HINTS FOR HOMEBUILDERS

PANEL LIGHT DIMMER FOR UNDER $4

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(Winner of the John Fluke Mfg. Co. Electronics Award)

This electronic lamp dimmer may be used to control the brightness of panel lights, map lights or rear seat reading lamps. It will handle 5 amps (60 watts) without a heat sink for the power transistor. If you wish to cook breakfast in flight, simply add an adequate heat sink and you can push this up to 15 amps (180 watts). The circuit may be mounted any place that is convenient as long as R1, the potentiometer whose knob you twist to vary the lamp's brightness, is convenient to the pilot or to whomever is controlling the lamps.

The components are not critical in their values. I've selected Radio Shack components for their ease of availability.

The potentiometer (R1) should be mounted in the instrument panel or other place that is accessible to the operator. The resistor (R2) can be soldered directly to the terminals of the potentiometer.

The transistor (Q1) must be mounted so that the transistor case (the collector of "C" terminal) is insulated from the aircraft ground. In my example I simply attached the aluminum heat sink to the back of the potentiometer with RTV. Some people may elect to buy a commercial socket (more dollars, weight and parts).

If you wish to use the full 15 amp capacity, you must heat sink the power transistor (Q1). You may buy a commercial heat sink or make it out of a piece of aluminum. It must be flat and meet the transistor case firmly. To transfer heat properly, use a silicone grease, heat sink grease (available at Radio Shack). The heat sink must be mounted in a location that will not be affected by heat, as it will be warm to the touch when the circuit is operating at full capacity.

The capacitor (C1) is optional and is only necessary if there is some alternator noise in the aircraft electrical system. The light dimmer circuit will not create noise but it will amplify it if any is present. Use insulating sleeving on any exposed component leads and resin core solder when making connections. A heat sink must be used when soldering to the transistor. Transistors are sensitive to heat and you will **nuke** the transistor if too much heat reaches it.

The parts listed below are off the nearby Radio Shack shelf. I know there are cheaper ways to buy components but this is handy and saves running around.

If you are a scrounger and wish to look for substitute parts, perhaps the following will aid you in getting what you'll need.

Transistor (Q1) - Several different high power NPN transistors should work, however, only these two were tested: 2N3055 and Radio Shack's 276-2041.

Potentiometer (R1) - A 1000 ohm linear potentiometer will work best, but is hard to locate. A 5000 ohm linear potentiometer is much easier to find and can be used in this circuit by adding a fixed carbon resistor (R2) in parallel with the 5000 ohm potentiometer as shown.

Resistor (R2) - A 500 ohm 1/2 watt carbon resistor will work fine and will handle the current sufficiently. The resistor can vary from 400 to 1200 ohms with only a slight change in circuit performance. This resistor is not necessary if the 1000 ohm potentiometer is used.

Capacitor (C1) - This component is optional but I recommend it as it's cheap insurance against the propagation of electrical noise in the aircraft.

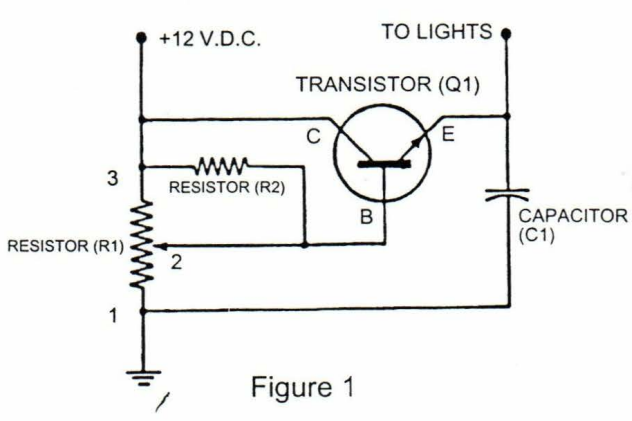

Figure 1

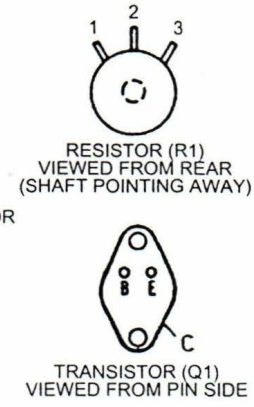

Figure 2

Quan.	Description	Cat. #	Price
1	Transistor 2N3055	276-204	$1.99
1	Potentiometer 5000 ohm	271-17	$1.09
1pk	Resistor 560 ohm 1/2 Watt	271-020	$ .19
1	Capacitor .01Mfd	272-105	$ .49

Readers are invited to submit entries to EAA, Hints For Homebuilders, Att: Golda Cox, EAA Aviation Center, P.O. Box 3086, Oshkosh, WI 54903-3086. Entries will be reviewed by a panel of EAA judges. Readers whose hints are published in any EAA magazine will be awarded one of three monthly prizes by Snap-on Tools - a 3/8" Drive Socket Wrench Set, a 1/4" Drive Socket Wrench Set or a Nine-piece Long-Handle Combination Wrench Set. Members are also invited to submit hints of an electrical nature. Any hint used will receive a Fluke Model 23-2 Multimeter with Holster from the John Fluke Mfg. Co., Inc. The contest will run from August through July of each year with a Grand Prize of a Snap-on Tools KR657 Roll Cab and KR637 Top Chest being awarded the best entry for the year. A Grand Prize will also be awarded by the John Fluke Mfg. Co. These awards will be presented during the EAA Convention. Our thanks go to Snap-on Tools and John Fluke Mfg. Co. for providing these awards.