

# MODEL A-108

## Ten-Tube, Three-Band, A-C Superheterodyne Console Receiver

### ELECTRICAL SPECIFICATIONS

#### FREQUENCY RANGES

|             |                    |
|-------------|--------------------|
| Band A..... | 540 kc.— 1800 kc.  |
| Band B..... | 1800 kc.— 6000 kc. |
| Band C..... | 6000 kc.—18000 kc. |

#### ALIGNMENT FREQUENCIES

|             |   |
|-------------|---|
| Band A..... | 600 kc. (osc.), 1720 kc. (osc., ant., det.) |
| Band B..... | 6132 kc. (osc., ant., det.)                 |
| Band C..... | 18000 kc. (osc., ant., det.)                |

#### RADIOTRON COMPLEMENT

|                   |                            |
|-------------------|----------------------------|
| (1) Type-6K7..... | Radio-Frequency Amplifier  |
| (2) Type-6L7..... | First Detector             |
| (3) Type-6J7..... | Heterodyne Oscillator      |
| (4) Type-6K7..... | Intermediate Amplifier     |
| (5) Type-6H6..... | Second Detector and A.V.C. |

|                    |                        |
|--------------------|------------------------|
| (6) Type-6C5.....  | First Audio Amplifier  |
| (7) Type-6C5.....  | Audio Driver Amplifier |
| (8) Type-6F6.....  | Power Output Amplifier |
| (9) Type-6F6.....  | Power Output Amplifier |
| (10) Type-5Z3..... | Full Wave Rectifier    |
| (11) Type-6E5..... | Tuning Indicator       |

#### POWER RATINGS

|                        |                             |
|------------------------|-----------------------------|
| Rating A.....          | 105—125 volts, 50—60 cycles |
| Rating B.....          | 105—125 volts, 25—60 cycles |
| Power Consumption..... | 135 watts                   |

#### MISCELLANEOUS

|                         |            |
|-------------------------|------------|
| Undistorted Output..... | 8.5 watts  |
| Maximum Output.....     | 11.5 watts |

|                           |                        |
|---------------------------|------------------------|
| Loudspeaker.....          | Electrodynamic—12 inch |
| Voice Coil Impedance..... | 7.5 ohms at 400 cycles |

|                             |         |
|-----------------------------|---------|
| Intermediate Frequency..... | 460 kc. |
|-----------------------------|---------|

### MECHANICAL SPECIFICATIONS

|                        |                                     |
|------------------------|-------------------------------------|
| Height.....            | 41 inches                           |
| Width.....             | 26 inches                           |
| Depth.....             | 14 inches                           |
| Weight (Net).....      | 79 pounds                           |
| Weight (Shipping)..... | 124 pounds                          |
| Chassis Base.....      | 15½ inches × 10½ inches × 3½ inches |

### GENERAL FEATURES

This instrument comprises a ten-tube chassis mounted in a console type of cabinet. Its tuning ranges cover frequencies between 540 kc. and 18,000 kc. including the standard broadcast, short wave broadcast, police, amateur and aviation bands. The following points of design are of particular importance:—

#### Metal Radiotrons

The new metallic tubes are used in the amplifying and detecting stages of this receiver. They provide distinct advantages over corresponding glass types in a number of respects. Their size makes for compact chassis design; the metal envelope eliminates need for shielding; they are not subject to breakage; microphonic tendencies are reduced; bases and sockets are standardized for all types; short wave efficiencies are higher; and general improvements in operation are gained from their use.

#### Tuning Condenser

The variable tuning condenser is supported by a new design of shock-proof mount which has been developed by our engineers to prevent chassis vibration from producing audio frequency howl.

#### Chassis

Servicing convenience has been a governing factor in the layout of the chassis parts and the associated wiring. Each part has been situated so that a minimum of wiring is necessary. Adjustments provided by means of substantial trimmers are mounted where they may be easily reached. Holes are included in the shield cans of the r-f coil system for testing the tuning with a Tuning Wand.





### Loudspeaker

A super-sensitive 12 inch electrodynamic speaker is employed. It is correctly adapted to the cabinet design to assure the best possible acoustic performance. Electrical connection is made from the speaker to the chassis through a plug and connector attachment, permitting easy removal for servicing.

## Dial Drive

The dial drive and station indicator system are of new and unique design. Five individual dial scales, each with full 180 degree band spread, are provided, one for use on each band. The scales are eccentrically arranged on a rotary disc and adapted to operate in connection with the band change switch so that as the switch is shifted to a certain band, the corresponding dial scale rotates into position. For other positions

### CIRCUIT ARRANGEMENT

The Superheterodyne principle of operation forms the basis of the circuit design. A single, tuned r-f stage is used ahead of the first detector. The functions of oscillator and detector are performed by two separate tubes. One i-f stage is employed and designed to operate at 460 kc. The combined second detector and a.v.c. stage uses an Type-6H6 double diode. The audio system consists of two single amplifier stages working in cascade with a push-pull power output stage. The loudspeaker is an electrodynamic type, receiving its field supply from the rectifier and filter system and simultaneously acting as a filter reactor. Full wave rectification is performed in the Type-5Z3 tube. The outstanding features of electrical design are concerned with the following:—

## Tuned Circuits

A total of seven circuits are tuned to provide gain and selectivity to the incoming signal. The variable gang condenser resonates the antenna transformer secondary, the detector transformer secondary and the oscillator coil. Alignment trimmers are included for each of these same circuits. Additional trimmers are used on the i-f transformers, tuning both the secondaries and primaries to 460 kc. There are separate groups of antenna, detector and oscillator coils for each of the tuning ranges. They are placed into operation by means of a rugged rotary switch.

### First Detector

This stage has unusually good high frequency mixing efficiency. The tube used, an Type-6L7, is a new hexode type. The signal is supplied to the first control grid and the oscillator is fed in on a second control grid, a screen grid separating the two. The arrangement of the grids prevents degenerative difficulties, particularly at the higher frequencies. The second grid is direct-connected to the cathode of the oscillator tube and has no d-c bias.

## Oscillator

The oscillator circuit is worthy of careful study inasmuch as it is different from the type ordinarily employed. It has self-stabilizing properties which are very advantageous for short wave operation. The generated frequency remains substantially constant, the circuit being unaffected by variation of line voltage and other similar influences. Output also remains uniform over the individual tuning ranges. The switching of the tuning coils is arranged so as to short those not

of the band switch, a similar scale selection takes place, there being only one scale visible at a time. The driving mechanism for the dial and condenser has tuning ratios of 10 to 1 and 50 to 1. Control may be interchanged between these two ratios by push-in operation of a positive action clutch which is actuated by the tuning knob. From the clutch and ratio controlling mechanism, the drive system interlinks with the tuning condenser, main dial pointer and vernier dial pointer through means of fibre and brass gears. The ratio of vernier rotation to the main pointer is 20 to 1. An intermediate gear is used in the system to reduce gear back-lash. This gear is suspended in position with two tension springs which maintain the proper mesh at all times. A flexible coupling disc is used between the drive and the condenser shaft.

in use in order to prevent absorption or any reactive effects in the particular band being tuned.

### Detector and A.V.C.

The modulated signal as obtained from the output of the i-f system is detected by an Type-6H6 double diode tube. The audio frequency secured by this process is passed on to the a-f system for amplification

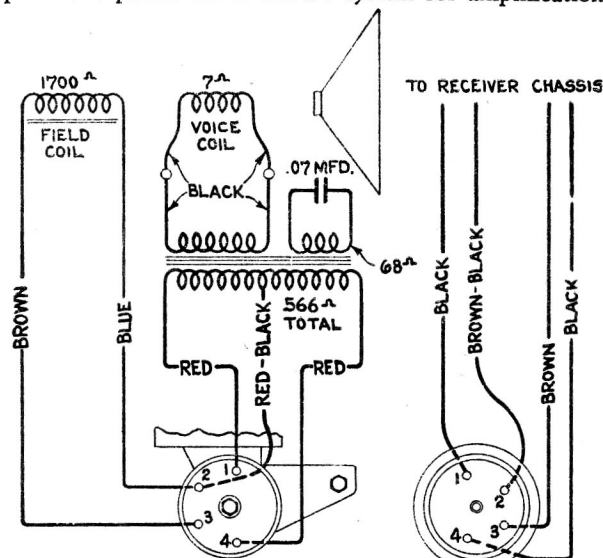


Figure 3—Loudspeaker Wiring

and final reproduction. The d-c voltage which results from detection of the signal, is used for automatic volume control. This voltage, which develops across resistors R-7 and R-8, is applied as automatic control grid bias to the r-f, first detector and i-f tubes through suitable resistance-capacitance filter circuits. The second diode of the Type 6H6 is used to supply residual bias for these controlled tubes under conditions of little or no signal. This diode, under such conditions, draws current, which flows through resistors R-7, R-8 and R-9, thereby maintaining the desired minimum operating bias on such tubes. On application of signal energy above a certain level, however, the auxiliary bias diode ceases to draw current and the a.v.c. diode takes over the biasing function. The cathode and anode of the signal-a.v.c diode have positive potential in respect to chassis-ground and cathodes of the a.v.c. controlled tubes when no signal is being received.



## Audio System

Manual volume control of the detected signal is effected by an acoustically tapered potentiometer in the grid circuit of the first a-f stage. This control has tone compensating filters connected to two points thereon. These filters effect the correct aural balance at different volume settings. A music-speech switch (low frequency tone control) is associated with one of the compensation filters. The purpose of this control is to make speech reproduction more intelligible and to reduce hum obtained from stray modulation on a carrier. The driver stage of the audio system uses an Type 6C5 which is resistance coupled to the first a-f tube and transformer coupled into the push-pull power output stage.

## SERVICE DATA

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation when such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R-3, L-2, C-1, etc., are provided for reference between the illustrations and the Replacement Parts List. The coils, reactors, and transformer windings are rated in terms of their d-c resistances only and where the resistance is less than one ohm, no rating is given.

## Alignment Procedure

Ten alignment trimmers are provided in the r-f, first detector and oscillator tuning system and four are used in the i-f system. All of these are accurately adjusted during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or have been altered by other means. Loss of sensitivity, improper tone quality and poor selectivity are the usual indications of improper alignment.

Correct performance of the receiver can only be obtained when the trimmer adjustments have been made by a skilled service man with the use of adequate and reliable test equipment. Such apparatus as may be required for alignment of this particular instrument is illustrated and described on a separate page of this booklet.

Two methods of alignment are applicable. One utilizes a Cathode-Ray Oscillograph as a means of output indication and the other follows former procedure where a glow type indicator or meter is used. The oscillographic method is much to be preferred, since greater accuracy is possible from the type of indication afforded. There are no approximations necessary as with the meter or aural method, but each adjustment can be made with definite precision. Both methods are hereinafter outlined so that alignment operations may be made according to the equipment available.

It is wise to determine the necessity for alignment as well as the direction of misalignment before making adjustments. The G. E. Tuning Wand is an instrument designed particularly for such a purpose.

The Tuning Wand consists of a bakelite rod having a small brass cylinder at one end and a core of finely divided iron at the other. It may be inserted into a tuned coil while a signal of the normal resonant frequency is being supplied to such

## Tuning Indicator

A cathode-ray tube is used as a means of visually indicating when the receiver is accurately tuned to the incoming signal. This tube is of new design and comprises an amplifier section and a cathode-ray section built in the same glass envelope. The cathode-ray section consists of a conically shaped luminescent screen, upon which a pattern is formed by an effect of the detected signal after said effect has been amplified by the amplifier section which is fed from the detector diode circuit. The size of the pattern is determined by the strength of the signal voltage, so that any change of tuning may be readily observed in order to facilitate tuning to exact resonance.

coil to obtain an indication of the tuning. Holes are provided at the top of the r-f shield cans for entrance of the Wand. The presence of either end of the Wand will cause a change in tuning which will be indicated at the receiver output as an increase or decrease in signal level. If there is a decrease of output when either end is inserted, the tuning is correct and will require no adjustment. However should there be an increase of output due to the iron core and decrease with the brass cylinder, an increase in inductance or capacitance is indicated as necessary to bring the circuit into line. The trimmer involved should therefore be increased accordingly. If the brass cylinder end causes an increase in output while the iron end causes a decrease, reduction of inductance will be necessary to place the circuit in alignment. This is equivalent to decreasing the trimmer concerned. The following tabulation gives the various changes and the adjustments required:—

| WAND         | SIGNAL    | TRIMMER        |
|--------------|-----------|----------------|
| {Brass ..... | Decrease} | ..... None     |
| {Iron .....  | Decrease} | ..... None     |
| {Brass ..... | Increase} | ..... Decrease |
| {Iron .....  | Decrease} | ..... Decrease |
| {Brass ..... | Decrease} | ..... Increase |
| {Iron .....  | Increase} | ..... Increase |

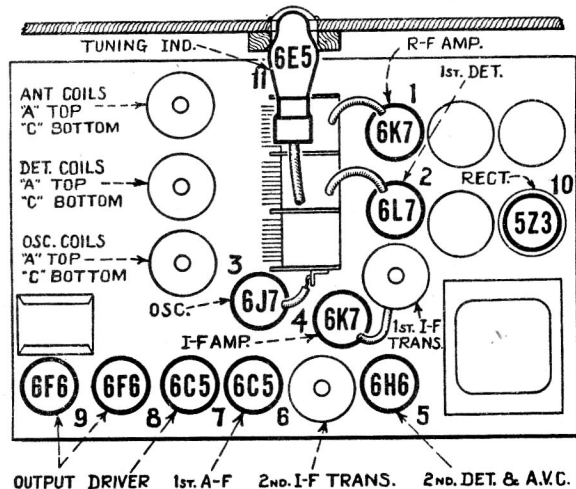


Figure 4—Coil and Radiotron Locations

## CATHODE-RAY ALIGNMENT

### Equipment

A standard source of alignment frequencies is required. Such a source should consist of an G. E. Full Range Oscillator, Stock No. 9595. Output indication should be by means of an G. E. Stock No. 9545

Cathode-Ray Oscillograph. An G. E. Stock No. 9558 Frequency Modulator will be needed to sweep the generated signal and synchronize it with the Oscillograph in order to obtain visual representation of the resonant characteristic of the circuit being tuned on the cathode-ray fluorescent screen.

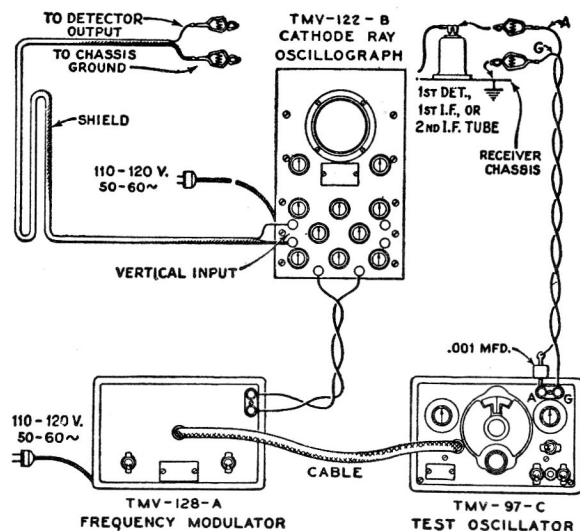


Figure 5—Alignment Apparatus Connections

#### I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by Figure 6. Each must be aligned to a basic frequency of **460 kc.** The last transformer must be aligned firstly and the first transformer aligned secondly. For such a process, it is necessary to feed the output of the Full Range Oscillator to the stages in their order of alignment, adjusting the trimmers of each transformer and observing the effect at the second detector output on the Cathode-Ray Oscillograph. The proper point of connection of the Oscillograph is with its vertical "high" input terminal attached to the junction of R-7 and R-8, as illustrated in Figure 6, and with the "0" or ground terminal to the chassis. The "Ext. Sync." terminals of the Oscillograph should be connected to the Frequency Modulator as shown by Figure 5. A .001 mfd. capacitor installed in series with the Oscillator "Ant." lead will prevent the voltages of the stage under alignment from becoming upset. The vertical "A" amplifier should be "On" for the ensuing adjustments and its gain control kept at maximum. For each adjustment, the Oscillator output must be regulated so that the image obtained on the Oscillograph screen will be of the minimum size convenient for accurate observation. Proceed further as follows:—

- (a) Place the receiver, Oscillograph and test Oscillator in operation. Set the receiver range switch to Band "A" and tune the station selector to a point where no interference will be encountered from signal pickup or from the Type 6J7 oscillator, removing the tube if necessary. Set the Oscillograph horizontal "B" amplifier to "Timing" and control its gain so that the luminescent spot sweeps a straight line trace

completely across the screen. Place the timing control to "Int." Adjust the intensity and focusing controls of the Oscillograph to produce the correct size and strength of spot.

- (b) Attach the output of the test Oscillator between the control grid cap of the Type-6K7 i-f tube and chassis ground as shown typically by Figure 5. Tune the Oscillator to **460 kc.** and set its modulation switch to "On." Regulate its output until the signal produces a wave pattern on the Oscillograph screen, adjusting the Oscillograph controls to give a shape which is convenient for peak indications. Cause the image to stand still on the screen by manipulation of the frequency and synchronizing controls. Then carefully tune the two trimmers C-20 and C-21 of the second i-f transformer to produce maximum amplitude (vertical deflection) of the oscillographic image. Under this condition the transformer will be sharply resonated to 460 kc.
- (c) The Frequency Modulator should then be placed in operation and interconnected with the Full Range Oscillator by means of the special shielded patch cord. Figure 5 shows the proper arrangement. Set the Frequency Modulator sweep range switch to its "Lo" position and turn the Oscillator modulation switch to "Off." Change the timing control of the Oscillograph to "Ext." and place the range switch to its No. 2 position. Then carefully shift the tuning of the Oscillator so as to increase its frequency, until two distinct and similar waves appear on the Oscillograph screen and become exactly coincident at their highest points. This condition will be found to occur at an Oscillator setting of *approximately 540 kc.* The curves will be identical in shape but appearing in reversed positions. Adjust the frequency control of the Oscillograph in order to cause the waves to conform with the above requirement and to make them remain motionless on the screen. This will require a setting of *approximately 1/2* clockwise rotation of the frequency control. The trimmers C-20 and C-21 should then be re-adjusted so that the two curves move together and become exactly coincident throughout their lengths, maintaining the maximum amplitude at which this condition can be brought about.
- (d) Leaving the equipment connected and adjusted as in (c), change the Oscillator output to the control grid cap of the Type-6L7 first detector tube. Then adjust the first i-f transformer trimmers C-16 and C-17 so that the forward and reverse waves appearing on the Oscillograph coincide throughout their lengths and have maximum amplitude. The shape of the composite wave obtained from this operation is a true representation of the overall tuning characteristic of the i-f system

#### R-F Trimmer Adjustments

Locations of the various antenna, detector and oscillator coil trimmers are shown by Figure 6. The test Oscillator should be removed from connection with

the i-f system and its output connected to the antenna-ground terminals of the receiver. No changes are to be made in the connections of the Oscillograph at the second detector. During the following adjustments, the Oscillator output should be regulated as often as is necessary to keep the oscillographic image as low as is practically observable. Adherence to this procedure will obviate the broadness of tuning that would result from a.v.c. action on a stronger signal. Proceed with the adjustments as follows:—

#### CALIBRATION

Set the receiver range switch to Band A and rotate the station selector until the tuning condenser plates are in full mesh (maximum capacitance). Then move the main dial pointer until it points exactly to the horizontal line at the low frequency end of the Band A scale. Correct the setting of the vernier second hand pointer to read zero.

#### BAND A

- (a) With the receiver range switch in its Band A position, tune the station selector until the dial pointer is at a reading of 1720 kc. Adjust the test Oscillator to 1720 kc. (modulation "On" and Frequency Modulator disconnected) and increase its output to produce a registration on the Oscillograph. Carefully align the oscillator, detector and antenna trimmers, C-47, C-12 and C-3 respectively, so that each brings about maximum amplitude of output as shown by the wave on the Oscillograph. It will be neces-

sary to have the timing control of the Oscillograph on "Int." for this operation. After each trimmer has been peaked, the Oscillograph timing control should be set to "Ext." and the Frequency Modulator placed into operation with its connections to the Oscillator and Oscillograph made in accordance with Figure 5. Turn the modulation switch of the Oscillator to "Off" and retune the Oscillator (increase frequency) until the forward and reverse waves show on the Oscillograph and become coincident at their highest points. Adjust the trimmers C-47, C-12 and C-3 again, setting each to the point which produces the best coincidence and maximum amplitude of the wave images.

- (b) Remove the Frequency Modulator cable from the Oscillator and shift the signal frequency to 600 kc. Place the modulation switch to "On". Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then insert the Frequency Modulator plug and retune the Oscillator (modulation "Off") until the two similar forward and reverse waves appear on the screen. For this adjustment, it is advisable to shift the Oscillator to its 200-400 kc. range using the third harmonic of the generated signal in order to obtain the desired range of sweep. The oscillator series trimmer, C-46, should then be adjusted to produce maximum amplitude of the images. No rocking will be necessary on the station selector inasmuch as the signal frequency

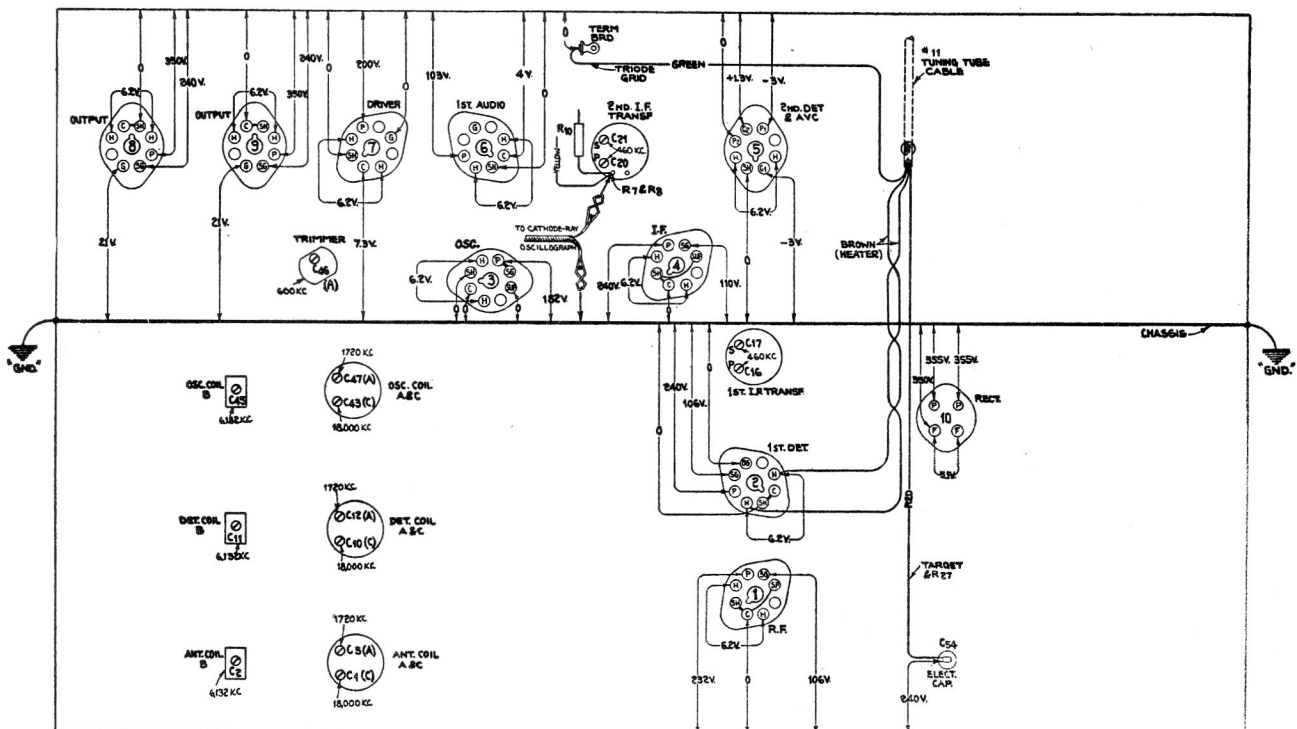


Figure 6—Trimmer Locations and Radiotron Socket Voltages  
Measured at 115 Volts A.C.—No Signal—Volume Control Maximum

is being "wobbled" by the Frequency Modulator to produce the same effect. After completing this adjustment, the trimmer C-47 should be re-aligned as in (a) to correct for any change brought about by the adjustment of C-46.

#### BAND B

- (a) Advance the receiver range switch to its Band B position and tune the station selector to a dial reading of **6132 kc.** Set the test Oscillator to this same frequency (modulation "On" and Frequency Modulator disconnected) and increase its output until a suitable indication is apparent on the Oscillograph. The Oscillograph should be adjusted for "Int." timing. Then adjust the oscillator trimmer, C-45, to the point at which maximum amplitude of the image is obtained. Two positions will be found for this trimmer which gives such a maximum. The one of least capacitance is correct and should be used. This can be checked by tuning the "image" signal, which will be received at **5212 kc.** on the dial if the adjustment of C-45 has been properly made. An increase in test Oscillator output may be necessary for this test. *Its frequency should not be changed from 6132 kc. nor any trimmer adjustments made on the receiver.*
- (b) Return the station selector to the **6132 kc.** reading and align the detector, and antenna coil trimmers, C-11 and C-2 respectively, for maximum (peak) output as shown by the Oscillograph. No further adjustments are to be made on this band.

#### BAND C

- (a) Turn the range switch of the receiver to its Band C position and tune the station selector until the dial pointer reads **18,000 kc.** Set the test Oscillator to the same frequency (modulation "On" and Frequency Modulator disconnected) and regulate its output to the level required for convenient observation. Adjust the trimmer C-43 to the point producing maximum output as indicated on the Oscillograph. Check for the presence of the proper "image" signal by tuning the receiver to **17,080 kc.** The **18,000 kc.** signal of the Oscillator will be received at this point if the adjustment of C-43 has been properly made by using the position of least capacitance which gives maximum receiver output. It may be necessary to increase the output of the Oscillator in order to get an indication of the "image". *No adjustments should be made during this check.*
- (b) Return the receiver tuning to **18,000 kc.**, realign C-43 if necessary, and then adjust the detector and antenna trimmers, C-10 and C-1, for maximum signal output as evidenced by the oscillographic image. No further adjustments are to be made on this band.

#### ALIGNMENT WITH OUTPUT METER

To align the receiver by means of an output indicator other than a Cathode-Ray Oscillograph will require the use of a standard test Oscillator, such as that recommended above, for the source of signals and means of indication for the output. The G. E. Neon Output Indicator, Stock No. 4317, will be found very satisfactory for such use. It should be connected across the voice coil circuit of the loudspeaker or across the output transformer primary.

#### I-F Alignment

Connect the test Oscillator to the control grid cap of the i-f tube. Advance the volume control of the receiver to its full-on position. Tune the test Oscillator accurately to **460 kc.** and align the trimmers C-20 and C-21 to give maximum receiver output. Regulate the Oscillator output during this adjustment so that the output indication is as small as can be conveniently observed. After completing the adjustments of these trimmers, re-connect the Oscillator so that it will feed into the control grid circuit of the Type-6L7 first detector. Then tune the first i-f transformer trimmers C-16 and C-17 for maximum receiver output.

#### R-F Alignment

After completing the i-f adjustments, it is advisable to correct the line-up of the circuits ahead of the first detector. The test Oscillator should be connected to the antenna-ground terminals of the receiver and the manual volume control turned to its maximum position. For each adjustment, the Oscillator output should be maintained as low as possible in order to avoid broadness of tuning which would result from a.v.c. action on a stronger signal.

**Band A**—This band should be aligned by supplying a **1720 kc.** signal to the receiver, tuning the station selector to a dial reading of **1720** and adjusting the trimmers C-47, C-12 and C-3 to produce maximum receiver output. The Oscillator should then be shifted to **600 kc.** and the receiver tuned to resonate this signal, disregarding the reading at which it is best received. Trimmer C-46 must then be adjusted, simultaneously while rocking the station selector backward and forward through the signal until the maximum output results from the combined operations. C-47 should be rechecked to assure that its adjustment has not changed because of the trimming of C-46.

**Band B**—This band must be aligned at **6132 kc.** by tuning the test Oscillator to such a frequency and turning the station selector to the **6132 kc.** dial reading. Then tune the trimmer C-45 to produce maximum receiver output, using the setting of least capacitance which causes same. The presence of the proper "image" may be checked by tuning the receiver to **5212 kc.** at which point the **6132 kc.** signal will be heard if the trimmer C-45 has been properly set to the position of least capacitance for maximum (peak) output. It may be necessary to increase the Oscillator output for this check. *No adjustments are to be made.* Return the station selector to the **6132 kc.** dial marking and trim capacitors C-11 and C-2 for maximum receiver output. No other adjustments are necessary



on Band B.

**Band C**—Change the receiver so that it is operative and the dial reads **18,000 kc.** on the "C" Band. Tune the test Oscillator to this same frequency. Then adjust the oscillator trimmer C-43 to produce maximum (peak) output. Two positions of this trimmer will be found which conform with this requirement. The one of least capacitance is correct. Check for the presence of "image" response at **17,080 kc.** by shifting the receiver tuning. If it is received at such a point, the trimmer C-43 has been correctly adjusted to the right peak. *No adjustments are to be made during this check.* Tune the receiver back to the **18,000 kc.** dial marking, readjust C-43 if necessary, and then tune the detector and antenna capacitors C-10 and C-1 for maximum receiver output. No further adjustments are necessary.

### Radiotron Socket Voltages

The voltage values indicated from the Radiotron

socket contacts to chassis on Figure 6 will serve to assist in the location of causes for faulty operation. Each value as specified should hold within + 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance becomes comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each reading is chosen as high as possible consistent with good readability.

## REPLACEMENT PARTS

| STOCK No.                  | DESCRIPTION  | STOCK No. | DESCRIPTION   |
|----------------------------|--|-----------|---|
| <b>RECEIVER ASSEMBLIES</b> |  |           |   |
| 4427                       | Bracket - High or low frequency tone control or volume control mounting bracket.   | 11205     | Volume control (R-14).....  |
| 5237                       | Bushing - Variable condenser mounting bushing assembly - Package of 3.....   | 11219     | Tone Control - High frequency tone control (R-22).....  |
| 11223                      | Capacitor - Adjustable capacitor (C-46)....  | 5226      | Lamp - Pilot lamp - Package of 2.....   |
| 11292                      | Capacitor - 22 MMfd. (C-9).....  | 8041      | Plate - I.F. or R.F. coil shield locking plate with screw - Package of 2.....   |
| 11289                      | Capacitor - 50 MMfd. (C-8).....  | 11220     | Resistor - Voltage divider resistor - comprising one 3900 Ohm and one 4200 Ohm section (R-31, R-32).....                |
| 11291                      | Capacitor - 115 MMfd. (C-50).....  | 11221     | Resistor - Voltage divider resistor - comprising one 50 Ohm, one 28 Ohm and one 195 Ohm section (R-28, R-29, R-30)..... |
| 11317                      | Capacitor - 600 MMfd. (C-34).....  | 5112      | Resistor - 1000 Ohm - Carbon type - 1/4 Watt (R-2).....   |
| 3784                       | Capacitor - 900 MMfd. (C-31).....  | 3706      | Resistor - 1800 Ohm - Carbon type - 1/4 Watt (R-15).....  |
| 4409                       | Capacitor - 1120 MMfd. (C-37).....   | 5159      | Resistor - 2200 Ohm - Carbon type - 1/4 Watt (R-20).....  |
| 11288                      | Capacitor - 1225 MMfd. (C-44).....   | 5175      | Resistor - 5600 Ohm - Carbon type - 1/4 Watt (R-21).....  |
| 11316                      | Capacitor - 1225 MMfd. (C-26).....   | 2731      | Resistor - 10,000 Ohm - Carbon type - 1 Watt (R-25).....  |
| 11287                      | Capacitor - 4500 MMfd. (C-58).....   | 11305     | Resistor - 22,000 Ohm - Carbon type - 1/4 Watt (R-16, R-17).....  |
| 4907                       | Capacitor - 0.005 Mfd. (C-40, C-41).....   | 11300     | Resistor - 33,000 Ohm - Carbon type - 1/10 Watt (R-24).....   |
| 4868                       | Capacitor - 0.005 Mfd. (C-33).....   | 5033      | Resistor - 33,000 Ohm - Carbon type - 1 Watt (R-23).....  |
| 4858                       | Capacitor - 0.01 Mfd. (C-24).....  | 3118      | Resistor - 100,000 Ohm - Carbon type - 1/4 Watt (R-1, R-3, R-5, R-6).....   |
| 4624                       | Capacitor - 0.01 Mfd. (C-30).....  | 5027      | Resistor - 150,000 Ohm - Carbon type - 1/4 Watt (R-19).....   |
| 4937                       | Capacitor - 0.01 Mfd. (C-39).....  | 11151     | Resistor - 2.2 Megohm - Carbon type - 1/4 Watt (R-9, R-10, R-11).....   |
| 11315                      | Capacitor - 0.015 Mfd. (C-38).....   | 11250     | Shield - Choke coil shield.....   |
| 5196                       | Capacitor - 0.035 Mfd. (C-57).....   | 5249      | Shield - R.F. coil shield.....  |
| 4836                       | Capacitor - 0.05 Mfd. (C-4, C-13, C-18, C-23).....   | 11273     | Shield - Radiotron shield.....  |
| 4885                       | Capacitor - 0.1 Mfd. (C-7, C-19, C-27, C-52).....  | 5250      | Shield - I.F. Transformer shield.....   |
| 4841                       | Capacitor - 0.1 Mfd. (C-6).....  | 11222     | Socket - Dial lamp socket.....  |
| 5170                       | Capacitor - 0.25 Mfd. (C-32).....  | 4794      | Socket - 4-contact Radiotron socket.....  |
| 11203                      | Capacitor - 10 Mfd. (C-53).....  | 11197     | Socket - 6-contact Radiotron socket.....  |
| 5212                       | Capacitor - 18 Mfd. (C-54).....  | 11198     | Socket - 7-contact Radiotron socket.....  |
| 11215                      | Capacitor pack - Comprising one 16 Mfd., two 10 Mfd., and two 8 Mfd. capacitors (C-29, C-35, C-36, C-55, C-56).....                        | 5224      | Switch - Low frequency tone control with power switch (S-11, S-13).....   |
| 11318                      | Capacitor pack - Comprising one .015 Mfd., one .05 Mfd., one 10,000 Ohm resistor and one 27,000 Ohm Resistor (C-25, C-28, R-12, C-13)..... | 11236     | Switch - Range switch (S-1, S-2, S-3, S-4, S-5, S-6, S-7, S-8, S-9, S-10, S-12).....                                    |
| 11201                      | Clamp - Cable clamp - located near variable tuning condenser - Package of 5....  | 5238      | Terminal - Antenna terminal assembly.....   |
| 11272                      | Clamp - Cable clamp - located above antenna terminal - Package of 2.....   | 11218     | Transformer - Audio driver transformer (T-2).....   |
| 4693                       | Clamp - Electrolytic capacitor clamp - for stock No. 11215.....  | 11216     | Transformer - First intermediate frequency transformer (L-16, L-17, C-16, C-17).....                                    |
| 5215                       | Coil - Antenna coil - A and C bands (L-1, L-2, L-5, L-6, C-1, C-3).....  | 11217     | Transformer - Second intermediate frequency transformer (L-18, L-19, C-20, C-21, C-22, R-7, R-8).....                   |
| 5245                       | Coil - Antenna coil - B band (L-3, L-4, C-2).....  |           |   |
| 11320                      | Coil - Choke coil (L-20).....  |           |   |
| 5216                       | Coil - Detector coil - A and C Bands (L-7, L-8, L-11, L-12, C-10, C-12).....   |           |   |
| 5246                       | Coil - Detector coil - B band (L-9, L-10, C-11).....   |           |   |
| 5217                       | Coil - Oscillator coil A and C bands (L-13, L-15, C-43, C-47).....   |           |   |
| 5247                       | Coil - Oscillator coil B band (L-14, C-45).....  |           |   |
| 5214                       | Condenser - Three gang variable tuning condenser (C-5, C-14, C-48).....  |           |   |



# REPLACEMENT PARTS—MODEL A-108

| STOCK No.               | DESCRIPTION  | STOCK No.                       | DESCRIPTION   |
|-------------------------|--|---------------------------------|---|
| 11212                   | Transformer - Power transformer - 105-125 volts - 25-50 cycles.....  | 8059                            | Board - Reproducer terminal board (2 terminals).....  |
| 11211                   | Transformer - Power transformer - 105-125 volts - 50-60 cycles (T-1).....  | 8060                            | Bracket - Output transformer mounting bracket.....  |
| <b>DRIVE ASSEMBLIES</b> |  | 11304                           | Cable - Reproducer cable - complete with connector.....   |
| 5243                    | Arm - Band indicator operating arm.....  | 8058                            | Clamp - Cone rim clamp - Package of 4.....  |
| 10194                   | Ball - Steel ball for drive assembly - - Package of 20.....  | 11189                           | Coil - Field coil, magnet and cone housing (L-22).....  |
| 8054                    | Cam - Five position cam for station selector drive assembly.....   | 8056                            | Cone - Reproducer cone (L-21).....  |
| 4422                    | Clutch - Tuning condenser drive clutch assembly - comprising shaft, balls, ring, spring and washers assembled..... | 5039                            | Connector - 4-prong male connector plug for reproducer.....                                       |
| 8048                    | Coupling - Flexible coupling for variable capacitor - (includes indicator shaft).....                              | 5040                            | Connector - 4-contact female connector socket for reproducer cable.....                           |
| 11334                   | Dial - Dial scale with mounting rivets....   | 9620                            | Reproducer - Complete.....  |
| 8045                    | Disc - Drive disc and gear assembly.....   | 8057                            | Transformer - Output Transformer (T-3,C-42)   |
| 11631                   | Drive - Tuning condenser drive assembly complete.....  | <b>MISCELLANEOUS ASSEMBLIES</b> |   |
| S1570                   | Escutcheon - Dial escutcheon with vernier scale.....   | 5211                            | Bolt - Speaker mounting bolt assembly - Package of 2.....   |
| 8046                    | Gear - Indicator shaft drive gear and vernier idler with one spring.....   | 11191                           | Bracket - Radiotron tuning lamp mounting bracket - less clamp (Stock #11192).....                 |
| 8050                    | Gear - Gear sector and band indicator operating link - (link connects to arm on band switch).....                  | 11319                           | Cable - Radiotron tuning lamp cable and plug - approximately 25" long.....                        |
| 8053                    | Indicator - Station selector indicator pointer.....  | 11192                           | Clamp - Radiotron tuning lamp mounting clamp - less bracket (Stock #11191).....                   |
| 8051                    | Link - Complete with roller and spring....   | 11276                           | Escutcheon - Radiotron tuning lamp escutcheon.....  |
| 8049                    | Pinion - Vernier pointer drive pinion and shaft.....   | 11379                           | Escutcheon - Station selector escutcheon and crystal.....   |
| 4669                    | Screw - No. 8-32 5/32" square head set screw - for variable condenser drive assembly - Package of 10.....          | 11346                           | Knob - Station selector knob.....   |
| 8047                    | Spring - Coil spring for indicator shaft drive gear and vernier idler (Stock #8046).....                           | 11347                           | Knob - Volume control, tone control, power switch or range switch knob.....                       |
| 8052                    | Spring - Coil spring for link - Package of 5.....  | 11382                           | Resistor - 1 Megohm - Carbon type 1/10 Watt (R-27).....   |
| 8042                    | Stud - Band indicator operating arm stud - Package of 5.....   | 5210                            | Screw - Chassis mounting screw assembly - Package of 4.....                                       |
|                         |  | 11348                           | Screw - No. 8-32 7/16" Headless cupped point set screw for knob (Stock #11346) Package of 10..... |
|                         |  | 11193                           | Shield - Reproducer cover (shield).....   |
|                         |  | 11381                           | Socket - Tuning lamp socket and cover.....  |
|                         |  | 11349                           | Spring - Retaining spring for knob (Stock No. 11347) Package of 5.....                            |