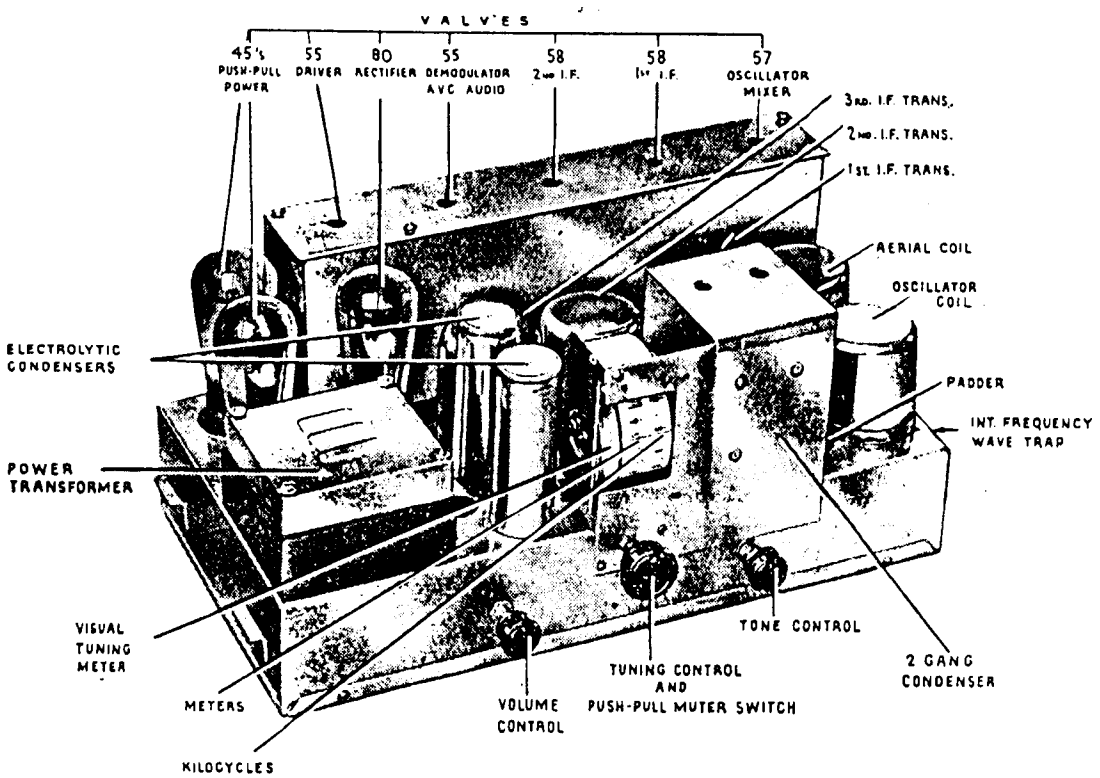
Stromberg-Carlson

STROMBERG - CARLSON

SERVICE BULLETIN No. 833

Stromberg-Carlson Model 833 Superheterodyne

ALL ELECTRIC SEVEN VALVES AND RECTIFIER



Chassis of Model 833

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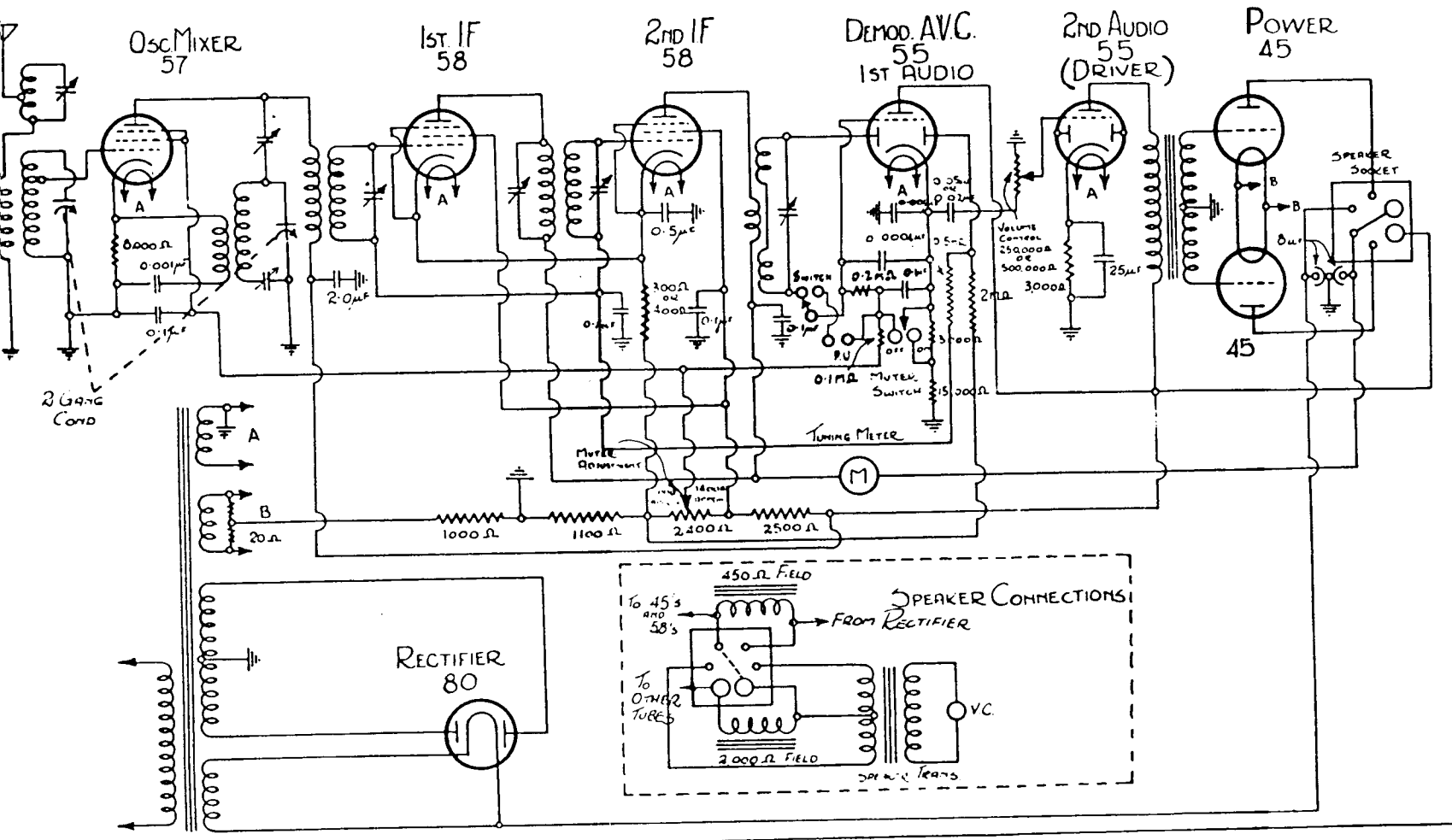
RADIO RECEIVER MODEL 833



CHANGES

STROMBERG-CARLSON (AUSTRALASIA) LIMITED
SYDNEY AUSTRALIA

DRAWING NO

DRAWN J.W.S
EXAMINED
APPROVED

DATE 19-4-33

SERVICE BULLETIN No. 833 *(Continued)*

Stromberg-Carlson Model 833 Superheterodyne

ALL ELECTRIC SEVEN VALVES AND RECTIFIER

1. GENERAL DESCRIPTION OF RECEIVER:

This Receiver employs the improved superheterodyne circuit designed and developed in the Stromberg-Carlson Laboratories. The Model also incorporates the latest Automatic Volume Control system coupled with Visual Tuning, and in addition employs a special Muting Device, developed and patented by Stromberg-Carlson (Australasia) Ltd. This Device "silences" or automatically "mutes" the Receiver, when tuning between stations, so that the background of noise, due to static and other sources of interference is reduced to a minimum.

The special audio amplifier used in this receiver incorporating push-pull 45 type valves and a driver stage gives the best possible quality of reproduction. **This, combined with the matched dual speakers and good** acoustic qualities of the cabinet, enables the full range of volume levels to be reproduced without distortion.

The Tone Control on this model has been incorporated to enable the operator to manually regulate the tonal quality of the receiver to suit the wide and varying range of reception conditions.

All the components and the R.F. Valves on this Model have been carefully and thoroughly shielded to a degree hitherto not attained commercially in Australia, the result being that this Model does not "pick-up" or amplify unwanted signals and extraneous electrical impulses. This condition is particularly desirable in "noisy" locations and in areas close to powerful broadcasting stations.

Particular attention has been paid to the outlay of the components to permit the greatest possible facility in servicing. The Valves are mounted in a line along the back of the chassis, where they are readily accessible for inspection, testing or replacement.

Beneath the Chassis all the minor components consisting of resistors and capacitors, are mounted on a single strip and are plainly numbered for ease in checking their values, testing voltages and general servicing. This method of assembly also contributes to the mechanical strength and electrical efficiency of the Chassis.

2. INSTALLATION INSTRUCTIONS:

(a) Aerial.

The sensitivity of this model is such that in most installations a well insulated wire about 20 to 30 feet in length, placed along the picture moulding in a room, or beneath the carpet, will prove satisfactory. Care should be taken to place all such indoor aerials, as far away as possible from electric light or power conduits, and in particular, clear of all **unshielded flexible leads, since these latter are prolific radiators of undesirable electrical impulses.**

Since an out-door Aerial is the most efficient, this type of aerial is to be preferred—especially where facilities for such are readily obtainable. In country areas, where the maximum receptivity of the receiver is desired, an outdoor aerial of from 30 to 50 feet in length is recommended.

In noisy areas (due to electrical interference) the aerial should be erected as far as possible from and at right angles to any electric power or light mains.

As a further precaution against undesirable pick-up the lead-in should be of the shielded type with the outer sheath connected to earth.

(b) Earth.

The chassis should be connected to earth by means of an insulated wire attached to a water pipe by an approved clamp. It is preferable to

SERVICE BULLETIN No. 833 *(Continued)*

connect the earth lead to the last section of the pipe where it enters the ground, thus avoiding the high resistance contacts at the joints. Should a water system not be available, an efficient earth may be obtained by driving a metal pipe or burying about four square feet of metal sheeting in moist earth, the connection to the metal should preferably be soldered.

(c) Voltage Adjustment Panel.

Before leaving the factory the power lead is connected to the 240 volt tapping on the power transformer. If the line voltage differs from this, the power lead should be unsoldered from the 240 volt tapping and soldered to the tapping which is marked with the voltage nearest to, but not less than, the measured line voltage in the locality. The voltage tappings for 200, 220, 240, 260 volts are designated on the power transformer.

When making any adjustment, **see that the power plug is completely removed from the socket of the supply source.**

(d) Trimmer Adjustments.

The tuning adjustments on the gang capacitor (the variable gang tuning condenser) and the trimmer capacitors on the Intermediate Frequency Transformers (tuned to 465 k.c.) are adjusted and sealed at the factory at the time of calibration. These adjustments should on no account be touched or the seals broken unless a specially calibrated oscillator and indicating instrument are available whereby such adjustments can be successfully carried out. In any repairs or adjustments the above remarks in regard to the gang capacitor and intermediate transformers should be carefully noted.

3. OPERATION:

(a) Automatic Volume Control.

This Model is so designed that the signal voltages feed to the audio system, tend to adjust themselves to a constant level. This signal level, is manually controlled and should be adjusted to the desired volume on a station of moderate or high power. The automatic feature will then tend to maintain this volume at a constant level on different signals, of wide variations in intensity.

The effects of fading being thus reduced to an absolute minimum constant attention to the volume control is obviated, especially on the reception of weak and distant stations.

(b) Visual Tuning Meter.

Since the Automatic Volume Control tends to keep the signal at a constant level, it would be difficult to tune to exact resonance, by aural means (except on weak signals.) With a Visual Tuning Meter, however, tuning to exact resonance, is always possible, and since improper tuning adversely affects the quality of reproduction, the correct tuning for any station is most important, and this condition is easily and quickly attained by means of the Visual Tuning Meter.

NOTE.—It may be observed that on one or two of the Australian Broadcasting stations better quality is obtained by slightly detuning—to a point where the Tuning Meter indicator is somewhat below the maximum swing. **This effect is due to the method of carrier modulation employed by such Broadcasting Stations, and not to any defect in the receiver, nor to the** method of tuning.

Should complete silence be desired when tuning over the dial, the Manual Volume Control may be turned to the "off" position, and the tuning performed visually by observing the swing of the Tuning Meter Indicator, then turning up the manual control when the desired setting is obtained.

When the Receiver is first turned on, the indicator on the Tuning Meter will move down to a fixed position.

On tuning to a signal, the indicator will rise, the height of the swing being an indication of the strength of the received signal, i.e., the stronger the signal, the greater the vertical swing.

It is interesting to note the wide variations of intensity from incoming signals, as observed by the swing of the indicator on the tuning meter,

SERVICE BULLETIN No. 833 *(Continued)*

OPERATION *(Continued)*

at the same time noting that the volume of the receiver is being maintained at a constant value due to the Automatic Volume Control Device.

(c) Muting Control.

The muting control is incorporated in the control shaft of the tuning knob and operation is effected by a horizontal movement of the knob. **With the knob pushed in, the receiver is set at the normal or most sensitive position. With the knob pulled out (the movement is about one-eighth of an inch) the automatic "muting" circuit is brought into operation whereby most of the natural static and practically all of the electrical interference and background of noise is eliminated when tuning between stations.**

In this position, the Manual Volume Control may be set for comfortable room volume and thereafter station after station tuned in quickly and at practically constant volume, irrespective of the varying intensity of the received signals.

(d) Tone Control.

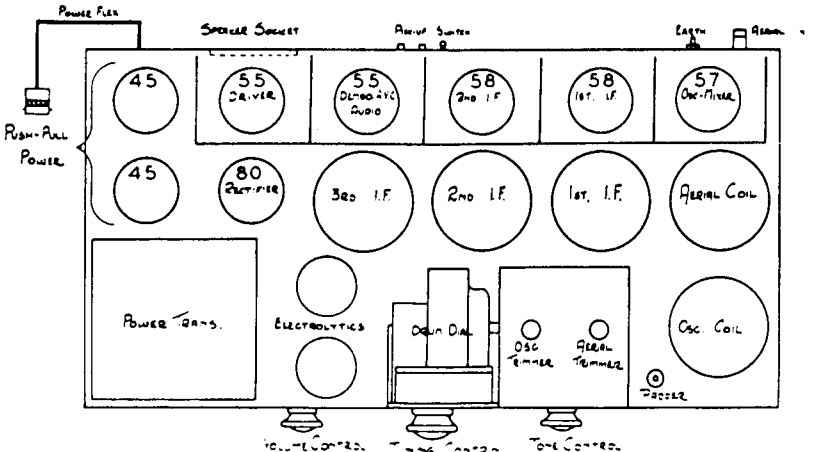
Under the normal conditions of reception, such as from a good local station, the tone control should be set at the "off" position, that is, turned as far as possible to the right. The Receiver is now set for "Brilliance" and the full range of audio frequencies from the highest to the lowest notes will be reproduced in their true values.

Under conditions of noisy reception whether due to natural static, local electrical interference, or when receiving weak or distant stations, more pleasing reception will result with the tone control turned to the "on" position, this will result in a "Mellow" tone, free from the high frequency background of noise, so disturbing under the conditions outlined. The tone control may, of course, be set at any intermediate position, between "Brilliant" and "Mellow" to suit the condition of reception or the taste of the operator.

4. VALVES:

All Receivers leaving the factory are equipped with valves inserted into the sockets. If for any reason it becomes necessary to remove the valves, care should be taken to see that each one is replaced in the socket from which it was taken. The photograph of the chassis on Page 1 shows the type and function of the valves and their exact location.

Function of Valve.	Type of Valve.
Oscillator-Mixer	57
First I.F.	58
Second I.F.	58
A.V.C. Demodulator 1st Audio	55
Driver (2nd Audio)	55
Push-Pull	45
Power	45
Rectifier	80



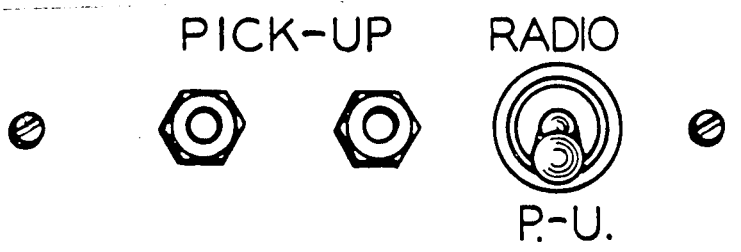
SERVICE BULLETIN No. 833 *(Continued)*

5. SPEAKERS:

Dual speakers of the dynamic or moving-coil type are used and being a matched pair are able to give particularly faithful reproduction and withstand large sound volume. The speakers terminate in a six-pin plug at the receiver chassis; detailed connections being shown on page 2. The field resistance of the speakers is 450 ohms and 2000 ohms respectively. THE SPEAKER PLUG MUST NOT BE REMOVED WHILE THE CURRENT IS TURNED ON.

6. PICK-UP JACKS.

Provision is made at the back of the Chassis for the attachment of a Phonograph Pick-up. To operate the pick-up, insert the leads from the pick-up and then throw switch from position marked "RADIO" to position marked "PICK-UP" as shown in illustration.

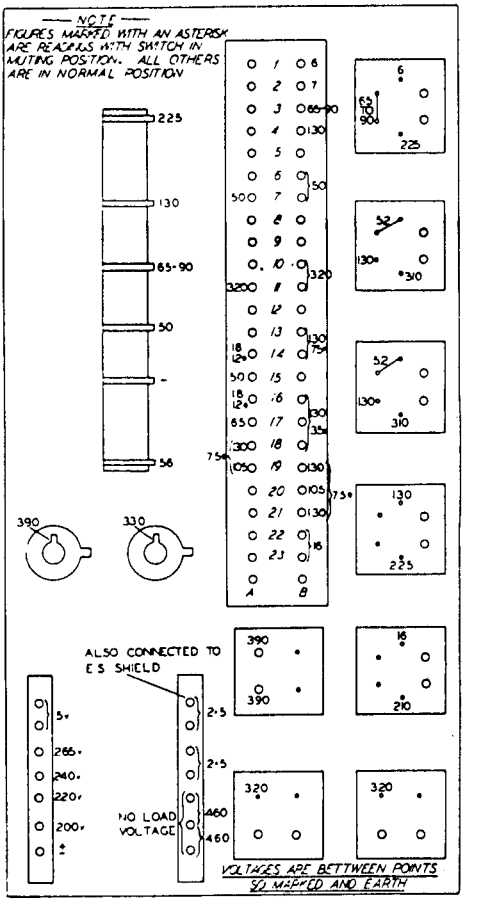


The volume control on the receiver may be used to regulate the audio output from the pick-up.

Some makes of Magnetic Pick-ups deliver comparatively low voltages, and in such cases, where these are used, an audio transformer of approximately 1-3 ratio should be used between the pick-up and receiver.

7. VOLTAGES:

All voltages shown in the chart on Page 6 are those which should be obtained when using a 0-10-120-300-600 volt voltmeter having a resistance of 1,000 ohms per volt. Voltages shown below 10 are to be read on 0-10 scale, those below 120 on the 0-120 scale, those below 300 on the 0-300 scale, and those above 300 on the 0-600 scale. It is important to note that other voltmeters having different internal resistances will give voltage readings different from those mentioned in the following table. Therefore, a 1,000 ohm. per volt voltmeter should be used.



SERVICE BULLETIN No. 833 *(Continued)*

8. FAULTS:

A list of probable faults with their causes is given below. Having located the fault, it is necessary to adjust or repair the component in question or, if beyond repair, to remove and replace it with a good component.

(a) No Signals.

1. Examine the house power socket for disconnection.
2. Speaker plug not properly in socket or failing to make contact.
3. Defective valves or valves failing to make contact in sockets, or screen-grid clips making faulty connection.
4. Defective 80 Rectifier.
5. Defective dynamic speaker due to disconnection in the transformer or voice coil.
6. Disconnection in voltage-divider.
7. Defective by-pass condenser.
8. Resistor or condenser shorting to frame or burnt out.
9. Volume control moving arm shorting to frame.
10. Defective audio transformer.

(b) No Signals when Audio End appears in Good Order.

1. Intermediate Frequency Transformer leads shorting to frame or open circuit coils.
2. Defective Detector-Oscillator Valve.
3. Defective resistor in cathode circuit of Detector-Oscillator Valve.
4. Defective oscillator coil or aerial coil. (See C.6.)
5. Grid Clip off valve caps or shorting to frame.
6. Coil in Visual Tuning Meter open circuit.

(c) Weak Signals.

1. Aerial trimmer not properly adjusted. See installation instructions 2 (d).
2. Trimmers on gang-condenser out of adjustment. Access to these trimmers is provided on the top of the gang shield.
3. Insufficient line voltage or voltage set at wrong tapping. See 2 (c).
4. Defective dynamic speaker. See a. (5).
5. Defective valves, or valves failing to make proper contact in sockets.
6. Defective aerial bobbin. In most instances it will not be possible to rectify these on site, they should be returned to the factory for repair.
7. Aerial filter circuit open-circuit or shorting to frame.

(d) Weak Signal with Distortion.

1. Secondary of I.F. Transformer or their leads shorting to frame.
2. Defective 55.
3. Defective coupling condenser (from plate of detector to grid of driver valve).
4. Valve Sockets or grid clips making poor contact.

(e) Poor Quality and/or Overloading Accompanied by Hum.

1. Adjust tuning by means of Visual Tuning Meter to see that the setting is on central point of broadcast station carrier wave.
2. Speaker cone assembly off centre and touching sides.
3. Defective valve or one 45 valve out of socket.
4. Defective or burnt out resistors in plate circuit of detector.
5. Defective Resistor in cathode circuit of second detector.
6. Distortion is sometimes due to an "out of phase" condition of the reflected waves from Broadcasting Stations, and is not attributable to any fault in the receiver.

(f) Howling and Microphonism.

1. Defective Valves.
2. Defective Speaker.

SERVICE BULLETIN No. 833 *(Continued)*

(g) Excessive Hum.

1. Defective Speaker.
2. Defective Valves, or one 45 Valve out of socket.
3. Defective or shorted resistors.
4. Defective coupling condenser, (plate of detector to grid of driver).
5. Shorting bar across pick-up terminal missing or making defective contact.

(h) Fading.

1. Natural atmospheric causes. The Automatic Volume Control will normally take care of this type of fading.
2. Defective Valves.
3. Broadcast station troubles.
4. Defective aerial due to its periodic contact with nearby objects as a result of swinging.
5. Extreme line voltage fluctuation. This Model is designed to operate between 200-260 volts. Any deviation from this will cause undesirable effects.
6. Loose or high resistance joints. Visually examine all soldered connections and when necessary test with a pair of pliers.

(i) Noise.

1. Remove aerial and earth from receiver. If noise ceases, the trouble is due to local interference such as flashing signs, refrigerators, proximity of power transformers, lifts or tram wires.
2. Atmospheric disturbances such as static. Direct attention of user to this phenomenon particularly during summer months.
3. Defective house lighting circuit. Check electric light and power sockets, switches, extension cords and electrical accessories for bad connections.
4. Defective valves due to loose elements.
5. See h (6.)
6. Defective Speaker. Check adjustment of voice coil and examine rear of cone.
7. Aerial intermittently touching surrounding objects.
8. Defective resistor.

9. COMPONENTS:

The following list of components is given to facilitate the servicing of the Receiver and as a guide to replacements.

The numbers refer to the position of the component on the assembly panel as illustrated on page 6.

1.	8,000 ohms.	13.	0.001 microfarad
2.	0.001 microfarad	14.	0.0004 microfarad
3.	0.1 microfarad	15.	2 megohms.
4.	0.1 microfarad	16.	200,000 ohms.
5.		17.	100,000 ohms.
6.	0.5 microfarad	18.	0.1 microfarad
7.	300 ohms.	19.	.3000 ohms.
8.	**0.1 microfarad**	**20.**	**15,000 ohms.**
9.	500,000 ohms.	21.	0.02 microfarad
10.	0.1 microfarad	22.	3000 ohms.
11.		23.	25.0 microfarads.
12.			

Voltage Divider Values: 2,500 ohms, (1,000—1,400 ohms variable tap), 1,100 ohms, 1,000 ohms.

N.B.—BEFORE LEAVING A STROMBERG-CARLSON RADIO RECEIVER IN A CUSTOMER'S HOME, SEE THAT EVERYBODY WHO IS LIKELY TO HANDLE THE RECEIVER FULLY UNDERSTANDS ITS OPERATION. BY SO DOING MANY UNNECESSARY SERVICE CALLS WILL BE AVOIDED.