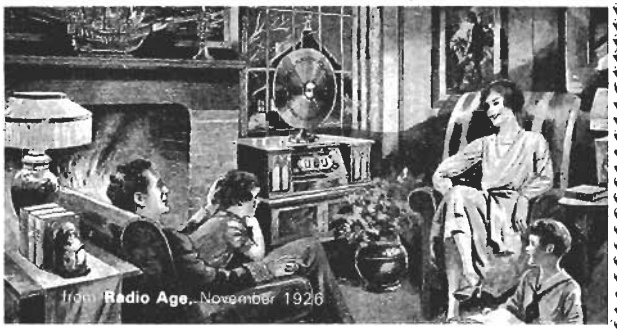
yesterday's radio



How to Restore Early Vacuum Tubes (part 3)

by N. C. Batch

No. 11 in a series

Most of us have at one time or another disposed of seemingly defective vacuum tubes. The majority of these seem to have an open filament and naturally we find it quite impractical or impossible to replace such a filament. However, read this article first, particularly if the tube is a R-215 Peanut tube or WD-11. You insist, you have tested the tube with a continuity meter and found an open circuit between the two filament prongs. Nine out of ten you may be right, but how about the 10th tube, it may be a WD-11 — a real treasure, and it could be saved. Let me tell you what I have experienced many times over again, with vintage vacuum tubes.

Case history # 1; after testing ten R-215 tubes from a "Mercury Super-10' receiver, I found 6 tubes to have open filaments, no continuity whatever between the two filament contacts. I was ready to dispose of them. However after removing the base of one of the tubes I found that the filament continuity was ok between the two leads at the glass base. I checked the base and found the reason for the open circuit, which can be attributed to three main factors:

1) The leads were cut so short that only the very tip was originally in contact with the solder in the prong (R-215 has an eyelet contact).

2) The tips of the leads had excessive corrosion, as a result of poor flux quality (more than likely, a variety of flux containing acid was used).

3) Old Man Time and the two above mentioned factors, resulted in a filament lead completely insulated from the base contact (Figure 1).

The remedy was quite obvious. I resoldered all the contacts and the tubes are now in working order.

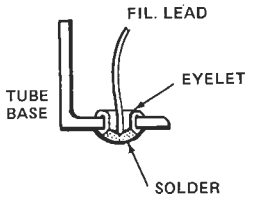


Figure 1

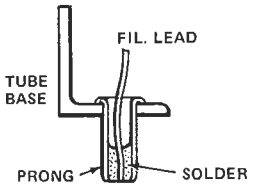


Figure 2

A good method to resolder leads in tube prongs, is to heat the prongs one at a time with a soldering iron and shake the solder out of the prong. Then use a sharp pointed tool, such as a small watchmaker's screwdriver and scrape the tip of the wire in the prong clean. Use a good flux and resolder. Make sure that sufficient solder enters the prongs to make a positive contact with the filament lead. This is particularly important on the short pinned version of the UV-199, 201A and WD-11 etc. (Figure 2).

Tubes with loose bases are very susceptible to broken leads within the base. After employing the above procedure to remedy the break (sometimes it is necessary to remove the base completely to convert a broken lead), use a good cement such as Epoxy to secure the vacuum tube to the base.

CANADIAN WESTINGHOUSE RADIOTRON CHARACTERISTICS

TUBE	FILAMENT CIRCUIT DATA			PLATE VOLTAGE		Negative C Battery	Plate Current Milliamperes Normal Operating Note 1 & 5	Output Resistance Ohms Note I	Voltage Amplification Factor Note I	Mutual Conductance Micromhos Note 1	DIAM. OVERALL	
	Battery Source Volts	Filament Terminal Volt	Filament Current	Detector Note VI	Amplifier						Height Max. Inch	Diam. Max. Inch
WD-11	1.5	1.1	.25	20 to 45	90 to 135	4.5 to 9.5	2.5 to 3.5	14500 to 13500	6.0 to 6.0	415 to 450	3 1/2 to 3 7/8	1 3/16 to 1 3/8
WX-12												
WD-25	6.0	5.0	.25	20 to 45	90 to 135	4.5 to 9.0	3.5 to 5.0	8000 to 6600	8 to 8	1000 to 1200	4 3/8 to 4 1/2	1 3/4 to 1 3/4
WX-25												
UX-201A	6.0	5.0	.25	20 to 45	90 to 135	4.5 to 9.0	3 to 4	12000 to 11000	8 to 8	675 to 725	4 1/2 to 4 1/2	1 3/4 to 1 3/4
UV-199	4.0 to 4.5	3.0	.06	20 to 45	90	4.5	2.5	15000	6.25	415	3 1/4 to 3 1/2 to 3 7/8	1 1/4 to 1 3/8 to 1 3/8
UX-199												
WX-199												
UX-112	6.0	5.0	0.5	20 to 45	Max. Note I 157 135 112 90	10.5 9.0 7.5 6.0	7.9 5.8 2.5 2.4	4800 5500 8400 8800	8.0 7.9 7.9 7.9	1670 1435 940 890	4 1/2	1 3/4
UX-200A	6.0	5.0	.25	45 Max.	Detector only		2.0	28000			4 1/2	1 3/4
UX-171	6.0	5.0	0.5	Amplifier only	180 157 135 90	40.5 33 27 16.5	22 20 16 13	2000 2000 2300 2500	2.65 2.65 2.65 2.7	1450 1350 1200 1050	4 1/2	1 3/4
UX-120	4.0 to 4.5	3.0	.125	Amplifier only	135	22.5	6.5	6600	3.3	500	3 1/2 to 3 7/8	1 3/16 to 1 3/8
WX-120												
UX-210	8	7.5	1.25		425Max	35	22	5000	7.75	1500	5 5/8	2 1/16
	8	7.5	1.25		350	27	18	5100	7.65	1500		
	8	7.5	1.25		250	18	12	5600	7.5	1330		
Amplifier and Oscillator		See Note V										
	6	6.0	1.1		175.5	10.5	6	7400	7.5	1020		
	6	6.0	1.1		135	9	4.5	8000	7.5	940		
	6	6.0	1.1		112.5	7.5	3	9700	7.5	775		
	6	6.0	1.1		90	4.5	3	9700	7.5	775		