

SOPWITH PUP

PETER RAKE adds another electric powered, R/C scale model of a W.W.I. aircraft to his range, designed for three function control and geared 400 size motors

The SOPWITH PUP has always been a great favourite with modellers, largely because it doesn't seem to matter what scale it is modelled to - they always fly well. This particular Pup is no different! This series of models is designed, mostly, around the 2.33:1 geared *Graupner Speed 400* unit. When powered by 7x500AR cells and turning a wooden propeller of about 11"x 7", a fine and mildly aerobatic performance is to be expected. Since all the models in this series are to a constant 1/9th scale, they compliment each other admirably. With flight times in the region of six minutes, a lot of fun is to be had with them for a minimal outlay.

Being small and quiet, you can fly your model from most smallish fields without upsetting anyone. I live about two minutes walk from our local cricket field, which means that I don't even need to take a charger with me when I pop

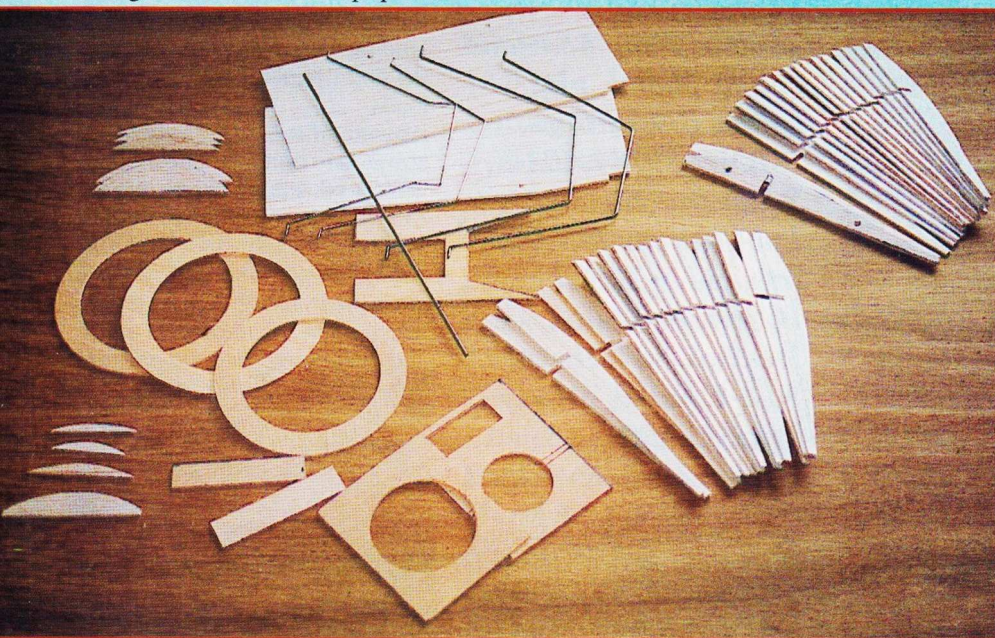
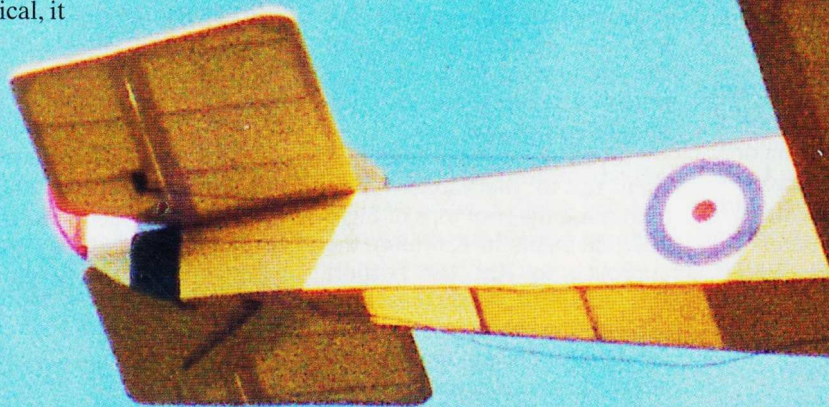
out for a quick buzz around. It is very nice just to nip back home for a cup of tea while the model recharges.

Anyway, enough on basics - I don't doubt that you'd like some more detailed information about what is involved in order to build the model. Here we go then.

EQUIPMENT

Since I like to build this type of model for rudder/elevator control, whenever practical, it

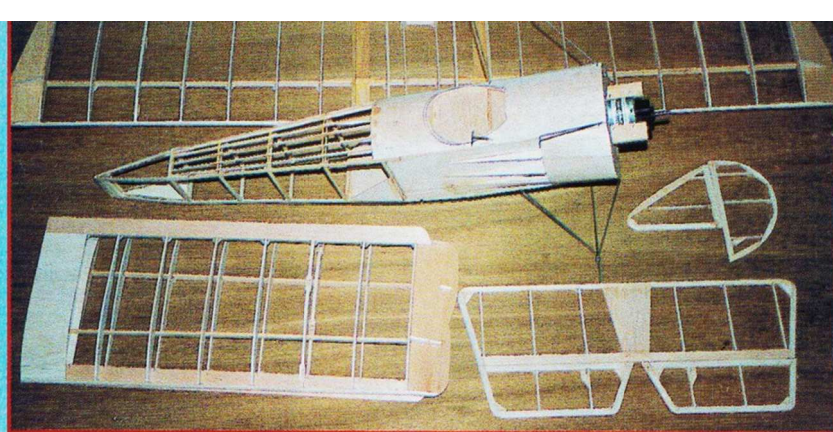
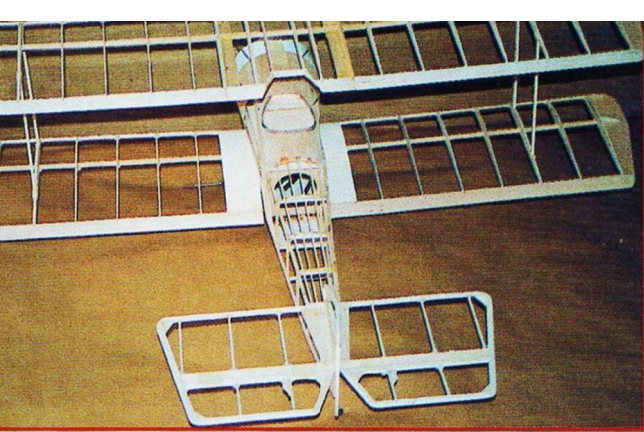
keeps the number of servos required and therefore the weight, to a minimum. The model will need mini servos at the very least. Micro servos will save even more weight, but are not absolutely essential for success. The one item that is mandatory in order to get the



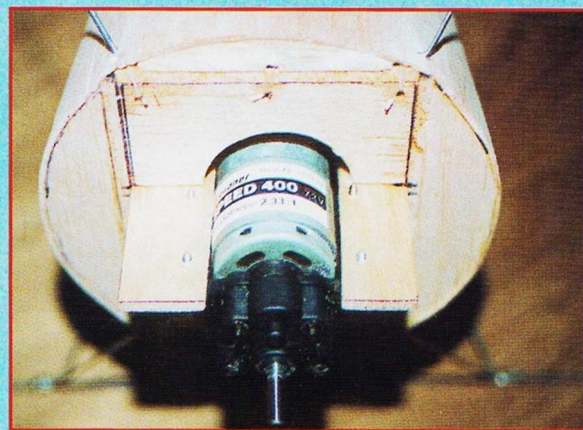
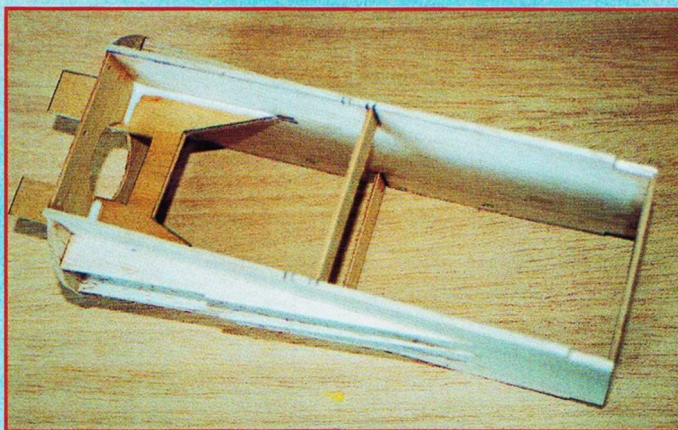
Left: it's not a bad idea to cut a complete component kit-set before commencing construction. That way you have an unbroken run at air-frame assembly.

best from your model is a speed controller. This one item will do more for the versatility of your model than anything else I can think of.

So, please don't be tempted to fit a simple on/off switch - the gears in your motor unit will appreciate it too, otherwise you run the risk of having teeth everywhere but where you need them - on the gears. A standard size receiver is acceptable if you really don't have anything else, but will use



The airframe of the Pup is a quite straightforward construction exercise, as the views above and top right indicate. At right is the basic forward fuselage box unit and at far right, a detail of the Graupner Speed 400 motor installation



up a lot of the weight you could otherwise have used to detail your model. Since there are now some excellent sub-micro units available at very reasonable cost (cheaper than many standard ones), it would be well worth investing in one. The actual equipment used in my model is comprised of a *JETI 4 Rx.*, two *HS50* servos and a *KONTRONIC EASY 1000* speed controller, giving an all up weight of the flight pack of about 1.5 oz. This is

less than some standard servos weigh.

Don't, under any circumstances, be tempted to use anything other than *SANYO 500AR* cells for your power pack. I have yet to find anything else that comes even close to them for lightness, performance and longevity. They really do work out cheaper in the long run. Although I designed this model around the *Graupner* motor unit, other brands may

be substituted. It may well be necessary to modify the motor plate or even the entire mounting system to suit them however.

CONSTRUCTION

I have deliberately kept this as simple, and as light as possible. To this end, I have made the model a one-piece assembly. Should you wish to make your model disassemble-able it would prove a fairly simple task to replace the lower wing





locating dowels with tubes and wire wing dowels and to have the top wing mounted with small saddle clamps. I would point out however, that the system shown has proven itself admirably on several models. If you hit the ground hard enough to need knock-off parts, then there isn't likely to be too much of the model left anyway! With the model built as shown, even the most disastrous looking crashes can usually be repaired in a couple of hours. Believe me, I know. Before getting on to specifics, I will stress, yet again, the need to keep the model as light as you possibly can. This especially applies to the tail end of the model because of its' short nose. As drawn, the Pup is adequately strong enough and should only require the use of hard balsa for such items as spars and longerons, with medium to light balsa being used elsewhere.

Although the model is very

straightforward to build, I will deal with each assembly in turn, giving any hints or tips that I feel may be of help. Do remember, however, that this is not intended as a model for a novice since it is unlikely to survive your learning curve.

WINGS

I like to get these built first since all that rib cutting will make the rest of the model seem something of a rest cure. Once you do actually have all the parts in front of you, you'll find that the building doesn't take very long at all.

Begin by using the strut positions shown on the plan to notch the four 1/8" ribs for the ends of the interplane struts and add the scrap balsa gussets. Now notch the trailing edges for the ribs and pin them down over the plan as shown. Pin down the spar and then glue in place all the wing ribs. Angle the root ribs slightly to allow for dihedral, but

ensure that all the other ribs are vertical. The leading edges and tips may now be added, along with the tip gussets. Once the glue is completely dry, the panels may be lifted from the board and the lower wings have the root bay ribs trimmed to allow the 1/32" sheeting to be added. You now only have to trim and sand the four wing panels and cut the slots for the ply braces into the top panels.

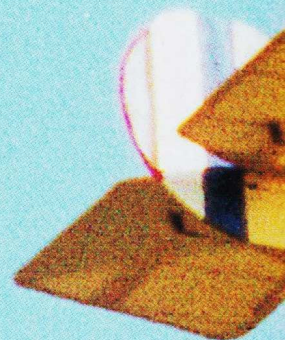
You see, it didn't take long at all.

CENTRE SECTION

This is a little more involved and so I'll deal with it separately. I do mean a LITTLE more involved though. Mark and cut to length the ribs that form the cut-out, but do not discard the bits removed and do not shorten them to allow for the 1/8" false trailing edge.

Now pin down the ready notched trailing edges and the

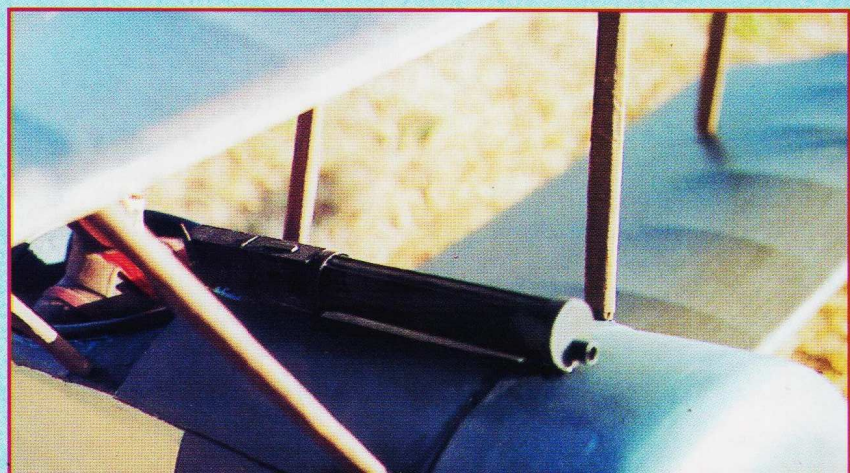
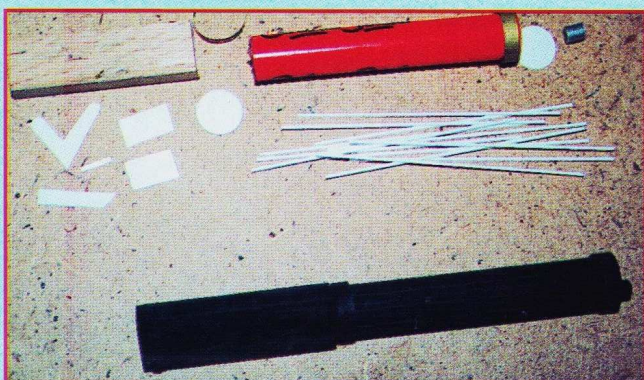
spar and glue the ribs in place. Again ensure that they are vertical and add

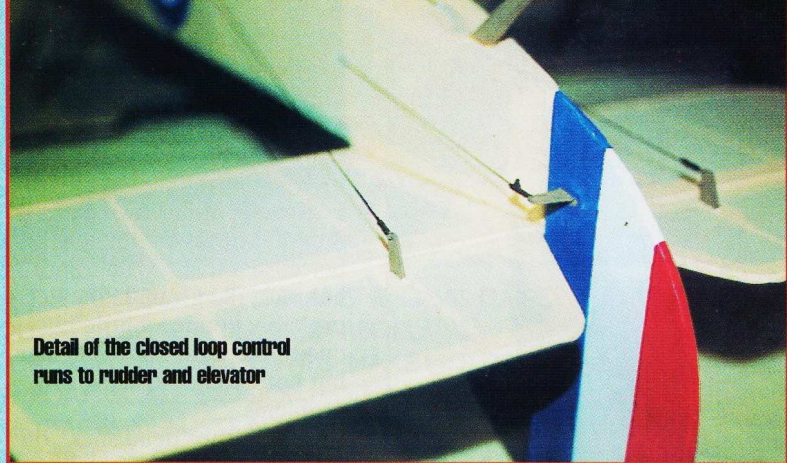


the leading edge. Glue the 1/8" balsa false trailing edge in place followed by the short sections of wing rib cut off earlier. As you should see, not shortening them means that they are long enough to allow for the angle they go in at.

You can now slot the centre section ribs for the ply braces and trim and sand the centre section before joining up the

The dummy Vickers machine gun is simply made up from appropriate scrap material comes ever scrap material comes readily to hand.





Detail of the closed loop control runs to rudder and elevator



Centre section cabane strut fixing.

top wing panels.

The ply braces are simply rectangles which are trimmed to shape after the wings are joined. This avoids any temptation to align the wings with the brace rather than the building board. Glue the braces to the centre section and allow to dry with the unit pinned down to the board before gluing the wing panels in position. Pin down the wing roots and

ENGINE COWL

Cut a strip of 1/32" ply long enough to wrap around former C1 and glue it in place using cyano. Now add the other C1, the built-up section and C2 and allow to dry thoroughly before trimming and sanding to shape. Once you are com-

undercarriage/axle joint. The front centre section strut is free to swing, but the fixed rear one will ensure that the wing stays in the correct position, so don't worry.

Now you need to fit all the formers, sheeting and stringers, after which you should cut out the cockpit and clearance for the lower wing panels. Fit the tail skid plate and it is time for some more trimming and sanding.

The 1/32" ply hatch in the underside provides access for both R/C installation and charging purposes and has a tape hinge and a wire in tube type catch. Do not fit the hatch until after the model is covered and the R/C gear fitted. It will only get in the way otherwise.

COVERING AND FINISHING

With the exception of the cowl, which is sealed and painted, the entire model is covered with *Litespan* using *Balsaloc* as adhesive. This method has proved to work well on these small models. It is very light, comes in the colours we need and doesn't shrink too severely. The latter point is quite important on the type of lightweight structure that the Pup uses.

For extra strength you could use *Solarfilm* on everything but the tail surfaces, but it will need to be matted down and painted, which will add a lot of weight. I have used this system on models but usually only if they are the same colour all over and thus don't need painting. Do make sure that you don't shrink it too much though.

Except for the top surface of the centre section, the model should be covered before the assembly stage. It is much simpler to do any paint work at this stage too. All the

dard method of being built in two separate sections, which are then joined over the plan.

Build your two rear side frames over the plan and join them with cross braces in the usual manner. This gives you one of the two sections. The other section consists of the two sheet side parts, F1, F2, F3 and UC1 which are assembled to form a box, again in the usual way and making sure it all remains perfectly square. These two sections are then joined and once checked for square, are allowed to dry completely before proceeding. Cut the slot in F1 and glue in place the motor plate. Make sure that you not only have the down thrust incorporated, but also that you have it the right way up. Left side thrust will do nothing to aid the models' flying performance.

Bind and glue in place the wire parts and solder up the

pack up the tips 1/2" under the penultimate rib. Fit the litesply mounting plates and allow the entire assembly to dry thoroughly.

pletely satisfied with the shape of your cowl, it should be sealed and sanded until smooth.

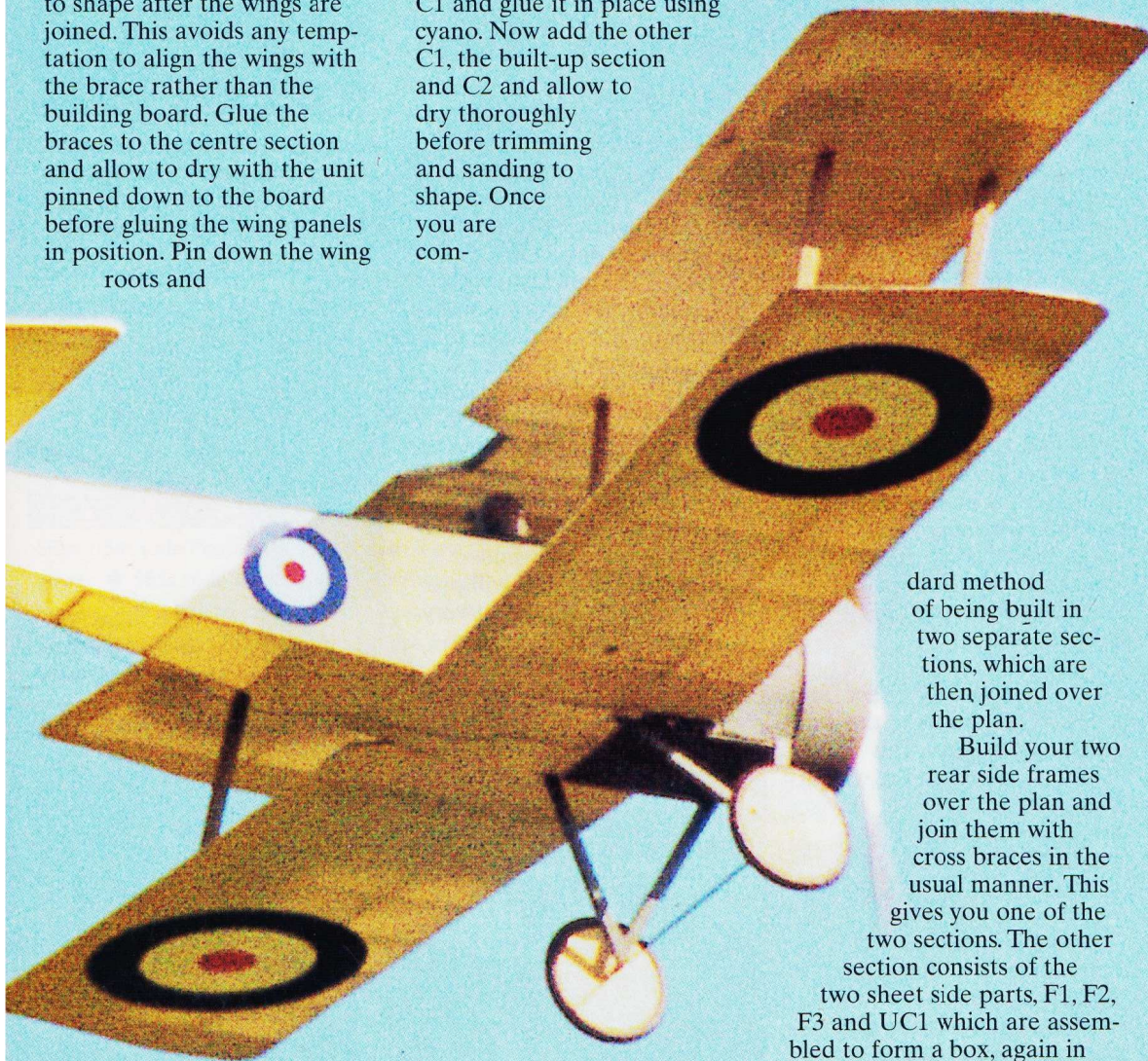
My cowls are usually glued in place, but you may wish to make yours removable by the addition of hardwood blocks and small screws. It should be safe to carefully remove the rear most C1 in order to do this.

FUSELAGE

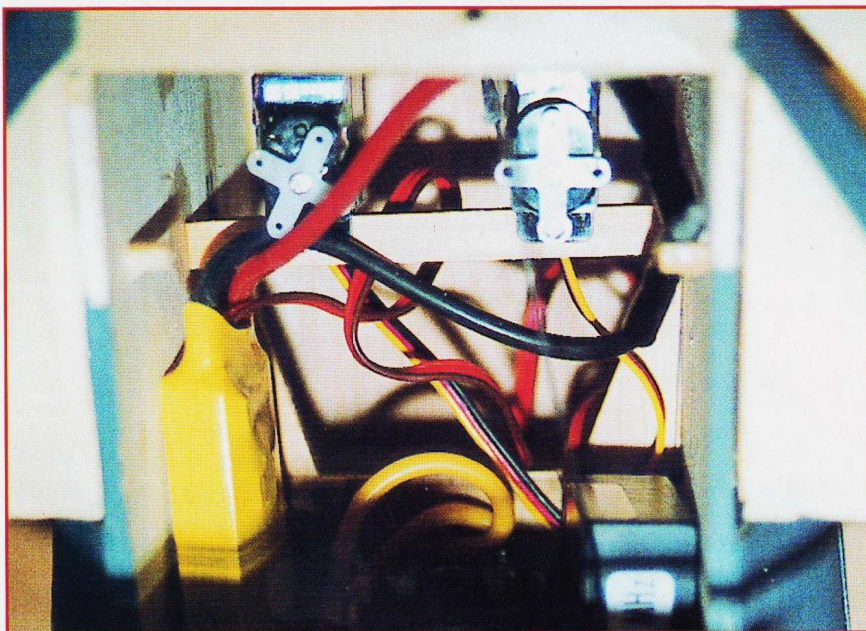
This follows my, by now, stan-

TAIL SURFACES

These really couldn't be much simpler, just build them over the plan using 1/8" balsa strip or sheet as indicated. Once the glue has set, sand the edges round and join the elevators with the 18SWG wire joiner.



Equipment installation inside the fuselage showing the two mini servos for rudder and elevator controls, plus the speed controlled



painting on my model was done with Humbrol enamels, including all the markings. Should you wish to give the impression of panel lines and stitching, I would suggest marking them in with a fine line, permanent, all surface marker. The ones for overhead projectors are ideal. I also use these for marking out my roundels as they are a lot kinder to *Litespan* than a pen or pencil and they come in the right colours too.

The Vickers gun on my model was made up from various pieces of scrap wood and tube, with the ribbing formed from thin plastic rod. Hopefully the photo will show this better than I could explain it.

ASSEMBLY

The first job here is to accurately mark the centre section strut positions onto the underside of the c/s. Once you are satisfied that it does, in fact, line up perfectly with the fuselage, drill the holes and bind the top wing in place on the struts. Check once again that it is lined up correctly, and cyano the bindings. You may as well cover the top of the c/s now before continuing with assembly.

Make up the interplane struts by measuring them off the side view on the plan. Both wings have the same dihedral, so the gap shown is the one to work to. Once you have both sets of struts ready, use these, the locating dowels in the lower wing roots and the top wing/fuselage assembly to glue in place and align the lower wing panels. Thirty minute epoxy is ideal for this

job as it allows time to get it all accurately aligned.

I realise that the wing mounting system sounds as if it would be more suited to a rubber powered model, but I can assure you that it does work very well.

All that's left to do now is to use the assembly that you have as a guide for aligning the tail surfaces.

INSTALLATION

The receiver and speed controller in my model are retained with servo pads as far forward as I could get them, whilst the servos are mounted to 1/8"x1/4" spruce rails in the normal way.

Control linkages are of the closed loop variety direct from the 1/32" ply horns to the servo output arms. This method saves both the weight and space required for clevises and adjusters. I use 25 lb. breaking strain monofilament fishing line for this job, which works very well indeed.

Make up and fit the hatch and fix the cowl in position using your chosen method before slipping the Ni-Cad pack into place. Adjust the balance of the model by moving the pack about and once satisfied, fix it in place with a small amount of silicon sealer. You should now be looking at a finished model of a Sopwith Pup, nice isn't she!

FLYING

Having chosen a nice calm day for your test flight, carried out all the necessary checks and made sure you have a fully charged Ni-Cad, it is time to put her to the ultimate test. How well does she fly?

My model will rise off ground (R.O.G.), but for initial flights I would recommend hand launching. From a gentle launch into wind the model will sink slightly before climbing steadily away. Don't try to climb out too quickly or you risk stalling her, which is neither pretty nor conducive to long life for your model.

Once you have gained some height and made any trim changes necessary, it is time to find out what she will do. The prototype model is quite capable of loops and stall turns with ease, while full rudder and elevator together will produce an interesting, if not very scale like, flick roll.

Landing the model is best

carried out under power, but remains pretty straightforward. Line her up with the strip, throttle back to control the rate of sink and allow her to come in at her own pace. Shut her down completely just before she touches and flare her onto the ground. She'll probably bounce a little bit due to the rigid undercarriage, but not enough to cause any problems.

Should she "dead stick" on you, line her up as soon as possible and let her sink in. Don't try to hold her off too long or you'll find out what I meant about stalls. She is quite a draggy little model so expect a fairly high rate of sink.

So once your test flight is out of the way and you have calmed down while she's recharged, it's time to go looking for Fokkers, or perhaps that Pfalz Eindekker your clubmate built from an earlier free plan.(A.M.I.)

The author, Peter Rake and prototype model, ready to go.

