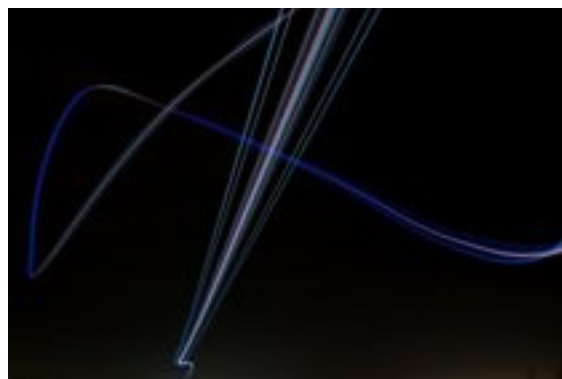


Night Flying

By: Jason Van Nostrand



Recently several members have begun night flying on a regular basis. When properly equipped, flying an aircraft at night is just as easy and enjoyable as flying during the day. As one of the first members to build a night flyer, I have had numerous questions asking about how to get started. In this article I hope to “shed some light” on how to setup your plane, where to get your equipment, and some of the new features of the flying site. Be aware that we do have a rule that only electric airplanes can be flown at night. We do not want the noise from gas or glow airplanes to disturb our neighbors and create problems for the club.

The first order of business is to decide how you want to illuminate your plane. This is not as easy as adding a red, a green and a white light. The goal is to have your plane lighted from all angles, and to allow you to quickly determine its orientation. We have found is that it is best to illuminate the top in one color and the bottom in a different color. You can add additional colors to the fuse and vertical stabilizer if you wish. You can also add patterns or blinking lights wherever you want, but the most important feature is to separate the top and bottom visually.

We’ve been using these SMD LED strips that come with an adhesive backing from 3M. They are by far the most economical way to get LEDs on your plane. You should be able to purchase around 60 LEDs on a one meter roll for less than \$10.

We have found that blue is by far the brightest color of LED, however the blue color tends to play some tricks on the eye. White and green are also very bright but they are easier on the eye. Finally yellow (also called orange) and red are the least bright colors, but are still very easy to see at night. At the least one strip should be applied to the top and bottom of the wing, horizontal tail, and fuselage. It’s a good idea to apply the strips in a chevron pattern with the strip starting at the front on the inboard end of the surface and going to the back of the surface at the tip.

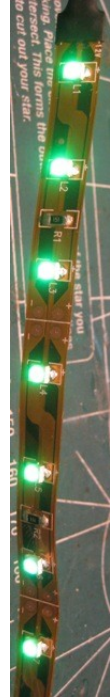




Now that you have decided on how to light your plane you're going to need some suppliers. BP Hobbies (<http://www.bphobbies.com>) is a mail order vendor located in New Jersey that has a fairly good selection of LEDs as well as some other items that you can use to enhance your lighting. Since they are in NJ you can expect plenty of consumer protection and reasonable shipping.

Hobby King (<http://www.hobbyking.com>) has a full selection of LEDs and other night flying items. Hobby King is located in Hong Kong and as such some special considerations need to be taken. DO NOT order anything that is not currently in stock. DO NOT pay directly with your credit card, use paypal instead. DO choose only EMS shipping, items will arrive in 5-10 days and will be insured against loss. DO only order items from Hobby King that other people have had success with, some of it is garbage. DO NOT expect any post sales support, if your items arrive at your house, that's all you can expect. Any items that are bad out of the box should just be discarded.

Most commercially available LEDs are designed to run on about 5vdc which means you would need to do some custom wiring to run them on most of our airplanes. The truly ingenious thing about these LED strips is that they are wired in series/parallel in groups of three so that they can be powered directly with up to 14.8vdc and work very well directly off of a 3s lipo. You can cut the strips on the white lines located every three LEDs to get it to the desired length.



The LEDs can be stuck directly to foam airplanes or covering on balsa airplanes. You may want to test a small section when attaching the strips to metal, plastic or painted surfaces as we have found in some circumstances they do not adhere well. In cases where the strips do not adhere we have had good luck using double sided 3M mounting tape (the grey kind). Do not use CA to attach the strips, it does not work well. Wiring can be run internally or externally, just remember to leave slack and install connectors so wings can be removed or whatever else may need to be moved for normal maintenance.



One meter (60 LEDs) consume 400ma per hour when run at 14v. If you are only running a couple hundred LEDs you could run them from your main flight battery and not see much of an impact on a 6-10 minute flight. If you are running several hundred or more, or you are installing them in an airplane that runs on 4s or higher then you will need to add an additional 3s battery for the LEDs.

Several members have found that they can wire an old brushed ESC into the power source for their LEDs in order to dim them.

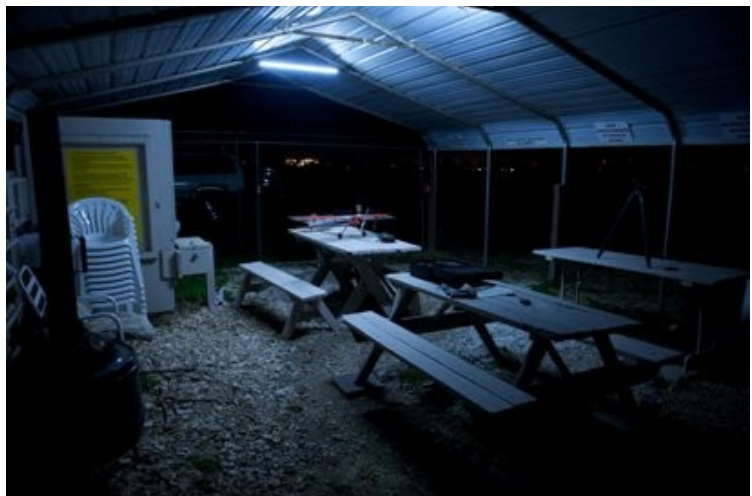




This works well if you have an extremely bright setup and will also reduce the milliamp drain on your battery. You simply connect the battery to the ESC as normal, and instead of connecting a motor to the other side of the ESC you can just connect the LEDs. Connect the servo connector to an open channel that is controlled by a dial on your transmitter. **IMPORTANT:** Remove the center wire from the servo connector, you do not want the secondary ESC to provide power to the receiver.

Flying at night is about the same as flying during the day. We have found that flying a lighted plane at dusk is just as difficult as flying a non-lighted plane at dusk. It's best to wait until it's completely dark. Winds are usually light at night, but of course you want to take off into the wind if there is any. At some angles you may momentarily lose orientation. If that happens continue to pull through your maneuver and once the plane levels out you should be able to recover. Keep in mind that while your airplane is lighted and very visible things like trees, the wind sock, and other stationary objects are not visible. You need to be cautious around those obstacles.

At the flying site Michael Ayres has donated two strips of white LEDs which have been added to the shelter. There are two 4mm bullet connectors hanging by the transmitter rack. You should get some female 4mm connectors and make an adapter to whatever you plan to power the LEDs from. They should run for about two hours on a 3s 2200mah lipo. You could also run an extension to your deep cycle battery that you use for charging your flight batteries. The setup is 14.8v max, please do not over voltage it.



We also have a wood stove that has been donated by Leroy Cade. If you decide to use it for heat please move it out from under the shelter before lighting it. Also you must bring a few gallons of water with you to make sure it is completely cold before leaving the flying site. If you are unfamiliar with the operation of the damper it's best to just leave the top off of it while you are using it. Leaving the top on with the damper open will cause the wood to burn very fast and very hot.

That's about it. I hope that everyone who is interested in night flying now has the knowledge to give it a shot. If you have any questions please don't hesitate to contact me. I will see you out there.



Benton County Flying Tigers
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