Overlooked item when calibrating tube testers
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I don't offer detailed instructions for every tube tester model there is because of the many differences in them. Most of them require a resistor value change or adjustment and to do this you have to figure out what resistor or adjustment that might be and determine the appropriate value.

Here's a brief explanation for the specific neglected calibration issue:

In what little calibration info is available, none that I have seen address's the heater (filament) voltage. A quick way to determine if this might be the issue with yours is to set up your tube tester to test a 6L6, place the tube in on of those test sockets (the type that has test pads on them so you can measure each pins voltage) then with the adaptor and tube plugged in the socket, set the line adjustment and measure with an accurate DVM the heater voltage (pin 2 & 7 of a 6L6).

I have found that voltage low on nearly all the tube testers I have worked on in the last 10 years, the voltage will usually measure anywhere from 5.2 - 5.6 volts. You cannot make an accurate test with the heater voltage that low, the tube will not test right.

Most tube testers do not have an adjustment for this and you must change the value of the series dropping resistor in the line voltage meter circuit to get the correct "line adjust" reading. Be sure your unit is level when making the adjustment or at least make the final test with you tester level. Tilting on it's side will often alter the meter reading. The adjustment should be made with the tube in the socket ready to test but not with the test button pushed.

To make the adjustment, with the tube tester level, tube in the socket, adjust the line voltage so that the voltage reading on the heater of the 6L6 is between 6.1 & 6.3 volts. Then adjust (or change the resistor value so that the meter is set to the set line voltage mark.

Bottom line, the goal is to be sure that the heater voltage on a 6L6 is 6.1 - 6.3 volts with the tube in the socket ready to test and the meter reading is on the "line adjust" mark.

IMPORTANT NOTE: a few tube testers have a compensation adjustment for this. It's a "pot" and on some of the Hickok 6000 series it's located near the meter, this adjustment only affects the meter reading in "line adjust" mode. So all you have to do is measure the heater voltage of the 6L6 test tube in the socket and set up to test (but test button not depressed) and set the "line adjust" so that the heater voltage measures 6.2 - 6.3 volts. Then adjust the "pot" so the meter is at the "line adjust" position.

PART TWO

The article I wrote concerning this matter does not apply on the '539C as it has a direct line voltage meter. The issue addressed in my short article relates to the lack of info on most tube testers (including other Hickok's) to verify the tube filament voltage as it relates to the line adjust setting. Since the 539C does not have a "line adjust" setting, this info does not apply.

However, I have found on some 539's where the line voltage meter reads incorrectly and there is no adjustment to correct this. If this is a problem, the meter must be replaced or you need to compensate by increasing and decreasing the power adjust setting.

Mine reads a bit low and I also fine big discrepancies in the tube under test filament voltage. Example, if you set the it for a 6L6 (as most calibration procedures specify), the filament voltage may be ok at 6 volts but with the line voltage set correctly when I test a #26 or 27 tube, the filament voltage is quite low. Low enough to give a low reading when testing these tubes.

The bottom line point I make in the article is that no calibration procedure addressees the tube's filament voltage. It is just assumed that when you set the voltage to the specific setting for the tube under test that it will be correct. This should not be assumed for a variety of reasons. Since these tubes testers have no form of voltage regulation and tube filament (or heater) current varies, it cannot be safely assumed that the set voltage is what the tube is seeing.

I'm considering installing a voltage meter dedicated to the tube under test heater (filament) voltage. If you don't do something to make sure you are testing a 6 volt tube with at least 6.2 volts applied, you are not getting a correct test (5.8 volts is too low).