

Henry 2k-4 Power Supply Up grade and Filament Voltage Fix:

The original Henry schematic can be found at BAMA.

### **The Upgraded Power Supply:**

The original Henry power supply uses a 3,500 volt HV transformer feeding a FWB, an LC filter circuit with a resonant filter choke of 8 Henry's, and an oil-filled filter capacitor of 20 uF. The bleeder resistor system used three, 20k 100 Watt resistors for a bleeder current of 60 mA. This bleeder current forces the three bleeder resistors to dissipate 72 Watts each. So a lot of heat is generated via the bleeder resistors and the filter choke.

There was no soft start, or inrush protection circuit. Rather, the start current is limited by the HV transformer primary and secondary resistance and the choke resistance.

I removed the old Triad HV transformer, the FWB, the resonating choke, the bleeder resistors, and the oil-filled cap.

I obtained a **FAR** Power Supply Circuit board, a Hammond-Dahl HV Power transformer with a secondary voltage of 2,570 Volts@800 mA, and a Hammond Filament transformer of [10.5Volts@17](#) Amps with a center tap for bias.

The FAR power supply circuit board measures 5X 11" and is a "10" position circuit board. I.E., it has positions for 10 filter capacitors in series, 10 equalizer/bleeder resistors, and a FWB consisting of 20 diode positions (green board, last picture). In my configuration, I populated the board with 10, 450uF, 450V screw top electrolytic computer grade capacitors, 10, 47k, 7 Watt equalizer resistors, and 20 1N5408 HV diodes. The power supply filter/rectifier board is protected from falling debris by an acrylic shield mounted above the PC board.

The biasing zener is a 12 volts, 50 Watt stud mount Zener that replaced the old 10V TO-3 cased zener on the back panel.

Additional fusing was added to protect the various circuits as indicated on the first schematic.

A new soft start circuit was incorporated to ramp up the supply current as indicated on the second and third schematics. This soft-start or inrush circuit is a necessity for capacitor filtered power supplies.

For the ALC bias, the FAR board is tapped at the 1,100 volt position, which is not shown on the schematic.

The no-load DC plate voltage is now 3,650 volts. At an exciter power of 15 Watts, the loaded DC plate voltage is 3,450 volts@250 mA with 200 Watts of carrier, giving an approx. power gain of 12 dB.

Regarding Only One Filament Lighting:

After rebuilding the power supply everything went well, but one day I noticed a power reduction. Only one tube was lighting.

This was traced to a crystalized solder connection on one of the filament connections as seen in the first picture, extreme right side.

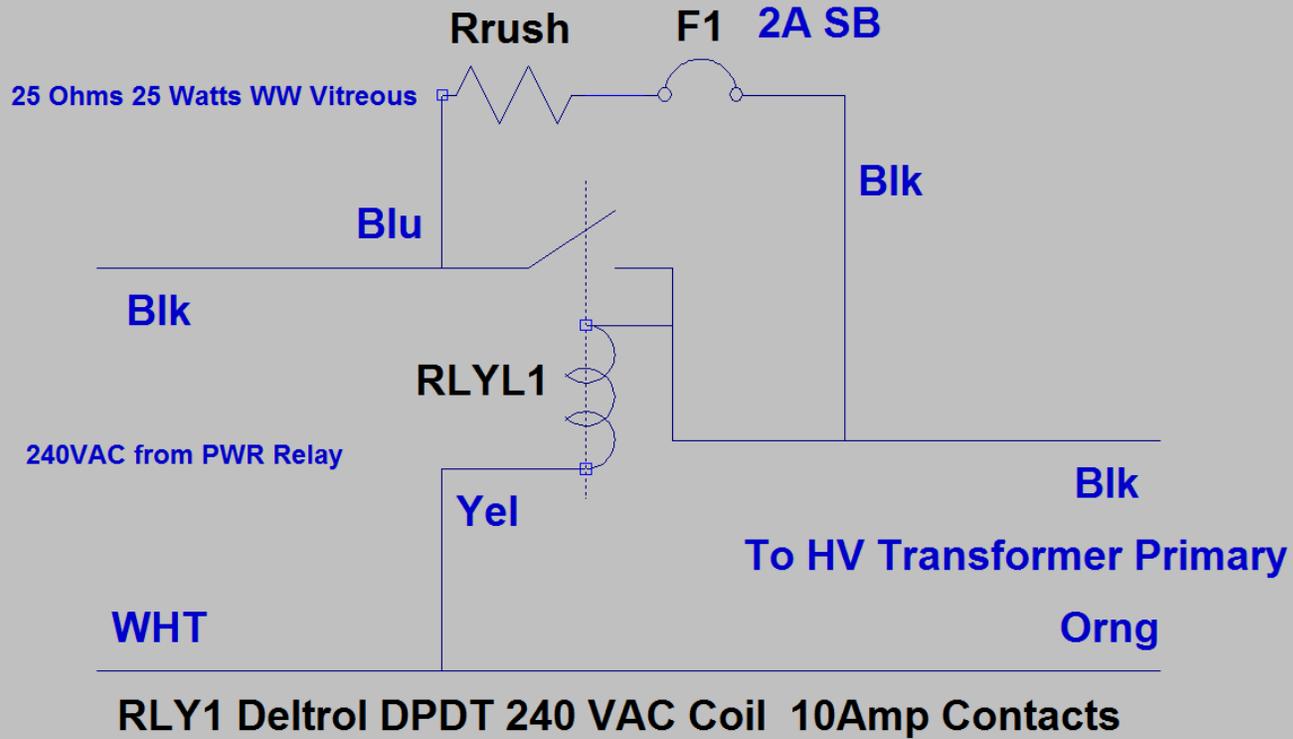
Two ferrules clamp the right side of the RF filament choke wires that go to the filament connection block. I de-soldered the wires from the ferrules and reshaped the ferrules for a better clamping force around the RF choke wires. I then re-soldered those connections with silver solder.

While under the RF deck, it is also a good proactive measure to re-solder the other side of RF filament choke wires to the tube pins with silver solder. Also check the resistor and capacitor connections.

Since the filament supply presents 10.5 VAC to the 3-500Z's "in series" and has a center tap, the other tube can still receive some filament current via that center tap. Consult the 2K-4 schematic at BAMA.



# Henry Inrush Protection Circuit



## Henry Inrush Protection Relay Connections

