SUPER SICRO

Team

By Hans & Han

EUROPE'S TOP AEROBATIC PILO

3rd PLACE WORLD CHAMPS MO

THE World Championship model *Super Sicroly II* was specially designed for the F.A.I. aerobatic schedule. After doing well in the 1971 World Championships in the U.S.A. (4th place), I made a few changes to the original model and have been able to improve its performance. The resulting *Super Sicroly II* incorporates all I have learned about aerobatic R/C model aircraft and, looking back at the contest results, it could be said that it is the ideal model for the F.A.I. schedule. A speciality of this model is its performance in the roll (slow roll, rolling circle and quick roll), and the knife edge on either side. In knife edge flight the power of the motor is an important factor. Therefore, the model is designed for a powerful motor, although the model will still fly well with a less powerful motor. The landing characteristics of this model are really fantastic. With up elevator, it can land as lightly as a glider. There is no need to worry that the *Super Sicroly II* will stall without warning, it may drop its nose, or, at the worst, veer slightly to one side or the other but that's all.

In spite of its excellent and forgiving flight characteristics, I would not advise this model for the beginner. It is safer to learn to fly with a more appropriate model, but in the hands of an experienced contest flier, the *Super Sicroly II* is sure to unnerve the opposition. The schedule can be flown so precisely that even in a cross wind the effect of every gust can be controlled.

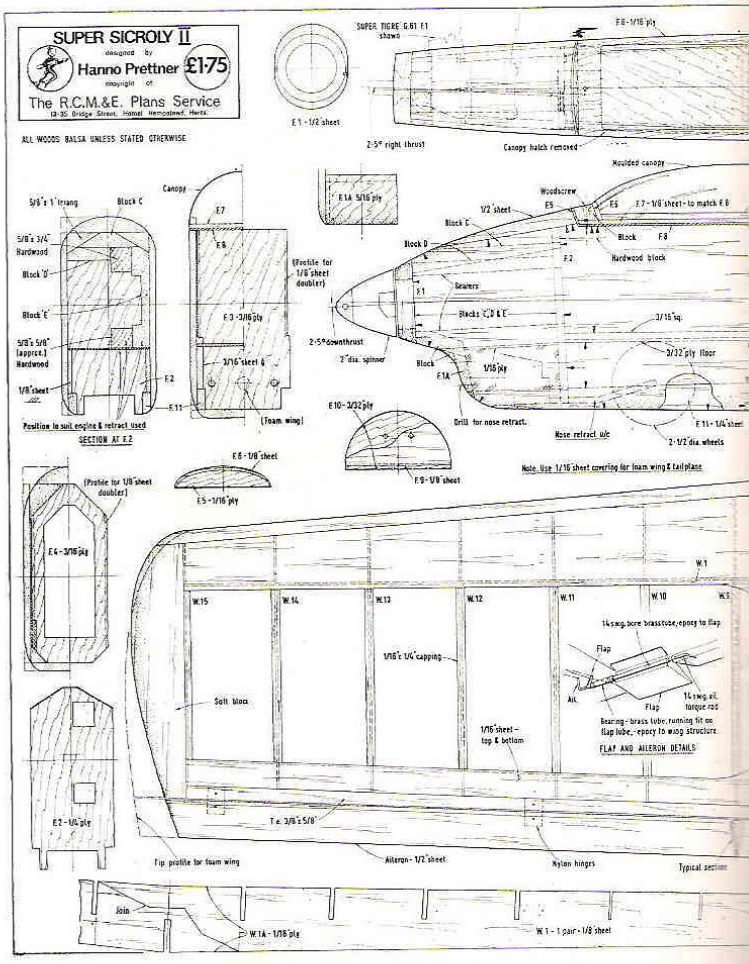
If possible, always fit a retracting undercarriage. This was planned and fitted in the prototype *Sicroly* and only by using this can one take full advantage of the model's aerodynamic qualities. I will start with some building hints; I am assuming that the builder already has some experience, and like most modellers, has personal building techniques that he swears by.

Building Hints

The *Super Sicroly II*, as previously mentioned, is by no means a beginner's model but on the other hand the plan is so explicit that any modeller with some experience will find the construction no problem. It is important that all the correct angles and dimensions are accurately measured and not guessed. Attention to this produces a stronger and better model.

Fuselage

Care must be taken to ensure that the fuselage sides and fin are built squarely. Every modeller has his favourite motor, so the motor mounting can be modified to suit any power plant. The same applies to the fitting of the retract gear. I suggest that the canopy hatch is made removable and the tank held in place by



Full-size copies of this plan, shown here at $\frac{1}{6}$th scale, are ava

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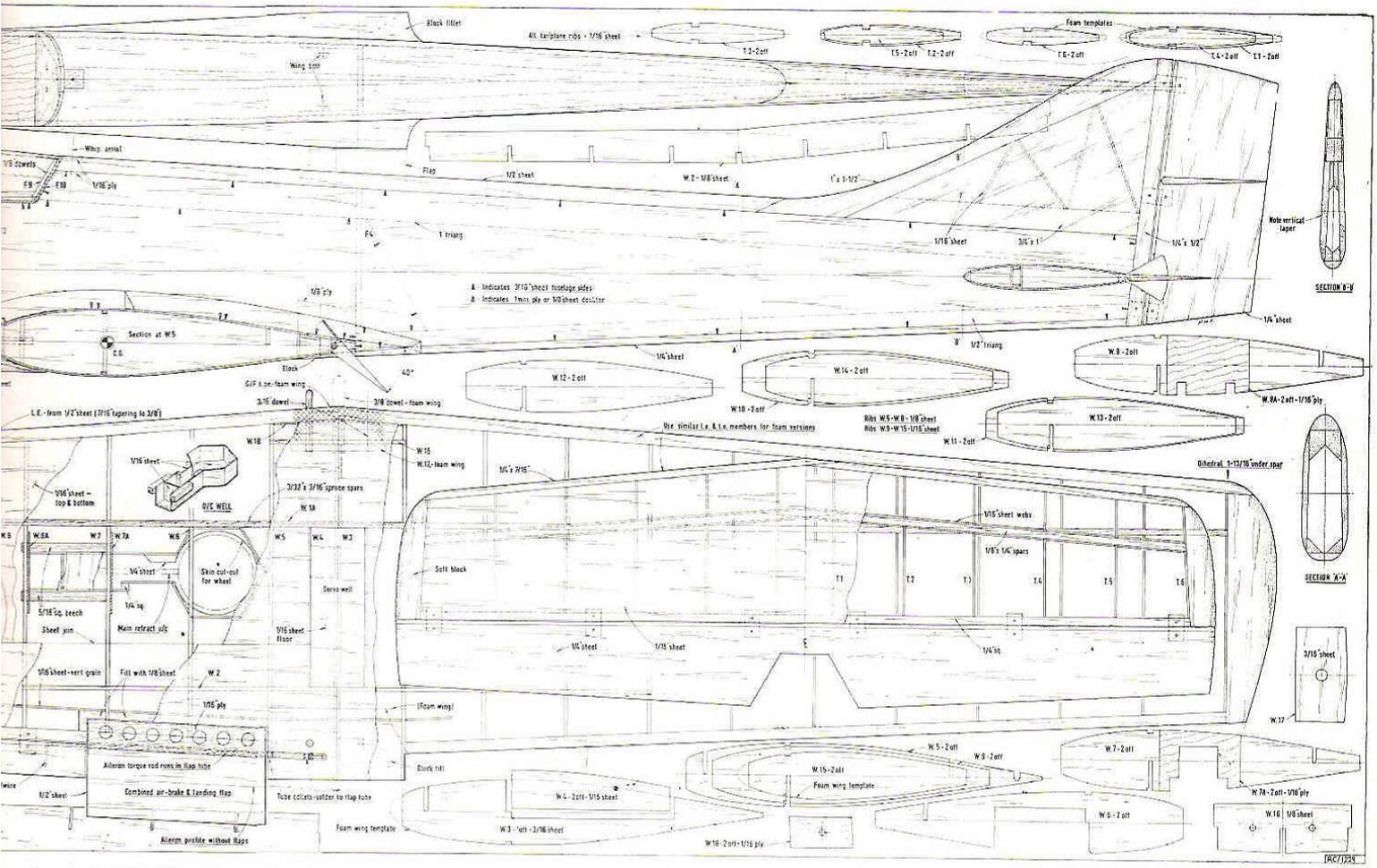
foam rubber packing. This enables any future tank problems to be easily found and corrected.

In the preliminary stages of fuselage construction, check that the fin and tailplane are 90 deg. to each other and at the correct angle in the fuselage. Take a thin piece of string (non-stretchable) and fix exactly along the centre line of the fuselage, from this mark out the exact position of the tailplane seating. Adjust the tailplane until it is exactly square in the fuselage. After this, the position of the wing should be marked out in a similar way. Measure and mark out accurately the shape of wing seating, taking distances from the fuselage centre line and tailplane. I need hardly mention that the centre line of the wing section must be parallel with the fuselage centre line.

The Wing

The accuracy of the wing is the beginning and end of a model. If you decide to build up the wings from balsa, then you need to take even more care over accuracy than with the fuselage, warped wings on R/C acrobatic models are highly undesirable! I always use wings made from expanded polystyrene foam, they have the great advantage that they do not warp or twist over a period of time. The retract gear is also very easy to mount. I simply glue two strips of spruce to the polystyrene and fasten the gear to these. The wing roots are glass-papered at an angle to give 45 mm. dihedral at each tip. Finally, when the wing halves have been glued together, a band of glass-fibre tape 15 to 20 cm. wide is applied around the centre. Take care that the ailerons blend into the profile of the wing thus avoiding unnecessary drag.



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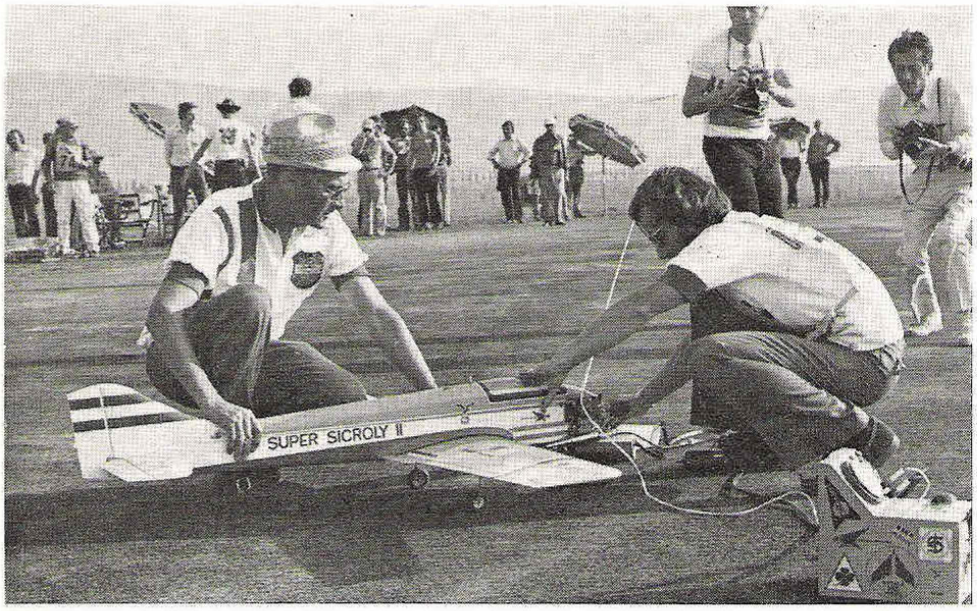
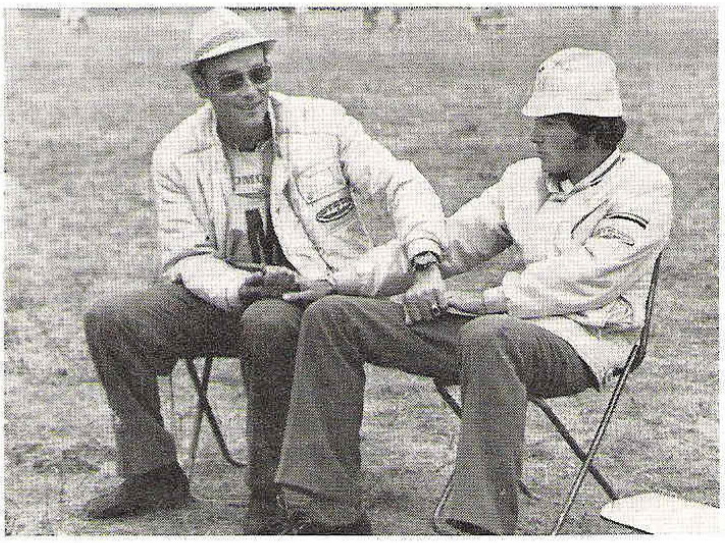


Right: two views of Hanno Prettner's flap system, showing units in retracted and depressed conditions. Note the drag strip which appears above the top wing surface when the flaps are depressed. Detail drawing bottom right. Below right: unique sighting wires on Super Sicroly, applied to elevator and aileron controls give immediate visual indication of trim state. Once the model has been accurately trimmed, the wires are applied to line up exactly.

Team Prettner in action at Gorizia. At left: father Hans holds Super Sicroly II while Hanno fires up the motor. Look closely and you'll see the chuck of the electric starter stuck to the spinner! Below: awaiting the fly-off at Gorizia World Champs – a little hand warming in cool morning air.



Tailplane/Elevators

I recommend that you build the tailplane as drawn on the plan (the same section root to tip). I have tried out various versions from very thick to extremely thin, but have had the best results with the one shown. Under no circumstances do I recommend a flat-plate tailplane, as this decreases flying performance. In all cases, I recommend the tailplane is built from polystyrene foam.

Finish

The fuselage should always be covered with tissue, as this increases the strength considerably. For the wings and tailplane I always use a heat-shrink film. Incidentally, I recommend that the upper and lower surfaces of the wings are different colours on the *Super Sicroly II*, for example, light blue and dark blue, like this, the altitude of the model in aerobatics is more easily seen.

Test Flying

Check that the centre of gravity is correct with the wheels raised. Check with the radio switched on and that all the controls are at neutral. The amount of control surface movement can be kept very small as the model is very responsive. With all these checks made, you are ready to start flying. Adjust the undercarriage so that when the model is resting on the runway the nose is pointing slightly upwards, the model will now take off with very little up elevator. With the model high in the air and the ailerons and rudder at neutral, check that the model is flying in a straight line. If it is not, then adjust the thrust line of the motor unit the *Super Sicroly II* flies and climbs dead straight If the model tends to turn when looping, inside or outside, note which way and put some weight in the opposite wing tip. When test flights have been completed and the model is flying correctly, all the control surfaces should be at neutral; if trim is needed, then there was some fault during the building.

That completes my instructions and hints for building this model. With practice, and a bit of luck, of course, you should soon have competition success with this top model; I am sure that you will want to build a second one!

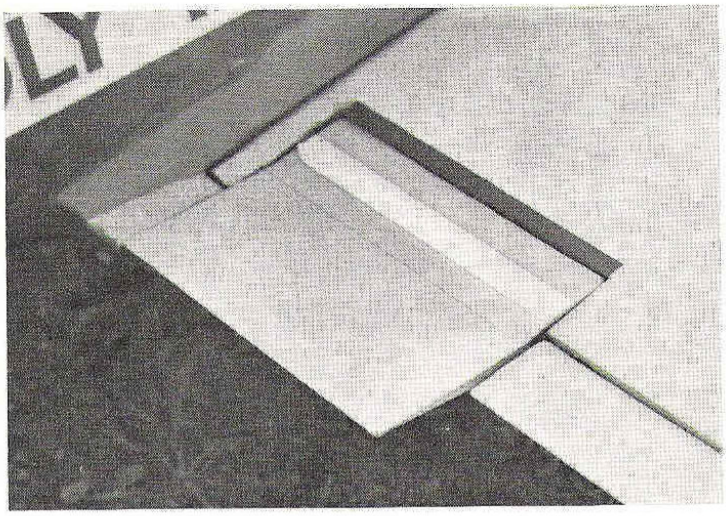
Instructions for built-up wing version

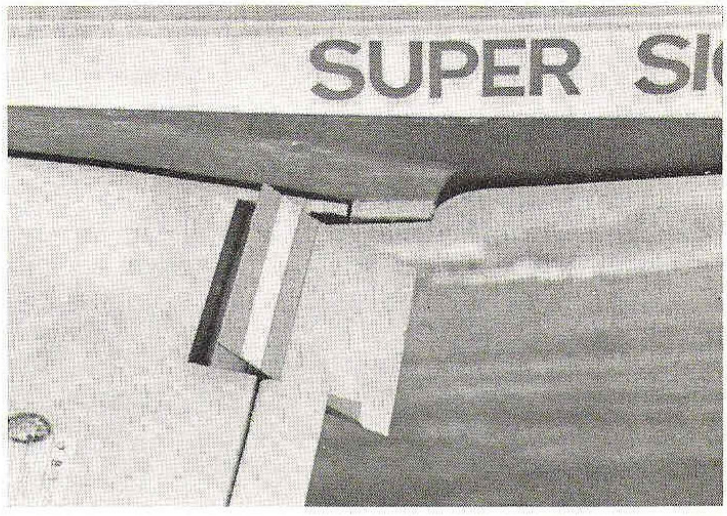
From his instructions it appears that Hanno Prettner always uses foam wings on this successful model. However, as we know a lot of fliers prefer the 'old fashioned' built-up wings, Peter Scherbaum from Vienna has written a separate description for this method.

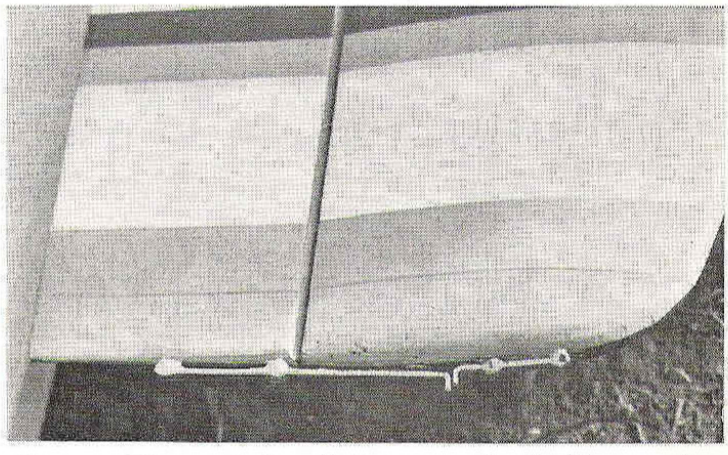
Provision has been made in the construction of the *Super Sicroly II* wing for fitting a retracting undercarriage. When the model is fitted with fixed gear the construction must be modified to suit. The recesses and mounting blocks are designed for the KDH gear. If another make is used, then the measurements must be altered to suit. Before we start to build the wing, cut out all the required parts and trim to shape. The ribs 9 to 15 are made using the sandwich method. The strengthening parts 7a, 8a and 1a are glued to parts 7, 8 and the main span before building starts. For this and the rest of the construction, PVA white glue is preferred. When all this has been done, we can begin by gluing rib 4 into the matching slot in the main span. The plan, suitably protected, should be laid on a flat building board and the span with the rib pinned down in place. The rest of the ribs can now be glued in place; do not be economical with glue! Care should be taken to ensure that the ribs are 90 deg. to the main spar. When the glue has set, the rear spar can be glued in place. The wing, still on the board, should now be examined for any signs of warping. The ends of the ribs should be exactly in line, if necessary, pack up or pin down. The leading edge and trailing edge are cut so that they protrude at least 1.5 mm. above and below the ribs. The upper and lower balsa sheeting will then butt up against this. The other wing half can now be built in the same way and the two carefully joined at the correct angle. The parts 20 from 1/16 in. balsa are now glued in place between the ribs. The undersides of the wing can now be checked and trimmed as required. Whilst the parts 20 are drying, the spruce upper spar can be glued in place, part 2. This spar should be carefully planed and sanded before the wing sheeting is added. At this point parts 17, 21, 22, 23 and 24 must be glued in place before wing sheeting can commence. If you are not worried about increasing the weight a little, the whole of the wing can be covered in sheet balsa. However, if the wing is built according to the plan, first sheet the section between the leading edge and the main spar. Then the rear section and finally the middle area. The glued parts should be allowed enough time to thoroughly dry before any further work is attempted. Preferably, leave the wings fixed down overnight. When the wing is really set and can be lifted without risk, add the spruce spar 3 to the other side and sheet as before. The tip blocks 31 can be glued in place and sanded to shape. The retractable undercarriage housings should now be carefully constructed, then the underside sheeting completed. Again, wait until the glue has really set hard before further work is carried out. When set the wing can be well sanded and the wheel recesses sanded to a circular shape (purely for appearance). Finally the wing dowels 25 are glued in place and the ailerons hinged. After the aileron rod has been fitted the groove in rib 5 and part 23 is covered in with a strip of balsa. The wing can now be covered with a heat-shrink film, this has proved to be the best, or almost as good as silk or tissue.

These novel combined airbrakes and landing flaps were designed specially for the *Super Sicroly II*. I used them successfully in the 1973 World Championships in Goriza.

Firstly, what effect do these flaps have on the model? While I did not want the flaps to create too much drag in the airstream I found that this can be useful in some aerobatic figures, for example, when spinning. With this flap arrangement, it is possible to increase the drag and achieve better control. One can feel,







more or less exactly, when the drag begins after lowering the flaps. The spin can be entered much more sharply and stopped quickly with the rudder. However, this is only one extra advantage.

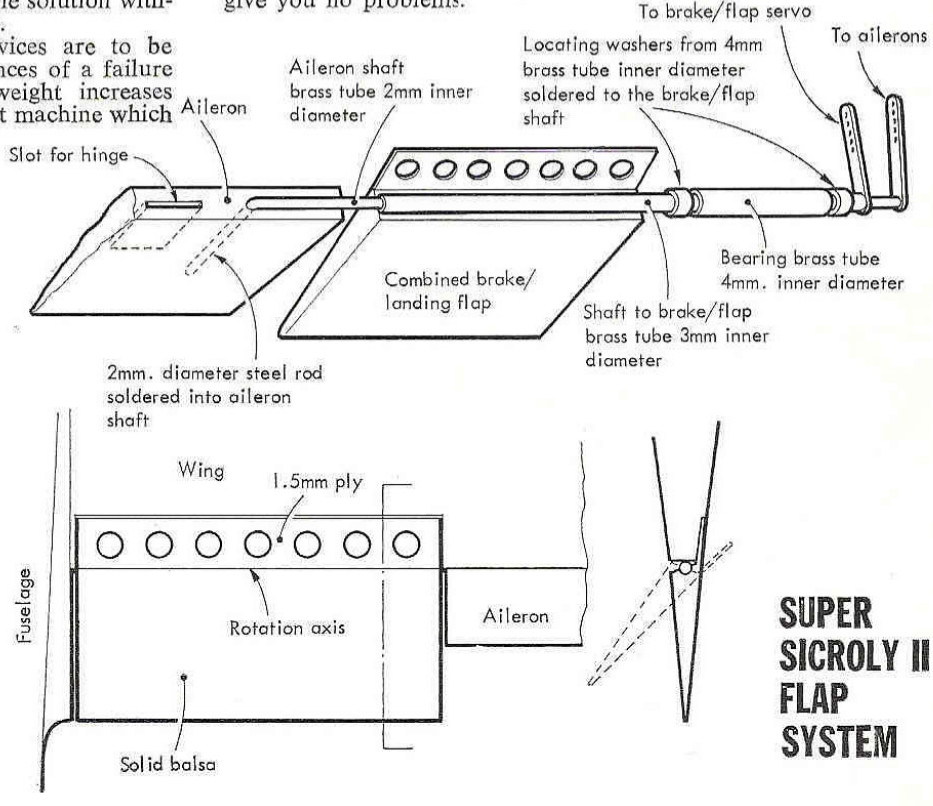
My first objective was for the flaps to assist landing, so that the elevator trim need not be altered. I can lower the combined air brakes and flaps at full throttle without the *Super Sicroly II* climbing or diving. However, you can produce a gradual climbing effect if you wish, the 40 deg. is only a guide. These flaps will not cause the model to climb or loop on its own, as happens with some flaps. This effect has been countered by the ply braking strip. This is 25 mm. wide, 5 mm. of which is glued to the balsa flap. Due to its air resistance, this strip stops part of the lift, yet allows the flaps to function properly. This extremely simple solution without technical complications is fantastically effective.

In my opinion, over-complicated technical devices are to be avoided, as I think, 1) that they increase the chances of a failure through malfunction, and 2) the total flying weight increases so much that one ends up with a technically perfect machine which is no longer suitable for aerobatics, because it is too heavy. It requires plenty of power to fly the new F.A.I. schedule and no extra weight can be carried even with motors as powerful as the Webra Speed, Rossi and HP.

But back to the air brakes and landing flaps. The landing speed is considerably reduced and one can fly higher on the landing circuit taking the final turn at no more than 2 m. above the ground. This realistic landing approach will give you, I hope, better points from the judges. That is, of course, as long as, while concentrating on your flaps, you don't forget to make the final turn! I have discovered one more effect of this brake/flap system. I have drilled 10 mm. holes in the ply strips and now the *Super Sicroly II* comes in to land as straight as a die without any tendency to veer. Why? My theory for it is as follows: the holes in the ply strip lie at the rear of the wings, behind the centre of gravity. The air is forced through these holes (like a jet nozzle) as the fully depressed flaps cause considerable resistance. Now the motor is pulling in front of the centre of gravity and the combined brakes/flaps are having a braking effect behind the centre of gravity. Hence this produces the same effect, only in a limited way, of a braking parachute steadying the flight path and stopping any tendency to veer.

Practical hints for making these flaps are hardly necessary as the diagrams are self-explanatory. However, here are a few points. The 4 mm. brass bearing tube is glued with epoxy into the wing. Check carefully that the ailerons and brake/flaps work freely and independently and that when the flaps are lowered the ailerons function correctly.

Finally, remember to check that you have the correct linkage to your servo to lower and lift the two flaps together (servo connected to give both push) both pull as opposed to aileron. Having done this, your first flight with the combined brakes/flaps should give you no problems.



SUPER SICROLY II FLAP SYSTEM