
Subject: Motor pod for radio controlled model aircraft.
Posted by [TugBoat](#) on Sat, 23 Oct 2010 08:44:02 GMT
[View Forum Message](#) <> [Reply to Message](#)

This is my second 3D print job - a removable motor pod for a radio controlled model aircraft.

This is shown below - to give an idea of size the propellor is 6.5" in diameter. (The wires will eventually go down some channels in the pylon.)

The background to this is as follows: you need some way to get a glider into the air. With full size gliders, and scale radio controlled models, this is frequently done with an aerotow - you tow the glider behind a powered plane (the "tug") and then release the glider at an appropriate altitude.

When flying models it is often a bit of a problem to find another model to use as a tug and it is often easier if you can just "self launch". Some full sized gliders have complex self-launch systems with a retractable motor, these are also available for models as well - although they are very expensive (think US\$1000 and upwards).

Of course, if you are building a vintage scale sailplane then they didn't have SLS systems anyway - so there is really no sort of scale way to do this.

I have a kit (2.5m wing span) of a scale glider - a Minimoa - and I wanted a removable electric power system that I could use to launch the model. The system is removable and can be taken off and the model then has the correct scale appearance and can be aerotowed.

I probably bit off a bit more than I should have for a 2nd run - but the results are mostly what I expected.

There are a few interesting features to be considered:

Structural integrity:

The pod has a relatively heavy motor and propellor (90gms) in the pod and needs to be structurally sound, even with heavy landings or other unexpected events. Based on my experience of the 3D printed wingtips I decided that a Carbon Fibre tube that slid into the pod would provide the appropriate strength.

This tube would slide into another tube in the model to provide the attachment to the model.

Cooling:

These motors require air cooling. Approximately 220W is being dissipated in the motor and that heat has to be taken away. This pod has two cooling systems. Holes in the front of the motor mount area that correspond to holes in the motor itself, this permits air into the motor windings. In addition there is a slot in the front of the pylon that forces air up a tube in the pylon, and the top of the tube is a beveled area to direct the air onto the outside of the motor. All the exhaust air is supposed to leave via the elliptical hole in the rear of the pod.

Motor access:

The pod should ideally be not much larger than the motor, and needs to be aerodynamically shaped. This presents some problems in getting the motor into the pod. So I decided to try a clip on rear section to the pod.

Locking in place:

The pylon needs to be locked in place so that if the aircraft is inverted the whole thing doesn't drop out.... this is achieved by a 1.5mm hole that runs through the base unit and permits either the pylon, or the blank plug, to be held in place with a piece of wire.

Parts

There are four parts in this 'kit':

- the pylon itself
- the clip on rear section to the pod
- a base unit that is assembled into the body of the model
- a filler plug that can be installed when the pylon is removed

To generate these parts I transferred some parts from the aircraft plans into the CAD system and then completed the design of the parts.

Proposed finishing

Following the success with my wing tips I am going to finish the parts with a sandable primer and then spray finish with auto paint.

What arrived

So yesterday my box arrived and all the parts were inside:

- a) A bag with the three smaller parts;
- b) A larger piece of bubble wrap with the pylon.

A quick inspection showed that a lot of filler material had not been cleared. Even a 6mm hole up through the pylon was full of filler. It only took a few seconds to remove all the filler.

Results

One of my major concerns was the fit of the parts inside each other (pylon to base, pug to base). This actually has worked perfectly. I just made the OD of one part the same as the ID of the other and this appears to have worked correctly.

The next area of interest was the clip on rear section. This didn't work so well. Close inspection showed that there were some 'ridges' on the lips that needed to be removed. Then the parts look like they will clip correctly - at this stage I am not going to actually clip them together until I have everything assembled and working. It looks like they may be difficult to unclip later.

At this stage I need to actually build the model to find out whether it actually fits correctly - and that is some time off at this stage.

Tim

File Attachments

- 1) [p1050679.jpg](#), downloaded 388 times
 - 2) [p1050674.jpg](#), downloaded 378 times
 - 3) [p1050676.jpg](#), downloaded 374 times
 - 4) [p1050678.jpg](#), downloaded 379 times
 - 5) [p1050677.jpg](#), downloaded 380 times
-

Subject: Re: Motor pod for radio controlled model aircraft.
Posted by [TugBoat](#) on Sat, 23 Oct 2010 08:50:27 GMT

[View Forum Message](#) <> [Reply to Message](#)

With a few bits of the body of the model the final finished installation should look like this:

The outer CF tube will attach to the wheel mounts so that loads on landing are taken by the wheel.

Tim

File Attachments

1) [design.jpg](#), downloaded 595 times
