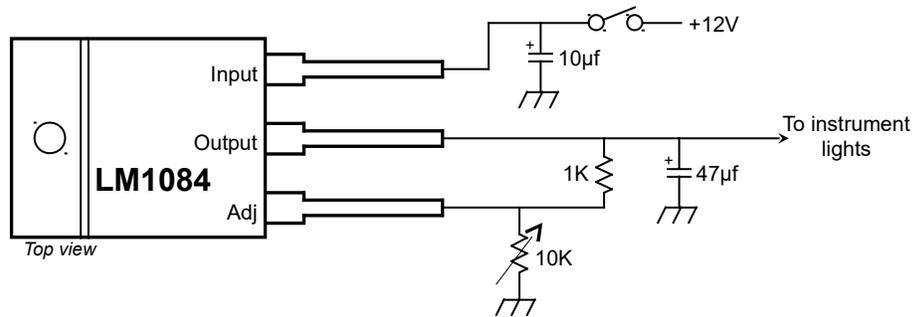


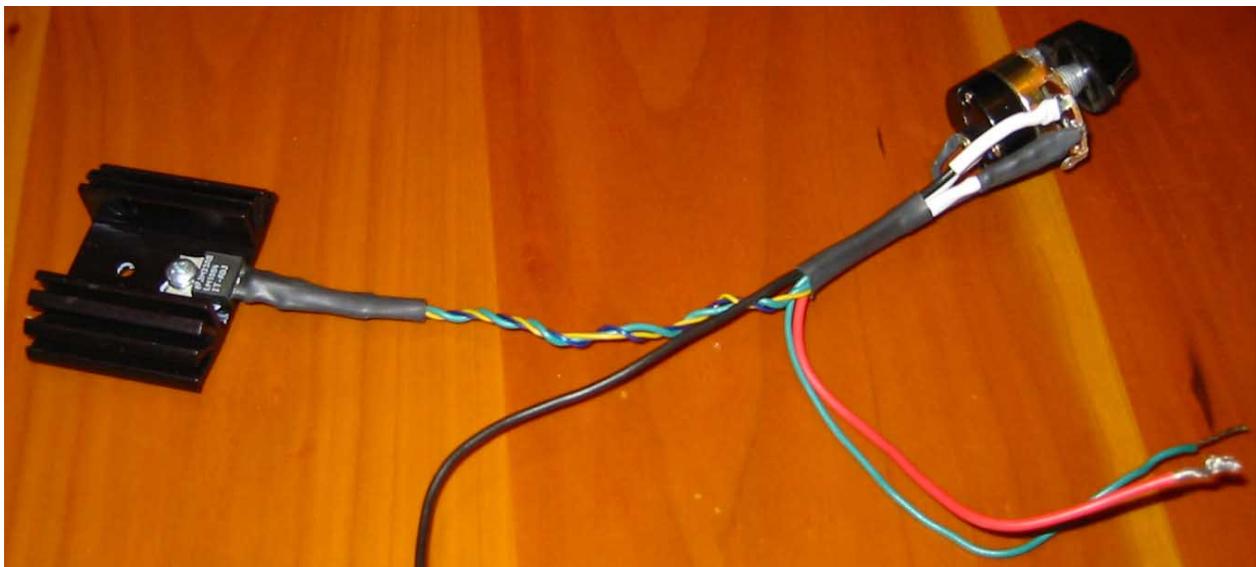
Instrument light dimmer

A few instrument-light dimming circuits have been published here, usually using a 2N3055 power transistor. However, this circuit is much more rugged. The potentiometer will never burn out since little current passes through it. More importantly, the regulator shuts itself down above 125°C so even if a post light socket gets shorted nothing will melt down or burn out. This circuit is easy to build, uses common parts (see www.digikey.com), and is much cheaper than any of the pre-built commercial units.

If you notice a sudden uncommanded dimming of the instrument lights, this means that the regulator is nearing its thermal limit and is an indication that you need a larger heat sink. The heat sink shown here can handle a small lighting system - up to about 2 amps. Above that you will need a bigger heat sink. The switch on the 12V input is part of the potentiometer. It's included because even though the lights would be dark at the dimmest setting, appreciable power would be wasted. When you rotate the knob all the way towards the dim setting, you will hear a click as it switches off. Of the potentiometer's three terminals, one end terminal remains unused. If the switch turns off as you rotate the knob to the full bright position then you have connected to the wrong end terminal. If your panel already has an on/off switch for the instrument lights then can save a little by buying a potentiometer without the built-in switch.



Part Description	Digikey Part No.	Cost
5A Low Dropout Regulator, TO-220	LM1084IT-ADJ-ND	\$2.14
10K Potentiometer, with switch	CT3047-ND	\$3.48
Heatsink, Dual TO-220, 15W	294-1082-ND	\$2.13
1K resistor, ¼ watt	1.0KQBK-ND	\$0.06
10µF electrolytic capacitor, 25V	P813-ND	\$0.30
47µF electrolytic capacitor, 16V	P5137-ND	\$0.21



I used red, black, and green for the wires to +12V, ground, and the instrument lights respectively. Typically you will want to build two of these, one for the instrument lights and the other for the radio lights. I used a separate heat sink for each, but you could use a single large heat sink instead. You can't see the 1K resistor in the picture because it is under the heat shrink tubing at one of the potentiometer terminals. You can't see the capacitors because I got lazy and left them off. Theoretically that could cause the circuit to oscillate, although it is working fine in my airplane. You should be able to use the same circuit in a 24V airplane. Just change the 1K resistor to 470 ohms and double the capacitor voltage ratings. One final installation warning: Don't mount the heat sink on anything connected to ground. The regulator case is connected to the regulator output, so if the heat sink touches ground, the instrument lights are shorted out.