

# *Klingon Lighting Kit with Torpedo and Engine FX*

By Madman Lighting Inc  
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**WARNING:** This product contains small parts not suitable for children less than 12 years of age. DO NOT SWALLOW! MAY CAUSE CHOKING OR INJURY!

**WARNING:** Madman Lighting products are shipped in good working condition and are not to be modified or changed by the purchaser. Any change or attempt to repair, change, alter, modify or enhance Madman Lighting products in any way will void any warranty, written or implied.

**ESD WARNING:** Madman Lighting products contain sensitive electronic components and may be damaged by electrostatic discharge (ESD). Avoid shock, sparks, and static electricity by working on a grounded surface or by using a wrist-grounding strip.

Thank you for purchasing a Klingon Lighting Kit with Torpedo FX from Madman Lighting. This kit will let you quickly and easily light most Star Trek Klingon style ships with Torpedo Lighting Effects, White Strobe marker effects and Flickering Engine Effects with minimal soldering and easy to use tools.

### **What You Get:**

1 Delux-Flasher 24 circuit card	2 feet fiber optic bundle	red and black hookup wire
3 three mm Red LEDs	2 three mm white LEDs	Instructions on CD ROM
1 five mm Yellow LED	Small and large size heatshrink tube	Push button

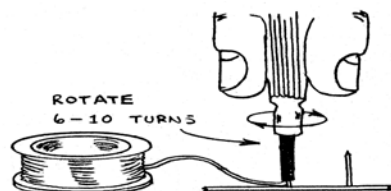
### **What you will need:**

Tools: Xacto knife, Wire Wrap tool (Radio Shack), small wire cutters.

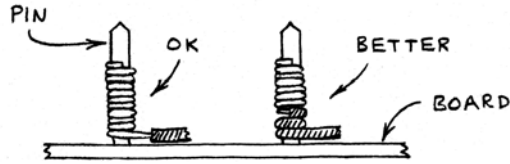
Supplies: 9V to 12VDC power source, batteries or wall transformer. Glue, putty, paint, etc.

No soldering is required when using the Delux-Flasher 24 circuit card. All connections are made with wire wrap wire, which is safer and easier than soldering. It is also easily changed.

Wire wrapping is easy! The wire wrap tool comes with a handy stripper you can use to remove the insulation from the wire. Remove about an inch of insulation, and then insert



the bare end into the guide groove of the wrapping tool. Slip the tool down onto the post and rotate a few turns while letting it gently push itself upwards as the wire wraps around the post. The figure below shows some examples of finished wraps.

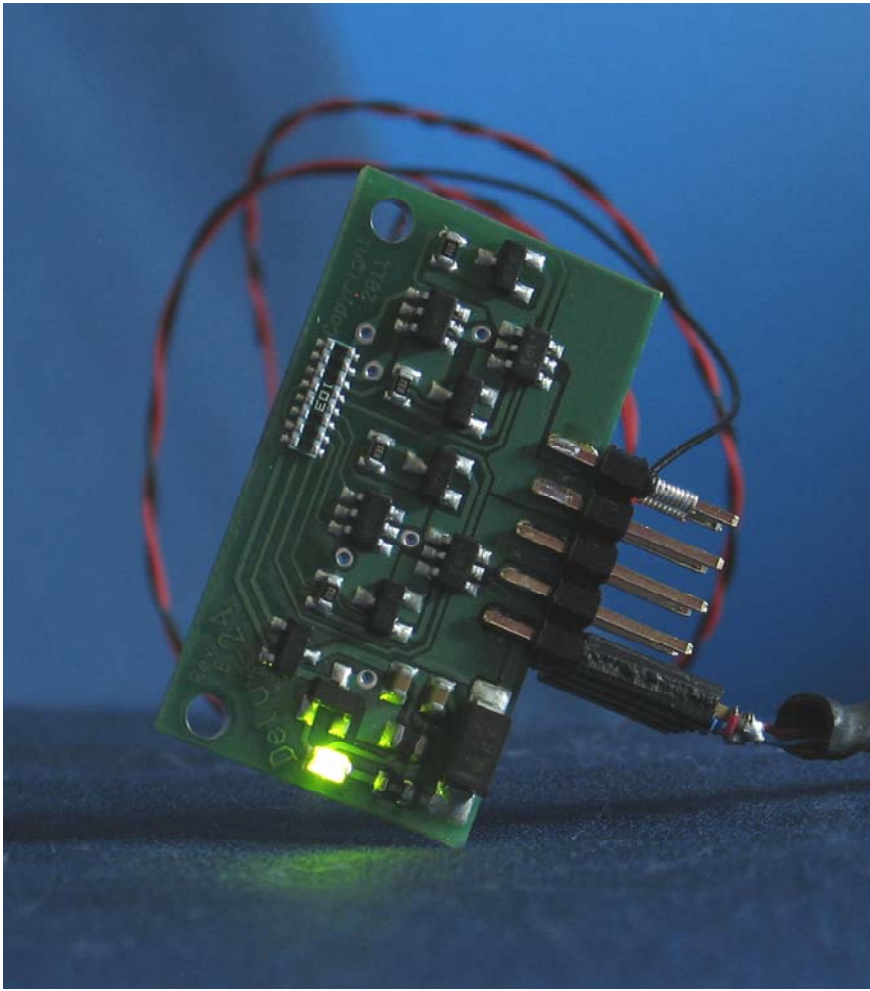


Power wires are provided as part of the kit. One length of twisted red and black wire is available for wiring your Delux Flasher to its LEDs and battery.

Black is for the Negative (-) connection, always the SHORT lead on the LEDs.  
RED is for the Positive (+) connection, always the LONG lead on LEDs.

### **Connecting Power to the Delux-Flasher 24 circuit card**

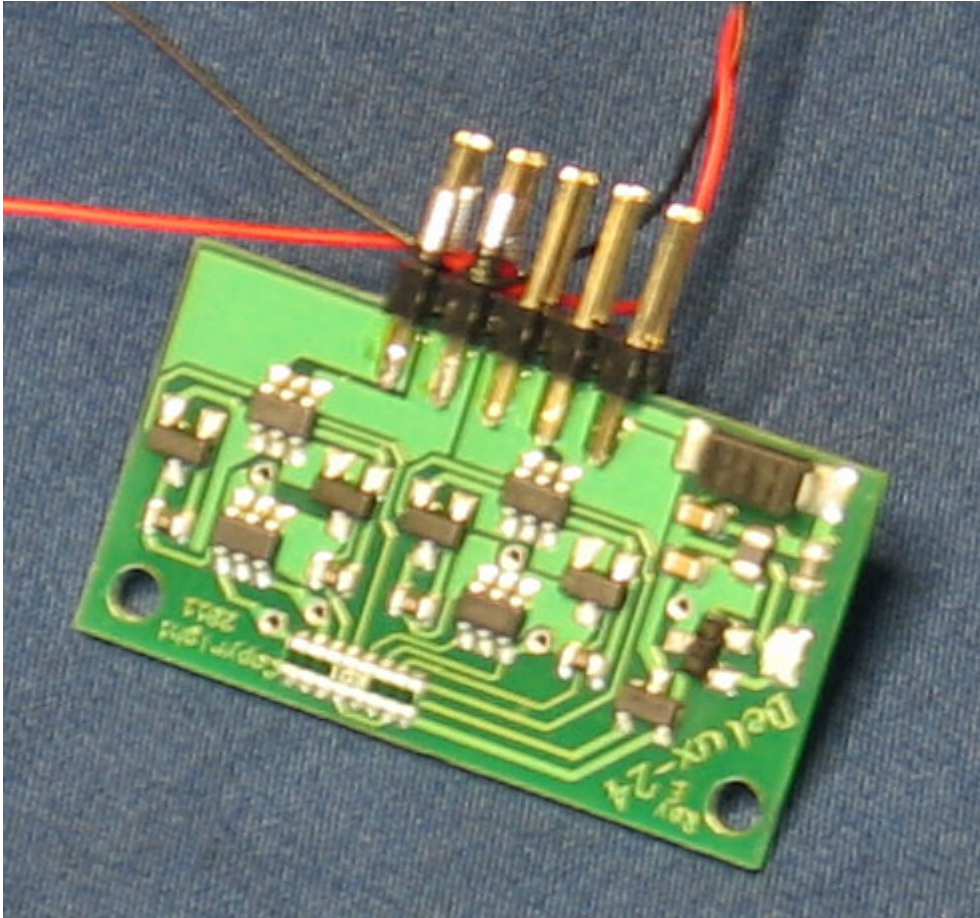
Use a 9V battery to power your lighting effect. Attach a 9V battery to the power pins of the Delux-Flasher 24 card as shown below. (optional wire-wrap hookup shown)



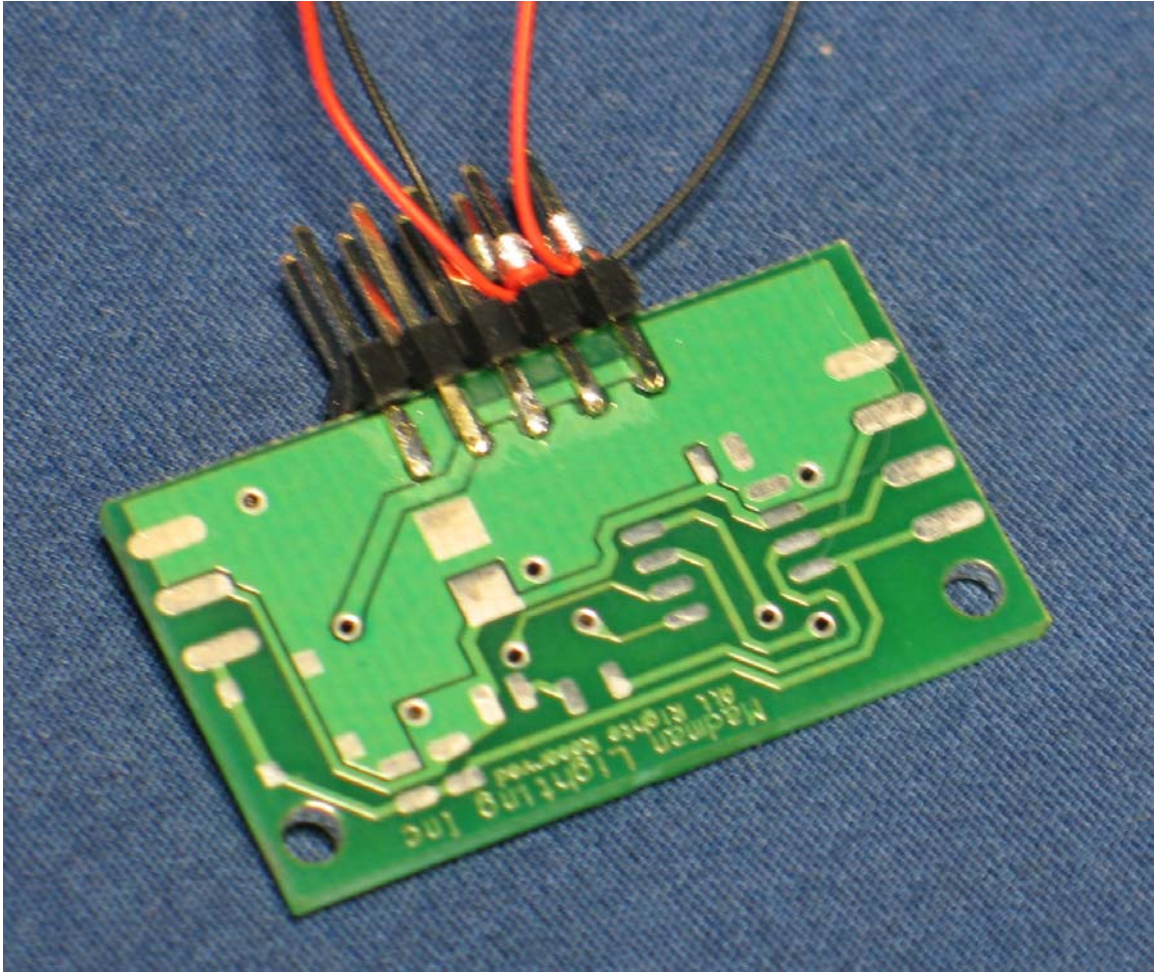
**Power and Ground hookups, Red wire is battery positive (+) , Black is battery negative (-), ie ground**

## Connecting LEDs to the Delux-Flasher 24

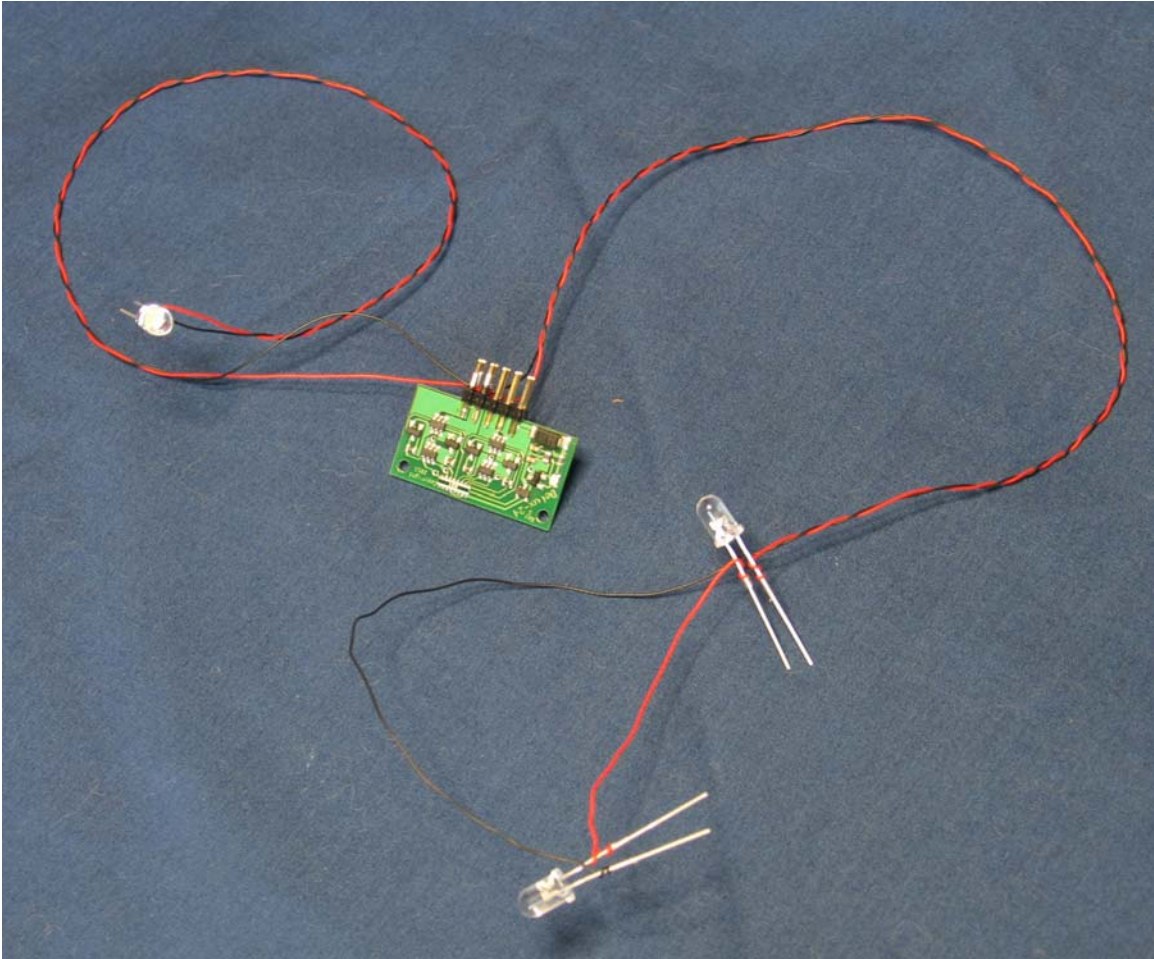
The following pictures show how to hook up wire-wrap wire to the Delux Flasher board



Hookup for two LEDs, showing the red and black wires for the LEDs. Notice that the wires for the LEDs have the **BLACK** wire on **TOP** side and **RED** wire on **BOTTOM** side.



**Hookup for two LEDs on the BACK side of the card. LED RED wires connect on the BACK side of the card.**



### **Wiring up the LEDs for the Kit**

See wiring diagram on last page please.

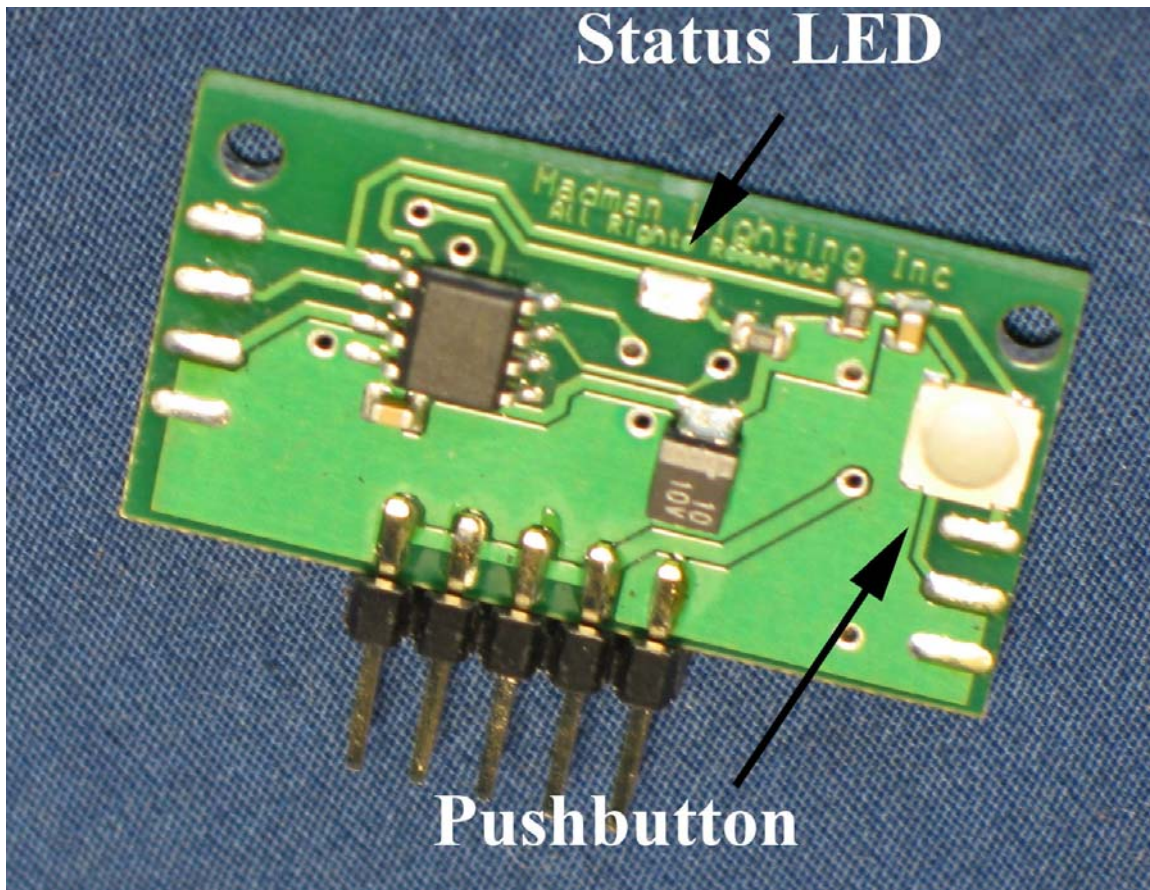
### **Firing the Torpedo Effect and Controlling the Effect Speed**

To fire the Torpedo effect, simply push the fire button. The red LEDs will light dimly at first, then ramp up in brightness and as they reach full brightness, the white LEDs will flash briefly to simulate launch of the torpedo. After the white flash, the red LEDs will dim rapidly.

To adjust the speed of the effect, **PRESS AND HOLD** the fire button. The longer the button is held down, the slower the effect will go. If you hold the button down long enough, the speed return to full speed again. This is a simple loop: Start at full speed, press and **HOLD** to slow, keep holding until its very slow, then it will return to full speed.

When you press the fire button, the Status LED on board will light, indicating a “good press”.

Speed settings are saved after each firing and stay set even if power is lost.



Closeup of backside of Delux-Flasher 24 board, Speed control button in upper right corner.

### Assembling the Torpedo Launcher

Create your Torpedo Launcher assembly with some fiber optics, heatshrink, and the white and red LEDs for the torpedo effect.

First, cut the leads on the LEDs short, only about 1/8" long but keep the long lead longer than the other lead, to know which one is which. This will help prevent short circuits from crossed wires.

Wire the white and red LEDs according to the wiring diagram on the last page. Leave enough extra wire so you can adjust the position of LEDs and controller card later. Cover over the ends of the red wires with some white glue or other goop to insulate them and prevent short circuits. I used some extra heatshrink tubing and pinched it tight over the wire while it was hot.

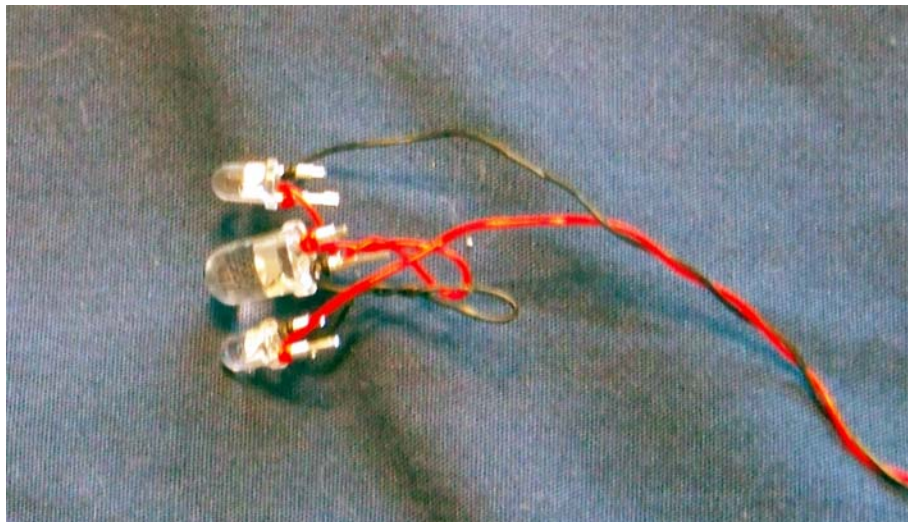
Cut the fiber optics bundle to about 2" long, and strip about 1/4" of the black covering from the end. Now heat both ends gently to soften them and cause them to melt very slightly. This will "lens" the plastic over and greatly improve light transmission.

Now take the heatshrink tubing, fiber optics and LEDs and bring them all together. The idea is to shrink just the ends of the heatshrink and create a “light box” for the LEDs to shine into the end of the fiber optics. Hookup power to the card and fire the effect several times while adjusting the position of everything to get the best effect. Apply more heat and press the ends shut to finish the assembly, shown below.



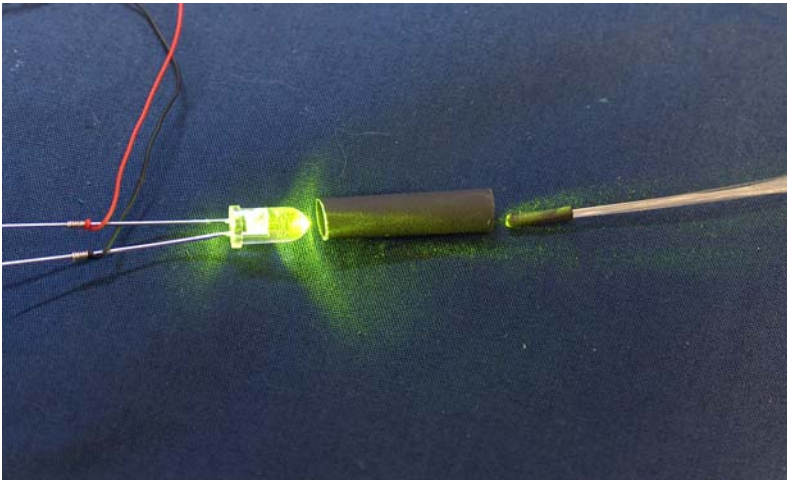
### **Engine Lights**

Engine lights are easy! Just hookup the three LEDs (red, yellow, red) in series as shown in the wiring diagram. Then form the wires to hold the LEDs close together in a row, as shown below:

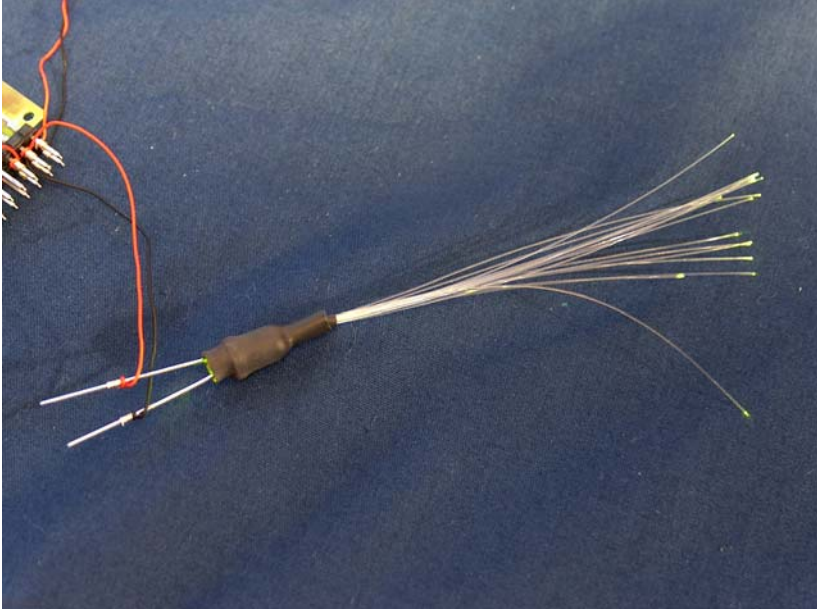


## Connecting Fiber Optics to LEDs

1. To light windows, portholes, or other small round lights use fiber optics. Cut the fiber a little longer than what you need and remove the black plastic covering by slitting it lengthwise and remove the fibers. **Gently** warm up the ends of the fiber with a low wattage soldering iron or other modest heat source by bringing the heat **CLOSE**, but **NOT TOUCHING** the fiber ends. This will smooth them and form a lens at the end of each fiber, greatly improving light transmission.
2. Cut a length of heat shrink about  $\frac{3}{4}$ " long for each LED you use. Stretch one end open so it fits over the LED easily. Join the LED to the fiber by butting them end to end and slipping the heat shrink over them both. (see pictures below) Heat the heat shrink with a low wattage soldering iron or hair dryer to shrink it and hold the fiber to the LED. Matches or flame are not recommended for heating.



LED, and heatshrink tube, and fibers, ready to join.



**Fibers joined to LED with heatshrink tubing.**

### **Painting with Fiber Optics and Lighting**

It's easy! Any place you have a fiber, leave a little extra, maybe ¼", sticking out, and paint the entire area, including the fiber. Once you're all done painting, cut the fiber flush with the surface. Light will shine from the flush cut fiber. Now you've got a great fiber optic lighting effect.

# Hookup diagram for Klingon Engine and Torpedo FX controller card

