

WindSynth Battery Project

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This page is about my project to power my WX5 Wind Controller and the MidAir wireless transmitter using a Lithium-Polymer (Li-Po) battery.

Introduction

A Wireless module for the WX5 is no good, unless also accompanied by a battery pack. My main inspiration was from Bob Hunt in the Wind Synth group, who powered his WX5 with a NiMH battery pack (he called the result Darth Vader's Ax, as it looked pretty funky!). Bob informs me that he originally got the idea from Dave Brillhart. Two things have happened since then: Bob has moved on to the Synthophone, and there is a whole new crop of rechargeable batteries in the market to power RC planes: they are called Lithium Polymer (LiPo) batteries. Battery Type

The battery that I chose is an 1800mAh 10C battery at 11.1V nominal. Each of these deserves an explanation; so here goes:

1800mAh: This gives the capacity of the battery. At present 1800mAh gives the most "bang for the buck" both in terms of price, as well as packing as much power as possible in as small a package as possible. This is PLENTY of power, especially since the voltage is higher than the NiMH battery packs, as seen further below.

10C: This is something that is confusing, but turns out to be an irrelevant spec for us. This has to do with peak amperage, which is important for "burst" delivery in RC plane situations. We don't care about this, so the lowest C capacity is good enough for our purposes. Don't pay more money for 12C or 15C or whatever.

11.1V: This is the 3-Cell battery. Fully charged, this is about 12.2 Volts. Fully discharged, it is about 10V. Hence, the 11.1V designation. The WX5 input is designated at 12V. Bob worked it fine with 9.6V NiMH. So, this is an ideal voltage range. With this range, you can extract the FULL 1800mAh capacity. One cause for concern was that the MidAir is rated at 9V input. However, the supplied 9V 500mA power supply is actually around 13V at the low current that the receiver draws (about 23mA). So, this voltage range is ideal for the MidAir as well.

I bought the battery from here: <http://www.hooobby.com/3e-11-1800-lipo-battery.html> . No endorsement, just happened to have the lowest price I could find for the product on the net at the time, and they did right by me (prompt shipping, good condition). I also bought the "balance" charger for this battery. The charger is more expensive than the battery! There are cheaper chargers available, but everyone recommends a "balance" charger, which charges each of the 3 cells individually to prevent any explosions (remember the laptop fiasco with Li-Ion batteries?). I think it is worth it for the peace of mind. Harness

If you look at the site above, you will see that the battery ships with a "JST connector". I modified this to add two connectors with the right shape for the WX5 and the MidAir inputs. Here is a picture:

In the first incarnation, I had included a 110 ohm resistor in series with the MidAir connector, to drop 2.5V to it. However, per the note above, I found that this was superfluous, and so eliminated it. Views of the battery mounted on the WX5

Here is a series of pictures of the Battery and the MidAir mounted with Velcro on the sides of the WX5. The whole thing is wrapped around with an elastic Velcro strap for additional safety.

Top View:

Bottom View:

Side View:

As you can see from this view, the battery width is smaller than the WX5. The whole thing hardly looks out of place on the instrument. Here is a full view:

A new stand

Since the bottom of the WX5 is "fatter", I constructed a new stand with a 6" PVC pipe, lined with foam. Here are a couple of pictures:

Battery life (between charges)

This is too early to tell (I have yet to recharge the battery, and I have used it for about 9-10 hours), but based on the current discharge rate, I am estimating over 20 hours of operation per full charge. This is tremendous! More than sufficient for my needs. Weight

The entire WX5, with the MidAir, and the battery weighs in at around 26-27 oz, or, just around 3/4 kg. As you know, this is less than HALF the weight of a typical Soprano Sax. So, the weight is not an issue at all. Conclusion

I am very pleased with the way this has turned out. Many thanks to Bob Hunt and Dave Brillhart for the original idea of using RC batteries. This is just the next generation of that idea.