

6. Thrust experiments with BL-X-UFO

UFO Doctor, Oct 1st, 2010

1. Introduction

The conversion of the Silverlit X-UFO to brushless is a good educational story. Paul from UK asked me for a proposal, but since I am not an expert in uC-programming I asked Quax from Germany for help. He gave us the advice how to program a low-cost ESC (Electronic Speed Controller). With some efforts we came finally to good results. Many thanks to Quax!

2. Components for this thrust experiment:

Original X-UFO with and without frame

Gyro: SwissGyro with Yaw-Sensor

BL-Motor: Turnigy 2204-14T

Propeller: Silverlit original

ESC: Roxxy 710

Software by Quax: 17a_icp_pwm1500Hz_r01, with modification (by Quax) for better start-up-conditions: Roxxy_Fast_PWM_V2Hex_Dat.hex (now on my homepage)

3. Overview of thrust experiments



Fig. 1. Overview thrust test setup

1: BL-X-UFO; 2: Voltage meter; 3: Power supply, 8-12V, 10 A;

4: Current meter; 5: Rotary table; 6: MX-12 RC transmitter; 7: Electronic balance

The BL-X-UFO with yaw sensor has to be fixed on a free rotating table!

3. Results

Shown are thrust versus effective current. The flight electronics with ESC consumes additional 0.23A@8V and [0.21A@12V](#) supply.

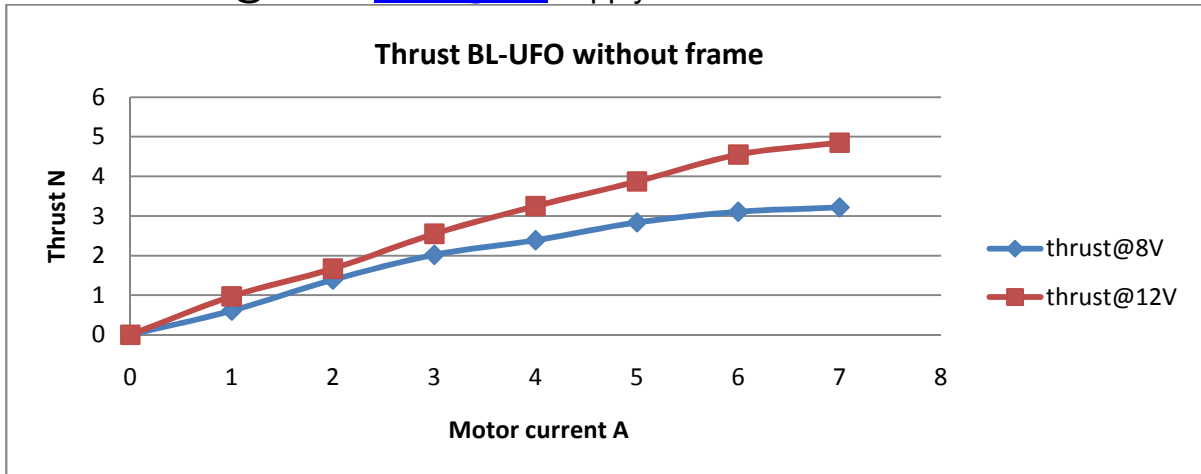


Fig. 2. Thrust experiments without EPP Frame

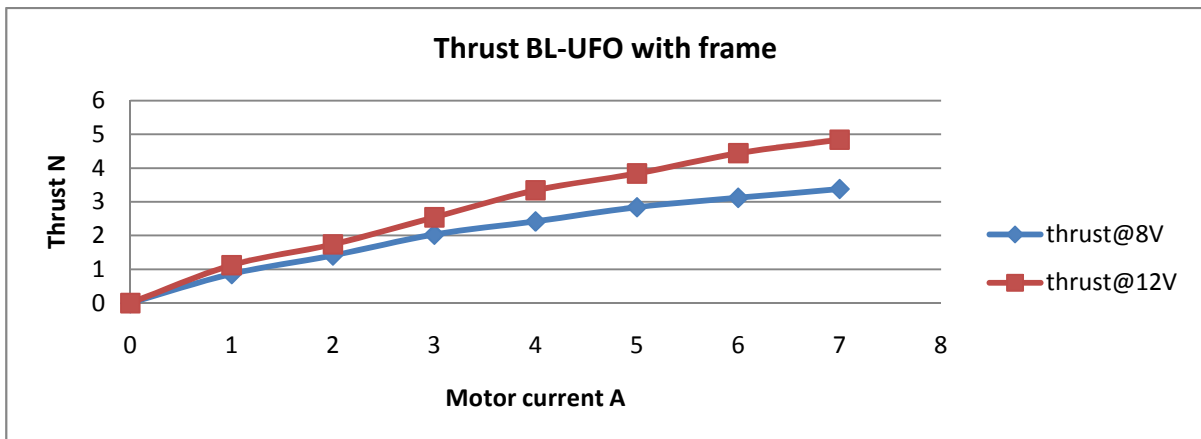


Fig. 3. Thrust experiments with EPP Frame

3. Conclusion

There is almost no difference in thrust between an X-UFO without or with EPP frame. It could be that other propellers deliver more thrust, but this is not checked here.

The EPP frame (30 grams) of the standard Silverlit X-UFO is a good protection. Since the BL+ESC shows a larger dynamic range it is now possible to fly against the wind also with EPP frame, in contrast to a standard X-UFO with brushed motors

The Silverlit BL-X-UFO has a weight of about 322 grams (with a 3 cell 450mAh lipo)

The currents to hover this BL-X-UFO are:

2-Cell Lipo: about 6.5A

3-Cell Lipo: about 4A

Thus, a 3-Cell Lipo of 900 up to 1600 mAh is highly recommended. The first flight with a two year old 3-Cell 450 mAh lipo was not so good: flight time below 5 minutes and overheating the lipo.