

## Electric SPADGnat Conversion

My goal was to build an electric combat plane based on the SPADGnat plans and also to save on cost using some parts I had accumulated. I used the SpadGnat Plans on – <http://www.spadtothebone.net/SPAD/Gnat/> as a guideline. Other than my 3D printed parts, an ESC, an electric motor and it's fabricated mount, it's essentially the same as the plan. This is my first build of a combat plane. This is what worked for me.

The following parts were installed:

New:

HobbyZone Pushrod Set-Sport Cub HBZ3218 (More or less universal, cut and bend to fit)

E-Flite EFL0370 Servo Arm set.

BadAss 2315-1480Kv Brushless Motor from <https://innov8tivedesigns.com/> It's an equivalent of a .15 nitro engine.

Aluminum channel -see plans

Aluminum angle 2" x 2" x 1/8" thick.

Misc hardware. I used a combination of US Standard and Metric hardware.

3D printed aileron and elevator horns. Local hobby shops should have plenty of them too.

Misc nylon ties.

BadAss 2315-1480Kv Brushless Motor from <https://innov8tivedesigns.com/> for higher RPM to use the recommended smaller 7" and 8" props. I chose it because it was one of the recommended motors there and I like the name, "BadAss" :) Plus another club member has used them and likes them.

Used:

Coroplast sign was given to me.

Spektrum AR620 receiver (basic, no AS3X/gyros/SAFE, etc.). Manual on Horizon Hobby

E-Flite 50 amp ESC. Manual on Horizon Hobby

4S 3200 battery

The Build:

The motor mount/firewall is 2" aluminum angle from a local hardware store. I cut 2" off of a 3ft piece for the mount (2" angle x 2" wide x 1/8" thick). I drilled two 1/8" holes in it for bolting it to the fuselage using 3mm bolts I had on hand. I used motor mount from the BadAss motor as a template to drill holes in the angle iron for the motor. I used a 1/2" drill bit for the center hole. I rounded the edges with a grinder. I bolted the mount on in case the motor may need to be changed to damage. I originally tried a BL15 E-Flite motor, but it doesn't have the RPM needed for the preferred smaller props. I used a piece of large heat shrink to help keep the motor wires from being cut on the motor mount and bolted it with a 3mm x 8mm bolt.

The battery tray is from an F-86 that someone crashed, along with the receiver. I trimmed the sides down for aesthetics. It's 1/8" inch plywood. I ended up bolting it down using four #8 screws and locking nuts because nylon ties were not strong enough for hard landings! I put a spacer between the plywood and the channel to help support the plywood. It's highly recommended to use Velcro to help keep the battery in place.

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### Suggestions/hints:

I recommend using a motor that attaches from the back to help with CG with a Kv range of 1400-1500.

For proper CG, use a 3S 3200 or 4S 3200 and slide the main wing back and forth to find the CG. It's about 4" from the front of the wing according to the plans.

### Website help:

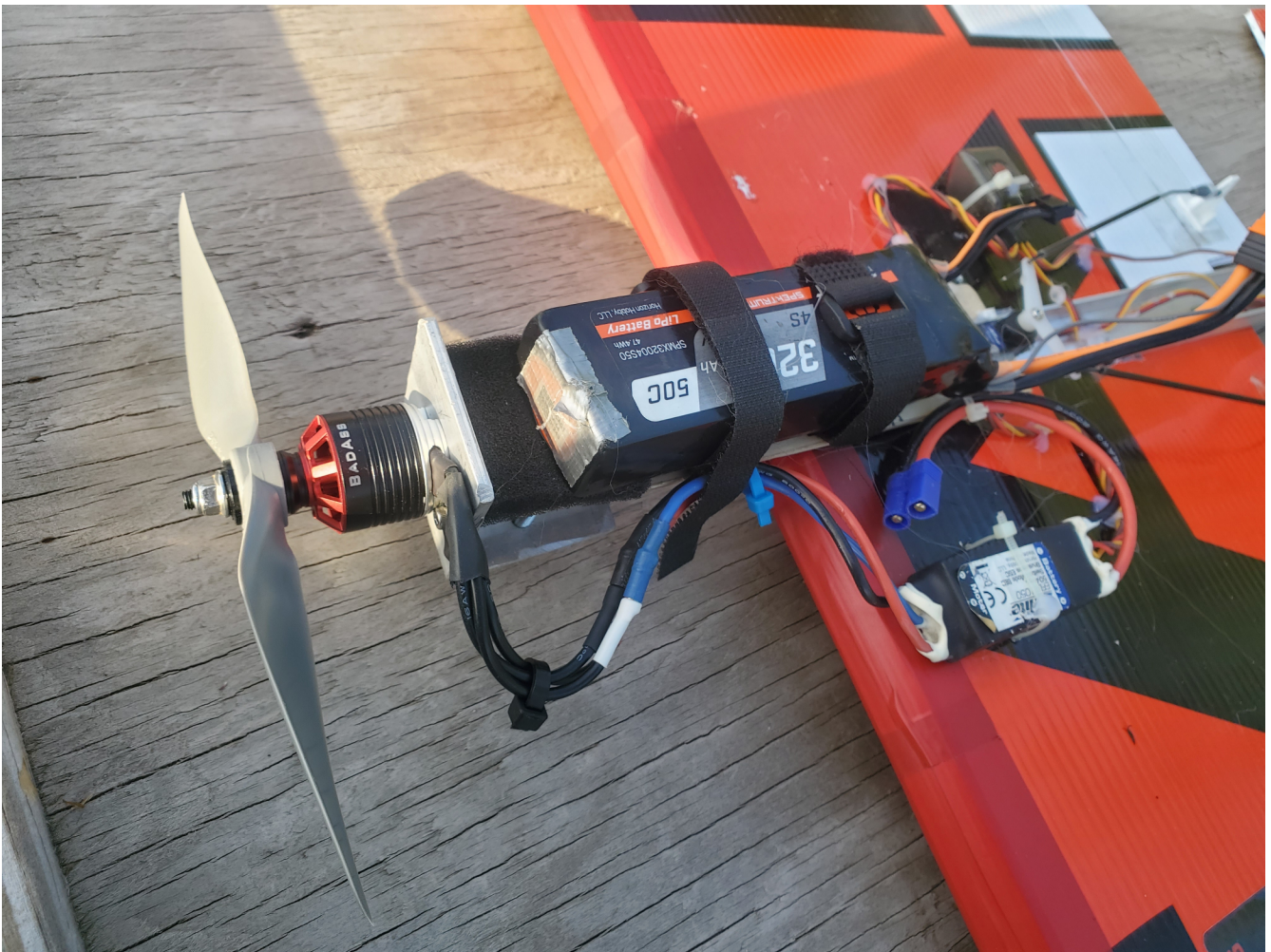
A great site for help in converting nitro to electric: <https://innov8tivedesigns.com/>

Does it fly? Yep!

Some photos: Note; Some wear from failed flights/landings!



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I added a piece of shrink tubing to the motor wire and bolted it down to help prevent scuffing of the wires. Of course, the motor mount could be cut down further too. I strapped the ESC and receiver down along with some Velcro. I actually had the receiver come off mid flight with using just Velcro. It was a hard landing! No damage other than a broken prop.