

Indoor flying with Supercaps

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We are a group of 6 or 7 indoor flyers in Southern Germany using the new high density capacitors such as the “Green Caps” from Samwha for powering indoor models. The supercaps have a 5 or 10 Farad capacity and weigh about 2 or 3 grams. If one cuts the legs and removes the plastic coating the caps get about 0.3 gms lighter.

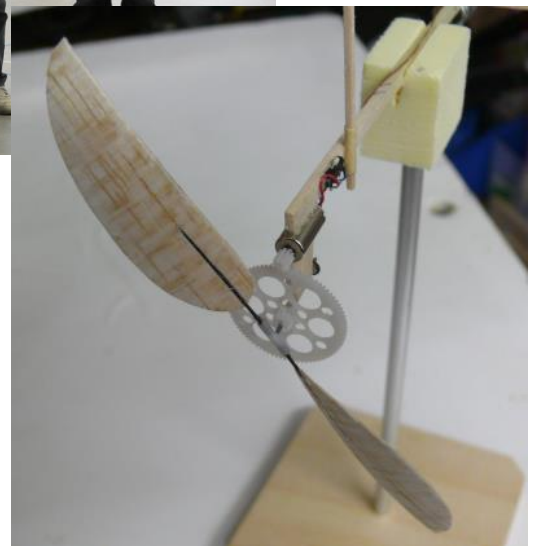
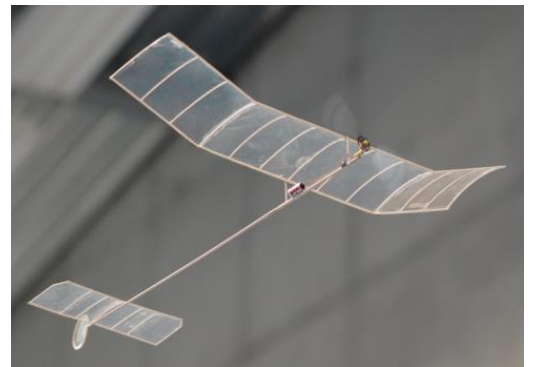
Principally, one can use the structure of an F1M or F1L with a lighter fuselage, because the extreme torques caused by the rubber band are missing. The structure should weigh about 1.4 g and be strong enough to bear 5 or 6 g in total. The coreless 6 mm pager motor with a resistance of 10 or 30 Ohms weighs 1.3 g and the 1:6.6 or 1:9 gear another 0.7 g. We also tested 4 mm coreless motors that are also usable but the gear with modul 0.2 is more difficult to handle. The 6 mm types show about 50% efficiency, the 4 mm types only 35-40%. Total efficiency of the drive ranges at about 20%, including propeller and gear losses. Depending on the equipment, the ready to fly weights range from 5.0 to 6.2 g.

The propeller diameters range from 120 to 135 mm and the pitch ranges from 70 to 110 mm depending on the gear ratio. I use blades made from 0.4 mm C-grain with spars from 0.7 mm CF. Other people make their blades from thin plastic (yogurt) cans.

What are the flight times? We started with 1:30 min and now – one year later – we are at 5:30 min. Theoretically, with a medium current of 30 mA, a flight time of max. 6 minutes should be possible. Roland Oehmann flew already 5:40. The green caps with a 2.7 Volts reference value can obviously be loaded up to 3.4 Volts taking no noticable damage. Then, a voltage range from 3.4 to 2.2 Volts is usable. Load times are from 30 to 60 seconds depending from capacity. Note: If the final voltage is reached the current flows another 10 to 20 seconds enhancing the total charge of the cap.

Charging is possible from any power supply that allows for a 3.4 Volts default value. No preresistor is necessary. Some people use a full 4.15 Volts Lithium cell and a silicon diode with the 0.7 Volts gap voltage loss in series. Please mind the high load currents of some Amps in the first seconds. But you can also cut them by presetting an upper current-limit.

Motors and gears come from www.Didel.com



Un groupe de participants à un concours indoor supercap. Heinrich Eder est le troisième en partant de la droite.

A gauche un montage typique. Hélice genre indoor, forte démultiplication. Le condensateur est près du mat arrière.

J'en profite pour rappeler que les condensateurs sont aussi très pratiques pour propulser des petits avions de sport ou jouet, grâce à leur simplicité de recharge et branchement quand on ne recherche que des vols de quelques dizaines de secondes.

Le plan du modèle de Uwe Bundesen se trouve en page 1896