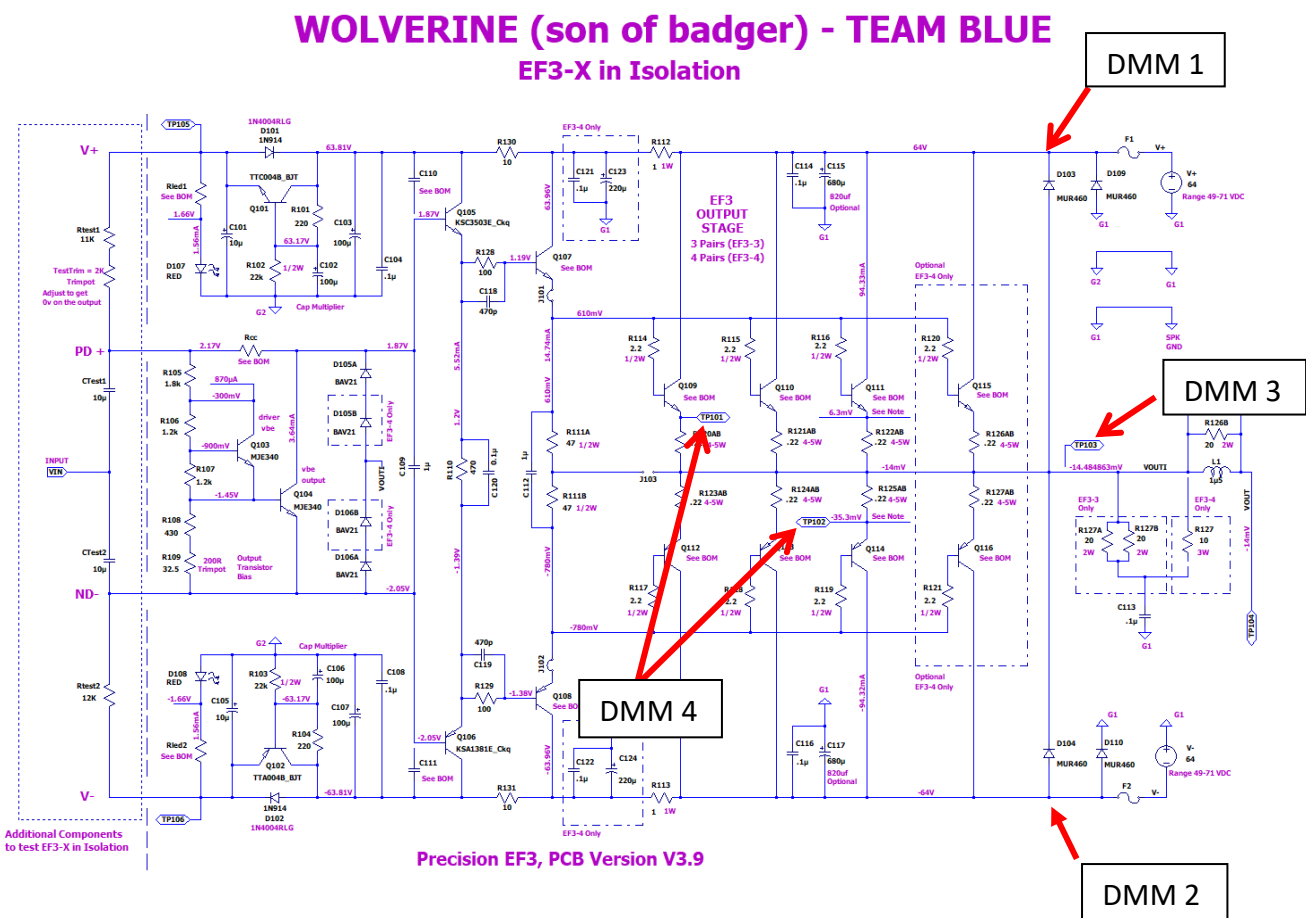




## EF3-X Board schematic:



## 22.2 The EF3-X Board can be Tested in Isolation

- A. Add the additional components & wiring connections as shown in the schematic above.
  - i. Rtest1 = 11K (0.5 Watt)
  - ii. Rtest2 = 12K (0.5 Watt)
  - iii. TestTrim = 2K Trimpot
  - iv. Ctest1, 2 = 10uF (Non Polarized / Bipolar)
- B. A current limiting DC power supply is ideal for initial tests or troubleshooting.
- C. Increase the resistance for R109 to the maximum resistance of approximately 500 ohms. Measure the resistance between pin's 1 & 2. Use the silkscreen on the underside of the PCB to ensure you measure the resistance correctly. This is very a very important step do not mix up pin's 1 & 2 for pin's 2 & 3 as this will definitely blow your fuses or even damage your output transistors.
- D. Next, short the Input shown on the schematic above to ground.

## 22.3 If your Output Transistors are Not Installed

- A. Connect a suitable supply voltage and appropriate 200 mA fuses.
- B. Use Test Hook Clips to make your connections between R111A (TP107) (DMM +) and R111B (TP108) (DMM -), and set up your voltmeter to monitor the bias voltage (millivolts) between R111A (TP107) and R111B (TP108).
- C. Turn your supply voltage on.
  - i) Check DMM 1 & 2 are close to the expected rail voltage.

*If not turn the voltage supply off, and check your fuses, you may need to follow some of the advice listed at Point 22 to help trace down the problem.*

- ii) Check DMM 3 is close to 0 mV if not adjust the DC offset using the 2K Trimpot.
- iii) Check DMM4 is between 800 mV and 900 mV. It should be close if R109 is set to maximum resistance.
- D. If everything checks out, turn off your voltage supply. The output stage board checks out.

## 22.4 If your Output Transistors are Installed

- A. Connect a suitable supply voltage and appropriate 200 mA fuses.
- B. Connect DMM's as shown with the negative lead of DMM 1, 2 & 3 going to ground and DMM 4 going from TP101 (DMM +) to TP102 (DMM -).
- C. Turn your supply voltage on.
  - i. Check DMM 1 & 2 are close to the expected rail voltage.

*If not turn the voltage supply off, and check your fuses, you may need to follow some of the advice listed at Point 22 to help trace down the problem.*

- ii. Check DMM 3 is close to 0mv if not adjust the DC offset using the 2K Trimpot.
- iii. Check DMM4 is close to 0mv. It should be close if R109 is set to maximum resistance.
- D. If everything checks out, turn off your voltage supply and replace the 200 mA fuses with 1A fuses.
- E. Next, turn your supply voltage on.
  - i. Check DMM 1 & 2 are still close to the expected voltage.
  - ii. Check DMM 3 is still close to 0mv if not adjust the DC offset using the 2K Trimpot.
  - iii. While watching DMM4 slowly reduce resistance of R109 until your DMM reads between 5 mV & 10mV.
  - iv. Recheck points i & ii above.
  - v. Continue to watch DMM4 and slowly reduce R109 a little further until your DMM reads between 20 mV to 22mV.
  - vi. Recheck points i & ii above.
  - vii. If everything checks out you have completed the DC voltage test. Feel free to check if any other voltages shown on the schematic are close to your measured value.
  - viii. Next, turn your supply voltage off so we can prepare for an AC small signal voltage test.
- F. Connect an input sine wave from a signal generator as shown above and set its output voltage to 100 mVpp and scope or measure the AC voltage with a DMM at the output terminal to ground. You should see around 95 mVpp.
- G. If everything checks out, you have completed the AC small signal voltage test and the output stage board checks out.