

DenTron MLA-2500B Linear Amplifier



This amplifier is a compact desktop 2000Watts PEP, amateur radio 1.8 - 30 MHz Linear amplifier, using two Eimac 8875 ceramic / metal triodes. The 8875 is not produced anymore, and therefore very hard to obtain. Due to this fact, it's a good idea to do some simple modifications to this amp to improve the lifetime expectancy of the tubes and other circuitry. Below you will find the circuit improvements I have applied to my amp.

On this page you will find:

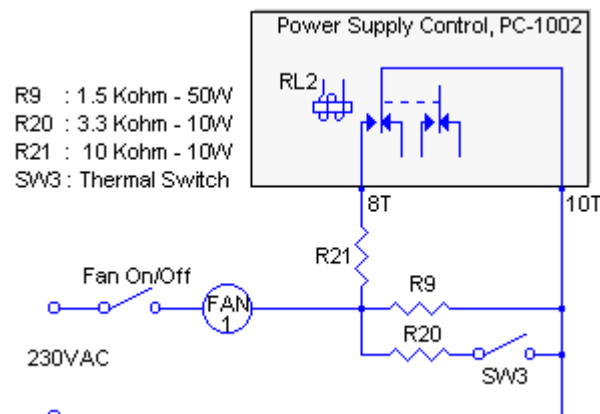
- Cooling / noise improvement.
- input VSWR improvement.
- tube arc protection.
- grid current meter improvement.
- HV power supply RF bypass capacitors.
- AG6K modifications.

On page [MLA Inrush](#):

- MLA-2500B inrush current measurements and its effects.

On page [MLA Soft-Start](#):

- Step-Start and optimization of the filament voltage.



Connect the fan as shown. When keying the amp, the fan will increase in speed during transmit. If the thermal switch activates, the fan speed will increase even more. If you find the speed too slow, simply decrease the value of the resistors. I have also mounted an on/off switch on the front panel, so the fan can be switch off some time later than the amp itself.

COOLING

I tested several fans from different manufacturers. There was one fan which stood out in the crowd when you also consider the noise from the fan. The **EBM 4650N** was the absolute winner. It has an air flow of 94 CFM at 230VAC 50Hz. At 230VAC 60Hz, the air flow is 106 CFM. If you want to use a 115VAC fan with the same air flow, you can use the 4600N.

Fan noise & vibration.

Fans will transmit some mechanical vibration / noise to the chassis if they are mounted directly on the chassis. To avoid this, mount the fan on four noise & vibration isolators. By doing this, there will be no mechanical noise at all. I used the Mount, Resilient, Part Number SMB003-0100-57 from Lord Corporation, in Erie, PA. It's also produced by Tech Products Corp. in Dayton, Ohio under the Part Number 50072-11.



Isolator

To close the gap between the fan and rear panel, I used a flexible sealing strip. And to ground the fan housing, a wire was connected from the fan housing to the rear panel.

Input VSWR improvement.

To improve the input VSWR, replace the 100 ohm inductive resistor R1 with a 200 ohm resistor. Mount it near the cathodes which will also improve the VSWR. I used two 100 ohm, 3W MOF resistors from Matsushita in series ([Matsushita ERG3SJ101](#)). Also the long cathode connection to the RF choke RFC-4, and bypass capacitor C24, mounted on the ALC board PC-1004, should be changed. Mount them near the cathodes. The capacitors C22 and C23, which also are mounted on the ALC board, should also be mounted near the cathodes. This reduces the bad effect of the long cathode connections going to the ALC board.

For perfect matching, an external manual antenna tuner can be used, like the Kenwood AT-120 between the transceiver and the input of the MLA-2500B.

You can also use a tuned input circuit. Omega Electronics in Knightdale, NC is selling a switched 6 band tuned input board, model ASI for use with this amp. Due to the very limited space in the MLA-2500B, mount this board in an external small housing, with a 6 position band switch, plus 6 LED's, indicating the band used.

Tube arc protection.

To limit the anode current in case of an arc, add a current limiting resistor of 10 ohm, 10W in series with the HV B+ output of the filter capacitors.

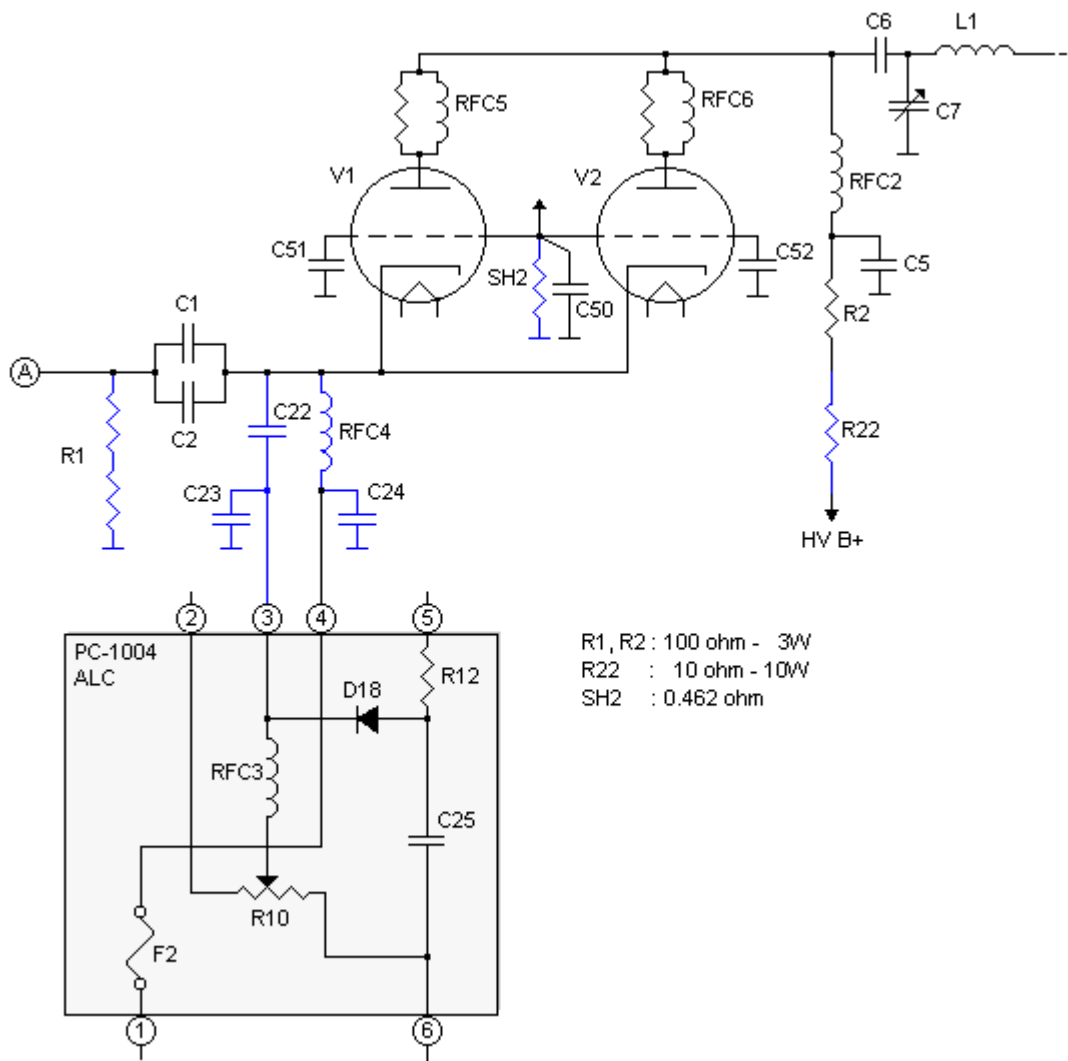
Grid current meter improvement.

It's difficult to read the grid current as the original grid meter shunt is 0.0462 ohm, which gives a grid current full scale of 1 A. By replacing this grid meter shunt SH2 to 0.462 ohm, the full scale will be 100 mA.

HV Power Supply RF bypass capacitors.

A 0.01 uF, 2KV capacitor added across each filter capacitor, C16 - C21.

Below a schematic of the modifications, most of them highlighted in blue color.



AG6K modifications. (not shown)

I also did the following modifications from AG6K:

- Cathodes to chassis low VHF-Q suppressors.
- Replacing the long wire from top of the HV RF choke (RFC2) to the tuning cap with a low VHF-Q conductor.

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