

# RICHMOND CONTROLS NEWSLETTER - FOURTH QUARTER 2004

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generally needs to attach the wires to the driver circuit, a process requiring good soldering skills.

For those up to the challenge, patterns supplied so far include alternating headlights and tail lights changing between bright and dim, the same but going between off and on, simple and complex triple strobes, and rotary beacons. Dual patterns can be synchronized, oppositely synchronized, or nonsynchronized. Customer-specified patterns and combinations are always welcomed.

In every case so far, the module has been mounted inside the vehicle, with only the power wires exiting the bottom of the vehicle. Surface mount or other small LEDs have been used, primarily in white, red, amber and blue.

As an example, the EZ04 fits nicely inside the body of an Athearn N Scale fire truck and most vehicles in larger scales. The module price is \$28.00 for the circuit plus \$4.00 for each blue LED or \$2.00 for each white, red or amber LED. Six different patterns can readily be supplied, and each pattern output can drive an LED on the front and another on the back. Our prototype for the Athearn N Scale fire truck has 12 LEDs all blinking and strobing.

**Marker Lights** -- LED marker lights for N Scale cabooses and passenger cars are now being shipped after lengthy delays. Next come the other scales.

Tomar makes a very nice HO Scale marker light. So far, they have stayed with lamps for illumination and "diode drop" circuitry to power the lamps. Sunny White surface mount LEDs can easily be inserted into the Tomar marker lights after removing the bulb. The one LED will illuminate all three lenses very evenly, and the LED should never burn out if used properly. With its very low current consumption (about 4 - 5 mA per side), the LED works very well when powered by a circuit with antiflicker capability, such as the EZ23, EZ31, EZ41, EZ51, or EZ61.

Dennis and Kathy Mashburn at K & D Casting make a beautiful brass marker light casting for O Scale. It can be fitted with colored lenses using MV lenses with the backings removed. A single Sunny White surface mount LED can be used for illumination, as with the Tomar HO Scale marker light. K & D has many brass detail parts for O Scale headlights and other lights that can be brightly illuminated using the same LED.

**Passenger Car Interior Lights** -- Our first customer for a low-cost, flicker resistant interior lighting kit for O Scale has appeared. To keep the cost down, this is supplied as a "Bag of Parts" kit that includes Golden

White LEDs, a strip of circuit board material, and an EZ23 driver circuit.

There has been increased interest lately for antiflicker circuitry on our EZ54 modules used to replace the lamps with LEDs in Kato N Scale lighting kits. In my opinion, you can't get track power any more reliably than with Kato trucks, but the wheels and track can still get dirty. These special EZ54 circuits can overcome moderate accumulations of dirt. They are two times the price of the simple EZ54 circuits, and they have to be made to fit specific cars. (For example, the module for the diner is different from the module that fits a coach.)

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## SPECIAL LIGHTING MODULES

Recently, customers have ordered special lighting modules. All were accomplished using a single module equipped with LEDs. Some of them are:

- Kato N Scale Bethgon - Track powered FRED installed completely out of sight under an empty car.
- Micro-Trains N Scale enclosed auto rack - track powered FRED.
- Athearn Southern Pacific HO Scale SD40T-2 - dual headlights and dual Gyalights using LEDs modified to be installed completely inside the existing headlight holes without using fiber optics.
- Atlas N Scale Mogul - Dim headlight lamp replaced with bright Golden White surface mount LED for headlight.
- Kato N Scale RSC-2 - dim yellow LEDs replaced with bright Golden White LEDs, and non-directional amber rotary beacon added.
- Lighted Bezels (bezels with surface mount LEDs installed) for a small number of O Scale, HO Scale and N Scale locomotives.

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## TRAIN SHOWS

Upcoming Train Show plans for Richmond Controls include the Ft. Worth Train Show (November 13-14), the Oklahoma City Train Show and Southern Plains N Scale Convention (December 2-5), the Plano (TX) Train Show (January 15 & 16, 2005), the San Antonio (Live Oak) Train Show (January 29 & 30, 2005), the Atlanta Train Show (March 12 & 13 2005), and the O Scale March Meet (Arlington Heights, IL, March 19 & 20, 2005).

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## INTRODUCTION

The following discusses what's new at Richmond Controls since the Third Quarter 2004 Newsletter. Feel free to call if you need additional information - Jim

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### NEW LED and REVISED TERMINOLOGY

A Golden White Surface Mount LED is now available from Richmond Controls. It is the 603 size (0.060" x 0.030"), has no blue tint, but has a gold tint, like the 3 mm and 5 mm Golden White LEDs that came before. They are \$1.50 each with no wires attached, or \$3.00 each with #36 wires attached. The Sunny White surface mount LED which has less gold tint is still available at the same price.

We are modifying the descriptive names of the LEDs we have, in hopes that it will make thinking about and specifying the color of "white" LEDs easier. At this time, you can buy "white" LEDs in what can be described as either "Cool White" or "Warm White", similar to the way fluorescent lamps are described. The difference is that "Cool White" implies a mild blue tint in the white, and also what has been called "Bright White" (a very stark white). On the other hand, "Warm White" means there is no blue tint, but there is some degree of golden tint, in an effort to approximate the color mix of light from an incandescent light. Within the "Warm White" category, we further distinguish between "Sunny White" and "Golden White". The "Sunny White" LEDs are Warm White LEDs that have a VERY MILD gold tint, while the "Golden White" LEDs are Warm White LEDs with a more pronounced gold tint. Neither has any blue tint.

In addition to color, there is also the variable of package size and shape. With the new LEDs, we can now offer either the Sunny White or Golden White color in any of three packages: the round 5 mm T 1-34 package, the round 3 mm T 1 package, and the 603 (0.060 x 0.030") rectangular surface mount package. Note that there are a total of SIX different LEDs, when you count three packages in two colors, not including any of the Cool White variety. I hope this is clear -- please contact me if you have any questions. (Please note that surface mount components are like tiny solid blocks, *and have no wire leads*. The 3 mm and 5 mm LEDs, on the other hand, both have two wire leads coming out of the bottom of the package.) In order to make these LEDs as useful as possible for model railroad applications, Richmond Controls offers the "603" surface mount LEDs in either Warm White color (Sunny White or Golden White) as well as red, amber, green, aqua, and blue, with two #36 wire leads attached. All are \$3.00 with wire leads,

except the aqua and blue, which are \$4.50 each because those colors of LEDs are inherently more expensive.

Richmond Controls also offers the 3 mm and 5 mm LEDs with tips turned down to fit exactly into existing headlight holes. For example, the upper headlight hole on a Kato PA1 is 0.108" in diameter, and the headlight holes in an Athearn U33C are 1.5 mm. LEDs with tips reduced to these or other sizes are \$3.00 each. These LEDs eliminate any need to use fiber optics, and greatly simplify installations -- you just push them into the headlight holes in most cases.

Finally, Richmond Controls offers LEDs with protective diodes and capacitors already attached, as would be need when, for example, when changing the yellow LED in a Kato RSC-2 to a Golden White LED. Please see the RECOMMENDATIONS document in the LED area at [www.richmondcontrols.com](http://www.richmondcontrols.com) if you want to understand the issues that come into play when replacing non-white LEDs with any flavor of "white" LED in a model railroad locomotive.

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### NEW PRODUCT APPLICATIONS

**All Scales, Flicker-Resistant Lighting** - Recently, customers in O, HO and N Scale have sought modules to provide flicker-resistant track-powered voltage for interior lights, marker lights, tail lights, etc. It turns out we had the ideal circuit all along -- the EZ23.

The EZ23 was originally designed to be a track-powered FRED flasher, providing bright flashes of power at the prototypically correct repetition rate and duration for FREDs. But the key semiconductor component was obsoleted by its manufacturer, necessitating the design of a new FRED flasher, the EZ26. Fortunately for us, without its flashing component, the EZ23 can be used to provide flicker-free power from the track for any lighting function. It is particularly well suited for driving LEDs. The basic EZ23 without LEDs is \$20.00, and several LEDs can be connected at \$2.00 each.

**Emergency Vehicle Warning Lights** -- There are quite a few nice emergency vehicles on the market, and customers have been requesting complex arrays of lights for them. Recent modules have included an O Scale State Trooper's car, two different HO Scale Highway Patrol and Police cars, an HO Scale fire truck, and an N Scale fire truck.

Most of our modules are modestly called "EZ-LITE™" modules. Some of the emergency vehicle modules might be more properly called "Not-So-EZ-Lite" modules, due to the difficulty in cramming a large number of small wires into a very small space. Also, the installer