

K9AXN Service note 030a

TESTING AND MATCHING THE 8122

I test and match the 8122 using an SR-2000 running low power --- 300 volts on the screen and 1700 volts on the plate. First, I continuity check for separation between elements and verify both pins for each element are connected in parallel and the filament is around 2 ohms. Second, if there are any dents on the tube, throw it away or proceed at your peril. **The 8122 cannot tolerate a drop.** Third, if it is a NOS tube, bring the heater up for an hour before applying high voltage.

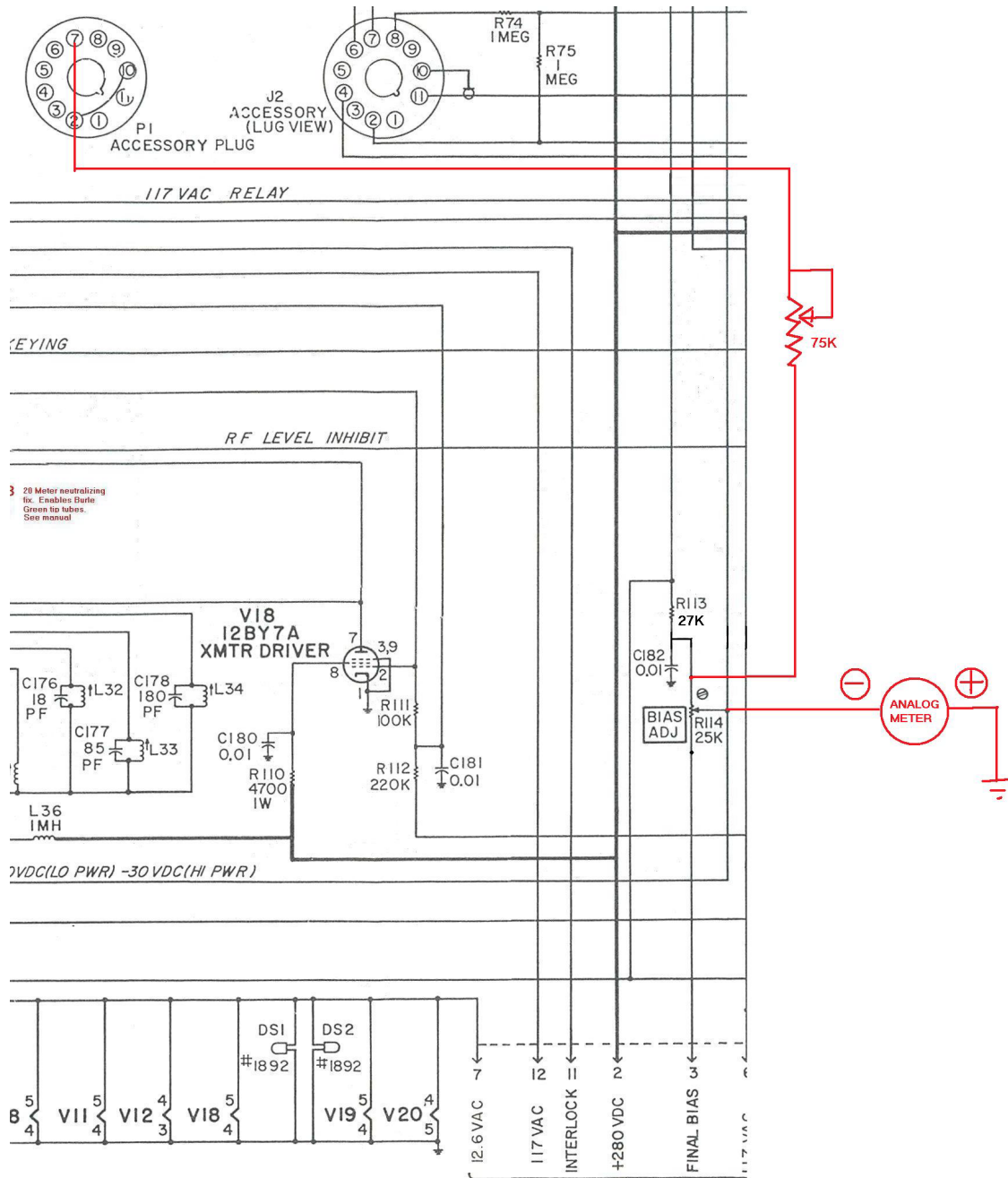
THERE IS NO ROOM OR EXCUSE FOR CARLESS BEHAVIOR HERE --- THESE VOLTAGES ARE ALWAYS LETHAL! WE IN NO WAY RECOMMEND THAT YOU PERFORM THE FOLLOWING PROCEDURE. WE ARE SIMPLY DESCRIBING THE METHOD THAT WE USE TO PROFILE 8122 TUBES.

WE TEST FOR A CORRECT MATCH AT 100ma, 550ma, AND MAXIMUM CLASS AB1 EMISSION --- APPROXIMATELY 850ma. ALSO EVALUATED ARE THE NEUTRALIZATION CHARACTERISTICS TO DETERMIN WHETHER IT CAN BE USED IN AN SR-2000 OR OTHER HIGH IMPEDANCE DRIVEN DESIGNS.

Power off and remove the high and low voltage connectors. Remember, if you pull the connectors before powering off, the 280 volt caps in the SR-2000 are still charged with no bleeder and the neutralizing tab is at 280 volts.

Always short to ground any connector/component that you may come into contact with before touching it. Remove the 8122's and block the rear tube socket to preserve air flow using something non conductive, being careful to place the plate connection well away from everything.

NOTE THE FOLLOWING DRAWING: Remove the 11 pin plug from the rear of the radio and add a two foot wire to pin 7 and the added 75K pot. Attach one end of a wire to the other pin of the added pot and attach a mini-grabber to the other end of the wire. Connect the mini-grabber to the bottom tab on the Bias pot. Attach an analog meter to the center tab of the bias pot and ground.



Install the tube to be tested in the front socket and attach the plate cap. **Always remember that the neutralizing tap is at 280 volts with the low voltage connector attached and power on. Connect only the low voltage connector and power the radio on.** Set the transmit RF drive to "0", the pre-selector fully clockwise and the band switch to 80 meters. We will be going to transmit mode and do not want anything to influence the control grid except bias. Set the added pot to 75K and

the bias pot counter clockwise, the lowest idle direction. The added meter should read approximately -70 volts in receive mode. Switch to tune and MOX --- transmit mode, and verify that the meter reads about -32 to -36 volts. If not, disconnect the added pot and determine why because the added pot should make only a one or two volt difference

. Once you have the 32 to 36 volt level with the pot installed, power the radio off. Install the HV connector and power the radio on.

Go to transmit, MOX, and TUNE to verify the -32 to -36 volt bias level **before enabling the high voltage. Return to receive mode.**

Enable the high voltage and if the HV trips you have a choice to make, If it's a NOS tube try it again; it may be gas and if it's used trash it or try again with higher risk of damage to the radio.

100ma BIAS TEST: If all is OK, check the screen current meter for positive or negative current --- should be neither. **Go to MOX tune/transmit and immediately check the idle current and screen current.**

Screen current should not occur during any of these tests. If the screen should display more than a couple of milliamps stop testing and call or email us.

If the plate current is above 100ma, go to receive drop the HV and remove the added pot. Enable the HV and go to transmit and if you still cannot reduce the idle current to 100ma, you probably have an 8122 that is in the Green or Black category and the bias system needs to be updated with the after production change that you will find in the engineering changes and service letters section of the site. This change affects both the SR-2000 and P-2000 and enables the bias and neutralizing bridges to work with all but the Black tip 8122

If the idle current is below 100ma, increase the bias pot for 100ma and record the bias voltage calling it "BIAS 100".

550ma BIAS TEST: Now we will test the 550 ma bias level. **Do not remain in transmit mode more than a second or two from this point on With HV on go to transmit and again verify 100ma of plate current.** Then carefully turn the bias pot clockwise until the plate current reaches 550 ma, check the screen current, and **go to receive.**

If it reached 550ma drop the HV, return to transmit, record the bias voltage, and call it "BIAS 550". Then go to receive.

If the bias pot reached full clockwise and the plate current did not reach 550 ma, turn the bias pot full clockwise, **go to transmit with HV off**, adjust the added pot for 0 volts of bias, and **finally turn the bias pot full counter clockwise**. Now, **repeat** the test for 550 ma being careful to stop at 550 ma because this bias configuration can reduce the bias to 0 volts when the bias pot is full clockwise, causing full conduction; possibly over 1000 ma.

FULL CONDUCTION TEST: Using the 0 volt configuration, we will test for the full conduction bias level. This test must be done very quickly and with great care. **Turn the bias pot full counter clockwise.**

Enable the HV. Go to transmit and immediately check the plate and screen current returning immediately to receive. The plate current will be well above 100 ma and the screen current should be neutral. If it is positive more than a few ma stop and consider not using the tube. **Now, the test for critical full conduction.**

Prepare with a screwdriver in the bias pot. Enable the HV. Quickly go to transmit and turn the bias pot clockwise not exceeding 950 ma or it increases no more and immediately stop and go to receive. Drop the HV, go to transmit and record the bias level calling it **BIAS MAX** and include the maximum plate current achieved at the recorded bias level. If it reaches 950 ma at minimum bias the tube will be good for 1000 watts+ and if the 100 ma idle bias is -28 volts or below, the tube will as a rule work in an unaltered SR-2000. If it peaked before reaching -2v of bias, don't use the tube, it will not generate AALC properly for class AB1 operation.

A matched pair will have comparable 100 ma, 550 ma, and max ma values within to 5% to 10% of each other. The common test for a match is at 100ma. This is NOT a valid test for match because medium and maximum conduction can be very different even though the idle currents are equal at a particular bias.

