Volantex
ASW28 2.5 m sailplane

Build notes

Table of Contents

Last edit 3 April 2022

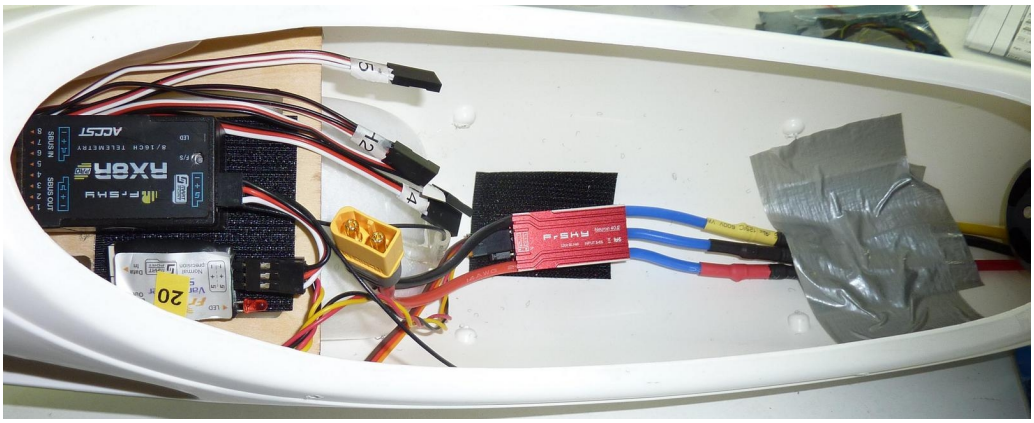
I bought this Volantex model from Hobby King for £142. The parts were well packed in a solid cardboard box. All servo leads were in place, though I replaced the aileron ones as they were on a Y-lead and I like to put aileron servos on separate channels. The mouldings are of good quality with little damage to the foam parts. There is a pilot mounted on a black moulding and a clear canopy.

Changes that I made:

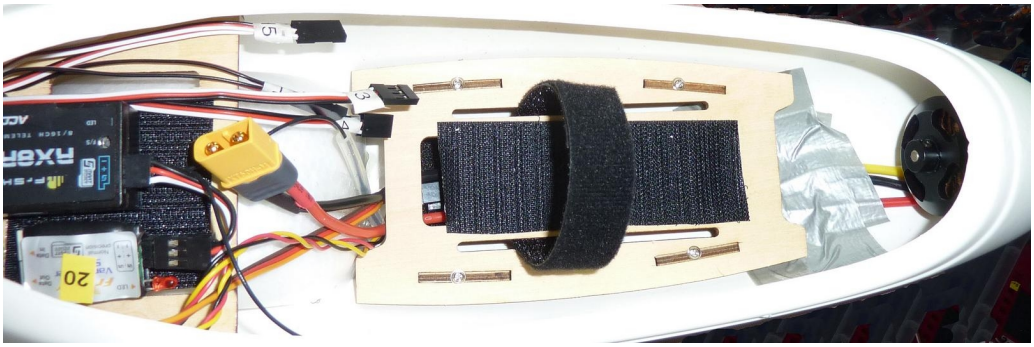
- Swapped the ESC for a FrSky Neuron 40S.
- Removed the red paint from the wing tips.
- Painted the spinner white.
- Replaced the battery strap.
- Left off the garish decals.
- Replaced the aileron Y-lead with two separate ones.
- Changed the way the canopy fitted on.
- Increased the size of the servo lead holes

Fuselage

You remove the battery plate by unscrewing four tiny self-tap screws in the fuselage sides. This picture shows the motor wiring with the FrSky 40S Neuron ESC that I used to replace the supplied ESC. This gives me all the telemetry I need except the vario, labelled 20. I shortened the ESC leads and fixed the wires for the motor and ESC firmly to the bottom of the fuselage with duct tape so they lie flat and don't touch the motor. On another model I have had insulation worn through by a motor with unhappy results.



Here is the same view with the battery plate fitted. I replaced the supplied battery strap with a strip of velcro with hooks on one side and loops on the other. It can be slid along to suits the battery.



The manual says that the battery should be a 3S one, and definitely not 4S. It doesn't say why. Perhaps the motor and/or ESC aren't capable of taking a 4S voltage though that seems unlikely. I think it probably is the prop. A change to 4S would mean having to use a propellor at least 25 mm smaller. If it runs slower than the kV rating times volts, the motor will probably overheat. The kV is now 1050 so connected to a 4S rpm would need to be up to 17000. However the blades are easy to remove and have the standard size 8 mm fitting so the change could be made. All of this is irrelevant if the model is used only for slope soaring.

Wings

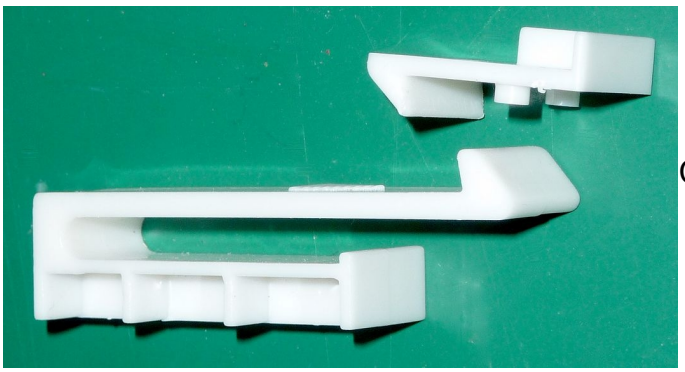
The full-size ASW28 is a 'standard class' glider. That means that it has no flaps, only an upper surface airbrake. The model has flaps but they are top hinged so they are partly concealed. This is a neat and useful compromise. A floaty model like this is likely to travel a long way when landing. Flaps or crow brakes are essential, especially on a slope.

The wings are held on with the same type of clip used on the Volantex Phoenix series of gliders. It is a light and neat method but the clips sometimes snap. It is worth buying a few spares. Buy replacement props and spinners at the same time. Oh, and maybe a spare fuselage just in case. Volantex glider fuselages are prone to motor mount failure with a nose down arrival. The spares can be bought from Hobby King and Banggood.

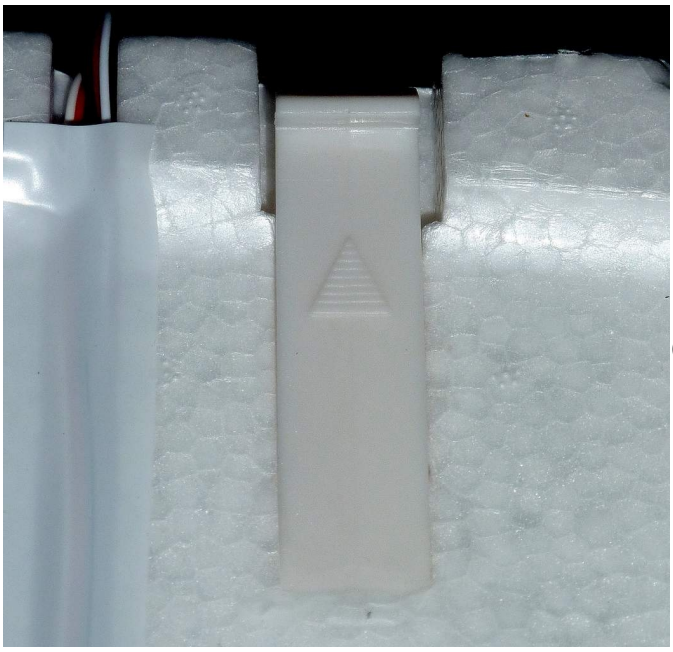
Strong hint.

Do test fittings of the wings into the fuselage before fitting the fin and tailplane. The tail feathers are easily damaged when you manoeuvre the fuselage. On my model the wings would not fit easily into their fuselage housings when slid in with the the rods in place. I had to slice a millimetre or so off the front underside of the root fairings.

The first two or three times you will find it difficult to push the wings in so the clips lock and go click. Push the mated aileron and flap connectors into the fuselage as they can stop the wing going in. Pushing the clips in to unlock and remove the wings is even more difficult and, again for the first few times, I pushed with a large flat blade screwdriver. It gets easier. However one side remained especially difficult so I sliced about 0.5 mm off the mating part of the wing clip.


Clip set

One of the clevises supplied for the wings was poorly made without a hole for the peg to plug into. Fortunately I had some spares.

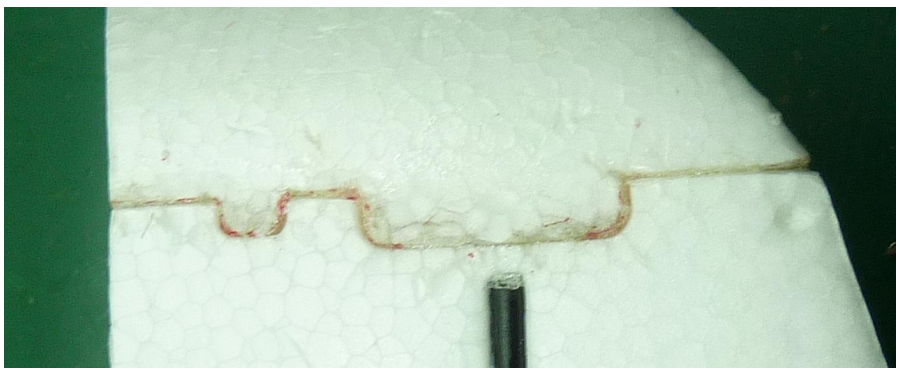


Clip in ASW wing

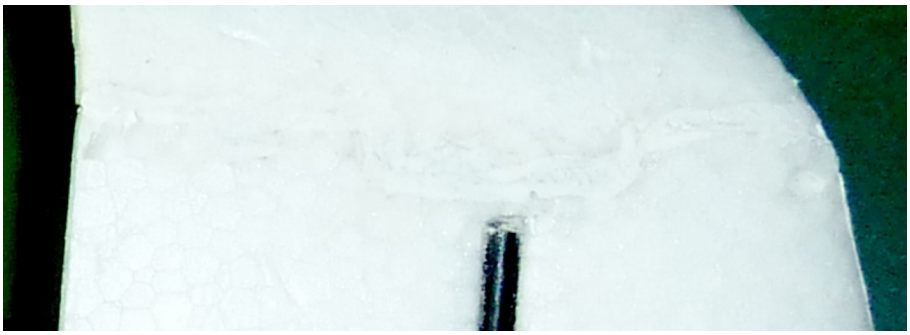
The wing mouldings are good with one exception and have the centre of gravity markers moulded in. I will probably fly with the CofG further back, especially as the leading edge tapers but not the trailing edge. Some of the control surfaces are quite thick so long screws were supplied to fit the horns. All were the same length. An extra pad was added to thicken the the aileron horn area but still these screws were too long. In the end the poor appearance and likelihood of scratching holes in my hands moved me to fit shorter ones. In my box labelled ‘small screws’ I found some 2 x 9 mm self-tappers that did the job perfectly.

The rising winglets are supplied unattached, and have to be glued on. Their leading and trailing edges were poorly finished with flashing sticking out, so I trimmed them with a scalpel and then gently sanded them. The wing leading and trailing edges needed a small trim to line up with the tips. I pulled off the naff red paint with sellotape. Even then, further fettling with knife and sandpaper was needed to remove the last of the paint. After gluing and pinning the winglets on with epoxy I filled in the joins with white filler made from Eze-Kote and micro-balloons. After a very gentle sand I spotted the joins with white acrylic paint to conceal them.

This is what one winglet looked like before the filling and painting.



And after filling, sanding and painting - far from perfect but better



Even when well glued the winglets are easily knocked off. After doing it the first time I reglued and pushed in a toothpick to strengthen the join.

One annoyance was that, with the winglets in place, the wings didn't fit into the box they came in. I like to take foam wings to the field in the supplied boxes to avoid damage. The tips make it more difficult to make padded wing bags too. I had a strong card box that came with a 2.4 m Phoenix. There was enough cross sectional room in it to hold both the Phoenix and ASW wings. I extended the box with scrap thick card and lots of duct tape so it could take both.

Fin and tailplane

The fin and tailplane screw into place. That is better than gluing when the time comes for repairs. On the model I received, the rudder and elevator servos were of different types. The elevator had a metal final shaft that made fitting the horn easier. The rudder one was plastic and involved squeezing the arm on by pushing with a rod - in my case a large allen key. The screw was very awkward to fit as there was no direct access only a sloping groove. The supplied screwdriver was badly made and didn't turn the screws. It would have been better for the maker not to glue the servos allowing me to make an easier job of screwing on the arms.

I originally thought that the servos were held temporarily in place by white tape so I took it off. In fact they were glued in and the tape was to conceal them. I had to buy some white tape to conceal them again.

Hint: Fit the tailplane pushrod before you screw the tailplane on to the fin. You can't do it after. The push rod runs up at a weird angle but seems to work OK. The elevator movement is asymmetric but that can be corrected in the Tx.

Minor fault

The plastic T-tail tailplane mount came loose after a while. I think the workers in the factories in China are paid a glue bonus if they use as little of the stuff as they can. I normally avoid thin CA glue as it runs to all kinds of unwanted places. I once glued the wheels of a model to my bench. However in this case a few drops carefully applied to the edges of the mount quickly got drawn in by capillary action and cured the problem.

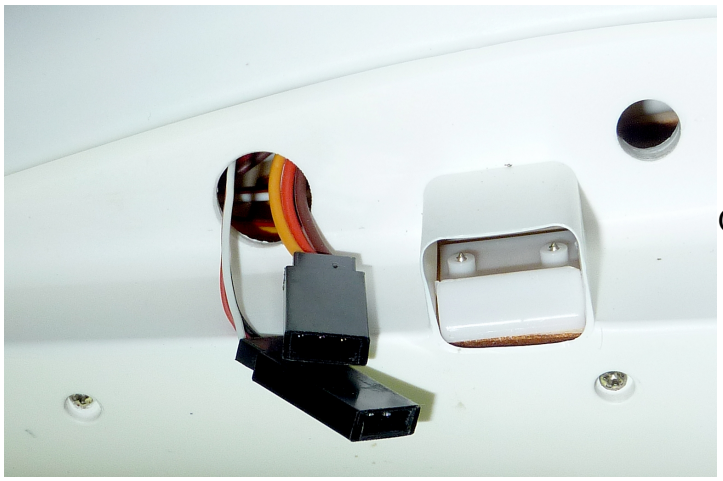
Electrics

The servo leads were already in place and labelled with channel numbers e.g. CH5. I replaced the aileron Y-lead with two leads, one in channel 2 and the other in 5. This enabled me to set up crow brakes and variable camber. The connectors on the leads from the aileron servos needed to be trimmed slightly on the corners to fit into the extension leads.

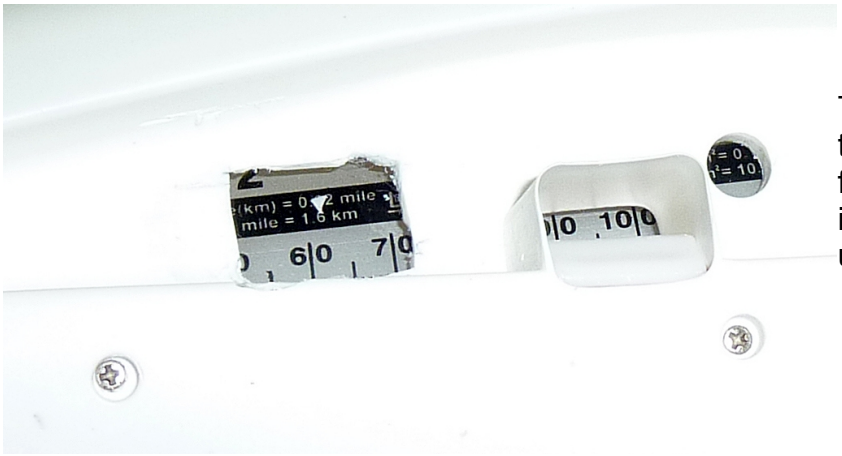
Because it was impossible to get a screwdriver in to tighten the arm screws on the wings, I cut V-shaped slots as shown in the next pixture. They will be covered with white tape.

Here's another hint. To avoid them dropping into the fuselage during transport and storage poke the wing servo leads into the clip holes.

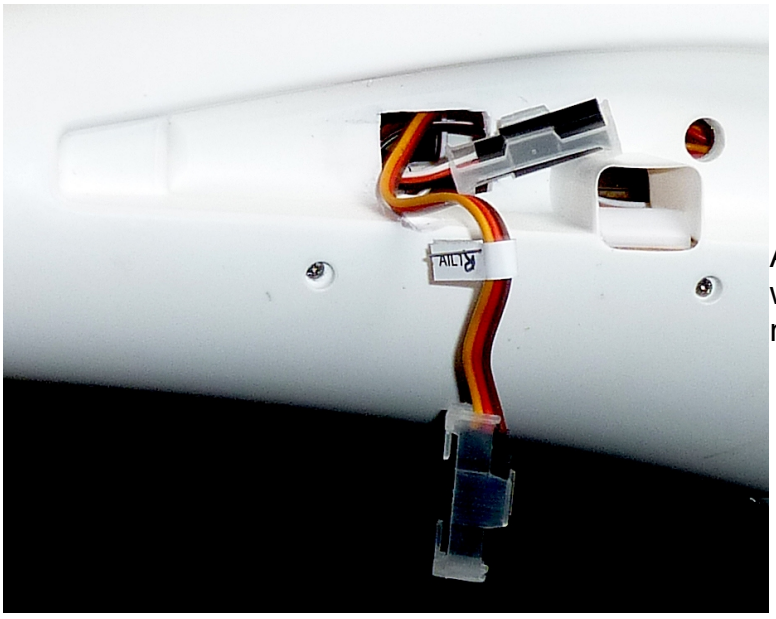
The holes into which you push the wires when fitting the wings are too small. I couldn't get the wires through with servo connector locks on. They are probably not needed but I like always to use them anyway and it helps when pulling the wires back out to remove the wings. So it was out with the Dremel and scalpel to making the holes rectangular and a bit larger.



Original hole



The metal ruler is there to avoid the Dremel grinder going in too far to damage the wires. Picture is before the holes were tidied up with a scalpel.



A finished hole with wires refitted with clips. More than enough room now.

The new larger holes will not weaken the fuselage. The walls are quite thick where they are.

The servo arms were well prepared. The thickish pushrods fitted the horns perfectly but were too thick for the servo arms. A single hole in these had been opened up to fit.

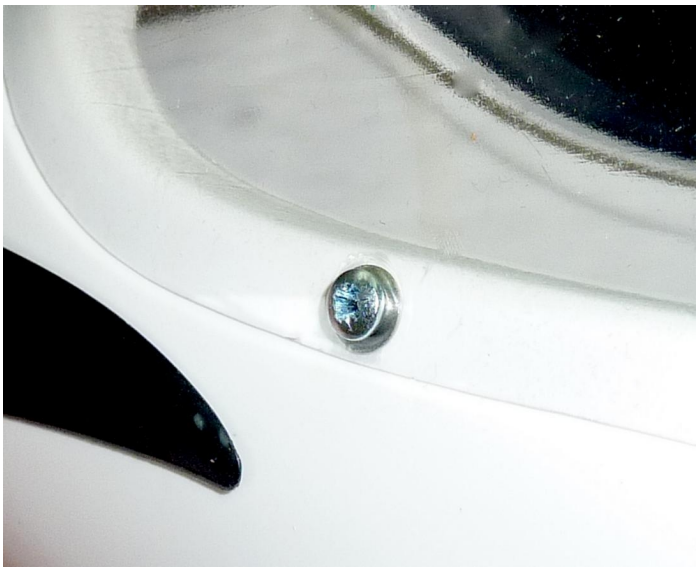
And now the canopy!

This has all the hallmarks of something that will fly off the model when in the air never to be seen again. It is very flexible and is held by four plastic studs that should pop into four holes in the fuselage. The simple fact is that the canopy doesn't fit. I smoothed the mating parts of the fuselage that projected a bit, but it still didn't fit. Any attempt to get all four studs to pop into place at the same time failed miserably. One last attempt at brute force resulted in a cracking sound from one stud.

The only solution was to use screws. They should hold the canopy down better with the bonus of reducing the drag from gaps. To do this I needed something to screw into. To start I epoxied some pieces of spruce inside the fuselage, one each side and one each front and back. I also planned to reinforce the edges of the canopy where the new screws would go.

Then it struck me. Why not remove the studs and screw into the holes in the fuselage into which the studs should pop? I raided my boxes of small screws and found some 4 x 12 mm self tappers that fitted perfectly and held well. I used M3 washers to spread the load. I cut around the studs and twisted them with some pliers until they came out. The glue deposits are concealed by the washers.

And here is one of the screws. It's another example of Occam's Razor or KISS (Keep It Simple Stupid!). The only downside is that four screws have to be removed to change the battery.



I had wasted money on a bottle of canopy glue – Zap 560 (PT56). I was going to use it to glue on strengthening strips of acetate. The results of the tests I carried out hopefully will be useful at some point in time. Use the tiniest drop of glue and spread it thinly by moving and pressing the two surfaces. It takes the glue 3 hours to set and 24 hours to harden fully and go clear. I did two pairs of test strips. I cleaned the surfaces for one test with methylated spirit. The adhesion after 24 hours was quite good, though I was able to separate the test strips. The meths made no difference. The glue had become almost transparent.

Pilot

Model pilots are usually the wrong size - sometimes absurdly so. The supplied pilot has a shoulder width of 80 mm. That translates to a scale of about 1:8. The span of the model is 2.5 m so the full size should be 20 m. Being a standard class glider the full size aircraft was 15 m wingspan, or 18 m if it was the ASW28-18 version. So that makes the pilot pretty much the right size if a little big. The pilot is fitted into a plastic mount that fills the canopy opening. From now on I'll call the whole thing 'the pilot'.

Instrument panel

This is a picture of the ASW28 instrument panel. You can print and laminate this picture to cut out and stick on to the cockpit moulding. You will need to change the percentage size to suit your printer. Copy the image and paste it into your image software, or printscreen and paste into Paint or similar.

Here it is in place. It's a bit small but the effect is good. It will just be for show and will not be fitted when flying.

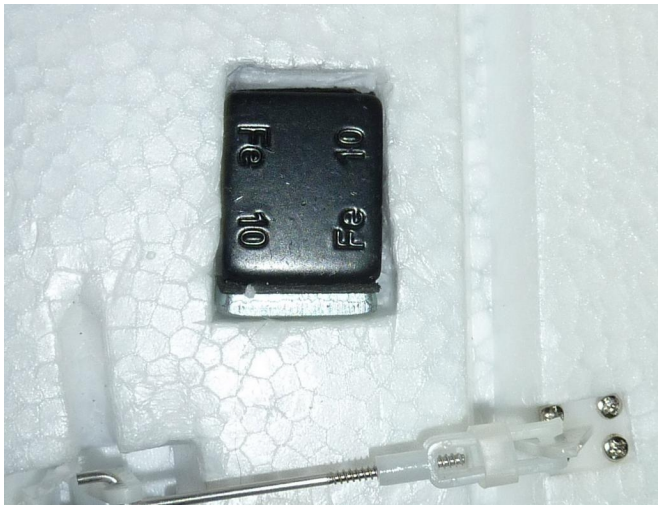
Balancing

I had hoped to use a 3Ah battery. With that as far back as it would go the model was very nose heavy. The same was true of a 2.2 Ah so I was forced to try a 1.3 Ah. Even with that I needed to put 25 g on the tailplane to balance. In all of these cases I had the pilot in place.

The pilot weighs 75 g. That is a lot of useless weight to add. I would rather it went into the battery. I tried a rebalance with the pilot missing. The results were:

	Battery weight	Weight needed on tail
1.3 Ah	127 g (graphene)	Zero
2.2 Ah	174 g (Turnigy)	15 g
3.0 Ah	214 g (Turnigy)	didn't balance even with 25 g

My final decision was to have no pilot and to use a 2.2 Ah. I buried 25 g of weights in the fin - which is quite thick - then fixed them with CA glue and filled with my own EzeKote filler. I covered them with white tape as used for the servos. I can move the 2.2 Ah battery forward a little if I need to.



After extended flight testing I will possibly add more rear weight to move the CofG further back.

Flying trim data

All up weight	1450 g	Including radio & 3S Turnigy battery but not pilot
Wing area	33.4 dm^2	Not specified in manual so measured Full size at scale 6:1 gives 29 m^2 but maybe the model is of the 18 m (7.2:1) span glider
Area loading	43 g/dm^2	
Aspect ratio	20:1	Calculated from model so only best estimate (Full size was given as 21.4:1)

The area loading is a little high. The normal desirable value for soarer wing loading is about 33. This might prove to be a fast flyer but the high aspect ratio should give good performance.

Throws

As I said above these were not specified in the manual. I set them up by eye and intuition with lots of expo just in case.

Both the aileron and elevator throws were assymetric, with more down than up. The elevator is the result of the strange angle of the pushrod. I could see no reason for the ailerons. In both cases I moved the position of the clevises in the control horns, then turned them to reset the zeroes and reduced the down throws in the transmitter. I also moved the rudder clevis to increase the throw.

The settings, with channel numbers, then were:

Ailerons	2 5	12 mm throw	Clevis down one hole	Weight: 100 up 70 down
Elevator	3	10 mm throw	Clevis down one hole	Weight: 100 up 80 down
Rudder	4	35 mm throw	Clevis down two holes	
Flaps	6		Clevis down two holes	

Flying

Allegedly model ASWs are tricky to master. The design has a very small tailplane and elevator. However I did a maiden flight on December 15th 2021 and it flew beautifully. The CofG was at the places marked but was too far forward. The model was too stable and I had to hold in up elevator to keep the nose up even after full trim. I'll try it 10 mm further back on the next flying session. I did attempt a gliding loop but it would not pull up enough. The wings flex a lot just like the real thing but I guess are strong enough for a simple loop and stall turn.

Things I didn't like

- Servo access for fitting arms
- Canopy fixing
- Rubbish supplied screwdriver
- Overlong screws for wing servo horns
- Poor weight distribution meaning no pilot for flying
- Poor wing root fairing moulding
- Balance does not allow a decent size battery to be used
- One wing clip very difficult to unclip
- Servo lead holes in the fuselage too small, so made larger and rectangular
- See below

And one more

I think there is a daily prize in Chinese model aircraft factories for the person who uses the least glue. After one landing I commented that the tail had wobbled quite a bit. But I didn't check and as I launched for the next flight the model lurched off to the left and hit the ground nose down. I thought it must be pilot error but when I looked closely to fix the minor damage I saw that there was very little glue holding the fin into its mounting. It might have happened in the crash but could well have been the cause. There was only minor damage and it was soon fixed. I needed to use one of my spare canopies. So the message is give every glued part a good tug as you build the model.

Summary

This is a very handsome model with a few minor faults and two bad ones. Don't expect to have this model assembled and ready to fly quickly. There is a fair bit of work to be done to get it ready. You might say, 'Why bother?' At the impressively low price it is well worth a bit of extra work. It looks beautiful in the air. The only ugly part is the rudder but that is the same on the full-size design.