

THERE CAN BE LITTLE DOUBT in anyone's mind that the Spitfire is one of the most evocative aircraft ever to grace our skies! Neither before, nor since, has any fighter captured the imagination of the world, yet some 50 years on still survives to thrill thousands where ever they appear.

To the modeller, the Spitfire is the stuff from which dreams are made. Virtually all flyers, whether R/C, F/F or C/L appreciate the grace and line of the "Spit" and even those stalwarts of the static model will feature an Airfix, Matchbox or Frog Spitfire, somewhere in their collection.

From my own personal point of view, I got this "Spitfire syndrome" out of my system nearly 10 years ago, with the publication of the "Dog-fight double" in *RCM&E* (Plan No. RC/1325 & RC/1326). this was a bold step to produce a '20' sized model that could be built and flown by almost anyone with a bit of "aileron" experience. Many were built with great success and we received gratifying letters from all round the world. Some were even flown from the slope "sans moteur" and may even have been amongst the very first P.S.S. models!

More recently the Spitfire came back into my life with the advent of a new Sport & Scale model of approx 1/5th scale from the D.B. Models stable. My involvement with this monster was only skin deep and involved the painting and decorating thereof. Much of this decoration was recorded on film and interested parties would do well to keep a weather eye open for a forthcoming feature showing, step by step, just how it was all done.

However, I digress, for the birth of the Spitfire stemmed from the idea of showing that electric power was a suitable source for "scale". I'd already made a couple of successful scale electric models (of the more slow and stable variety) together with a couple of "hot ships" of the pylon racer derivative. Bringing the two together seemed to be a natural progression and the Spitfire came inevitably back to mind. After all, if the Spitfire could be made to fly electric, then surely anything could!!

The real thing

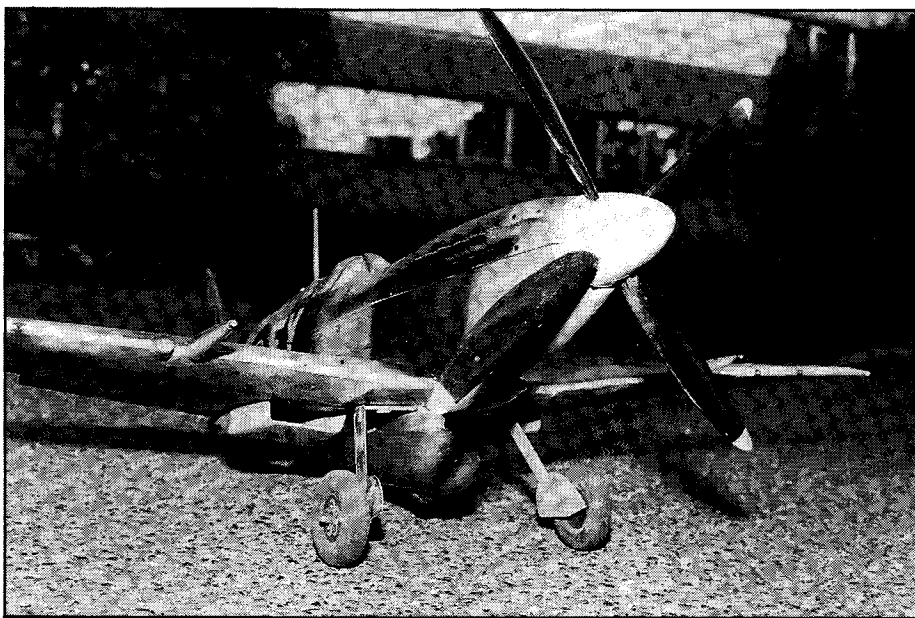
There are many who have very fixed ideas about the Spitfire. Some would argue that the only true "Spits" were the Mk's 1-V (in brown and green!!) and that all later marks had lost the true character of the design. Others would disagree, the later, Griffon engined variants offering a much more interesting subject. From the model flyers point of view, the later marks make for somewhat easier flying, but the "character" is undeniably "different".

I believe that the Mk IX offers the best compromise having a longer nose, that helps with getting the C of G in the right place, yet retaining the basic charm of those earlier marks.

ELECTRIC SPITFIRE

Supermarine Spitfire Mk IX Free Pull-out plan.

This fascinating electric powered model - it could be converted for I.C. engines - is suitable for 3-4 function radio. Designed by Ian Peacock.



Historically, the Mk IX was also a compromise, which went on to set the seal on Spitfire development. It was in September 1941 that the RAF pilots reported the presence of a new, radial-engined fighter in the air over Northern France. The superior ceiling and speed of this new fighter, known to the Luftwaffe as the Focke-Wulf 190A-1 produced a somewhat urgent requirement for a better British fighter with which to combat the growing menace. Consequently an updated Spitfire was proposed and the Mk VIII was born. Even in war time, it is an unescapable fact that such a complete redesign takes a finite time to achieve. This factor had been foreseen by the Air Staff planners and the decisions taken with some alacrity to ask Rolls Royce, the manufacturers of the Spitfire's engine, to convert a couple of existing airframes to take the uprated engines (Merlin 60 & 61) destined for the Mk VIII. Mk I and Mk III airframes were

Dummy four bladed propeller adds to the realism of the Electric Spitfire. Undercarriage is purely cosmetic - the 'drop tank' acts as the launch hold and houses the landing wheel.

suitably converted, both using 4 bladed propellers and tested at Boscombe Downs during the Summer/Autumn of 1941. Encouraged by the success of these aircraft, further airframes (Mk V's) were strengthened and fitted with Merlin 61's and these served as the definitive prototypes. Known now as the Mk IX, they had an additional radiator beneath the port wing to house the existing oil cooler and the intercooler from the later engine. This gave the Mk IX a symmetrical appearance when viewed from the front. (This feature had been used previously on other interim models.)

So successful was this conversion a grand total of 284 had been converted at Hucknall by the time retro fitment work finished in 1944. In addition to these conversions, existing contracts

for the manufacture of Mk V's were modified to complete them as Mk IX's at both the Southampton and Castle Bromwich factories as more and more Merlin 61's became available. In point of fact more Mk IX's were made than any other version! Not bad for a bodge job!!!

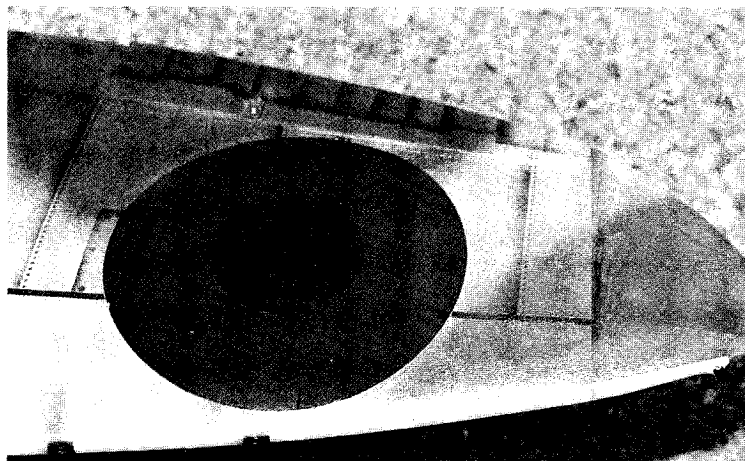
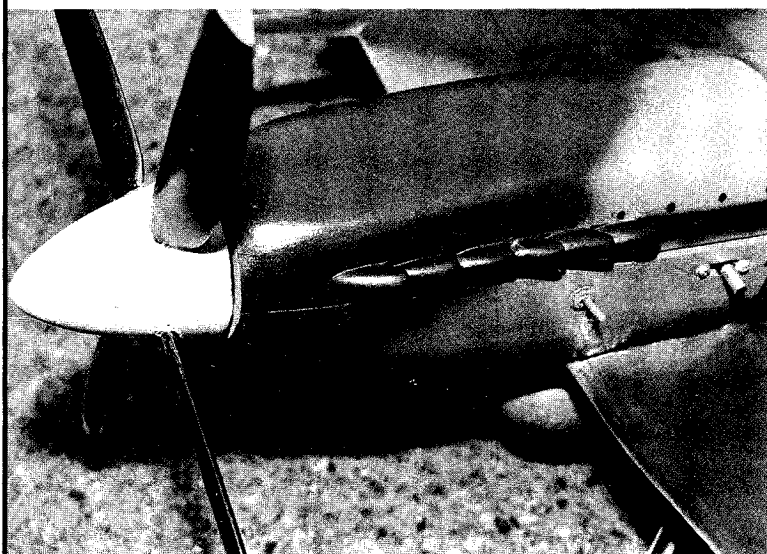
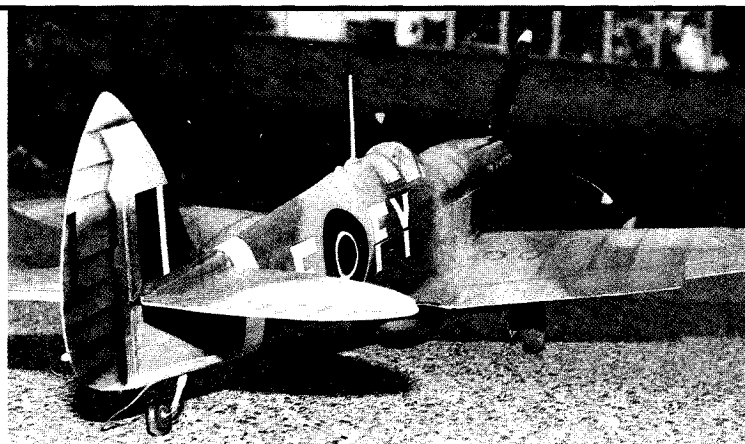
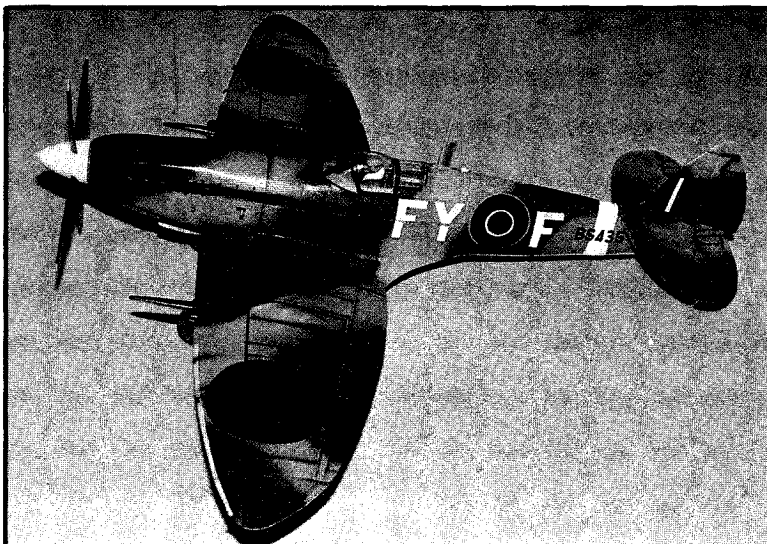
The Model

To the modern modeller, more at home with GRP and foam models, the Electric Mk IX might well appear a little strange. However, these "long-in-the-tooth" modellers like myself will not be overly surprised at the structure. In fact, the more astute amongst you might even recognise the parentage, for I am indebted to that maestro of the scale rubber job, Doug McHard for permission to use his magnificent 1/24th scale model as the basis for this design. Whilst making the "thank you's" I must also credit "VARISCALE" of Bristol, whose plan enlarging service was used to scale up Doug's original

drawings. I must say that this route to plan drawing is a great deal less time consuming than scaling up by hand. Of course, the light but strong structure of such a model is fine in the smaller scales, although some sacrifices need to be made as the size gets larger. Furthermore, the fitting of Radio Control equipment places further requirements upon the structure. Additional areas of sheet creep in here and there, and the eagle eyed reader will notice areas on the plan that differ from those shown in the photographs. Of course we all benefit from hindsight, and there were many areas in the "Electric-Spit" that I would not follow again when building a copy. Consequently the plan benefits from this hindsight. Also let me say that this model, despite several false starts (due to illness among other things) does fly and fly well. It is not in any way a difficult model to handle and anyone with a modicum of aileron/elevator experience will be able to fly it. It has no hidden vices but one does need to

watch the weight of the airframe.

Power is derived from that excellent electric combination the KYOSHO 360 PT, matching gearbox and propeller and the battery source is the now universally accepted 6-cell buggy pack. I'll come quite clean, here, and state that I haven't flown it with any other combination, however one supposes that any *good* quality buggy motor, suitably geared, and driving a well matched propeller should work as well. Of course, for the well heeled amongst you, the more exotic American or German Cobalt motors with their matching gearboxes or belt reducers would give an even better performance. The problem of hand launching (and the subsequent landing!!) is neatly overcome by reverting to the technique used on the Dog Fight Double Spitfire. As was seen earlier a wide variety of drop tanks were used on Spitfires and the use of one here, offers the modeller an excellent "hand hold" for launching and a suitable "wheeled skid" to protect the



It is hard to believe from these illustrations that the model uses an 'old fashioned' stringer and open structure construction. Ian's excellent spray work gives a sense of depth to the finish.

underside detail upon landing. The tank is a removable feature and therefore can be removed if required although I strongly recommend its use. After all, a built up structure such as this is difficult to grip tightly so far behind the C of G, which makes single handed launches somewhat difficult. No fixed undercarriage is featured, after all it could be sensibly argued that Spitfires look "daft" with the wheels dangling during flight and as yet I haven't come up with a suitable retract system ideal for the electric scale model!!!

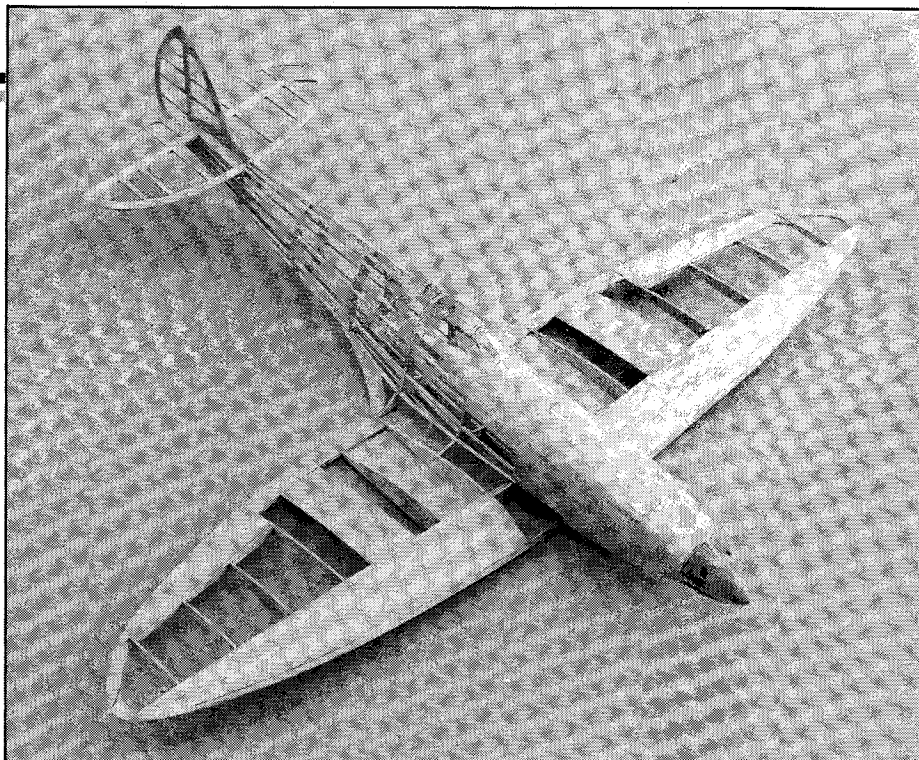
However if an undercarriage is required, the ply plate that forms the centre section of the wing could be suitably strengthened to take the leg mounting blocks. (In fact I'm thinking of putting blocks in mine so that I can fit wheels as a temporary measure for static display!)

Forget the foam and GRP

So - let's get down to brass tacks. Because the Spitfire is a "free-plan" it pre-supposes that a great many more will build in than if it were a "bought" plan. Of these people, it might reasonably be supposed, many will be "today's" modellers rather than "yesteryear's". With this in mind, a slightly more detailed instruction programme might not come amiss.

The structure is somewhat lighter than the normal (by today's standards!) and should be undertaken with reasonable care and without rushing it! Keep an eye on the weight and use firm, light wood. Use care to obtain accurate fitting of all parts and use cyano adhesive throughout to avoid the weight build up with white, or epoxy glues.

The fuselage is the place to start, cutting out and sanding all of the pairs of half formers and the horizontal and vertical crutch or keel pieces. Working over the side view on the plan pin down the upper and lower keel pieces, joining where shown to produce the required length. Erect the half formers over these keel pieces taking particular note of perpendicularity! Now cut and sand the horizontal keel parts, again joining where shown. Make two off each keel member. Drop the upper and lower side keels into the slots in the formers and glue in place. Add all of the fuselage stringers, glued into the relevant slots. The front of the fuselage is filled in with soft $\frac{1}{8}$ " sheet between the stringers and formers as shown. Note that the keel/former assembly includes the wing centre section and that the root rib can now be added. This completes the first half of the fuselage. Lift it carefully from the plan and cyano the other half formers to the keel and existing formers taking care to get them square and exactly in line with the first half of the former. Keeping an eye open all the time for squareness (it is easy at this stage to let warps creep in) add the side keels, stringers, sheet in-



The 'bare bones' clearly indicate the Doug McHard influence of the original free flight rubber model. Lightness is all important.

fills and root rib to the other side. Note that there are two identical formers to the rear of the cockpit and two identical horizontal keel members from this former to the nose. This is to allow the entire upper deck to be removed to gain access to motor, battery and radio gear. DO NOT cut this top deck away at this stage!

Elliptical lightness

The wings are made next - do not be alarmed if they appear to be a bit flimsy - it all works out well in the end. The wing spar is full depth in $\frac{3}{32}$ " medium hard sheet. All of the rest of the wing can be made from soft, firm balsa. Cut ribs to pattern (using quarter grain stock for preference) and assemble them egg-box fashion onto the spar. Note that there is no root rib. Add leading and trailing edges as shown, plus the false trailing edge and aileron, and the lower sheet that will act as support for the under wing radiators. Fit the tip profile and sheet the upper leading edge - back as far as the spar - with soft $\frac{1}{16}$ " sheet. Also fit the upper sheet to support the cannon blisters. With both wings built, assemble carefully to the centre section ensuring that the dihedral is correct and that the inboard spar extension is well glued to the rear of the relevant former.

At this stage it is best to go over the whole airframe with fine garnet paper and to add all of the wing gussets, particularly those where leading and trailing edges attach to the centre section. Ensure that the grain on all gussets is at 45° - i.e. across the long edge of the gusset. Tail surfaces are shown on the plan as built up from $\frac{3}{16}$ " sheet outlines and spars. It is questionable whether this is really necessary and if you can find soft enough $\frac{3}{16}$ " sheet, you could probably make them from solid. The fin and rudder are made separately and can be hinged if 4 function radio is to be

fitted or stuck permanently in place as I did, for a three function model. The tail assembly should be glued in place taking the usual steps to ensure that everything is square and in line. This completes the basic airframe with the exception of the ply brace to carry the drop tank fixing. This is cut from $\frac{1}{8}$ " lite ply and fitted flush with the lower surface of the centre section of the wing. To do this entails cutting away the lower vertical keel in the area of the ply brace. Offcuts of $\frac{3}{8}$ " square hardwood are fitted on top of the brace flush against the formers to assist in spreading the load on the ply.

T-t-t-tissue

At this point, one can think about the covering. I opted for light weight tissue on the fuselage and heavy weight on the wings. It was stuck on in the time honoured manner with Humbrol tissue paste and water shrunk. Two coats of thinned dope were applied all over. This is the stage where this flimsy, floppy airframe suddenly takes on a new, rigid feeling and is the time to consider the wash-out. Whilst the dope on the outer panels of the wings is still wet, sit the model on the bench, resting on the underside of its centre section and weight it down so that it can't move. A couple of polythene bags full of wet sand does the job well. Now prop up the tip of the wing at its trailing edge (about level with the outboard end of the aileron) to achieve about $\frac{3}{8}$ " of wash out (I found a pair of coffee cups that were just the right height!!!) and leave to dry. Put the second coat on and jig up in similar manner. When totally dry - I left mine for a good 24 hours - the wing should have equal wash out of at least $\frac{1}{4}$ " - allowing for the wings to relax a little. Whether this is absolutely necessary I am unsure; maybe the "Spit" will fly without wash-out, I don't know. All I can say for a certainty is that mine flies with no apparent vices - so - if in doubt - build

the wash-out in. The airframe's rigidity with just this tissue covering is remarkable and first time builders of this technique should not worry about it being "all floppy" prior to covering and doping. At this stage the airframe requires only the cosmetic attention to bring it to completion. The canopy is a standard Micro-Mold item and such things as cannon, exhaust stubs, radiators, blisters etc. can all be fabricated from the softest, lightest sheet to hand. The only real 'hassle' is the spinner for there is nothing scale on the market at all suitable. Readers who can remember the original Dog Fight Double Spitfire will recall that the spinner gave cause for concern there as well. It was overcome by producing an "almost scale" spinner by machining down a Fox "slim jim" spinner. Fortunately, I kept that spinner on the demise of the model and that was pressed into service here. This is of little help to you, though, for the Fox spinners are no longer available in the U.K. (please don't ring John Haytree - just take my word for it!) Hopefully, by the time that this all appears in print, a vacuum formed spinner will be available through the "reader services" department of ASP.

In fact, there may be other parts available on a single vac-form sheet such as exhaust stubs, radiators etc - watch out for details accompanying the plan!!

Final finishing is up to the individual. As must be apparent from the introductory notes to this feature, the Mk IX Spitfire offers the widest possible choice of finishes not only in colours and markings but in fixtures and fittings. Personally I chose F-FY the subject of the excellent Mk IX plan pack from ASP (Plan Pack No. 2740). This is a must for anyone wanting to accurately detail a Mk IX of any scale or power. Other references abound, from the Profile Publications to the specialist tomes. Whichever route you go - watch out for the weight build up - too much paint will reduce performances noticeably. That does not mean that you should skimp on detail. Do not omit the "obvious" detail that is the "character" of the Spit, after all it has got to "look" the part as well as "fly" the part.

Gear installation is quite straight forward. If you've followed the plan faithfully you will already have the nylon snake "outers" installed for aileron, elevator and aerial. This, then, is the time to take a razor saw to your pristine new model. Carefully cut through each former, separating the top decking from the rest of the airframe. Remove the decking and hollow out the soft block upper and lower areas to clear the motor. Now drill the 5mm fixing holes for the drop tank and check that the tank fits neatly and squarely in place. Tank construction is detailed on the plan but it is basically laminations of soft sheet with a 1 1/2" dia light weight wheel

sandwiched in between. The tank pylon contains either metal blind nuts or can simply be drilled and tapped M5. Do this carefully, and liberally soak the tapped hole with cyano. This will toughen up the soft balsa to the extent that the tap will need to be used again to clear out the thread. The whole process can be repeated if necessary.

It might seem to be a bit "iffy" just screwing into the balsa. However it does work and is lighter than steel nuts.

Small is better

Mini radio is not a necessity, but it is a good route to go if you can afford it. My prototype uses ACOMS AM equipment with the mini receiver, 2 x Harry Brooks mini servos and a home made 150 mAH nicad and switch. (Primarily because my two prime mini outfits, the Fleet and Futaba sets, were already installed in other electric models. Motor switching was by way of the ACOMS relay unit filched from a now defunct Cessna 172.

The elevator servo fits at the rear of the wing and the aileron servo lies cross ways in the bottom of the forward fuselage. SLEC Brass push rod connectors (type SL63) were used, remembering to thread one onto the centre of the aileron cable before soldering on the clevis links!!! However, I abandoned the snap on washers in favour of 16 SWG collets, making it easier to get the connectors off afterwards. Radio installation was "thought about" to the extent that "normal" servo direction can be used, avoiding the necessity to "reverse" direction, either by mechanical means or by using the transmitter switching. (My ACOMS gear doesn't have such sophistication and that works out fine by me - I'm the sort who could easily write off a model by forgetting just which way round all those fancy switches need to be set!!!).

The receiver and nicad are so light that their exact position within the airframe do little to assist in positioning the C of G, so I tucked them up in their

foam jacket and put them just in front of the elevator servo.

Motor installation is a "breeze", simply remove the 3 fixing screws from the front of the KYOSHO gearbox and insert them through the 1/16" ply former and back into the gearbox. As the whole weight of the motor/gearbox rests on these screws, it is not a bad idea to support the rear of the motor on a block of soft balsa or expanded styrene foam.

Motor wiring is largely a matter of choice. I chose, for what its worth, to fit the usual suppressor capacitors, an in line fuse holder and a "master" on/off switch. This latter device allows me to isolate the motor completely so that accidental operation of the electronic on/off switch does not fetch the motor on by mistake. Just because the Spitfire is "only electric", does not mean that the propeller cannot give you a nasty bite!

Battery packs are also a matter of choice and there is room for up to 8 x 1.2 Ah sub-C cells. Working on the principle of "what is available", I carried out all my test flying on a "standard" 6 cell buggy pack. Performance is more than adequate in this form!

Now I don't want to lay down chapter and verse on the power requirements, for I feel that I would be too restrictive. Instead I would say that in my experience, virtually any good geared buggy motor should prove suitable with any battery combination from 6-10 cells. Similarly I've not tried a "straight", ungeared, motor with, say, a 6 1/2" or 7" prop but I feel that there should be little reason to doubt that it would work.

So here we are - at the bottom line!

Into the unknown

How does it fly? Well it would be unfair of me to say that the first flight was approached without trepidation! Never have I been so terrified! Even my wife, well used to the trials and tribulations of being married to an

Copies of Plan Pack No. 2740 (£3.05 incl. postage) are available from A.S.P. Plans Service, P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS.

