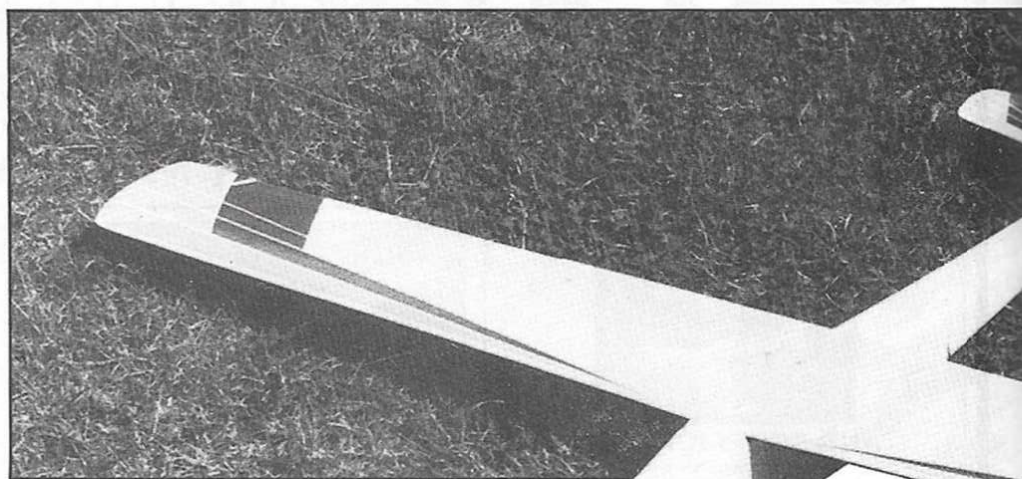


FROM the outset, Live Wire was designed to be aerobatic, yet it had to be easy to fly and with a good glide performance. In this last respect it would make an excellent aileron trainer, and a quiet one, too!

There is no need for expensive motors or mini radio. Indeed, the prototype flies extremely well with a Graupner Speed 600 motor and an 8 x 4.5 folding prop, costing, in all, no more than £14 or so. As for nicads, I strongly recommend Sanyo SCR cells. Performance otherwise may be disappointing.

So – if smooth, silent aerobatics take your fancy, let's get cracking!



Live Wire

**Sparks fly with
Jason Carroll's 59"
electric stunter**

First the fuselage

Select two firm sheets of similar-grade 1/8in balsa for the fuselage sides. Spot glue the sheets together and cut them as one, to give identical components. Now draw onto the sides (one left, one right!) the position of formers and floor support rails. Next glue the 1/2in and 3/8in triangular lengths to each side.

Formers F2 to F5 are cut from Lite-Ply. Cut F1 from birch ply, for this has to take the weight and torque of the motor. Glue F2 and F3 in position on one side using a set-square to ensure accuracy. F4 and F5 are next. Note the angles on the top, plan view.

Add wing seat doublers and 3/16in rails, followed by the elevator snake 'outer'. At this stage you may wish to fit a second snake tube for the receiver aerial.

Now glue the sides together at F2 and F3, trapping the Lite-Ply sheet floor between them. Don't forget this, as it will be impossible to fit later. Fix F1 in place with plenty of adhesive; pull the fuselage in at the nose, check for accuracy and hold together with clamps or rubber bands until the glue is dry. Now join the fuselage at the tail, gluing F4 and F5. Top and bottom fuselage sheeting is fitted with the grain running lengthways. Add the 1/8in sheet tailplane seat.

This is the time to transform the box in front of you into a smooth, sleek fuselage. The cross-sections on the plan show how. Templates will help. Be careful to not remove too much balsa as this will weaken the structure.

Face F1 with 1/8in sheet and F2 with the 1/32in ply wing peg support. Don't

omit these as much strength is added. Now fit the wing seat LE spacers.

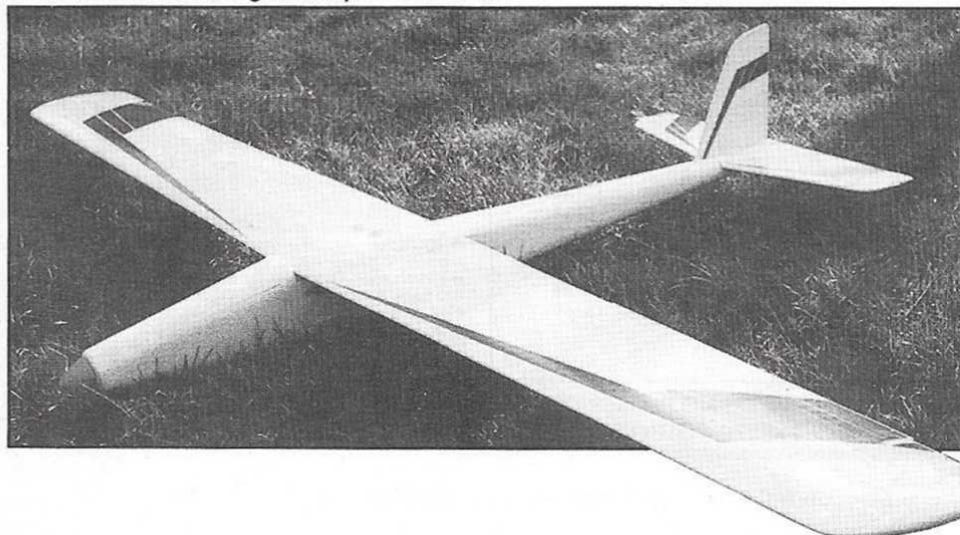
The top hatch and nicad bay hatch are cut away as shown on the plan. The latter is retained by two ply tabs and screws; ply plates in the fuselage will allow threads to be cut. The result is easy access, allowing you to change packs very swiftly indeed.

Finally, glue the wing bolt shear plate under the wing seating. The holes for the nuts will be drilled later.

Tailfeathers

Tailplane and fin are very simple. If you select a good grade of light but firm 3/16in balsa there's no need for anti-warp inserts. All edges are simply

The Live Wire's sleek lines ensure a good glide performance. Leave off the motor and it would make a good slope soarer too!

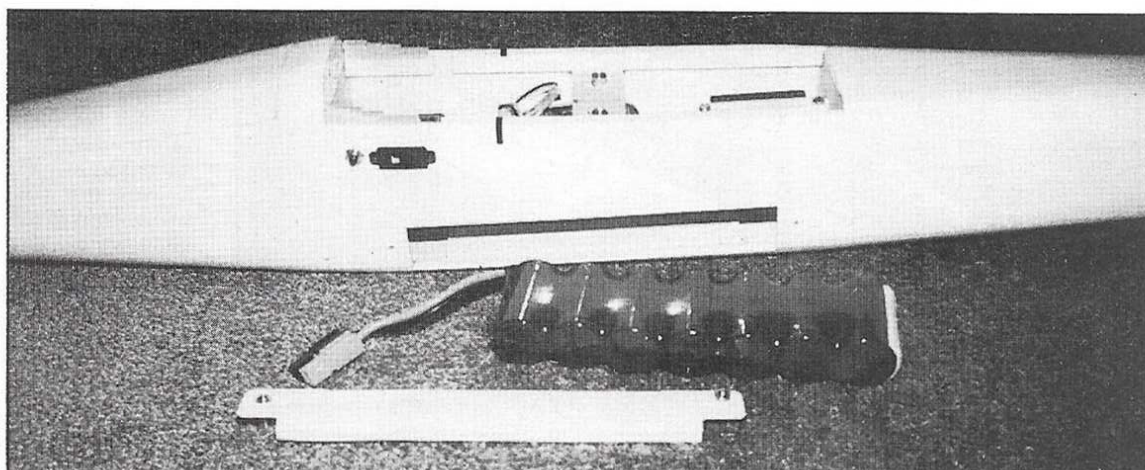




sanded round, the elevator LE being angled. This allows 'top hinging' with tape after covering. Fin fillets are from scrap balsa.

The lifting force

The wings consist of a traditional D-box with capstrips and sheeting. Build panels separately and then join. There is no washout.



Changing over batteries is a simple matter thanks to the easily accessible battery bay.

Ribs are made by the sandwich method which is clearly shown on the plan. Cut the spar slots with a razor saw while ribs are still packed together. Now drill the holes in the ribs for the Bowden cable tubes.

That's the time-consuming bit over and done with; now it's all straightforward. Glue the bottom LE sheeting, TE sheet, centre section sheet, aileron cable exit sheet and cap strips in place over the plan. Glue and pin down the 3/16in bottom spar. Now pack up the LE sheet with 1/8 x 3/8in TE section (this will later be used to face the ailerons).

Fix each rib squarely in position, checking that the LE sheet is stuck firm. The root rib is angled at two degrees with the aid of a card template. Now glue the top spar in place, followed by LE balsa infills which will later support the wing pegs.

Glue the top LE sheeting, centre section sheet, cap strips and TE sheet in place. Chamfer the lower sheet to



Live Wire should climb effortlessly into the sky. Keep the climb-out shallow and when you have enough height check out the stall. Unless you're really heavy handed she just mushes, and even then rarely tip stalls. I'm sure that you'll be surprised at how slowly she can fly.

Now that you've flown around for a while, shut the motor off and try the glide. Hardly any trim change is needed

achieve a thin trailing edge. Glue in place the 1/4in pre-shaped LE and tip block. Carve and sand the wing smooth.

Repeat for the opposite wing panel, but omit the centre section top sheeting for the moment.

The ailerons have been extended by one rib spacing on the plan. The prototype would have benefited from this for aerobatics.

Next cut the ailerons away from the wings and add the 1/8 x 3/8in TE facings. Fill the aileron ends with 3/32in balsa.

To join the wings lay one flat on the board and pack the other up by four degrees at the tip. Thoroughly glue the mainspar brace and two rear braces to the wing bolt support block. Now add the top centre sheeting and sand smooth. You can now put the wing on the fuselage and stand back and admire your craftsmanship!

Next cut away the lower centre LE sheet and ribs for the servo bay. Fabricate the servo mounting and trial-fit the servo. Fit the inset aileron horns (Micro Mold are ideal) and route the cable through the wings. Connect up using screw clevises. Once you are happy with the set-up remove the servo and linkages.

Now fit a 1in fibreglass or ribbon bandage around the wing joint with PVA. Note that it continues under the LE to support the wing pegs.

Drill out the LE for the 3/16in dowels, noting their downward angle. Glue these in place. Offer the wing LE to F2 and mark the position of the wing pegs on it. Then drill holes.

Mark the position of the wing bolt holes and drill through the wing blocks at right angles. Re-fit the wing to the fuselage and drill through the shear plate. Now fit the spike nuts under the plate and check the bolts connect freely through the wings before glueing the nuts in place.

Cover-up time

You can use whatever method you like for covering, but try and keep it light.

The prototype was covered in white Solarfilm, with the hinges for ailerons and elevator being Scotch magic tape top and bottom.

If the wood used on the fuselage is a bit soft, then a thin coat of Balsaloc will protect it from dents and digs. It also adds strength for very little weight.

The fluorescent stripes on the wings and tail are Ikarus Dekofilm self-adhesive

patterns. They're surprisingly light and can help orientation enormously during 'unusual' (who said unintentional?) aerobatic manoeuvres!

Radio installation

Any standard radio control equipment with three or more functions will fit, although I would suggest using a 250mAh receiver nicad as this not only saves weight, but also helps to maintain the CG position.

The servos are located between spruce blocks and held by 1/16in ply braces and screws. Avoid using servo tape (for speed of installation) unless you never intend to remove them again! Metal clevises were used to connect up the elevator snake, whilst the aileron servo horn cable connector was a Graupner item. (Cat. No. 1177). It's very compact with a grub screw allowing cable adjustment. Of course, other methods of connection could be used.

The receiver, speed controller and 250mAh nicad are held in place with velcro; a thin coat of epoxy on the wood helps adhesion. Mount the switch inside the top hatch and route the receiver aerial along the fuselage.

Electrics

I've tried several motors in the prototype, and for overall duration and power a Graupner Speed 600 8.4v with an 8 x 4.5 folding prop has proved to be the most successful. The folding prop not only prevents bent motor shafts on landing, but also improves the glide performance. M3 x 8mm bolts are used to mount the motor.

Seven SCR cells (8.4v) were used in the prototype, but six cells could also be used. Don't be tempted to use cells that cost half as much, as they may only work half as well!

The nicad pack has an inch of movement either way in the fuselage, so you can use it to alter the CG position. Soft foam blocks stop the pack from moving in flight.

Flying!

For the first flights adjust the CG to the forward position and the control surface movements as per plan. This will give enough movement without making the handling twitchy.

Choose a day that's not too breezy and collar a friend to give you a handlaunch. She needs a fair heave to get going, but this doesn't mean throwing her like a pylon racer!

The Live Wire features a bolt on wing and is easily transportable. The neat radio installation in the prototype shows just how things should be done - but don't forget to unravel the aerial before flying!

and she'll fly around at a relaxed pace, losing little height. She responds well to light lift and you should easily get ten minutes airtime, without thermal assistance, by using bursts of power and glide.

By now it's probably time to land. Keep the speed up on finals and don't hold up elevator in for too long during a low turn. The speed may not look about to decay, but lift will!

No, I haven't forgotten about aerobatics. But it's better to try and manoeuvres after you've become familiar with the model. With a forward CG aerobatics are possible but a bit sluggish. So, move the CG back slightly, no more than 1/4in. If you still don't think that it's enough then you're on your own! Remember that with a rearward CG she'll fly faster, so the stall speed will also increase. You could increase the control throws, but I haven't found this necessary.

Loops, rolls and inverted flight are all easily achieved, as are most other manoeuvres that don't require rudder. Gain a bit of speed first by entering a shallow dive before any manoeuvres. Inverted needs about half down elevator to stay level, and a jab of down is needed as you go around a roll. You should get about six minutes duration from an aerobatic flight.

I have flown with a Kyosho 360PT and 7 x 3 folding prop which gave an improved aerobatic performance, and an increased climb rate. However, you lose a third of the duration. It all depends on the style of flying you prefer.

Well, as the weather men say, 'that's about it from me!' Have fun with your Live Wire, that's what it's designed for...

Technical specification

Wingspan	59in
Wing area	2.87sq/ft
Weight	48oz
Wing loading	16.1/2oz sq/ft
Wing section	Semi-symmetrical
Incidence:	
Wing	+2 degrees
Tail	0 degrees
Motor thrustline	-4 degrees