AERO IC

TOCCATA Typhoon 80: MKII Building guide.

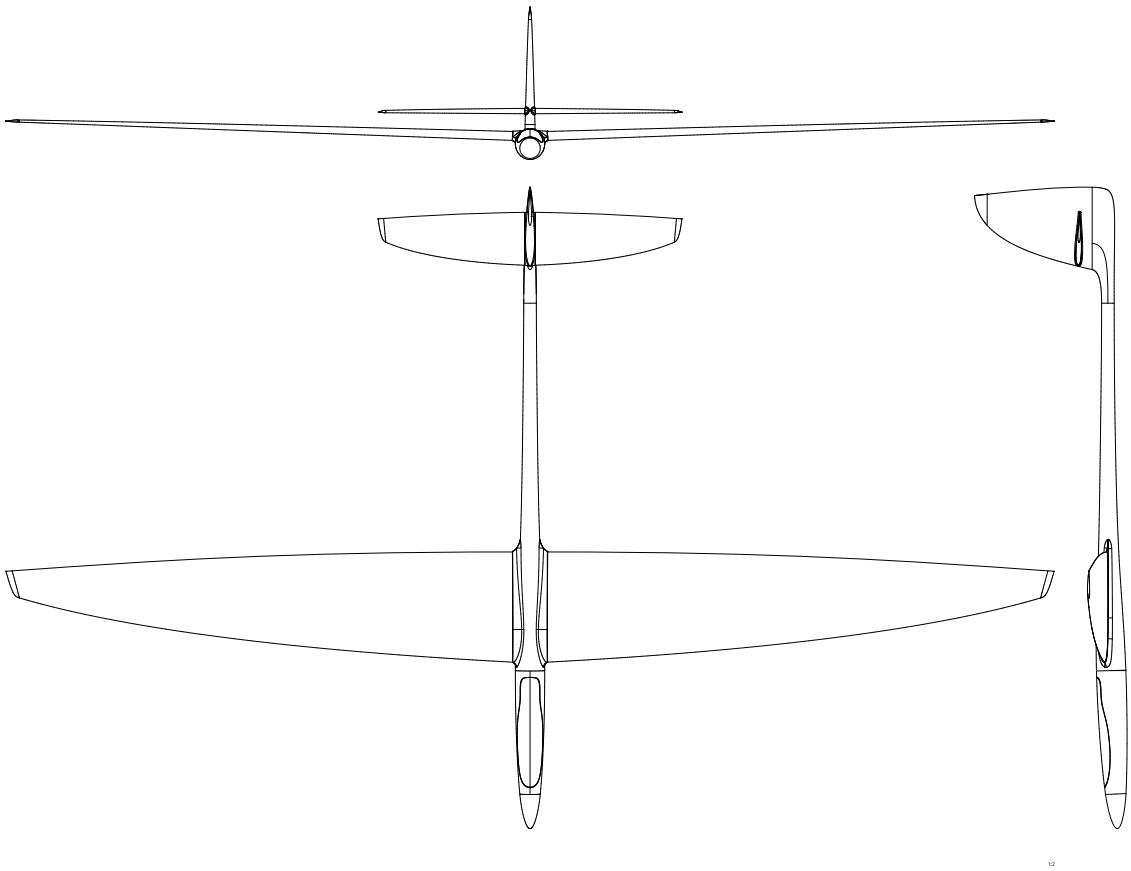
15-year old Ryan Jensen; builder of the very first Typhoon MKII Toccata.

First, a sincere note of thanks from me:

Hello discerning flyer, and now owner of a brand spanking new Typhoon MKII Toccata model sailplane. I'd like to thank you for choosing the Toccata. A lot of thought, much testing, a whole slew of theory and calculation, but most of all a heck of a lot of experience went into its design.

It's different, certainly not a "me too" and I have to say I am really happy with the way it came out.

I believe that your Toccata will reward you by making you giggle insanely, while grinning so hard your head might be at risk of falling in your mouth – which event, is actually a good thing. But most of all I hope it brings you much joy and real fun.



Toccata Info/Technical Specs.

Toccata basic information:

Toccata 80 (2M) is the long-awaited replacement for the classic Typhoon that I designed with RCRCM over 15 years ago, which incidentally is the biggest selling 2 metre model of all time with over 2500 models sold.
Originally intended as an introduction to moulded models, it has been a first model for many, a trainer, and a good flying, reliable, and easy to install model for many hundreds of slope flyers. Everything has been improved on the new version in both construction and aerodynamics while the basic dimensions and curves that distinguish the model and have made it a classic remain.

The all-new Toccata is lighter, stronger, faster and slower on landing than the original; maintains its easy to install radio and has the added benefit of better flying performance, especially in light wind flying, acceleration and energy retention.

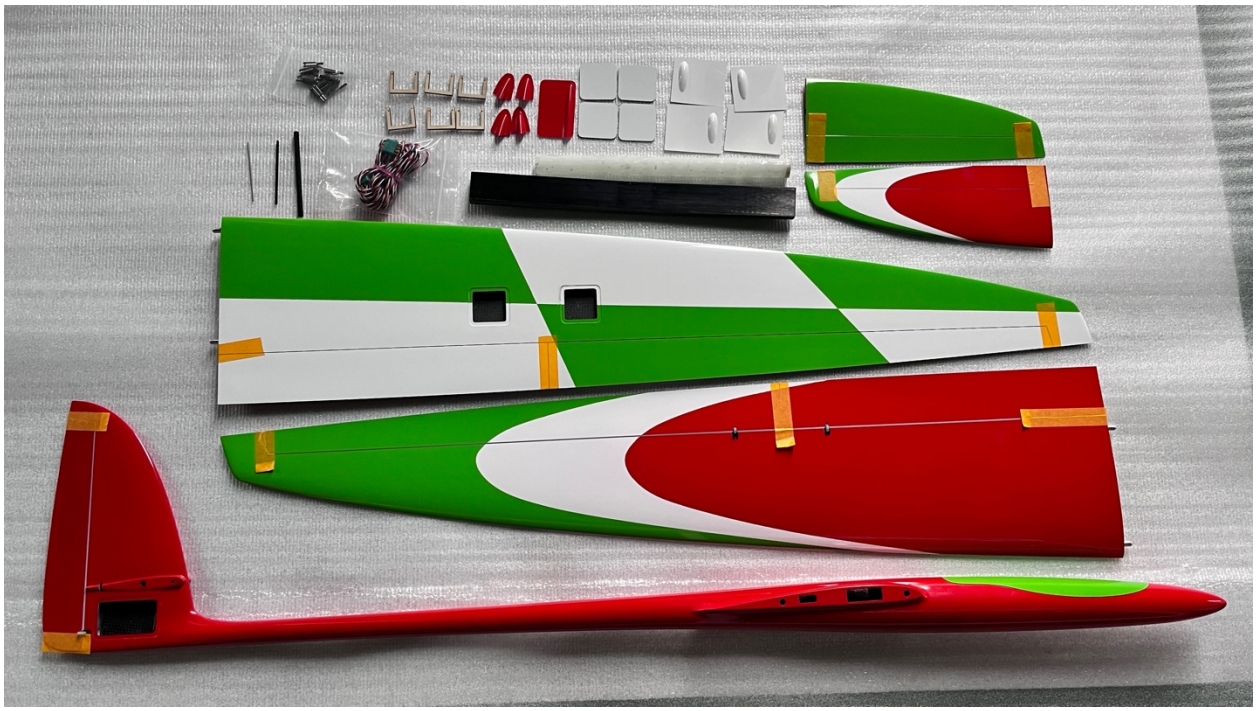
Toccata is electric ready with removal of the nose.

Construction: GFK/CFK Hybrid (Aeroic)
Wings: Carbon with Aeroic Sine Wave Spar - SS version has a double carbon/double ASWS
Fuse: Strong Carbon/Kevlar Reinforced Glass (2.4Ghz friendly)
Tailplanes – carbon tissue skinned.

Specifications:

Span:	80” (2.0M)
Length:	37.375” (950mm)
Wing area:	237 Sq” (15.3Dm)
Wing aerofoil:	JH817
Tailplane aerofoil:	JH10SYM
Controls:	Ailerons, Flaps, Elevator, Rudder
Servos:	10mm
Designer:	Dr. James D. Hammond

What’s in the box?



a. IDS Loose Hardware package – For Toccata/IDS servo: Used for?

1. 2mm x 5cm threaded rods (2)	Carbon rod servo connections
2. 2mm x 2cm threaded rods (2)	Carbon rod V-Tail connections
3. Clevises (2)	Fuselage servo connections
4. Ball type control rod end (2)	X-Tail connections
5. Servo covers (8)	4 x flat and 4 x bubble
6. Wiring loom (1)	Servo connections
7. Ballast tube	Ballast

b. Non-IDS Loose Hardware package – For Toccata/normal servo Used for?

1. Servo trays (4)	Servo mounting
2. Control horns (4) 2 x flap, 2 x aileron	Control surface actuation
3. 2mm x 5cm threaded rods (2)	Carbon rod servo connections
4. 2mm x 2cm threaded rods (2)	Carbon rod V-Tail connections
5. Clevises (2)	Fuselage servo connections
6. Ball type control rod end (2)	X-Tail connections

7. Flap connection clevis/rod assembly	Flap actuation
8. Aileron connection Clevis/Rod assembly	Aileron actuation
9. Servo covers (8)	4 x flat and 4 x bubble
10. Wiring loom (1)	Servo connections
11. Ballast tube	Ballast

Before you start: PLEASE Read me!

PLEASE do read through this instruction document carefully, and identify all of the parts needed and the work to be done. Make sure you thoroughly understand it, and if there is anything you are not completely sure of - then ASK Red Jensen or I – we're always happy to help.

Working surfaces:

YOUR model has a nice high polish, and unfortunately its quite easy to get scratched by sharp tools, abrasive paper, or your wife's fingernails – when she finds out he much you paid for it. - Even a slightly gritty surface can scuff the paint. So, always use a cradle or at least a soft surface to lay your parts on when working – anything might do – an old blanket, just as long as it won't scratch your new baby

Note: Those nice soft towels on the building table.

Glues not to use in construction:

THERE is no place on this airframe for 5-minute epoxy or hot glue. Please don't use these. Yes, they may save time but I can assure you that you'll spend a lot more time repairing the plane if they fail, and at worst you won't be able to.

Glues to be used in construction:

SLOW Epoxy, or failing that, slow epoxy, or as an alternative, slow epoxy.
Cyanoacrylate – "Zap" good quality and used in very small gaps, or for "tacking" components in place before securing with Epoxy.
I have heard good things about Gorilla glue but I have never used it, so I can't recommend it.

Preparation:

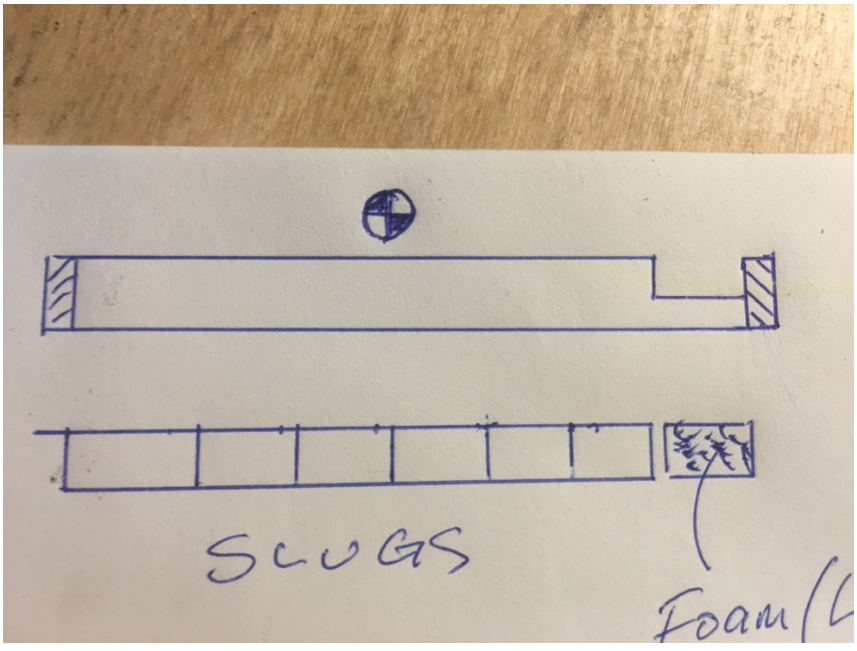
- ALWAYS try to keep the surfaces to be secured clean and especially free of dust or any form of oil – ESPECIALLY - silicon oil or wax.

- Always prepare the surfaces to be bonded by light abrasion, and then by degreasing with good alcohol (no, not the single malt variety) or acetone etc.

- Always make sure that the components to be secured fit well, with gaps as small as you can manage. The fuselage installation:

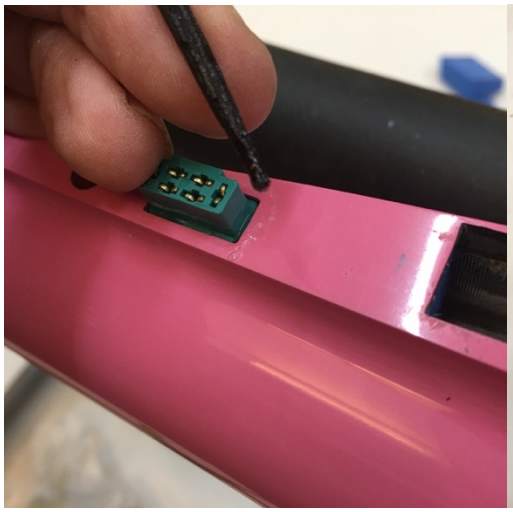
Fuselage fit out:

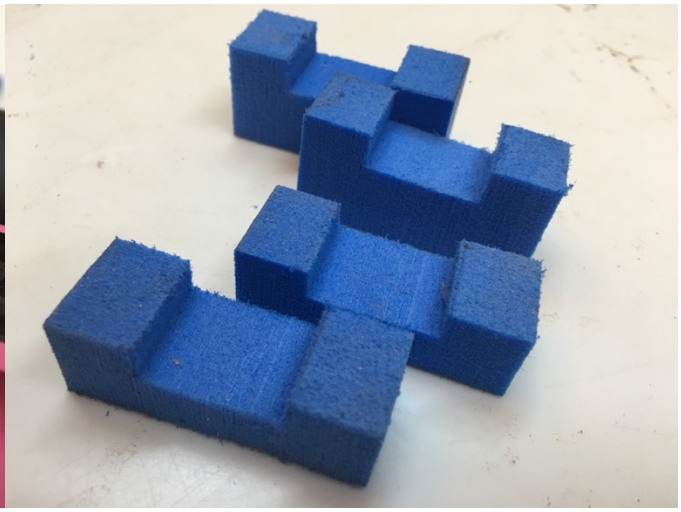
Note: A Radio tray is not supplied, but one can be fitted and may help to add strength to the front of the fuselage. The material can be 3mm ply or 3mm G10 glass fiber plate if you don't mind sacrificing a few saw blades. Note: The fuselage ballast tube is fitted in the fuselage. Please make sure that the ballast tube – if fitted – has its centre at the CG position Ca 100mm from the wing LE.



If you elect to design and fit your own radio tray then CHECK that the battery, receiver and servos all fit well and trim to suit if needed (The radio tray, NOT the battery, servos and receiver). Then check to see that the tray fits inside the fuselage on top of the spruce rails. If all is good, then epoxy it in, but try not to get any epoxy on the wires. I sometimes put a bit of shrink wrap or suitable plastic tube on the wires (but don't shrink it.) to provide a little protection.

NEXT I usually make some Depron or other foamy type connector wire keepers to bung inside the fuselage wing stubs to prevent the wires from obscuring the wing joiner orifice. Note that these are cut about 20% larger than the space they have to go into, both are different sizes, and they have channels cut so that each side holds down the wires, etc. well but do not obstruct the carbon control rods. Bingo! wires and tubes now firm and secure and not obstructing the ingress of the wing joiner or the control rods.





Before adding the wire keepers, carefully file out the Multiplex plug orifices and fit the fuselage wiring loom. The plugs can be fixed with thin CA carefully applied on the end of a sharpened stick or toothpick etc.

LAST, it's time to tidy everything up, fit the servos, and connect the receiver and battery etc. By the way I rarely use switches of any kind. I prefer to leave a connector between the receiver and battery etc., and use a model finder alarm to remind me to disconnect – but it's entirely up to you.

Wing fit out:

Preparation:

PLEASE DO remember to make up your wings on a soft surface. The paint used for the model is actually hard 2-part car paint so it's pretty resilient, but we use a lot of hard tools, mini-grinders, and abrasive paper - not to forget the vengeful wife's nails - all of which can be harmful to the nicely polished wings.

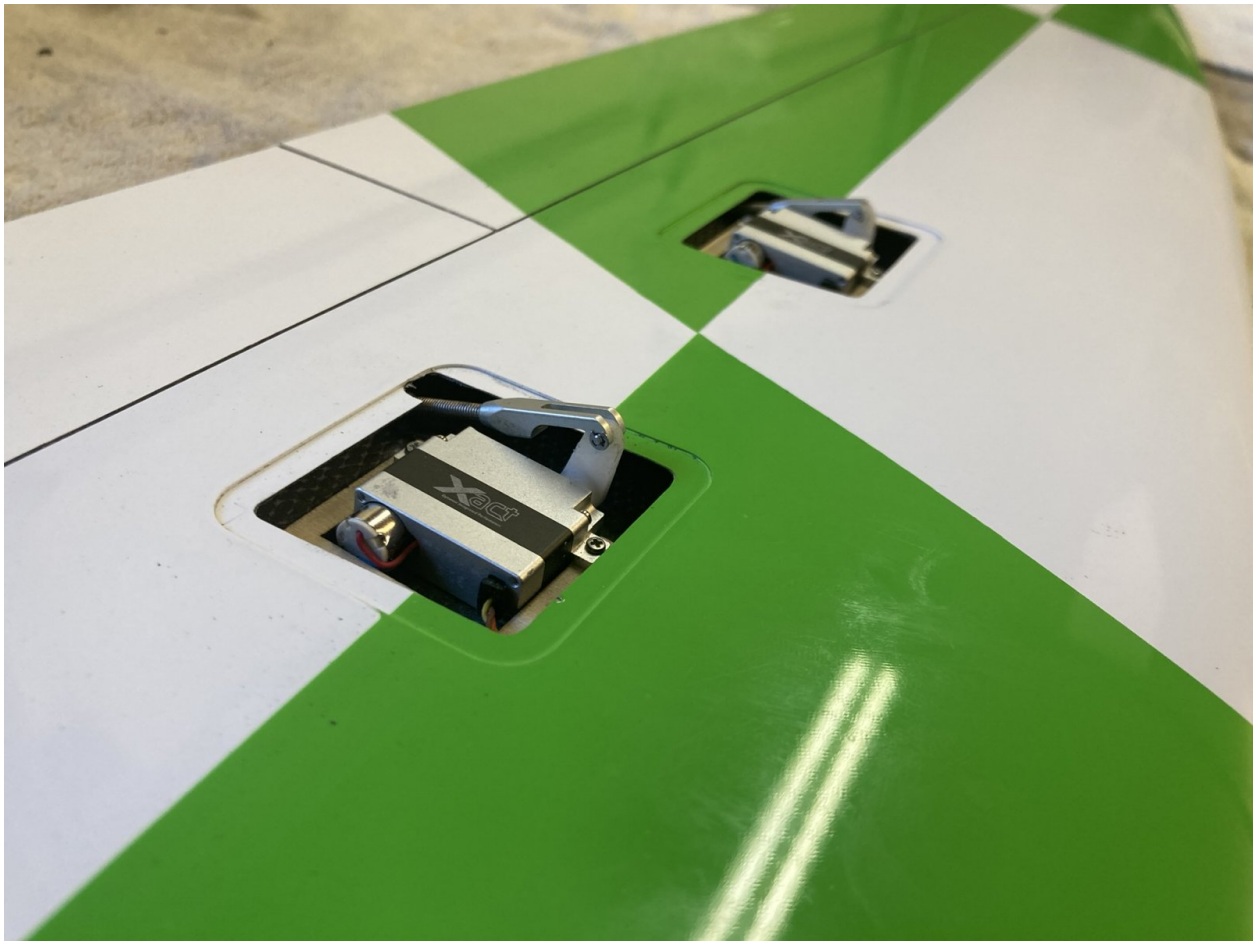
NOTE: We have found that pure IPA has a slight softening effect on the paint we use, so it's better not to use that for cleaning.

Flaps Ailerons:

for the flaps, 8mm (5/16") thick wing servos are easiest to install, and for the ailerons the same – and these are in fact what the wing is designed to use. 10mm Servos will fit, but end up being a bit fiddly to install.

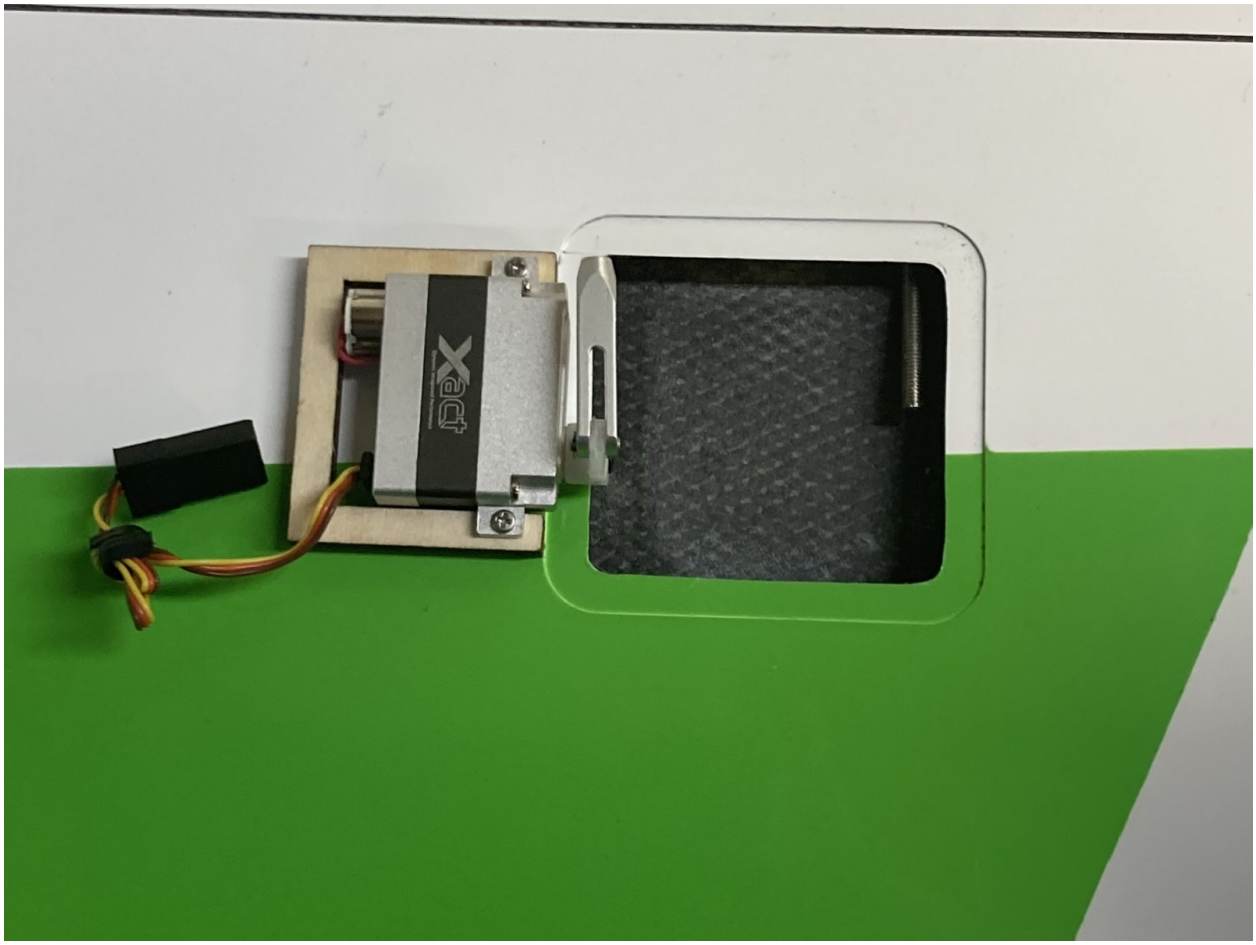
Start by spotting the servo mounting holes on the servo frames – either the ones supplied, or any you wish to use. Then drill the correct sized holes through the frames and trial fit the servos, checking to make sure that the mounting screws do not protrude through the bottom of the frames. If they do then just file them off. Sometimes I have found I necessary to file a small clearance on the side of the frames to let the servo wires fit freely.

Note: the model can have IDS, or IDS with control horns, or just plain old-fashioned servo/control horn servo installation.



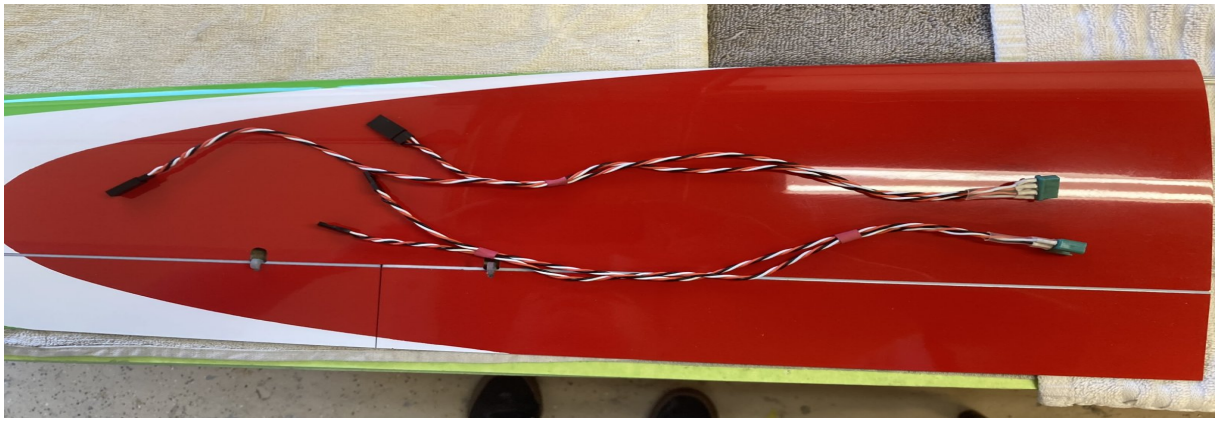
TRIAL FIT everything! Make sure the whole assembly fits where it should, and that the servo arms will line up with the control horns. If anything needs to be fettled, adjusted, or modified – now is the time to do it. Also, please don't forget to roughen the undersurfaces of the servo trays to provide good adhesion.

NOW it’s a matter of degreasing the pocket insides and the servo trays then bonding in the trays with epoxy. I find its best to do them one by one even if it does take longer as this part is important.

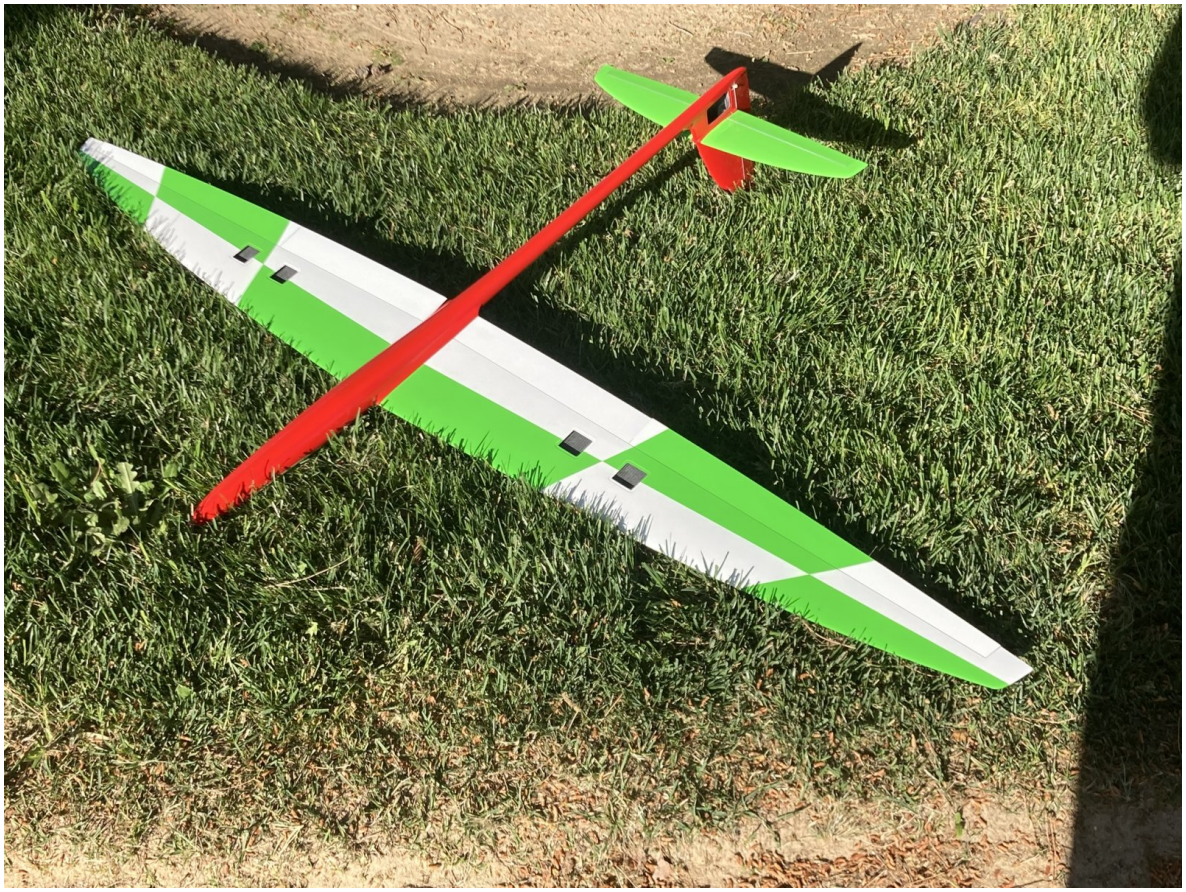


SERVO COVERS supplied are very slightly too large to fit the servo pocket recesses, so you will have to sand them down to fit. I normally save a little time by snipping off the sides to within a couple of millimeters of the correct size and going from there.

LAST, PLEASE thread the servo connector harness through and connect the servos. To keep things tidy and not too loose I put some Depron “keepers” where I can to hold it in position inside the wings. Ever since I was a baby I have hated rattles. Don’t be tempted to glue the connector into the wing. It’s hard to get correctly aligned and really not necessary.



Done, your model should look like this:



Toccata Controls etc.:

1. Dimensions in millimeters
2. Angles in degrees

CG	Conservative/start 90mm from LE. Later up to 96mm

General flying:

Parameter:	Position up	Position down
Ailerons	+12	-8
Elevator	+5	-5
Rudder	+10	+10
Flaps		-80º
Snap flap		-5

Butterfly:

Flap		-80 º
Ailerons	+10	
Elevator		-4

Enjoy! And lease take a look at our website www.aeroiccomposites.com and send your picture with your model and some really tasty, scantily clad, female so we can put it up in our owner's gallery.

James Hammond June 9th 2024.