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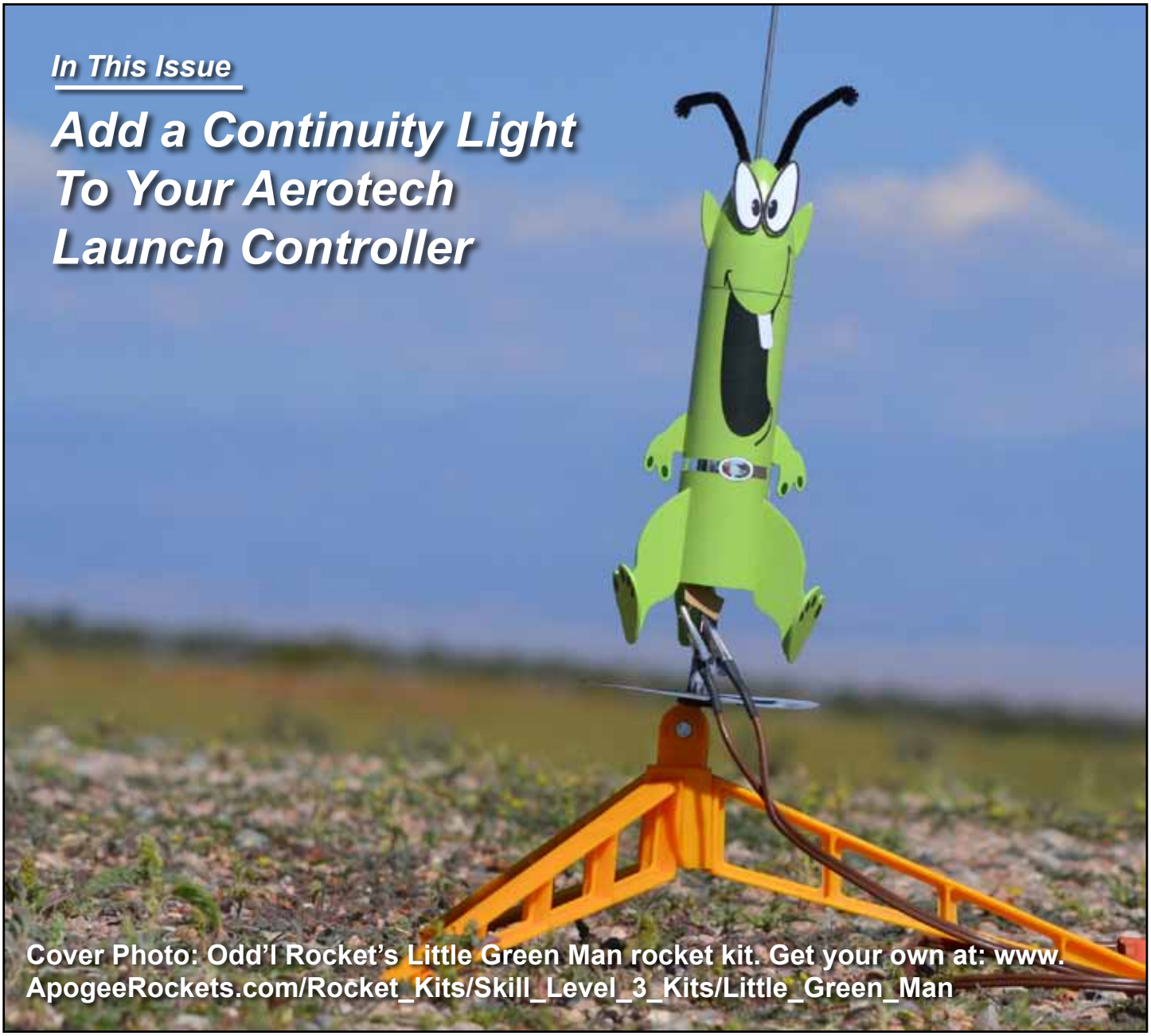
# PEAK OF FLIGHT

NEWSLETTER



*In This Issue*

## *Add a Continuity Light To Your Aerotech Launch Controller*

**Cover Photo: Odd'l Rocket's Little Green Man rocket kit. Get your own at: www.ApogeeRockets.com/Rocket_Kits/Skill_Level_3_Kits/Little_Green_Man**

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# Add a Continuity Light to Your AeroTech Interlock Launch Controller

By Mike Zapolski, Sr.

## Background

I first became interested in model rockets forty years ago. Due to personal reasons, I had to set the hobby aside until this year. This year I began to accumulate the tools and materials to start my own rocket club.

I chose the AeroTech Interlock launch controller because it was designed to work with AeroTech igniters and its safety features. Yet I was disappointed that it had no immediate way to check the continuity of the rocket's ignition circuit. So I set out to change that by adding an LED (Light Emitting Diode) indicator to the controller.

The first question I had to solve was one of determining just how much electrical current I could safely allow in the continuity circuit without activating an igniter while turning-on the LED. Investigating the various igniter types, I felt the igniter with the lowest ignition current threshold was the ESTES igniter.

My testing showed that the ESTES igniter could continually pass (for at least 2 hours) 5 ma without igniting the pyrogen. Using that information I designed the circuit shown in Figure 1 that operates at 1.8 ma, which affords an additional safety margin.

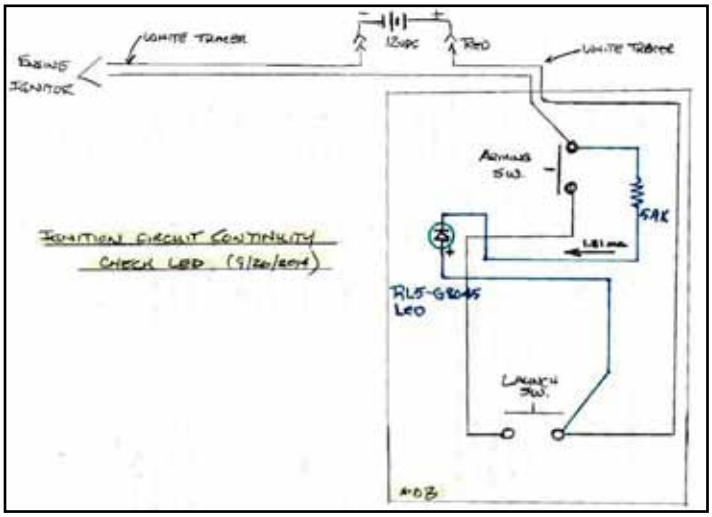


***Figure 1: Electrical schematic of the modified launch controller with the continuity light.***

## Materials

You will need the following items to modify your AeroTech Interlock launch controller.

| Parts | Materials | Tools |
|---|---|---|
| One 5.9K 1/8 W Resistor | 60/40 Solder | Wire Cutters |
| One RL5-G8045 LED (1) (2) | No. 24 solid conductor wire | Soldering Iron |
| | - 12" black insulator color | 60-40 Rosin Core Solder |
| | - 12" red insulator color | Needle Nose Pliers |
| | 1/8" 2:1 heat shrink tubing, or other suitable wire insulation. | Phillips Screwdriver |
| | | 3/16" Drill bit |
| | | Hair Dryer |

(1) Caution: Do not substitute unless you have the electronic expertise to match the LED's luminance, forward current, and operating voltage ratings.

(2) A Red or Blue color LED may be substituted for the Green LED as follows:

(3) Red RL5-R3545 (this item can be found at: https://www.superbrightleds.com/search/led-products/rl5-r3545/)

(4) Blue RL5-B2545 (this item can be found at: https://www.superbrightleds.com/search/led-products/rl5-b2545/)

## Construction

*Warning: The instructions that follow assume the launch controller was built in accordance with the AeroTech Assembly Instructions and that the battery polarity was NOT reversed.*

1) Remove the four (4) Phillips head screws on the bottom of the controller, and separate the controller faceplate from the controller base taking care that the launch button spring inside the launch button stem is not lost. Set the 4 screws and launch button spring and stem assembly aside.

2) Unscrew the screw at Terminal 4.

3) Solder one end of the 5.9KΩ resistor to the Terminal 4 eye lug end of the wire removed from Terminal 4.

4) Reconnect the eye lug wire with the attached resistor to Terminal 4.

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## Continuity Light in the Aerotech Controller

5) Strip-off about 3/8" of insulation from the black wire, and slide a 1-2" piece of heat shrink tubing onto the wire about 2" past the stripped end.

6) Solder the black wire to the unconnected end of the 5.9KΩ resistor.

7) After the connection cools, slide the heat shrink tubing over the solder joint, and heat tubing with the hair dry to shrink fit.

8) Unscrew the screw at Terminal 2.

9) Strip-off about 3/8" of insulation from the red wire, and solder it to the Terminal 2 eye lug.

10) Reconnect the eye lug wire with the attached resistor to Terminal 2.

11) Position the resistor and wires as shown above and wire-tie to the larger black wire as shown above – cut-off the excess wire tie lead.

12) Group the red & black wires together; slide 8" of heat shrink tubing onto them until the tubing reaches the wire tie – at least 3" of both wires should be visible on the opposite (unconnected) end.

13) Heat the shrink tubing with the hair dry to shrink fit both wires into a single 2-conductor cable.

14) Using needle-nosed pliers, bend the LED leads to conform to the orientation shown in the photo shown in Figure 3.

Continued on page 4

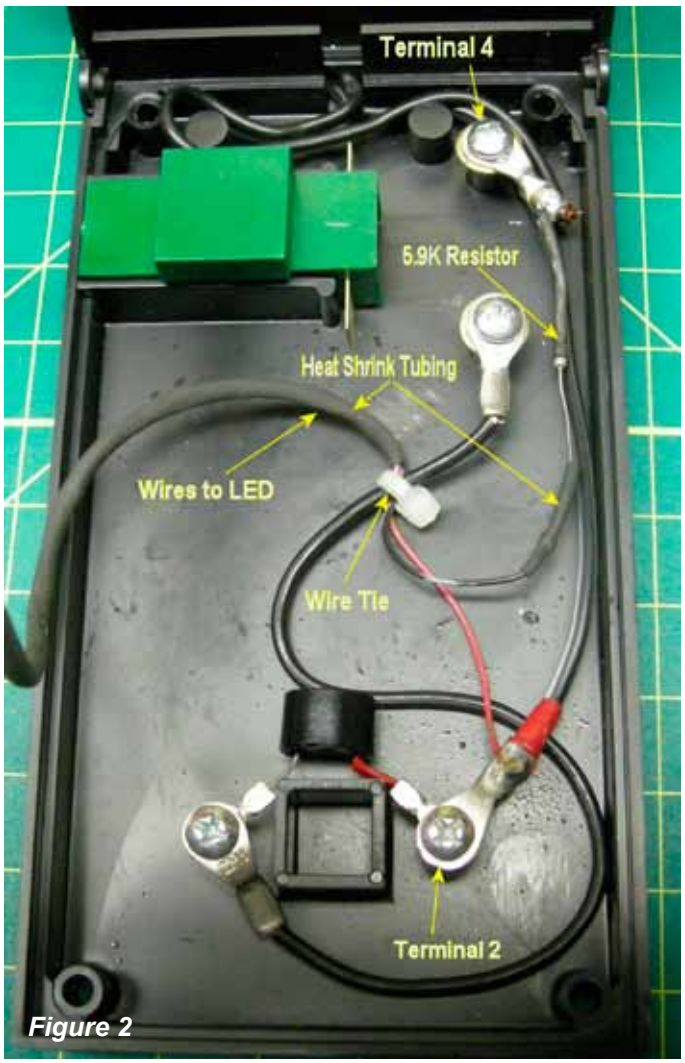


*Figure 2*

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## Continuity Light in the Aerotech Controller

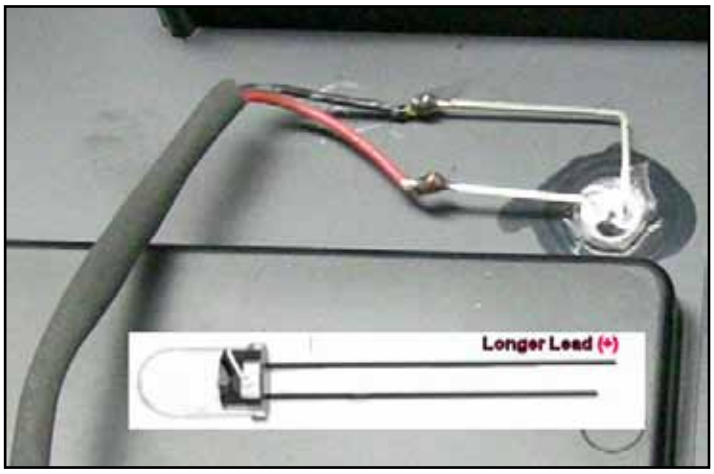


***Figure 3: Bend the leads of the LED as shown here.***

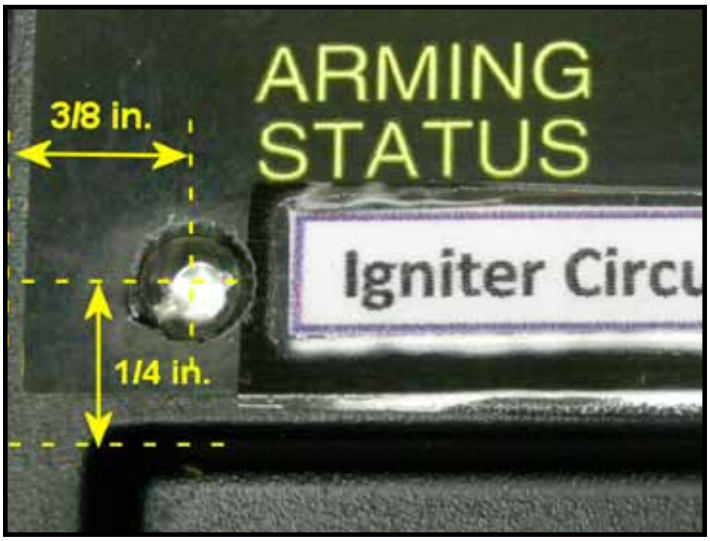


***Figure 4: Location of the hole for the LED light.***

15) Cut-of both red and black wires to lengths of 1-1/2" extending out of the heat shrink tubing.

16) Strip-off 3/8" of insulation from each wire.

*Caution: Do not overheat the LED leads or the LED may be damaged.*

17) Solder the red wire to the LED lead that was the longest lead ***before bending.***

18) Solder the black wire to the LED lead that was the shortest lead ***before bending.***

19) Mark a drilling position 3/8" from the controller faceplate left edge, and ¼" from the edge of the interlock key storage tray as shown in Figure 4.

20) Drill a 3/16" hole at the position found in step 19 above. Carefully clean the sticker edges.

21) Test fit the LED in the hole from the underside of the controller faceplate. It should be a snug fit.

22) Carefully widen the LED mounting hole such that the LED fits snugly.

23) Glue or epoxy the LED into its mounting hole and allow sufficient time for the adhesive / epoxy to setup.

24) The completed modification should appear as shown in Figure 5.

25) Carefully place the controller faceplate on the controller base taking care to position the LED cable in the available space inside the controller so faceplate sits properly on the controller base.

26) Install the four (4) Phillips head screws in the bottom of the controller.

27) The reassembled controller appears as shown in Figure 6. It is being tested with a connected ESTES igniter.

During this test the circuit's current draw was 1.83 ma.

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## Continuity Light in the Aerotech Controller

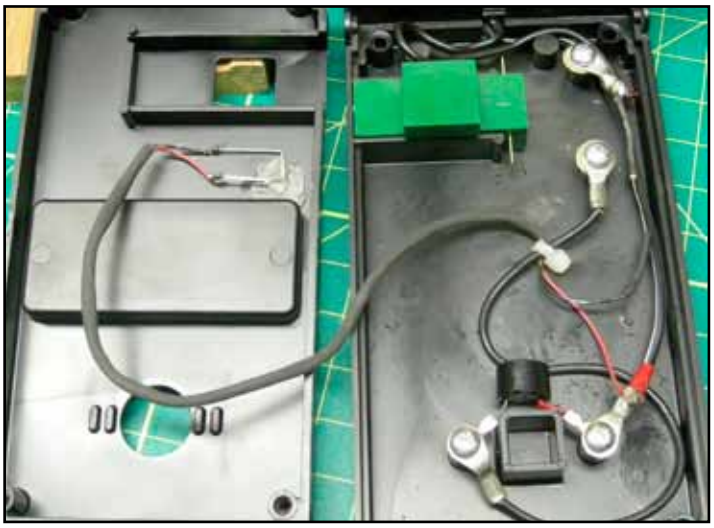

*Figure 5: The modified wiring of the controller.*

I hope you all find this modification helpful. I would think the same circuitry could be installed in other launch controllers as well.

*Figure 6: The continuity light comes on when the leads are attached to the igniter.*

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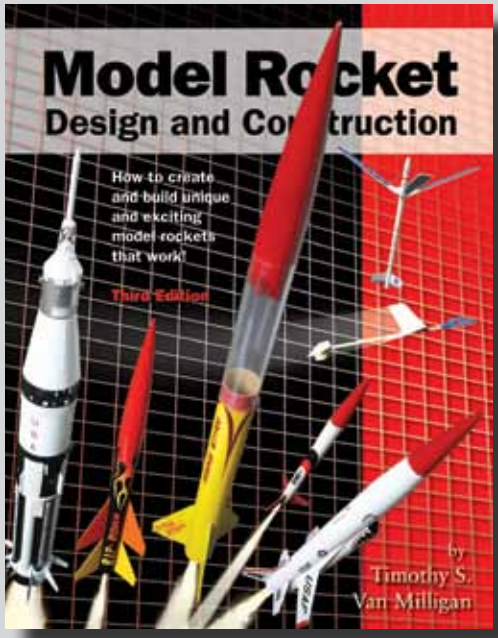


## Model Rocket Design and Construction

*By Timothy S. Van Milligan*

**The Expanded 3rd Edition**

This massive, 328 page guidebook for serious rocket designers contains the most up-to-date information on creating unique and exciting models that really work. With 566 illustrations and 175 photos, it is the ultimate resource if you want to make rockets that will push the edge of the performance envelope. Because of the number of pictures, it is also a great gift to give to beginners to start them on their rocketry future.

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