SIMPROP ELECTRONIC

Building Instructions
for Order No. 031 824 8

SOLUTION XL

TECHNICAL DATA

Wing span	approx. 157.7 ins
Length	approx. 65.2 ins
Wing area	1180 sq. ins
Aspect ratio	21.1 : 1
Tailplane area	124 sq. ins
Wing aerofoil section	HQ-Profilstrak
Tailplane aerofoil section	NACA 0009
Flying weight	from 8 lb. 6 oz
Wing loading	from 16.35 ozs/sq. ft
R/C functions	Elevator, rudder, aileron, flap, tow coupling, retractable undercarriage (optional), switch or controller if electric drive used.

INTRODUCTION

Dear SIMPROP customer,

With the kit for the new SOLUTION XL you have acquired one of the most modern and highly developed sailplane models of the 4-metre class. Its looks are based on our success model SOLUTION which had a 2.7 m span, however, the XL is a successful compromise between modern functional aerodynamics and forward-looking design which will also delight the aesthetes amongst the sailplane pilots. The SOLUTION XL kit in front of you has a set of parts of the finest, from the largely pre-built main components to the complete fittings and accessories (incidentally, everything 'Made in Germany') and makes your dream come true of the elegant sailplane in the shortest time.

The new SATS (SIMPROP Artificial Turbulence System) gives the lowest air resistance, above all in slow flying, and is supplied by us for the first time in a model kit.

The great strength of this model, which will certainly captivate you, is its flying. The total handling of SOLUTION XL, from the start to the landing, is so agreeable that you can concentrate on the actual flying, the struggle to stay up there and so reveal the full potential of the model's outstanding performance. You will learn to appreciate the fully problem-free use of the flaps and the stabilising effect of the winglets in banked turns. You can easily build an electric drive into the model due to the roomy fuselage and the low structural weight.

What is SATS?

The **S**improp **A**rtificial **T**urbulence **S**ystem, SATS for short, increases model performance by improving the airflow over the upper surface of the wing. Because models have a relatively short wing chord and low flight speeds, many of them have a laminar 'bubble' on the upper side of the aerofoil. About the first third of the chord has laminar flow and so a low flow resistance. After that the laminar flow breaks away in the pressure rise area and so does not flow along the contour of the wing any more - producing a laminar bubble. The flow over the bubble is usually turbulent, joins the contour again for the last third of the chord. This effect is visible if condensation is present on the wing during the flight. If a laminar bubble is present, the moisture is not blown away by the air in the middle third of the chord as the flow has already broken away from the surface while at the end of the flight the rest of the wing is dry. As the air flow does not follow the contour of the wing there is a drop in performance.

This is where **SATS** comes into play - just before the flow becomes turbulent at the bubble. This is done by blowing air through holes in the upper surface of the wing. The holes get their air from two inlets in the fuselage which in turn are fed by the impact pressure of the air there. The turbulent flow can now counter the pressure rise without breaking away from the surface. The form of the intakes and the pressure conditions on the wing upper surface have the effect that the turbulator brings the best results in slow flying with a high angle of attack, whereas at higher speeds, where there is normally no bubble anyway, there is virtually no effect.

Braking

The model has a very flat gliding angle because of its the high-quality aerodynamics. For braking on approach the flaps and ailerons are used in a 'butterfly' combination, i.e. the flaps are lowered and the ailerons are raised. The aileron function can still be overlaid on this. Experience has shown that an elevator movement (see section 'Control Surface Throws') should be mixed to this to avoid having to 'force' the model down.

Mixing Combinations

Modern R/C, especially computer units, allows a multiplicity of settings and mixing combinations. The combinations below shown with a * should certainly be used for SOLUTION XL:

*flap	in aileron	(aileron throw in same direction as flaps)
*brake	in aileron and flap	(butterfly brake with ailerons and flaps)
*brake	in elevator	(trim correction for butterfly brake)
flap	in elevator	(trim correction when flaps have been lowered)
aileron	in rudder	(for well-balanced control in banking)
*aileron	in flap	(carries the flaps with them when moving the ailerons)

Thermal Flying and Banked Turns

Professionals don't normally use a mixer 'aileron in rudder' to fly a clean banked turn. They operate ailerons and rudder separately by hand and so have exact and sensitive control of all flight manoeuvres at any time. This also makes it possible when turning in thermals to avoid the roll tendency (slight, however, with SOLUTION XL) towards the centre of the turning circle by setting the ailerons 'against' the turn.

We recommend less experienced pilots, however, to use an aileron in rudder mixer for these manoeuvres. If the ailerons are moved the rudder is then moved in the same direction. This effectively opposes the annoying roll turning moment and gives a clean banked turn. This mixer must, however, be switched off during the flight for many aerobatic figures.

Visibility at great Height

Unfortunately it happens only too often that the flyer can't see his model any more when it is at a very high altitude. You should not tow your model so high or let it climb to such an altitude, that the visibility can no longer be guaranteed. You can, however, improve the visibility by your choice of colour for the underside. A dark colour (dark blue matches the SOLUTION XL decals) is favourable in all weathers in which flying is possible.

Gliding with Lead Ballast

Each type of manoeuvre requires its particular flying weight so the weight of SOLUTION XL should be adjusted to meet the particular demand. We recommend for pure thermal soaring, especially in light thermals with updraughts close together, not to add any ballast.

For stronger thermals with widely spaced updraughts it is, however, sensible to load ballast to increase the gliding speed and so get more quickly from one updraught to the next.

You will also have more fun in aerobatics when you add ballast as the figures are more spacious and elegant when flown faster.

Ballast is also largely indispensable in slope soaring and in high winds. The extra ballast should not, however, be more than 2kg for structural reasons.

FITTINGS & ACCESSORIES

R/C unit	at least 4 channels, computer unit if possible
4 off wing servo	mini servos - maximum 16 mm thick

2 - 4 off fuselage servo	standard servos - number depends equipment
Universal tow coupling	Order no. 100 279 1
Shrink film, 5 metres (if single colour)	

Electric Drives

SOLUTION XL is outstandingly suited to electric drive because of its capacious fuselage and low structural weight. The motors which come into question should have a shaft power at max. efficiency of about 350 watt. You can use either direct or geared drives. To keep the motor current within sensible limits, use battery packs with at least 16 cells but with 24 cells at the most. In choosing the propeller you should lay emphasis on a dynamic, flowing climb characteristic, i.e. rather a greater pitch and faster forward speed than 'hanging' on the prop.

Recommended Types of Glue

Epoxy adhesive 10 mins 20 gm	Order no. 110 410 1
Cyano extra thin	Order no. 110 403 9
Cyano medium	Order no. 110 400 3
Cyano extra thick	Order no. 110 351 2
Activator spray 150 ml	Order no. 110 356 3
White wood glue, e.g. Ponal Express 120 gm	Order no. 110 362 9

Important: **you must roughen (sand) the surface of the GRP fuselage before applying adhesive**

You'll find the adhesives from Henkel and Simprop in our main catalogue.

Preparations for building

Before you start building you should check the contents of the kit against the parts list and study the plans and instructions. Number the die-cut parts with the help of the plans, photos and the parts list. After that carefully press the parts out of the sheets and trim them with a sharp knife.

Separate the connected GRP parts 26 to 28 with a metal saw or similar.

Please remember that we can only accept complaints before the parts have been worked on, not afterwards.

BUILDING INSTRUCTIONS

Part 1 Fuselage

Drill the following holes and make the following openings in the fuselage:

- forward mounting hole for the tailplane, 6 mm dia.
- hole to allow the elevator push rod to pass through the tailplane seating
- marked holes and openings in the seating for the root ribs:
    - holes for taking the steel wing braces, 13 mm dia.
    - holes for SATS, 12 mm dia.
    - elongated hole for servo cable (Fig. 1)
    - forward locating hole 5 mm dia., then countersink
    - rear locating hole 4 mm dia., then countersink.

- Open up the SATS inlet ducts (Fig. 1). Mask off the surrounding area, drill a pilot hole and open out the rear surface carefully with a needle file.

SATS Inlet Ducts

Cut out the vacuum formed parts 15/16 (air ducts) where marked and roughen the circumference to be glued. Once you have roughened the corresponding surfaces on the inside of the fuselage, glue the ducts to the fuselage with thickened epoxy using the drawing and Fig. 1 as guides. Use microspheres or cotton wool flock to thicken the epoxy and apply the epoxy in 'caterpillar' form along the entire surface to be glued. Once the epoxy has hardened check for leaks and re-do where necessary. Check that the holes which take the wing brace are still free; file if necessary. Glue the sealing rings 32 around the holes for the air ducts in the wing root seating.

Wing Retention

Take a small needle file and file notches at right angles across the retaining tube 19 as shown in the drawing and Fig. 2. Push the positioning rings 20 on to the tube 19, screw grub screws 18 part way into the rings 20 and position the rings on the tube 19 so that the screws can fit into the notches. Screw in the grub screws 18 and check the alignment of rings and screws. Soft solder the rings 20 to the tube 19. Degrease the unit and thoroughly roughen the ends of the tube. Now file one of the forward locating holes (5 mm dia.) from the inside in the forward direction so that the retaining tube can be fitted in if it is held at an angle. Make sure, however, that the diameter of the hole that has been filed from the inside does not change on the outside of the fuselage at the wing root seating. Roughen the other forward locating hole from the inside. Lead the retaining tube 19 into place from the inside, align according to drawing and glue carefully in place with epoxy. Once the epoxy has hardened, loosen the grub screws a few turns and check that the locating pins 53 fit into the locating tube. If need be, use a needle file or 4 mm drill to remove any snags.

R/C Tray and Elevator Servo Mount

To avoid ruining the immaculate white fuselage we recommend putting the receiver switch on the R/C tray 5. Make a cut-out in the tray to take the switch you have selected.

Glue part 6 at right angles under part 5. Fit both parts in the curve of the fuselage so that they can be glued in position as shown in the drawing (Fig. 1). The tray 5 has room for 3 standard servos. The rear servo in the middle controls the rudder, next to it is room to install a servo for a retractable undercarriage. At the front there is room for a tow-coupling servo.

Trial fit the elevator servo in the servo mount 7. Make sure that the servo can still be removed from the mounting once the gluing has been done. Assemble the elevator push rods from the parts 29 to 31. If necessary, modify the servo disc to be used so that it does not come in contact with the sides of the tailfin. Attach the push rods and glue the servo mount 7 (with servo in place) in the fuselage (Fig. 3). The push rods should be free to move without being under strain and should protrude through the hole in the tailplane seating. Sand the guide block 9 to a thickness of about 2 mm and glue into the fin (see drawing). Bend the top end of the elevator push rod 30 as in drawing. Glue in the end piece 8 at the bottom of the fin only when all adjustments to the elevator servo and push rods are complete.

Canopy

Fit the carbon fibre canopy 2 exactly to the fuselage. It has to sit snugly in the recess over the entire length of the mating surfaces. Sand where necessary to improve fit. Bend the canopy locking wire 17 so that it has approximately the curvature of the canopy. At the front (about 65 mm from the front edge of the canopy) bend the piano wire slightly away from the canopy as shown in the drawing and Fig. 1. At the rear bend the wire "into" the canopy so that it is slightly pre-tensioned and let it protrude about 5 - 10 mm beyond the edge of the canopy. Roughen the surface of the wire at the glue points and glue the wire to the canopy with the two fixtures. Be careful to keep the glue to the area of the fixtures. Drill 3 mm holes in the front and back of the canopy seating in the fuselage to take the ends of the locking wire (use a round needle file to enlarge if necessary). Place crepe tape, or similar, on the inside surface of the canopy, left and right, on the areas as shown in the drawing and trim at the edge of the canopy with a sharp knife (Fig. 1). This protects the surface of the fuselage from scratching when the canopy is set in place. To put the canopy in place first set the locking wire 17 in the hole at the rear, lower the canopy over the recess in the canopy seating and slide towards the rear, set the front end of the locking wire into the front hole and slide the canopy towards the front until it clicks into the recessed seating.

Hi-start Hook

If you also want to start SOLUTION XL using a winch or a bungee then a robust hi-start hook has to built into the underside of the fuselage. The position of the hook should lie about 15 - 20 mm forward of the centre of gravity. Make sure you spread the load over as large an area as possible in the fuselage. If you are also installing a retractable undercarriage then the hook can be offset to the side. This has, however, the disadvantage that the model tends to break away to the side opposite to the hook, especially in the initial phase of the launch.

Towing Coupling

We recommend building the universal towing coupling (see under 'Fittings') in the fuselage nose. For this, drill a 5 - 7 mm dia. hole in the tip of the nose and enlarge using a round file till the coupling fits. Roughen the surface of the coupling and glue in place as shown in drawing. Make the actuating linkage and install in as straight a line as possible. The lever arm at the servo should be kept as short as possible to ensure a clean release even under load.

Part 2 Wing

The SOLUTION XL wing has been heat-pressed using the most modern engineering. It contains all the reinforcements, built-in blocks, drilled holes, machined slots as well as the complete mountings. The wing is light but high strength because of the addition of local strengthening and is designed to cope with all typical flight loads.

First sand the entire surface, including the wing-tips, rounding off any corners and edges as shown in the drawings and cross sections (Fig. 4 and 5).

Ailerons and Flaps

At the end of the V-shaped notch of each aileron/flap stick a pin through the wing from below. Lay the wing on the work bench, line up a steel rule with the pins sticking up and cut through the upper sheeting by repeatedly cutting with a sharp knife.

From the plan draw the end slits of the control surfaces cleanly on the surfaces and make < 3 mm wide slits with a fine-bladed saw. Sand flat the edges of the cuts in the flap/aileron and wing. Cut out the facing strips 52 for sealing the foam in the ailerons/flaps and the wing. Glue them in place and when dry sand flush, ensuring also clean, sharp edges at the corners (Fig. 4). Draw the positions (take from drawing) of the triangular shaped reinforcements 51 relative to the servo wells on the underside of each aileron/flap. Using a sharp knife, cut out the shapes from the control surfaces. Epoxy the reinforcements 51 into the underside of the ailerons/flaps and, when hard, sand flush with the surface (Fig. 5).

Locating Wing on Fuselage

The mounting of the SOLUTION XL wings is so designed that the only function of the steel brace is to absorb the bending moment of the wing. If it has been built in properly it should not come in contact with the fuselage. The link between fuselage and wing is made by two steel pins in each wing which carry the transverse forces to the fuselage.

Firstly deburr the steel wing brace 66 at both ends, if needed, so that it can fit easily into the corresponding tubes in the wing halves.

Make yourself a drill 300 mm long from 4 mm dia. steel rod and grind to the shape shown in the plans.

For the following work it is a great advantage to get someone to help you. Place one of the wings flush on to the fuselage. The wing brace should not touch the fuselage - if necessary enlarge the hole. Now feed your home-made drill through both of the rear location holes until it touches the wing rib on the opposite side. Whilst your helper holds the wing steady on the fuselage drill the rear locating hole for pin 53 in the root of the wing. Roughen the surface of the pin up to 10 mm from one end and epoxy the pin in position (see drawing and Fig. 6). Once the epoxy has hardened get your helper to place the wing again exactly in position flush with the fuselage and drill the hole for the forward locating pin 53 using the retaining tube 19 for access. Epoxy this pin also in position and once hard place the wing again in position on the fuselage. Now place the second wing in position and align with the first. Mark this position; you and your assistant should now proceed with this wing as for the first. Tighten the grub screws 18 to hold the wings securely to the fuselage.

Hint:

After a very hard landing or similar stress check that the locating pins 53 are still sitting correctly in the wing roots.

Part 3 Tailplane

Roughen the tailplane seating from the inside for the gluing of the retaining press nut 25. File the nut flatter if necessary until it can lie in the correct position under the tailplane seating. Roughen the surface of the nut, place the tailplane 45 in position and screw down with the fixing screw 47 (grease the screw first to prevent it picking up any epoxy). Now epoxy carefully around the nut. Once hard, align the tailplane with the wings and drill carefully through the tailplane (in position and aligned) the hole for the locating dowel 46 in the fuselage. Remove the tailplane and cut out the elevator using the same method as for the ailerons/flaps in the wings and seal the open ends with the facing pieces 52. Now glue the locating dowel 46 into the tailplane and, once hard, sand flush with the upper surface. Hinge the elevator provisionally to the tailplane, mount the tailplane on the fin and mark on the underside of the elevator the position of the control horn 56. Cut a slit there in the veneer and the foam, roughen the horn surface and epoxy in place (see drawing). Do the necessary adjustment work on the push rod and servo disc and then close off the aperture by gluing in the part 8 (see plan).

Part 4 Rudder

Cut the hinge pin 39 to length as in drawing (260 mm, incl. thread). Solder the capping piece 40 flush on the non-threaded end of 39 and saw a screwdriver slot in the end. Sand the upper face of the grooved strip 36 at a slant to fit. Grease the threaded end of the hinge-pin 39 and then feed into the bearing tube 34 which has been shortened (231 mm) and roughened on the outer surface. Screw the sleeve 38 on to the pin 39. Lay this assembly in the groove of the strip 36 - the end with the cap 40 should protrude about 0.8 to 1 mm beyond the bevelled end of 36 (see drawing and Fig. 8). Epoxy the bearing tube 34 and sleeve 38 carefully to the grooved strip. Once hardened, screw out the hinge pin. Glue the strip assembly to the rudder 35, ensuring that they are flush at the top and in line (the hinge must be aligned centrally with the rudder). Once the joint has hardened, sand the bottom end of the strip 36 flush and remove anything at the side which stands proud with a balsa plane. Make the cut-outs in the rudder and grooved strip for the rudder horn 27 at the lower end of the rudder. The rudder horn must fit flush, at right angles and centred (both holes must be in line with the centre of the groove), do not, however, glue in the rudder horn just yet. Glue on the lower edge 37 of the rudder and, once hard, sand to shape (see drawing and Fig. 9). Cut out the facing piece 52 for the top edge of the rudder larger than required and drill in it a hole (3.5 mm dia.) for the rudder hinge pin 39. Screw the hinge pin into the rudder - so far that about 5 mm protrudes at the top. Lay the facing piece 52 over the end of the hinge pin and glue to the rudder. Sand away all superfluous material and sand the leading edge of the rudder to its rounded shape.

Sand out the inside of the tail fin, at top and bottom, to a half-round shape to take the rudder, also the cut-outs for the free movement of the rudder horn 27 as in plan and Fig. 3.

Saw a slit (2.2 to 3.0 mm wide, 16 mm deep) at right angles in the leading edge of the rudder to take the bearing 'tabs' 26 as in drawing. Roughen the surface of the rudder horn 27, slide into the cut-out, adjust till centrally placed and epoxy in place.

Rudder Hinges

Slide the hinge 'tabs' into the rudder and screw the hinge pin 39 in place. Position the tabs to point towards the back strip inside the rear of the tail fin and make the cut-outs in this strip to take the tabs. trial fit the rudder with the tabs in the fin to check the position. Shorten the tabs so that they only extend 5 mm into the strip in the fin (important for the free movement of the elevator push rod). Thoroughly roughen the tabs and, with the rudder fitted, epoxy in place. Ensure that the gap on both sides of the rudder is equal and large enough for a 40° throw on both sides.

Rudder Actuation

Make the rudder control wires from the parts 21 (cut to length when the servo selected has been installed), 22 (solder directly to the wires at the back) and 24. Screw the locking nuts 23 and clevises 22 on to the solder sleeves. Once these have been adjusted, secure the forward clevises 22 by turning the locking nuts backwards.

FINISH

The fuselage is white, self-coloured and has a highly polished finish. Painting is not necessary and not recommended. We recommend Oracover adhesive film for covering the wood parts. Before you cover brush the parts twice with grain filler, sanding between applications (grade not rougher than 180) when dry. Carefully remove dust after each sanding. To apply the film, first remove a small piece (about 10 cm in wing span direction) of the protective paper from the rear side, line up carefully the film over the area to be covered and press on the film which has had the paper removed. Now remove the protective paper from under the film, step by step, and rub on the film by hand or with a soft cloth. Iron on the film only at the edges. Now apply the decals. Cut out cleanly the individual motifs and lettering. The illustration on the box can be used as an example for the positioning of the decals. Wipe afterwards with a soft cloth to remove air bubbles.

Turbolator holes

The outlet holes of SATS are drilled in the upper surface of the wing after the covering is complete. Make for yourself several drills 30 to 40 mm long from the wire 67 supplied (0.8 mm dia.). It is an advantage here to make these drills in the form of a screwdriver, i.e. grind only two flats so that the point is straight and at right angles. The aim is more to machine out the holes rather than drill them. Commercial drill bits are therefore not suitable. Problems arise especially with the film covering as normal drill bits penetrate very quickly and tear the film. The following method machines clean, circular holes using a straight cutter. It is also important to machine with as high a speed as possible, so use a high-speed mini electric drill.

Mark the positions of the holes with a very fine waterproof felt-tip pen (see drawing). Stick a strip of transparent self-adhesive tape over the entire row of holes.

Now drill the holes at an angle of about 5 - 10° (see drawing) so that, when in operation, the air is directed a little to the rear. Once all the holes have been made, pull off the adhesive tape carefully and at a flat angle. Now iron over the row of holes with a film iron to remove any surface roughness caused by the drilling of the holes

Make sure later when flying the model that no moisture gets into the holes as this can cause the veneer to swell. Use a sheet or special wing covers to protect the wings from rain.

Warning:

Do not use nitro thinners to clean the decals.

Final Assembly

Carry out all fitting and assembly work such as control surface hinges, push rods, r/c equipment and various detail parts as shown in the plans and figures.

Control Surface Throws

The values shown in the table below have been tested by us and, as an approximation, should be adopted at least as a start.

Elevator (up)	10 mm
Elevator (down)	10 mm
Rudder (to each side)	50 mm
Ailerons (up)	18 mm
Ailerons (down)	9 mm
Flaps with ailerons up	8 mm
Flaps with ailerons down	4 mm
Flaps (up)	2 mm
Flaps (down)	4 mm
Ailerons with flaps up	2 mm
Ailerons with flaps down	3 mm
Ailerons/brake flaps up	25 mm
Flaps/brake flaps up	maximum throw
Rudder with aileron	30 mm

All values , especially in mixing, are only first approximations. Final adjustments should be made after flying the model.

The change in trim when using the flaps was found in trials to be so small that we can make no recommendations on mixing of elevator(up)/elevator down.

Balancing

As the slightest inaccuracy in construction and deviation in the alignment can lead to a change in the centre of gravity, the SOLUTION XL is balanced for a C. of G. in the middle of the range. This is always non-critical for flying-in the model. The optimum position is determined after the model has been flown in (see FIRST FLIGHT).

Balance the completed model to get the C. of G. as shown in the plans. This is done for the sailplane by moving the ballast weights in the nose. For the electric version move the battery pack to get the right balance. Next check the balance about the longitudinal (roll) axis and correct any deviations by adding lead weights to the lighter of the two wingtips.

Instructions for the First and Subsequent Flights

After a successful check and length-of-flight test (for the electric version, with running motor) the first start can take place. The electric version should be started with the motor running by getting an experienced launcher to start it with a hefty swing of the arm or, alternatively, launch the model using a bungee with the motor off and only start the motor when the model is up to flight speed and freed from the launcher.

For the sailplane version it is best to make the first flight as a flight tow or from a slope. Allow yourself plenty of room at first and get used to the flight behaviour of your new SOLUTION XL. Test the air brakes at a typical approach speed, but before the landing, to avoid any nasty surprises.

To find the exact position of the centre of gravity observe the recovery behaviour of the model in flight. This behaviour depends on the interaction between the centre of lift and the centre of gravity at various speeds. We must emphasise that this is a fine adjustment method which does not work if there are any gross errors in construction or the mean position of the C. of G. has not been set correctly.

Trim the model to fast horizontal flight, then push the stick forward for a moment to bring the aircraft into a steep dive. Let go of the stick. The model is optimally adjusted when it recovers of its own accord in a long, gentle curve. If, on the other hand, the short push on the stick causes the model to climb sharply, the stability is too great and the C. of G. must be moved to the rear. Remove ballast from the nose (or move the battery towards the rear) and trim the elevator slightly lower.

If the model doesn't recover from the stick push or perhaps goes into an even steeper dive, immediately bring the model under control by pulling gently back on the stick. The C. of G. in this case is too far to the rear. Add ballast to the nose (or move the battery pack towards the nose). To get a noticeable result the changes in ballast should be at least 50 gm.

In the flights which follow test the behaviour of the model in slow flying and other flight patterns at a safe height to gain confidence in flying SOLUTION XL. A condition for safe, fast flying is that the control surface action is stiff and free from play. The faster you fly the more careful you should be, especially with the elevator, so as not to overtax the model beyond its structural limits (even if these are very high). For appearances sake aerobatics should be flown anyway with typical sailplane elegance; such a model is not suited to bustling around the skies.

The flaps have the function of adapting the curvature of the aerofoil to different flight conditions. Always lower the flaps when you want to fly slowly and with the lowest possible sink rate, e.g. leaving a thermal or slowly losing height by gliding to lengthen the duration of the flight as much as possible. The roll flexibility is slightly less in this state but for this SOLUTION XL can circle very tight and flat. The flaps should be in the neutral position when you are flying with average speed and want the best gliding qualities, e.g. to get from one updraught to the next. We recommend this position also for the start and for the landing approach. Only raise the flaps (less camber) when you want to fly very fast or in the inverted position. As the aerofoil has a relatively low camber when the flaps are in the neutral position, it is really only recommended to raise the flaps in the two cases mentioned above. Incidentally, the flying performance and quality when inverted and with the flaps raised are outstanding.

The more confidence you have in the model, especially with the use of the highly effective flaps, the more you will be able to realise the full potential of your SOLUTION XL.

Warning

If fitted with an electric drive and the motor is shut off the propeller blades must fold back immediately - so use switches, controllers or electromagnetic brakes to ensure this.

It is absolutely necessary when you are flying your models to observe the safety rules. Think about taking out a third party insurance and remember to get a licence from the postal authorities for the R/C transmitter. Read the instructions from the manufacturer of each of the fittings.

Adjust the centre of gravity by flying

a. trim the model to the horizontal on a fast glide path

b. bring the model into a nose-dive

c. shift the centre of gravity as in the sketch

ideal line, centre of gravity correct

nose-heavy, move centre of gravity towards the tail

tail heavy, move centre of gravity towards the nose

Parts and Spare Parts List for SOLUTION XL — Order No. 031 824 8

Part No.	Pieces	Description	Material	Dimensions and Spare Part No.
1	1	Fuselage	GRP, white	Finished part 031 320 3
2	1	Canopy	carbon fibre	Finished part 100 793 9
5	1	R/C tray	Model ply	Die-cut
6	1	Half-round support	Model ply	Die-cut
7	1	Elevator servo mount	Model ply	Die-cut Sheet A
8	1	End piece	Model ply	Die-cut 4 x 190 x 280 long
9	1	Guide block	Model ply	Die-cut for parts 5 to 10
10	2	Reinforcement	Model ply	Die-cut
15	1	Air duct, right	Plastic	Vacuum formed please enquire
16	2	Air duct, left	Plastic	Vacuum formed
17	1	Canopy locking wire	Steel	3 mm dia. x 415 long
18	2	Grub screws	Steel	DIN 913 M4 x 5 long
19	1	Retaining tube for wing halves	Brass	5 mm dia./4.2 mm dia. x 105 long
20	2	Positioning ring	Brass	Finished part 5.1 mm/12 mm dia.
21	2	Rudder control wire	Galv. steel	0.5 mm dia. x length; 1 pce 2500 lg
22	8	Clevis	Galv. steel	M2 100 002 0
23	6	Locking nut	Galv. steel	DIN 934 M2 103 360 3
24	2	Solder sleeve	Galv. steel	M2 / 0.8 mm dia.
25	1	Retaining press nut	Galv. steel	M6 x 9 mm 103 434 0
26	2	Hinge tab	GRP	Finished part machined GRP
27	1	Rudder horn	GRP	Finished part 2 mm
28	1	Elevator horn	GRP	Finished part 100 065 9
29	1	Locking nut	Galv. steel	DIN 934 M3 103 362 0
30	1	Elevator push rod	Galv. steel	M3/2.6 mm dia x 250 lg 100 016 0
31	1	Clevis	Galv. steel	M3 100 021 7
32	2	Sealing ring	PU Foam	Finished part 12/18 mm dia. x 2mm
34	1	Hinge bearing	Plastic	3.2/2.1 mm dia. x 231 long
35	1	Rudder	Foam/veneer	Finished part 031 704 7
36	1	Grooved strip	Balsa	15 x 30 x 300 long incl.
37	1	Lower edge of rudder	Balsa	17 x 30 x 115 long item 52
38	1	Threaded sleeve	Brass	M2 x 4 long

Part No.	Pieces	Description	Material	Dimensions and Spare Part No.
39	1	Hinge pin	Threaded steel	M2/2 mm dia x lg, 1 pce 800 long
40	1	Capping piece	Brass	3/2.1 mm dia x 14 long
45	1	Tailplane	Foam/veneer	Finished part 031 703 9
46	1	Locating dowel	Beech	6 mm dia. x 20 long incl. item 52
47	1	Tailplane fixing screw	Plastic	DIN 85 M6 x 25 long
50	Pair	Wing	Foam/veneer	Finished part
51	4	Triangular reinforcement	Birch	Finished part 031 197 9
52	21	Facing strip for control surface	Birch	1 pce 0.8 x 100 120 lg
53	4	Locating pins	Spring steel	4 mm dia x 40 long
55	8	Self-tapping screws	Galv. steel	DIN 7971 B2.2 x 6.5 long
56	4	Control surfacc horn	Plastic	15 mm 050 832 2
57	2	Flap push rods	Threaded steel	M2/1.7mm dia x lg 1 pce 140 lg threaded both ends
58	Pair	Flap servo well covers	Plastic	Vacuum formed 100 398 4
59	2	Aileron push rod	Threaded steel	M2/1.7mm dia x lg 1 pce 140 lg threaded both ends
60	Pair	Aileron servo well covers	Plastic	Vacuum formed 100 395 0
66	1	Wing brace	Spring steel	12 mm dia. x 320 long 031 459 5
67	1	Wire 'drill'	Spring steel	0.8 mm dia. x 500 long
	1	Set of decals	Plastic film	self adhesive 170 349 8
	1	Set of plans, with building instructions		
		not included in kit:		
70	10	Tape hinges	Plastic	self-adhesive, 25 x length 1 pce 7240 long 110 455 1

All dimensions are shown in mm unless otherwise stated.

Simprop Electronic wishes you lots of fun and successful flying.

January 1997

Simprop Electronic, Ostheide 5, D-33428 Harsewinkel