

Pluto

This construction manual shall be used as a guide for the assembling of the Pluto. In addition to the wings and the vertical-tail you need the following things:

- 3M 90 spray adhesive
- 3M 50mm strapping tape
- 2 pieces balsa wood, 580x45x6mm
- control horns (1mm thick plastic or CFRP plate)
- 5min Epoxy or hot glue
- coloured Monta tape
- 6mm CFRP Pipe (Length 300mm)
- 8mm CFRP Pipe (Length 1000mm)
- Aluminium pipe (inner diameter 6mm; length 100mm)
- 2mm wire as control rods for the elevons
- 2mm CFRP bar (Length 140mm)

The spray adhesive and the strapping tape are both available on our website (www.epp-modelle.de) if go to accessories.

1. Remove the foam cores from their beds. Use the sandpaper or a scrap piece of foam to clean off any melted foam debris. Now align the cores such that the trailing edge is a straight line (correct slight irregularities) and apply epoxy or hot glue and bond the foam cores together.

After the glue is cured you can start drawing the cut-out lines for the spar and the vertical tail holder. Use a sharp knife to make groove (8mm deep and 8mm wide) over the entire span and about 105mm parallel displaced from the trailing edge. Cut a groove with the same dimensions starting from the centre of first groove backwards to the middle of the trailing edge.

Now use 5min epoxy to bond the 8mm CFRP Pipe and the aluminium pipe into the designated grooves.

2.

Elevons:

Take the 6mm balsa wood and cut the elevon from it as shown in the figure. The elevon should be 580mm long and 45mm deep. Bevel a 45-degree angle at the hinge edge of each elevon. Reinforce the balsa elevon with one layer of CFRP or GFRP (at least 49g/m²). This is necessary in order to avoid twisting and consequently oscillating of the elevons at high speed.

Now you simply tape (strapping tape) the elevon to the trailing edge by leaving enough room so it doesn't bind. You should tape one stripe at the top and one at the bottom of the elevon.

Vertical tail:

Drill two holes into the 6mm CFRP pipe (Position of the holes: 30mm and 130mm from the end of the pipe). Use 70mm long CFRP bar and put them through the holes in order to fix the coroplast tail on the pipe. Bond the bar to the coroplast and the pipe. Now grind the pipe such that it just fits into the aluminium pipe, but is attached strong enough to hold position in flight.

3. Trace your radio gear, battery and receiver on the top site foam core using a pen or marker. The positions for the RC components are as shown in the drawing. Pay attention to the position of the centre of gravity (162.5mm from the nose backwards) Use a sharp knife to do the cut-outs (The cut outs should be a bit smaller then the RC components as they wont be glued but pinched into the core).

Make a cut about 6mm deep from the receiver to the end of the wing and push the antenna into the cut. Proceed the same way to run servo and battery wires to the receiver.

4. Remove the RC components in order to spray a light cote of 3M 90 spray adhesive on the wing. Now you should wait about 5min to allow the adhesive to evaporate, before you start taping the wing. In the meantime you can start putting the RC components in place. Apply the 50mm strapping tape as shown in the figure standing down. It is important that you tape the wing equally on the top and bottom side in order to avoid twisting of the wing. The taping is necessary to make the wing bending proof and torsion proof.

5. The wing is now ready to be covered with Monta tape. After this you can install the control horns on the elevons. Now connect the control horns with the servo horns by using control rods (2mm wire). The attachment can be done by using Z bends. Adjust the elevon movement to an approximate deflection of 8mm for the elevator and 8mm for the aileron. At neutral position the elevons should be positioned at 0° in order to make the wing fly straight.

6. Check the position of the centre of gravity again (162.5mm from the nose). Use plump to adjust the CG.

