

EL 750 Hovercraft

Designed and built by Fran Oakey



The EL 750 hovercraft is a freelance model designed in response to Jag of Palaform wanting to convert his IC Gemini to electric power. The original Gemini was an integrated design, one prop to supply both the lift and thrust air. One member of the MHA was given a set of parts to find and fit a brushless motor. Weight reduction is also a requirement in order to achieve a good performance when converting to electric power. My approach was to design and build a model in wood and keep the weight low whilst having a fairly robust model.

The deck was made from 3 mm soft balsa sheet sandwiched between two pieces of 0.4 mm ply. This gives a very strong light weight deck requiring no extra support. The rest of the hull was made from balsa for the sides and 1/16 ply for the base.

The duct was made using a former, which makes the task easy and ensures that the inner skin is perfectly circular, the former was made from two ply discs 198mm diameter and spaced 96mm apart. A piece of 0.4mm ply 100mm wide and long enough to wrap around the former was cut and held in place on the former using elastic bands. A piece of 0.4mm ply 12mm wide or so to join the ends together to form the inner cylinder of the duct. A 12mm wide ring from 3/32" thick ply was made with its inside diameter a close fit over the 0.4mm ply cylinder made above (should be 198.8mm i/d) and glued on one end of the 0.4mm cylinder. The outer skin of the duct is also 0.4 mm ply again held in position with elastic bands while the glue sets. 1/2" by 3/4" balsa segments were glued to the face of the Liteply ring to form the leading edge of the duct then sanded to an aerofoil shape.

The model only requires a two-channel standard size radio set for its control, one channel for the rudder and one for the throttle. Control of the model can be made easier by using a gyro, which is connected between the receiver rudder output and the rudder servo. The thrust/lift motor used is an AXI 2814/10 brushless driving an 8"x 4" APC E prop trimmed to suit the duct inside diameter and powered by an 8-cell Nimh pack through a Jeti "Advance 40-3ph" ESC. Power to the receiver is supplied from the ESC BEC to save the weight of a separate receiver battery.

The calculated weight for a model of this size, 750mm x 400mm, was 4.67lbs and actually came out at 4.5lbs in its RTR state. Performance of the model is quite good on water and much better on a hard surface, Tarmac for example. Jag didn't use the Gemini parts but created a new model which he called the Aero Racer based on my design, the dimensions of which are the same as my F1 style racer.