

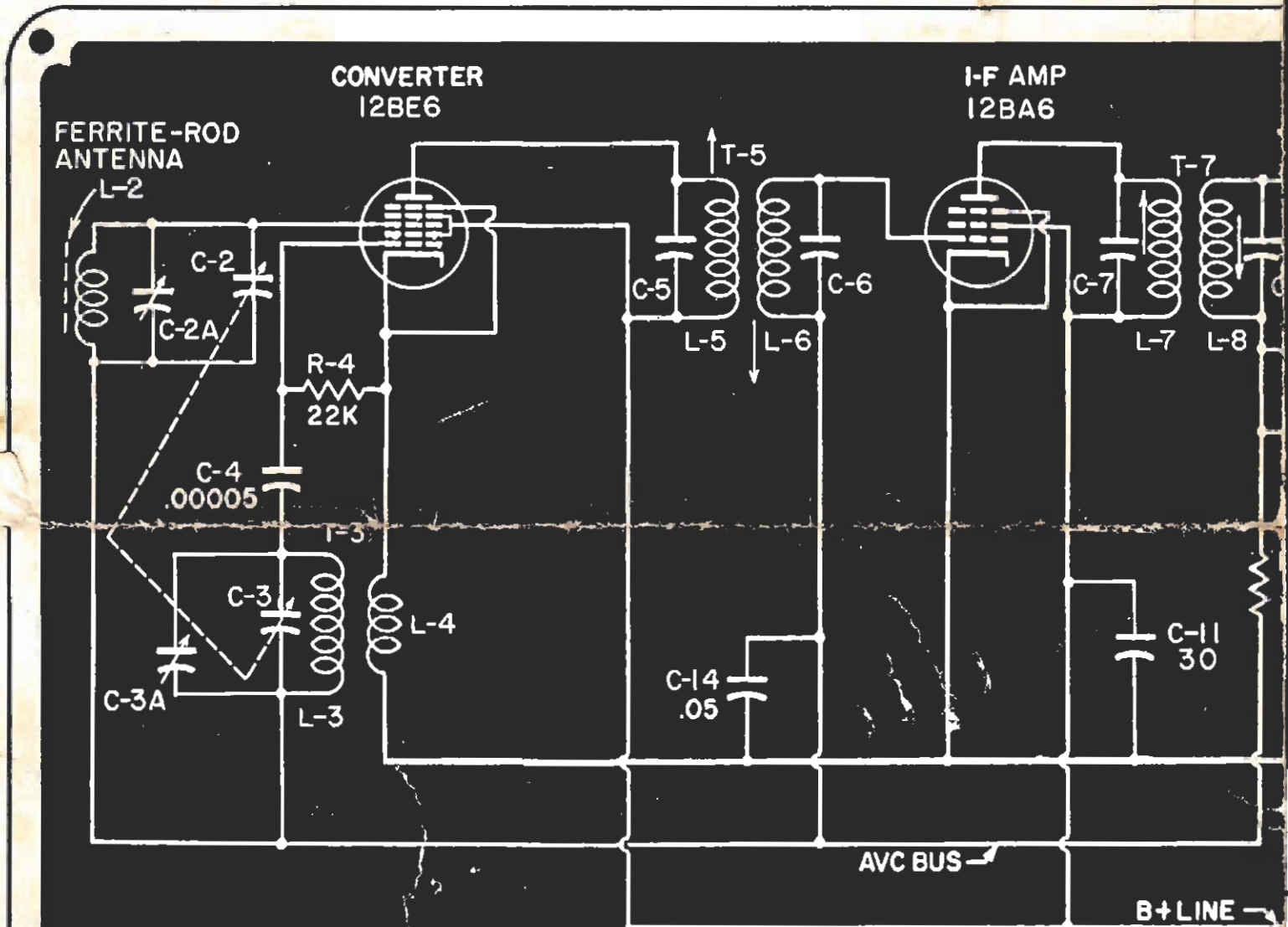
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Based on Marcus and Levy's
PRACTICAL
RADIO SERVICING

Radio

DETECT-O-SCOPE

FAULTY PARTS



HOW TO USE RADIO DETECT-O-SCOPE

1. Plug radio into wall outlet and turn it on.
2. While radio warms up, inspect line cord.
3. Turn up volume control, try to tune in stations, and note trouble symptoms.
4. Unplug radio, take off back cover, push each tube down, and look for obvious defects.
5. Plug in set, turn it on, and see if all tubes light up and get warm.
6. Check tubes in tester or try new tubes.
7. Unplug set and take chassis out of cabinet.
8. Look for obvious under-chassis defects such as shorted wires and overheated parts.

Common Radio Trouble Symptoms and Pro

Symptom	Abnormal Test Condition	Look for
Set does not play. Tubes do not light.		Dead outlet. Defective line cord or plug. Tubes in wrong socket (check 12AV6). Open tube heater. Defective heater wiring.
Set does not play. Tubes light.	Voltage at rectifier cathode checks zero.	Dead rectifier tube (probably caused by a shorted input filter capacitor C-10).
Set does not play. Tubes light.	Voltage at rectifier cathode is high. Voltage at B plus is zero.	Open filter resistor R-10 (probably caused by shorted output filter capacitor C-11 or a short in the B-plus circuit).
Set does not play. Tubes light.	Voltage at rectifier cathode is low. Voltage at B plus is zero. Filter resistor R-10 overheating.	Shorted output filter capacitor C-11. Short in B-plus circuit.
Set does not play; signal check places trouble in power output stage.	Plate voltage on power output tube is 120 volts; cathode voltage is zero.	Dead power output tube.
	Plate voltage on power output tube is 120 volts; cathode voltage is high (20-30 volts).	Open cathode resistor R-9.
	Plate voltage on power output tube is zero; cathode voltage is low (2-3 volts).	Open output transformer primary L-9.
	Plate voltage on power output tube is low (20-30 volts); cathode voltage is high (20-30 volts).	Shorted plate capacitor C-9.
	Voltage check shows normal readings.	Open or shorted voice coil in the loudspeaker.
	Voltage check shows normal readings; speaker tests as good.	Short in the grid circuit of the power output tube.
Set does not play; signal check places trouble in the inter-stage coupling circuit.	Voltage check shows normal readings.	Open coupling capacitor C-18.
	Plate voltage on first a-f tube is zero.	Shorted plate capacitor C-17.
Set does not play; signal check places trouble in the first audio stage.	Plate voltage on first a-f tube is zero.	Open plate resistor R-17.
	Voltage check shows normal readings.	Dead first a-f tube.
	Voltages normal; first a-f tube is good.	Short in the grid circuit of the first a-f tube.

Symptom	Abnormal Test
Set does not play; signal check places trouble before the first a-f stage.	None.
Set does not play.	I-f plate voltage
	I-f cathode high.
	Voltage check normal reading
Set plays intermittently—pilot lamp blinks on and off.	
Set hums.	Rectifier-cathode voltage low (proximate volts).
Set hums, squeals, or motorboats.	
Set plays—hums on some stations.	
Hum.	
Modulation hum.	
Set hums.	Voltages are
	None.
	Hum clears up checking grid
Low volume.	
Set plays weakly.	B voltage below normal.
Set plays weakly.	B voltage normal

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Condition	Look for
	Open coupling capacitor C-15. Open volume control R-16. Short in the volume-control wiring.
Volume is zero.	Open i-f output transformer.
Volume is low.	Open circuit from i-f cathode to common negative.
Distorted reception.	Defective i-f tube. Defective detector tube. Opens or shorts in the i-f transformer. Open or shorted volume control. Shorted i-f filter capacitor C-16.
Volume is low.	Tube heater that opens intermittently (check with neon lamp tester).
Volume is low (approx. 50%)	Open input filter capacitor C-10.
	Open output filter capacitor C-11.
	Open line capacitor C-12.
	Open ferrite-rod coil L-2.
	Defective converter tube.
Volume is low.	Open filter capacitor.
	Defective tubes.
Volume is low when all voltages are normal.	Open grid resistors R-18 or R-15.
	Weak tubes. Defective speaker or output transformer. Leakage in plate capacitor C-17.
Volume is low.	Weak rectifier tube. Leakage in filter capacitors C-10, C-11.
Volume is normal.	Open output filter C-11.

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Television, Radio,
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Symptom	Abnormal Test Condition	Look for
Weak reception.		Weak converter tube. Misalignment. Open avc bypass capacitor C-14.
Distorted reception.		Defective tubes. Open i-f filter capacitor C-16. Leaky or shorted avc bypass capacitor C-14.
Set has poor tone quality.	None.	Defective loud speaker.
	Plate voltage on power output tube is low; control grid on power output tube shows positive voltage.	Short or leakage in coupling capacitor C-18.
	Cathode voltage on power output tube is high.	Leakage in plate capacitor C-9.
	Plate voltage on first a-f tube is low.	Leakage in plate capacitor C-17.
	Grid voltage on first a-f tube is low.	Leakage in coupling capacitor C-15.
Set develops poor tone quality after playing for awhile.	A positive voltage develops on power output grid.	Grid emission in the power output tube.
	None.	Speaker warping due to lack of ventilation in cabinet.
No stations over part of the dial.		Shorts in tuning capacitor. Weak converter tube. Leakage in oscillator tuning capacitor. Wrong value of oscillator grid leak R-4.
Squeals when tuning certain stations.		Image-frequency interference (realign).
Squeals or oscillation.		Open output filter capacitor in the power supply. Open ground connection to shielding. Open avc bypass capacitor C-14. Open i-f filter capacitor C-16. Tube shielding is missing or poorly grounded. Incorrect wire dress. Misalignment.
Noise.		Capacitor plates touching. Need for outside antenna.
Noisy reception.		Defective tubes. Corrosion in i-f transformer windings.