



## BIKE LIGHT SAVER

I installed a Soubitez alternator to power the head and tail lights on my bicycle. Unfortunately, I found that the bulbs were burning out rather quickly when I was travelling at speeds greater than 15 mph. The problem was solved by installing two zener diodes back-to-back as shown in the figure. Before the modification, the alternator output was 6 volts rms at speeds greater than 6 mph. After the change, the voltage applied to the bulbs dropped to about 4.9 volts rms. Bulb life was considerably extended without significant reduction of light output. In the diagram, left, the miniature headlight (*I1*) is rated at 6 volts and 300 mA. The taillight (*I2*) is rated at 6 volts and 100 mA. The two zener diodes (*D1* and *D2*) are rated at 6 volts and 3 watts. Higher-powered zeners can be used.—*D.F. O'Connell, Palo Alto, CA.*