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THE ISSUE AHEAD...

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Cuba's Fuerzas Armadas Revolucionarias may well have been the last air arm to use the Hawker Sea Fury in combat action. Graham Buchanan chose Cuba air force colours for his spectacular 1:4.5 example, built from Jerry Bates plans. Full review in this issue.

Photo: Alex Whittaker

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# CONTACT

## TIME TO THINK ABOUT INDOOR SCALE

It feels a bit odd to be contemplating the coming Indoor Scale season when this piece is being written while August is not yet gone, but by the time you read this, the evenings will be drawing in, even if only just noticeably, and thoughts may turn to autumn and winter indoor flying.

Among the features we have lined up for the coming months is Richard Crossley's 21" wingspan free flight Nakajima Ki-43 Oscar, WW2 warbird, which will be presented as a full size plan feature.

Historically, the Indoor Scale scene has been the domain of free flight and BMFA national indoor F/F scale events have enjoyed excellent support. Indoor-capable lightweight radio control equipment has been available for years, initially quite expensive but progressively lighter, smaller, more mainstream and affordable. The drive toward miniaturisation seems unbounded.

To promote R/C Scale at the competition level, our BMFA last year launched a new R/C competition category with classes for scratch-built models and ARTFs, and allocated time at this year's Indoor Scale Nationals at Nottingham - but lack of entrant support curtailed flying.

Even so, a point that did emerge from the amount of R/C scale flying that took place, was that disciplined flight pattern needed to perform a designated schedule of manoeuvres too-and-fro in front of a panel of judges is very different from general tooling around, particularly with the additional distraction of four walls. It needs its own special brand of practice!

Despite the initial low support, BMFA's Indoor R/C Scale series will continue this autumn, starting with an event at the excellent RAF Shawbury facility of Sunday October 19th. Why not give it a go, either as a competitor, or spectator. Andy Sephton (07872 625279/ [andrewjsephton@gmail.com](mailto:andrewjsephton@gmail.com)) will be happy to provide more detail.



Richard Crossley's Nakajima Oscar, also seen in bare bones above.



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## SPAD XIII ARTF IN 1/5TH SCALE

**T**he SPAD XIII was one of the premier French fighter aircraft of WW1 and was a development of the earlier SPAD VII, which had seen wide service with French Escadrille on the Western front from May 1916. It was successful and the development of the SPAD XIII (Société Pour L'Aviation et ses Dérivés) was a logical follow-on as the demand for greater performance became urgent. Its distinctive shape sets it apart from that other leading French fighter type, the Nieuport 11 & 17 series.

Maxford USA have produced an ARTF kit in 1/5th scale which gives a wingspan of 68" (1727mm) - a nice manageable size, without being too big. Power required is in the 26cc range with CRRC GF26i petrol engine shown with the kit but any equivalent .90-1.20 cu. in glow engine or equivalent electric power system may alternatively be applied using the suitable installation hardware provided. Typical finished weight is 13 lbs.

The kit also comes with glass fibre cowl, scale exhaust stack that can be linked to the engine exhaust using the optional adaptor, which is available separately.

Additional separate items include a set of 1/5th scale dummy Vickers machine guns and WW1-era pilot bust.

The UK supplier is MacGregor Industries R/C Division and the kit costs £299.95 from MacGregor Industries stockists. The Vickers machine guns cost £49.95 per pair. Look it up at [www.macgregor.co.uk](http://www.macgregor.co.uk)

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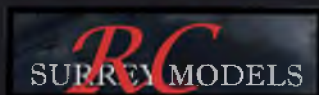
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# STOP PRESS

## *Scale World Championships results*

*Report by John Carpenter*

**T**he 2014 FAI World Championships for Scale Model Aircraft was held from July 19th to 26th at Marmande in the Gascone region of France. Two three-man teams represented

the UK for F4c and F4h. The F4c event is, in almost all respects, exactly the same as the UK event whilst the F4h Class is similar to our stand off competition in that the static score represents one third of the total. A total of

thirty-nine competitors contested the F4c event including just about all the well-known names in European scale circles, together with a further fifteen in F4h. Given the location of the competition it was not







for UK were a team Silver medal in F4h and team fourth place in F4c. Individual placings for our team members were:

**F4c**

9th: Dave Knott  
Hurricane Mk I

10th: Dave Womersley  
DH Chipmunk T Mk 10

16th: Mick Henderson  
DH9a

**F4h**

8th: Alex Kennedy  
DH Tiger Moth

9th: Richard Crapp  
Westland Wessex

11th: Dave Toyer  
Miles Messenger

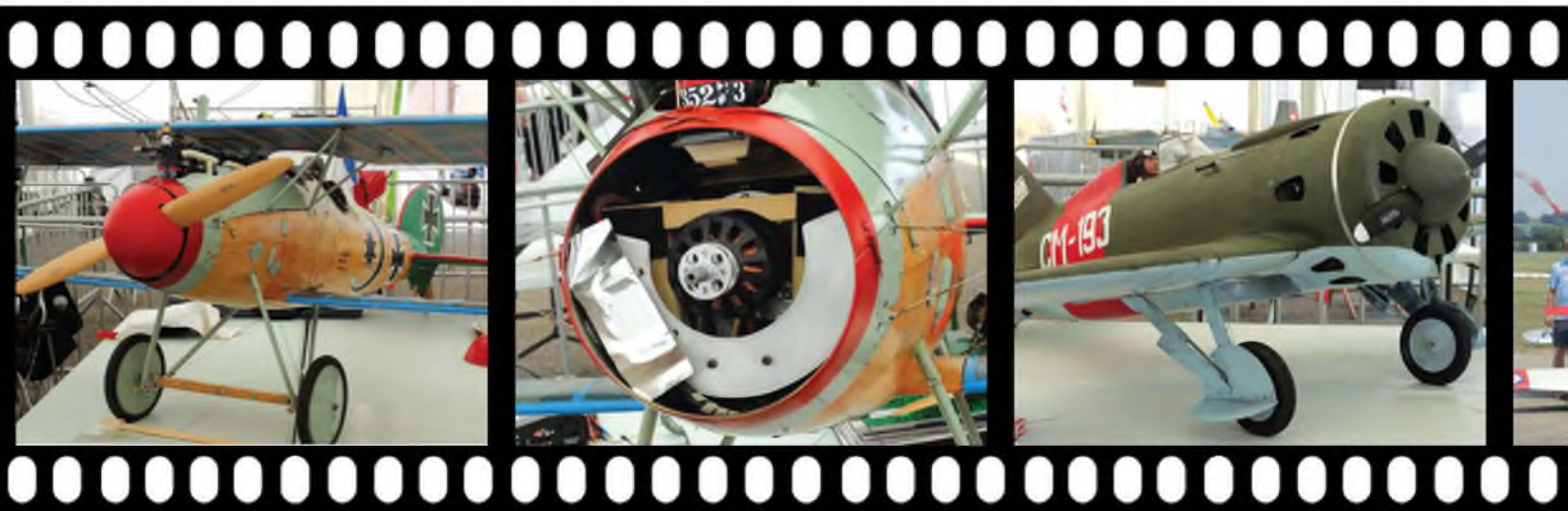
surprising that the European nations were well represented but competitors also arrived from as far afield as Japan and Australia.

Marmande municipal airport was given over to the competition for the week and both the weather and the site proved almost perfect throughout, with just the odd

evening thunderstorm to liven things up a bit. To add that final frisson of aeronautical excitement the Patrouille De France rounded off the final day with a low-level formation display in their Alpha Jets, in which they comprehensively beat up the airfield to the delight of all.

In a close fought competition, the results

***A more detailed report will follow in FSM November issue, but for now the photos provide a tantalising 'taster' of the event.***



# Great Lakes Trainer

Concluding the construction feature for the electric powered model designed by Peter Rake and built and described by Pat Lynch

**W**ith all the basic construction completed we move onto covering the model, getting it assembled and the all important flying notes. By way of a brief preview of that point, just suffice it to say

that this model flies sufficiently well that Pat now uses it as his 'hack' model. If he needs something to fly at any time, this is the model he takes, in preference to any other. Far from meaning it's tatty and knocked about, although well over a year old, it recently placed well in a district

competition - second place in 'Civilian Scratch Built'.

So, with that said, it's over to Pat for the final details.

**PETER RAKE**

I hope the photographer is ready to leap out of the way if Pat's thumb slips on the throttle stick. 15 x10 props take no prisoners.



Prior to covering the model reveals its' totally traditional structure. Lots of balsa and ply, a little bass and wire and very little else.



## COVERING AND PAINTING

This will be almost entirely personal. After some study of the early examples of the type, it seemed that any combination of cream, red, white, orange or black would satisfy the critics. I liked the cream fuselage and tail with orange wings and trim and used *Lifespan* on the fuselage and tail for lightness, and orange *Solarfilm* for the wings for ease (read laziness!).

The *Lifespan* was given a coat of dope and a very light mist of cream acrylic. The forward fuselage, where it was metal on the original, was sprayed a slightly different shade of cream. The orange trim was a combination of *Solartrim* vinyl along the sides and a nearly-matching orange acrylic spray can on the front. All strut work was sealed, sanded and painted satin black.

The fictitious registration numbers and the Great Lakes logo on the tail were simple decals made on my inkjet printer. The wing numbers are from black *Solartrim*.

## ASSEMBLY AND RIGGING

The tail parts were slipped into their places and any gaps made good. The elevator was hinged with Mylar CA hinges and fixed in place AFTER threading the

pushrod and clevis into fuselage and connecting it to the brass horn.

Anchor points for the rigging were made from split pins (cotter pins) glued into the wing struts and brass lugs fixed between the fuselage and lower wing roots.

The assembly was very straightforward - the lower wings were slid into place on the wire dowels (being sure to fit the aileron servo leads) and secured with the brass strap. These were checked for equal distance from tip-to-tail and that they were square with fuselage.

The upper wing was then secured to the centre struts with brass P-clips and checked for tip-to-tail alignment. The distance between the outer wing panels should be very close to identical. (If your wire bending wasn't quite as accurate as Pat's, small shim pieces between the P-clip and wing will even things up. PR) The outer struts were now CAed into the lower wing and checked that they lined up with the slots in the top wing underside then everything was inverted and the struts glued to the top wing.

If everything has been made according to the plan, it must be aligned correctly - after all, computers don't lie! (Well, computers might, but the accuracy you

can achieve using CAD helps to make sure it all lines up - on the drawing at any rate. PR) The rigging is stranded wire similar to the closed loop linkage cables.

A pilot was carved from foam, a simple instrument panel fitted and the model was deemed finished. Almost. I don't like shiny film finishes so the wings were given a very light coat of clear satin acrylic - it looks much better...

(That said, and it's how Pat likes his models, being a civilian type likely to be in private ownership there's always the option of a pristine, highly polished finish. In other words, if you want to cover your model with glossy film, it won't look out of place on this particular prototype. PR)

## THE CRUCIAL PART

With a 3S 3700 LIPO Velcroed onto the tray, the Hitec receiver bound to the transmitter and a satisfactory range check completed, it was off to the flying field. A quick pre-flight check confirmed that the control surfaces all moved in the right directions so onto the strip...

The 'Trainer was pointed into a very slight breeze and the throttle eased open. Tracking was dead straight so full throttle, some down elevator until she gained airspeed and....lift off! A click of right trim



The wire parts and interplane struts all faired and sanded. Note that the front legs don't get joined until after fitting to the fuselage.



How the u/c fits onto the fuselage. You can see that only one side is soldered up at this stage.



As you see, those effective looking louvers are nothing more than sanded strips of wood.



With the u/c and c/s struts plugged into their tubes the cowling separation line is clearly visible in this shot.



Some colour, exhaust stacks, spinner and panel detail complete the front end.

and she was flying circuits at half throttle. Beautiful!

The model was so stable, I was able to return to my car, pick up the camera, turn it on, zoom and take some photos while still flying the model! A commendation indeed.

A great machine. Easy enough to build,

easy to fly and probably capable of some mild aerobatics - but that will be later.

(Yes, the flying part was fairly brief but what more is there to say than that within minutes of taking to the air Pat felt sufficiently comfortable with the model's performance that he was able to take photos while actually flying the model?

Not, I hasten to add, the flying shots you see here. They did require a bit more concentration and Pat's good lady on the camera. PR)

All things considered, the Great Lakes Trainer is an ideal prototype for a model that isn't difficult to build and flies well right from the outset. Self-praise may be

Maybe not the marque's best known offering, but certainly an attractive model that flies very well indeed.





The model cruises gently by at around half throttle. Even on the first flight it proved a smooth and predictable flyer within minutes of take-off.

no recommendation but I'm rather pleased with the way this one has turned out. My thanks go out to Marion for suggesting the model and Pat for stepping into the breach and actually building the prototype. PR) ■

### SPECIFICATION

**Span:** 53"  
**Weight:** 5 pounds  
**Motor:** Turnigy 4250-500  
**ESC:** Turnigy 60 amp.  
**Battery:** Turnigy 3700 3S  
**Rx:** Hitec Optima 6 2.4 GHz  
**Prop:** 15X10 APC-e  
**Time to build:** 3 weeks!



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# COSFORD 2014

Alex Whittaker attends the LMA's flagship large scale event at RAF Cosford July 19/20th

**L**MA Cosford remains one of the 'must see' events of the aeromodelling season. Only The BMFA Nats are bigger. For those of us of the scale persuasion, it is a scale event where we can trust that the majority of the models have been bench-built by their owners. The Trade area is huge. It also attracts a number of modelling concerns whose main interest is

flying scale models. So you could justify the claim that LMA Cosford is the premier scale event of the year.

#### **Cross-wind hinderance**

It was very hot. Although rain threatened at one point, it held off. The only fly in the ointment was the awkward cross-wind which made life difficult for lightly-loaded models, especially the vintage types and

WWI Scouts. Incidentally, *Dawn Patrol Extended* put 23 WWI scouts in the air at once without a single mid-air!

#### **Flying Fleas**

Anthony Hill and Ian Redshaw flew Mignet Pou Du Ciels in contrasting schemes. Ian's scheme was based on an historic Bassett's Liquorice Allsorts theme, whereas Anthony's Flying Flea sported a fine red





Ted Allinson's DH Rapide G-AGSH Jemma Meeson, powered by two DLE55s. 197" (5m) span, third scale, weighs 43 kgs.



Lovely, lovely, lovely! Druine Turbulent by Dave Lowe. 22"x8" prop and 40% scale. Powered by a Zenoah 38.



Anthony Hill's Pou Du Ciel catching a crab on a cross-wind take-off.



Ted Allinson's DH Rapide G-AGSH Immaculate and a great performer.



Beautifully executed instrument panel in Dave Lowe's Druine Turbulent.



Ian Redshaw's Pou Du Ciel was covered in allsorts.

and white finish. They were sorely troubled by said crosswind, their skittishness no doubt compounded by flying off tarmac. Once in the air, both examples were a delight to watch.

### English Electric Wren

Richard Curry-Pearce shared the Flying Fleas slot with his impressively large vintage powered glider, the British E.E. Wren of 1923. The scale patina was

remarkable. Three examples of the full size Wren were built, the 3rd one, restored using parts of Wren no.2 now resides at Shuttleworth, Old Warden and on its last outing there whitened by FSM, it used a

Exquisite Dart Pup by Clasue Smith. 3W38 flat twin petrol powered. 13 foot 6 inch span and built to 40% scale. Weighs 23 kg.







Focke Wulf Fw 190D by Phil Clark of Fighter Aces. Powered by a Zenoah 62, built to one-fifth scale, 83 inches in span, and weighs 33 lbs



Don Billingham's huge HP W10 flown by Steve Holland. 197" (5m) span, powered by two Laser 100s twin 4-stroke, driving 28"x8" props.



Majestic Comet 4, flown by Steve Rickett. Carries 8 litres of fuel, weighs 120lbs, powered by two Jetcat 120 gas turbines. Utterly convincing.



Superb rivet and panel line detail on the Clark FW 190D.



Don Billingham's huge Handley Page W10 biplane airliner dwarfed all the other models in the pits.



Steve Rickett's Comet really is an impressive beast.

Cosford pyrotechnics were big, brash, loud and proud.



Brian Hutchison's scratch built, 4.1m span Mosquito on short finals. Superb!





Pat Cuss's lovely Stinson SR16, built to one third scale, 166" in span, and powered by DA 150 twin.



Smoke on! Perry Lambert and Darren Goule flew matching Horizon Hobbies Piper Pawnees, both Zenoh 80 powered.



DH Hornet by Karl Mander. 1: 4.5 scale, powered by Zenoh 62 driving 23X10 props. 114 inch in span and weighs 19kg.



Colomaban Cri-Cri built to 75% scale, powered by two Zenoh 26s, and flown by Dave Hayfield.



Incident averted! After a flame-out, Dave Johnson brought the new LMA Vulcan in dead-stick, cool as a cucumber.

bungee catapult to get it airborne!

I thought the well-used, upright dashboard a work of art. Watch this space for a full photographic walk-around.

### Stinson SR16

Noted Large Scale maestro Pat Cuss's new SR16 is a very characterful model. It's a real biggie at 166" wingspan and is powered by a DA 150 petrol twin. The red and yellow scheme was a winner, as was the scale cowl, with its trademark rocker box blisters.

### DH Mosquito

Brian Hutchison brought his ambitious, new, scratch-built, 161" (4.1 metre) span, DH Mosquito powered by two ZDZ 100cc inline twin petrol engines. It was flown superbly well on the day by Steve Holland. Brian has yet to complete the scale undercarriage but the overall effect was astounding. Many felt this model was the Star of the Show.

### DH Rapide biplane airliner

Ted Allinson amazed us all again with yet another large scale masterpiece. This time a majestic one-third scale De Havilland DH 86 Rapide, powered by two DLE 55s. This one weighs in at 43 kgs. Utterly convincing in the air.

### Cri-Cri ('Cricket')

Dave Hayfield flew his French Colomaban Cri-Cri ultralight. The real one is tiny. She was powered by two Zenoh 26 petrol engines on stalks. She flew really well, but developed a significant problem in the air with her throttle control. One engine could not be cut-off, or throttled back. Dave bravely had two attempts at landing power-on, but with no engine control, the outcome was inevitable. He carefully landed her in a safe place, but of course she was flying too fast, and damaged her tail. Very upsetting to all who saw it.

### Vulcan flame-out

Dave Johnson suffered starting and running issues with Ted Allinson's large and immaculately prepared EE Lightning. Then later, Dave was flying the new large white LMA Vulcan, when it too had turbine issues. A flame-out occurred whilst low in the circuit and Dave had to land the big Vulcan dead-stick by turning her smartly onto the tarmac. All was well but I did wonder if fuel problems were the common cause.

### Incident

There was a troubling incident when one of the 1/3rd scale WWI aircraft Dawn patrol Team collided with a Show Steward. The incident took place deep in the outfield, far from the crowd line. I did not actually witness the event, just its immediate aftermath. I was at the flight line gate when the paramedic vehicles arrived. Later I saw the injured Steward get back on his feet, but beyond that, I have no more information.

### Watch This Space

Freed from onerous caption duties by generous Crash Parry, I was able to snap a



**Impressive Luton Minor by Tony Hill, powered by a DLA 112 with a 28"10" prop, 12' 6" span.**

good few scale walk-arounds for FSM. So, watch this space over the next few issues.

### The Verdict

Cosford continues to celebrate large and impressive hand-crafted models. Quite simply, it is one of the very best days-out in British scale aeromodelling.

### Acknowledgements

Thanks to the LMA Committee for their

annual invitation, and to Rob Buckley, LMA Secretary, who helped me track down some vital model information in the days after Cosford 2014. Especial thanks to Michael 'Crash' Parry for gathering so many model notes for me on the day. He worked like a Trojan. His energetic support allowed me more time to take photos for this proud organ. ■



**Superb 1923 EE Wren by Richard Curry Peace, had this sensational dashboard! True scale patina.**



**EE Wren by Richard Curry Peace, really has the presence of the full-size.**

**Close up of the pilot and office in Richard Curry-Peace's delightful EE Wren powered glider.**



## FREEWING

## MESSERSCHMITT

All-foam, virtually ready-to-go and with a really spectacular performance

**F**oam airframe ARTFs are not often featured in any detail in FSM. It has to be said though, that very considerable advances have been made in recent times that have taken this type of scale model well beyond the simple hand-launch miniature chuck-in-the-back-of-the-car type. Full radio installations and fully working and reliable retracting undercarriages, wing flaps and folding wings (in scale fashion) are now very much a part of the all-foam ARTF scene.

Occasionally something comes along

that is truly impressive and outstanding and such can be fairly said of the Freewing Messerschmitt Me 262, for here is an all-foam airframe with all the R/C system installed, tricycle retracting undercarriage fully fitted and requiring little more than a superficial screwdriver exercise for final assembly.

At 59" (1500mm) wingspan it is also a nice size.

#### Twin ducted fans

As with all-foam airframe ARTFs, the Freewing Me 262 (made in China) is

electric powered. As the kit comes, the two 28mm diameter brushless motors are ready installed in the wing mounted jet nacelles with 70mm diameter six-blade fan units. Recommended power source is a 6S 3,700mAh Lipo pack. Our review model, built and tested by Ken Shepherd, actually used a 4,000 mAh pack but anything up to 5,000mAh may be used, provided the positioning of the battery is slightly adjusted to preserve the correct fore/aft balance.

The two motors are controlled by two 50A brushless ESCs installed in the wing



LANDING APPROACH IS FLAT, FAST AND ROCK-STEADY!

**1 & 2:** The battery installation bay in the nose will accommodate anything from a 3,700 to a 5,00mAh Lipo pack. Once the correct balance has been established, it is perhaps best to add a stop fore and after of the pack to prevent movement, rather than rely only on the strap provided.

**3:** In addition to the engine nacelle front intake, each nacelle also has an intake grille on its inside face to boost the air intake flow.

**4:** Wing underside showing the main undercarriage in the retracted position. The doors are attached directly to the U/C legs.

**5:** Main U/C leg in extended position. Note the air grille in the wing underside to cool the ESC speed controller.

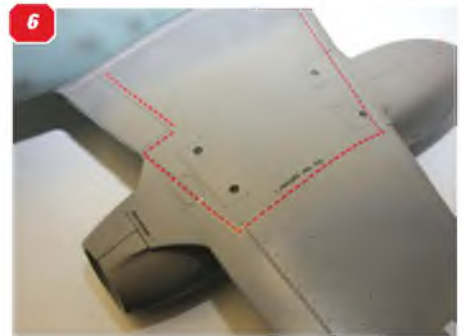
**6:** Each engine nacelle is retained to the wing with two (front and rear) plastic brackets and four self tap screws.

**7:** Wing underside, outboard of the engine nacelle, showing the pre-installed control surface hinges for aileron and outboard flap panel, plus pre-installed servos in wells, underneath surface covers.

**8:** The inner flap, between the fuselage and nacelle pod. Hinged, with wire control link and adjustable clevis - all fitted as the kit comes.

**9:** Further view of the wing underside reveals the split type flaps in the deployed position.

# MITT ME 262



centre panels that are cooled by grilles on the lower wing surface.

## Control system installation

Six control functions are required to operate control surfaces and motor control, plus flaps and retracting undercarriage system. All control surfaces are ready fitted and hinged together with

control horns. This includes the four-piece wing flaps (two for each wing panel - inboard and outboard of the respective engine nacelle), which are split type. Servos for all control functions are accessible on wing and tailplane undersides under removable covers held in place by self-tap screws and are ready wired via the extension leads provided,

running to a central-fuselage receiver installation position.

## Electric retracts

The retracting undercarriage system is deliciously smooth in operation. The main legs have covers that attach directly to the undercarriage legs. The noseleg is a bit more complicated, with two main



## SPECIFICATION

**Wingspan:** 59" (1500mm)

**Length:** 50" (1280mm)

**Scale:** 1:8.3 (approx)

**Weight:** 6.4 lbs (2.9 kg)

**Power:** 2 x 2200kv outrunners  
(ready fitted)

Fan units 2 x 70mm dia. (ready  
installed/contra-rotating)

**ESC:** 2 x 50A brushless (ready  
installed)

**Battery:** 6S 3,700-5,000mAh Lipo

**Control functions:** rudder/  
elevator/ailerons/flaps/throttle/  
retracts (all installed)

**Servos:** 4 x 9g; 4 x 17g (all installed)

### Manufacturer:

Shenzhen Freewing Model Co. Ltd.

**UK supplier:** Reds R/C Ltd

07773 516553

www.redsradioccontrol.com

email: sales@redsradioccontrol.com

**UK retail price:** £359.00

doors that are servo sequenced to close behind the noseleg after it has folded rearwards into the front undercarriage well. The doors then open first when the undercarriage is extended - all controlled from an electronic sequencer unit ready installed in the fuselage. The third, front door, lifts and drops with the undercarriage leg. Really neat! The noseleg is steerable from its own servo, ganged with the rudder control function.

### Assembly

The left and right wing panels are joined by twin carbon fibre tube spars, the panels then held together by front and rear plastic straps which are screwed in place on the wing undersurface with four

self-tap screws.

The twin engine nacelles are similarly mounted to the wing, each retained with four self-tap screws through plastic straps. There then remains only the mating of the rudder and tailplane/elevators - again self-tap screw retained.

Assembly time is minimal - Ken Sheppard received the test model on the Thursday prior to the *ModelAir* Scale Weekend (Sat/Sun July 19/20th) and had it ready to test at the Shuttleworth Old Warden grass field by Friday afternoon.

Total weight, ready to fly with 4,00mAh power pack installed is 6.4 lbs (2.4 kg)

### All ready to go

From a standing start on cropped grass,



**10** Servo at the rear of the nose undercarriage well is sequenced with the undercarriage leg to close after the leg has tucked away and opens the doors before the leg extends. **11** View of the noseleg steering servo in the front wheel well. **12** The forward wheel well cover closes and opens with the leg, to which it is attached.





**13:** Realistic pilot figure in the cockpit. **14:** The business end of the Me 252, well replicated by this plastic moulding of the gun ports for the 30mm cannon. **15:** Detail of the cooling grille for the ESC in the wing underside, mounted between the fuselage and engine nacelle. **16:** Tailcone, showing the rudder and elevator linkages - and the elevator servo mounted in the fin, under plastic cover.

the take-off run proved to be surprisingly short and the climb-out was brisk. All trimmed out, level flight speed was impressive and there is more than enough momentum of loops and rolls

On landing approach, it proved to be rock steady. Flight time, with a 4Ah power pack was relatively low, test pilot Ken allowing 3-4 minutes of cruising around before settling in for a long flat, rock

steady landing approach. Ken indicated that the power-draw from the Lipo source, even at 4,000mAh is high - the high revving twin brushless motors drink the juice quickly - a characteristic in which the model mirrors the thirsty nature of the full size early jets!

### Verdict

The accompanying manual is mostly

pictorial, with some quaint and brief written advice, but it is adequate for the minimal assembly task that it represents. Such however is a minor criticism and one can only admire the manner in which all the mechanism has been boiled down to a crisp simplicity.

In the air, the Freeing Messerschmitt 262 really is a spectacular performer - and that's the only thing that really matters! ■



# MESSERSCHMITT ME 262

Some say it could have changed the course of WW2 - at least in the air war. Whether that's so is questionable, but it was certainly a great technological achievement.





It can fairly be said that overconfidence often leads to unforeseen problems or, in the worst case, complete disaster. In the case of Nazi Germany, the armed forces of the Third Reich enjoyed a string of early easy victories first in Poland followed by rapid progress through Belgium and France, which engendered a confidence of supremacy that led to a view that the war would soon be over.

This prevalent attitude had its effect on weaponry development and procurement such that, in the field of aviation, advanced and promising projects were either cancelled or given a very low priority. Not surprising then that a new method of powering aircraft that clearly was then in its development infancy, should lack any priority in official circles.

At this point it is fair to record that although Sir Frank Whittle's pioneering work on gas turbine power for aircraft was a major

milestone in its development, it should also be noted that similar experimental effort was taking place, roughly concurrently, in several other countries, particularly in Germany, but also in Italy and even in Japan.

Germany's first serious developments in the field, by Hans von Ohain began in 1935 when he started work on a centrifugal jet engine that first ran in 1937. Ohain's work then continued when he joined the Heinkel Company. The developed engine, the HeS-3 then powered the Heinkel He 178, a single engine design, with nose air intake and unswept elliptical wing, which made the world's first jet engine powered flight in late August 1939. It was nothing more than a test bed for the propulsion system, but then so was the Gloster E28/39, Britain's first jet powered aircraft that did not fly until May 1941, powered by an early Whittle jet engine.

Although the achievement received little official encouragement, Heinkel persisted

with this line of development as a private venture to produce their twin turbo-jet powered, twin-finned He 280 - the world's first fighter jet - although it gained little more interest and only about 20 examples were built.

Meanwhile the Junkers organisation were in development of an axial-flow compressor turbo jet, which, long term, offered greater performance.

### Enter the Me 262

In parallel with developments by Heinkel, the Messerschmitt Company commenced development of their Projekt P.1065 in the latter part of 1938 to be powered by either the BMW 003 or Junkers Jumo 004 engine, although neither engine at that stage could offer a useful thrust. Meanwhile three prototypes of the Me 262 were built, one of which, with tail wheel undercarriage, was first fitted with a Jumo 210 G piston engine in the nose and flown in early April 1941 to test



1



**1:** Me 262A, experimentally fitted with Lichtenstein SN-2 airborne interception radar system.

**2:** Head-on view of this Me 262A-1a demonstrates the clean aerodynamic shape. Note the ejection shutles for the expended 30mm shell case in the lower nose.

**3:** Nearing the end-game. Me 262A-1a fighters at a Luftwaffe airfield in late spring 1945. The end of WW2 in Europe only weeks away.

**4:** Post WW2, A number of Me 262s were assembled in Czechoslovakia under the designation S-92.

**5:** A two-seat trainer Me 262B-1a assembled in Czechoslovakia.

general airborne handling characteristics.

The first jet-powered flight, with the piston engine still installed in the nose, was attempted in November that year, with two prototype BMW 003 engines of nominally 1,000 lbs thrust each, but both turbo jets failed at take-off revolutions. This left the Me262 dead in the water awaiting further development of more reliable powerplants, which came in the form of Jumo 004s, by now delivering 1,850 thrust each. Still fitted with a taildragger undercarriage, the Me262 V-3 became airborne for the first time in July 1942, but 11 months later, with just under 2,000lbs thrust squeeze out of the Jumo turbojets, the fifth prototype flew with tricycle undercarriage (albeit with fixed noseleg).

### Incompetent interference

Gen. Lt. Adolf Galland (Inspector of

Fighters) had test flown the Me 262 and Herman Goring had been highly impressed too. However in late November 1943, the aircraft had been demonstrated to Adolph Hitler, who considered himself to be a military genius, immediately exhorted the aircraft as a bomber, as a retaliatory weapon against the mass allied bomber formations by now beginning to ravage the length and breadth of the German heartland. How such a small aircraft could match the bomb load delivery of thousand-bomber formations of Boeing B-17s in daylight and Avro Lancasters at night is perhaps just another testimony to the Fuhrer's military incompetence, forbidding further production of the aircraft as a fighter and reference to the aircraft as such.

### Development and diversification

The production version of the Me 262 fighter named *Schwalbe* (Swallow) was the A-1a and despite Hitler's intervention, development of the fighter version continued, with armament of four 30mm cannon - a powerful punch. The first bomb carrying Me 262 (Me 262A-2a - ('*Sturm*vogel' - Stormbird) prototype flew in May 1944, by which time the German Reichluftfahrtministerium (Air Ministry) had realised the importance and significance of the type and ordered full production, calling for a minimum of 60 aircraft per month.

Further versions projected included an unarmed photoreconnaissance variant (2a/U2) and a variant of the bomber with



2



two of the four 30mm cannon removed, the space used to accommodate a bulged wooden and partially glazed nose section with a bomb aimer's position, plus a ground attack variant (A-3a) with additional armour protection and also an armed reconnaissance conversion with two 30mm cannon, cameras and additional fuel tankage.

### Into combat

Deliveries of production fighter variant of the Me 262 commenced in the summer of 1944, the first operational group being the Kommando Nowotny commanded by veteran Austrian ace Maj. Walter Nowotny, which commenced operations in September with an establishment of about 40 aircraft.

The Nowotny Gruppe was immediately employed in attacks against the daylight bombing raids by USAAF, concentrating on the B-17 and B-24 bomber streams and within a week had lost two aircraft to P-51 Mustangs. This revealed the vulnerability of the Me 262 to escort fighter intervention when the '262 was slowed to a pace that would allow the jet aircraft to be manoeuvred into a firing position behind the bombers. Early jet engines required careful and progressive throttle advancement to avoid flame-out, which allowed pistol engine fighters like the P-51 escorts the chance to engage.

The marauding Allied escorts soon latched on to this, which also left the Me



262 vulnerable during take-off and landing phases. With ever more effective air superiority over Germany from late 1944 onwards, it became possible to catch the 'Swallows' in those critical phases.

As production gained pace, additional 'Kommando' units, named after their commanders became operational.

### Dawn of the missile age

In a quest for an even greater knock-out punch for the fighter, a number of rocket armaments were either introduced or projected, the first being a cluster of

twenty-four 55mm R4M unguided rockets mounted under the wings, aimed with the aid of a standard fighter gunsight and fired at a distance of 650 yds. This broadside was very effective but establishing an aim needed to be very quick, due to the Me 262's high closing speed. Also tested were the unguided, but radar aimed R.100BS missile and Kramer X-4 guided weapon but these, like the Me262 itself, came too late.

### Into the night

An airborne interception radar equipped Me 262 was first tested in October 1944



**6:** The RM4 rocket array of 12 missiles under the wing under panel pfan Me 262A-1. The rockets had folding fins and were aimed from the standard gun sight. The mounting rack was made from wood.

**7:** This flying pass illustrates the flat bottom shape of the fuselage undersurface that contributes to the triangular fuselage cross section.

**8:** Me 262-A2a 'Stormvogel' bomber. Camouflage netting is being removed prior to bombing up the aircraft.



and found to be excellent for the purpose of night fighter - which is perhaps surprising, given that night fighter attacks involved the stealthy stalking of much slower, lumbering bombers in a unco-ordinated stream, rather than swift closure to target.

The initial night fighter production variant and only operation version was the Me 262 2B-1a, the radar aerial array of which reduced maximum speed by approx. 40 mph. A more ambitious follow-on, the 2B-2a was to have a 4ft rear fuselage extension to accommodate addition fuel, plus a twin 30mm cannon 'Schrage Music' array firing obliquely upward into the target's underbelly, which had already been successfully applied to existing Luftwaffe piston engine night fighter. However, only a single 2B-2a was produced before war's end.

### Final throw of the dice

By early 1945 with Germany hemmed in from all sides, with air superiority over its own airspace lost, the Luftwaffe possessed a dwindling number combat-experienced pilots. Inspector of Fighters Gen Lt. Adolf Galland was a man with little enough anymore to "inspect" and thus, in January 1945, formed Jagdverband 44, drawing into this unit the very elite of Luftwaffe fighter pilots.

With a wealth of fighter combat experience on which to draw, they quickly developed their own tactics against the huge streams of Allied daylight bomber formations pounding Germany. Elements of three Me 262s (Ketten), stepped up from behind in three ketten would pass through and over the bomber formations at high speed, firing first their R4M rockets and then their 30mm cannon. After a firing window of no more than six seconds, the Me 262s would fly on over the bomber formation at a speed that the B-17G gun turret transverse was unable to follow.

Nevertheless, the German jets were by no means invulnerable to successful interception by USAAF P-47 Thunderbolts, P-51 Mustangs and by RAF Hawker Tempest Vs and Spitfires. More than 100 Me 262s were lost to the guns of the Allied piston engine fighters.

### In a class of its own

Like all groundbreaking aircraft that herald a new era in aviation, the Messerschmitt Me 262 was not without its problems, but it was certainly the best of the very first jet fighter types. Examined close up at the RAF Museum, Hendon, it looks so aerodynamically clean and minimalist as it sits next to the prototype

## SPECIFICATION

**Manufacturer:** Messerschmitt  
**Type:** Twin turbojet fighter, night fighter, reconnaissance and light bomber  
**Wingspan:** 12.50 metres  
**Length:** 10.58 metres  
**Height:** 3.83 metres  
**Wing area:** 21.73 square metres  
**Weight (Empty):** 3795kg  
**Weight (maximum):** 6387kg  
**Speed (Max):** 827km/hr (0 metre)  
852km/hr (300 metres)  
869km/hr (600 metres)  
**Climb rate:** 1200 metres/minute  
**Take off run:** 1800 metres (grass); 1500 metres (hard standing)  
**Roll out:** 11850 metres (minimum weight)  
**Max altitude:** 11850 metres  
**Operating altitude:** 9250 metres

### SOURCES

**Photos:** José Fernandez (JF) and Squadron-Signal (SS)

Gloster Meteor which, by comparison seems like a cart horse, firmly entrenched in the aerodynamics of the piston engine fighter era.

Not surprisingly, captured examples of the Me 262 were must-have prizes for the victorious Allies. Was it really a 'wonder plane' of its era? Probably yes, but not one that, even if development had not, firstly been hampered by initial lukewarm official support, and by a megalomaniac who turned the whole development program on its head. Finally, diversification into sub types sapped the flow of production aircraft.

Given sufficient numbers, in sufficient time and with development of correct tactics in meeting the massed Allied bomber streams, the fighter version would have given the Allied strategic bombing offensive a hard, even very hard time. But the Allied war effort was nothing if not determined and a relatively effective counter would certainly have been developed. ■



## FATEFULL ENCOUNTER?

Aviation Artist Laurie Bagley captured this dramatic combat scene as a Republic P-47D Thunderbolt closes to point blank range on an Me 262. The P-47D pilot would have need to have dived, with throttle through the 'gate' to catch the Messerschmitt.

Picture originally formed the cover of the July 1969 issue of *AeroModeller*.



1

# MESSERSCHMITT ME 262

In terms of the numbers built, the count of examples that have survived in museums is high in comparison to other equally significant types built in far greater numbers - which explains the clamour by the Allied nations to test the secrets of the Me 262 after WW2



**1:** Head-on, the fuselage presents an almost benign cheery face, even with for 30mm cannon visible! **2-4:** The cockpit canopy provided the pilot with good all-round visibility. **5:** Spent 30mm cartridge ejectors - two either side of the lower fuselage nose. **6:** Wing-to-fuselage fairing at the wing leading edge. **7:** nose-mounted landing light. **8 & 9:** Two views of the aerodynamically clean engine nacelle. **10:** Nacelle panel detail showing the latched main inspection panel. **11:** Front of the engine nacelle, showing the domed internal fairing.





**12:** Shape of the wing-to-nacelle fairing at the wing trailing edge. **13:** Head-on view of the wing-to-nacelle fairing. **14 & 15:** Two views of the main undercarriage leg, which is very short. **16:** Main undercarriage inner doors. **17:** Tailplane, showing the trim tab. **18:** Further view of the tailcone, showing rudder trim tab and elevators. **19:** Rudder trim tab drive arm detail. **20:** Tail light positioned at the base of the rudder. **21 & 22:** Two further views of the fin and rudder showing the rudder hinge line and trim tab.







**23:** Wing undersurface at the nacelle fairing. **24:** Aileron trim tab linkage. **25:** View along the wing underside showing the aileron and flap hinge lines. **26-28:** Three views of the flap outboard of the engine nacelle. **29:** A view of one of the inner wing flap panels between the fuselage and engine nacelle. **30:** One of the full-length wing leading edge slats. **31:** D/F loop on the rear fuselage upper surface. **32:** View along the rear fuselage again emphasises the aerodynamically clean airframe. **32 & 33:** The Noseleg is quite tall, with a long throw to the compression strut. **35:** The single main fairing to the noseleg well. **36:** Detail of the nosewheel.



**SCALE 1:60**

Tip navigation light.

WHITE Swastika.

Trim tab linkage.

BLACK.  
WHITE.  
BLACK.

WHITE.

Detachable panels.

Access to tail unit controls.

Aerial

STBD. SIDE VIEW, Me262A-2a.

Whip aerial.  
FuG 25A

Cooling air scoops.

COLOUR NOTES:

Detachable panel;  
Fwd. fuel tank.

Detachable panel;  
Rear fuel tank.

Elevator tab linkage.

The above aircraft  
DARK GREEN Fuselage  
& Fin; there was on  
suggestion of mottling  
the lower colour d

Bomb rack: A-2a.

Top surfaces of W  
planes & Nacelles:  
camouflage in 70, S  
(BLACK GREEN) and 7  
(DK. GREEN). Sharp c

Nosewheel u/c door  
hinged stbd. side.

Whip aerial.

All Undersurfaces:  
(LT. BLUE). Fuselage  
(GREENISH GREY.) Mottled over  
02 Almost solid at top but  
sides to plain 65 undersur

UNDERPLAN VIEW.

J.G.7. Emblem.  
WHITE. Greyhound on  
DK.BLUE Band, on  
LT.BLUE ground.

Filler access,  
Hydraulic.

Slight bulge in gun  
bay access doors.

Gun ports.

Camera gun  
access door.

Access panel  
fasteners.

PORT SIDE VIEW, Me 262A-1a.

65

RED Broken ri  
Footsteps this s

Detail: Aileron and tab linkage.

FRONT VIEW.

Whip aerial.

2x 250 Kg. Bombs on  
Me 262A-2a only.



Detail: Tyre tread patt

line of inner petals  
thin RED line.

Edelweiss emblem of K.G.51.  
YELLOW on LT. BLUE ground.

RED '5' with thin WHITE outline.

Upper gun ports often covered  
over on Me 262 A-2a's.

Colour division.

Pitot tube.

Detail: Nosewheel leg.

Detail: Main  
wheel leg.

250Kg.  
Bomb.

Shell ejector chutes.

Removable panel, access to  
tailplane incidence actuating  
motor.

Fuel filler access.

Access doors to gun bay.

Hinge

Removable panel.

'5' had 71  
ge, Rudder  
ly slight  
ing at  
division line.

ngs, Tail-  
Splinter  
SCHWARZGRÜN.  
DUNKELGRÜN,  
colour division.

65 HELLBLAU,  
e-02 RUM.GRAU,  
er 65 HELLBLAU;  
nottle lightening down  
faces.

PLAN VIEW

Fuel pump access.

Fuel filler access.

Filler point: fuel for  
initial engine start.

Filler point: 2-stroke  
fuel for Reidel starter  
motor.

BLACK.

WHITE: Outline

Footstep.

D.F. Loop.

112395

Flaps,  
extended

Slats, extended.

WHITE.  
'8' and band:  
YELLOW.

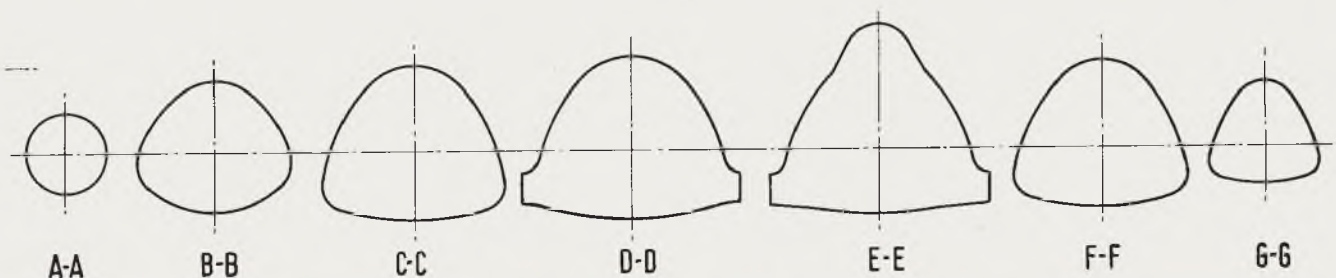
'Werke no.'  
BLACK.

Tail navigation light.

WHITE.

Colour divisions thus.

# MESSERSCHMITT ME.262 A-1A & 2A



ern.

# ME262 FLYING COLOURS

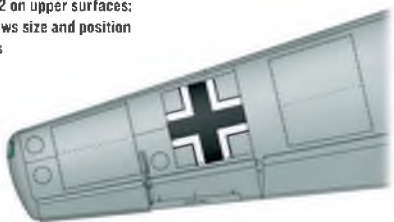
Messerschmitt Me 262A-1a, Wk.Nr. 501232, ISS I, later flown by JV 44, captured by US Forces at Lechfeld. RLM81/82/76 finish with yellow nose and '5' on fuselage side and green/blue checks on rear fuselage. All other markings standard

Below: Messerschmitt Me 262 A-1a/Jabo, 9K+HN, flown by Fw Witzmann of 5./KG(J) 51. RLM81/82/76 with RLM 02 wavy pattern on top surfaces; Rot 23 'H' outlined in white. Note bombs in ventral position and upper gun troughs covered over



Messerschmitt Me 262A-1a, 'Green I', flown by Maj Rudolf Sinner, Gruppenkommandeur III./JG 7, Brandenburg-Brieset, March 1945. RLM81/82/76 finish with green 'I' under unit crest outlined in white; Kommandeur's double chevron in black and white. III. Gruppe vertical bar in white over Rot 23/Dunkelblau 24 bands around rear fuselage

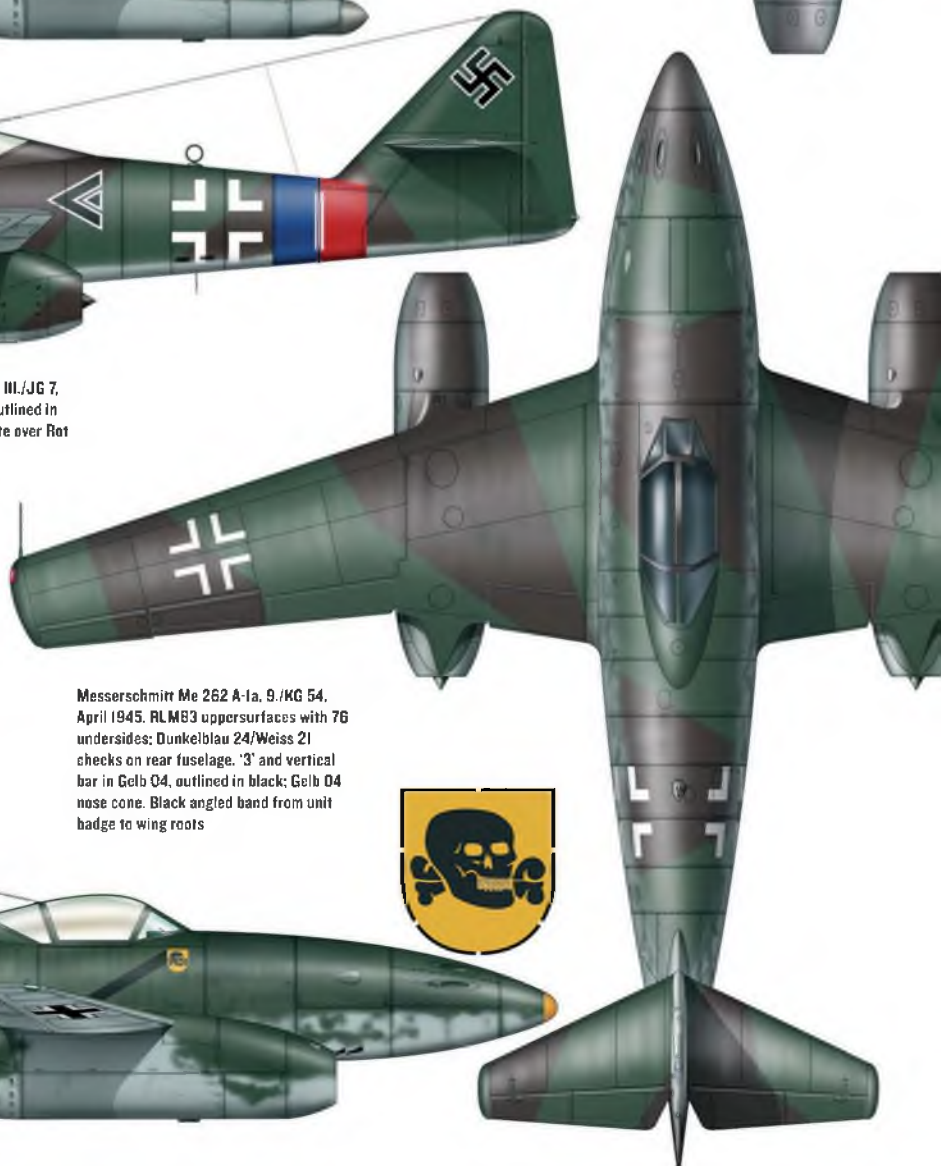
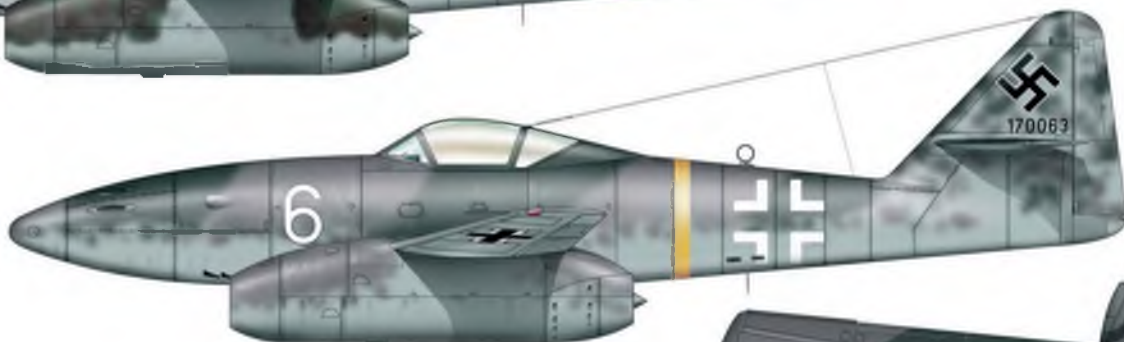
Right: Typical camouflage pattern for aircraft finished in RLM 81/82 on upper surfaces; scrap view below shows size and position of underwing crosses



Messerschmitt Me 262 A-1a, 9./KG 54, April 1945. RLM83 uppersurfaces with 76 undersides; Dunkelblau 24/Weiss 21 checks on rear fuselage. '3' and vertical bar in Gelb 04, outlined in black; Gelb 04 nose cone. Black angled band from unit badge to wing roots



Below: Messerschmitt Me 262A-1a, Wk.Nr. 170063, White 6, Ekdo, September 1944. RLM 74/75/76 finish with white '6' thinly outlined in black



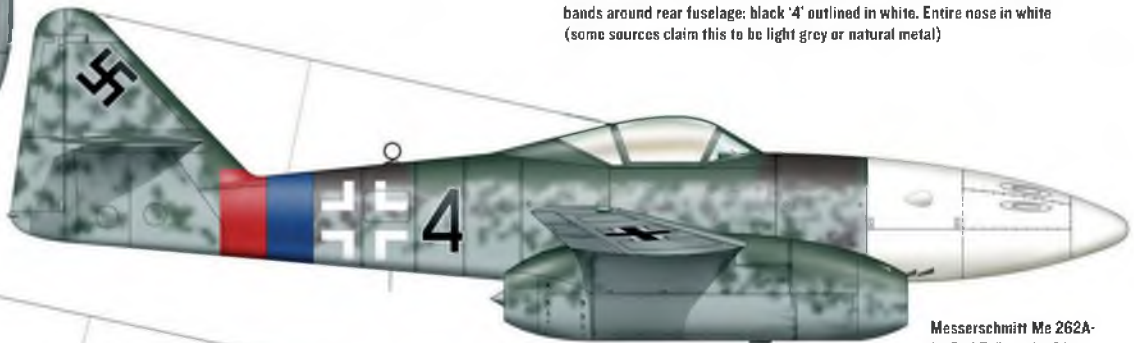
Messerschmitt Me 262A-1a/U3. 500539/White 33, 2./NAGr 6. Lechfeld. May 1945. RLM 76 overall with squiggle overspray in RLM 02 and 83; white code 33 on fuselage. Standard national markings



Messerschmitt Me 262A-1/U3. 110585, flown by Oblt Wilhelm Knoll, 2./NAGr 3. RLM81/82/76 finish with Rot 23 '2' outlined in white on nose; standard national markings. Note replacement unpainted panel on port engine cowling



Left: Typical upper surface camouflage pattern for aircraft finished in RLM 74/75



Messerschmitt Me 262A-1a, Black 4, of JG 7, found abandoned in Czechoslovakia at war's end. RLM81/82/76 with Rot 23 and Dunkelblau 24 bands around rear fuselage; black '4' outlined in white. Entire nose in white (some sources claim this to be light grey or natural metal)



Messerschmitt Me 262A-1a, Red 7, flown by Ofw. Franz Gaap. Saatz, May 1945. RLM81/82/76 finish with Rot 23 '7' and Rot 23/Schwarz 22 checks on rear fuselage; nose cone also in Rot 23; standard national markings



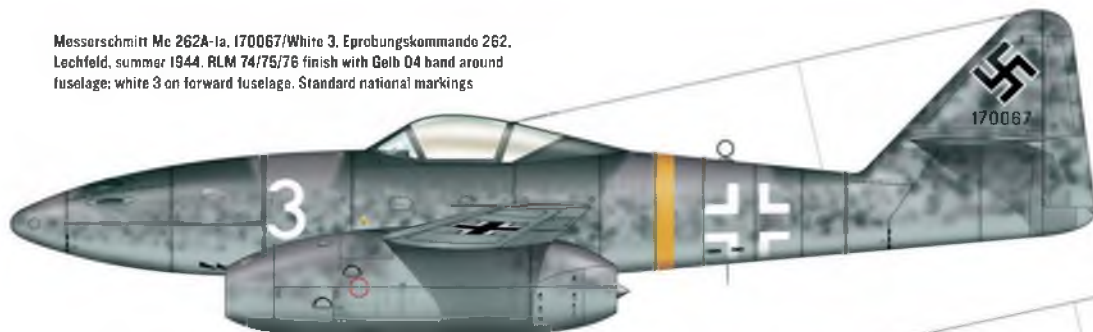
Avia S.92.2, V-36, Czechoslovak Air Force. 1947. Olive Green overall with black codes; national marking, edged in blue, in six positions. Mickey Mouse emblem on forward fuselage; scrap view (far left) shows size and position of wing markings



Avia S.92, PL-01, assembled at Letnany Research centre in 1945. Czechoslovak Air Force. Dull natural metal overall with red lightning flash on forward fuselage; codes in black. National markings in six positions

# ME262 FLYING COLOURS

Messerschmitt Me 262A-1a, 170067/White 3, Eprobungskommando 262, Lechfeld, summer 1944. RLM 74/75/76 finish with Gelb D4 band around fuselage; white 3 on forward fuselage. Standard national markings



Messerschmitt Me 262A-2a, 170096/8K+8H, I./KG 51, Rehine, late 1944. RLM81/76 finish with RLM 83 mottling on top surfaces; white nose, cannon port, tail tip and tip of rear lower fuselage, all edged in black. White 'B'; standard national markings



Messerschmitt Me 262A-1a, Wk.Nr. 500042, 83+AA, flown by Oblt V. Rieseldele Freiherr zu Eisenback, Geschwaderkommodore KG(J) 54, Gibelstadt, February 1945. RLM81/82/76 with codes in black and individual letter in Dunkelblau RLM 24; standard national markings



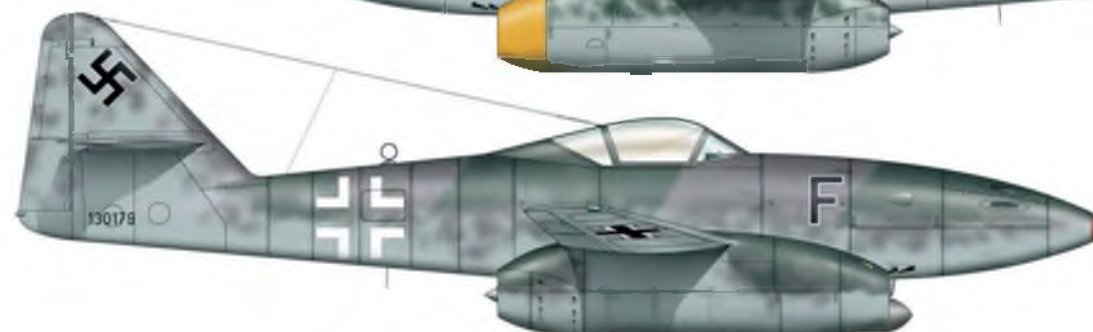
Messerschmitt Me 262A-1a, Wk.Nr. 112385, Yellow 8, III./JG 7, Kaltenkirchen, 1945. RLM81/82/76 scheme with RLM Blue 24/RLM Red 23 Reich Defence band on rear fuselage. RLM 04 Code '8' on fuselage sides; note serial and swastika in grey, probably RLM 02



Messerschmitt Me 262A-1a, Wk.Nr. 110559, III./EJG 2, flown by Oblt. Heinz Bar, Gruppenkommandeur III./EJG 2, Lechfeld 1945. RLM81/82/76 scheme with RLM Rot 23 nose cone; '13' is also Rot 23, outlined in black



Messerschmitt Me 262A-1a, Wk.Nr. 110813, Yellow 3, Kommando Nowotny. RLM81/82/76 scheme with RLM Gelb D4 '3' on forward fuselage and engine nacelle intakes



Messerschmitt Me 262A-1a/Jabo, Wk.Nr. 130179 flown by Mj Wolfgang Schenk, Kommando Schenk, summer 1944. RLM74/75/76 finish with red nose cap; black 'F' outlined in white. Standard national markings; note bombing angle marks on cockpit canopy





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17 OF THESE SEA FURIES WERE  
EXPORTED TO CUBA IN 1958.





CUBAN

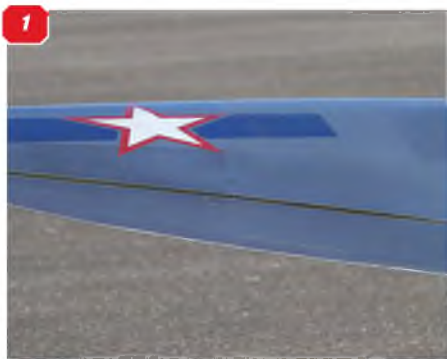
# SEA FURY!

**ALEX WHITTAKER ADMIRES GRAHAM BUCHANAN'S STUNNING NEW HAWKER SEA FURY IN CUBAN COMBAT COLOURS**

It is a little-known, but remarkable fact of Post WW2 aviation history, that Hawker Sea Furies were operated on the side of Communism for Fidel Castro in Cuba. Indeed, in 1958, Hawker had a contract to

supply 17 armed and refurbished ex-Fleet Air Arm Sea Furies to the pre-revolution Batista regime. However, historical events overtook the deal. Some of these Furies were only just arriving right in the middle of the Cuban Revolution.





**1:** Outboard ailerons are surprisingly slim on the full-size Sea Fury, replicated here on the model. **2:** Those guns have been used in anger! Some of that Spanish stencilling is tiny, but completely legible. **3:** Wing vents complete with scale gauze. **4:** Weathered exhaust stubs and panel edging are masterful. **5:** Artfully weathered exhaust stub detail and an exhibition in the various types of rivet finish! **6:** This is surface-finishing as an art. Graham uses his own secret 'wash' to get that 'utilised' effect. **7:** A handsome nose. There's even full fastener detail on the spinner! Admire the lock-catches on the cowl. **8:** A 3W B2 twin petrol engine lurks under that neat cowl. **9:** No matter what the scheme, the Hawker Sea Fury is the pinnacle of British piston engined fighters. **10:** Bubble cockpit gives a glimpse into the fully decked-out cockpit. **11:** Split flaps and non-slip walkway are suitably subtle.

With the country in disarray, these aircraft did not see immediate service, but Castro's followers managed to arm some of those they had captured. Intriguingly they were able to turn these Furies on their invaders at the infamously failed Bay of Pigs counter-revolutionary invasion that took place in 1961, a year prior to the Cuban Missile Crisis. During the invasion, one of these Sea Furies even helped to sink the main CIA supply ship Houston. However, a number of the Revolutionary Furies were destroyed on the ground by the would-be invaders.

### The Model

Scotsman Graham Buchanan is recognised as one of the UK's finest scale modellers, and we have featured his aircraft here before. Graham is renowned for the convincing finish he achieves on

traditionally constructed models. At this point it is appropriate to remind oneself that Graham's Sea Fury is not epoxy-moulded, nor metal panelled, but a pukka balsa and ply scale aircraft. Graham was commissioned to build this model for an American modeller, and Ali Machinchy Jnr was due to test fly it at RAF Barkston Heath in the spring of this year. However, Ali has since accepted a new post in America, so the maiden flight has been postponed and rescheduled for the USA. As you read this, the Sea Fury has been crated up for its long journey, so this is photo-report is something of a scoop.

### Plan

The model is built from the plan of the illustrious *Jerry Bates* from the USA. ([www.jbplans.com](http://www.jbplans.com)). The consensus amongst many UK modellers is that the

scale authenticity of a Jerry Bates' plan is always assured. Just note that this Sea Fury is actually a new JB design, and larger than Jerry's previous 1/5th scale Sea Fury, at 1:4.5 scale. Jerry Bates' website states that this version is "...for experienced modellers only...". The wing span is 115" (2921mm) and total weight of Graham's version is around 80 pounds (36.4 kg).

### Documentation

The overall documentation for the specific prototype modelled by Graham is very limited. In fact there are only a few black and white photos extant, and many feel that the preserved Furies in Cuba have historically inaccurate schemes.

### Construction

As stated, the Sea Fury is of all built-up construction from traditional balsa and





lately. To give a suitable substrate for Graham's well-tried finishing techniques, the wooden airframe was then covered in glass cloth and resin.

### Preparation

It is always worth relating the techniques that individual scale modelers use. Although the generalities of techniques are fairly universal, it's the detail variations which individuals adopt that are worth relating. In Graham's case, the entire airframe are painstakingly wet-and-dry rubbed back to a mirror finish. Next, all panel lines are marked out. Graham did most of these using fine

line tape, after which he sprayed a high-build primer over them. Once dry, removal of the tapes thus revealed inlaid lines. The Sea Fury has a selection of raised panels, these are done with a few layers of tape to mask off the edge of the panel. After this, a lightweight filler is applied to the edge of the tape. Once dry, this is sanded back flush, then the tape is removed to reveal the panel.

### Rivet Detail

Graham said he lost count after applying 50,000 rivets. Most are burnt into the primer using the well-known soldering iron technique. However, some

are individually stamped out from chrome tape then applied to the model. Others are raised domed rivets, which are only added once the coloured base coats have been applied.

### Buchanan metal technique

Graham is justly famous in the world of large scale radio models for his trademark 'metal-effect' finish. To achieve this realism he masks off individual panels and these are painted in different shades of silver, "...which takes forever..." quoth Graham, as the panels have to be wet and dry'd back,



## CATCHING THE LATE AFTERNOON SUN AT RAF BARKSTON HEATH.



and then polished again. The next process according to Graham is the application of chrome paint, to spray over the airframe. He adds: "...this is quick, but you must mist over and build up the chrome, and not bang it all on in one hit".

The chrome is now left to cure for a few days, after which he applies all stencilling and insignia. "Once this is all on and dry, I apply my secret 'dirty wash' over the airframe, which tones down the chrome and adds depth. After this I apply a range of weathering techniques ...". So now we know!

### Legending

All markings and legending masks are from Nigel Wagstaff's *Flightline Graphics*. Apparently, Nigel spent about a month translating all the stencilling from English language into Spanish. As you walk around the Sea Fury, you will note that there are rather

a lot of them. The completed look is very convincing.

### Engine, exhaust and prop

The model is fitted with a 3W B2 Twin spark ignition. Graham describes this power plant as "...super reliable - something you really want after all those hours of construction...".

Graham says that tuned twin canisters quieten the engine, whilst extracting more power. Prop applied is a 32"x14" carbon

### Radio

The model employs no less than 15 Hitec high torque servos and the radio installation uses the SRS Powerbox Champion system.

### Pilot

The impressive pilot is hand made by Graham. World class scale modellers have to be truly multi-disciplinary! ■

### MODEL SPECIFICATION

#### Sea Fury from The Jerry Bates Plan

**Wing span:** 115 inch

**Weight:** 80 pounds.

**Engine:** 3W B2 Twin petrol engine

**Exhaust:** Twin tuned canisters.

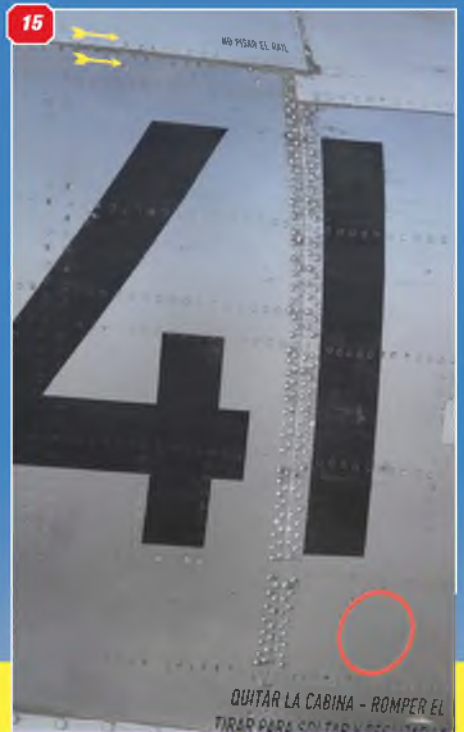
**Prop:** 32"x14"

**Radio:** Rx is the new PowerBox Champion SRS

**Servos:** All High torque Hitec. 15 in all.

## UNMISTAKABLY A SEA FURY, BUT STRANGE EXOTIC MARKINGS





**12:** Wheel struts and tyres are indistinguishable from full size. **13:** The wheel doors are a delight! Note wheel details include brake hydraulic lines. **14:** This is artistry! Utterly superb fastener detail on the fuselage. Painted letters flatted down to look exactly right, too. **15:** Astounding rivet detailing and an amazing panel finish.



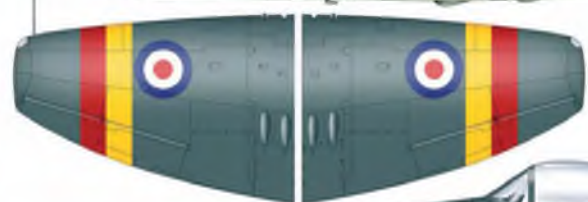
# SEA FURY FLYING COLOURS



Hawker Sea Fury FB Mk II, TF991/102/JR, No.805 Naval Air Squadron, Eglinton, 1948. Extra Dark Sea Grey/Sky finish with white codes on fuselage and fin; remaining lettering in black. 'C1' roundels on fuselage sides. 'C' roundels in four wing positions. Spinners are believed to have been red



Hawker Sea Fury FB Mk II, VX730/109/K. No.805 Naval Air Squadron, Royal Australian Navy, HMAS Sydney, Morea, 1951. Extra Dark Sea Grey/Sky finish with black/white stripes around rear fuselage and wings; all lettering in black, except areas of codes over black areas which are painted white. Red spinner



Above: Hawker Sea Fury FB Mk II, WE683/109/ST, No.1831 Naval Air Squadron, RNVR, RNAS Stretton, September 1953. Extra Dark Sea Grey/Sky finish with all lettering in black; roundels in six positions. Yellow band around spinner; red/yellow Exercise Mariner bands around rear fuselage and wingtips (covering underwing serials)



Above: Hawker Sea Fury FB Mk II, WJ280/175/T, No.802 Naval Air Squadron, HMS Theseus, 1953. Extra Dark Sea Grey/Sky finish with all lettering in black; roundels in six positions. Unit crest on fin

Below: Sea Fury FB Mk II, 6-46/860, No.860 Squadron, Royal Dutch Navy, HrMs Karel Doorman. Extra Dark Sea Grey upper surfaces with Sky undersides; all lettering in black. Orange cowling and spinner; national markings in six positions



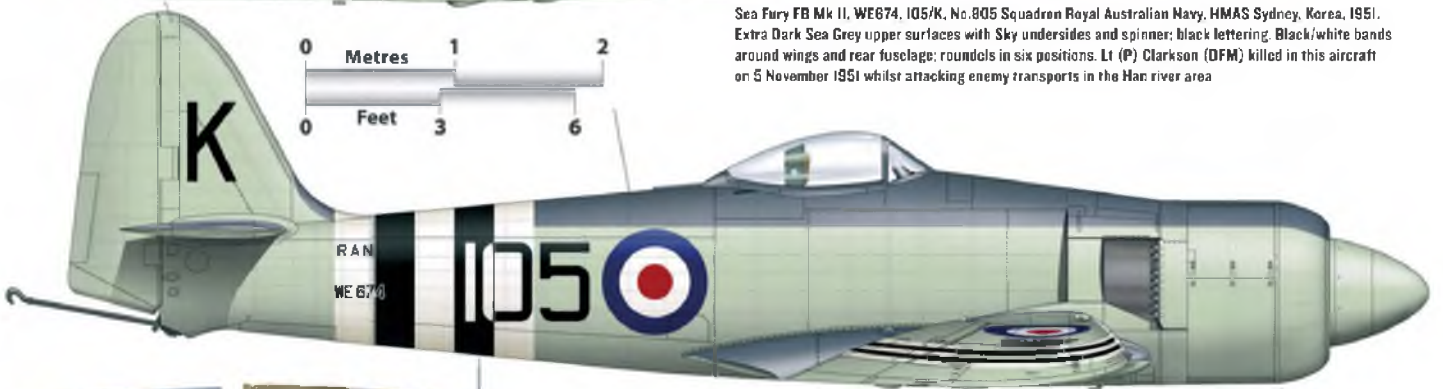
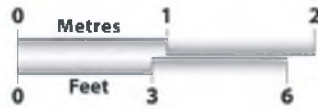
Sea Fury FB Mk II, WH589, 115/NW, No.805 Squadron, Royal Australian Navy (RAN), Bankstown, 1968. Oxford Blue overall with all lettering and spinner in white; national markings in six positions. Canopy frame unpainted



Sea Fury FB Mk II, WZ645, 103/K, No.805 Squadron Royal Australian Navy, HMAS Sydney, Extra Dark Sea Grey upper surfaces with Sky undersides; black lettering and red spinner. Aircraft written off in May 1955 after colliding with WZ642



Sea Fury FB Mk II, WE674, 105/K, No.805 Squadron Royal Australian Navy, HMAS Sydney, Korea, 1951. Extra Dark Sea Grey upper surfaces with Sky undersides and spinner; black lettering. Black/white bands around wings and rear fuselage; roundels in six positions. Lt (P) Clarkson (DFM) killed in this aircraft on 5 November 1951 whilst attacking enemy transports in the Han river area



Fury, 321, Royal Iraqi Air Force. Dark Earth and Mid Stone upper surfaces with Azure Blue undersides and spinner; white bands around wings and rear fuselage. National markings in six positions; serials in black, repeated below wings

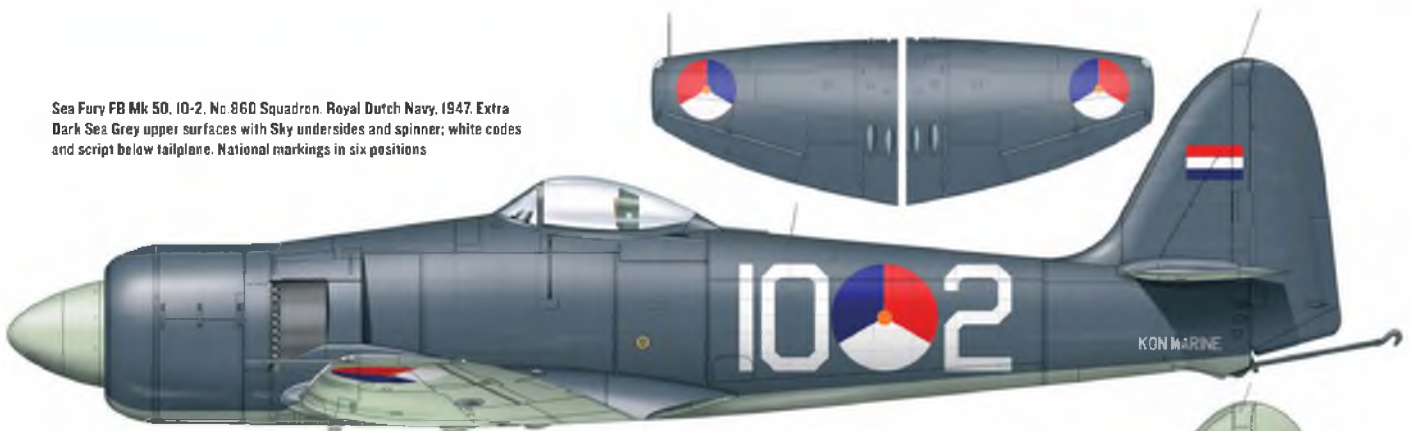


Sea Fury FB Mk II, 703, Royal Egyptian Air Force, 1960. Silver overall with white bands, edged in green, around wingtips (not overlapping onto ailerons) and rear fuselage; all lettering black. Roundels in six positions; serial in arabic script repeated below wings



# SEA FURY FLYING COLOURS

Sea Fury FB Mk 50, 10-2, No. 860 Squadron, Royal Dutch Navy, 1947. Extra Dark Sea Grey upper surfaces with Sky undersides and spinner; white codes and script below tailplane. National markings in six positions



Sea Fury FB Mk 50, 6-26, No. 860 Squadron, Royal Dutch Navy, Valkenburg, 1950. Extra Dark Sea Grey upper surfaces with Sky undersides; orange spinner with Sky rear plate. All lettering in black; national markings in six positions



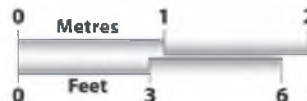
Sea Fury FB Mk II, 6-29/860, No. 860 Squadron, Royal Dutch Navy, HrMs Marel Doorman. Extra Dark Sea Grey upper surfaces with Sky undersides; all lettering in black. Orange cowling and spinner; national markings in six positions



Sea Fury FB Mk II, TF993, BC-B, No. 803 Squadron, Royal Canadian Navy, 1948. Extra Dark Sea Grey upper surfaces with Sky undersides and spinner; codes and serials in white, the latter repeated in black below wings. 'C' type roundels above wings (note all roundels carry a black maple leaf on the red sector)



Sea Fury FB Mk II, TG119, 110, No. 871 Squadron, Royal Canadian Navy, 1953. Extra Dark Sea Grey upper surfaces with Light Sea Grey undersides; all lettering in black. Blue/white roundels with red maple leaf in six positions; 'NAVY' in black below starboard wing, '110' below port. Red/white



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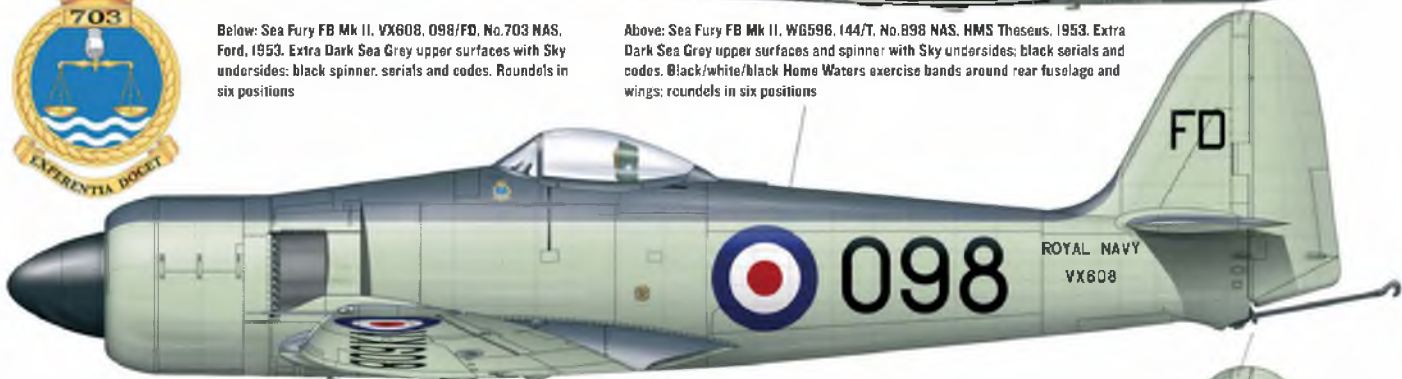


Sea Fury FB Mk II, WZ692, 155, No.804 NAS, Hal Far (Malta), March 1953. Extra Dark Sea Grey upper surfaces with Sky undersides; black serials and codes. Red/white spinner with Extra Dark Sea Grey rear plate; roundels in six positions. Unit crest on fin; '5' repeated in black on mainwheel covers



Below: Sea Fury FB Mk II, VX608, 098/FD, No.703 NAS, Ford, 1953. Extra Dark Sea Grey upper surfaces with Sky undersides; black spinner, serials and codes. Roundels in six positions

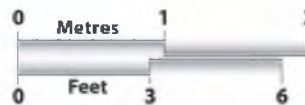
Above: Sea Fury FB Mk II, WG596, 144/T, No.898 NAS, HMS Theseus, 1953. Extra Dark Sea Grey upper surfaces and spinner with Sky undersides; black serials and codes. Black/white/black Home Waters exercise bands around rear fuselage and wings; roundels in six positions



Sea Fury FB Mk II, WE693, 106/C, No.810 NAS, HMS Centaur, 1954. Extra Dark Sea Grey upper surfaces and spinner. Sky undersides; black serials and codes. Roundels in six positions



Sea Fury FB Mk II, VW656, 151/BR, No.1833 NAS, Bramcote, 1954. Extra Dark Sea Grey upper surfaces with Sky undersides; spinner, serials and codes in black. Roundels in six positions



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# SEA FURY FLYING COLOURS

Sea Fury F Mk X, TF952, 106/JR, No.805 Squadron RAN, Eglinton, 1948. Extra Dark Sea Grey upper surfaces with Sky undersides; white codes, black serials. 'C' type roundels in four wing positions; spinners are believed to have been red



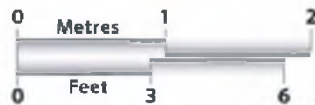
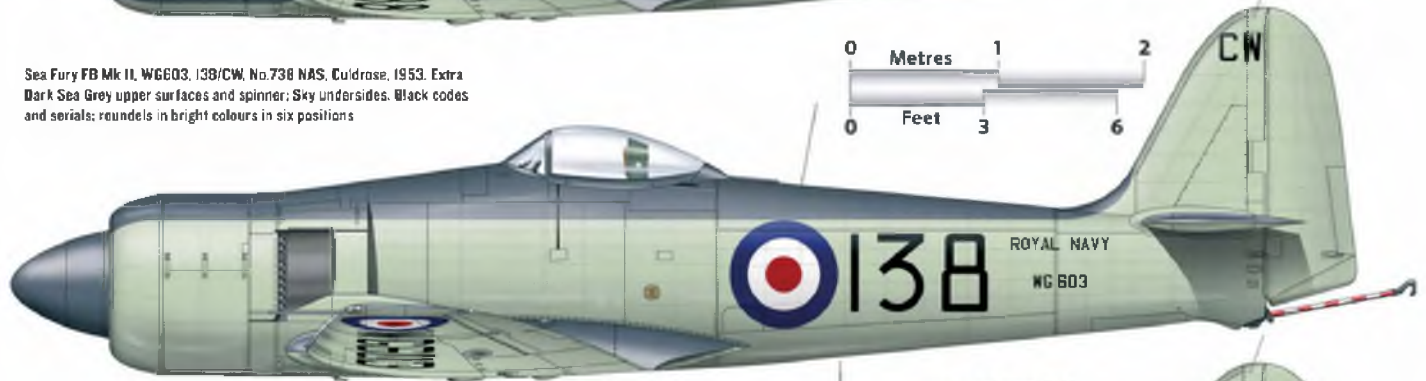
Sea Fury F Mk X, TF912, 120/VL, No.799 NAS, Yeovilton. Extra Dark Sea Grey upper surfaces with Sky undersides; white codes, black serials. Yellow spinner; 'C' type roundels in four wing positions



Sea Fury FB Mk II, VW238, 107/Q, No.802 NAS, HMS Vengeance, Cape Town (South Africa), January 1949. Extra Dark Sea Grey upper surfaces with Sky undersides; white codes, black serials. 'C' type roundels in four wing positions



Sea Fury FB Mk II, W6603, 138/CW, No.738 NAS, Culdrose, 1953. Extra Dark Sea Grey upper surfaces and spinner; Sky undersides. Black codes and serials; roundels in bright colours in six positions



Sea Fury FB Mk II, VR943, 105/R, No.801 Squadron NAS, HMS Glory, Korea, 1951. Extra Dark Sea Grey upper surfaces with Sky undersides; all lettering in black. Black/white bands around wings and rear fuselage; roundels in six positions



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Sea Fury FB Mk 60, L965, No. 9 Squadron, Pakistan Air Force. Dark Earth/Mid Stone upper surfaces with Azure Blue undersides; red spinner, black serials. National markings in six positions (outlined in yellow); unit crest below windscreen



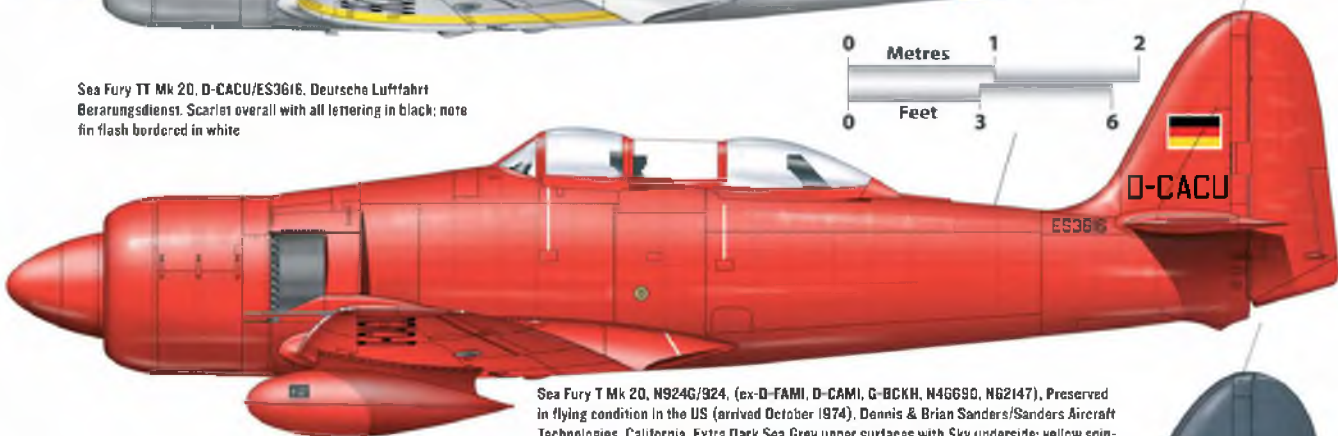
Sea Fury FB Mk II, UB-471, Burmese Air Force. Natural metal overall with red spinner and red/white checks on rudder; national markings in six positions. Lettering in black



Sea Fury T Mk 20, VX286, 294/CW, No. 738 NAS, 1951. Silver overall with yellow bands around wings and rear fuselage; blue spinner. All lettering in black; roundels in six positions



Sea Fury TT Mk 20, D-CACU/ES3616, Deutsche Luftfahrt Berungsdienst. Scarlet overall with all lettering in black; nose fin flash bordered in white



Sea Fury T Mk 20, N924G/924, (ex-D-FAMI, D-CAMI, G-BCKH, N4669D, N62147), Preserved in flying condition in the US (arrived October 1974), Dennis & Brian Sanders/Sanders Aircraft Technologies, California. Extra Dark Sea Grey upper surfaces with Sky underside; yellow spinner and bands around wings and fuselage. All lettering in black, with 'NAVY' repeated below the wings



## TECHNIQUE

The DH Venom wing panel underside, with panel lines drawn faintly onto the skin surface.

Fig. 1

# PANELLING WITH PAPER

## IAN BAILEY REVEALS HIS METHOD OF ACHIEVING REALISTIC AIRFRAME SURFACE PANELLING, RIVET LINING AND WEATHERING

**D**uring a conversation with Tony the editor of this magazine I was asked if I could produce an article showing the method by which I achieve a simulation of the metal panels on my scale models. I have used this method ever since I saw the late John Palmer's models back in the 1980s. I copied the method from him using the type of paper he recommended and the method by which

he applied the paper to such good effect. The bad news was that the minimum order from the paper suppliers was 1,000 sheets at A2 size!

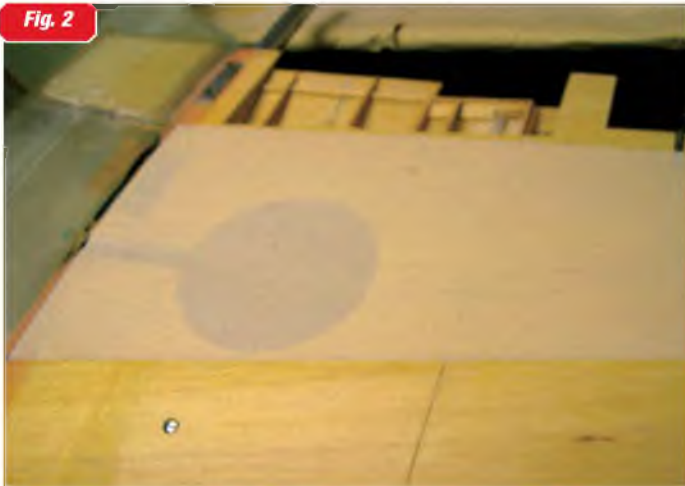
Well, several models later, I haven't made a dent in the pile of paper shoved under the bed in the spare bedroom, but I'm trying!

At the time, I was about to use this method on a De Havilland Venom I was building and would take photos as I went

along with the covering.

This method of finishing provides smooth surfaces to which can be added flush and domed rivets without the weight penalty of finishing in glass fibre and epoxy and using built-up layers of primer to simulate panel lines. It's worth mentioning here that in the case of the 'glass method', there is no evaporation of the epoxy when it cures and primer is heavy. When dope and sanding sealer are used, the amount of

Fig. 2

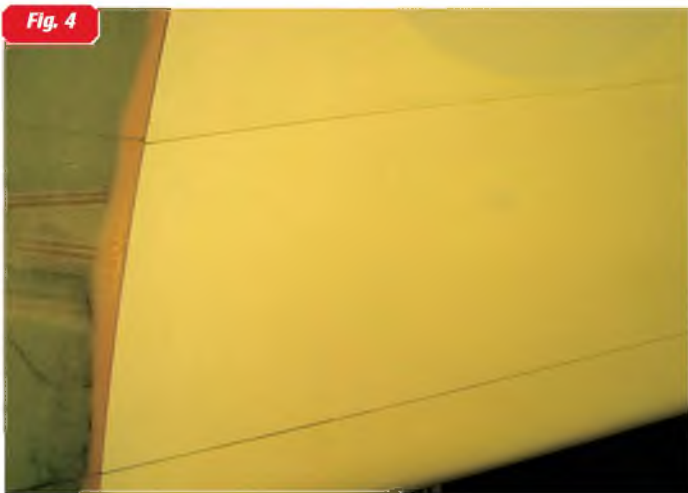


First wet panel applied. Best to do the wing underside first.

Fig. 3



The second paper panel applied. The paper for this panel did not run the full length of the panel shape with the paper in the require stretch direction and an overlap of 2mm was necessary.



**Fig. 4**  
Paper panelling applies and overpainted with sanding sealer.



**Fig. 5**  
A further view of the finished paper panelling - ready to move on to the next stage.

evaporation can be up to 60% of the weight applied. There's a certain amount of effort I must admit, but the pain and exercise is worth it with the end results.

### Surface preparation

To start with, the surfaces to be covered need to be smooth and free from dents etc. and are then covered in lightweight tissue. I apply the tissue with slightly thinned PVA glue around the edges of the area to be covered. When dry, I water-shrink the tissue, then apply two coats of thinned non-shrink dope, rubbing down between coats and followed by a final coat of thinned sanding sealer.

The surface is then given a final rub-down with very fine wet-and-dry or flower paper and the dust taken off with a *Tacky-Wipe*. Panel lines are then marked on with a 2B pencil.

**Fig 1** shows the tissue-covered underside of the Venom wing with faint pencil lines already applied.

### Panelling

Here it starts to get interesting and it's worth practising on an old model first if you are not sure. Working from the wing root outwards or the front of the fuselage, cut the first panel to size. Here you will need a good straight edge and a new blade in your modelling knife, not to mention a smooth and clean cutting surface.

Once cut, immerse the paper panel in a

bowl of water, as the paper has to be applied wet. I use 'Miss Management's' finest washing up bowl for this and drape the panel over the edge to drain off the excess water.

Whilst the paper is shedding itself of excess water, apply well-thinned PVA with a brush to the area to be covered by the panel and then carefully lay the panel into place, sliding it about to accurately position it. Then, with a piece of kitchen roll robbed from 'her' domain, pat down and smooth out the paper.

Here I must say that the type of paper I use stretches in one direction when wet, so it's important to find out which way it's going to stretch and mark the panels beforehand in the direction the paper is going to lengthen. I always ensure that it is outwards, so if I'm doing a wing panel for example, I cut the panel to the normal size, wet and apply it. The amount it has stretched is revealed immediately because it will overlap the pencil line.

I now mark the overlap with a sharp pencil, remove the panel and carefully lay it down onto a smooth surface. (Melamine board is fine for this). Then, using a very sharp blade, I cut the excess off, re-apply the paper panel to the model's surface and hey, it fits perfectly. **Fig 2** shows the first panel applied, I always cover the underside of a wing first.

### More of the same

Having laid the first panel down, I move on

to the next. **Fig 3** shows the second panel applied. It so happens that the paper here was shorter than required because of the stretch direction, so in order to give the panell a one-piece appearance, I overlapped the next piece applied by 2mm and when dry, the 'step' of the overlap was sanded off, leaving a seamless joint, but more of this later.

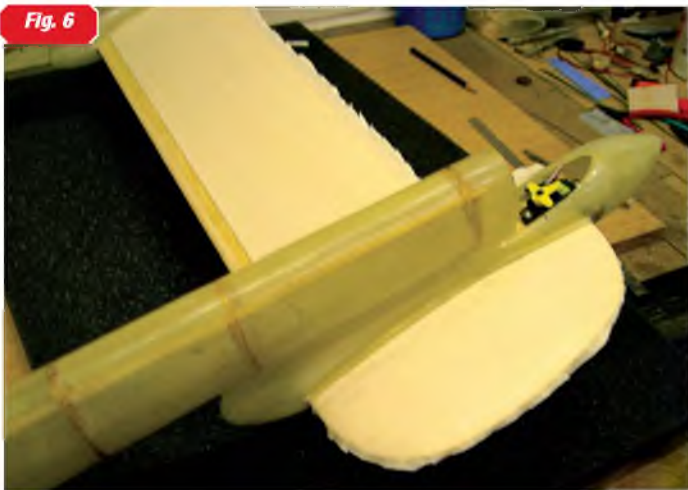
When applying the second panel, a gap, which equates to the width of the full size aircraft's gap between the panels, is left between the paper panel edges. It is this gap that creates a truly authentic effect.

**Figs 4** and **5** show the wing panel finished ready to move onto the next stage of finishing. The panel gaps can be seen and **Fig 4** demonstrates the state after the sanding sealer has been applied, more of this later.

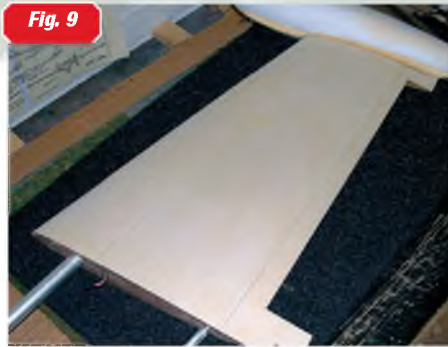
### Curvy stuff

Wings and tailplanes often have a compound curve at the tips. Here the paper is applied as normal and sharp scissors are used to cut darts in the paper, after which the paper is smoothed around the compound curve. There is a limit to which the paper can be stretched around the curve as can be seen in **Figs 6** and **7**, where I worked the paper around the tailplane of the Venom. Leave a decent overlap over trailing edges; this can be sanded off later.

On some aircraft, the metal panels are



**Fig. 6**  
Compound curve shapes can be accommodated to some extent by working the wet paper, but more severe curling requires the cutting of darts at the paper edges.



Two views of the fully surface panelled wings, prepared for rivet-live detailing.

Here's one I did earlier! The author's Hawker Hurricane, showing domed and flush rivet detail on the wing.

attached clinker style, overlapping as in boat building (the Spitfire's rear fuselage is an example). This can be simulated by applying the first panel and, when dry, carefully sand the edge off, then apply the next, panel, creating the overlapped effect. Drying can be accelerated with careful use of a heat gun, which works extremely well and I used this effect on my Hawker Tempest fuselage.

When the paper has been applied top and bottom, a coat of thinned sanding sealer is brushed on and, when dry, sanded with fine wet-and-dry paper.

Where the top surface at the leading edge of the wing overlaps the bottom covering, the step is sanded off. The paper I use sands like light filler when sanding sealer is applied and doesn't 'bobble'. The excess comes off in a fine dust. A second coat of sanding sealer is then applied and a final rubdown is done, taking care not to sand down the panel gaps. **Figs 8 and 9** show the wing ready for rivet detail to be added. **Fig 10** shows the model finished and waiting for the

detail. The interesting bit starts here.

### Riveting stuff

Mark out with a soft pencil where all the rivets are and mark out the rivet spacing. Where the rivets are flush, a sharpened brass tube of the appropriate diameter is gently pressed onto the paper surface and rotated 90 degrees back-and-forth to pierce the paper surface, but not the tissue underneath.

Patience is a virtue, or so they tell me and it's here I have to switch off, as this task can be a little monotonous. I'm told I am an expert in stating the patently obvious, but believe me, having the radio on or playing a CD relieves this task somewhat. It's only when the paint is applied and the detail becomes obvious that this task feels worthwhile.

Domed rivets are applied using a hypo syringe with an oiling needle fitted. **Fig 11** shows the flush and domed rivets on my Hawker Hurricane.

### Dirty-up

After all the rivets, hatches and catches have been applied, the paint can be

applied and the weathering can be done. Here I use oil-based pastels to dirty-down the surfaces. I rub a little black pastel onto a tissue and work this into the panel gaps, then wipe across (not down) the panel line with tissue moistened with white spirit. The 'dirt' thus collects at the panel edges, which is where it would collect on the full size aircraft. Give this a try, the effect is impressive and make sure it's done in the direction of the airflow over the surface, i.e. front to back. A quick blow over with thinned fuel proofer prevents the weathering from being wiped off when cleaning the model after use.

I hope this discourse proves useful to you keen scale types like me, wishing to achieve a scale finish on these toys we play with.

Now the bad news, I can't remember the type of paper I use but, having experimented with different sorts, the closest I've found is the type fish and chips are wrapped up in, lightweight printer or photocopy paper is excellent and can be obtained in A3 and A2 sizes from print shops. ■



The assembled DH Venom airframe model fully assembled prior to commencement of surface detailing.

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MASTER MODELS

# HANDLEY





# PAGE O/40

The Editor looks at Roger Godley's WW1 heavy bomber fresh out of a long hibernation

**T**he first question I asked Roger Godley when I called to get the detailed story of his Handley Page O/400 model was: "... why the O/400 in preference to the Vickers Vimy, which was rather the more widely known of the two RAF heavy bombers of WW1."

The answer was that, quite apart from the fact that the Vimy had already been modelled, the O/400s were made at

Waddon, near Croydon, quite close to where Roger was living when this project was started. The O/400s were made by Tubricks, a large furniture manufacturer and after the airframes were assembled and completed, they were wheels across the road onto the Croydon airfield, to be taken on charge by the RAF and flown out.

Roger's O/400 project was started about ten years ago and for want of a





**1 & 2:** Pilot and co-pilot keeping a sharp lookout for enemy fighters. **3:** Nose gunner perching in his position well ahead of the main undercarriage - must have been a bit dangerous in the event of a nose-over! **4:** Mid-upper gunner position just behind the wing training edge line. All figures hand carved by Roger. **5 & 6:** Just an example of the rigging wire replication that went into this model. **7 & 8:** Front and rear view of one of the engine nacelles. Laser 100 engine completely hidden. **9:** Engine radiator grille.

**BELOW:** For its time the Handley Page O/400 was a massive aeroplane - struts and rigging wires everywhere! Note the fabric covering panel lacing.

decent scale drawing from which to draw up construction plans to the required 1/10th scale which give a wingspan of just under 100", he created his own scale drawing by measuring up a 1/48th scale

plastic kit.

Given the wood and fabric era of the full size, the model is similarly 'conventional' in airframe structure of balsa and plywood, fabric covered in the

open framework areas using *Solartex*, finished in Fair WW1 era PC10 colour. The four-wheel main undercarriage uses *Flair* 4" diameter Vintage wheels.

Construction took a year which, given





the extensive nature of the airframe and the volume of external bracing wires and strutter, is actually good going. Laser 100 four-stroke engines provide the power driving the 16" x 8" propellers, the power of which is well sufficient to get the



model airborne.

Sometime during the first two years of the model's existence it suffered a major crash, which dictated a total rebuild of the fuselage.



### Extended hibernation

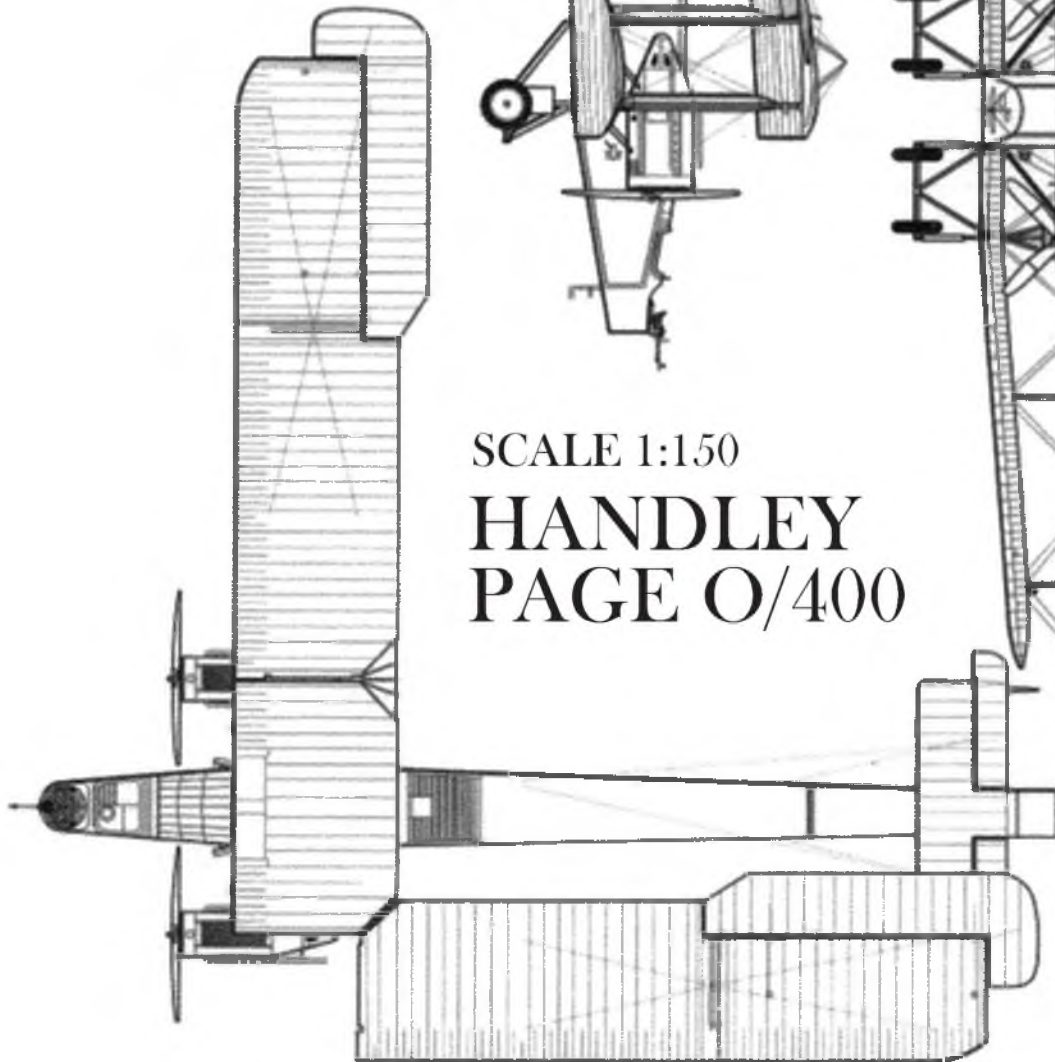
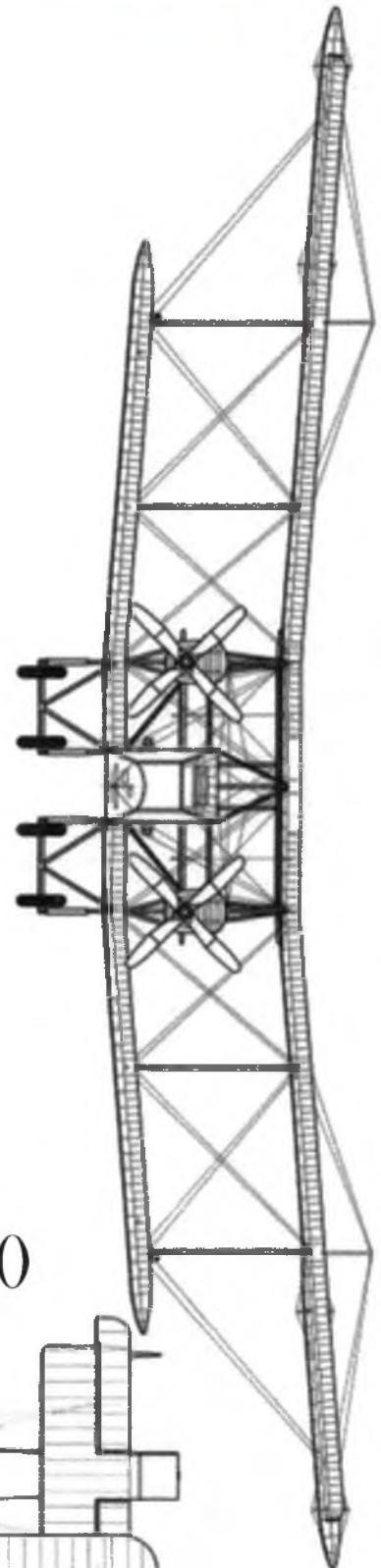
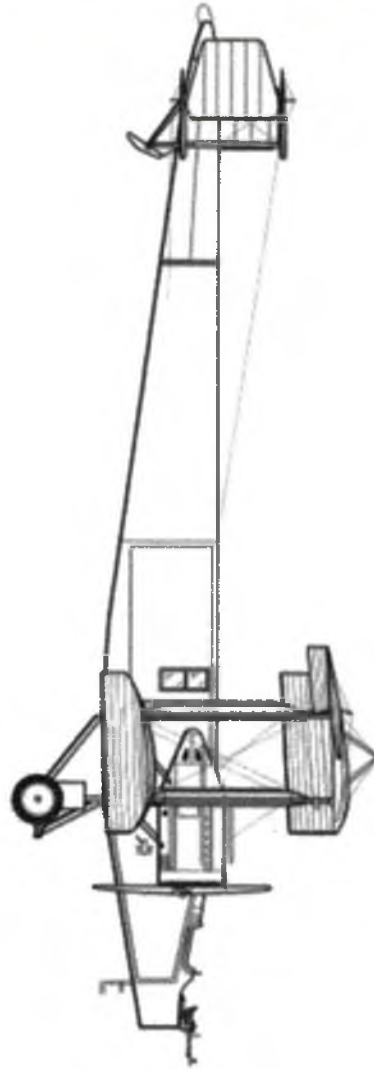
At the end of the model's second year, Roger moved away from the Croydon area to the UK south coast and the O/400 was boxed up and stored away, where it stayed until a bit earlier this year before

10



Roger, preparing to fly the O/400 at Old Warden, lends scale to the model.

11



SCALE 1:150

**HANDLEY**  
**PAGE O/400**



**10:** Fuselage centre section and interplane struts. **11:** External mounted bomb on the fuselage underside. **12:** Upper wing struts. The two circular finned details at the base of the struts replicate the wind driven fuel pumps of the full size. **13 & 14:** Two views of the biplane tail assembly - plenty of rigging and strutting in there too. **15:** Dummy wind-driven generator mounted on the forward fuselage left side. **16 & 17:** Main undercarriage use Flair 4" bia. Vintage wheels.

being dug out, check assembled, and prepared for flying at this year's *ModelAir* Scale Weekend at Old Warden over the July 19/20th weekend.

Here, the model's stately progress

around the Old Warden circuit during the Saturday's flying was much admired. Roger says it's a very stable flyer, but take-offs and landings need to be performed directly into wind - which

preluded participation in *ModelAir*'s mass WW1 model flypast on Sunday 20th.

We look forward to seeing Roger's Handley Page O/400 is the air again. ■



# THE QUIET ZONE

R/C SCALE ELECTRICS WITH  
PETER RAKE

time. In the meantime though, a little more waffle from yours truly, who is still up to his ears in clearing out the detritus from his own modelling room.

## THE GREAT CLEAR UP CONTINUES

This clearing-up lark is taking rather longer than I had intended. Quite apart from there being far more junk to get rid of than I'd have thought possible, some fool (me) keeps buying more model planes and helicopters. As you'd expect, everything else has to take a back seat while I rip open parcels, check that everything is there and that it all works as it's supposed to. Well, you have to check these things, don't you? If it's an item I've bought for its fiddling-about-with value, then it gets even more complicated and takes even longer. Then I have to check what works, what doesn't, why it doesn't and how I can make it work - all great fun, but it doesn't half eat into tidying time - thank goodness.

Anyway, just like my wife, no doubt you'll be pleased to note that the space beside my armchair is no longer filled with miscellaneous helicopters in varying stages of disassembly and our lounge has returned to being just that - a lounge rather than an extension of the model room.

Totally ruthless organisation, coupled with trips to the recycling centre (during which I manfully resisted the urge to seek out more 'useful bits') have resulted in a model room I can actually get into without a fight. Umpteen model planes and helicopters all neatly stacked on the new shelving, clear, vacuumed floor space and a lack of clutter have conspired to make it almost a pleasure to go in there. I say 'almost' because there's still the bench to be organised and a

**Y**es, it's no use you trying to hide I'm afraid, that flamin' bloke is back to bend your ear with more electric flight nonsense. Admittedly, not quite so much nonsense as last time, but I'll do my best to keep you amused.

Okay then, you're in luck this time because much of this has already been written for me. QZ regular Jonathan Rider has prepared a couple of hopefully inspiring articles to help you attain even better results with your scale modelling. One item for this month and another next

**ENGINE DETAIL CAN BE AS SIMPLE AS AN IMAGE PASTED INTO THE COWL.**





The other end of the engine detailing scale, Darrin Covington's Antionette engine under construction. It's amazing what you can do with a few plastic mouldings and some bits of tube.



Just how flexible that self adhesive veneer Jon mentioned actually is. The simulated wood grain doesn't look quite right though.



Here a more realistic grain pattern is printed onto the veneer applied to the rounded DVA fuselage very well.



A mix of sealed wood and plastic panels sets off the nose of Jon's Camel.

couple of boxes of basically sorted odds and ends to be ruthlessly sorted again, but it is a vast improvement. It's surprising just how much potential rubbish, disguised as potentially useful stuff, you can accumulate over nine years. The room was all tidy and organised when we moved here, and it went rapidly downhill from there on in. My name is Peter and I am a hoardaholic. Sorry, let me get that right, a recovering hoardaholic. (I hope)

Right then, with the rambling intro out of the way let's move on to more interesting things, like Jon's article about improving the finish on our models. I just wish he'd learn to write in The Queen's English. Then I wouldn't have all those i and u spelling errors to correct (aluminium and colour). Yes, I am a cheeky beggar, but Jon knows my strange sense of humour by now.

## COVERING UP

I'm back - if not for a little while, but as long as Peter will provide the space, I will ramble on about all things scale modelling. I have had conversations recently with fellow modellers about how they could make their models 'stand out' and be even more scale with added finer details and greater accuracy. Be it an ARF, a scale kit or plan built masterpiece, there are wonderful ways to add finer details to improve the looks, the accuracy and even (sometimes) the flight capabilities of your aircraft. Let's take a

further look into one of the key areas of your model - the covering and finish.

Most models are covered by a coat of paint, a plastic or cloth 'iron-on' covering, tissue or silk. (There are other lightweight cloths or woven based coverings, but you get the idea). Most of the earlier WW1 and pioneer aircraft were made from hardwood, with open-area framework covered in linen fabric, while other parts of the airframes were wood-skinned and the exposed wood just given a coat of varnish. Getting into the later years of aircraft design, the aircraft were primarily made of metal, and either painted or left in the metal colour for sake of weight, time, resources or all of the above.

So, as scale modellers, how can we reproduce these wonderful finishes on our masterpieces? Well, let's take a look. Yet before we jump into the deep end of the pool, let's chat about things like the weight of the aircraft and also some of the basic needs of your aircraft. (Yes, even your small-scale aircraft have needs above a charged battery and a full fuel tank). You normally want your model aircraft to be as light as possible, with a wing loading that is sufficient for flying within the flight profile of the original aircraft. If you have a Sopwith Camel that is quite overweight, it will have to fly like a P-51 Mustang to just stay aloft. You also have to keep the signal clear to the receiver, and items like metal and carbon fibre can impact the signal. So let's do

this, but keep things in perspective.

Let's talk about what makes up the materials that keep our planes together, and then we can see how we can replicate the look of the original without the burden of the weight penalties the real ones carried with them. I'll stay within my comfort zone of WW1 and early aviation aircraft, but you can apply any of these methods across any era of aircraft.

## THE LOOK OF WOOD

You have probably seen that most early aircraft have a wood (or plywood) covered forward fuselage around the cowl and cockpit area, as was used to add strength and help support the engine, armament, pilot and wing attachment points. The structures were built with internal and external braces for all of this stress and used an external skin to add extra strength.

This approach of combining internal and external support is called a Truss structure, covered by a monocoque shell. This combination adds significant strength to the nose of a fabric-covered basic airframe, and in fact, the Albatros D.V series used the Monocoque method for its entire fuselage. So how do we get this look?

Well there are a couple of ways; first, you can use real wood! Even balsa wood can be used (the grain will look different) but if stained, it has a great texture and looks

like the real thing. You can also apply a wood veneer over the area (like I did on my D.Va) where I used a 1ply adhesive backed Birch veneer over a balsawood base. Or you can even paint on a simulated wood grain over any material. There are a few examples (including Pete's D.Va full size free plan featured in earlier issues of FSM) with a fantastic simulated wood finish over a painted surface. Either way, the look of the grain, texture and feel of wood on any aircraft really makes a model stand out.

(What Jon hasn't mentioned here, and I think very worthwhile, is that although the veneer he used on his D.Va went on to give a good representation of the ply skin of the original, the grain was still six times larger than it should have been - a 1/6th scale model skinned with 1:1 scale veneer. His rather clever solution was to print (it's thin enough to go through a printer) some 1/6 scale grain onto it. It's still a work in progress, so it remains to be seen how it works out, but it sounds a very good idea to me. PR)

### FABRIC

Virtually all these early aircraft had a fabric covering of some sort, and they are pretty easy to simulate with the new coverings on the market today, as there are coverings that are designed just for a

fabric covered aircraft. But let's take it a little further, you can add additional fabric attachment stitching (On my little Sopwith Pup, I just used a dark brown pen to simulate stitching) or you can use thread under the covering to give the look of a stitched surface.

On my FE2b, I layered three sheets of covering then actually used a needle and thread to simulate the fabric sewn sides of the fuselage; you would never know it's balsa under there, and it's strong and scale-like.

The fabric look can be painted or weathered. I actually painted the roundels of my DH1a with a technique used in stencilling using a flat brush, paste paint and Frisket mask. The finish was scale-like and easy to achieve, as I did not need any spray equipment or cans of paint. The final result is a weathered and faded finish looking like it sat in the sun for a while.

### METAL

Most of the cowls, front panels and other items of these early machines were either made from aluminium, thin steel or other sheet type metal. This finish can be tough to replicate with balsa or other wood-based lightweight materials. On my Fokker D.VIII and Sopwith Pup, the scale was small (1:16) and weight was a factor,

so I made the cowls out of balsa and soaked them with CA.

When the CA was dry, I put another layer of medium CA on top and let that dry, then sanded with 600 grit sandpaper. After a few coats of CA and a fine sanding to 1200 grit paper, the surface area became like glass, and was easily painted to a glossy finish, just like paint over metal. For the front panels of the Pup, I wanted a duller 'brushed' aluminium finish, so I used less CA and painted the areas silver. (Being lazy, and finding dried CA too hard to sand easily and taking too long to do, I use a different technique for these areas. It requires the adjoining areas to be covered first and then all non-metal areas to be masked, but does give very good results. Using automotive filler/primer I build up multiple coats, sanding lightly between coats, until all trace of wood grain has disappeared. Then I add a couple more coats of filler/primer to build up the thickness and give the whole area a final sand using wet or dry abrasive, used wet. 800-grade will give ideal results and being used wet helps get a really smooth finish. Then you can apply your colour coats.

The best paint I've found for aluminium finishes is automotive wheel paint (Silver Wheels or similar). It takes handling better



Once painted the CA sealed, and much sanded, cowl paints up looking just like metal.



However, nothing represents metal quite like the real thing. Especially if you need a brushed effect finish. The wood area is shellac over balsa.



Jon came up with a neat way to hide the white decal paper edges on these markings.



The nicely sanded nose of the author's Ponnier all ready for priming.





**THE PIONEER AGAIN AFTER MUCH FILLER/PRIMER, SANDING AND APPLICATION OF SILVER WHEEL PAINT.**

than any other metallic paint I've come across and can even be further finished with clear varnish to further protect it, add or reduce gloss or seal anything added to the area, like decals.

By using careful masking, and working one panel at a time while applying the filler/primer it is possible to add panel detail at the same time you build up your smooth finish. Finish sand the first area, mask the edge of the next and finish sand with the masking still in place. When the tape is removed you will have a tape thickness 'edge' to the last panel applied. Then just add your bolt/rivet detail. (PR)

For metal panels, hatches and access points, what could be better than... Metal! There is real aluminium tape on the market (and in your local hardware store for sealing duct work) that is easily used to create metal in almost any area on your aircraft. I have found it's difficult to wrap a cowl or tight space with the aluminium tape, but for flatter areas, it works just fine, and can be brushed, polished or left as a dull metal finish.

Remember I mentioned earlier about the needs of your aircraft? If you have an internal receiver (2.4GHz) and you cover the fuselage around it with metal tape - PLEASE do a proper range check, as the metal tape can interfere with the signal to the receiver. Most companies make receivers for metal airplanes, or at least satellite modules where you can have the antenna external to the aircraft to ensure a good strong signal.

Another great way to simulate metal is

fibreglass. There are many cowls and accessories available on the market (you can even make your own) that once sanded and shaped, there is almost no way you can tell it's not metal.

**PLASTIC (my favourite metal)**

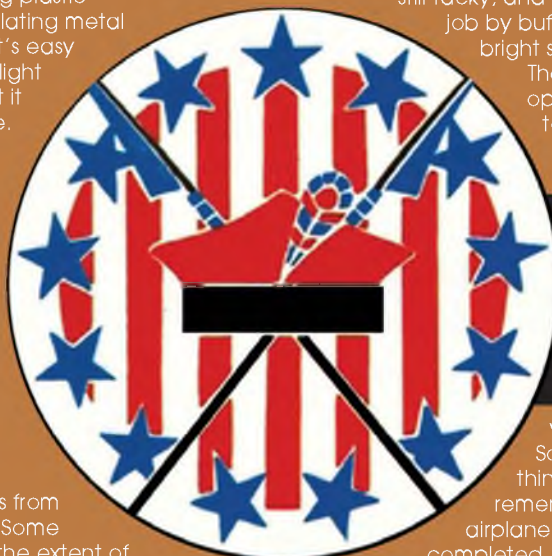
I have been using plastic sheeting for simulating metal for a long time. It's easy to work with, it's light and you can get it almost anywhere. The upper sheeting on my Sopwith Camel, the side panels, the gun ports and shell ejector ports are all plastic pieces.

As you have seen in earlier articles, you can make guns, accessories and even wheel parts from plastic sheeting. Some modellers go to the extent of making or buying a vac-form machine for making plastic cowls, pieces and odds and ends. The other benefit of plastic is that it does not block the radio signal to the receiver, you can glue pieces together to make more complex items (like engines and such) and you can paint it with almost any type of model paints,

matching the colours of your aircraft.

Plastic, when sanded smooth and primed, makes a wonderful surface to simulate metal. With some of the advanced metal paints today, you can paint on a silver colour and then dust it with real silver powder while the paint is still tacky, and you can finish the job by buffing it to a bright shine!

There are a lot of options you can use to add texture, definition and scale finishes



**By printing the wood background into the decal you can use clear decal sheet and paint in the underlying white areas.**

with your model. So until next time, think scale, and remember, a scale airplane model is never completed, you just either run out of time, money or are distracted by the next project!

So, there we have it for this month. Next time we'll have another item from Jon and more of the usual old waffle. In the meantime, you'll find me at [PETERRAKE@aol.com](mailto:PETERRAKE@aol.com)

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