

Indoor Supercapacitors Fee Flight Westland Lysander

By Paul Burling IVCMAC October 2023

Introduction

I have had a long standing interest in electric indoor FF; why, because it is rewarding to see your own creation take to the air. If people have an interest in aircraft/aerospace this is a good platform to experiment and explore the art of designing and flying model aircraft.

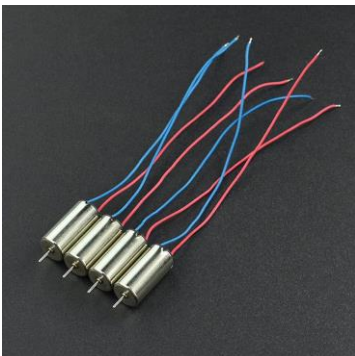
The technology is now easily available at a budget price using off the shelf Supercapacitors, micro switches and motors. My view is to keep modelling simple, This approach is particularly helpful for newcomers to model aircraft building and flying. It is also an alternative to flying drones and offers the pilot new skills and building techniques which are life skills.

What better way to have fun at the lowest possible cost.

So what are the options for your first build? Well, success doesn't come the first time around and experimenting is part of the enjoyment but can be a little frustrating at times. Therefore, picking an aircraft that flies slowly is a safe way to go. There are many cheap Chinese gliders on the market but these tend to fly around like demented bees and not that interesting to look at or fly. But you could purchase and use electronic components to build your own. There are generally two choices a long floating glide, or a rapid climb, followed by an even faster disintegration. This will determine if you wish to fly outside or inside and how long you wish to keep your creation.

Motors, switches and Supercapacitors

I have found that using 8 x 20mm Coreless motors from old broken indoor drones are ideal, or alternatively they can be purchased on the internet at a very reasonable price, typically less than £15.00 for a set of four. Propeller size is 55mm diameter as used on the indoor donor drone.



These coreless motors are just right for those who love to DIY drone models! Designed to be high-performance and easy to wire, the motor will work at a maximum of 3.7v. The compact size of 8x16/20mm can give out 50000 RPM. Combined with propellers, the motors are good choices for DIY projects like remote control aircraft too.

Micro switches can be purchased online or removed from LED cork lights that no longer work. Always good to recycle!

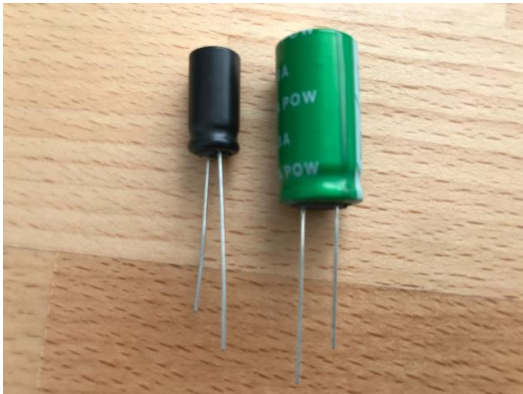


Supercapacitors have many advantages over batteries: they weigh less, also generally don't contain harmful chemicals or toxic metals and they can be charged and discharged zillions of times without ever wearing out. But and there is always a but, the amount of energy they can store is small in comparison to batteries.

Supercapacitors are sized in farads and for our use we will be using:

2.7v 5 Farad 1.75g

2.7v 10 Farad 3.2g.

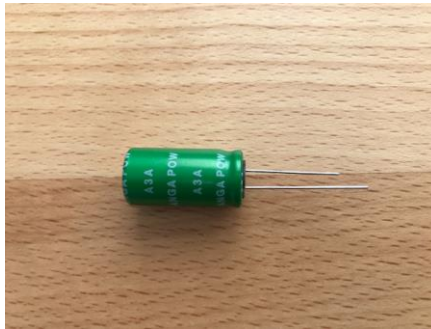
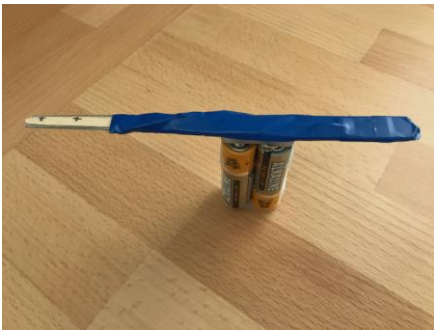


Note: the longer wire stem is the positive terminal you can also see this printed on the body of the Supercapacitor.

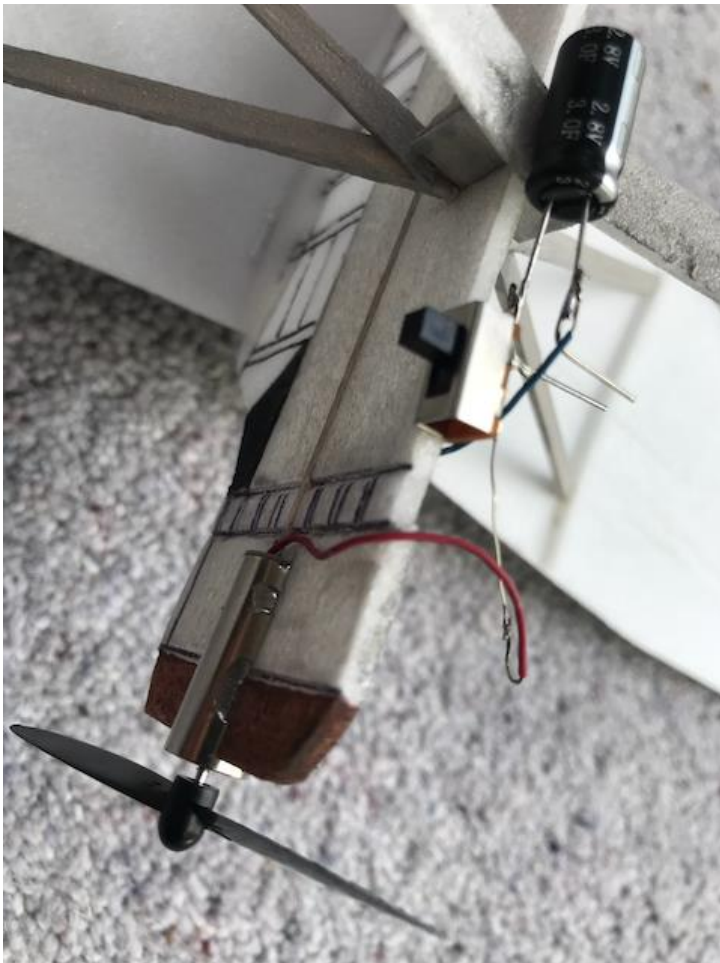
Using these supercapacitors will run the motor for about 30 45 seconds- it's a power burst, followed by a long decrease in power for cruise/descent. They charge quickly, typically generally in a minute or less. This is enough duration for a good flight. Charge time will determine the motors endurance. Do not charge at a higher voltage than 3.2v as this will destroy the Supercapacitor over time.

Charging a 2.7v supercapacitor is easy. Purchase an AA battery holder for two batteries (3v) in series and solder on a paper clip and bond to a piece

of wood as shown below. Mark the polarity as the positive part of the paperclip connects to the longer stem of the supercapacitor.



Once you have all the components wire them up and solder them using the micro switch to isolate the motor. this is important as the capacitor will be able to reach the optimum voltage, typically just under 3v. see picture below



If you are flying indoors, build light, less than 16g AUW. and use the 2.7v 5Farad. Move up to 10Farad for bigger models or possibly a twin motor!

The best building material option is probably foam (pack of 3mm thickness from B&Q is great value). This is under £10.00 for a pack of eight sheets see spec below.



I use an Observer book of aircraft to get plans or you can go on the internet. Use UHU POR and PVA glue to bond the Foam and wood. I have found using wooden stirring coffee sticks ideal for reinforcing the fuselage of models as the foam can easily be damaged when landing. High lift wings like the Westland Lysander are good fliers for indoors. But it is possible to make jets using the small ducted fans from old indoor drones. Have fun and experiment!

