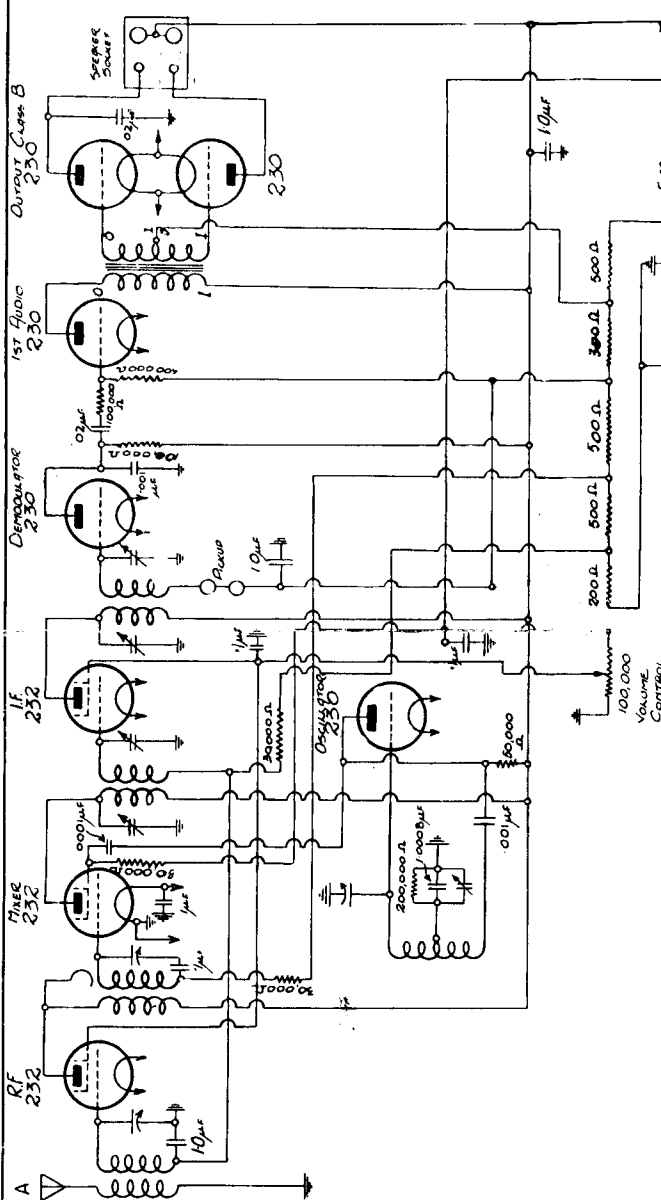


CHANGES

DRAWN IWS
EXAMINED S.F.T.H.
~~APPROVED~~
DIRECTOR
DATE 21-7-32



RADIO RECEIVER MODEL 802A

BATTERY SUPERHET.

* SEE SERVICE BULLETIN - SECTION 2

101-*[Handwritten scribble]*

Stromberg-Carlson

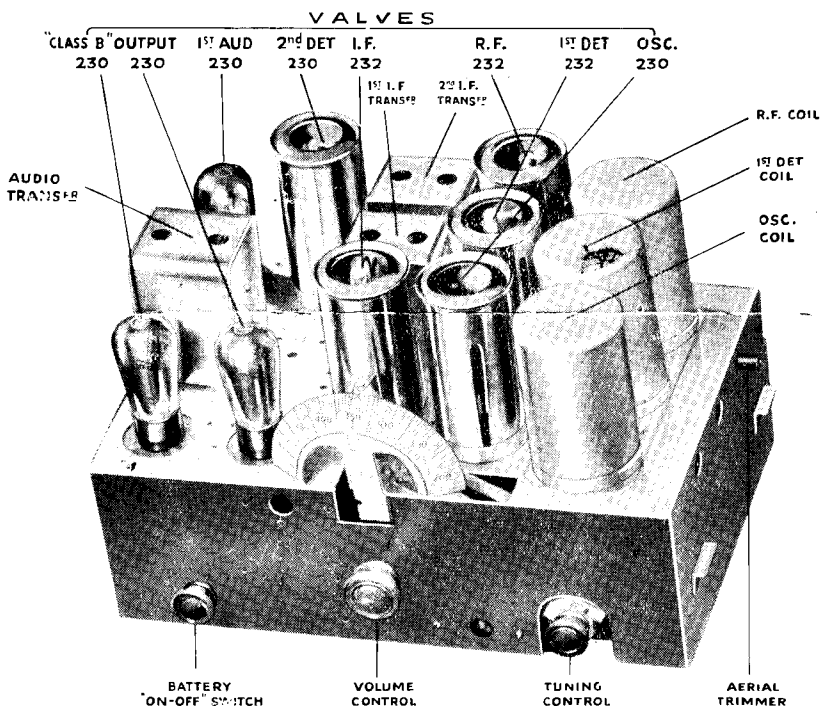
SERVICE BULLETIN No. 802

Page 1

Radio Receiver Models 802A and 802B

BATTERY-OPERATED, SUPERHETERODYNE, EIGHT VALVES

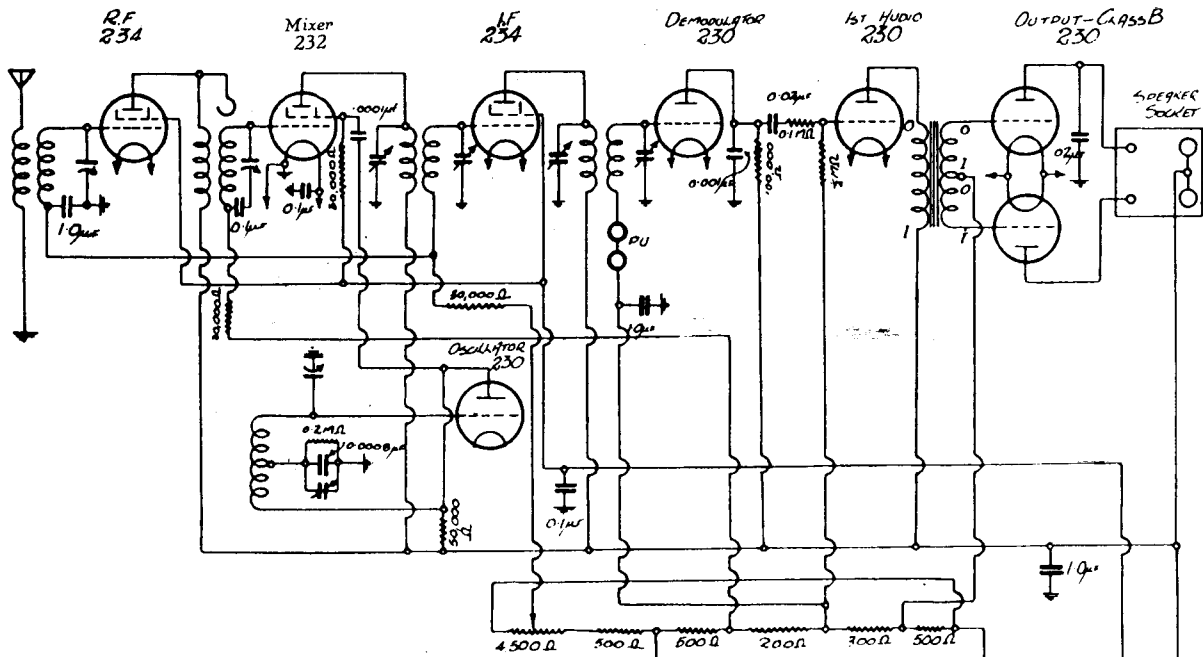
NOTE.—The Model 802A uses type 232 Valves in the Intermediate Frequency and Radio Frequency stages. Models marked 802B use type 234 Valves instead.



Chassis of Model 802A

(See Note above).

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Radio Receiver Model 802B

Battery Superheterodyne

* See Service Bulletin Section 2

Two more fairly early Stromberg-Carlson receiver circuits are shown above. Model "533" is a five-valve console designed for broadcast coverage and A.C. operation. It uses an 8-inch, 1,000 ohms field, loud-speaker, and is fitted with three controls—volume, tuning and tone (continuous). The I.F. used is in the vicinity of 465 KC. A particular feature of this model is found in the provision of a built-in wavetrap

(tapped coil in series with aerial lead) which is adjustable by means of a pre-set trimmer.

Model "802B" is an 8-valve console designed for broadcast coverage and operation from battery power supplies. It uses an 8-inch, permanent magnet, loudspeaker, and is fitted with three controls—volume, tuning, and battery switch. Power supply is obtained from a two-volt accumulator and

four series-connected 45 v. dry batteries. No bias batteries are required as all grid voltages are obtained from a voltage divider system shunted across the first 22.5 v. tap on the "B" battery. The 22.5 v. tap on the "B" battery therefore becomes the true "B" negative, and the total high-tension voltage applied the valves is therefore 157.5 volts.

CHANGES

STROMBERG-CARLSON
STROMBERG-CARLSON
MONTICELLO, N.Y.

LIMITED

Drawing No.

Designed by
Approved by
Date 26-7-32

Radio Receiver Models 802A and 802B

BATTERY-OPERATED, SUPERHETERODYNE, EIGHT VALVES

(The 802A uses Type 232 Valves in the Intermediate Frequency and Radio Frequency stages, but the 802B uses 234 instead—see paragraph 2 on page 5)

This Receiver is designed specially for satisfactory service, with low battery current consumption, in areas where electric power is not available. The Model 802 has a sufficient sensitivity over the whole wave-length band to ensure daylight reception with satisfactory volume and clarity and, since it incorporates the well known superheterodyne principle, the selectivity is such that broadcast stations may be received without interference and overlapping. It uses one tuned radio stage, oscillator, two intermediate frequency stages feeding into a detector and one audio stage which drives two 230 type valves in "Class B" amplification and comprises eight valves in all.

1. GENERAL INSTALLATION INSTRUCTIONS:—

(a) Aerial and Earth.

The usual procedure of a well-insulated aerial and a short lead to an efficient earth should be followed. The 802 Receiver is a very sensitive instrument and will operate satisfactorily on an indoor aerial. However, it is strongly recommended that 40 to 60 feet of outdoor aerial be used, since such an aerial will transfer greater signal strength to the receiver. This condition allows the volume control to be turned back, resulting in less background of noise and interference and, at the same time, economises in B battery consumption.

(b) Lay-Out of Components.

For the lay-out of components appearing on the top of the chassis reference should be made to the photograph which appears on Page 1.

(c) Aerial Trimmer.

After installation this Model should be finally adjusted to work at maximum efficiency with the aerial to be used.

To do this proceed as follows:—

Tune the receiver to some station around the low wave-length end of the scale—say, 200 to 250 metres—turn the volume control down until the incoming signal is just audible then adjust by hand the small trimmer on the right-hand side of the chassis until a point of maximum signal is obtained. Once obtained, this adjustment should not be altered.

The tuning adjustments on the gang capacitor (variable tuning condenser) and the trimmer capacitors on the Intermediate Frequency Transformers (tuned to 175 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 to hand 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.

(d) Batteries.

- (i.) *A Battery*.—This consists of a 2 volt, 40-60 ampere-hour accumulator.
- (ii.) *B and C Batteries*.—These comprise 4 heavy duty 45 volt dry cells.

To join the battery leads correctly to the batteries, reference should be made to the Instruction Card which accompanies every Model 802. For further details of current consumption, etc., see 4 (a) and 4 (b) of this Bulletin.

The four B batteries may be housed in the back of the cabinet on the lower shelf, two on the right and two on the left-hand side of the loud speaker. The A battery may then be placed in between the B batteries or on the floor immediately behind the cabinet.

(e) Fuse Lamp.

As soon as the battery connections have been carefully checked, screw the Fuse Lamp into the socket as indicated on the Instruction Card. The purpose of the Fuse Lamp is to protect the valves in cases where the A and B battery leads have become inadvertently reversed. It should be noted that the receiver will not operate if this lamp is missing, making bad contact or burnt out.

2. VALVES.

All Battery-operated Receivers leaving the factory are supplied with valves which have been tested and matched to the receiver which they accompany. Since these valves are less robust than the A.C. type of valves, they are not shipped in the sockets of the chassis but are carefully packed to avoid unnecessary jolting in transit. The photograph on page 1 shows the type and function of the valves and their exact location.

It should be noted that the manufacturer reserves the right to vary without notice the types of valves used in the Model 802 as per the following schedule. These variations will be recognised by the letters A and B being suffixed to the model number.

Function of Valve.	Model 802A.	Model 802B.
Radio Frequency	232	234
Inter. Frequency	232	234
Mixer	232	232
Oscillator	230	230
2nd Detector	230	230
1st Audio	230	230
"Class B" Pushpull	230 }	230 }
Output	230 }	230 }

3. SPEAKER.

The Speaker in this model is the Dynamic or moving coil type and is matched to the "Class B" push-pull output from two 230 Type valves. The combination of a dynamic speaker and "Class B" amplification in a battery-operated receiver is of recent development and for the first time allows a battery operated receiver to operate with output, power and fidelity comparable with all-electric model, at the same time considerably conserving the battery consumption.

8. FAULTS (Continued):—

- (vii.) Fuse lamp blown or not making contact in socket.
- (viii.) Pick-up shorting bar missing or making defective contact.

c. Weak Signals.

- (i.) Aerial trimmer not properly adjusted (see Installation Instructions 1 (c)).
- (ii.) Trimmers on gang condenser out of adjustment. Access to these trimmers is provided on the right-hand side of chassis and an insulated lining rod should be used for adjustment purposes.
- (iii.) Batteries weak. See 4 (a) and 4 (b).
- (iv.) Defective dynamic speaker. See a (v.).
- (v.) Defective valves or valves failing to make proper contact in sockets.
- (vi.) Defective aerial-bobbin or R.F. coils. In most instances it will not be possible to rectify these on site; they should be returned to the factory for repair.
- (vii.) Bias voltages not correct due to faulty resistors.

d. Weak Signals with Distortion.

- (i.) Bias voltages not correct on 2nd detector, 1st audio or output valves due to defective resistors, defective audio transformer or batteries.

e. Poor Quality.

- (i.) Adjust tuning to see that setting is on central point of broadcast station. Adjust volume control to ensure that it is not advanced past the overload point.
- (ii.) Fading (atmospheric).

f. Howling and Microphonism.

- (i.) Defective valves.
- (ii.) Defective speaker.
- (iii.) Defective batteries.

g. Fading.

- (i.) Natural (atmospheric) causes—may be accompanied by distortion.
- (ii.) Defective valves.
- (iii.) Broadcast station troubles.
- (iv.) Defective aerial due to its periodic contact with nearby objects as a result of swinging.
- (v.) Defective batteries. See 4 (a) and 4 (b).
- (vi.) Loose or high resistance joints. Visually examine all soldered connections and, if necessary, test with a pair of pliers.

h. Noise.

- (i.) Remove aerial and earth from receiver. If noise ceases the trouble is due to local interference—static, electric light plants, etc.
- (ii.) Natural atmospheric disturbances such as static. Direct attention of user to this phenomenon particularly during summer months.
- (iii.) Defective battery connections. See that these are clean and making good contact.
- (iv.) Defective valves due to loose elements.
- (v.) Fuse lamp loose in socket.
- (vi.) See g (vi.).
- (vii.) Defective speaker. Check adjustment of voice coil and examine rear of cone.
- (viii.) Aerial intermittently touching surrounding objects.
- (ix.) Defective resistor.

N.B.—BEFORE LEAVING THE 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 MAY BE AVOIDED.

4. BATTERIES:—

(a) B and C Batteries.

In this receiver it has been arranged that both B and C battery supply shall be drawn from the one battery block. Four 45-volt heavy-duty batteries are used, the 22½ volts in the first battery being used for C bias and the remaining 157½ volts for "B" supply. Current is taken from the C battery section while the set is switched on and this current drain has been carefully calculated so that both the B voltage and the C bias voltages remain in the correct ratio throughout the useful life of the batteries, thus ensuring excellent quality of reproduction.

The voltages of the 45 volt units should not be allowed to fall below 35 volts when readings are taken on a 1,000 ohms per volt voltmeter with the batteries on load, i.e., feeding the receiver in normal operation. (The voltages of batteries taken whilst the receiver is not operating are not a true indication of their condition).

(b) A Battery.

This consists of a 2 volt, 40-60 ampere-hour accumulator which should give approximately three weeks service before requiring a recharge. Storage batteries should be re-charged at least once a month to give maximum life and efficiency. They should not be allowed to fall in voltage below 1.8 volts as read by a voltmeter with the receiver in operation or in specific gravity below 1150, as read by a hydrometer.

5. OPERATION.

The more sensitive and selective the receiver is the greater the care to be taken in the operation and tuning to obtain the best results. In this model the left-hand knob is the "on-off" switch, the centre knob is the volume control, and the right-hand knob is the tuning control. Improper tuning will affect the quality of reproduction. Care should be taken to keep the volume control well down, then adjust the tuning control to the point of maximum undistorted signal, thereafter adjusting the volume to the desired level. Judicious use of the volume and tuning controls in the Model 802 will assist in the economy of battery consumption.

6. PICK-UP JACKS.

Provision is made at the back of the chassis for the attachment of a phonograph pick-up. Unless the receiver is issued from the factory as a phono-radio combination, the pick-up jacks are shorted with a metal bar which must not be removed unless it is desired to insert a pick-up into the terminals. When the pick-up is in use, care must be taken to see that the volume control on the receiver is turned right off, thereafter using the volume control supplied with the pick-up.

7. VOLTAGES.

All voltages given in the table on page 7 are those which should be obtained when using a 0-60-120-300 volt voltmeter having a resistance of 1,000 ohms per volt. Voltages shown below 60 are to be read on the 0-60 scale, those below 120 on the 0-120 scale, and those above 120 on the 0-300 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.

7. VOLTAGES (Continued).

Valve	Fila- ment	Bias (Grid)	Screen	Plate Volts	Plate Current
RF		(232) (234)			
232 or 234	2.0	2 2 (a) 22 (b)	67.5	157.5	1.5 m.a. (a) Nearly zero (b)
Mixer					
232	2.0	5	67.5	157.5	0.2 m.a.
Oscillator					
230	2.0	0	—	60-80	1 m.a.
Intermediate Frequency		(232) (234)			
232 or 234	2.0	2 2 (a) 22 (b)	67.5	157.5	1.5 m.a. (a) Nearly zero (b)
2nd Detector (Demodu- lator)					
230	2.0	12 v.	—	100	.2 m.a.
1st Audio		As read on			
230	2.0	Divider (See circuit) 12 v.	—	157.5	2 m.a.
Output Class B					
2 230	2.0	15 v.	—	157.5	1 m.a. total with no Signal

(a) = Volume control full on.

(b) = Volume control in "off" position.

Bias voltages given are those measured at valve sockets. Actual bias voltages measured on bias potential divider (see circuit) are:—

R.F. and I.F.	(232) 3 volts, (234) 3 to 22 volts
Mixer	7.5 volts
2nd Detector	12 volts
Audio	12 volts
Output	15 volts

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.

- (i.) Examine battery connections and battery switch on receiver, also battery cable.
- (ii.) Speaker plug not properly in socket or failing to make contact.
- (iii.) Valves failing to make contact in sockets.
- (iv.) Defective valves.
- (v.) Defective dynamic speaker due to disconnection in transformer or voice coil.
- (vi.) Defective by-pass condenser.
- (vii.) Resistor or condenser shorting to frame or burnt out.
- (viii.) Fuse Lamp not in socket, making faulty contact or burnt out.

b. No Signals When Audio End Appears in Good Order.

- (i.) Open circuit in volume control.
- (ii.) Intermediate frequency transformer shorting to frame or open circuit.
- (iii.) Defective oscillator valve.
- (iv.) Defective resistor in plate circuit of oscillator valve or defective grid resistor in oscillator circuit.
- (v.) Defective resistor in grid circuit of mixer valve.
- (vi.) Defective oscillator coil or R.F. coils. See c (vi.).