(c) Repeat adjustments "a" and "b" until sensitivity is maximum.

(d) Check for tracking and sensitivity at 1400, 1600, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

**Fig. 3—Bottom View Showing Trimmers**

**Dummy Antennas:**

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

**Dummy 1:** (I.F.)—Consists of a 1 mil. condenser connected in series with the external oscillator.

**Dummy 2:** (Broadcast)—Consists of a 200 mil. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

**Dummy 3:** (Short Wave)—Consists of a 1 mil. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.
ARVIN CAR RADIO MODEL 5
ADJUSTMENT OF INTERMEDIATE FREQUENCY STAGES

1. Connect the balancing oscillator to the grid cap of the 6A8 tube through a .002 mfd. condenser. Place a 200,000 ohm resistor between the grid cap of the 6A8 and the grid clip which normally fits on the cap of the 6A8 tube. This will maintain the bias on this tube during alignment.

2. Adjust padder Nos. 1, 2, 3, and 4 for maximum output.

ALIGNMENT OF OSCILLATOR AND ANTENNA TRIMMERS

1. Connect the balancing oscillator to the antenna lead wire through a 50 uuf. dummy antenna. Rotate the rotor plates in the radio chassis tuning condenser completely out of mesh.

2. With an input frequency of 1,575 K. C. adjust Padder No. 5 to resonance.

3. Reset the balancing oscillator to 1,400 K. C. Rotate the tuning condenser until the signal is tuned to resonance. Reduce the output of the balancing oscillator until the signal barely deflects the output meter.

4. Adjust padder No. 6 until a maximum output reading is obtained. Check the sensitivity. See rating above.

5. After installation of the radio receiver in an automobile, tune in a very weak station between 1,300 and 1,500 K. C. and readjust padder No. 6 for maximum output.

The sensitivity of this receiver may be determined by reading the number of microvolts input required to produce 500 milliwatts output. That output is obtained when a reading of 1.2 volts across the voice coil of the speaker is indicated by the output meter.
MODEL No. 5
Top Chassis View

Bottom Chassis View

MODEL 5 SOCKET VOLTAGES

Tube | Heater | Votage | Suppressor | Screen | Grid
--- | --- | --- | --- | --- | ---
6AQ | 6.3 | 0 | 86 | 190
6CG | 6.3 | 0 | 86 | 190
607C | 6.3 | 4 | | 125
6AKG | 6.3 | 0 | 190 | 180
6X5G | 6.3 | 0 | 190 | 180

Sensitivity: 1.2 Volts across voice coil
Gain: 2500 Microvolts

*Antenna Input (1,000 K.C.)
657 T.F. Grid (455 K.C.)
5500 Microvolts
6648 Mixer Grid (1,000 K.C.)
400 Microvolts
648 Antenna Grid (1,000 K.C.)
240 Microvolts

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NOBLITT SPARKS INDUSTRIES

Power Supply: 6 Volt Storage Battery Ampere Drain: 5.7 Amperes

Power Output: 3.3 Watts

MODEL 6
Schematic, Parts Voltage, Specs., Tuner, Alignment

TUBES:

6A8  1st Detector, Oscillator
6K7  I. F. Amplifier
6Q7G 2nd Detector, 1st Audio, A. V. C.
6K6G Audio Output
6X5G Full Wave Rectifier

FREQUENCY RANGE: 1,540-510 Kilocycles

BALANCING INSTRUCTIONS

1. Connect the balancing oscillator to the grid cap of the 6A8 tube through a .0002 mfd. condenser. Place a 200,000 ohm resistor between the grid cap of the 6A8 and the grid clip which normally fits on the cap of the 6A8 tube. This will maintain the grid bias on the tube during alignment.

2. Adjust padders 1, 2, 3, and 4 for maximum output.

3. Rotate the Variator shaft to its mid-point position.

4. Reading from left to right the push buttons cover the following frequencies:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1550-1050</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>1350-850</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>C</td>
<td>1350-850</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>D</td>
<td>1100-650</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>E</td>
<td>1100-650</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>F</td>
<td>950-510</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

SENSITIVITY: (Specified for 500 milliwatts output. 1.2 volts across voice coil of speaker.)

- 1000 K.C.—Ant. (50 uuf dummy) 8.2 Microvolts
- 1000 K.C.—Grid Cap 6A8 Tube 130 Microvolts
- 455 K.C.—Grid Cap 6A8 Tube 110 Microvolts
- 455 K.C.—Grid Cap of 6K7 Tube 5,200 Microvolts

Push button frequencies are adjusted by the padder screws directly above and below each individual push button. For example, suppose a station operating on 1400 K.C. was desired; this is within the range of button A only.

a. Connect a balancing oscillator to the set antenna terminal through a 50 uuf dummy antenna.

b. With an input frequency of 1400 K.C., adjust padder No. 5 to resonance. Adjust padder No. 6 for maximum output.

Follow the same procedure for any of the other buttons always selecting a frequency within range of the respective buttons.

5. Final adjustment of the Antenna padders should be made with the receiver installed in the car connected to the car antenna.
MODEL 6 - TOP VIEW

MODEL 6 - BOTTOM VIEW

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MODEL 22A ARVIN CAR RADIO BALANCING INSTRUCTIONS

SPECIAL NOTE: Model 22A Arvin Car Radio has been designed to utilize the advantages of the exclusive Arvin Permatune Intermediate Frequency Transformers which are prebalanced at the factory and sealed to prevent frequency drift. This Arvin feature greatly simplifies balancing procedure. It is necessary, therefore, to adjust only the three screws located on the tuning condenser as follows:

1. Rotate the tuning condenser completely out of mesh. Connect the balancing oscillator to the antenna lead through a 200 uuf. dummy antenna. Ground the balancing oscillator to the antenna cable shield.
2. With the balancing oscillator set to 1,575 K. C. adjust padder No. 1 to resonance.
3. Reset the balancing oscillator to 1,400 K.
4. Adjust padders Nos. 2 and 3 until a maximum output reading is obtained.
5. After installation of the radio receiver in an automobile, tune in a very weak station between 1,300 and 1,500 K. C. and readjust padder No. 3 for maximum output.

The sensitivity may be determined by reading the number of microvolts input required to produce 500 milliwatts output. That output is obtained when a reading of 1.2 volts across the voice coil of the speaker is indicated by the output meter.

Form No. RS10 Jan. 1938
MODEL 32 ARVIN CAR RADIO

BALANCING INSTRUCTIONS

3. Reset the balancing oscillator to 1,400 K.C.; rotate the tuning condenser until this signal is tuned to resonance. Reduce the output of the balancing oscillator until the signal barely deflects the output meter.

4. Adjust padder Nos. 2 and 3 until a maximum output reading is obtained.

5. After installation of the radio receiver in an automobile, tune in a very weak station between 1,300 and 1,500 K.C. and readjust padder No. 3 for maximum output.

The sensitivity of this receiver may be determined by reading the number of microvolts input required to produce 100 watt output. That output is obtained when a reading of 1.9 volts across the voice coil of the speaker is indicated by the output meter.
FOR BALANCING INSTRUCTIONS

MODEL 9A ARVIN CAR RADIO

Special Note: All Arvin 1937 model car radios are designed to use the Exclusive Arvin Permaset prebalanced intermediate frequency transformers, which require no adjustment whatsoever. This Arvin feature greatly simplifies balancing procedure. It is necessary, therefore, to adjust only the three screws located on the tuning condenser as follows:

See page 51 for trimmer condenser locations.

1. Rotate the tuning condenser completely out of mesh. Connect the balancing oscillator to the antenna lead. Ground the balancing oscillator to the radio chassis.

2. With the balancing oscillator set to 1575 K. C. adjust padder condenser No. 1 for maximum output.

3. Reset the balancing oscillator to 1400 K. C. Rotate the tuning condenser until this signal is tuned to resonance. Reduce the output of the balancing oscillator until the signal barely deflects the output meter.

4. Adjust padders No. 2 and No. 3 until maximum output reading is obtained.

5. After installation in car tune in a WEAK station between 1150 and 1400 K. C. and readjust padder No. 3 for maximum output.
**MODEL No. 42**

**Top Chassis View**

- **Frequency Range:** 1,575-540 Kilocycles
- **Power Output:** 12.0 Watts
- **Speaker:** 8" separate case type; other type optional.
- **Voice Coil:** E-9 3 Ohms; E-10 3 Ohms
- **Power Supply:** 6-volt storage battery
- **Ampere Drain:** 8 Amperes
- **Dial Tuning Ratio:** 16:1
- **Chassis Shipping Weight:** 19 pounds

**Bottom Chassis View**

- **Tubes:**
  - 6G6, 6G7, 6G7G, 6G5, 6N7, 6X5G
- **Model No. 42 Layout, Specs.**

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Voltage Alignment

Specifications

NOBLITT-SPARKS INDUSTRIES, INC.

Models 58, 58A, 88
Chassis RE29, RE35
Schematic, Parts

Antenna M -49B 25L6G
30 6Q7G 455 IF 6K7 6A8 30
6K7 6A8
C1 - C2 C172 C9 17-4292 .001 mfd. 600 volt
0104 17-4206
Ref. No. Part No. Description Price
R150 17-14242 5,000,000 ohm. watt
8149 17-14241 150 ohms watt
R-113 17-14178 250,000 ohms watt
R27 R59 17-4191 15,000 ohm. watt
n 2.5n
17-15900 Tuning Condenser 3.00
17-14239 20-20 mfd. 150 volt 2.25
17-14015
17-1424f. 17-4788 2,000,000 ohms
Part
RESISTORS
R 17-14998 Needle cup
34-13360 Dial drive takeup spring
29-13583 Dial drive cord
29-13470 Tuning shaft retaining washer
83-2357 Grille cloth (ivory rayon)
28-5188 Dial drive
Part
CONDENSERS
C112
CST
C174
SW1
Operation
ROWWE DIAL
1. Antenna Wire
2. Antenna Wire
3. Antenna Wire

455 KC

IF PEAK

All voltage readings taken to cathode terminal of 6A8 tube.

* Circuit diagram of Radio Chassis RE29 is same as above except that R106 is connected between points X & Y and phone switch and pickup is not included.

CAUTION: The signal generator dummy antenna should be grounded to the radio chassis through a .10 mfd. condenser. Do not make a direct connection as the chassis of the radio is connected directly to one side of the 110 volt light lines and may seriously damage the balancing oscillator attenuator if connected without a blocking condenser

Operation No. Connect Balancing Oscillator to: Balancing Oscillator Weekly Adjust Padder Number Dial Setting
1. "6A8 Grid Cap 455 KC 1.2, 3, & 4 600 KC
2. Antenna Wire 1725 KC 5 1725 KC
3. Antenna Wire 1400 KC 6 1400 KC

I.F. sensitivity should be 150 microvolts minimum for 50 milliwatts output.

DIAL LIGHT - Mazda 51 FREQUENCY RANGE - 1725 to 545 KC POWER OUTPUT - 2.0 Watts

6A8 - 1st Detector, oscillator 6K7 - I.F. Amplifier 6Q7G - 2nd Detector, 1st audio 25L6G - Power output audio 256G - Rectifier M-49B - Balast resistor

The generator dummy antenna should not make direct connection to one side of the 110 volt light lines and may seriously damage the balancing oscillator attenuator if connected without a blocking condenser.

CABINET DIMENSIONS
Model 58-58A width 11 1/2" height 8" depth 6 1/4"
Model 88 width 14 1/4" height 10 3/4" depth 11 1/8"
SPEAKER - 5" Electrodynamic; 3 ohm voice coil VOLTAGE AND FREQUENCY - AC - 119 volts, 40-60 cycles DC - 110 volts
SENSITIVITY - 80 Microvolts minimum for 500 milliwatts output
WATS POWER CONSUMPTION - 40 watts APPROVED & UNDERWRITERS

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**Parts Alignment Specifications**

**NOBLITT-SPARKS INDUSTRIES, INC.**

**ARVIN RADIO CHASSIS RE26**

**MODEL 68**

**RADIO MODEL NUMBER 68**

---

**NOTE:** All voltage readings taken to chassis base. Allowable voltage variation plus or minus 2% from values shown.

---

**Parts, Alignment, Specifications**

**TUBES**

- 6A8 - 1st Detector, Oscillator
- 6K7 - I.F. Amplifier
- 6Q7G - 2nd Detector, A.V.C., Audio Amplifier
- 6K6G - Power Output Amplifier
- 5Y3G - Rectifier

**DIAL LIGHT:** Mazda 51

**FREQUENCY RANGE:** 1725 to 5400 KC

**POWER OUTPUT:** 2.3 Watts

**SPEAKER:** 5" Electro Dynamic, 3 ohm Voice Coil

1600 Ohm Field

**VOLTAGE & FREQUENCY:** 117 V-60 cycles; AC only

**WATTS POWER CONSUMPTION:** 45 watts

**SENSITIVITY:** 20 microvolts minimum for 500 milliwatts output

**APPROVED BY:** Underwriters

**LICENSED UNDER:** RCA & Hazeltine Patents

**CHASIS DIMENSIONS:** width 10 3/4" height 6" depth 6 1/2"

**CABINET DIMENSIONS:** width 11 1/2" height 8" depth 6 1/4"

**AUTOMATIC TUNING:** 6 Push Button, Trimmer Tuned.

---

**Parts, Alignment, Specifications**

**Schematic, Voltage**

**Parts, Alignment, Specifications**

---

**Connect Balancing**

**Balancing to:**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Depress</th>
<th>Adjust</th>
<th>Padder Frequency</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A8 Grid Cap</td>
<td>455 KC</td>
<td>F</td>
<td>1,2,3, &amp; 4</td>
<td>1725 to 1350 KC</td>
</tr>
<tr>
<td>Red Antenna Wire</td>
<td>1200 KC</td>
<td>A</td>
<td>5 and 6</td>
<td>1500 to 1150 KC</td>
</tr>
<tr>
<td>Red Antenna Wire</td>
<td>1200 KC</td>
<td>B</td>
<td>7 and 8</td>
<td>1300 to 900 KC</td>
</tr>
<tr>
<td>Red Antenna Wire</td>
<td>1000 KC</td>
<td>C</td>
<td>9 and 10</td>
<td>1100 to 650 KC</td>
</tr>
<tr>
<td>Red Antenna Wire</td>
<td>800 KC</td>
<td>D</td>
<td>11 and 12</td>
<td></td>
</tr>
<tr>
<td>Red Antenna Wire</td>
<td>700 KC</td>
<td>E</td>
<td>13 and 14</td>
<td></td>
</tr>
<tr>
<td>Red Antenna Wire</td>
<td>600 KC</td>
<td>F</td>
<td>15 and 16</td>
<td></td>
</tr>
</tbody>
</table>

**Padders 5, 7, 9, 11, 13 and 15 are oscillator padders and will cover the range of frequencies shown above.**

---

**BALANCING INSTRUCTIONS**

All adjustments to be made for maximum output. Volume and tone controls in high position. Standard output is indicated by a reading of 1.2V AC across the speaker voice coil.

---

**Electrical and Mechanical Specifications**

- **5" ELECTRO DYNAMIC, 3 OHM VOICE COIL**
- **1600 OHM FIELD**
- **117 V-60 CYCLES; AC ONLY**
- **45 WATTS POWER CONSUMPTION**
- **20 MICROVOLTS SENSITIVITY FOR 500 MILLIWATTS OUTPUT**
- **APPROVED BY UNDERWRITERS**
- **LICENSED UNDER RCA & HAZELTINE PATENTS**
- **CHASSIS DIMENSIONS: WIDTH 10 3/4" HEIGHT 6" DEPTH 6 1/2"**
- **CABINET DIMENSIONS: WIDTH 11 1/2" HEIGHT 8" DEPTH 6 1/4"**
- **AUTOMATIC TUNING: 6 PUSH BUTTON, TRIMMER TUNED.**

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NOTE:
T-1, Antenna Coil
00-15921 and 6K7 Tube
located behind pushbutton
switch.

FOR TUNER DATA
SEE INDEX
### Operation Connect Sig. Input Adj. Set. Dial Switch no. Generator to Frequency Padder no. Setting Position Sensitivity

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>680 QHM 455 EC</td>
<td>1, 2, 3, 4</td>
<td>600 EC</td>
<td>Broadcast</td>
<td>150 uv</td>
</tr>
<tr>
<td>2</td>
<td>Antenna Wire 1755 EC</td>
<td>5</td>
<td>+1255 EC</td>
<td>Broadcast</td>
<td>150 uv</td>
</tr>
<tr>
<td>3</td>
<td>Antenna Wire 1400 EC</td>
<td>6</td>
<td>+1400 EC</td>
<td>Broadcast</td>
<td>150 uv</td>
</tr>
<tr>
<td>4</td>
<td>Antenna Wire 1725 EC</td>
<td>6</td>
<td>+1725 EC</td>
<td>Broadcast</td>
<td>150 uv</td>
</tr>
<tr>
<td>5</td>
<td>Antenna Wire 18.0 MC</td>
<td>8</td>
<td>+18.0 MC</td>
<td>Short Wave</td>
<td>150 uv</td>
</tr>
<tr>
<td>6</td>
<td>Antenna Wire 15.0 MC</td>
<td>9</td>
<td>+15.0 MC</td>
<td>Short Wave</td>
<td>150 uv</td>
</tr>
</tbody>
</table>

* Condenser should be wide open with dial pointer parallel to horizontal line above dial calibration.

** Sensitivity limit at 7.0 KC = 75 uv.

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---

**Schematic, Voltage, Trimmers, Alignment Parts**

**All voltages taken to ground with 110 Volts AC input. Allowable variation plus or minus 20% from values shown.**

### Parts (Sheet 1/2)

**Resistors**

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Capacitors**

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Inductors**

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Miscellaneous**

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Alignment**

**ARVIN MODEL 78 - RE37 CHASSIS**

(All sensitivities given for 200 milli-watt output = .61 V.A.C. across voice coil)

---

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MODEL 608 ARVIN RADIO

ELECTRICAL SPECIFICATIONS

TUBES:
6A7—1st Detector-Oscillator
6D6—1st F. Amplifier
6Q7G—2nd Detector, A V C 1st Audio Amplifier
25B6G—Audio Output Power Amplifier
25Z5—Rectifier
BK49D—Ballast

FREQUENCY RANGE:
Band A—550 to 1725 Kilocycles
Band B—2.00-6.27 megacycles

POWER OUTPUT: 1.9 watts

SPEAKER: 6" Dynamic, 3 ohm voice coil

VOLTAGE AND FREQUENCY: 110 V. AC or DC; 25 to 133 cycles

SENSITIVITY:
Band A—75 microvolts minimum for 50 milliwatts output
Band B—120 microvolts minimum for 50 milliwatts output

INTERMEDIATE FREQUENCY:
150 microvolts minimum for 50 milliwatts output; 456 Kilocycles

WATTS POWER CONSUMPTION: 70 watts

FOR SCHEMATIC SEE INDEX

MODEL 608 SOCKET VOLTAGES

<table>
<thead>
<tr>
<th>Tube</th>
<th>Heater</th>
<th>Cathode</th>
<th>Suppressor Grid</th>
<th>Screen Grid</th>
<th>Plate</th>
<th>Oscillator Grid</th>
<th>Anode Grid</th>
<th>Diode</th>
<th>Control Grid</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A7</td>
<td>6.3</td>
<td>1.6</td>
<td>1.6</td>
<td>90</td>
<td>100</td>
<td>3.7 V.</td>
<td>100</td>
<td>0</td>
<td>-15</td>
</tr>
<tr>
<td>6D6</td>
<td>6.3</td>
<td>1.6</td>
<td>1.6</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>0</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>6Q7G</td>
<td>6.3</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>0</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>25B6G</td>
<td>25.0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>0</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>25Z5</td>
<td>25.0</td>
<td>100</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100 (A.C., D.C.)</td>
<td>0</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Readings taken with a vacuum tube voltmeter and no input signal. With 100,000 microvolts input 6A7 and 6D6 grid bias will be approximately 70 volts.

Oscillator grid voltage 600 K. C. to 1500 K. C.

BALANCING INSTRUCTIONS

1. Connect the balancing oscillator to the grid cap of the 6A7 tube after removing the grid clip. With an input signal of 456 K. C., adjust padders 1, 2, 3 and 4 to maximum output. The Intermediate Frequency sensitivity should be at least 150 microvolts for 50 milliwatts output.

2. Rotate the tuning condenser to wide open position. Check the dial pointer to see that it is parallel to the horizontal line across the dial face.

3. Connect the signal generator to the antenna lead wire (green) on the rear of the receiver through a 200 microinchorafarad dummy antenna. With the dial pointer set to 1400 kilocycles and a similar input from the signal generator adjust padders No. 5 to resonance. Adjust padders No. 6 to maximum output.


5. Turn band switch to short wave position. Set dial pointer to 5 megacycles and with an input of the same frequency adjust padders No. 8 to resonance. Adjust padders 9 for maximum output.

6. With an input of 456 K. C. into the antenna wire of the receiver adjust padders No. 10 for minimum output. This is the wave trap circuit for 456 kilocycle code interference.
MODEL 608
Socket, Trimmers
Layout

NOBLITT-SPARKS INDUSTRIES, INC.

608 Top Chassis View

608 Bottom Chassis View

FOR SCHEMATIC SEE INDEX

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INSTRUCTIONS FOR SETTING UP ARVIN PRESTO-STATION-CHANGER

The Arvin Presto-Station-Changer offers a means whereby ten stations may be pre-selected and set up on the buttons so that thereafter an operator may receive any one of these ten stations by a simple direct mechanical motion applied to the dial.

Each button on the Arvin Presto-Station-Changer covers a certain group of frequencies on the dial. Identifying these buttons in a clockwise direction from the wide space between two of the buttons on the dial, each button covers a group of frequencies as follows:

1. East of scale to 1620 K.C.
2. 1620 to 1420 K.C.
3. 1420 to 1210 K.C.
4. 1210 to 1000 K.C.
5. 1000 to 910 K.C.
6. 910 to 790 K.C.
7. 790 to 680 K.C.
8. 680 to 620 K.C.
9. 620 to 575 K.C.
10. 575 K.C. to end of scale.

With these above bands in mind for each button, one should first select a station for each button whose transmission frequency falls within the band for that button. A list of these stations together with their frequencies should be made.

With this list made out, the actual operation of setting up the stations on the Arvin Presto-Station-Changer may be made. From this point on, the instructions will be general, applying to any of the buttons.

The receiver should be placed in operating conditions by connecting an antenna and plugging the line cord into a suitable socket. The receiver is turned on by means of the knob in the center of the front panel. This knob has three positions. In the full counterclockwise position (No. 1) the receiver is "off." In the center position (No. 2) the receiver is turned "on," and the automatic frequency control circuit is in operation. In the full clockwise position (No. 3) the receiver is turned "on," but the automatic frequency control circuit is no longer in operation. A three-position switch is provided as a convenience in setting up the Arvin Presto-Station-Changer, and for those who desire to accomplish exact manual tuning prior to holding the station in with the automatic frequency control circuit. To set up the Arvin Presto-Station-Changer, this center switch should be turned to the maximum clockwise position, i.e. position No. 3.

The hand switch should be in the broadcast or full counterclockwise position.

Unscrew the center knob by securely holding the escutcheon which covers the ten buttons, and turning the center knob in a counterclockwise direction. Remove both the center knob and the center escutcheon, exposing the buttons beneath.

Tune in each of the above selected stations manually. It should be noted that the button corresponding to the band in which this station falls is now approximately at the bottom of the dial. Loosen this button by turning the bakelite escutcheon clockwise not more than two full turns. Depress the button with the index finger of the left hand, and slowly rock the dial mechanism by turning the manual tuning control with the right hand, through an arc determined by the frequencies which are button controls.

While the button is depressed, no signal will be heard, due to the action of the muting switch. When this button engages the gate, a distinct click will usually be heard. That this button properly engages the gate can be determined by again turning the manual tuning control with the button depressed and noting that the dial movement is limited to the arc previously described. With the button still depressed, again tune in the desired station, noting the point of exact resonance on the electric eye above. While keeping this button depressed and "on station," tighten the bakelite cap with the right hand.

During this tightening operation, observe the electric eye to be sure that its degree of closure does not change.

To determine that a button has been properly set, turn the dial off station, and depressing the button just set, return it to its former position of engagement with the gate. The station should again be tuned in. If it is not, loosen the button and repeat the operation just described.

When the button has been properly set, remove the station identification disc from the slots supplied in the envelope in which these instructions were found. Place this disc in the center of the bakelite cap and push down firmly all around the edge.

There will be found in the envelope containing these instructions another small envelope in which has been placed ten transparent celluloid discs. One of these celluloid discs should be placed in the bakelite cap over the station identification disc and firmly pressed in place. The disc just described for setting up the one button on the Arvin Presto-Station-Changer should be repeated for all other stations chosen in above manner.

When all stations have been set up, replace the center escutcheon and screw on the center knob.

When using the Arvin Presto-Station-Changer to tune in your favorite stations, the switch in the center position of the panel should be in its No. 2 position. To perform the set of tuning, place the index finger on the bakelite escutcheon beneath the switch, push the button in firmly and rotate the dial to left or right with your other finger until the dial locks with this button at the bottom. Withdraw the finger from the muting switch, allowing the set to operate.

INSTRUCTIONS FOR SETTING UP ARVIN PUSH-BUTTON TUNING

FIRST: Put the set in operation in accordance with the instruction sheet furnished with the receiver. Next, make a list of the stations that are desired on the push-button selector, arranging them in order as to their assigned frequencies and placing the lowest frequency station at the top of the list, etc.

SECOND: Assign the stations to the buttons, starting with the first button on the left and the station with the lowest frequency—making certain that each station falls into the assigned frequency group for each button as listed below:

<table>
<thead>
<tr>
<th>Button</th>
<th>Kilocycle Coverage</th>
<th>Station Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>530-610</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>530-610</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>500-700</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>500-700</td>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
<td>680-900</td>
<td>5.</td>
</tr>
<tr>
<td>7.</td>
<td>800-1150</td>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
<td>800-1150</td>
<td>8.</td>
</tr>
<tr>
<td>10.</td>
<td>1050-1550</td>
<td>10.</td>
</tr>
</tbody>
</table>

The above frequency coverage is only approximately for each button, as there is a tolerance at each end of the coverage so that additional stations may be accommodated should there be more stations desired in a given group than there are buttons allotted to that group.

THIRD: The actual adjustment is made as follows:

(1) Loosen the electric-eye tube and turn it around so that it is visible from the back of the set when making adjustments. (2) With a long screw-driver, adjust the lower push screw directly behind the first button until the program from the desired station is audible.

FIFTH: Adjust the push condenser screw on the middle row directly behind the first button for maximum closing of the electric-eye tube. Follow the same procedure for the second push screw on the top row directly behind the first button.

SIXTH: Now readjust the button screw for maximum closing of the electric-eye tube and repeat on the middle and top screws. The first station is now tuned in properly on No. 1 button. Care must be taken so that the same station is tuned in on the lower push screw as is tuned in manually, as it is possible to confuse another station broadcasting the same program if it is in a "chain program" with the original.

SEVENTH: Locate the second station on the list by manually tuning it in with the wave-band switch in the broadcast position. Then change the wave-band switch to push-button station—this time by adjusting the lower push screw directly behind the second button. Then follow the same procedure as when setting up the first button. Repeat this for the remaining buttons.

FINALLY: After all buttons are set, the middle knob should be switched to "AFC on" position and left there whenever the Push Button Station Selector is used.

After all the stations have been selected their respective call letters may be inserted in the escutcheon plate provided in the receiver operating instruction envelope.

Cut out all letters of the desired stations and place them one of the small tabs of celluloid provided. Push the call letter and celluloid tab together into the slot provided in the escutcheon.

When all of the tabs have been inserted the escutcheon should be attached to the radio cabinet by the wood screws and trim washers provided.

---

[Image of Arvin Presto-Station-Changer]
BALANCING INSTRUCTIONS

All sensitivity measurements should be made with a standard output or AC voltmeter connected directly across the voice coil terminals of the speaker. For convenience in checking sensitivity, standard output is obtained when a reading of 1.12 V is reached. For sensitivity measurements it is necessary to use a calibrated signal generator although any good balanced oscillator is satisfactory for aligning the 12- tube Arvin Radio chassis. If a calibrated signal generator is used for the balancing procedure described, a dummy antenna should be inserted between the radio chassis and the generator as follows:

Broadcast Band: 200 mW
Mid-band: 400 mW
Short Wave Band: 400 mW

Special Note: Place the receiver in operation by turning the AVC to the extreme right. Switch is located in the center of the radio chassis.

Adjustment of 100 K Intermediate Frequency Stages
Connect the signal generator to the grid cap of the 3rd 6A8G tube through a 100 mW condenser. Place a 200,000 ohm resistor between the grid cap of the 6A8G and the grid clip leading to the 655 K C. 1 F. Transformer. This will maintain the AVC bias on this tube during alignment.

Adjust paddles 1, 2, 3 and 4 for maximum output.

Adjustment of Discriminator Circuit with a Vacuum Tube Voltmeter
1. Connect the vacuum tube voltmeter between ground and the No. 8 cathode terminal of the 6HG6 discriminator bias rectifier tube.
2. Turn paddle No. 5 to maximum clockwise position.
3. Adjust paddle No. 6 for minimum voltage as indicated by vacuum tube voltmeter.
4. Short cathode of 6HG6 tube to ground and adjust vacuum tube voltmeter to half scale reading. This reading should be zero since voltages either positive or negative with respect to ground potential may be read without the necessity of reversing the voltmeter input terminals. Disconnect 6HG6 cathode from ground.
5. Adjust paddle No. 5 until half scale reading is obtained that was selected above when the cathode of the 6HG6 tube was grounded.
6. Check this adjustment further by varying the frequency of the signal generator plus and minus noting the maximum positive and negative voltages developed as indicated by the vacuum tube voltmeter. The voltages developed above and below the half scale reading should be equal or at least within 10% of each other. Disconnect the vacuum tube voltmeter.

MODEL 1247 ARVIN HOME RADIO

Adjustment of the Mid-Board Paddles
1. Substitute for the 200 mW dummy antenna one having 800 ohms output impedance.

Adjustment of 4.75-7.5 M. C. Band Paddles
(Dial Scale Printed in Black)
1. Set band switch indicator to short wave position indicated by the words "Short Wave" printed in black. Rotate dial pointers to 7.5 megacycles and adjust paddler No. 17 to resonance. This may be accomplished by adjusting the paddle to the extreme clockwise position. Rotate paddle screw counter-clockwise, selecting the second resonance point reached.
2. Adjust paddles 18 and 19 for maximum output.
3. Rotate dial pointer to 5.0 megacycles. Adjust series paddler No. 20 to maximum output.

Adjustment of 7.5-12 M. C. Band Paddlers
(Fig Scale Printed in Blue)
1. Set band switch indicator to short wave position indicated by the words "Short Wave" printed in red. Rotate dial pointers to 11.5 M.C. and adjust paddler No. 21 to resonance. This may be accomplished by adjusting the paddler to the extreme clockwise position. Rotate paddle screw counter-clockwise, selecting the second resonance point reached.
2. Adjust paddler 22 and 23 for maximum output.

Check the Receiver for Sensitivity
After completion of balancing procedure the radio receiver should be checked for sensitivities as follows:

Sensitivity

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Average Sensitivity for Standard Output (12.12 words per minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000 K. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.600 K. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.45 M. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.30 M. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.25 M. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.20 M. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.15 M. C.</td>
<td>10 Microvolts</td>
</tr>
<tr>
<td>0.10 M. C.</td>
<td>10 Microvolts</td>
</tr>
</tbody>
</table>

Average Sensitivities per Stage (1.12 Volts across Voice Coil)

Point of Input from Signal Generator | Frequency | Input Required to Operate (1.12 Volts across Voice Coil) |
--- | --- | --- |
Diode 6HG6 | 100 K C. | 600,000 Microvolts |
6A8G Grid | 100 K C. | 25,000 Microvolts |
7A8G Grid | 100 K C. | 1,000,000 Microvolts |
7A8G Grid | 100 K C. | 1,200,000 Microvolts |
7A8G Grid | 100 K C. | 1,500,000 Microvolts |

Special Instructions for Model 1237 Arvin Radios with Presto Station Changer
Arvin radio chassis model 1237 with Presto Station Changer have the broadcast paddler located in the coil cans rather than on the under side of the radio chassis as Model 1237-D Push Button chassis. The paddlers are located as follows: The oscillator paddle is the top adjusting screw in the oscillator coil can, located along side the rear section of the tuning condenser. The R. F. paddle condenser is located in the top position on the coil can along side the center section of the tuning condenser. The antenna paddle condenser is similarly located in the coil can along side the front section of the tuning condenser. The 600 K C. paddling condenser is located in identically the same place as the series paddler No. 13 on the 1237-D chassis.

Adjustment of the Mid-Board Paddlers
1. Substitute for the 200 mW dummy antenna one having 800 ohms output impedance.
CHASSIS 1237D
ARVIN
HOME RADIO

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FIG. 4 OLDS MODEL 982043 CIRCUIT DIAGRAM

TUBE SOCKET VOLTAGES

<table>
<thead>
<tr>
<th>TYPE</th>
<th>FUNCTION</th>
<th>H</th>
<th>P</th>
<th>S</th>
<th>Gs</th>
<th>G1</th>
<th>G2</th>
<th>K</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>6K7G</td>
<td>R.F. Amplifier</td>
<td>5.95</td>
<td>236</td>
<td>87</td>
<td>3.9</td>
<td>-</td>
<td>-</td>
<td>3.9</td>
<td>0</td>
</tr>
<tr>
<td>6A8G</td>
<td>Translator</td>
<td>5.95</td>
<td>244</td>
<td>87</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.9</td>
<td>0</td>
</tr>
<tr>
<td>...</td>
<td>Oscillator</td>
<td>5.95</td>
<td>120</td>
<td>-</td>
<td>-</td>
<td>-18</td>
<td>+120</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6K7G</td>
<td>I.F. Amplifier</td>
<td>5.95</td>
<td>244</td>
<td>87</td>
<td>3.9</td>
<td>-</td>
<td>-</td>
<td>2.5</td>
<td>-</td>
</tr>
<tr>
<td>6G7G</td>
<td>Det. A.V.C. 1st A.F.</td>
<td>5.95</td>
<td>130</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7.4</td>
<td>5.7</td>
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<tr>
<td>6N6G</td>
<td>Output</td>
<td>5.95</td>
<td>255</td>
<td>244</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6X5G</td>
<td>Rectifier</td>
<td>5.95</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Total ampere drain at 6 volts is 7.9

FOR

CONNECT TERMINALS
TOGETHER

DISTANCE  1 & 4
LOCAL     1 & 3
TONE CONTROL  1 & 2
(FIGURE 1) LOCAL DISTANCE SWITCH CONNECTION

No. 1 - Connects to cable shielding.
No. 2 - Connects to blue wire (tone control)
No. 3 - Connects to yellow wire (local)
No. 4 - Connects to red wire (distance)

NOTE: When peaking IF. transformers without tone control cable plug, short No. 1 and No. 4.

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In order to reduce the battery drain on Model 982043, the rectifier tube 6Z5G has been changed to an OZ4G rectifier tube. This change may be made in the field by adding the following items:

1. Choke Coil, Part No. 7233229, 1 ohm 400 V. Condenser, Part No. 7232184.

Shield for the OZ4G rectifier tube, Part No. 7232184.

Olds Model 982043
Date: 11-1-36

FIG. 1

MODEL 982043 Early
Socket, Trimmers
Chassis

OLDSMOBILE MOTOR CAR CO.

Voltage (Field Change)

Olds Model 982043
Below Serial No. A-20,000

Date: 5-13-37

© John F. Rider, Publisher
Fig. (1) Olds Model 982043 Circuit Diagram

IF PEAK 262 KC.

Beginning with Serial No. A-20,000

Date: 5-13-37

Fig. (2) Olds Model 982043 Socket Voltage

Fig. (3) Olds Model 982043 Parts Layout

©John F. Rider, Publisher
Before shorted.
Short circuit the connections
Connecting DO the use of alignment
the Sensitivity Control 7230712
quency made near
590 the receiver operates with the same high selectivity. 1210697
9-4 Peaking the I.F. stages at 262
If the oscillator padding condenser was materially out
oscillator padding condenser was materially out
the same time rock the gang condenser completely out
If the oscillator padding condenser was materially out
setting
the grid clip
The grid clip
a .1
the ground lead of the test
the signal lead of the test
a .1
in series
that will give
repeated, using the lowest oscillator output
the receiver from affecting
the I.F. stages at 262
a .1
the I.F. stages at 262
a .1
the oscillator trimmer
the antenna compensating condenser
is
the signal lead of the test
the ground lead of the test
to
the grid clip
(a) Connect the ground lead of the test oscillator to the chassis frame.
(b) Set the test oscillator on the UHF K.C.
(c) Turn the volume control of the receiver full.
(d) Peak both I.F. trimmers on the 1st I.F. coil. This is part 5 in the top view of the receiver, (Figure 2).
(e) Then peak both trimmers on the 1st I.F. coil, part 4 in the drawing, (Figure 2).
(f) In order to insure accurate settings of the I.F. trimmers, the above adjustments should be repeated, using the lowest oscillator output that will give a reasonable deflection of the output meter pointer. Make all adjustments by the following procedure.

ALIGNING OSCILLATOR AND R.F. STAGES

(a) Connect the signal lead of the test oscillator to the antenna connector through a .0056 mfd. condenser.
(b) Set the test oscillator at exactly 1560 K.C.
(c) Turn the gang condenser completely out of mesh.
(d) Adjust the oscillator trimmer for maximum output. (Center section of the gang condenser).
(e) Set the test oscillator at 1400 K.C.
(f) Tune the gang condenser for maximum output.
(g) Adjust the R.F. trimmer for maximum output. (Top section)
(h) Adjust the antenna compensating condenser for maximum output. (Part 77 in Figure 3.)
(i) Set the test oscillator at 600 K.C.
(j) Tune the gang condenser for maximum output.
(k) Adjust the oscillator padding condenser (Part 28 in Figure 3) and at the same time rock the gang condenser back and forth through the signal. This operation should be continued until no further increase can be obtained.

Repeat: E, F, G, H.

If the oscillator padding condenser was materially out of adjustment, it may be necessary to repeat the entire procedure for accurate adjustment.

DO NOT ATTEMPT TO PEAK THE I.F . STAGES OF THIS RECEIVER WITHOUT CAREFULLY NOTING THE FOLLOWING INSTRUCTIONS:

Connecting the Output Meter
Connect one terminal of the output meter to the plate of the 6606 output tube. Insert
in series with this lead a .1 mfd. or larger, 600 volt condenser. Connect the other
end of the condenser to the chassis frame. If the series of the output meter
is to prevent the meter from damage. 1. Peaking the I.F. stages at 262 Kilocycles
Before any attempt is made to peak the receiver, the "sensitivity" control must be turned to the "Distance" position.
If the control head is not removed from the car, use any convenient method to short
the connections of the tone control and sensitivity control receptacles.

Short circuit the connections as shown in Figure 1 with the control plug properly
shorted.
(a) Connect the ground lead of the test oscillator to the chassis frame.
(b) Connect a .1 mfd. condenser in series with the other lead and connect this lead to the grid clip of the transistor 6AH6 tube leaving the grid clip in place.
(c) Turn the volume control of the receiver full.
(d) Peak both I.F. trimmers on the 1st I.F. coil. This is part 5 in the top
view of the receiver, (Figure 2).
(e) Then peak both trimmers on the 1st I.F. coil, part 4 in the drawing, (Figure 2).
(f) In order to insure accurate settings of the I.F. trimmers, the above adjustments should be repeated, using the lowest oscillator output that will give a reasonable deflection of the output meter pointer. Make all adjustments by the following procedure.

ALIGNING OSCILLATOR AND R.F. STAGES

(a) Connect the signal lead of the test oscillator to the antenna connector through a .0056 mfd. condenser.
(b) Set the test oscillator at exactly 1560 K.C.
(c) Turn the gang condenser completely out of mesh.
(d) Adjust the oscillator trimmer for maximum output. (Center section of the gang condenser).
(e) Set the test oscillator at 1400 K.C.
(f) Tune the gang condenser for maximum output.
(g) Adjust the R.F. trimmer for maximum output. (Top section)
(h) Adjust the antenna compensating condenser for maximum output. (Part 77 in Figure 3.)
(i) Set the test oscillator at 600 K.C.
(j) Tune the gang condenser for maximum output.
(k) Adjust the oscillator padding condenser (Part 28 in Figure 3) and at the same time rock the gang condenser back and forth through the signal. This operation should be continued until no further increase can be obtained.

Repeat: E, F, G, H.

If the oscillator padding condenser was materially out of adjustment, it may be necessary to repeat the entire procedure for accurate adjustment.
Note A - R31 used only on models dated 11-1-36 and 3-7-38

Note B - R46 used only on model dated 5-13-37

Note C - R47 used only on model dated 5-13-37

Note D - R46 used only on models dated 5-13-37 and 3-7-38

Note E - Heater was grounded on models dated 11-1-36, 5-13-37 and 3-7-38

Note F - Heater was connected to A "Hot" on models 11-1-36, 5-13-37 and 3-7-38

**TUBE SOCKET VOLTAGES**

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
<th>H</th>
<th>P</th>
<th>S</th>
<th>Gs</th>
<th>G1</th>
<th>G2</th>
<th>K</th>
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<tbody>
<tr>
<td>6U7G</td>
<td>R-F Amplifier</td>
<td>5.75</td>
<td>230</td>
<td>60</td>
<td>2.5</td>
<td>-</td>
<td>-</td>
<td>2.5</td>
</tr>
<tr>
<td>6A8G</td>
<td>Translator</td>
<td>5.75</td>
<td>230</td>
<td>-</td>
<td>60</td>
<td>3.0</td>
<td>60*</td>
<td>2.5</td>
</tr>
<tr>
<td>6U7G</td>
<td>I-F Amplifier</td>
<td>5.75</td>
<td>230</td>
<td>60</td>
<td>5.0</td>
<td>-</td>
<td>-</td>
<td>5.0</td>
</tr>
<tr>
<td>6Q7G</td>
<td>Det-1st A.F.</td>
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<td>80</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.2</td>
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<tr>
<td>6F6G</td>
<td>Output</td>
<td>5.8</td>
<td>220</td>
<td>230</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>14.0</td>
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<tr>
<td>6X5G</td>
<td>Rectifier</td>
<td>5.75</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>240</td>
</tr>
</tbody>
</table>

* AC

"B" supply drain approximately 52 ma.***

Current drain 6.8 amperes

** G2 is 165 volts for model dated 5-13-37

*** "B" supply drain is 62MA for model dated 11-1-36

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1. Aligning 1-F Stages at 262 Kilocycles

**IMPORTANT**: The "Local-Distance" switch on the tuning control used with this receiver is used to control the alignment of the first 1-F coil windings. The capacity existing between the leads and the shielding of the cable connecting to the switch in the tuning control is part of the 1-F tuned circuit and must be taken into consideration when aligning the 1-F stages.

(a) Connect the signal lead of the signal generator to the grid cap of the 6AQ5 Translator Tube through a 1 mfd. condenser, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the chassis frame.

(b) Insert the four prong plug of the tuning control cable into the socket provided on the receiver chassis. Turn switch on tuning control to "DISTANCE" position. (If the receiver is aligned with the switch in the "local" position, the "Local-Distance" switch will operate backwards.)

(c) Connect the output meter from the plate prong of the 6F6G to ground. Care should be taken when connecting the output meter to insert a series condenser to protect the meter from D.C. voltages.

(d) Set the signal generator to exactly 262 K.C.

(e) Adjust the trimmers on the 1-F coils for maximum output. These adjustments should be repeated several times.

**Checking 1-F Band Spread**

The Model 165 Cathode Ray Oscillograph should be used to check the 1-F band spread. After completing the "Alignment Procedure", slight adjustment of the 1-F stages may be found necessary in order to obtain a symmetrical selectivity curve.

2. Aligning at 1220 Kilocycles

Leave the signal generator leads connected the same as for aligning the 1-F circuits. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop. Set the signal generator to 1220 kilocycles. Adjust the parallel trimmer for the oscillator section of the condenser gang for maximum output. (It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the entire high frequency end of the dial.)

3. Aligning at 540 Kilocycles

Leave signal generator leads connected the same as before. Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop. Set the signal generator to 540 K.C. Adjust the oscillator tuning condenser located on the underside of the receiver sub-panel to maximum output.

4. Aligning at 1400 Kilocycles

Remove the signal lead of the signal generator from the grid of the translator tube and connect to the antenna terminal of the receiver THROUGH A .0005 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .0005 mfd. mica condenser be used in aligning the antenna stages of these receivers in order that this circuit can be made to track properly.)

Set the signal generator to 1400 K.C. Turn the condenser rotor plates until the frequency is tuned in with maximum output. Adjust the R-F parallel trimmer on the condenser gang and the antenna compensating condenser which is the parallel trimmer on the condenser gang.

5. Aligning at 600 Kilocycles

The oscillator padding condenser was previously adjusted at 540 K.C. However, it is necessary in most cases to repeat the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

Set the signal generator on 600 K.C. Turn the condenser rotor plates until the signal from the signal generator is tuned in with maximum output. Maintain a low output signal from the signal generator and readjust the oscillator tracking condenser while rocking the variable condenser gang tuning shaft back and forth through the signal. This operation should be continued until no further increase in output can be obtained.
**FIG. 3 OLDS MODEL 982045 CIRCUIT DIAGRAM**

**(PRODUCTIONS DATED 11-1-36 & 3-7-38)**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>FUNCTION</th>
<th>H</th>
<th>P</th>
<th>S</th>
<th>Gs</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>6U7G</td>
<td>R.F. Amplifier</td>
<td>5.75</td>
<td>230</td>
<td>60</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>6U7G</td>
<td>Translator</td>
<td>5.75</td>
<td>230</td>
<td>60</td>
<td>-10.0</td>
<td></td>
</tr>
<tr>
<td>6J5G</td>
<td>Oscillator</td>
<td>5.75</td>
<td>230</td>
<td>-</td>
<td>-3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>6U7G</td>
<td>I-F Amplifier</td>
<td>5.75</td>
<td>230</td>
<td>60</td>
<td>-</td>
<td>6.0</td>
</tr>
<tr>
<td>6V7G</td>
<td>Det.--1st Audio</td>
<td>5.75</td>
<td>90</td>
<td>-</td>
<td>-</td>
<td>7.5</td>
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<tr>
<td>6J5G</td>
<td>Driver</td>
<td>5.75</td>
<td>230</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6N7G</td>
<td>Output</td>
<td>5.8P1P2</td>
<td>230P1P2</td>
<td>-</td>
<td>-</td>
<td>240</td>
</tr>
<tr>
<td>6X5G</td>
<td>Rectifier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*AC Current 7.8 amperes. "B" supply drain approximately 52 Ma.

Reading taken with a 1000 ohms per volt, voltmeter. "A" Battery - 6 Volts.
TO ELIMINATE HARMONIC TWEETS

COMPLAINT: HIGH PITCHED WHISTLE OCCURRING WHEN TUNING INTO SIDE BAND OF STATION CARRIER AT APPROX. 766 K.C.

It has been found that some of the early deluxe radios, Model 982045, do have an objectional "tweet" although there are a percentage which appear normal.

The remedies below will eliminate this on even the worst offenders.

1. Move the grid lead of the 6U7G R.F. tube away from the 6N7G output tube.

2. The 1 MEG. A.V.C. filter resistance item No. 37 should be removed from the mounting strip in the front of the 2nd I.F. transformer and mounted near the sub-panel away from the I.F. transformer, to reduce coupling. (See sketch)

3. Bond the antenna connector metal case to the chassis ground.

4. Install a shield over the grid lead to the 6B7 Tube.

5. Remove the shield from the 6J5G audio tube.

6. Install a shield over the 6V7G detector tube (use same type shield as used on a 6AG6 tube).
The Oldsmobile Model 982085 is a six tube single unit receiver with variable tone control. This receiver was designed specifically for 1938 Model Oldsmobiles and is equipped with an instrument panel tuning control having a variable tone control in addition to the tuning and volume controls.

FIG. 2--OLDS MODEL 982085 CIRCUIT DIAGRAM
FIG. 2-3 MODEL 982085 - PARTS LAYOUT

The Antenna Circuit is directly coupled to the antenna in contrast with the capacity coupled circuit used in some previous Oldsmobile models. There are two taps provided on the antenna coil - one for use with the Running Board Antenna and the other for use with Overhead (Roof) Antenna. No adjustment is made to the antenna when used with the Running Board Antennas. When the Overhead (Roof) Antenna is used, the movable lead on the antenna coil should be moved to the other tap provided as indicated, and the antenna circuit should be adjusted to the antenna with the small antenna adjusting condenser provided. This adjustment is made near the high frequency end of the band (1400 K.C.) instead of at the low frequency end, as with the capacity coupled sets.
CONNECTING THE OUTPUT METER

Connect one terminal of the output meter to the plate of the 6V6G output tube. Insert in series with this lead a .1 mfd., or larger, 600 Volt Condenser.

Connect the other terminal of the output meter to the chassis frame. The purpose of the series condenser is to protect the meter from damage.

1. Aligning I-F Stages at 280 Kilocycles:
   a. Connect the signal lead of the test oscillator to the grid of the 6AG6 tube through a .1 mfd. condenser, leaving the tubes grid clip in place.
   b. Connect the ground lead of the test oscillator to the chassis frame.
   c. Set the test oscillator to exactly 266 Kc.
   d. Turn the volume control of the receiver on full.
   e. Peak both I-F trimmers on the 2nd I-F coil for maximum output. This is Illustration 5 in the top view of the Receiver, (Figure 2).
   f. Then peak both trimmers on the lst I-F coil (Illustration 4, Figure 2).
   g. In order to insure accurate settings of the I-F trimmers, the above adjustments should be repeated several times and, during alignment, the oscillator output should be kept as low a value as is consistent with obtaining a readable indication on the output meter. Make all adjustments for maximum output.

2. Aligning at 1560 Kc:
   a. To align the oscillator and R-F stages, connect the oscillator signal lead to the antenna connector through a .00056 mfd. condenser, leaving the ground lead of the oscillator connected to the chassis frame.
   b. Set the test oscillator to exactly 1560 Kc.
   c. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.
   d. Adjust the oscillator trimmer (Illustration 11, Figure 2) (center section of oscillator) for maximum output.
   e. Set the test oscillator to exactly 1400 Kc.
   f. Turn the rotor plates until the 1400 Kc frequency from the oscillator is tuned in with maximum output.
   g. Adjust the R-F trimmer on the condenser gang (Illustration 11, Figure 2) (Top Section) for maximum output.
   h. Adjust the Antenna Compensating Condenser (Illustration 10, Figure 2) (Bottom Section) on the gang condenser for maximum output.

3. Aligning at 600 Kc:
   a. Set the test oscillator to exactly 600 Kc.
   b. Turn the condenser rotor plates until the 600 Kc frequency from the test oscillator is tuned in with maximum output.
   c. Adjust the oscillator padding condenser (Illustration 8, Figure 2) and at the same time rock the gang condenser back and forth through the signal. This operation should be continued until no further increase can be obtained.
   d. Repeat E-F-G-H under "ALIGNING AT 1560 Kc".
   e. If the oscillator padding condenser was materially out of adjustment, it may be necessary to repeat the entire procedure for accurate adjustment.

NOTE: "When the receiver leaves the factory, it is properly adjusted to obtain maximum results from the running board Antenna. No adjustment of any kind is required."

"If a TOP ANTENNA is to be used with this receiver, it is necessary to make two adjustments." [1171-1172]

"SELECT PROPER ANTENNA COIL TAP. Remove the front cover of the receiver. In the upper right corner (See Figure 2) is the Antenna coil assembly Illustration No. 1. Two positions for the Tap Selector Plug are provided marked "A-B," and "TOP." Pull out the plug from position "A-B," and insert in the position marked "TOP." Replace the front cover." [1172-1173]

"ADJUST THE TRIMMER CONDENSER IN THE ANTENNA CIRCUIT. This condenser is located on the side of the Variable Gang Condenser and is on the section nearest the back cover (See Figure 2). Remove the Cover Plate on the right hand side of the receiver case to expose this adjusting screw." [1173-1174]

"CAUTION - Receiver alignment may be upset if other trimmer screws are disturbed." [1174]

"PROCEED TO ADJUST ANTENNA TRIMMER CONDENSER. Tune in a BARELY AUDIBLE station between 140 and 150 on the dial with the volume control FULL-ON. With a small screw driver, adjust the Antenna trimmer Illustration No. 10, (See Figure 2) for MAXIMUM VOLUME." [1174-1175]

"No further adjustment is necessary unless the Antenna with which the receiver is now tuned is changed." [1175]
CAUTION - RECEIVER ALIGNMENT MAY BE UPSET IF OTHER TRIMMER SCREWS ARE DISTURBED