Radio Restoration and Lead Dress Guidelines

These radios contain potentially lethal voltages inside, use extreme care!
When restoring an original old radio it is best to first test or replace the electrolytic filter capacitors before powering up the radio. A shorted filter capacitor could destroy the expensive power transformer. All tubes should also be tested before power up to test for any shorts in the tubes.
Radio should also be inspected for shorted wires due to dried and crumbling rubber coated wires where insulation flaked off. These dried rubber wires may be present on many 1938-1950 radios especially Philco and Zenith but used by other manufacturers also. The power cord should also be free of potential shorts.
After all the above is done the radio may be carefully powered up with one of two methods.
Plug radio plug into what is called a dim bulb tester which is an incandescent light bulb of the same wattage and the radio usually about 60 watts. This light bulb is wired in series with the radio so that if there is a short in the radio the light bulb absorbs the energy. The light bulb should start out brighter than immediately go dim. If the light bulb does not go dim the radio should immediately be unplugged and investigated for shorts.

The other method is using an isolated variac where a small voltage is applied usually under 20 volts and immediately check current draw.
The current draw should not be more than about 100mA. Slowly increase voltage while watching current draw. If current draw begins to rise rapidly immediately unplug and investigate shorts. Total current draw at 50 volts is typically 150 to 250 mA and at 75 volts it usually ranges around 200 - 300 mA. Some high tube count radios may draw double these numbers. At 115 volts the radio should not draw more than its rated power expressed in watts or amps. Typical total current draw of a 5 to 7 tube radio should be around 300 to 400 mA and a 10 to 15 tube radio around 750 mA.

Once power up is completed test radio for reception of any radio station. Do not run radio longer than necessary. Once a radio station is found power down and unplug and begin replacing one wax paper capacitor at a time with a very brief radio test after each replacement. Resistors get replaced one at a time only if they are out of stated tolerance. With resistors it may be necessary to disconnect one end for measurement. You must follow lead dress rules mentioned later in this note.

Lead Dress Rules

Take photos of top and bottom of radio chassis before beginning any work

If wire replacement is necessary it should be replaced with a wire of the same gauge and length as original and routed in same manner as original. You may also apply heat shrink tubing over original wire by just disconnecting one end.

When replacing a resistor or wax paper capacitor it should be replaced with one with lead length as close as possible to original and routed in same manner as original.

Do Not Replace Any Mica Capacitor Unless Absolutely Necessary!

Mica capacitors are in the picofarad range (pf or mmfd or mmf on schematic) and typically are plastic coated looking like dominoes with colored dots. These capacitors rarely go bad.

Some radios have very small cylindrical ceramic capacitors typically found on tube sockets directly between pins. These capacitors also don't go bad and should not be disturbed in any way. These capacitors are also in the picofarad range.

Special care should be observed when working on a radio with FM (42-50 MHz band or modern 88-108 MHz band) or any radio with shortwave. These radios operate at higher frequencies and wire and component placement becomes even more important. Do not disturb the FM section of a radio unless absolutely necessary.