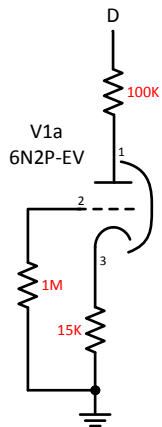
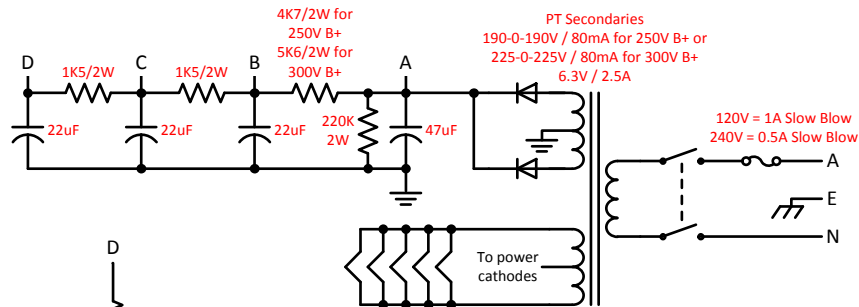
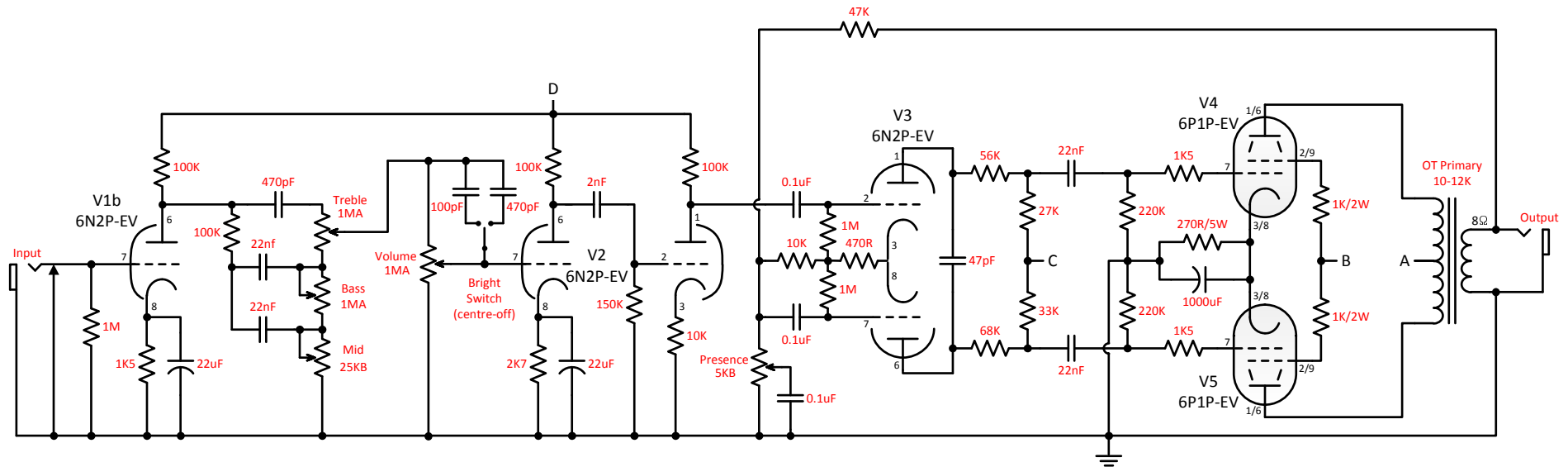


# Thrifty Wreck

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Component values have been optimised for best clean to mean with no volume change performance. This involves balancing the PI output level with screen supply sag under signal vs. the output valve grid clipping threshold. The result is that firstly both power valves start to clip, then V4 actually backs out of power clipping and that side is dominated by PI distortion, while V5 remains dominated by power distortion.

The best place for clean to mean fine tuning is actually the screen supply resistor. For the power clipping to dominate more decrease the value. Alternatively for larger changes to the amount of power clipping and resulting tone the ratio of PI split plate resistors, the feedback resistor, or the PI supply resistor value can be experimented with.

All common TW Express mods can be used (parallel 1<sup>st</sup> triode, tone-stack changes, parallel 2<sup>nd</sup> to 3<sup>rd</sup> stage coupling caps of different types, etc). If the spare triode is not used for a parallel 1<sup>st</sup> stage, tremolo bias wobbler, line output buffer or any other function it is recommended that it is tied to the preamp supply node D with 100K plate resistor and 10K cathode resistor to ground with no signal connections under the assumption that cathode poisoning is real, rather than being left disconnected.

The main instability sensitivity is the proximity of PI output wires to the tone-stack wiring running along the chassis front panel. The wiring from PI plates to power valve grids should be kept away from the tone-stack wiring and can be shielded. Instability and oscillations are likely to be ultrasonic and can only be seen with a CRO. Also a lower output and hotter running temperatures will be noticed if there is a problem. Either follow the common TW Express turret board layout or follow good point-to-point layout practices.

The Express has a power supply node E for the first two preamp stages. With the tone-stack losses and the low gain of the 3<sup>rd</sup> stage, running all three preamp stages from one power node works fine. Install another one if you wish.