

## Fix for Rear LED Leakage on SoundTraxx LC Decoders

This series of tech notes is designed to help modelers with DCC decoder installation. Much of the information comes from questions asked by modelers and ideas we have found. This note covers a possible fix for the rear light LED leakage problem when using an LED for the rear light on some SoundTraxx LC decoders.

### THE PROBLEM

There have been a number of modelers using the SoundTraxx LC decoder that have installed white LEDs as backup lights. SoundTraxx recommends using lamps instead of LEDs for this application. There is no problem with the headlight using LEDs, but the rear light has a leakage problem that causes the LED to glow or blink when the air pump, bell or whistle is running. It does not come on at full brightness, just enough of a glow to be noticed.

The LC problem comes from a series of small pulses that occur on the rear light function output, the yellow lead. These short pulse are too short for a lamp to respond. The LED will respond to very low power and microsecond pulses. **Lamps** are slow to respond and take a lot power. **LEDs** take very little power and turn on instantly.

### Finding a Fix

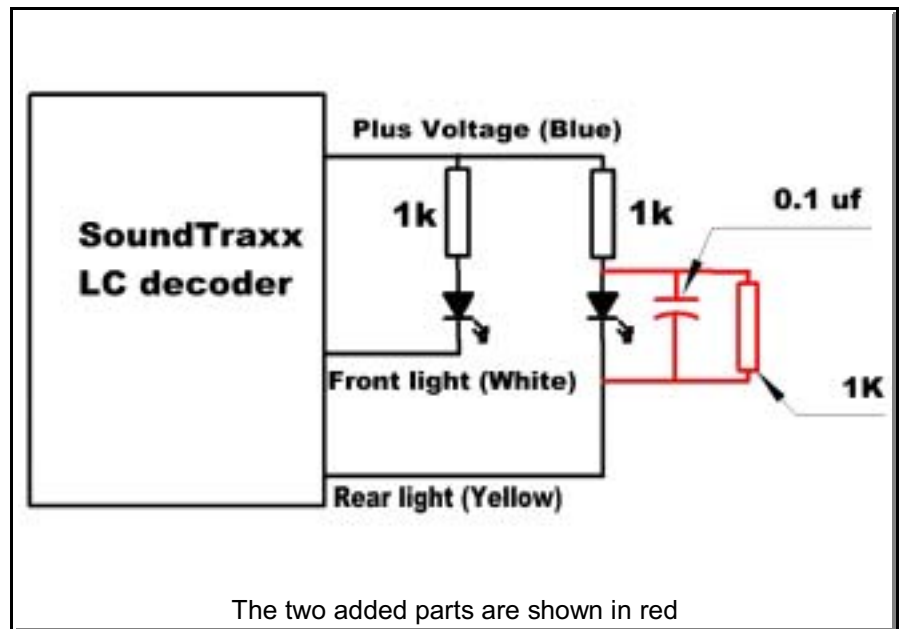
A number for local modeler have asked me to look into this blinking problem. One modeler gave up and final just turned off the air pump. Then Tony forwarded an E-mail to me from Roger Smith who had the leakage problem. Roger came up a solution that used a micro relay to cut off the power to the rear LED when the front LED is on. This circuit works by cutting off the power to the rear LED when the front LED is on. This is OK if the front light is on. If you turn the front light off, the problem returns to the rear light. We felt a better solution would be to fix the rear light so it would be totally off unless turned on.

Roger and I went back a forth a couple of times with a number of other suggestions. The final solution had to be simple and use a minimum of small parts.

### The Fix

An LED acts like an open circuit until it has enough voltage to turn on. Putting a capacitor in parallel with the LED would absorb the pulses. But was a problem because there was no way to discharge the capacitor and it would simple pick up a charge until the LED turned on. Putting a 1K resistor in parallel solved this by allowing the capacitor to discharge between the short pulses. This would keep it off but turn on when the rear light was selected.

The final version only uses two small parts. A 0.1uf capacitor and a 1K resistor. The added 1K resistor can be a 1/8 watt or 1/4 watt resistor. The 0.1uf capacitor like Radio Shack 272-135 (2 in a package) is rated at 50 volts and is in small size. This capacitor is not polarized.



The two added parts are shown in red

My thanks to Roger for his help in finally getting this fix done!

### LEDs Available at Tony's

We stock a variety of LEDs in different sizes and colors. Check our website for a list of available LEDs at discount prices. ([www.tonystrains.com](http://www.tonystrains.com)) or call us at 1-800-978-3472.

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