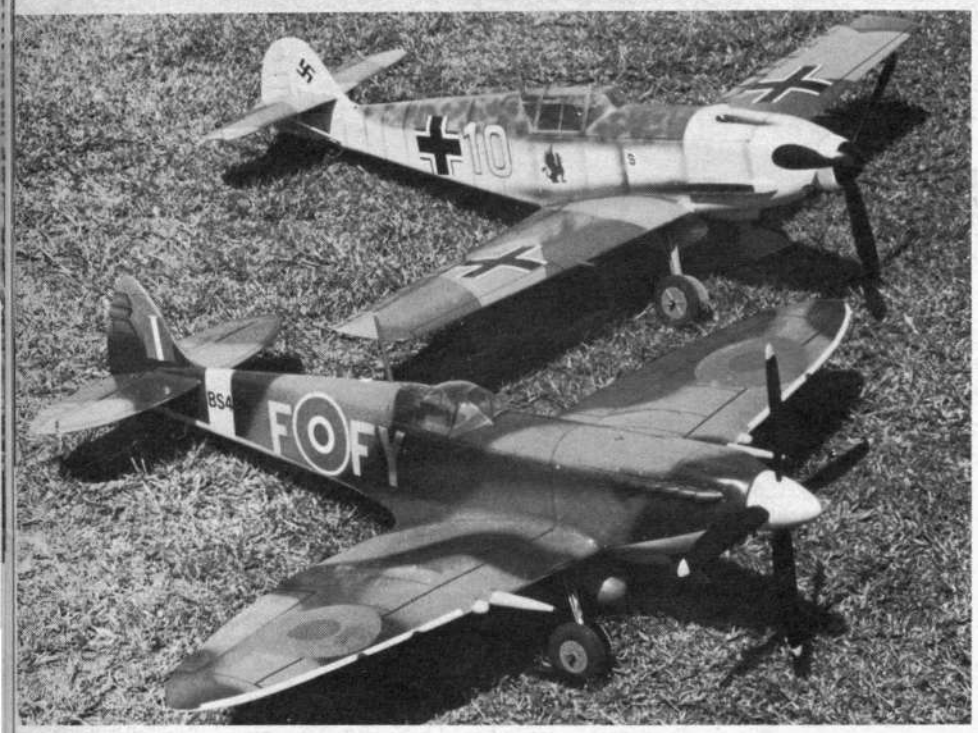


Classic Double Act of Me109 and Spitfire for 20 cu in Motors and Three or Four Function R/C.

Design By
Ian Peacock

DOGFIGHT DOUBLE

Part 1 of a Three Part Pull-Out Plan Feature

THE Spitfire and the Me109E have long been popular subjects among modellers and will probably remain so for many years to come.

Nowhere in the annals of aviation history has so much been written of two such famous combatants. The legendary 'Few' and the 'Battle of Britain' will fill the story books and historical journals for a long time to come. The background stories of these machines and the biographies of their creators are there for all to read, and who can fail to thrill to the sight and sound of the Spitfire when flown at displays and demonstrations. To many it provides the highlight of events such as those held at Sywell and Biggin Hill causing more modern creations to pall almost into insignificance.

The decision to produce models of these two aircraft is not taken lightly; many successful versions have been flown and many have failed.

This particular version was inspired by the Club 20 class for pylon racing and long before it was decided to add scale and aerobatics to the Club 20 bag I had formed the opinion that .19 cu. in. motors and thereabouts offered much to the average modeller. There can be few of us without an engine of this general size kicking about in the dust of the workshop.

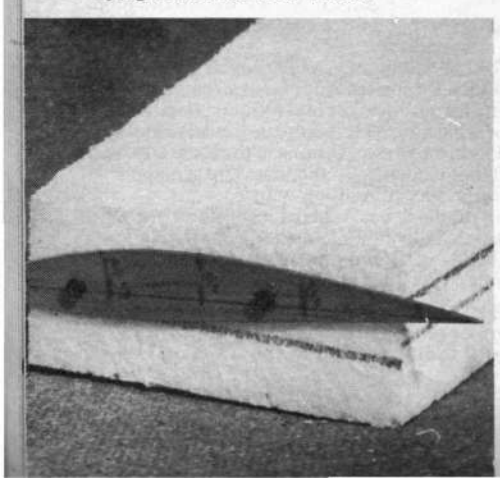
So the die was cast; first steps were to produce a 'near scale' Spitfire to meet the existing racing class. Some of you may remember the photograph in D.B.'s column last year. This model had thin symmetrical wings to the racing dimensions and despite a hefty 26 oz/sq.ft. wing loading, the model was quite fast powered only by an ageing OS 19. Regrettably no washout was incorporated and the thin sharply tapered elliptical wing produced a model that was difficult to control at slow speeds, although at higher speeds, handling was quite satisfactory. Due to the foam wing construction drastic changes to the wing would have been difficult and were soon rendered unnecessary when the model was written-off at a flying session at D.B.'s field.

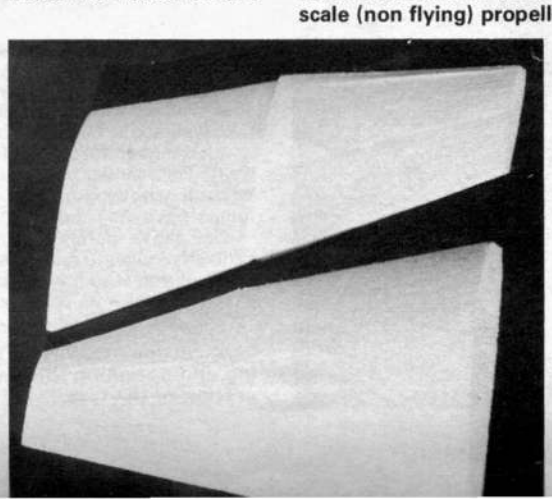
Subsequently a change of wing section plus the added safety factor provided by washout has removed most of the handling problems although it should be said that neither model is really suited to the novice. Low-wing models with such a high wing loading are not *that* easy to fly but anyone with an average amount of low-wing experience should have no difficulty flying these.

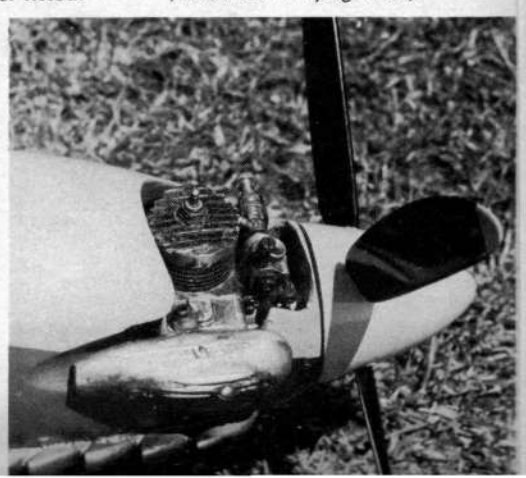
Presented here then are two quite lively and 'very near scale' models with relatively simple construction. They are one piece models (i.e. the wings do not come off – at least not deliberately!) and both will fit into most small family cars. Only in one or two places has the scale outline been 'fiddled' and these are shown on the drawings to assist those of you brave enough to attempt to build to an even 'nearer scale'. Probably the most noticeable non-scale area is the undercarriage. The wheels have been brought forward and spaced wider apart for better ground handling, but even so take-off's and landings are difficult on rough surfaces.

For use on grass fields I would recommend unscrewing the undercarriage and fitting the optional 'drop tank' under the belly, this serves as a useful handle for hand launches, and also as a belly wheel for grass landings. Both models look better in the air without the wheels-a-dangling anyhow. The drop tank (or bomb if you so desire!) is virtually to scale, although the tank support bracket is not. Scale tank/bomb racks are fiddly and probably would have insufficient strength to handle landing shocks.

Left to right: core cutting sequence, ensure production of one left and one right hand panel. Templates shown attached to the styrene block with masonry nails prior to cutting. Cut and joined cores now to be sanded then veneered. Close up of engine installation with scale (non flying) propeller fitted. *(continued on page 682)*







The marks of Spitfire and Me109 chosen, actually place these two models at a time when they probably would not have met much in combat. They were chosen both from practical considerations and to satisfy personal whim. The very squareness of the E variant of the Me109 appeals to me and seems to capture Teutonic approach to aircraft design. The later versions, being more rounded do not have the same attraction for me. Interestingly, more Me 109s were built than any other fighter throughout all of WWII and the 'E' version was favoured by many of the Luftwaffe 'aces'.

The Spitfire Mk IX was chosen because of its longer nose (to house the improved Rolls Royce Merlin) and because I like the pointed, broad chord rudders often fitted to later Mk IXs. Incidentally the Mk IX was an interim version, brought about by the delays in getting theMk VIII into production. It evolved by the marrying of the larger engine (from the Mk VIII) with the airframes of the Mk V currently rolling off the production line, and was therefore intended purely as a stop-gap design. So successful was this 'marriage' that more Mk IXs were produced than any other version.

The more eagle-eyed amongst you will notice that the models and the drawings do not quite tie up. There are several unnecessary errors in the models, most of which crept in during construction. These have all been rectified on the drawings. The most noticeable error on the Me109 is the curve on the top nose cowling, it is much too gentle. Such errors as these are easy to avoid if one keeps strictly to the drawing.

For editorial reasons (largely to do with the layout of the series to get maximum information in minimum space) it was decided to feature the Spitfire first, followed by the Me109. Apologies to all Luftwaffe fans but you'll get your turn next month.

Construction

Because there is much in common to these models, construction notes are offered as a fairly broad guide throughout this and the next two months. Areas of overlap occur and a general guide covers both models – individual notes will be shown where major differences are apparent.

Most modellers have a preferred starting point for any new project, some start with the wings and some with the fuselage. In this instance the wings are dealt with first, not for any personal reason but for the fact that the fuselage is built onto the finished wing.

Wings are veneered foam yet maintain scale outline (even on the Spitfire) and are scaled to give 300 sq. in. of area. Note that this in fact produces a pair of models which are *not to the same scale.*

Stage 1

Cut from card the wing planform and separate the L.E., T.E. and tips. Retain these parts for later. Cut the foam core blocks to size using card template as a guide.

Cut each core blank in half producing inner, outer left, and right hand panels. Using the root and centre, then centre and tip templates, cut inner and outer panels to section. (Note 10° washout appears as 5° at centre point). Glue inner and outer panels together with 5 min. epoxy and lightly sand joint when dry. *See diagram below.*

Stage 2

Carefully sand the root ends of the cores to the dihedral angle and cut the slots to fit the undercarriage block. Note that the undercarriage block acts as a dihedral brace and no other form of stiffening is needed. Check that the wing cores fit together with the undercarriage block in position and that the washout is correct. (I have made one wing with wash-in before now – it makes a good propeller but a lousy wing!!).

Stage 3

Cut the veneer slightly oversize and coat it with Copydex (see notes in foam wing article elsewhere in this issue). Similarly coat both sides of the cores. When completely dry, veneer the top and bottom of both wing panels and trim off the excess veneer. Check that the washout is still correct, it can disappear if too much uneven pressure is exerted during the veneering stage.

Stage 4

Using the card templates produced earlier cut the balsa leading and trailing edge parts and wing tips. Add the L.E. and false T.E. and fit the aileron torque rods. Add the T.E. (Suitably grooved) and the aileron. Finally fit the wing tips and sand the whole wing to taper and section all over. Check that the washout is still correct, and that the aileron and T.E. follow the correct angle.

Stage 5

Join the wing with undercarriage block in place using 5 min. epoxy. Check the alignment of the wing halves. When the join is dry mark out and cut the holes for the broom handle sections. Cut and drill these sections carefully and epoxy into place. Sand smooth all over with fine garnet paper.

Stage 6

Cover the entire wing with lightweight tissue applied with clear dope. Use the dope sparingly and check that there are no gaps or cracks in the veneer before doping. Such defects must be filled with epoxy, white glue or Polyfilla and sanded smooth before doping. Dope will dissolve the foam if it comes into contact with the foam core. Apply additional coats of dope or sanding sealer, sanding between coats to produce a satisfactory smooth surface. Hinge the ailerons with nylon or mylar strip. When completely satisfied with the finished wing, the fuselage should be commenced.

Stage 7

Left and right hand sides are cut from 1/8 in. medium sheet and the doublers are fitted. M.F.A Mirralyte was used for doublers on the original but 0.8mm ply would be satisfactory. Doublers are bonded into place with Evo-Stik or a similar contact adhesive. The doublers are fitted with a 'rolling' action (top to bottom of fuselage) with the result that the fuselage sides adopt a curved profile. This is an easy but essential step as there is little internal stiffening in the way of formers. Mark the positions of the formers on the inside of the fuselage sides and make F1 from 1/8 in. ply and F2 and F3 from 1/8 in. balsa.

Carefully mark a centre line on the wing and the centre lines on the formers. Using a slow setting adhesive such as PVA or Aliphatic resin, assemble the fuselage sides and formers onto the wing. Check carefully that the centre lines of the formers coincide with the wing centre line and for general 'squareness' of the assembly. Fasten in place with pins, masking tape, rubber bands, G-clamps, etc., and allow to dry.

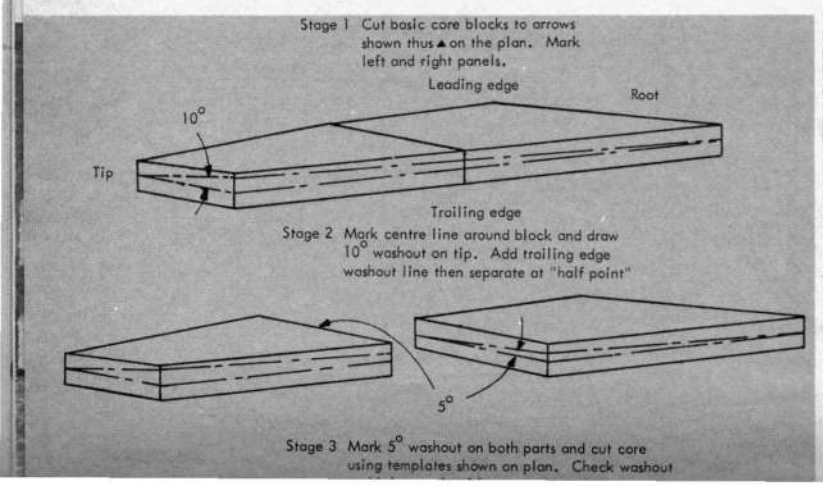
Stage 8

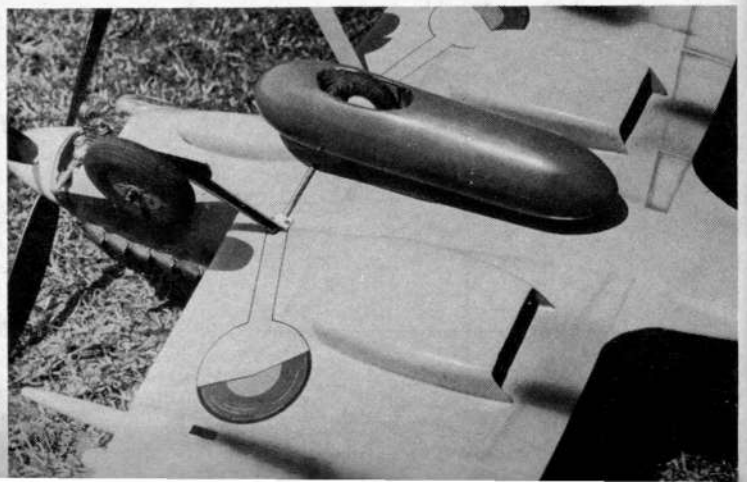
When dry check again for alignment then pull in the rear fuselage sides to the stern post. Add the rear fuselage bottom sheet. At this point it is better to fit the nylon tubes (one for the elevator linkage and one to route the aerial) anchoring each end firmly. Bend the tail wheel leg and insert through the bottom sheet – epoxy into place.

The top decking is made from 1/8 in. *SOFT* sheet soaked in warm water and rolled to suit. Hold in the rolled state with masking tape or rubber bands and place in a warm place to dry. (I found that 30 minutes on top of the hot water tank in the airing cupboard was ideal). When dry you will find that the rolled shape still remains when the tape and bands are removed (see photo). Fit the top formers and drop the decking over them. Mark the top of the fuselage sides onto the decking and trim it to fit. Glue to the top of the fuselage when you are satisfied with the fit.

Stage 9

Sand the lower rear fuselage to blend with the lower wing surface and fit the wing fairings. The bottom of the fairing is 3/32 in. medium hard balsa. Top fairing is cut from 1/16 in. soft balsa and trimmed to fit, gently paring off the edges with a knife to achieve the correct result. Fast setting glues such as ZAP are a help here as one can hold one edge in place whilst trimming the opposite edge. Polyfilla may be used to make good any defects but use it sparingly as it can add a lot of weight.





The tank complete with wheel provides a convenient hand grip for launching and adds to the scale 'wheels-up' appearance in flight.

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STAND-OFF SCALE (CLASS II)
AEROBATICS (TOP SIX AT NATIONALS)
FOR KRAFT TROPHY

DEMO'S
BY LEADING PERSONALITIES
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continued

Stage 10

Drill F.1 and fit motor mount. Note that most commercial mounts will extend beyond the top of F.1. necessitating either the hollowing out of the top block (when fitting later) or removal of the upper edge of the mount. Bolt the motor in place – there is no side thrust. Cut the nose ring from 1/16 in. ply and cut a spacing ring from 1/16 in. balsa. Slip the ply ring followed by the balsa ring over the crankshaft and fit a prop and spinner. Lightly ZAP the balsa ring to the back of the spinner and the ply ring to the back of the balsa ring. This determines the exact position of the nose ring. (The balsa ring being removed later).

Fill in around the engine (between nose ring and F.1.) with scrap 1/4 in. and 1/2 in. sheet and then add the top fuselage block (or laminated sheet). Note that this top block is only glued from F.1. forwards. Lightly tack glue the rear and sides of the block in place in order that after sanding it may be easily cut away. Remove the prop and the spinner and cut away the 1/16 in. balsa ring. Remove the engine and add a double layer of 1/2 in. sheet to the underside of the nose. Sand the entire nose to shape taking particular care with the cross section around F.1. in order to achieve the characteristic bulges covering the Rolls Royce Merlin of the prototype. Sand the entire top block back to the cockpit. When completely satisfied with the overall appearance carefully cut away the top block from F.1. to the rear of the cockpit. Fit the rear cockpit former, drill and fit a locating dowel through this former and add a hold-down block cut from scrap engine bearer (drilled and tapped 4BA) onto F.2. The top deck is located at the rear by the dowel and held down at the front by a 1 1/2 in. long countersunk 4BA screw. To ensure positive location, strips of 1/8 in. sq. balsa can be added to the underside of the top decking.

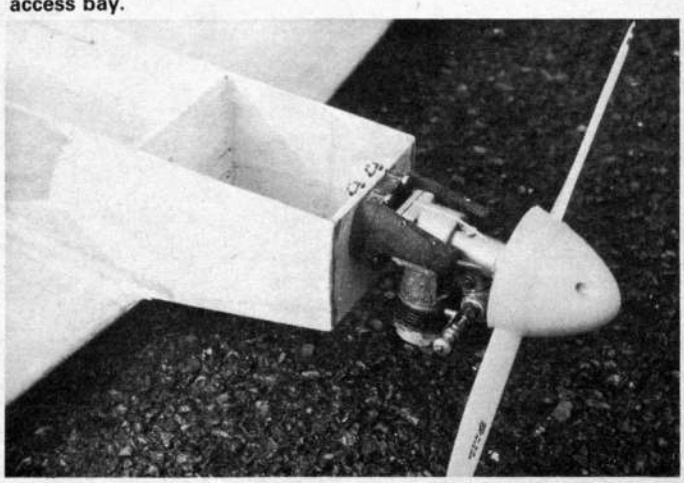
The lower nose block can now be hollowed to clear the engine taking care to allow for the silencer, and internally, to allow adequate room for throttle linkage. Prototype models all featured inverted motors but there is no technical reason for this, it is purely a matter of taste. Upright, side or angle mounts can be used if preferred incurring no extra work at the front end.

Nearly all of the prototypes were found to 'bulge' between F.2. and F.3. when heavily doped and to prevent this a simple 'Z' was formed from a bicycle spoke and used as a spacer between the fuselage sides. Check position of servos, etc., to ensure that there will be no installation 'foul-ups' with this cross brace in place. Finally sand smooth and tissue cover the complete fuselage using dope as an adhesive. Progressively dope and sanding sealer the fuselage, sanding between coats until you are satisfied with the finish.

Next month we will add the cockpit, tail surfaces, undercarriage, etc., etc., together with details such as guns, radiators, exhausts and so on plus finishing and flying hints. The first part of the Me109 drawing will also be included.

Meanwhile for those who are, like me, more disposed to the easy approach, I am investigating the possibility of making available a selection of parts as a package to ease construction. These parts will probably include most of the following: Scale plan pack; ready veneered wings; undercarriage block/dihedral brace; moulded canopy; accurate set of transfers; scale wheels; extended aileron torque rods; moulded set of accessories (e.g. blisters, exhausts, intakes, etc.); engine mount, tank, accessory pack of quick links, clevises, etc. I hope to include details of this in the next issue.

It is necessary to trim some commercial motor mounts to preserve the integrity of the top cowling block. Note also the wire "Z" brace referred to in the text stiffening the large equipment access bay.



Classic Double of Me109 and Spitfire for 20 cu. in. Motors and Three or Four Function R/C.

Design By Ian Peacock

DOGFIGHT DOUBLE

Part 2 of the feature

THOSE of you who have got to the point where we left off last month may be thinking that it's nearly all over. At the risk of putting you off, it's only just beginning!

The tail surfaces are next and these are cut from 1/4 in. soft sheet and sanded to appropriate section. Care needs exercising with the tips of the elevators and rudder or they may break. Join the elevators with 1/4 in. dowel or with a wire joiner if preferred. Note that the earlier round rudder, and the later pointed, broad chord rudders are both shown as options. Many early aircraft were retrospectively fitted with the new rudder when it was found to improve handling. This style of 'in field' modification makes it hard for the modeller striving to make an accurate copy, but opens more variety to those of us looking to satisfy personal whims. It is unlikely that one could be proven wrong with this type of situation to hand, whichever rudder one chose to fit.

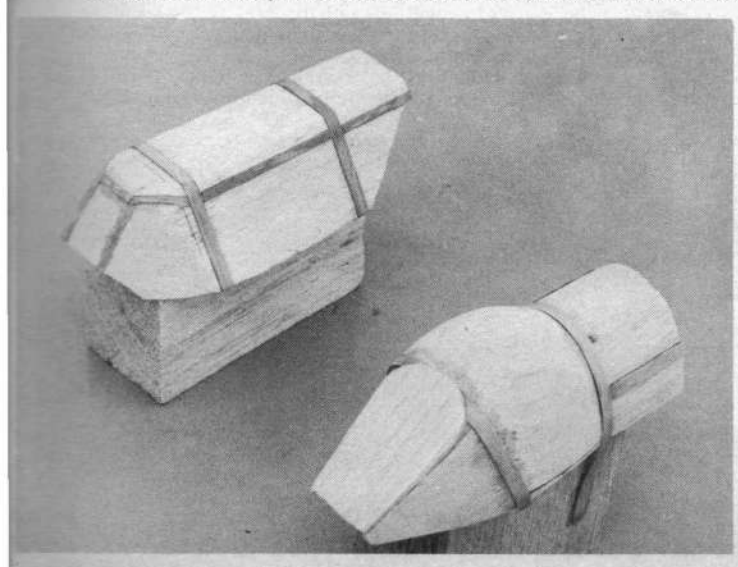
It is also pertinent to note that all of the prototype models flew with 3 function R/C, that is to say they had fixed rudders. I daresay some of you will fit an extra servo for rudder control, but frankly unless a steerable tail wheel is used coupled with tarmac take off areas, I doubt if it is of much advantage. I further doubt that it justifies the extra weight and complications. Tissue cover all tail components, with clear dope and sanding sealer applied and sanded until smooth. Fit the tailplane in to the slot in the rear fuselage checking for squareness both from the front and from the top. Hinge the elevators with mylar or nylon strip.

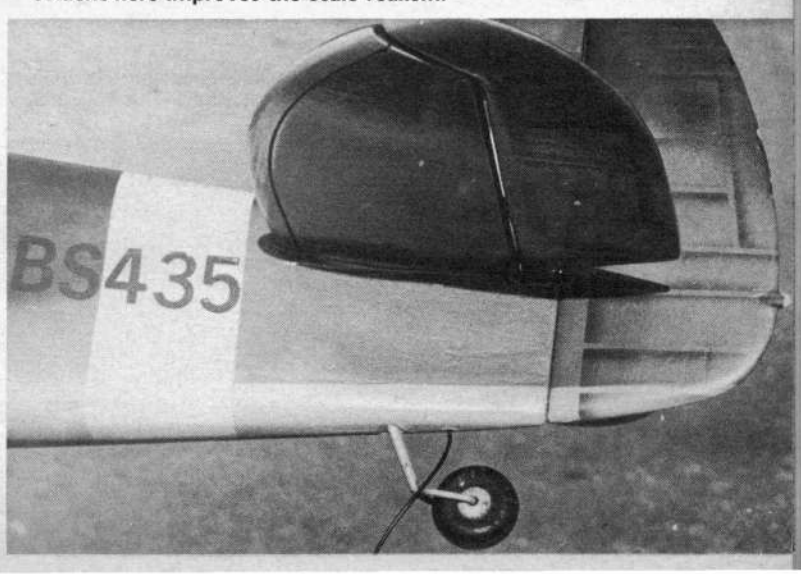
If necessary, slightly relieve the fuselage sides to clear the elevator joiner. Small fillets of scrap balsa are added to each side of the base of the fin to blend into the rear of the upper fuselage.

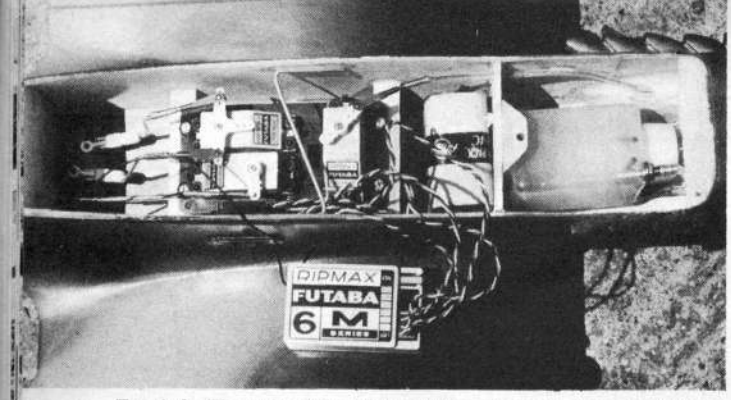
The rudder is finally added – stuck firmly into place. Now to consider ancillary details. Having taken great care to ensure the correct cross sections at the nose, the exhaust stubs should be carved from a soft 3/8 in. × 1/2 in. balsa. This is not in fact an onerous task, but one that benefits from a little peace and quiet in the workshop and a *NEW* blade in your favourite modelling knife. Just whittle away until an approximate final shape is reached and finish with fine garnet paper. Glue to the fuselage as shown and finish with sanding sealer. A carburettor intake can be fashioned next from scrap block. Many earlier Spitfires had smaller intakes (see plan pack or photos) but the longer scoop shown on the plan was equally common. Blend this to fit the under nose profile, glue in place, tissue cover and dope. Radiators on the MK IX Spitfire were identical (not asymmetric as on earlier marks). They can be made from 3 pieces of 3/8 in. soft sheet. Zap together to make a 'U' shape and carve and sand to final outline and section. Fit these under the wings and tissue cover, allowing the tissue to overlap the joint and fair smoothly into the existing finish. Cannon breech fairings are cut from 3/16 in. soft sheet carved and sanded and fitted to the top of the wing in similar manner. Cannons and recoil covers are made from balsa dowel (balsa is better than hard wood dowel – it snaps if mishandled rather than wrenching out of the wing!) Note that some aircraft had fairings over the cannon and some did not. I used the faired cannon as they are easier to make! Like the radiators and blisters the cannon are tissue covered and doped. Cannon are fitted into holes drilled into the L.E. of the wing and are faired in with Polyfilla.

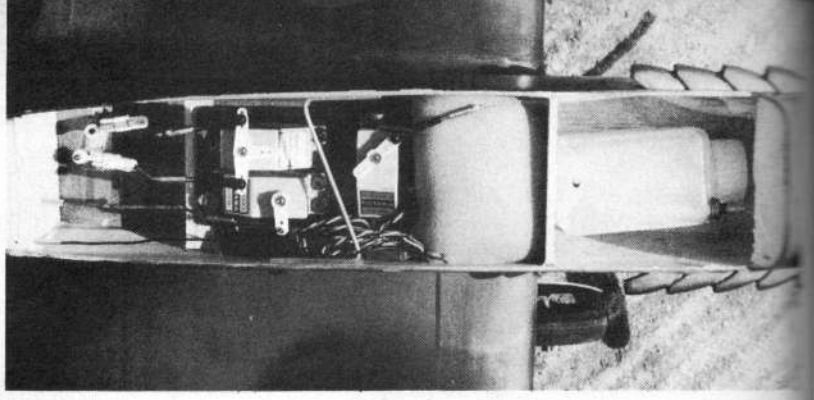
Machine gun holes may be drilled at this stage if desired but may equally be left until after spraying (more of which later!) Navigation lights

Below left. The cockpit canopy formers referred to in the text. Note the substantial block for holding whilst forming. Right. The aerial exits neatly behind the tail-wheel. Excellent air-brushed detailing evident here improves the scale realism.









Top left. The wire 'Z' which stiffens the bay. Receiver removed to show the Ni-Cad battery pack position. Right. Rx in place.

at the wing tips are glass headed pins faired with Cataloy or other vehicle filling paste. The tail light is carved from balsa, as is the white light on top of the fuselage. The radio mast is made from a hard typist's eraser with a balsa fillet at its base. The cockpit canopy mould was carved from balsa block and the canopy frame-work added from 1/32 in. plywood. The canopy itself was formed in the time honoured manner of warming the acetate sheet (approx .040 in. - .060 in. thick) under the grill, in the oven, or in front of the fire until soft and then forcing gently but firmly over the mould. Canopy forming is a subject that frightens many modellers but should not really be regarded as difficult. A little practice and one can knock-out specialist canopy shapes with no trouble at all.

The canopy is stuck into place after painting the cockpit area and allowing it to dry *thoroughly*. All solvents should be allowed to evaporate before attaching the moulding. The outside edges of the canopy can be faired with tissue and dope. U/C legs if required are bent from 10swg piano wire and fitted to the underside of the wing with mini saddle-clamps. U/C fairings are 1/16 in. ply tissue covered and doped. Epoxy the fairings to the legs. Both the Spitfire and the Me 109 have odd size and shape wheels (Messerschmitt more so!) and it is difficult to buy wheels to suit. My prototype used wheels made by Comet Products to an approximately scale size, treads being cut into the solid foam tyre with a small file. These wheels, apart from their near scale appearance, are exceptionally light, a major point in their favour. For those flying over long grass fit a drop tank or bomb. Both Spitfires and Me's carried centre line pick-up points and either drop-tanks or bombs would be quite appropriate.

Many different drop tanks were fitted to Spitfires, probably the most common being the 30 gallon 'Slipper' tank. Whilst many of the variants performed in a satisfactory way, none of them were sufficiently successful to merit adoption as a permanent solution. Some tanks were so aerodynamically clean that they refused to separate from the aircraft when released, others caused too high a drag factor. Some tanks were even used to ferry beer to the troops after the Normandy landings!! The tank shown is based on one of several 'medium successful' designs used during the war (Monograms 1/48th scale Spitfire IX shows this tank in greater accuracy).

Laminate tank from 1/2 in. sheet or carve from block. The 1 1/2 in. wheel on a 6BA bolt axle is supported on two small ply plates let into the balsa. The tank support bracket is also from laminated 1/2 in. balsa and has the blind nuts from a 'wing fixing bolt' set epoxied inside. Carefully line up this fixture with the bottom of the wing using the holes through the 'Broom handle' reinforcements as guides.

Nylon bolts go through from the inside of the fuselage to attach this bracket. Cut away top of tank (or bomb) to fit to the bracket and if necessary ease the top of the tank to clear the nylon bolts. Epoxy the tank to the underside of the bracket. Remove the complete assembly, tissue cover and dope, etc.

The biggest single problem on the Spitfire was the spinner. I was unable to find a 2 1/4 in. diameter spinner that anywhere approached the correct profile. Eventually John Haytree of Fox UK came up with a suggestion. Their 2 1/4 in. 'Slim Jim' spinner was the right profile but was approx 5/16 in. too long. To reshape the nose of the spinner was not feasible due to lack of wall thickness and eventually I turned the excess length from the rear of the spinner on a lathe which necessitated cutting a new groove in the back plate and touching up the edge of the back plate to suit. Loss in diameter was only about 1/32 in. which did not show and the finished spinner was close enough to scale shape to satisfy the most critical observer.

Below left. The M.E. 109 foam blocks ready for core cutting. Note the washout line drawn on the rear of the block. Right. The M.E. 109, final details to appear in our next issue.

Finishing

The entire model should have a final coat of well thinned sanding sealer and a rubbing down with fine wet and dry paper and is then ready for painting. The first step is to mask off the canopy leaving only the airframe exposed. The entire airframe is sprayed with cellulose primer and rubbed down again. Grey primer dries matt and has the property of showing up all the faults in the surface beneath, it gives a visual check that all is o.k. before proceeding further. The underside colour (light grey) is sprayed on and when dry the edges masked off. The top side colours (Dk grey and Dk green) are applied (note that there is *no* hard line between these two colours). They are simply sprayed on with a 'feather' edge. Accurate colour detail for this Spitfire – a MK IX of 611 squadron (serial BS435 – codes F-FY) are to be found in the M.A.P. plan pack No. 2740. Leading edge yellow stripes are added and roundels applied with Humbrol enamel and a draughtsman's compass.

Spinner and rear fuselage bands are 'Sky type "S"'. Serial numbers are from Letraset dry print transfers.

Detail paintwork can be added by airbrush. (Airbrush technique is the subject of a feature by Ian in *Model Colour*, a *Scale Models* special edition available now, and also of a series soon to begin in *Aeromodeller*.) Many readers will have noticed the excellent detail airbrushed on Ian's original models featured on our August cover.

Radio Installation and Flying

Radio installation is straightforward but note that the aileron torque rods are off-centre to facilitate ease of connection. Keep the radio well forward to achieve the correct balance point. Batteries may be placed in the tank bay if necessary.

Flying presents no problems if the usual steps are taken. For instance, a carefully adjusted motor, no warps, correct balance, right flying conditions, etc. etc. After a hand launch the model should be allowed to climb out at its own speed and not 'hauled' up too quickly. Aileron response is rapid but not twitchy. Loops, rolls and inverted flight are easy, although inverted flying needs a fair amount of down elevator to be fed in! Landings should be kept fairly fast until thoroughly familiar with the model's overall performance characteristics.

Since Part 1 has been published I have received many comments and not a little criticism. Most pointed of these have been the requests from complete novices for further details and 'tips to make it fly easier'.

Let me state quite categorically that whilst not at all difficult to fly for the experienced low-wing pilot, the Spitfire and Me 109 – or indeed any model of this size and style – *are not suitable for beginners*. Despite this one feels that many will be built by those not yet experienced enough to handle them. To those people who persist in biting off more than they can chew *please* seek experienced help before flying the model yourself. At the very least allow an experienced flyer to trim the model before 'having a go' yourself.

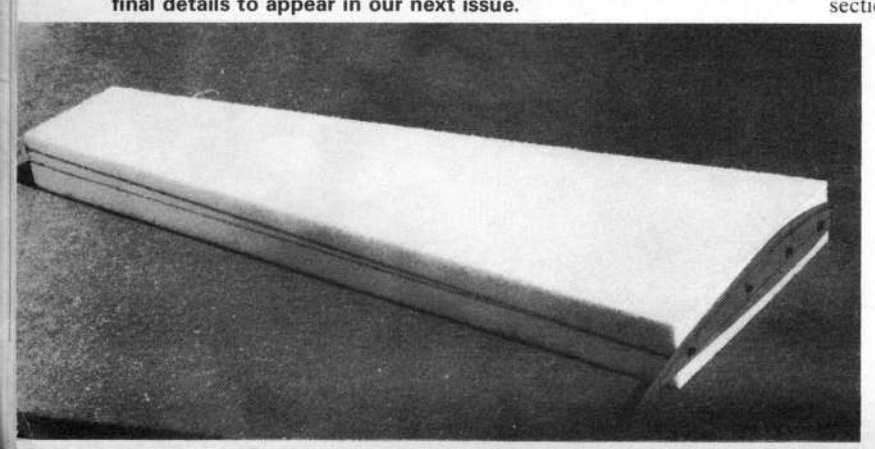
Messerschmitt 109e Construction

Those of you who have followed right through the Spitfire construction will not be surprised at the similarity between the two models (and incidentally the P51 Mustang and Hawker Hurricane built as part of the same exercise!)

Probably the most noticeable difference being that the straight tapered wing on the Me 109 allows the foam wing cores to be cut in one piece rather than the two pieces required for the Spitfire. Beyond that no difficulty should be encountered in the wing construction which follows the general practice shown for the Spitfire.

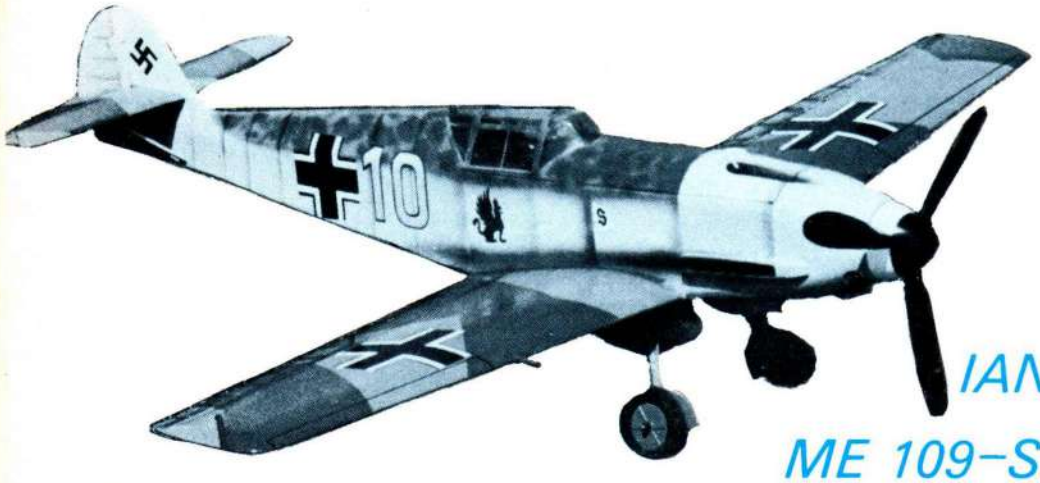
Next month in the final part we will deal with the fuselage and tail of the Me 109 together with some thoughts on other fighters which could quite easily be 'adapted' from this basic idea.

Finally as mentioned last month we have arranged a 'package deal' of parts for both models, details of which can be found in the classifieds section.



DOGFIGHT DOUBLE

PART THREE



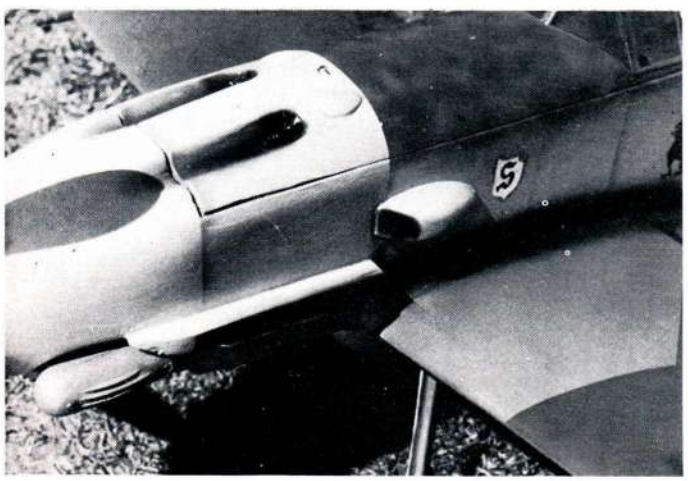
FINAL DETAILS OF IAN PEACOCK'S ME 109–SPITFIRE DUO

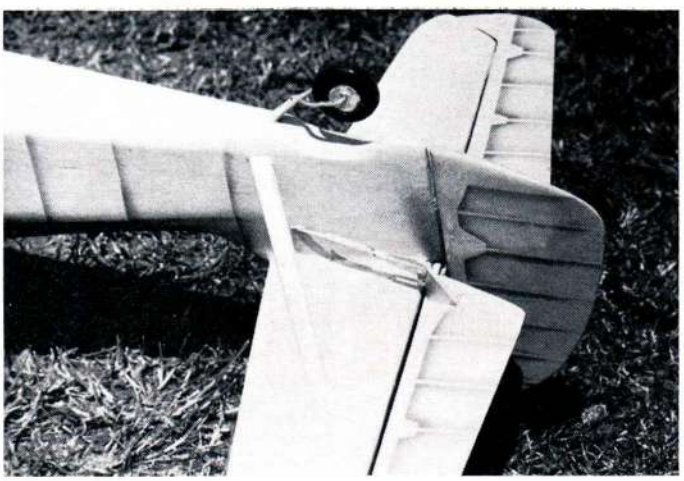
PART 2 completed the description of the wing construction for the Me 109 and this, the final part, carries on from that point. Check at each stage of wing construction that the 10° washout remains correct. Tissue cover the entire wing taking the same precautions as previously mentioned in the Spitfire construction notes. When completely satisfied with the wing, the fuselage may be added. Note how the fuselage sides curve when viewed from the front. This curve is achieved by bonding the 'Mirralite' ply doublers to the fuselage sides with Evo-stik contact adhesive using a rolling motion. Assemble formers 3 and 4 to the fuselage sides and the top of the wing, using a slow setting adhesive such as P.V.A. or aliphatic resin, check all round for squareness and leave to dry. The front and rear are pulled-in as with the Spitfire. The front end is built in exactly the same way, as for the Spitfire but the rear top deck is not rolled but formed from 3 pieces of flat sheet as shown on the drawing. Remember to fit the 'snake' for the elevator control and also the nylon tube to route the aerial through. The lower rear fuselage is carved from 1/2 in. sheet and the tail wheel is added as shown.

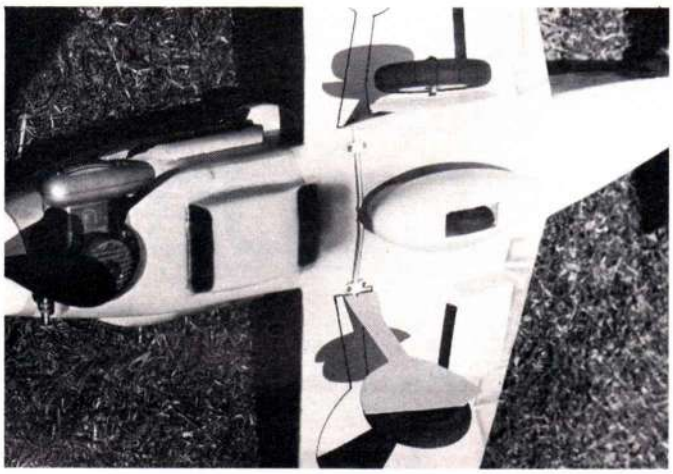
Tailplane and Fin

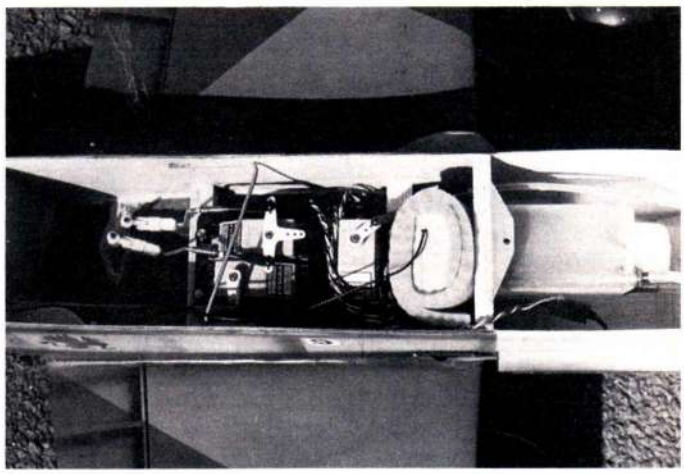
Make up the fin, rudder, tailplane and elevators from 1/4 in. sheet as with the Spitfire but take note of the grain direction on the lower part of the fin. This lower fin sits on a 1/8 in. balsa floor fitted between the fuselage sides and is faired in on each side with scrap balsa sheet. Join the elevators with 1/4 in. dowel, or piano wire if preferred, and hinge to the tailplane with nylon or mylar strip. Tissue cover and dope all the tail parts. Fit the tailplane/elevator assembly to the top of the lower fin and check for alignment from both top and front view. When completely dry add the upper fin and the tailplane support struts made from 1/4 in. dowel (or 1/4 in. sq. spruce) sanded to section. Fair the ends of the struts with scrap balsa. Note that these struts are functional and add considerable strength to the tail assembly. Do not omit or replace them with anything of lesser strength. Gently ease the fin to allow the elevators to pivot freely and fit the rudder securely into place. Sand the airframe lightly all over and tissue cover the remainder of the fuselage. Mould a cockpit canopy (in the same way as detailed in the Spitfire instructions) and fit this into place. Additional details can now be added and the air scoop under the nose made from soft block or sheet. The radiators under each wing are from soft sheet as are the cannon blisters. The cannons are made from 3/16 in. dowel 'turned' in an electric drill. A similar constructional method was used for the cowl-mounted machine guns. The gun troughs were hollowed with a sanding drum driven by a Dremel flexidrive but could equally be taken out with an Exacto gouge. Note that the port machine gun protrudes further than the starboard. The exhaust stacks were carved from 1/4 in. × 1/2 in. balsa with strips of 1/16 in. balsa top and bottom. Take care if using an inverted motor (or in some cases a side winder!) that the silencer does not obliterate the exhaust stack detail on one side thereby removing much of the 'character' of the model. U/C legs, like those on the Spitfire, are 10 swg piano wire with 1/16 in. ply doors, and are designed to be easily removed. Scale wheels are virtually impossible to

Below: effective use of air-brush to produce, Left, gun and exhaust smoke stains plus camouflage mottle, and Right, single sheet structure given the 'solid' look.









Above left: M.E. 109 underside showing hand-grip pod with partially enclosed wheel. Above: The battery pack is sited benea*h the tank, receiver aerial routes through tube to tail.

buy unless advantage is taken of the 'package' on offer. A spinner is not difficult to come by as several commercial spinners can be adapted by removing the nose portion to reproduce a passable facsimile.

The drop-tank/bomb is of similar construction to that on the Spitfire and represents the most commonly used auxiliary tank. Note that the tank centre line is roughly parallel to the wing and not sloping down as on the Spitfire.

Finishing

Cover all the additional detail parts with light-weight tissue, doped on. Follow with the usual dope, sanding sealer and elbow grease treatment until a satisfactory surface finish is achieved. The finish on my models was all cellulose, applied after first masking the glazed areas of the canopy leaving the framework exposed. Grey primer is applied and rubbed down with 'wet or dry' paper to obtain a good base finish. The underside is finished in 'Hellblau' – a lightish blue. No masking is used as the light grey/dark grey top surfaces merge with the blue at all edges. Masking is required though on the top surfaces of the wings and tail as the 'splinter' camouflage used had a clearly defined edge.

A DeVilbiss MP gun was used for all 'solid' colour and a Sprite airbrush used for all the fuselage mottle effect. Colour details can now be added. Gruppe and Staffel markings can be applied using a 'frisket' film, cutting out the design and spraying through. Again a Sprite or similar airbrush is adequate for this job. Crosses, Swastikas, aircraft serial number, etc., can all be masked and sprayed with the 'frisket' method. Yellow nose and tail can be similarly treated. Exhaust stains, cannon and machine gun stains can be airbrushed in, as can the fuselage panel lines. Masking with 1/16 in. and 1/8 in. wide tape provide the basis for airbrushing the simulated fabric covering on the flying control surfaces. More detailed accounts of this technique will be found in our sister magazine *AeroModeller* or the *Scale Models* special *Model Colour* (available now) who are to publish a detailed exposé of the entire field of spray painting and finishing techniques throughout the ensuing months.

The entire model must now be fuel proofed and 'matted' by rubbing the final coat with steel wool to produce a semi-matt effect.

Flying

Radio installation is identical to the Spitfire and should offer no difficulty.

Flight characteristics are not markedly different from the Spitfire as one would tend to suspect. My own model is a little twitchy due to a particularly poor example of building resulting in a great deal more washout on one wing than on the other, but for all this-flying does not present any major problems.

As with the Spitfire, speeds of around 70-75 m.p.h. (estimated) are common and virtually all elevator/aileron manoeuvres are possible. Keep the landing speed up until you have the full measure of the model.

Markings on the prototype model are from the MAP plan pack No. 2790 and depict an aircraft of 9th Staffel, III Gruppe, J.G. 26.

Future Possibilities

Serious students of the modern model flying machine will recognise in these small scale models a simple design philosophy which is eminently suited to a variety of similar subjects. In fact I have already drawn up several more subjects including: P51 Mustang, Hawker Hurricane, FW 190D, Japanese Tony and Zero fighters, P39 Airacobra, P40 Warhawk. Amazingly the foam cores for the Me 109 could be used for several of the above list simply altering the L.E., T.E., and tip wood parts to produce a wing close enough to scale to be practical and all with an area in excess of 300 sq. ins.! So who knows what other subjects could appear at Club 20 scale meetings in future seasons.

CONTEST CALENDAR

S.M.A.E. Centralised R/C Events

SEPTEMBER 10/11th – R/C Thermal Soaring, Abingdon.
SEPTEMBER 11th – S.M.A.E. Southern Gala. R.A.F. Odiham, Nr. Basingstoke, Hants. S.M.A.E. members only, details being advised to all clubs.
SEPTEMBER 11th – R/C Aerobatics, R.A.F. Cottesmore.
SEPTEMBER 11th – F.A.I. Pylon, R.A.F. Fulbeck.
SEPTEMBER 18th – South Coast R/C Rally, Golden Cross, East Sussex. Send for pre-entry details (S.A.E.) from: N. F. Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex.
OCTOBER 2nd – Autumn Scale Meeting, Class I (RipMax Trophy – to new F.A.I. rules), R.A.F. Little Rissington, Glos.
OCTOBER 2nd – R/C Aerobatics, Bulford Camp.
OCTOBER 9th – Towner Thermal Soaring Trophy, Golden Cross, East Sussex. Percentage slot. Pre-entry £1.00 plus S.A.E. to G. Hockney, 1 Bainbridge Close, Seaford, East Sussex.
OCTOBER 9th – F.A.I. Pylon Race, R.A.F. Fulbeck.
One week before all R/C Aerobatic Centralised Meetings please ring G. Franklyn, Leicester 548313 (day), Leicester 895876 (evenings) to check venue.

OTHER EVENTS

SEPTEMBER 11th – Anglia M.F.C. Thermal Competition (B.A.R.C.S. League). Entry 75p plus S.A.E. to Mr. B. J. Austin, 10 Manor Road, South Woodham Ferrers, Nr. Chelmsford, Essex.
SEPTEMBER 18th – Flying Druids Class 2 Scale Event.* Middle Wallop Airfield, Entry 50p. plus S.A.E. to G. Murray, 18 Armitage Square, Larkhill, Wilts.
SEPTEMBER 18th – North London Scale Day*, Baldock, (Sorry, no sailplanes) mid-day barbecue. No pre-entry.
SEPTEMBER 18th Teesside M.F.C. 3rd Annual Thermal Soaring Event. B.A.R.C.S. Rules – League event 50p pre-entry stating frequencies + S.A.E. to A. Oliver, 19 Regency Drive, Hartlepool, Cleveland.
SEPTEMBER 25th – South Midland Area Rally. R.A.F. Halton. R/C assist Vintage models. S.M.A.E. Members only.
SEPTEMBER 25th – Basingstoke Thermal Meeting.* BARCS rules. Pre-entry 75p to A. Wisher, 15 Aster Road, Basingstoke, Hants.
SEPTEMBER 25th – Avon Cosmetics Club 20 Pylon meeting. Championship meeting. Entry £2.00 (£1.00 refund on day) state frequency to D. Boddington, 3 East Street, Irchester, Northants.
SEPTEMBER 25th – Flying Druids Fly-for-Fun event,* Golden Lands Farm, Burbage, Wilts.
OCTOBER 2nd – Liverpool & District M.A.S. Contest, any Seaplane, Flying Boat or Float Fitted Helicopter. Leisure Lakes, Nr. Southport on A565. 11 a.m. start. No entry fee but prior notice of intention to attend would be welcomed by A. Searl, The Barn, Chorley Road, Hilldale, Parbold, Wigan. Tel: Parbold 2000. Prizes for best T/O and landing, etc.
OCTOBER 2nd – High Wycombe and District M.A.C.* Thermal Soaring competition, 100 inch class. S.M.A.E. members only. Details, S.A.E. to A. O'Shea, 68 Blumfield Close, Burnham, Slough, Berks.
OCTOBER 2nd – Lilford Park Club 20 Aerobatic and Scale. Entry 75p plus frequency to D. Boddington, 3 East Street, Irchester, Northants.
OCTOBER 2nd – Ribble Valley M.S.A. Cross Country Soaring Event.* Pre-entry 75p plus S.A.E. state frequency to: Phill Goddard, 31 Basnett Street, Burnley, Lancs.
OCTOBER 2nd – Southampton Model Aeroplane Club, Beaulieu Trophy, Aerobatics.* Beaulieu Airfield. Pre-entry £1.00 (S.A.E.) to K. Anderson, 17 Brook Road, Fair Oak, Eastleigh, Hants.
OCTOBER 23rd – Cotswold End of Season Class 2 Scale Rally. Aston Down airfield, Nr. Stroud, Glos. Pre-entry £1.00 S.M.A.E. members only. Entry form (S.A.E.) from D. V. Parish, Laurel Cottage, Randwich, Stroud, Glos.
OCTOBER 23rd – Hull Area R.C.S. 100S Thermal Soaring Event. Walkington, near Beverley. S.M.A.E. rules. Pre-entry 50p state frequency to Steve Jackson, 4 Albion Grove, Carrington St., Hull, N. Humberside.

* LICENCE AND INSURANCE REQUIRED.

Scottish Aeromodellers' Association Major Events

SEPTEMBER 17th/18th – The Scottish Nationals, Club 20 pylon, FAI Aerobatics, Class 2 Scale, Thermal Soaring. Venue:— Cumbernauld.

Details of these events and full list of other S.A.A. events available (SAE) from J. E. Glen, 5 Brownhill View, Bonkle, Wishaw, Lanarkshire.