

Circuit Tests

RCA

Radiolas 26, 24, Super-Heterodyne
and Super-VIII

SERVICE NOTES

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Radio Corporation of America

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A WORD OR TWO ABOUT SERVICE

Service goes hand in hand with sales. The well informed Radiola Dealer renders service at time of sale in affording information as to proper installation and upkeep. Subsequent service and repair may be required by reason of wear and tear and mishandling, to the end that Radiola owners may be entirely satisfied.

Obviously this service can best be rendered at point of contact and therefore Dealers and Distributors, who are properly equipped with a knowledge of the design and operation of Radiolas, occupy a favorable position to contract for this work.

To assist in promoting this phase of the Dealers' business the Service Division of the RCA has prepared a series of Service Notes—of which this booklet is a part—containing technical information and practical helps in servicing Radiolas.

This information has been compiled from experience with Radiola Dealers' service problems, and presents the best practice in dealing with them. A careful reading of the Service Notes will establish their value to Dealer and Distributor, and it is suggested they be preserved for ready reference.

In addition to supplying the Service Notes the RCA, through its Service Stations, has available to Dealer and Distributor the services of engineers who are qualified to render valuable help in solving service problems.

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Circuit Tests

RCA Radiolas 26, 24, Super-Heterodyne and Super-VIII

PREPARED BY RCA SERVICE DIVISION

These Circuit Tests are divided into two parts, the first part covering Radiola 26 and the second part Radiolas 24, Super-Heterodyne and Super-VIII.

PART I—RADIOLA 26

The catacomb of Radiola 26 is mounted differently than in other Radiolas employing the standard six-tube catacomb and the connections thereto are reversed. As a stage change switch is not used, the built-in loudspeaker is at all times connected to the second audio stage and the phone tip pin jacks to the first stage.

TEST PROCEDURE

(1) See if the filaments of all Radiotrons are lighted. If none of the Radiotrons light, look for a possible cause at the filament rheostat or "A" battery connections.

(2) If No. 3 from the left alone does not light, examine the volume control rheostat. With volume control at 100 Radiotron No. 3 should be of equal brilliancy with the other Radiotrons.

(3) If Radiotrons light, tap lightly with the finger the fourth Radiotron from the left. There should be a distinct ringing noise in the loudspeaker. If this noise is not obtained, one of the three last Radiotrons to the right may be defective.

(4) After substituting new Radiotrons in the three right hand sockets if the ringing noise is not obtained check the battery voltages with a high resistance type of voltmeter.

The readings should be taken at the terminal block in the battery compartment, or if the home battery box is used, at terminal block on the back. The plug should be removed and the readings in cabinet from top to bottom and in home battery box from left to right should be as follows:

<i>Terminal Numbers</i>	<i>Should Read</i>
1 to 2	4.5 volts. If less than 3.5 replace "A" batteries.
1 to 3	4.5 volts. If less than 4.0 replace "C" batteries.
2 to 4	45 volts. If less than 34 replace "B" batteries.
2 to 5	90 volts. If less than 68 replace "B" batteries.

If batteries test O. K. and Radiotron No. 2 from left is functioning properly a distinct click should be heard in the loudspeaker when the finger is placed on the stator plates of the right hand condenser. Another click should be heard when the finger is removed.

If none of the above tests give any indication of the failure, the circuit tests on the panel and catacomb should be made to isolate the trouble. The panel must be removed from the cabinet in order to get at the terminal strip, and the battery cable disconnected from the panel, which is accomplished by pulling the connection plug *out* in the battery compartment. A pair of head phones with at least 4½ volts in series should be used in making this test.

CIRCUIT TESTS

The numbers of the terminals referred to in the following tests apply to the terminals on the connecting strip at the rear of the catacomb. The terminals are numbered from left to right when facing the front of the set. The designation "P" and "G" refer to plate and grid contacts of the socket indicated. For example G2 would indicate the grid contact of the second socket. P6 would indicate the plate contact of the sixth tube socket. In the same way the indication "F" denotes the filament contact of the tube socket indicated by the number. The filament contacts are also noted as minus and plus. The designation of the socket contacts are shown in Fig. 2 (page 7).

Fig. 1 (page 6) shows the continuity circuit of the standard six-tube catacomb and is included to assist in testing catacombs.

PANEL

<i>From Terminal No.</i>	<i>To Terminal No.</i>	<i>Should Test</i>
1	5	Closed
2	7	Closed thru loop
3	4	Closed
5	6	Closed
9	10	Closed

CATACOMB

<i>Terminal No.</i>	<i>To</i>	<i>Should Test</i>
3	P 1 and P 3	Closed
3	Terminal 13	Closed
3	Whisker 13	Closed
4	P 2	Closed
5	G 2	Closed
7	G 1, 3, 5 and 6	Closed
9	— F 3	Closed
10	— F 1, 2, 4, 5 and 6	Closed
11	all + F	Closed
11	G 4	Closed thru grid leak
11	P 4	Open
12	P 4	Closed
16	P 6	Closed

PART II

Radiolas 24, Super-Heterodyne and Super-VIII

The testing procedure to determine the cause of imperfect operation of Radiolas 24, Super-Heterodyne or Super-VIII is as follows:

1. See if filaments of all the Radiotrons light. If none of the Radiotrons light look for a possible cause in the filament switch or "BATTERY SETTING" rheostat.

Put volume control at 100. If third Radiotron from right does not light, look for cause in the volume control rheostat.

2. If Radiotrons light, tap lightly with the finger, the fourth Radiotron from the right end of catacomb. With two stages of audio amplification there should be a distinct ringing noise in the loudspeaker. If this noise is not obtained, one of the three last Radiotrons may be defective.

3. If after substituting new Radiotrons in the last three sockets and still the ringing noise is not obtained by tapping the fourth Radiotron, check the battery voltages with a high resistance type voltmeter as follows:

The numbers refer to terminals on the catacomb terminal board starting at the right when looking at the front of the panel.

Terminal No.		Remarks
From	To	
6	9	Should measure 4.5 volts and not less than 4 volts. If less replace "C" battery. Positive terminal of voltmeter to be placed on terminal 9.
9	10	Should measure 4.5 volts and not less than 3 volts with all tubes lighted. If less replace the "A" batteries. Positive terminal of voltmeter to be placed on terminal 10.
10	11	Should measure 45 volts. If less than 34 volts replace "B" batteries. In Super-Heterodyne, in <i>right</i> hand compartment and in Super-VIII in the <i>middle</i> compartment.
11	12	Should measure 45 volts. If less than 34 volts replace "B" batteries. In Super-Heterodyne, in <i>left</i> hand compartment and in the Super-VIII the <i>upper</i> compartment.
8	10	Should measure 3 volts when the volume control rheostat is at 100 and the Battery Setting rheostat is adjusted to the proper point.

4. If batteries test O.K. try substituting new Radiotrons for those in the first three sockets. If the second Radiotron is working properly a distinct click should be heard in the loudspeaker when the finger is placed on the stator plates of the right hand variable condenser. Another click should be heard when the finger is removed.

5. If batteries are all O.K. inspect panel wiring, making sure all connections are tight. Test the jack circuits with a telephone and battery. These circuits are shown in the instruction book that comes with the set.

6. Test for continuity of loop between terminals 1 and 6.

7. Test for continuity of oscillator coils between terminals 5 and 6 and terminals 3 and 4.

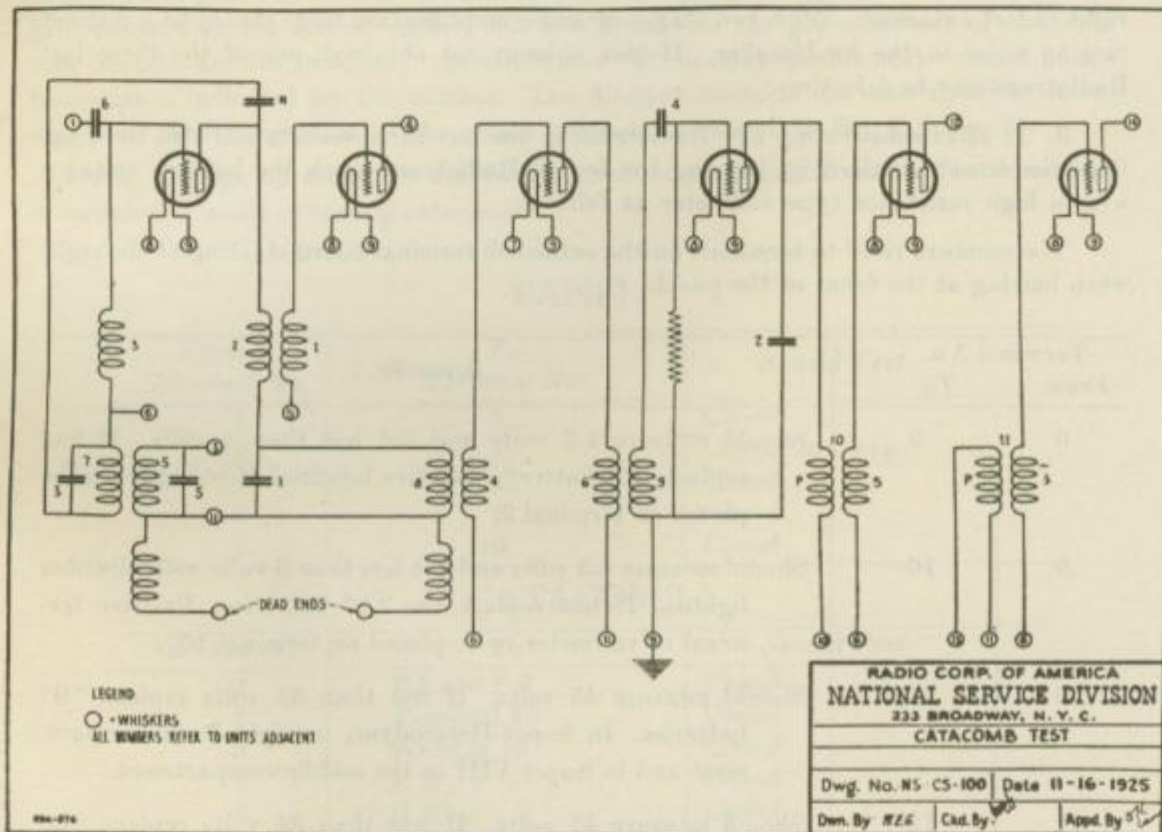


Figure 1

Continuity test circuit of standard six-tube catacomb *

8. If none of the above tests give any indications of the trouble try the following series of tests on the catacomb without removing it from the panel. Use head phones with at least 4.5 volts in series or voltmeter with voltage sufficient to give full scale

deflection when connected directly across the battery terminals. The battery cable should be disconnected from the panel during this test and the Radiotrons removed.

<i>From Terminal No.</i>	<i>To</i>	<i>Should Test</i>
1	Grid of 1st socket	Open
12	Terminal 3	Closed
12	P of 1st socket	Closed
12	P of 3rd socket	Closed
15	P of 6th socket	Closed
12	Terminal 14	Closed
4	P of 2nd socket	Closed
5	G of 2nd socket	Closed
6	P of 1st socket	Open
6	G of 1st socket	Closed
6	G of 3rd socket	Closed
6	G of 5th socket	Closed—weak click in phones
6	G of 6th socket	Closed—weak click in phones
7	— F of 3rd socket	Closed
8	— F of 1, 2, 4, 5, 6, socket	Closed
10	P of 4th socket	Open
10	Catacomb Can.	Closed
10	All + F	Closed
10	G of 4th socket	Open
11	P of 4th socket	Closed
13	P of 5th socket	Closed
15	P of 6th socket	Closed

If the catacomb fails to pass any of the tests in part 1 or 2 of these instructions it should be removed from the panel and replaced by a new one. Under no circumstances should the lead seals on the cover plate be broken. No marks of any kind should be made on the catacomb. Some service men have made a practice of indicating the defect in the catacomb by markings on the catacomb cover. To indicate the defect in the catacomb for future reference, attach tag to catacomb and note thereon observed defect.

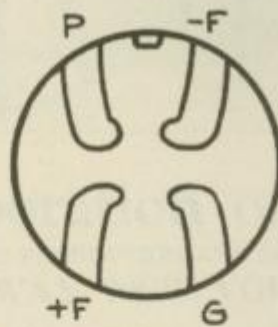


Figure 2
Radiotron UV-199 Socket Terminals

The following table shows the results of the tests conducted on the RCA 6X4 tube. The tests were conducted at a constant filament current of 0.5 amperes and a constant plate current of 10 milliamperes. The results are given in terms of the average life in hours.

Tube No.	Life in hours
1	100
2	100
3	100
4	100
5	100
6	100
7	100
8	100
9	100
10	100
11	100
12	100
13	100
14	100
15	100
16	100
17	100
18	100
19	100
20	100
21	100
22	100
23	100
24	100
25	100
26	100
27	100
28	100
29	100
30	100
31	100
32	100
33	100
34	100
35	100
36	100
37	100
38	100
39	100
40	100
41	100
42	100
43	100
44	100
45	100
46	100
47	100
48	100
49	100
50	100



The above table shows that the average life of the RCA 6X4 tube is 100 hours. This is a very high life for a tube of this type. The reason for this is that the RCA 6X4 tube is a high quality tube. It is made of the best materials and is carefully tested before it is put into service.



1	2
3	4

The following table shows the results of the tests conducted on the RCA 6X4 tube. The tests were conducted at a constant filament current of 0.5 amperes and a constant plate current of 10 milliamperes. The results are given in terms of the average life in hours.