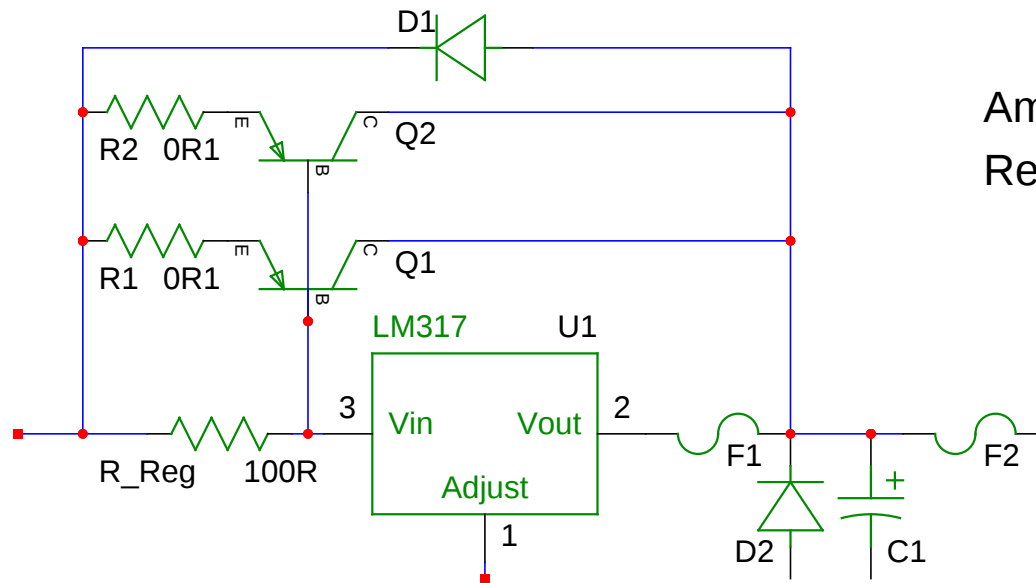




Amperage Boosters for Regulated Power Supplies

This is only a small section of the overall regulated power supply shown for placement clarity and simplicity.

D1+D2 are the standard protection diodes for capacitor discharge.

C1 represents all the output capacitance for the main circuit.

Q1+R1 is one stackable segment. Several may be stacked (as Q2+R2 is shown).

Q1+Q2 are PNP power pass transistors (typically TIP2955/2N2955 type, add about 5 amps each).

Transistors will require a big heat sink and/or fans. The regulator should run reasonably cool.

R1, R2...Rn are balancing resistors and prevent current swamping on any one transistor. 5 watt rated.

R_Reg is the resistor that pushes the amperage off to the transistors. Should be 0.5-1 watt rated.

F1 should be rated close to the regulator's max amperage (usually about 1 amp).

F2 should be rated for the entire transistor stack + regulator's amperage.

Input voltage to the regulator will need to be increased a few volts more to handle the extra voltage drop when the transistors kick in.

As additional transistors are stacked, transformer, diode bridge, large filter input and output capacitors will need to be increased.

Filtering ripple during high amperage use will likely need capacitors well into the milli-Farad range.

The diode bridge may suffer very large peak current surges and should be rated at least 5x normal current draw.

R_Reg is usually 100 ohms (but have seen anywhere from 2-100 ohms). I don't know the calculations for this.

Not shown: negative regulators use a mirrored setup with an NPN TIP3055 instead (emitter should be next to resistor still).

The LM317 data sheet shows a signal level PNP controlling a stack of power level NPN's for boosting as an alternative.