

# R/C Afterburner Light Kit For Electric EDF Jets

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Congratulations on purchasing the Afterburner light kit. Your kit is hand assembled in the USA, and we appreciate you supporting our products.



The afterburner light kit includes the following features:

- Unit runs off receiver BEC circuit, receiver 6V battery, or the system battery (lipo, NimH) up to 16V
- Intensity of afterburner light effect is linked to throttle stick position
- Afterburner trigger point is auto learned when radio turned on
- Custom burner ring assembled to match your exhaust tube
- Unmatched LED brightness – you can see the afterburner effect in broad daylight
- Can be used with existing receiver on an unused channel (linked to throttle) or y-cabled to your ESC throttle servo channel.
- Long length ribbon cable attached for flexible install
- Low current requirements – typical is around 250mA draw
- Lightweight

## PACKAGE CONTENTS

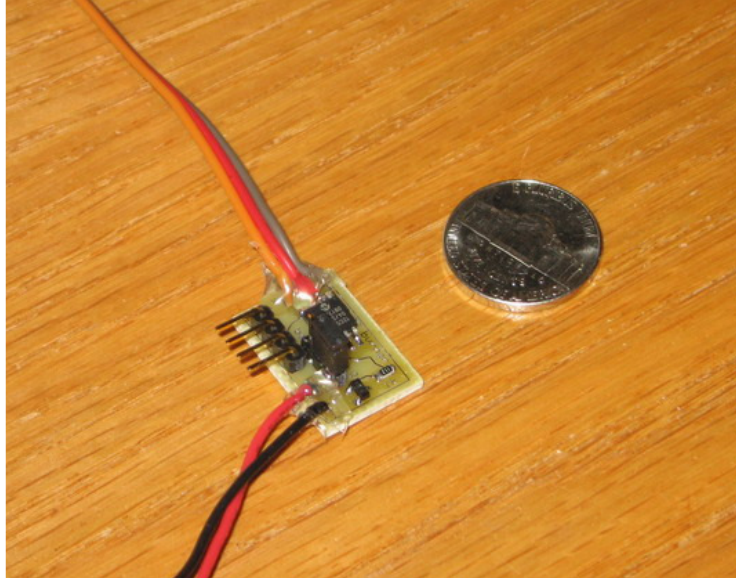
Your RC afterburner board comes with the following:

1. Assembled light board
2. Servo connector wired to board
3. 4-conductor ribbon cable
4. 4-pin female connector
5. 12 hyper-intensity red LEDs for afterburner ring (assembled required)
6. Jumper to select BEC power source or battery power source
7. Power wires to run to system battery

## ASSEMBLING THE RED LED BURNER RING

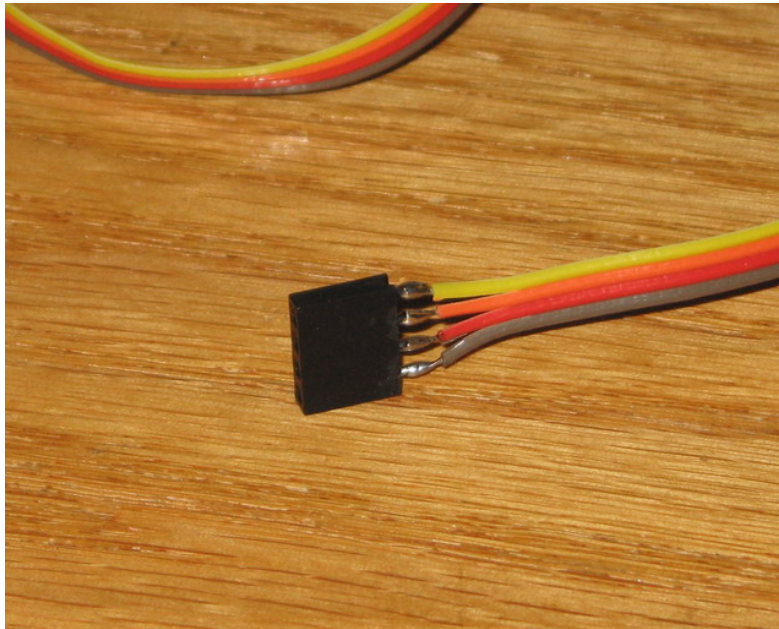
Tools needed: Scissors, wire strippers, soldering iron, solder, needle nose pliers, hot glue gun, exacto knife.

Here is a picture of the assembled light board:



### Attaching connector to ribbon cable:

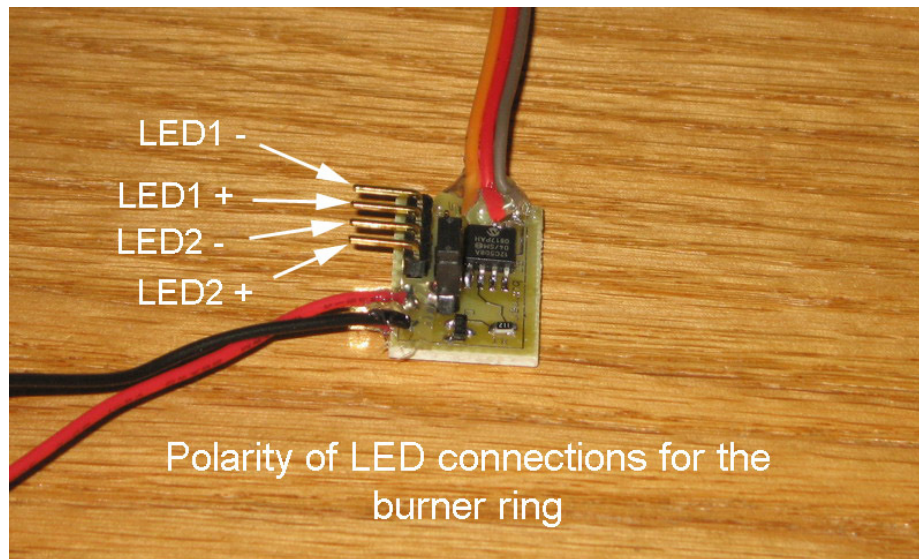
First you will want to take the 4-pin black female connector and solder it to one end of your ribbon cable. You can splice the ribbon cable with a sharp exacto knife. Solder one wire to each male pin on the connector as shown:



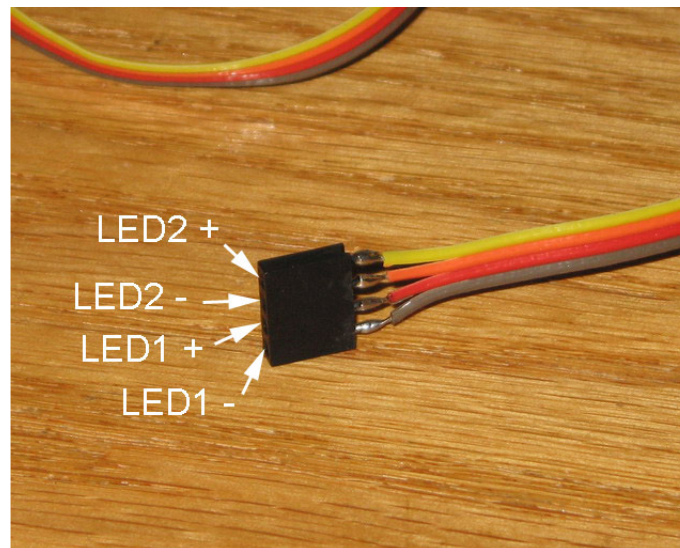
The 4-conductor flat ribbon cable will run from the light board to your exhaust tube. Included is 24" of ribbon cable, which is sufficient for most EDF jets up to 70mm size.

This cable will connect up to the afterburner board, attach it to the 4-pin right angle header on the board. Also note the polarity of the wires, as you will need this for when you solder the burner LEDs to the other side of the cable.

Here is a pic showing the polarity of the pins:



Match this up with the wires on the ribbon cable connector. The colored ribbon cable will help you remember which wire is positive (+) and which is negative(-).



#### Measuring the length of cable you will need:

- 1) You want to measure how much ribbon cable you need to run to the exhaust tube from the location of the board in your plane. This is akin to running servo extension cables. Measure twice! Once you get the correct measurement, you can trim the ribbon cable end to that length with some scissors.
- 2) Next, measure how large the exhaust tube is going to be. You will want to make your ring a tad larger so it mounts on the outside of your thrust tube. If you don't have a thrust tube, you can mount the ring on the inside of the foam exhaust. But this may effect your plane's performance, it is best to use some type of thrust tube so you don't change the airflow.



- 3) Take the red LEDs and note polarity. The longer lead on the LED is the positive (+) side, and the shorter lead is the negative side.



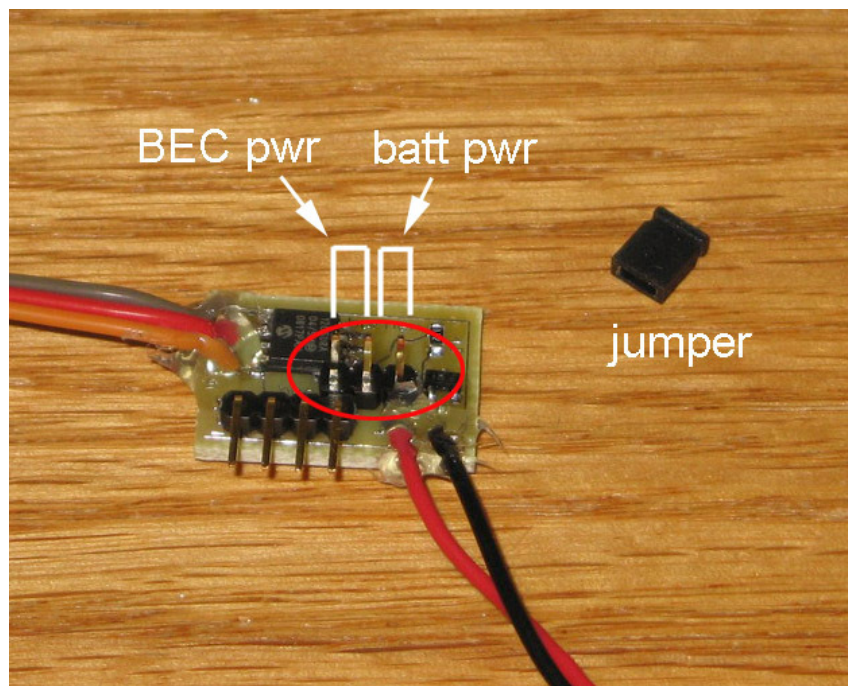
Choosing the ring size and battery source:

To make your LED ring, you are going to need to know whether you want to use your battery for the LED power source or your BEC. If you use the BEC, you are limited to 5V and only 4 total LEDs. This is recommended for very small planes that only need a handful of LEDs.

If you are planning on using the system battery (this is typical), you can use a 3s or 4s lipo pack, or NimH up to 12 cells. With this setup, you can use up to 12 LEDs for your ring. With a 4s lipo pack, a total of 10 LEDs works nicely.

You next want to put the jumper over the pins to select whether you want to use BEC or battery power. By default the jumper is on the battery side, which is the most common setup.

Here is a pic of the header pins and jumper:



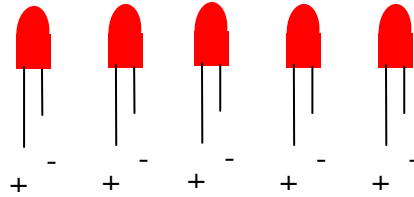
For Lipo packs, here is a rule of thumb of how many LEDs you can use to get a good amount of brightness:

<b>BEC circuit for power:</b>	<b>4 LEDs total</b>
<b>Lipo battery 2s 7.4V pack:</b>	<b>4-6 LEDs total</b>
<b>Lipo battery 3s 11.1V pack:</b>	<b>8-10 LEDs total</b>
<b>Lipo battery 4s 14.4V pack:</b>	<b>10-12 LEDs total</b>

- 4) Once you know how many LEDs you are going to use, it is time to make the ring. Take the circumference of your exhaust tube and divide it by 2. This is the length of each semi-circle ring you will make. You will be using 2 wires from the ribbon cable for each side of the ring. You will make a top section and a bottom section, both which will make up the total ring.

### RING ASSEMBLY

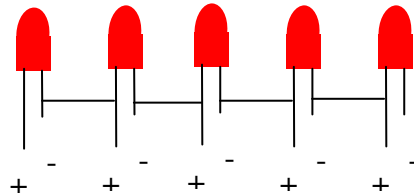
Take  $\frac{1}{2}$  the number of LEDs for assembling the top ring. You are going to solder the LEDs in series, which means that you will line them up positive to negative one after another.



Line up LEDs + to -

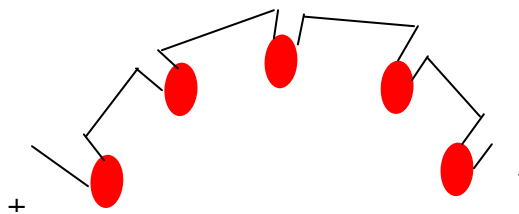
You then will solder the legs together to make up the top ring. NOTE: You can bend the legs and solder them to its neighbor's lead to form up a curve. You may want to get the distance correct by using your thrust tube or similar tube to space out the LEDs equally.

When you are done, the outer longer leg of the first LED will be the positive leg and the shorter lead is the negative leg.



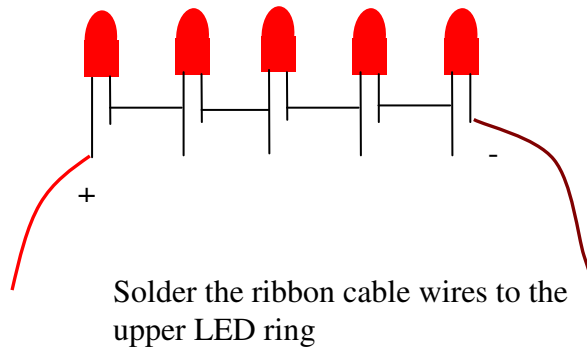
Solder the LED legs together in a curve to make upper ring

With your pliers, you can custom bend the LEDs to tweak the curvature like shown.

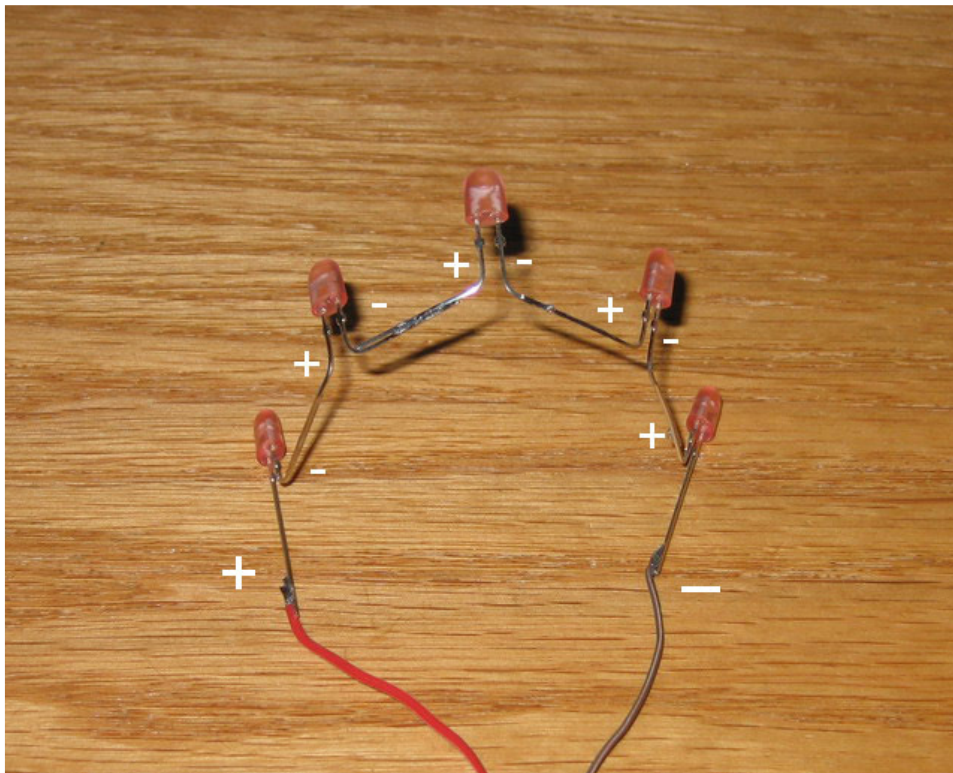


Looking towards front of LED ring

Once you have completed the upper ring, you will finish it by soldering the ribbon cable wires 1-2 to the positive and negative legs of this ring



Here is a picture of a completed upper ring:



Follow the same steps to create the bottom ring. **Once done you will have 2 semi circles that will make up your afterburner ring.**

### Mounting ring on your plane:

Now you are ready to install the ring on your plane. You can further bend the ring assembly to match the shape of your tube. Mount your 2 semi-circle rings to your thrust tube so the LEDs point OUTWARDS. This will give you the best light effect that can be seen even in daylight.

You can use hot glue to secure the top and bottom ring to the thrust tube. Just dab glue over each lead and press until dry. Use low temp glue so it doesn't burn through the thrust tube material! If you need to readjust the mounting, you can remove the hot glue by dabbing it with some rubbing alcohol and then peeling it off.

Run the ribbon cable all the way back to the light board and plug the 4-pin connector to the light board. Remember the polarity as shown previously!

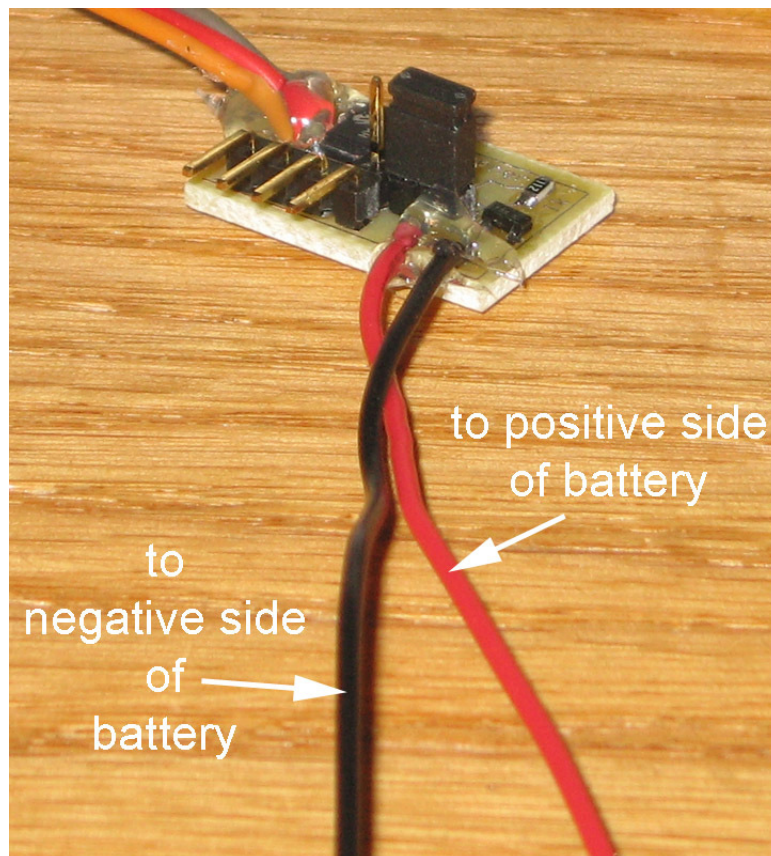
### **CONNECTING BATTERY POWER TO LIGHT BOARD**

If you are using the BEC power option (via the jumper), you can skip this section.

Most likely you will be using the battery as the power source for the LEDs if you plan on running more than 4 LEDs. So you will have to wire in the battery power to the light board.

You can do this simply by soldering the wires to your battery connector or using a power y-cable. The red wire on the light board is the positive wire and the black wire is the negative wire.

NOTE: Double check the connections, reversing the wires can damage the board!!



Connection servo cable to your receiver:

**MAKE SURE** you abide polarity when plugging the connectors into your receiver and servo. Plugging them in wrong can damage your servo and possibly the board! The orange or white wire is the servo signal wire. The black or brown wire is ground.

You can use the existing throttle channel if you use a Y-cable to split the servo signal between the afterburner board and your ESC (y cable is not included). Or if you have a mixing radio, you can use an aux channel and link it to your throttle channel. Either method will be fine.

### **OPERATING THE AFTERBURNER KIT**

Using the kit after installation is straight forward. As a test, put a battery in your plane and power it up. With no Tx signal from your radio, the LEDs will blink on and off\*\*. This is normal.

The throttle position you want the afterburner effect to enable is auto learned everytime your receiver and radio are turned on.

1. If you want the afterburner to engage when the throttle is right above the minimum setting, leave your throttle stick in the lowest position.
2. If you want to trigger the afterburner at half throttle, full throttle, or some other custom setting, move the throttle stick to this position and leave it. Now power on your radio.

**NOTE: Most ESCs will not arm until the throttle stick is in the lowest position. If your ESC does not support this failsafe mode, LEAVE the throttle in the lowest position (off) when powering on your radio and receiver.**

When you power on your radio, the kit will blink again to let you know it is going to sample the throttle stick for the desired trigger position for the afterburner effect. Once it does this you are ready to go.

Now move your stick to the low position to arm your ESC. When your ESC arms, you can now test the throttle to spin up your motor and see the afterburner effect kick in at the sampled throttle position!

**\*\*NOTE:** It is typically not recommended to power up your plane without the radio turned on first, so please note this. On the bench this test is fine to make sure the kit is operating. Some 2.4GHz radios give out a servo signal even when a radio is not on. So in this case the LEDs will not blink





Kit installed in Phase 3 F-16 EDF jet

**Fly your plane and have fun!!! Please be safe.**

If you have any problems, please contact [shima@hyperdynelabs.com](mailto:shima@hyperdynelabs.com)

**NOTICE:** There is no warranty on kits!! It is your responsibility to install the board. Kits cannot be returned! Be careful if you plan to use a battery source that is capable of delivering a lot of current. Contact a professional if you need assistance. Hyperdyne Labs assumes no responsibility for the misuse of this kit.

