

# MODEL A-1 Series Coils, Phono Socket Notes, Parts List

## WELLS-GARDNER & CO.

### Series A1 - Replacement Parts

#### CONDENSERS (Cont.)

| Part No. | Code | Capacitance                        | Voltage | List Price |
|----------|------|------------------------------------|---------|------------|
| 4X199    | C36  | .01                                | 180     | .15        |
| 4X200    | C37  | .02                                | 180     | .15        |
| 4X201    | C38  | .05                                | 180     | .15        |
| 4X202    | C39  | .10                                | 180     | .15        |
| 4X203    | C40  | .25                                | 180     | .15        |
| 4X204    | C41  | .50                                | 180     | .15        |
| 4X205    | C42  | 1.0                                | 180     | .15        |
| 4X206    | C43  | 2.5                                | 180     | .15        |
| 4X207    | C44  | 5.0                                | 180     | .15        |
| 4X208    | C45  | 10.0                               | 180     | .15        |
| 4X209    | C46  | 25.0                               | 180     | .15        |
| 4X210    | C47  | 50.0                               | 180     | .15        |
| 4X211    | C48  | 100.0                              | 180     | .15        |
| 4X212    | C49  | 250.0                              | 180     | .15        |
| 4X213    | C50  | 500.0                              | 180     | .15        |
| 4X214    | C51  | 1000.0                             | 180     | .15        |
| 4X215    | C52  | 2500.0                             | 180     | .15        |
| 4X216    | C53  | 5000.0                             | 180     | .15        |
| 4X217    | C54  | 10000.0                            | 180     | .15        |
| 4X218    | C55  | 25000.0                            | 180     | .15        |
| 4X219    | C56  | 50000.0                            | 180     | .15        |
| 4X220    | C57  | 100000.0                           | 180     | .15        |
| 4X221    | C58  | 250000.0                           | 180     | .15        |
| 4X222    | C59  | 500000.0                           | 180     | .15        |
| 4X223    | C60  | 1000000.0                          | 180     | .15        |
| 4X224    | C61  | 2500000.0                          | 180     | .15        |
| 4X225    | C62  | 5000000.0                          | 180     | .15        |
| 4X226    | C63  | 10000000.0                         | 180     | .15        |
| 4X227    | C64  | 25000000.0                         | 180     | .15        |
| 4X228    | C65  | 50000000.0                         | 180     | .15        |
| 4X229    | C66  | 100000000.0                        | 180     | .15        |
| 4X230    | C67  | 250000000.0                        | 180     | .15        |
| 4X231    | C68  | 500000000.0                        | 180     | .15        |
| 4X232    | C69  | 1000000000.0                       | 180     | .15        |
| 4X233    | C70  | 2500000000.0                       | 180     | .15        |
| 4X234    | C71  | 5000000000.0                       | 180     | .15        |
| 4X235    | C72  | 10000000000.0                      | 180     | .15        |
| 4X236    | C73  | 25000000000.0                      | 180     | .15        |
| 4X237    | C74  | 50000000000.0                      | 180     | .15        |
| 4X238    | C75  | 100000000000.0                     | 180     | .15        |
| 4X239    | C76  | 250000000000.0                     | 180     | .15        |
| 4X240    | C77  | 500000000000.0                     | 180     | .15        |
| 4X241    | C78  | 1000000000000.0                    | 180     | .15        |
| 4X242    | C79  | 2500000000000.0                    | 180     | .15        |
| 4X243    | C80  | 5000000000000.0                    | 180     | .15        |
| 4X244    | C81  | 10000000000000.0                   | 180     | .15        |
| 4X245    | C82  | 25000000000000.0                   | 180     | .15        |
| 4X246    | C83  | 50000000000000.0                   | 180     | .15        |
| 4X247    | C84  | 100000000000000.0                  | 180     | .15        |
| 4X248    | C85  | 250000000000000.0                  | 180     | .15        |
| 4X249    | C86  | 500000000000000.0                  | 180     | .15        |
| 4X250    | C87  | 1000000000000000.0                 | 180     | .15        |
| 4X251    | C88  | 2500000000000000.0                 | 180     | .15        |
| 4X252    | C89  | 5000000000000000.0                 | 180     | .15        |
| 4X253    | C90  | 10000000000000000.0                | 180     | .15        |
| 4X254    | C91  | 25000000000000000.0                | 180     | .15        |
| 4X255    | C92  | 50000000000000000.0                | 180     | .15        |
| 4X256    | C93  | 100000000000000000.0               | 180     | .15        |
| 4X257    | C94  | 250000000000000000.0               | 180     | .15        |
| 4X258    | C95  | 500000000000000000.0               | 180     | .15        |
| 4X259    | C96  | 1000000000000000000.0              | 180     | .15        |
| 4X260    | C97  | 2500000000000000000.0              | 180     | .15        |
| 4X261    | C98  | 5000000000000000000.0              | 180     | .15        |
| 4X262    | C99  | 10000000000000000000.0             | 180     | .15        |
| 4X263    | C100 | 25000000000000000000.0             | 180     | .15        |
| 4X264    | C101 | 50000000000000000000.0             | 180     | .15        |
| 4X265    | C102 | 100000000000000000000.0            | 180     | .15        |
| 4X266    | C103 | 250000000000000000000.0            | 180     | .15        |
| 4X267    | C104 | 500000000000000000000.0            | 180     | .15        |
| 4X268    | C105 | 1000000000000000000000.0           | 180     | .15        |
| 4X269    | C106 | 2500000000000000000000.0           | 180     | .15        |
| 4X270    | C107 | 5000000000000000000000.0           | 180     | .15        |
| 4X271    | C108 | 10000000000000000000000.0          | 180     | .15        |
| 4X272    | C109 | 25000000000000000000000.0          | 180     | .15        |
| 4X273    | C110 | 50000000000000000000000.0          | 180     | .15        |
| 4X274    | C111 | 100000000000000000000000.0         | 180     | .15        |
| 4X275    | C112 | 250000000000000000000000.0         | 180     | .15        |
| 4X276    | C113 | 500000000000000000000000.0         | 180     | .15        |
| 4X277    | C114 | 1000000000000000000000000.0        | 180     | .15        |
| 4X278    | C115 | 2500000000000000000000000.0        | 180     | .15        |
| 4X279    | C116 | 5000000000000000000000000.0        | 180     | .15        |
| 4X280    | C117 | 10000000000000000000000000.0       | 180     | .15        |
| 4X281    | C118 | 25000000000000000000000000.0       | 180     | .15        |
| 4X282    | C119 | 50000000000000000000000000.0       | 180     | .15        |
| 4X283    | C120 | 100000000000000000000000000.0      | 180     | .15        |
| 4X284    | C121 | 250000000000000000000000000.0      | 180     | .15        |
| 4X285    | C122 | 500000000000000000000000000.0      | 180     | .15        |
| 4X286    | C123 | 1000000000000000000000000000.0     | 180     | .15        |
| 4X287    | C124 | 2500000000000000000000000000.0     | 180     | .15        |
| 4X288    | C125 | 5000000000000000000000000000.0     | 180     | .15        |
| 4X289    | C126 | 10000000000000000000000000000.0    | 180     | .15        |
| 4X290    | C127 | 25000000000000000000000000000.0    | 180     | .15        |
| 4X291    | C128 | 50000000000000000000000000000.0    | 180     | .15        |
| 4X292    | C129 | 100000000000000000000000000000.0   | 180     | .15        |
| 4X293    | C130 | 250000000000000000000000000000.0   | 180     | .15        |
| 4X294    | C131 | 500000000000000000000000000000.0   | 180     | .15        |
| 4X295    | C132 | 1000000000000000000000000000000.0  | 180     | .15        |
| 4X296    | C133 | 2500000000000000000000000000000.0  | 180     | .15        |
| 4X297    | C134 | 5000000000000000000000000000000.0  | 180     | .15        |
| 4X298    | C135 | 10000000000000000000000000000000.0 | 180     | .15        |
| 4X299    | C136 | 25000000000000000000000000000000.0 | 180     | .15        |
| 4X300    | C137 | 50000000000000000000000000000000.0 | 180     | .15        |

#### ELECTROLYTIC

| Part No. | Code | Capacitance            | Voltage | List Price |
|----------|------|------------------------|---------|------------|
| 4X251    | E1   | 1000.0                 | 180     | .15        |
| 4X252    | E2   | 2500.0                 | 180     | .15        |
| 4X253    | E3   | 5000.0                 | 180     | .15        |
| 4X254    | E4   | 10000.0                | 180     | .15        |
| 4X255    | E5   | 25000.0                | 180     | .15        |
| 4X256    | E6   | 50000.0                | 180     | .15        |
| 4X257    | E7   | 100000.0               | 180     | .15        |
| 4X258    | E8   | 250000.0               | 180     | .15        |
| 4X259    | E9   | 500000.0               | 180     | .15        |
| 4X260    | E10  | 1000000.0              | 180     | .15        |
| 4X261    | E11  | 2500000.0              | 180     | .15        |
| 4X262    | E12  | 5000000.0              | 180     | .15        |
| 4X263    | E13  | 10000000.0             | 180     | .15        |
| 4X264    | E14  | 25000000.0             | 180     | .15        |
| 4X265    | E15  | 50000000.0             | 180     | .15        |
| 4X266    | E16  | 100000000.0            | 180     | .15        |
| 4X267    | E17  | 250000000.0            | 180     | .15        |
| 4X268    | E18  | 500000000.0            | 180     | .15        |
| 4X269    | E19  | 1000000000.0           | 180     | .15        |
| 4X270    | E20  | 2500000000.0           | 180     | .15        |
| 4X271    | E21  | 5000000000.0           | 180     | .15        |
| 4X272    | E22  | 10000000000.0          | 180     | .15        |
| 4X273    | E23  | 25000000000.0          | 180     | .15        |
| 4X274    | E24  | 50000000000.0          | 180     | .15        |
| 4X275    | E25  | 100000000000.0         | 180     | .15        |
| 4X276    | E26  | 250000000000.0         | 180     | .15        |
| 4X277    | E27  | 500000000000.0         | 180     | .15        |
| 4X278    | E28  | 1000000000000.0        | 180     | .15        |
| 4X279    | E29  | 2500000000000.0        | 180     | .15        |
| 4X280    | E30  | 5000000000000.0        | 180     | .15        |
| 4X281    | E31  | 10000000000000.0       | 180     | .15        |
| 4X282    | E32  | 25000000000000.0       | 180     | .15        |
| 4X283    | E33  | 50000000000000.0       | 180     | .15        |
| 4X284    | E34  | 100000000000000.0      | 180     | .15        |
| 4X285    | E35  | 250000000000000.0      | 180     | .15        |
| 4X286    | E36  | 500000000000000.0      | 180     | .15        |
| 4X287    | E37  | 1000000000000000.0     | 180     | .15        |
| 4X288    | E38  | 2500000000000000.0     | 180     | .15        |
| 4X289    | E39  | 5000000000000000.0     | 180     | .15        |
| 4X290    | E40  | 10000000000000000.0    | 180     | .15        |
| 4X291    | E41  | 25000000000000000.0    | 180     | .15        |
| 4X292    | E42  | 50000000000000000.0    | 180     | .15        |
| 4X293    | E43  | 100000000000000000.0   | 180     | .15        |
| 4X294    | E44  | 250000000000000000.0   | 180     | .15        |
| 4X295    | E45  | 500000000000000000.0   | 180     | .15        |
| 4X296    | E46  | 1000000000000000000.0  | 180     | .15        |
| 4X297    | E47  | 2500000000000000000.0  | 180     | .15        |
| 4X298    | E48  | 5000000000000000000.0  | 180     | .15        |
| 4X299    | E49  | 10000000000000000000.0 | 180     | .15        |
| 4X300    | E50  | 25000000000000000000.0 | 180     | .15        |

#### MOLDED

|       |       |                                          |     |
|-------|-------|------------------------------------------|-----|
| 17A76 | { C10 | mmf. Oscillator Range "C"                | .25 |
| 17A75 |       | mmf. Oscillator Range "C"                | .25 |
| 17A76 |       | mmf. Oscillator Range "C"—Series Padding | .50 |

## WELLS-GARDNER &amp; CO.

MODEL A-1 Series  
Schematic, Specs.  
Sensitivity, Phono.

Power Consumption - 67 Watts (At 117 volts 60 cycles)  
Power Output - - - 2.5 Watts Undistorted  
- - - 4.5 Watts Maximum  
Selectivity - 30 KC Broad at 1000 times Signal  
(Sharp)  
Intermediate Frequency - - - 456 KC.  
Speakers - - - 8", 10" or 12" Dynamic

6F6  
6F6G  
OUTPUT

6F5  
6F5G  
AUDIO AMP.

6H6  
2ND. DET. 250MMF

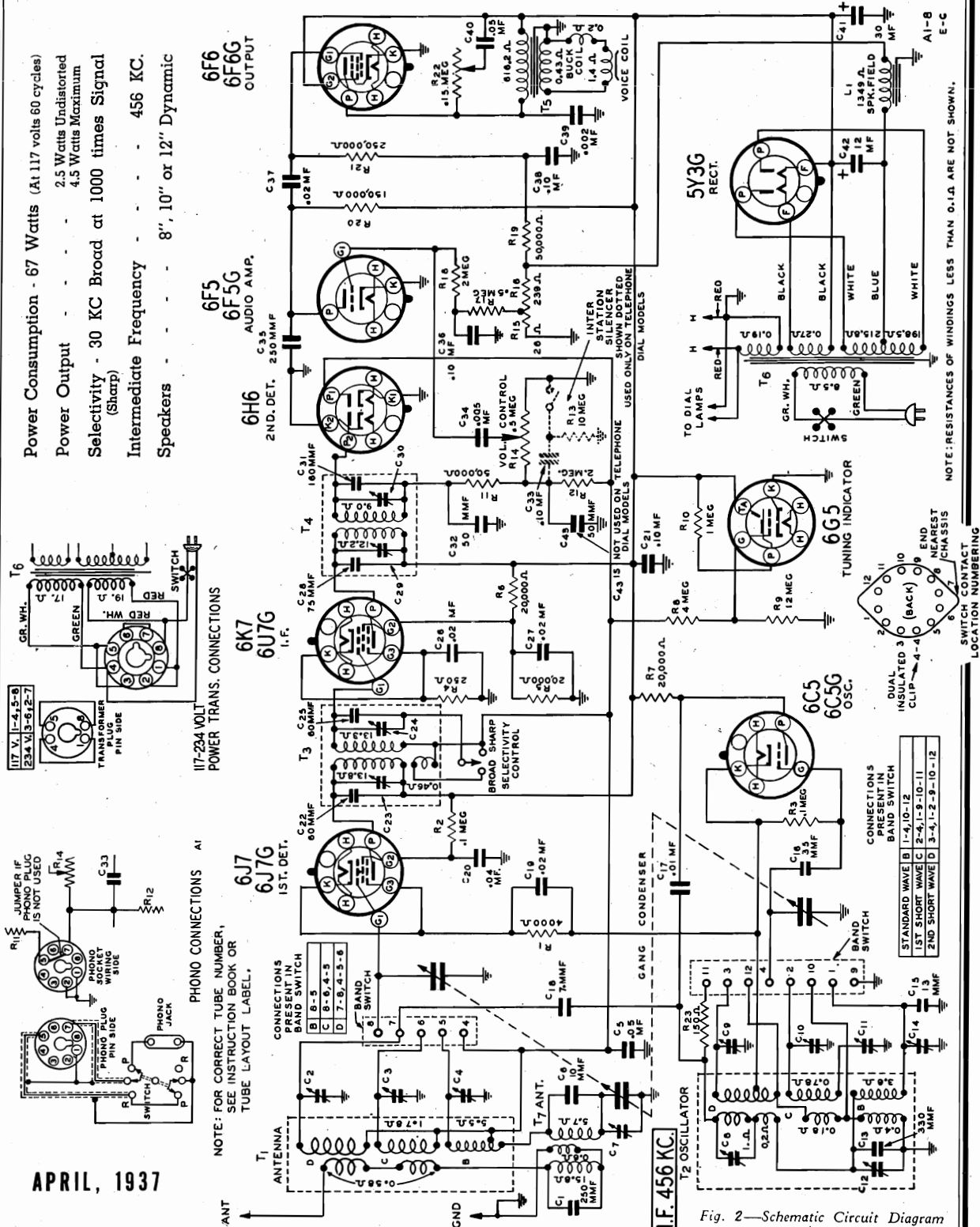
6K7  
6U7G  
I.F.

6J7  
6J7G  
1ST. DET.

6C5  
6C5G  
OSC.

6G5  
TUNING INDICATOR

5Y3G  
RECT.



APRIL, 1937

## Tuning Frequency Range

B Range..... 528 to 1830 KC.  
C Range..... 1810 to 6350 KC.  
D Range..... 6300 to 22000 KC.

## Sensitivity

B Range..... 8 Microvolts Average  
C Range..... 13 Microvolts Average  
D Range..... 9 Microvolts Average

Fig. 2—Schematic Circuit Diagram

# MODEL A-1 Series Alignment, Trimmers Circuit Data, Voltage

## WELLS-GARDNER & CO.

8 TUBE • 3 BAND • ALL WAVE SERIES A1

### ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.  
Selectivity Control—Sharp Position All Adjustments.  
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.  
Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

The following equipment is required for aligning:  
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.  
Output Indicating Meter — Non-Metallic Screwdriver.  
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

| STEP<br>(Follow Order as Given) | BAND SWITCH | DUMMY ANTENNA | SIGNAL GENERATOR<br>FREQUENCY SETTING | CONNECTION AT RADIO | TRIMMERS ADJUSTED<br>See Illustration          | PROCEDURE<br>INITIAL STEPS                                           | ADJUSTMENT                                          |
|---------------------------------|-------------|---------------|---------------------------------------|---------------------|------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------|
| I. F.                           |             |               |                                       |                     |                                                |                                                                      |                                                     |
| 2nd I.F. Adj.                   | Range B     | .1 mf.        | 456 KC                                | Grid of I.F. Tube   | 2nd I.F. (C29) & (C30)                         | Turn Rotor to Full Open                                              | Adjust to Maximum Output                            |
| 1st I.F. Adj.                   | Range B     | .1 mf.        | 456 KC                                | Grid of 1st Det.    | 1st I.F. (C23) & (C24)                         | Turn Rotor to Full Open                                              | Adjust to Maximum Output                            |
| RANGE B                         |             |               |                                       |                     |                                                |                                                                      |                                                     |
| 1830 KC                         | Range B     | 200 mmf.      | 1830 KC                               | Antenna Lead        | Oscillator Range B (C14)                       | Turn Rotor to Full Open                                              | Adjust to Maximum Output                            |
| 1500 KC                         | Range B     | 200 mmf.      | 1500 KC                               | Antenna Lead        | 1st Ant. Range B (C7)<br>2nd Ant. Range B (C4) | Turn Rotor to Max. Output<br>Set Indicator to 1500 KC—<br>See Note A | Adjust to Maximum Output                            |
| 600 KC                          | Range B     | 200 mmf.      | 600 KC                                | Antenna Lead        | 600 KC (C12)                                   | Turn Rotor to Max. Output                                            | Adjust to Maximum Output<br>Rock Rotor — See Note B |
| RANGE C                         |             |               |                                       |                     |                                                |                                                                      |                                                     |
| 6350 KC                         | Range C     | 400 Ohm       | 6350 KC                               | Antenna Lead        | Oscillator Range C (C10)                       | Turn Rotor to Full Open                                              | Adjust to Maximum Output                            |
| 6000 KC                         | Range C     | 400 Ohm       | 6000 KC                               | Antenna Lead        | Antenna Range C (C3)                           | Turn Rotor to Max. Output                                            | Adjust to Maximum Output                            |
| 2000 KC                         | Range C     | 400 Ohm       | 2000 KC                               | Antenna Lead        | 2000 KC (C11)                                  | Turn Rotor to Max. Output                                            | Adjust to Maximum Output<br>Rock Rotor — See Note B |
| RANGE D                         |             |               |                                       |                     |                                                |                                                                      |                                                     |
| 22,000 KC                       | Range D     | 400 Ohm       | 22,000 KC                             | Antenna Lead        | Oscillator Range D (C9)                        | Turn Rotor to Full Open                                              | Adjust to Maximum Output                            |
| 20,000 KC                       | Range D     | 400 Ohm       | 20,000 KC                             | Antenna Lead        | Antenna Range D (C2)                           | Turn Rotor to Max. Output                                            | Adjust to Maximum Output<br>Rock Rotor — See Note B |
| 7000 KC                         | Range D     | 400 Ohm       | 7000 KC                               | Antenna Lead        | 7000 KC (C8)                                   | Turn Rotor to Max. Output                                            | Adjust to Maximum Output<br>Rock Rotor — See Note B |

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—In sets using the telephone dial tuning, there will be seen inside the telephone dial button ring an escutcheon plate held in place by four screws. Loosen the 2 screws nearest the pointer. An extension of the pointer will be seen protruding over the edge of this escutcheon plate. Move the pointer to the 1500 KC mark on the dial and then tighten the 2 escutcheon screws. (Do not tighten these screws too much.)

In sets using the moving beam of light indicator, there is a moving light assembly held to the front of the drive drum by means of a screw. Loosen this screw and move the light assembly until the beam is at the 1500 KC mark on the dial. Retighten the screw.

### Circuit

This model is a three band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T7 are the antenna coil assemblies and T2 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D respectively.

The band switch completes connections to the coils in use. When it is in the Range B position, a double tuned antenna R.F. stage is used while for the C and D Ranges, a single tuned secondary is used.

A type 6J7 tube functions as the 1st detector. A separate type 6G5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

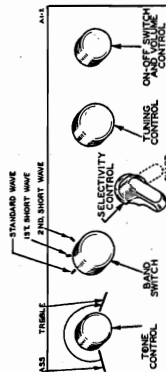


Fig. 1—Arrangement of Controls

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 bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

### Glass and Metal Tubes

All sets of this series use a 6H6 metal tube and 5Y3G and 6G5 glass tubes.

It will be noted in the schematic that there are two tube type numbers shown at the other sockets. The "metal" tube sets use the upper tube type numbers which are for metal tubes while the "glass" tube sets use the lower tube type numbers which are for glass tubes.

Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

### VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum  
Readings taken with 1000 Ohm-per-volt meter.

| TUBE | FUNCTION         | VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated) |             |             |             |             |             |             |             |             |              | Antenna Shorted to Ground | Position of Band Switch: Standard Wave |
|------|------------------|----------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|---------------------------|----------------------------------------|
|      |                  | Prong No. 1                                                          | Prong No. 2 | Prong No. 3 | Prong No. 4 | Prong No. 5 | Prong No. 6 | Prong No. 7 | Prong No. 8 | Prong No. 9 | Prong No. 10 |                           |                                        |
| 6J7  | 1st Det.         | 0                                                                    | 6.1(1)      | 220         | 100         | 7.9         | 6.1(1)      | 7.9         | 6.1(1)      | 0           | 0            | 0                         | 0                                      |
| 6G5  | Osc.             | 0                                                                    | 6.1(1)      | 140         | 100         | 2           | 6.1(1)      | 2           | 6.1(1)      | 0           | 0            | 0                         | 0                                      |
| 6K7  | I.F.             | 0                                                                    | 6.1(1)      | 220         | 100         | 2           | 6.1(1)      | 2           | 6.1(1)      | 0           | 0            | 0                         | 0                                      |
| 6H6  | 2nd Det.         | 0                                                                    | 6.1(1)      | 220         | 100         | 2           | 6.1(1)      | 2           | 6.1(1)      | 0           | 0            | 0                         | 0                                      |
| 6F5  | Audio Amp.       | 0                                                                    | 6.1(1)      | 220         | 100         | 2           | 6.1(1)      | 2           | 6.1(1)      | 0           | 0            | 0                         | 0                                      |
| 6F6  | Power            | 0                                                                    | 6.1(1)      | 215         | 220         | 6.1(5)      | 6.1(1)      | 6.1(1)      | 6.1(1)      | 0           | 0            | 0                         | 0                                      |
| 5Y3G | Rectifier        | 0                                                                    | 4.9(4)      | 220         | 6.1(5)      | 6.1(5)      | 6.1(1)      | 6.1(1)      | 6.1(1)      | 6.1(5)      | 6.1(5)       | 4.9(4)                    | 4.9(4)                                 |
| 6G5  | Tuning Indicator | Plate to Ground 20                                                   | 0           | 220         | 6.1(5)      | 6.1(5)      | 6.1(1)      | 6.1(1)      | 6.1(1)      | 6.1(5)      | 6.1(5)       | 4.9(4)                    | 4.9(4)                                 |

(1) A.C. voltage at read across heater terminals 2 and 7.  
(2) Bias (1.5 volts) as read across resistor R15.  
(3) Bias (1.4 volts) as read across resistors R15 and R16.  
(4) A.C. voltage as read across filament terminals 2 and 8.  
(5) A.C. voltage as read across filament terminals 4 and 6.

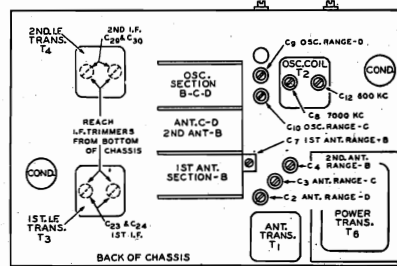


Fig. 3—Location of Trimmers