VOLUME I

PERPETUAL

TROUBLESHOOTER'S MANUAL

J O H N  F. R I D E R
**McMILLAN® A.C. POWER SET**

Use this circuit diagram for all receivers equipped with a sealed power transformer block, or condenser block not having any brown or slate colored leads.

**McMILLAN® A.C. POWER SET**  
Second Type

Note: Use this circuit diagram for receivers equipped with power blocks having removable covers or condenser blocks having one brown and one slate colored lead.
Line Voltage 120—Set on 120 Volt Tap—Volume Control Position Max
Note: "C" Bias Voltage Reading on Audio tubes is low due to the current draw of the set tester and high resistances in the set.

<table>
<thead>
<tr>
<th>Tube</th>
<th>Type</th>
<th>Position</th>
<th>Voltages</th>
<th>Plate Currents</th>
<th>Grid (M/K)</th>
<th>Screen Grid (M/K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>226</td>
<td>2AF</td>
<td>1st RF</td>
<td>1.5</td>
<td>145</td>
<td>20</td>
<td>6.5</td>
</tr>
<tr>
<td>226</td>
<td>2AF</td>
<td>2nd RF</td>
<td>1.5</td>
<td>140</td>
<td>20</td>
<td>6.5</td>
</tr>
<tr>
<td>226</td>
<td>1RF</td>
<td>3rd RF</td>
<td>1.5</td>
<td>140</td>
<td>20</td>
<td>6.5</td>
</tr>
<tr>
<td>226</td>
<td>4th RF</td>
<td>4th RF</td>
<td>1.5</td>
<td>140</td>
<td>20</td>
<td>6.5</td>
</tr>
<tr>
<td>225</td>
<td>5TF</td>
<td>5th TF</td>
<td>2.5</td>
<td>112</td>
<td>30</td>
<td>6.5</td>
</tr>
<tr>
<td>226</td>
<td>1st RF</td>
<td>6th RF</td>
<td>1.5</td>
<td>137</td>
<td>30</td>
<td>6.5</td>
</tr>
<tr>
<td>225</td>
<td>1st RF</td>
<td>1st RF</td>
<td>1.5</td>
<td>127</td>
<td>30</td>
<td>6.5</td>
</tr>
<tr>
<td>226</td>
<td>7TF</td>
<td>7th TF</td>
<td>2.5</td>
<td>112</td>
<td>30</td>
<td>6.5</td>
</tr>
<tr>
<td>226</td>
<td>8TF</td>
<td>8th TF</td>
<td>2.5</td>
<td>112</td>
<td>30</td>
<td>6.5</td>
</tr>
</tbody>
</table>

**McMILLAN MODEL Series 900**

**McMILLAN RADIO CO.**

www.americanradiohistory.com
General Description

Not many of these changes were put out. Because of the high "A" battery consumption, certain changes were suggested that could be made to reduce "A" battery consumption.

Diagram No. 1 gives the original circuit and it will be seen that the tube circuit consists of:

2-224's, 1-226, 1-120A, and 1-112A.

Diagram No. 2 shows the changes to be made so the set will consume less "A" battery current. The tubes are now:

2-3°64's, 2-226's, 1-201A, and 1-112A.

The NY 64 tubes are screen-grid battery-operated tubes which were designed for use in automobile radio sets. Their current consumption is small; their amplification factor quite high and they are rugged and very long lived.

The "A" and "B" batteries are not changed to convert the receiving set for lower "A" battery consumption.

Make the changes shown on the diagram. Connect the storage battery to black (neg.) and red (pos.) leads. Insert two NY 64 tubes in sockets marked 224. Place a 201A in socket marked 226 and one 120A in socket marked 201A. Use a 112A in socket marked 112A. Turn on filament switch and see if tubes light—it is necessary to connect "B" batteries as tagged, except "B + 135" leads—connect this to "B + 135" terminal.

Connect two 4½ Volt "C" batteries in series. The "C"—4½ Volt leads go to the connection between the 4½ Volt "C" batteries. The "C"—45" goes to the 4½ Volt part of the second battery.

It is recommended that these changes not be made on sets where the customer is entirely satisfied with the operation and the life of the "A" battery. The operation with the 224 tubes is very highly satisfactory. The sensitivity is extremely high, and the tone quality very good.
* Not used in 30-C chassis.

**PART NO. ELECTRICAL VALUE**  **PART NO. ELECTRICAL VALUE**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>VALUE</th>
<th>PART NO.</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2290</td>
<td>2 megohms</td>
<td>2344-1</td>
<td>.5 mfd</td>
</tr>
<tr>
<td>2366</td>
<td>17500 ohms</td>
<td>2344-2</td>
<td>.5 mfd</td>
</tr>
<tr>
<td>2299</td>
<td>175 ohms</td>
<td>2405</td>
<td>.0001 mfd</td>
</tr>
<tr>
<td>2340</td>
<td>1750 ohms</td>
<td>2246</td>
<td>.0001 mfd</td>
</tr>
<tr>
<td>2341</td>
<td>3500 ohms</td>
<td>2347</td>
<td>.00025 mfd</td>
</tr>
<tr>
<td>2436</td>
<td>10 ohms</td>
<td>2343</td>
<td>2 mfd</td>
</tr>
<tr>
<td>2364</td>
<td>600 ohms</td>
<td>2345</td>
<td>1 mfd</td>
</tr>
<tr>
<td>2339</td>
<td>1000 ohms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2388</td>
<td>2500 ohms</td>
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</table>

**NORMAL WORKING VOLTAGES (APPROXIMATE)**

<table>
<thead>
<tr>
<th>TUBE</th>
<th>FILAMENT</th>
<th>PLATE</th>
<th>GRID</th>
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</thead>
<tbody>
<tr>
<td>1 R.F.</td>
<td>A.C. 2.46</td>
<td>D.C. 100</td>
<td>D.C. 6</td>
</tr>
<tr>
<td>3 R.F.</td>
<td>A.C. 2.46</td>
<td>D.C. 100</td>
<td>D.C. 6</td>
</tr>
<tr>
<td>Detector</td>
<td>A.C. 2.46</td>
<td>D.C. 100</td>
<td>-</td>
</tr>
<tr>
<td>1 A.F.</td>
<td>A.C. 2.46</td>
<td>D.C. 100</td>
<td>D.C. 4.5</td>
</tr>
<tr>
<td>Output stage</td>
<td>A.C. 5.1</td>
<td>D.C. 175</td>
<td>D.C. 38</td>
</tr>
<tr>
<td>Rectifier</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Line Voltage 119. Set on 115 Volt Tap. Volume Control on Full.)
2344-1 .5 mfd 2290 2 megohms
2344-2 .5 mfd 2366 17500 ohms
2405 .0001 mfd 2299 175 ohms
2346 .0001 mfd 2340 17500 ohms
2347 .00025 mfd 2341 3500 ohms
2343 2 mfd 2436 10 ohms
2345 1 mfd 2364 600 ohms

2707 replaces 2339 900 ohms

Series .40 Receivers employ a 5000 ohm field coil.
THE NATIONAL COMPANY

MODEL S-G 5
MODEL S-G
Short Wave Tuner

MODEL S-G Short Wave Tuner with '71

MODEL Auto Box Conn.

Model Screen Grid 5

Model Auto Box Connections

Model Screen Grid Short Wave (7L)

Model Screen Grid S.W. Tuner

www.americanradiohistory.com
MODEL MB-30
Schematic, Chassis
MODEL MB-29
MODELS Thrill Box AC, Short Wave
MODEL Auto Box

THE NATIONAL COMPANY

Model MB-30

See preceding page for battery connections.

Model Thrill Box 2-volt Tubes

www.americanradiohistory.com
MODEL C-7
MODEL Super 10

R is 20 ohms. R1 is 7 ohms. R2 is 750 ohms. R3 is 2 megarms.
R4 is 30,000 ohms. C3 is 0.0025 mfd. C4 is 0.00025 mfd. C2 is .5 mfd. C5 is 1.1 mfd.
MODEL 90
Schematic, Chassis
Voltage

Tube Type Plate Grid
R.F. '24 160 160
R.F. '26 160
R.F. '26 160
R.F. '26 160
Det. '27 40
A.F. '27 150
Pwr. '45 300
Pwr. '45 300
Volume Max.
All Volts to Ground.
Grid Volts Fil.To Grd.