

FIRST PLUS – 2M SAILPLANE.

By Klaus Weiss.

The First + is one of a range of high performance and high-quality sailplane kits manufactured by BLEJZYK in Poland, and distributed in Australia by Sky Affairs, Brisbane. The First plus, is suitable for slope or thermal soaring.

Representing original and modern composite materials, this model is well suited to intermediate pilots. It features a blended SD7037-7012 airfoil and 2 – 4 channel controls. The two-piece wing has turned up tips (winglets) and has servo wells pre-cut with wiring channels already done for you. The joiner is a blade steel and brass unit, which is more than strong enough for this model. The wings are pre sheeted in black poplar and do not need much final preparation to finish them off. The fibreglass fuselage is glossy white (Gelcoat?) and features a slip on nosecone sheath with separate internal nosecone for servos, switch and battery pack mounting. The wing seat is also carbon fibre reinforced. Stabs are pre-built, sanded and hinged.

Kit Contents

This kit is of a very high quality. Fibreglass and carbon fibre reinforced fuselage, featuring inner nose cone, sheath nose cone for rapid access to radio, and spare nosecone for electric version.

The wings are precision cut from virgin white polystyrene foam. The black poplar veneer is bonded to the foam, and sanded. The ailerons are marked and ready to cut out, with servo wells and wire channels already prepared for you.

The tailplane consists of a ‘V’ tail stabiliser/elevator and mount, which is pre sanded and hinged. A nice feature which saves a little bit of work.

There is also a plan sheet, showing details, measurements, cross-sections, and a step by step instruction leaflet. Also the builder is provided with a hardware bag containing all the little bits needed to assemble the airframe, push rods and sleeves, and a steel wing joiner. The First plus, goes together hassle free and fairly quickly. The other nice thing about this kit is that, with the removal of four wing bolts and two tailplane bolts, you can pack the airframe back into its original box for storage.



kit contents.

Building

The assembly process in any kit usually starts with the wings, so lets not break with convention. Both wings have the leading edge and black poplar skins, bonded at the time of manufacture. The First plus, also has turned up wingtips, which look good but lose a little of the airfoil integrity, due to the fact that they are not moulded. The wings are of very good quality with sharp, straight trailing edges and no warps. The wing has a pre-routed channel for the servo extension wires to run through. This channel is of a smaller diameter than the servo extension plugs so the plugs won't fit into them. I generally run my own servo extension wires anyway, and solder them directly to the servos, so this wasn't a big problem for me. Most of the work you need to do is at the wing roots, where the wing hold down blocks and the joiner system, have to be fitted. Both are relatively simple jobs.



wing root preparation is easy with Permagrit tools

Trial fit the wing halves, to ensure the roots match up and the dihedral angles are accurately sanded into the roots. If you are happy with the fit, then proceed with the joiner box installation.

I used a few Permagrit tools for the sanding and cutting in the various construction sequences, as I find them exceptional abrasives for modelling purposes.

The joiner system consists of a steel strip that is glued permanently into one half of the wing, and slides into a rectangular brass tube, which is glued into the other wing. The joiner box recess in each wing half, is about 35cm long, whilst the brass tube and steel joiner blade, only slide into this recess to around 6cm per wing half. The instructions say to fill the recess with epoxy, but it would take a lot of it to fill the void. I opted to make a snug fitting balsa filler, about 28cm long, to take up the excess space inside the spar box, and then fitted the brass and steel joiners respectively, as per instructions. I feel that this actually contributed to the overall strength of the wing, but having said that, I have seen First gliders without the filler piece, undergoing pretty severe launching loads on the reflex hand tow, without any sign of bending or stress.

Four hardwood blocks were shaped to fit cavities in the wing roots and glued in place with epoxy. They become the hard points for the mounting screws. I sliced a cross-hatch pattern into the foam of the wing root, so that the cavities would be slightly oversize for the shaped blocks. Dig out the foam with a flat bladed screwdriver. I also used a Permagrafit 6mm square file, to clean up the cavity. Mix up epoxy and micro balloons, then glue the blocks in place. Mark the block locations on the outside of the wing because, they will soon be covered up by the plywood root ribs.

To get the correct angles for the wing bolt mounting holes, I drilled a pilot hole at 90° through a 30mm x 30mm block of timber, and laid it flat on the top surface of the wing and then drilled through the pilot hole and the encased mounting blocks. This way, the flat head nylon bolts will actually sit flat against the wing skins. There are also steel alignment pins, which need horizontal holes drilled into the mounting blocks, to provide accurate alignment of the wing halves. When drilling the holes for these, be careful not to drill into the holes you have drilled for the wing bolts.



Dremel fitted with Permagrit cone, makes light work of this chore

The ailerons have been sliced through the poplar wing sheeting, but still need to be cut free from the wing. I used an OLFA knife with long snap off blades for this job, but any similar type of blade will do the same chore. Bevel the front edge and face them as described. I actually faced them with .08 ply, which I glued on with PVA.



this Permagrit block gets right in close for a perfect job

With that done, I centred my servos and installed them into the servo bays with a micro-balloon/epoxy mixture. A little smear of Vaseline on the wires, where they exit the well, prevents them from being bonded in the mixture. Press the servo in place, and allow the mix to cure. This may seem a little too permanent for some, but they are secure, and a sharp twist is all that is required for it to be removed, if it becomes necessary. There are a number of ways you can mount the wing servos, and a number of manufacturers make generic servo mounts, which will fit into the pre-cut holes. Alternatively, you could also wrap the servo in masking tape and epoxy it into the well. This method will allow you to cut away the tape from the servo, and remove it from the well. You could also glue in some spruce mounting beams and screw the servos in the conventional manner.

Fuselage

The fuselage is a very nice fibreglass moulding with a slip on nose cone. I installed the push rod snakes, servo and receiver mounting plates, the plywood for the wing hold down bolts, and the tow hook block, before gluing the inner nose moulding in place. Just a few seconds of sanding with the Permagrit block was required to achieve a perfect fit for the nose cone. Lay the wings onto the fuselage wing seat to align them properly. I held them in place with double side transfer tape, and drilled through the holes I had previously made into the wing blocks, through the fuselage and plywood blocks. Remove the wings and enlarge the fuselage mounting holes, so that the wing nuts will sit snugly up to their collars. Place the wing back on, and smear some Vaseline onto the 4mm wing bolts. Mix a little 30 minute epoxy and apply it to the wing nut collars, being careful not to get it into the threaded portion. Screw the bolts in, through the wing, and allow the epoxy to cure. This will enable the wing nuts to be at the correct angle to the bolt holes, in the wings.

The provided pushrods and sleeves are quite flexible and need to be supported, or glued inside the fuselage. There are two ways to go about this. First, you can run the outer control sleeves in the fuse where you want them to lay, then using a long stick, push chunks of shaped EPP or polystyrene foam into the fuse at around 10cm intervals. This provides a press-fit support system. I chose the second option, which is to run the sleeves, and then attach them to the fuselage using a long stick to which I applied some 5 minute epoxy. I smeared the glue over the sleeves and onto the fuse at three equal intervals. A short time later and the rods were securely in place, and no longer flexed.

The inner nose was glued in next, so I marked and cut out the servo holes for mounting the JR331 mini servos. These were angled slightly, so that the servo arms would not hit the side of the outer nose cone, during operation.

The tail surfaces are supplied finish sanded, with the control surfaces already hinged. Join the halves with 5 minute epoxy, and later on, reinforce the joint with the supplied fibreglass cloth. Ensure that you have the correct angle, by using a cardboard or polystyrene template to hold the tail, as it is curing.

Finishing

You can either paint the wings and tail surfaces with a water based varnish, or cover them with a lightweight plastic film. I covered the tops of my model with yellow profilm, and the bottoms with red solarfilm. This process would possibly make the wings very slightly heavier, but nothing, which concerned me. You may want to add a different colour to a wingtip, to aid in orientation.



Radio Installation

Two Hitec HS-85BBMG servos were installed in the wings for the ailerons. Two JR331 mini servos were used for rudder and elevator control. I wanted to fit everything inside the inner

nosecone, with as little fuss as possible, and using mini servos and a JR610M 6 channel FM micro receiver, allowed me to fit a standard sized AA 1100mah nicad pack right up front. If desired, a standard sized receiver could be used, and fitted under the wing seat.

Balancing and Surface Throws

I set the control throws to the values given in the manual and had no reason to change them. I balanced the First Plus at 90mm from the leading edge. That is where I started, but I subsequently have moved the centre of gravity back by a further 12mm so far.



Flying

The glider was test flown on the flat field, and hand launched for the initial trim check. I found that it need a bit of elevator up trim, to glide well, but from a toss of about 3m altitude, the First + glided about 80m. When satisfied with the setting, the glider was committed to a high start. It climbed steeply and got a good ping off the line. First flight was 10 minutes, as it hooked a thermal or two. Turns were nicely banked, and the rudder worked quite well on the V tails. The air was terrific on this day, and flights could have been much longer. The First+ indicates lift very well and allows the pilot to turn tightly to climb in light thermals. It felt like a high performance glider that is both relaxing and easy to fly. Landing speed seemed to be a bit faster than I would have been used to. If you have a computer radio, then you might consider programming your radio for spoilers to help kill some of the lift over the wing and aid in a shorter landing approach.

It took many weeks to get conditions right, for a slope test, but eventually, a day presented itself, with a steady South East wind of around 12 – 15 kph. Beautiful, warm weather and no other flyers, made for a perfect opportunity. The First + penetrated very well, and maintained a good amount of inertia, to perform snappy aerobatics and rock-solid flying. It is very eye

catching and a welcome change from the usual sight of foam combat wings. High speed dives and passes, had both visual and aural appeal, with the wind whistling off the wingtips. This model is definitely a keeper! Pay attention to your landings, because if a tip digs in and the glider slews sideways, you will most likely end up with a cracked wing seat or broken wing bolts. Don't ask how I know.



Peter McGregor getting ready to launch the First +. Goes great.

Evaluation

The First + is a well-designed and engineered kit. It builds into an excellent flying glider in a very short time. It is equally at home at the slope, or on the flat field as a thermal duration sailplane. The quality and completeness of the kit is exceptional, and the flight characteristics are very honest. If you are looking for a glider with good looks, ease of assembly, and solid performance, the First + is the sailplane for you.



Three Firsts at a 2M glider contest. They are winning all over the country.

Specifications:

Wing span: 1970mm

Length: 1136mm

Weight: 800g (mine came in at 960gm, flying weight)

Wing profile: SD7037/7012

Radio used: JR 3810

The new FIRST+, now features winglets as standard.

Model can be converted to electric using 480 to 600 type motors. Electric version nose is provided in the kit.