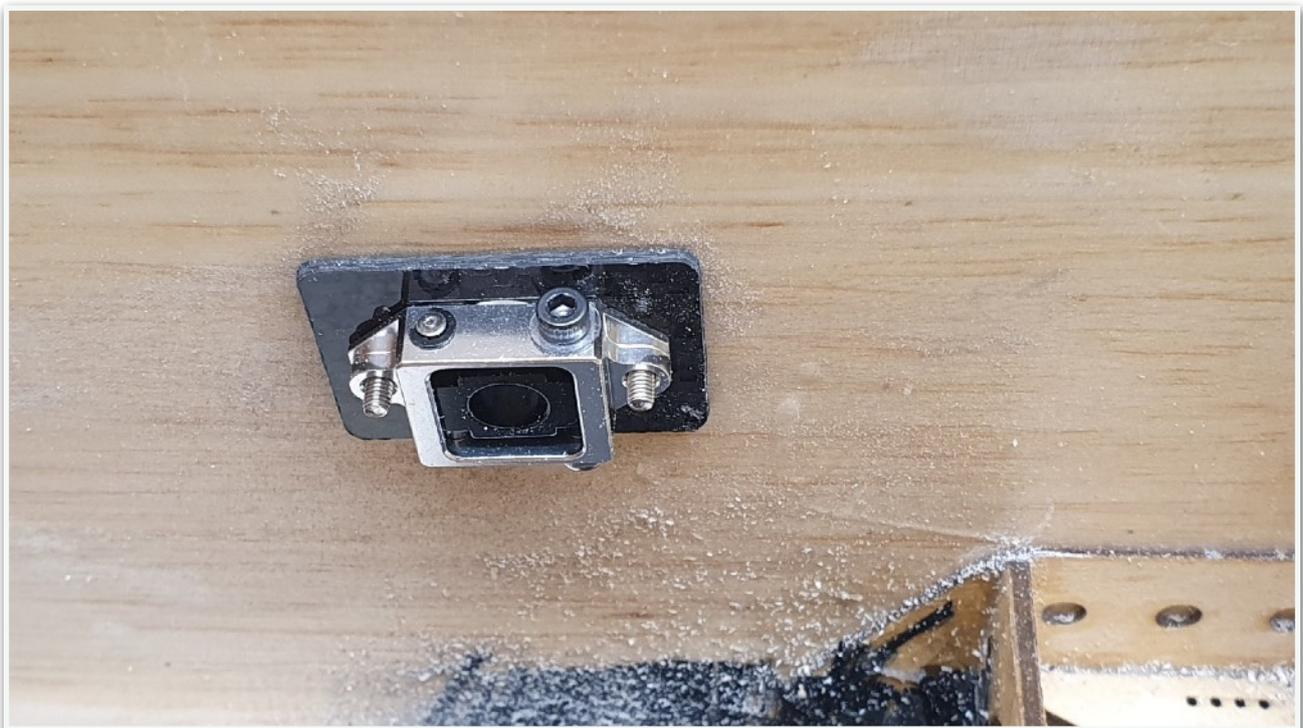
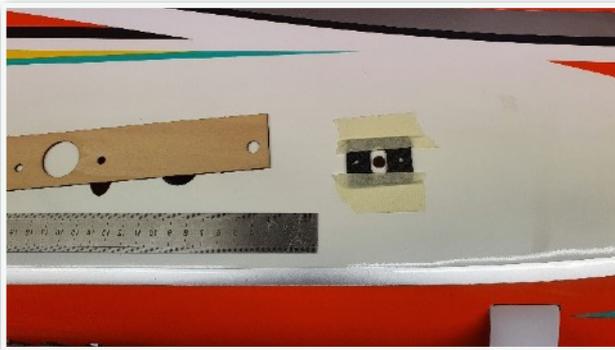


Peter Jenkins - B J Craft Anthem with TMCR, Part 4

Wing Attachment

Time to fit the incidence adjusters. These are a simple device consisting of a captive 3mm bolt with a plastic moulding that will take the front anti rotation carbon tube that I mentioned earlier and that I had not glued into the wing till I reached this stage.

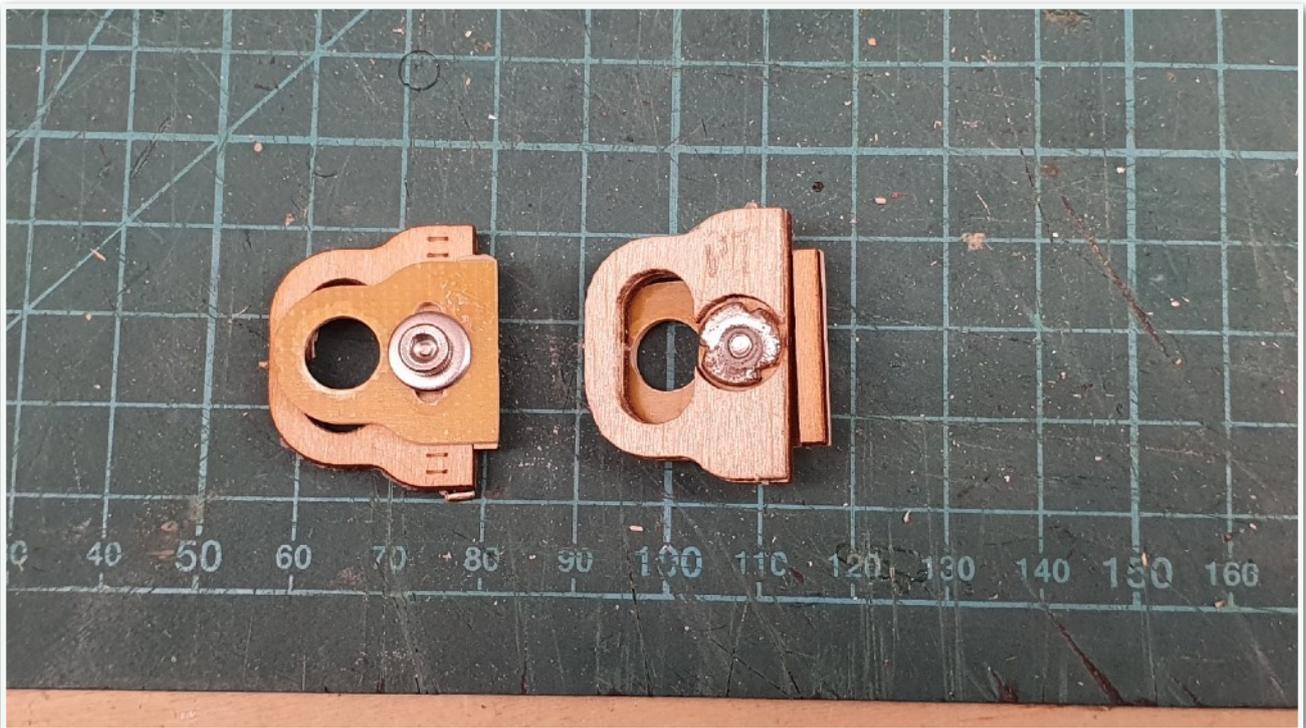
I marked the fuselage for the required slot to allow the adjuster to work. Chris (Bondaero) had supplied some 3D printed carbon plates that reinforced the fuselage sides. These were ideal for use as drilling jigs to drill through the fuselage. The holes needed countersinking to allow the retaining bolts to sit flush with the fuselage sides.



Once the incidence adjusters were fitted, I used them to dry fit the front anti-rotation pins into the wings, made sure the fit was good and then glued the carbon tubes in place as shown in the photo below.

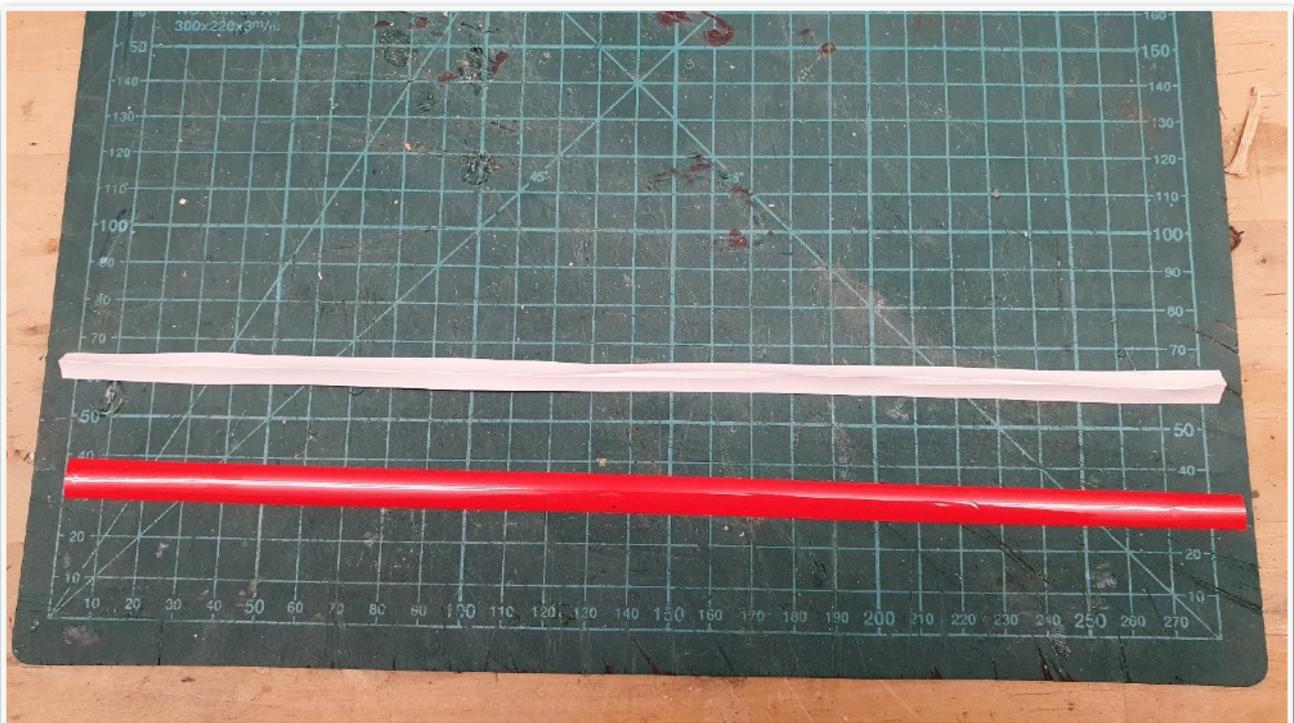


The next task was to fit the rear anti-rotation carbon tube and its retaining brackets. The brackets are slotted to allow the wing incidence to be changed and have a locking mechanism built into them that is engaged and released by a hex headed bolt. The photo shows both sides of this device. The wood part is glued to the fuselage while the paxoline plate can slide up and down to accommodate incidence adjustment. It is a bit fiddly to loosen and tighten the bolt but it is perfectly possible to do that at the field. This is very useful when you want to make small adjustments to wing incidence between flights. It is also a useful feature to take out any aileron trim that is needed to trim for S&L flight. You just have to increase the wing incidence on the side that has a touch of down aileron so that you end up with zero aileron trim on the servo.



The next step was to mount these adjusters. In order to align with the wing, I used a slow curing glue, Uhu, to glue each rear anti-rotation bracket in place so that the slot in the fuselage aligned, then put the wing in place and inserted the anti-rotation tube so that everything fitted before the glue set. Same procedure for the other bracket. After leaving the glue to set, both wings slid off smoothly – phew!

With the wings off, it was time to seal the aileron hinge gaps. To do this, I cut some red film covering to a 5 mm width and then folded it along its length so that it would drop into the V formed by the aileron and fuselage. In order to keep the V gap to a maximum, I used masking tape to hold the aileron in the fully deflected position.



I used a steel rule placed into the V to hold the film in place and used my sealing iron to fix the covering to the fuselage and aileron. The before and after photos are below.



I did the same for the elevator hinge gaps. However, the rudder has multiple colours and so I will use transparent tape to seal the rudder hinge gap.

Control Rods

Time to fit the control rods. Sadly, the rods supplied for the aileron and rudder were a little too long. I suspect this might have been a function of using mini as opposed to full size servos. So, I ordered some 2 mm threaded rods, with solder extenders and 2mm ball links. Sadly, when they arrived the rods were 1.5mm diameter. However, the solder extenders which had threaded ends were just able to slide over the 2mm unthreaded rods that I had. So, I ended up with ball joints at both ends for the ailerons and rudder!



After that, it was just a matter of getting their length right so that the ailerons were flush with the wing and the rudder central when the rod was installed. It's important to note that you should zero any sub trim you may have on the servo and then fit the servo arm so that it is parallel with the hinge line of the control surface.

Futaba provide a 4 arm horn that can be rotated to present each arm in a slightly different position at neutral. Using this feature, I find it easy to eliminate the need for any sub trim to get the servo arm in the right position. JR servos have a similar adjustment trick but as they only come with 2 arms you have less opportunity not to use sub trim for the final adjustment but it is usually less than 5 clicks of sub trim. This is very important as using large amounts of sub trim to achieve the neutral position can cause unequal movement of the servo arm and is to be avoided, particularly for aerobatic aircraft.

Incidences

Time now to assemble the aircraft and check and set the required incidences. You may remember that this was to set the TP at 0 degs, the wing at +0.7 degs and the canalyser at +0.7 degs.

Once again, I "borrowed" the kitchen to do this job!

I used various books and magazines to pack up the aircraft stand to achieve the TP at the datum 0 deg.

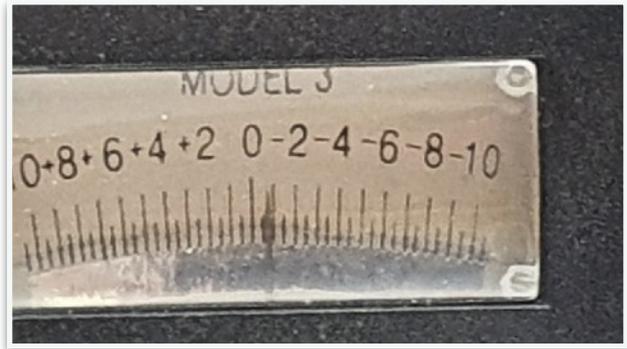


In order to achieve an accurate reading, you must have the radio system on so that the elevator and aileron servos can hold neutral with the weight of the Robart incidence adjuster resting on them. I fine tune thickness of the packing by only using part of a magazine as you can see in the photo below!

I use a selection of books and magazines to achieve this datum setting as you can see from the photo. The disadvantage is that this arrangement is not rock solid so I have to double and triple check the datum as well as the wing incidence.



So, this was the result:



The canalyser proved to be almost +3 deg so I packed up the rear until it also showed +0.7 deg. Another pilot who is flying his Anthem advised setting the canalyser to this incidence as it worked better like that. The packing was 5 mm thick so I will have to make a suitable balsa packing piece to fill the gap between the canalyser and the fuselage, in case that leads to some odd aerodynamic forces or noise.

I also set up 3 rates for all three flight controls. These are all operated by the Flight Mode switch which gives the lowest deflections for aerobatics, a smidge more for landing and full elevator and rudder for spinning. I will also be setting up the throttle curves and other logical switches in the next installment.

< End of Part 4 >