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THE ISSUE AHEAD...

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FLYING SCALE MODELS - THE WORLD'S ONLY MAGAZINE FOR SCALE MODEL FLYERS



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ON THE COVER

When we photographed this Martin B-26 Marauder, at Kermit Weeks' Fantasy of Flight Museum back in 2003, it was newly arrived, hardly in pristine museum standard condition and (they said) flown in on the proverbial 'wang-and-a-prayer'. It is this month's 'Subjects for Scale challenge.

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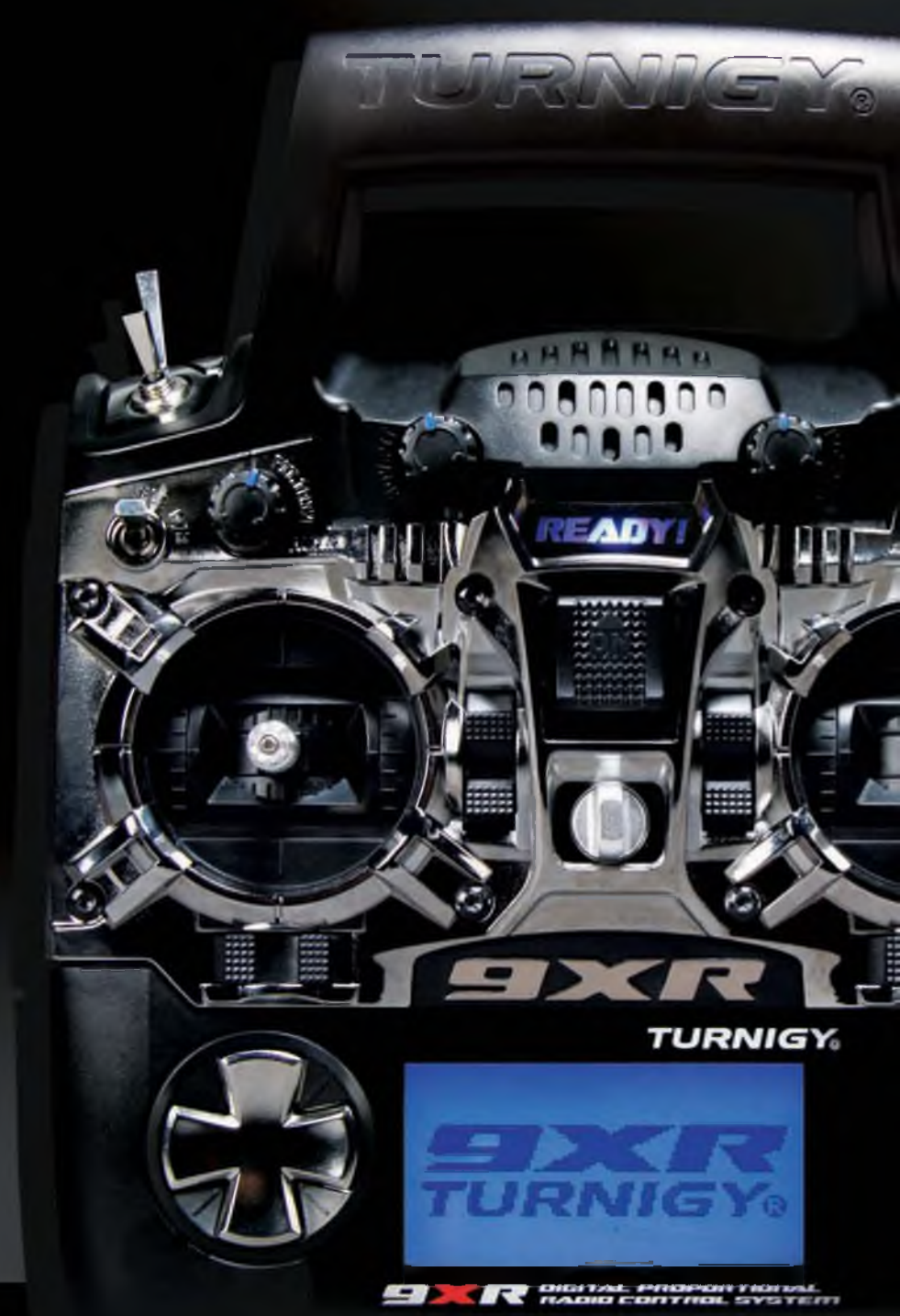


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& CIRCULATION: Doolittle Mill, Doolittle Lane, Totternhoe, Beds, LU6 1QX.
Tel. 01525 222573 Fax. 01525 222574.
Email: enquiries@adhpublishing.com

CIRCULATION TRADE ENQUIRIES:

Seymour Distribution, 2 East Poultry Avenue, London, EC1A 9PT
020 7429 4000.

NEWSTRADE: Select Publisher Services, 3 East Avenue, Bournemouth, BH3 7BW.
01202 586848
Email: tim@selectps.com

SUBSCRIPTIONS: Doolittle Mill, Doolittle Lane, Totternhoe, Beds, LU6 1QX.
Tel. 01525 222573. Fax. 01525 222574.

PRINTING: Symbian Print Intelligence, Calverley House, 45 Dane Street, Bishop's Stortford, Herts, CM23 3BT.
Tel: 0870 870 1670; Fax: 0870 870 1675

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CONTACT

Depending on who you are, where you are, personal circumstances and (perhaps more importantly) one's personal ambitions, cheque-book aeromodelling has been part of our hobby for a very long time. It was, at one time, much frowned upon, somewhat akin to cheating - even if practiced only for non-competitive purposes.

But such objections have tended to be blurred and eroded over time, mollified but the abandonment of the 'Builder-of-the-Model' rule for most aeromodelling competition classes (excluding Scale of course - except for 'Flying Only'). The ever-widening range of really decent ARTF R/C scale models has also blurred the issue.

Even in these days of 'Recession' there are in fact a surprising number of people willing and able to shell out money on bespoke, built-to-order projects that can easily cost what one might otherwise pay for a small new car. Wherever there is a demand, there will always be people able and willing to provide the requisite service and there are now a handful of professional model makers currently satisfying that demand. These highly skilled individuals are very much a breed apart, meticulous in their craftsmanship and with a huge capacity for scale

aeromodelling that imparts the ability to turn out models of staggering quality over timescales that most of us could never match - even to a far lesser quality.

Irrespective of one's personal views of such cheque-book aeromodelling services, those service providers have skills and techniques from which we lesser scale modelling mortals can benefit and in this issue, Alex Whittaker presents the first of an occasional series picking the brains of some of these individuals.

We've entitled the Series, 'The Professionals' and we start in this issue with Paul 'Limey' Rice.

Hope you get something out of it!

DOUBLE THE CHALLENGE

This editor has flown a twin engine scale model only once - just one flight to test a review model of the Svenson kit Britten Normal Islander - and that was back in the mid-1970s! One engine died on me, but I got away with it - JUST!

But twin engine scale models hold their own fascination and present-day electric power makes twins so much more practical. So this month, our Subject for Scale challenge is the superbly elegant, super sleek Martin B-26 Marauder, a rarely modelled subject just waiting for someone to have a go.

Tony Dowdeswell
Editor

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ASK-13

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Plan: £24.50
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PLAN4

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DFS Reiher II

1/4 scale replica of the famous pre-WW2 vintage gull-wing German sailplane. This is one for the enthusiast who loves building. Three large sheet plan.

Plan: £28.50
Cut Parts: £135.00

PLAN158

Cliff Charlesworth Scale Gliders



ASK-18

1/4 scale 157.5" (4000mm) span replica of one of the best and most elegant pre-glass fibre era club single-seater sailplanes. A great flier. Two sheet plans.

Plan: £24.50
Cut Parts: £130.00

PLAN6

Cliff Charlesworth Scale Gliders



Grunau Baby

1/4 scale superb example of the machine which is the epitome of pre-WW2 vintage open cockpit gliders. 133.5" (3390mm) wingspan. Two sheet plan.

Plan: £24.50
Cut Parts: £125.00

PLAN83

Cliff Charlesworth Scale Gliders



Hutter H-17

1/3 scale 129.9" (3300mm) span replica of a lovely vintage scale 'floater'. Light, yet tough. Two sheet plan.

Plan: £22.50
Cut Parts: £130.00

PLAN81

HOW TO ORDER: www.flyingscalemodels.com

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This covers most destinations and secures your order with us. However, we will contact you accordingly with an accurate total shipping charge prior to dispatch and either issue a refund or a PayPal money request for the balance.

Cliff Charlesworth Scale Gliders



Kaiser Ka6E

1/4 scale 147.5" (3750mm) wingspan model of an elegant high performance sailplane. Two large sheet plan.

Plan: £24.50
Cut Parts: £125.00

PLAN220

Cliff Charlesworth Scale Gliders



Kaiser Ka-7

1/4 scale 157.5" (4000mm) wingspan model of the famous German two-seater glider. Performance is superb and simulates the full size very nicely. Plans on two large sheets.

Plan: £24.50
Cut Parts: £125.00

PLAN101

Cliff Charlesworth Scale Gliders



Kaiser Ka-8

1/4 scale 147.6" (3750mm) wingspan Class 1 scale model of the most popular Club glider. Very docile and a joy to fly. Two large sheet plans.

Plan: £24.50
Cut Parts: £125.00

PLAN98

Cliff Charlesworth Scale Gliders



MU13-D3

1/4 scale 157.5" (4000mm) span, super lightweight model of the famous German Soarer. Three sheet plan.

Plan: £26.50
Cut Parts: £125.00

PLAN125

Cliff Charlesworth Scale Gliders



Lo 100

1/4 scale 98.4" (2500mm) span model of a famous aerobatic sailplane. Two sheet plan.

Plan: £22.50
Cut Parts: £125.00

PLAN217

Cliff Charlesworth Scale Gliders



Olympia 2B (DFS Meiser)

1/4 scale 147.6" (3750mm) span of a really lovely soarer of the pre-glass fibre 'hotship' era. Two large sheet plans.

Plan: £22.50
Cut Parts: £145.00

PLAN139

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Bespoke SCALE



Alex Whittaker visits an accomplished scale modeller in his lair

These days, economic gloom and doom seem to predominate, so it is refreshing to see a new model business start up. So far, so good; but Paul 'Limey' Rice's new business is not just another mail order electric supplies house, or another foam emporium. In fact, it is that most rare of commercial beasts, a truly top-class scale-orientated concern. Indeed, it is directly attuned to our special frequency as flying scale model fanciers. Paul's enterprise is a bespoke scale building service, no less - a veritable Temple To Scale!

Limey

The nickname comes from Paul's family's sojourn in the USA, where he was dubbed 'Limey'. He was actually born on the Wirral Peninsula, just over

the water from Liverpool, so his distinctive twang is an admixture of Scouse and Yank, though to my ear as a fellow Scouser, his patois could easily be Irish! Paul had a very distinguished scale modelling career in the USA as his many scale trophies and medals attest, so it seemed natural for him to eventually enter the scale business.

Paul has cultivated his Trans-Atlantic connections, so he has contacts with a myriad of stateside specialist scale model kit, engine, accessory, and materials suppliers. This means that he is up to speed with the latest scale techniques, materials, and products from the other side of the Pond, and can source them for us. This is handy, since, as scale modellers we have particular, often rarified requirements, especially with new adhesive and finishing

technologies.

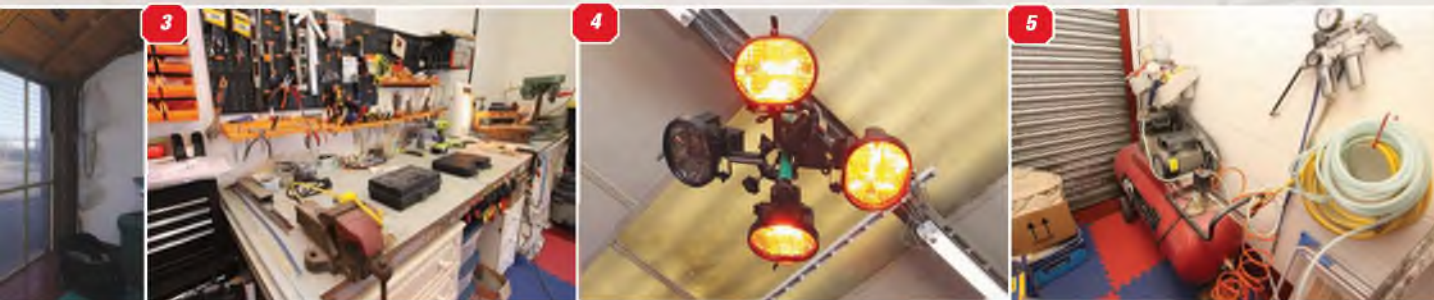
As local model shops recede in the UK, as a specialised branch of the R/C hobby, we flying scale modellers are getting used to sniffing out scale specialists, and we are increasingly sourcing our scale sundries by Mail Order. Paul has recognised this too, and is now directly importing a range of scale goodies from around the world, to complement his building business. This is great news for we scale fans.

Factory unit

Paul has set up his business in a start-up factory unit at the end of the M53 motorway. It is near to the Birkenhead end of the Mersey tunnel, so finding him is a doodle. But don't let the 'factory unit' tag fool you, in effect this is a scale modeller's dream workshop. It is warm,

1





1: An example of Paul's work. 2: Paul's novel idea to admit more light to the workshop. Ideal for those of us whose shed is actually the home garage. 3: Paul neat tool bench. How unlike my own! 4: Workshop heat and light. 5: Paul uses hefty compressor for his sprayguns, airtools, and airbrushes. 6: Paul was building Tempest for a customer. 7: Paul accepts modest commissions as well as the big stuff.

well lit (see below), comfortable, spacious, and highly amenable to top quality building. Paul has some great scale building ideas, such as island benches on castors that allow 360 access to the model under construction. Bigger models may be accommodated by simply pushing two benches together.

Besides the specialised lighting and heating, Paul has modified the roll-up factory door to incorporate an inner weatherproof but translucent panel. He has also added translucent roof panels.

Together, these upgrades admit a huge amount of natural 'colour balanced' light, which greatly assists when spraying and colour matching - a vitally important prerequisite when scale finishing. Even the rubber foam flooring is useful for us shed dwellers, since it is comfortable to walk upon, has high insulating properties, and anything fragile dropped on it is cushioned. It also locks together and does not move. Paul sourced it from ebay as interlocking children's play-flooring.

Bespoke

Although Paul has invested in a full range of high quality hand tools, I noticed his power tools were surprisingly familiar and modest. I quickly realised

this was because He really does believe in 'hand-crafting' the scale model for the customer. In effect, you are engaging a gifted scale modeller, with umpteen scale trophies, to build your model for you. You give Paul your kit and its powerplant and so forth, or instruct him to source it all for you, and he does the rest.

If you so wish, he will even undertake to test fly and trim out your new scale aircraft for you, though naturally you will have to sign an indemnity! He will also undertake refurbishments, alterations and re-scheming of existing modes, if you so wish, so it really is a fully integrated service.

For the more elaborate projects, say an expensive German all-moulded kit, Paul will first construct a good quality plastic kit for the client, to demonstrate the agreed colour scheme, and the level of detailing. I have seen two or three of these, all works of art in their own right. Mind you, don't get the idea that Paul's service is only for larger, expensive projects, he has a brisk business in re-scheming and refurbing inexpensive ARTFs, and adding extras like retracts.

It is Paul's policy to not turn anyone, or any project away, and is certainly not all expensive 1,000 hour stuff. On my first

visit to the Unit, Paul was lovingly airbrushing an eighty quid scale foamie for an elderly gentleman, for a very modest fee. It is testament to his welcoming approach that he has a full order book.

Birth of a Corsair

One client has entrusted Paul with a really ambitious and demanding scale project. This is a 1:4.5 / 2.8m scale Carf Models F4U Corsair, complete with 250cc Moki five-cylinder radial engine - a tremendous vote of confidence from a knowledgeable customer who had clearly done his homework on suitable builders. I was there when it was all delivered. A series of delightful parcels, each one excelling the other!

Paul has been instructed to systematically upgrade the existing Carf hydraulic system for the Corsair's integral landing gear and wing folding mechanism, and replace it with an electric conversion. This system is sourced for *Down And Locked, USA*. This will be the first model in the UK with this system.

Paul is noted for his attention to detail, with a huge list of contacts to back it, so he has even sourced the distinctive scale exhaust stubs from the USA for his





8: Paul's own majestic Dauntless on the bench.

9: Some of the scale wheels that Paul imports. **10:** The Sullivan On-Board Glow System.

11: ProMark prop decals. **12:** ProMark stencils and legending.

13: Paul stocks a range of dummy cast resin radial engines. **14:** 1.5 mm masking tape. **15:** Paul carries the Top Flite dummy radial engine. **16:** Simple idea - colour coded servo leads stickers!

client. The Corsair will have Sierra wheels and an innovative variable pitch (1-24 degree range) prop hub from Solo Props USA. Paul is the UK dealer.

Paul has employed motorised exhaust flaps on his own Douglas SBD Dauntless, so the customer has specified a similar arrangement of the Corsair. The flaps are motorised to match the chosen throttle setting so for example, full throttle closes them completely. Full details of this ambitious Corsair in FSM soon!

Other projects on the go

On a casual perusal of the workshop, I spotted a Brian Taylor Spitfire being built for a customer. Paul is fitting this with Sierra retracts and it also being fitted with a US-sourced I-Fly Tailies full cockpit, the first in the country.

Paul has also completed an exquisite Valley Aviation 1/5th scale / 96" span Hawker Tempest Mk.V, complete with ZDZ 80 engine with 26"x10 Menz prop - a real stunner. There was also a fine classic Stearman kit,

which Michael 'Crash' Parry and I were at Limey's workshop to pick up. You see, Paul had just completed it for Mike from the famed Marutaka kit. Paul has made a lovely job of it, and Mike and I were both delighted with the outcome.

I also noticed another more modern classic, a Great Planes ARTF Lancair. This elegant light aircraft was being heavily refurbished for a customer. Paul was rebuilding the cowl for an updated engine, re-covering the wings and surfaces, and

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As a one man band, Paul has to do his own paperwork, but at least his office overlooks his workshop.

Just a few of the Scale Wards won by Paul in the USA, both for his models and for his realistic flying.

repainting the body. He is also fitting new wheel pants.

The biggest project currently underway that I saw was a superb CNC Waco from *AMR Kits*. This huge 40% biplane spans 157 inches, and is powered by a Moki 400cc five-cylinder radial using a 37x14 prop. Once again, Dear Reader, watch this space!

Scale goodies I saw

Paul employs interesting goodies on his models, which he also sells. For example, I really liked the *Sullivan On-Board Glow Driver*. I also liked Paul's extensive range of imported scale wheels. (see photo). He also carries a range of scale WWII dummy radial engines in various sizes, both blow-moulded, and some really detailed cast-resin jobs, like the one on his own famed Douglas Dauntless. He even has a range of moulded WWII drop tanks.

I was also very interested in the specialist masking tape which he stocks

down to really small sizes like 1.5mm.

One really nifty scale item was a sheet of *Pro-Mark* WWII panels and hatches, complete with embossed rivet detail. These made were from self-adhesive aluminium foil, and looked very useful indeed. They could be used as per, or sprayed over and chipped and weathered back.

Finally, Paul stocks has some really nifty prop decals and sheets of scale stencils and legends, which were excellently finished.

Scale potions

Like all scale fanciers, I am fascinated by the particular products and potions that top-end scale builders use, especially those sourced from the American scale community. Therefore I was interested to note that besides familiar products like *Grip* cyano glue accelerator, Paul was using things like E600 clear multi-purpose glue. A rubberised glue that sticks pretty much anything to anything, but you can

un-bond it by un-peeling; great for locating formers in cowl rings, and tricky jobs like securing integral servos in areas where later access will be difficult.

He was also using *Formula 560*, unblinkingly dubbed on its own bottle as "The World's Best Canopy Glue". Paul told me it does what it says in the tin and was easily his favourite.

Next potion up, was an exotic *Loctite E-20HP* Hysol epoxy two pack adhesive, which I have never clocked before. Paul uses this arcane unguent for the specialist bonding of formers in composite aeroplanes.

One other nifty idea was a very simple one: peelable www.meister-scale.com ID decals that colour code all your servo leads. In the age of multiple servos and mega-servo control boxes, I can see the point! Another theme I noticed, was that Paul routinely fits the largest capacity receiver battery that will suit the space available in the model. Since many scale models will need some added

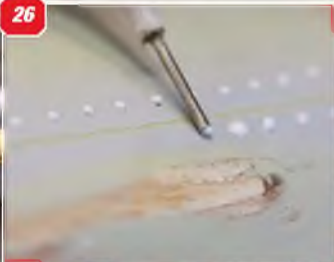
17: Paul swears by this product, E600 Multi Purpose Adhesive. See text. 18: Imported Formula 560 Canopy Glue. 19: The exquisitely cast hub from Solo Props. 20: The (normally hidden) degree wheel on the Variable Pitch (1-24 Degree range) Prop Hub from Solo Props USA. 21: Superb bespoke exhaust stubs for the Corsair. Paul sourced these from the USA for his client. 22: Another exotic unguent: Paul uses this Hysol for composite models. 23: Sierra WWII scale wheel. 24: Utterly splendid Moki 250cc / 5 cylinder radial destined for the Carl Models Corsair. Nothing in scale-dom sounds better.



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25: Scale ingenuity: TV UHF braiding for scale engine wiring! 26: Applying scale rivets with a glue syringe. 27: Making the wheel-well conform to the documentation. 28: Using a flexible drafting aid to get the pitch of the rivets just right. 29: For big projects Paul will complete a construction kit in the proposed scheme. 30: The construction kit has many uses in visualising the finished flying model. 31: Using foil for hatches and detailing. 32: Paul has motorised the exhaust flaps on his dauntless, and the new Carf Corsair. 33: Paul built this classic Marutaka Stearman for my mate and co-conspirator Michael Crash parry. 34: Watch this space: Paul's enormous new Waco biplane will feature here soon. 35: Paul gives some scale to the Carf Corsair fuselage.

nose-weight, this seemed to make perfect sense. In fact I noticed that as he worked on a customer's model, Paul habitually incorporated his building ideas culled from years of scale flying. This showed in such clever things as skilfully hidden hatches, simplified rigging, and quick release fittings: clever stuff that a pro will

automatically build into his own models.

And there's more

I had a great day learning things from Paul in his workshop. As soon as the weather perks up, I will bring you some flying shots of this year's crop of Limey's flying scale models. Stay tuned!

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Martin B-26 Marauder

For those who fancy the challenge of a twin engine scale subject, the Marauder is a very handsome aircraft

THE MAIDEN FLIGHT of the first production B-26, originally known as the Glenn Martin Model 179, took place on 25th November 1940. Powered by twin 1,850 h.p. Pratt and Whitney R-2800 engines (also selected for the P-47 Thunderbolt) the B-26 was of advanced concept, with an almost perfectly streamlined fuselage of circular section and small wings - a configuration that gave a maximum speed of 315 m.p.h. and a landing speed of just over 100 m.p.h.

In retrospect, the U.S. Air Corps' acceptance of this latter figure might be queried, but the specification of January 1939 contained no limits in this part of the performance envelope, employing sturdy construction and a tricycle undercarriage. It is more than probable that the Air Corps awarded the contract in the light of known peace-time pilot experience (USA was then not at war) and of Glenn Martin's guarantee of rapid production.

Even before the first flight, no less than 1,131 B-26 aircraft had been ordered 'off the drawing board'; the first instance of this policy in America. In consequence, there was no XB-26, and the first test flight of No. 40-1361 was in the first production aircraft. After over 100 hours of

further testing, four B-26s were handed over to the 22nd Bombardment Group at Langley Field, Virginia, and following elimination of teething troubles including nosewheel collapse, this Air Group was fully equipped as production gained momentum.

At this stage of the B-26, this model featured overload fuel tank fittings in the rear bomb-bay, torpedo shackles under the fuselage, and a 0.5" gun in the nose. 52 B-26As were assigned to the Royal Air Force as the Marauder Mk.I and these, together with subsequent deliveries of later marks, all served in the Mediterranean theatre, forming the equipment of No. 14 Squadron in July 1942, and later issued to Nos. 326 and 327 Squadrons.

The first U.S.A.A.F. Marauder combat mission was flown in the Pacific theatre of combat on 5th April 1942, when an attack was made on Rabaul from an Australian base. The torpedo-carrying capability of the B-26A was exercised during the Battle of Midway in June 1942, and in the Aleutians, but no hits were secured on the targets, which were Japanese aircraft carriers in both actions.

The B-26B appeared in May 1942, differing visibly from earlier models by the introduction of an improved



MARAUDING HORDES!
Martin M-26s of the 596th and 599th Squadrons, 397th Bomb Group set out on another daylight raid over Europe from UK.





BAR FLY - a very busy example of the B-26 flown by the 386th Bomb Group shows a tally of 66 missions below the cockpit. Overall olive drab/grey underside finish.



We photographed this B-26 at the 'Fantasy of Flight' Museum, Polk City, Florida in 2003. In unrestored state, it had recently been acquired and flown in.

tail-gunner's position mounting twin 0.5" guns; a modification which increased the overall length from the original 57 ft. 6 in. to 58 ft. 3 in. The gross weight had now risen to 34,000 lb, and in consequence the B-26B-2 was fitted with R 2800-41 engines of 2,000 h.p. The B-26B-3 saw the introduction of distinctive cowling mounted air intakes with sufficient internal diameter to fit tropical filters, these being fitted to many earlier aircraft including all R.A.F. Marauders.

The 2,500 ft. take-off run of the Marauder was giving increased concern, and in the Pacific theatre it had already caused replacement by B-25 Mitchells and not a few accidents there and elsewhere, so, as an interim measure, the B-26B-4 was fitted with a lengthened nosewheel strut to increase lift during the take-off run. Also, the last 141 aircraft of this model featured a pair of 0.5" waist guns, firing through side hatches in the rear fuselage and

replacing the original 0.30" central gun.

A bit of a handful

The year 1942 saw a crisis in the Marauder's career, for every week saw an increase in the accident rate, mainly in the training sphere during intensive conversion flying in hand for the formation of nine new medium bomber groups. Pilot training standards under wartime conditions had inevitably fallen and young pilots, straight from single engined AT-6s in some cases, found high stalling and critical speeds beyond their capabilities to handle. Morale began to suffer and on several occasions US Air Corps Inspection Boards considered cancellation of the type.

In the event, the B-26 was saved by three factors; the institution of a revised training programme utilising the Curtiss AT-9 'Jeep'; major modification to the aircraft to reduce wing loading and increase control; and the enthusiastic

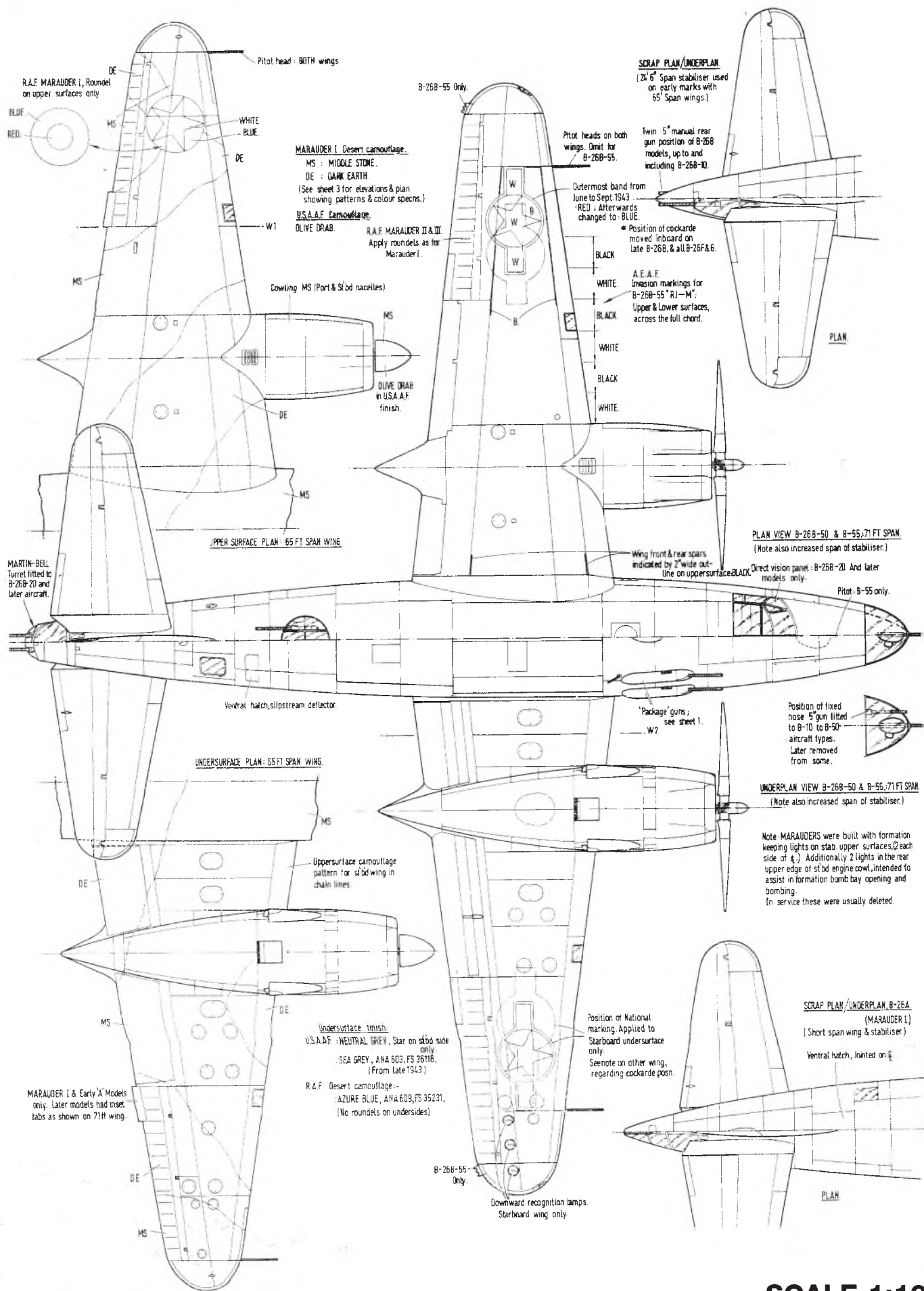
reports from experienced squadron crews plus combat zone commendations.

The modification took the form of an entirely new wing, which increased the span from 65 ft. to 71 ft. and the wing area from 602 to 658 sq.ft. A small dihedral angle was embodied and the original split trailing edge flaps replaced by the slotted type, while the fin and rudder were considerably increased in height, the lengthened nosewheel strut being retained.

Originally, all Marauders had been built at Martin's Baltimore plant but the new long-span model, designated B-26C-5, was manufactured in a new factory at Omaha, Nebraska, 89 aircraft being produced by the end of 1942. After a run of short-span B-26Bs, the Baltimore plant commenced production of the new model.

Meanwhile, in March 1943, the first of the 322nd Group's Marauders arrived in the U.K. and the 322nd's baptism of fire





SCALE 1:100

COLOR SCHEMES

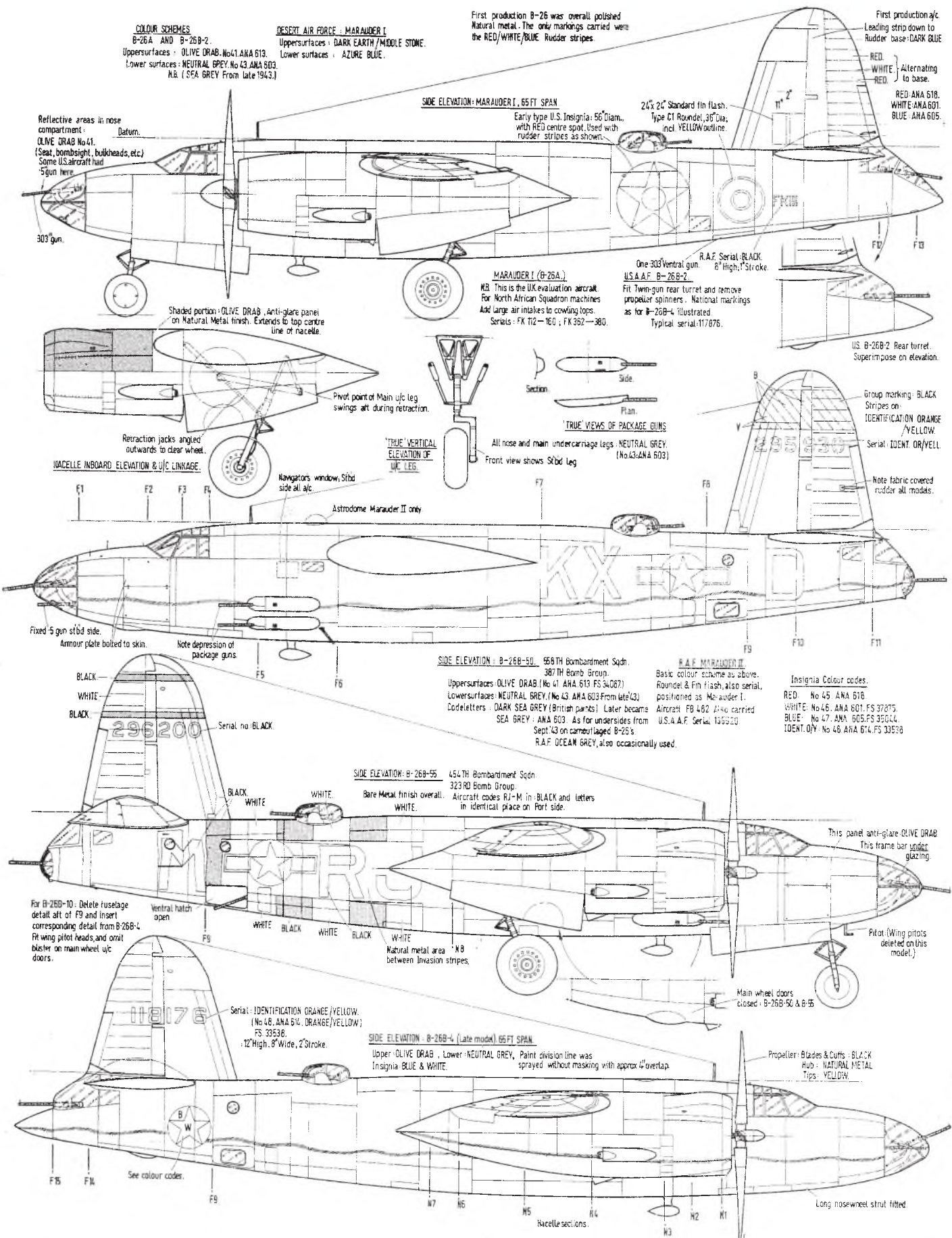
B-26A AND B-26B-2.
 Upper surfaces: OLIVE DRAB, No.41, ANA 613.
 Lower surfaces: NEUTRAL GREY, No.43, ANA 603.
 N.B. (SEA GREY From late 1943)

DESERT AIR FORCE - MARAUDER I

Upper surfaces: DARK EARTH/MIDDLE STONE.
 Lower surfaces: AZURE BLUE.

First production B-26 was overall polished Natural metal. The only markings carried were the RED/WHITE/BLUE Rudder stripes.

First production a/c. Leading strip down to Rudder base: DARK BLUE



SCALE 1:100

came on 14th May, with a 12-aircraft attack on a generating plant near Ijmuiden on the Dutch coast, during which every aircraft but one was hit, seven men wounded and one killed. Despite objections by Group officers, a second low-level attack was ordered on the same target for the 16th May, and this time one aircraft aborted and all the remaining 11 were shot down. Following this debacle, the Eighth Air Force Command ordered only medium-level attacks by Marauders, and in October 1943 the U.K.-based Groups were assigned to the Ninth Air Force,

At this time, in the Mediterranean area, the Marauder force consisted of three U.S.A.A.F. Groups together with five RAF Squadrons, and four Squadrons of the South African Air Force.

With the re-organisation of the French Air Force in North Africa, six of their squadrons were equipped with the B-26C-45.

Further versions

In February 1944, the first B-26F-1s began to emerge from the Baltimore plant. In this model, a further modification to reduce take-off run and landing speed took the form of increasing the wing incidence angle by 3.5 degrees, and of the 300 B-26F models produced, two-thirds, a total of 200, were supplied to



BOMBS GONE!
A 386th Bomb Group B-26C-25 lets go its load. This 9th Air Force aircraft is finished in olive drab/grey, with invasion stripes that date the action to post June 6th 1944.



'DOMINION REVENGE', A short - wingspan Martin B-26B delivered to the Royal Air Force and operated by No.14 Squadron.



The Editor still remembers swinging from the proverbial chandelier to get this upper surface picture of the Fantasy of Flight Museum's B-26 at Polk City, Florida in 2003!

This B-26B-55 of the 397th Bomb Group features natural metal finish, Invasion Stripes and shark's mouth nose art.



the R.A.F. and S.A.A.F. as the Marauder Mk.III. and fitted with British equipment.

The last Marauder variant to see combat was the B-26G-MA, which differed from the F-model in internal equipment only, and 150 B-26Gs served with R.A.F. squadrons under the Marauder III designation. The final production B-26 was the TB-26G, 57 of which were built for training and target towing duties, and a few served with the U.S. Navy as the JM/1 and JM/2.

The total Marauder production comprised some 5,157 aircraft, and in

Europe alone the total sorties flown were 129,943, with 169,382 lb of bombs dropped.

911 B-26s were lost in combat, the general loss rate being less than one per cent; an outstanding record for its class. In its time it had been called 'Widow Maker', and demanded a highly trained pilot, in whose hands it became a superb weapon of war.

Three other Marauder variants should also be mentioned though these were strictly nonoperational types, the AT-23A was a TargetTowing aircraft with all

armament, turrets and similar equipment removed and a T.T. Windlass being added. The AT-23B was similar but produced at the Omaha plant.

Finally, there was the TB-26G TargetTowing version of the B-26G of which some 30 machines were supplied to the U.S. Navy as JM-2s. This ended the Marauder series and it is tragic to recall that after victory in Europe hundreds of B-26s were burned or destroyed on allied airfields in Europe simply because they were 'in excess of requirements'.

The Martin B-26A was used by the Royal Air Force as the Marauder Mk.I. This is one of an initial 52 examples acquired, most of which went to the Middle East.

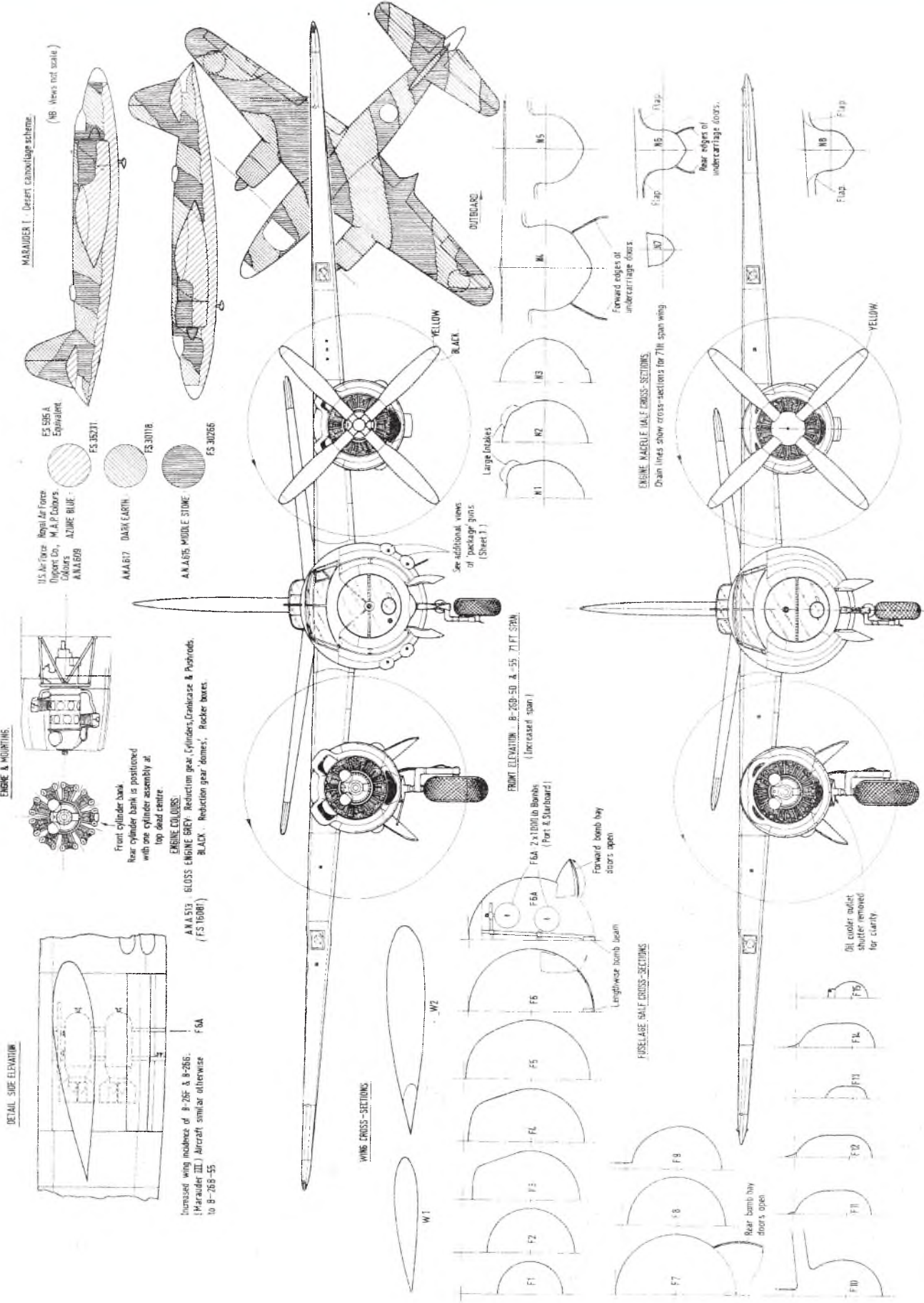


AVAILABLE FROM ADH Marauder Walk Around

From bombardier's station to the pads for the tail gunner's knees, this all-new B-26 Walk Around explores the Marauder up-close and in detail, surveying the intricacies of Martin's WWII medium bomber in depth. Exclusive photos illustrate the rarely seen inner workings and outer features of the B-26G, with additional coverage of the B-26, B-26B, and

B-26C. Initially dubbed "the Widowmaker" due to its high wing loading and high landing speeds. But following refinements in the design and improved crew training, the B-26 ended the war with the lowest loss rate of any USAAF bomber. The B-26 Marauder saw service in Europe, the Mediterranean and the Pacific, including use by the United States, the Free French, the Royal Air Force and the South African Air Force. More than 220 photographs, plus numerous detailed line drawings and color profiles. **Price: £18.99**

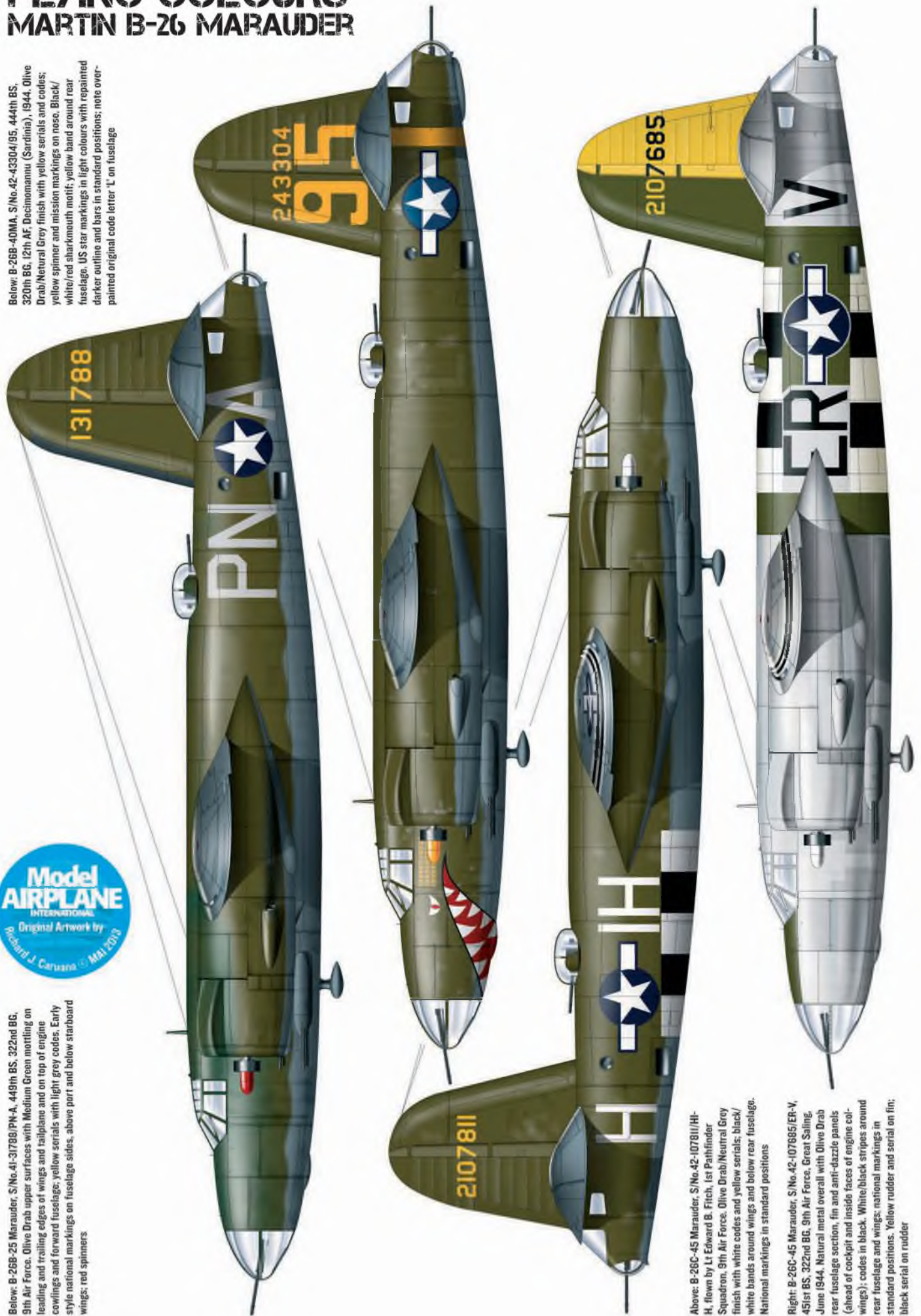




FLYING COLOURS MARTIN B-26 MARAUDER

Below: B-26B-40MA, S/No.42-43304/95, 444th BS, 320th BG, 12th AF, Decimomannu (Sardinia), 1944. Olive Drab/Neutral Grey finish with yellow serials and codes; yellow spinner and mission markings on nose. Black/white/red sharkmouth motif; yellow band around rear fuselage. US star markings in light colours with repainted darker outline and bars in standard positions; note over-painted original code letter 'L' on fuselage

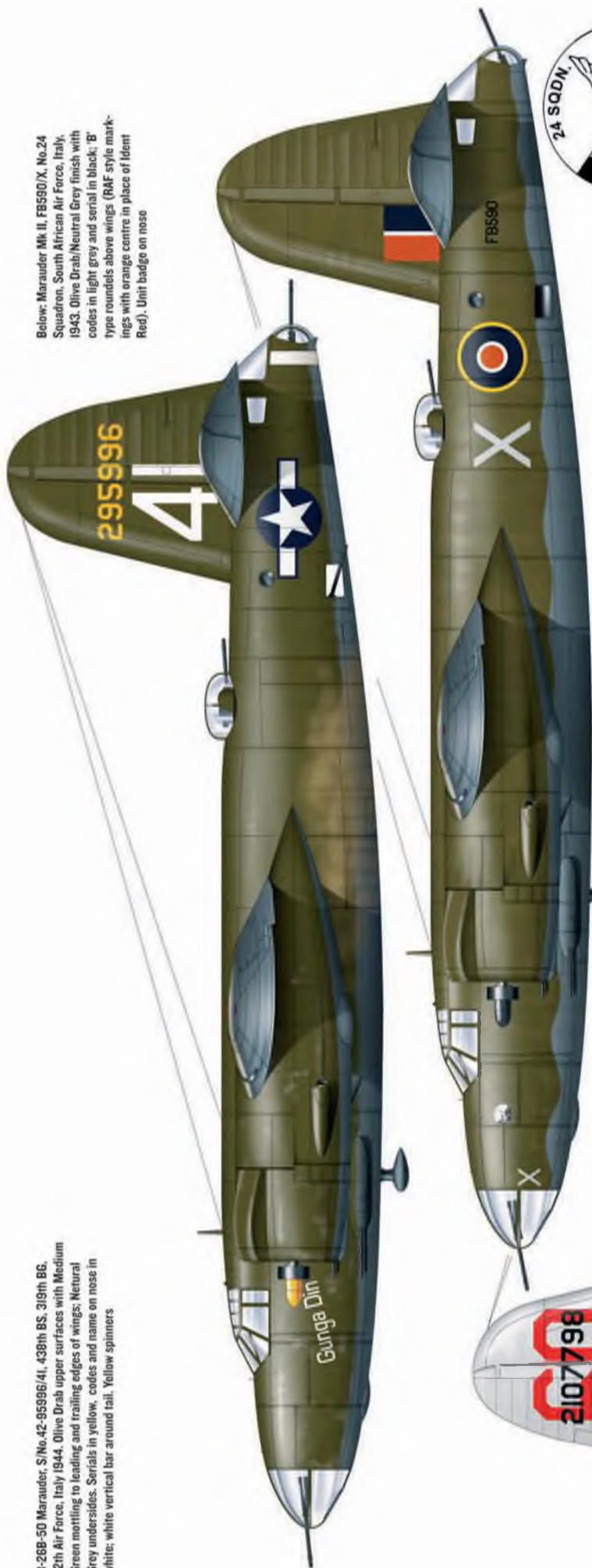
Below: B-26B-25 Marauder, S/No.41-31788/PN-A, 449th BS, 322nd BG, 9th Air Force. Olive Drab upper surfaces with Medium Green mottling on leading and trailing edges of wings and tailplane and on top of engine cowlings and forward fuselage; yellow serials with light grey codes. Early style national markings on fuselage sides, above port and below starboard wings; red spinners



Above: B-26C-45 Marauder, S/No.42-107811/H-H, flown by Lt Edward B. Fitch, 1st Pathfinder Squadron, 9th Air Force. Olive Drab/Neutral Grey finish with white codes and yellow serials; black/white bands around wings and below rear fuselage. National markings in standard positions

Right: B-26C-45 Marauder, S/No.42-107685/ER-V, 451st BS, 322nd BG, 9th Air Force, Great Sailing, June 1944. Natural metal overall with Olive Drab rear fuselage section, fin and anti-dazzle panels (ahead of cockpit and inside faces of engine cowings); codes in black. White/black stripes around rear fuselage and wings; national markings in standard positions. Yellow rudder and serial on fin; black serial on rudder

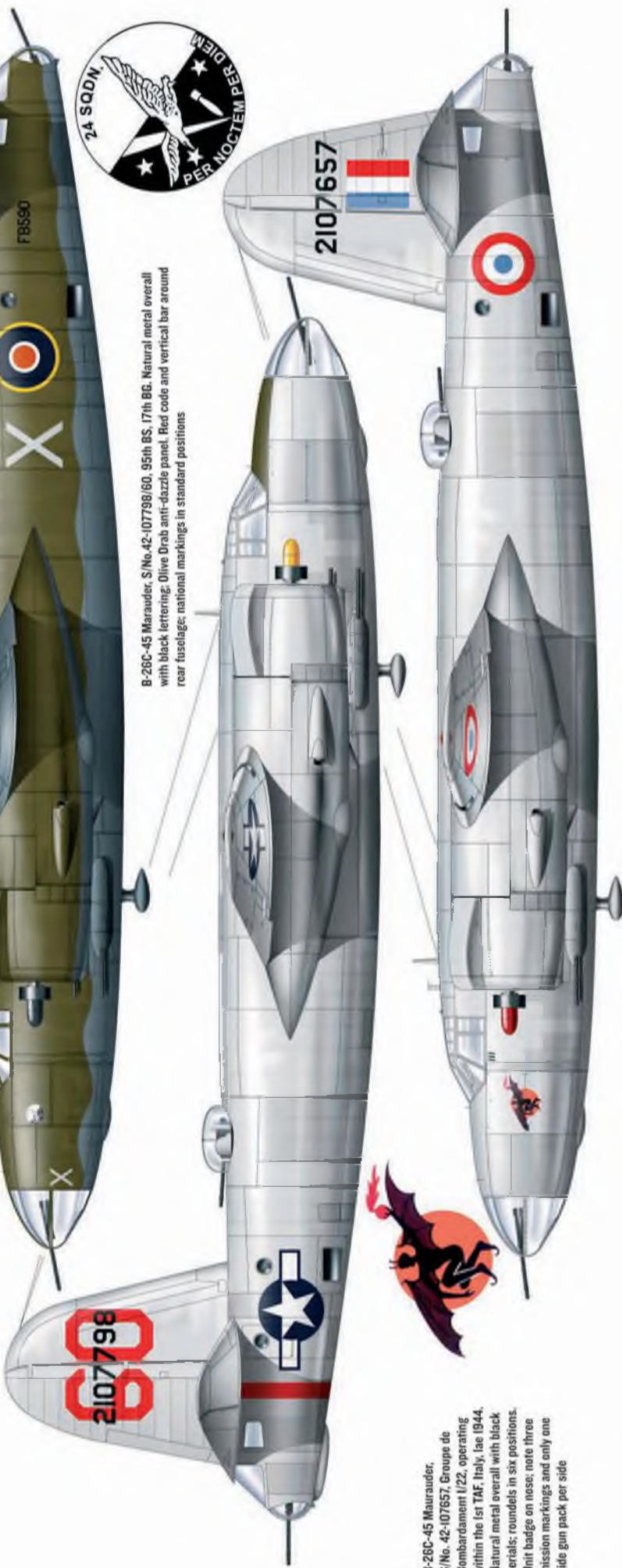
B-26B-50 Marauder, S/No.42-95996/41, 438th BS, 319th BG, 12th Air Force, Italy 1944. Olive Drab upper surfaces with Medium Green mottling to leading and trailing edges of wings; Natural Grey undersides. Serials in yellow, codes and name on nose in white; white vertical bar around tail. Yellow spinners



Below: Marauder Mk II, FB590/X, No.24 Squadron, South African Air Force, Italy, 1943. Olive Drab/Neutral Grey finish with codes in light grey and serial in black; 'B' type roundels above wings (RAF style markings with orange centre in place of Ident Red). Unit badge on nose



B-26C-45 Marauder, S/No.42-10798/60, 95th BS, 17th BG, Natural metal overall with black lettering; Olive Drab anti-dazzle panel. Red code and vertical bar around rear fuselage; national markings in standard positions



B-26C-45 Maurauder, S/No. 42-107657, Groupe de Bombardement 1/22, operating within the 1st TAF, Italy, Iae 1944. Natural metal overall with black serials; roundels in six positions. Unit badge on nose; note three mission markings and only one side gun pack per side



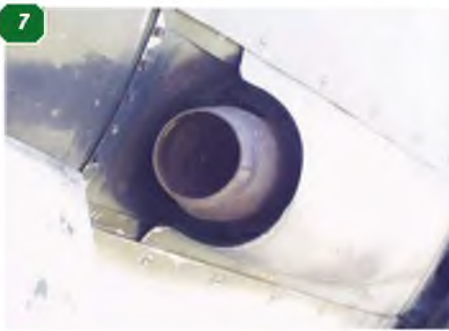
Martin B-26 Marauder

This, one of the few remaining examples, is held at the Fantasy of Flight Museum, Polk City, Florida.

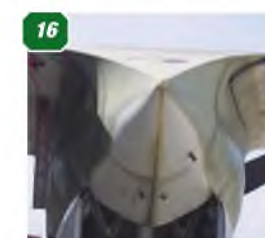


1 & 2: Engines Nacelles viewed from lower rear. **3:** Another view of the engine nacelle viewed from front, showing main undercarriage door. **4:** The complete right hand engine nacelle. The engine is tightly cowled. **5:** The same nacelle viewed from the rear.





6: Exhaust outlet, lower side of engine cowl. **7:** Exhaust stub positioned between the cowl rear and the main undercarriage door. **8:** Adjustable exhaust outlet just in front of the main undercarriage bay. **9:** Engine cowl front ring. Note air scoops top and bottom. **10, 11 & 12:** Inside the main undercarriage bay, showing the door hinges. **13:** Exhaust gills, viewed from front. **14:** Propeller spinner and prop. blade cuffs. **15 & 16:** Rear fairing of the engine nacelles. **17:** Air scoop in front ring of engine cowl.





18: Front firewall of the left engine nacelle and main undercarriage door. Note the fixed stay that links the lower hinged undercarriage door to the firewall. **19:** Close-up of stay attachment. **20, 21 & 22:** Lower hinge line of the two-part main undercarriage door. **23:** Upper hinge line of the main undercarriage door. **24:** Rudder hinge line. **25 & 26:** Detail of the rear gun turret. **27:** Fin and rudder hinge line.



26



29



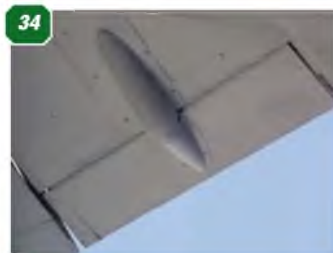
30



33



34



35



36



31



32



28 & 29: Two views of the mid-upper gun turret.
 30, 31 & 32: The clear plexiglass nose turret/bomb almer position.
 33: Elevator hinge detail.
 34: Elevator trim tab and fairing.
 35: Tailplane-to-fuselage joint.
 36: Tailplane/elevator hinge line
 37, 38 & 39: Three views of the main cockpit, also showing the radio aerial mast.

37

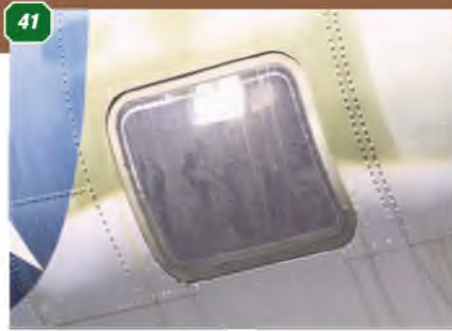


38



39



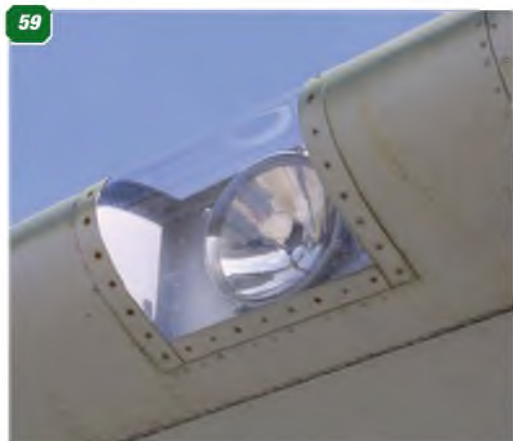


40: Blister fairing, bottom of fuselage behind nose undercarriage position. **41:** Window, lower rear fuselage left side. **42:** Tail bumper on fuselage underside below fin/rudder position. **43:** Window in fuselage rear lower right side. **44 & 45:** Two masts supporting radio aerial, lower rear fuselage. **46:** Ventral hatch in fuselage rear underside. **47:** Top of undercarriage noseleg. **48:** Inside the nosewheel bay, showing the hinged undercarriage door. **49-51:** Three views of the undercarriage noseleg and wheel.

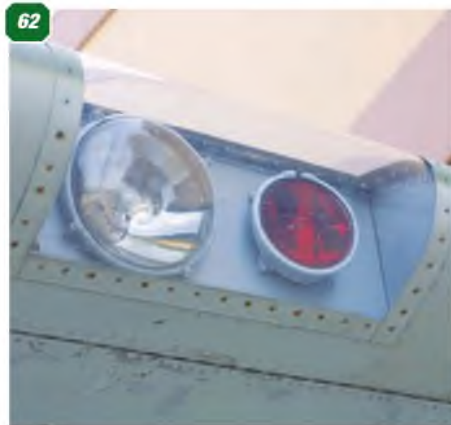




52-55: Main undercarriage leg and wheel. **56:** Hinge line of the aileron. **57:** Close-up of an aileron hinge. **58:** Navigation light and hatch. **59:** Landing light in right wing leading edge. **60:** Wing-to-engine nacelle fairing fillet.



61: Window, right fuselage side, just ahead of the wing leading edge. Note the two spoiler strips on wing leading edge. **62:** Landing light, left wing leading edge. **63:** Pitot head, left wing tip leading edge. **64:** Navigation light wing underside. **65:** Wing-to-fuselage fairing fillet. **66:** Pitot head on right wing tip leading edge.





THE FLYING FLEA

PART 2: Richard Crossley complete the two-part construction feature for his 1/12th scale 19" (483mm) wingspan replica of the 1930s 'Flying Flea' for electric or Co2 power free flight, with full size plans

If you made a start on my Flea in the last edition of *Flying Scale Models*, then hopefully you will have been waiting for this final part with enthusiasm! There is plenty to get through here, including those curved wings, which are easier than you might expect. Ok, lets get cracking...

First, remove the balsa undercarriage platform that you would already have temporarily glued in place. Bend the wire

axle to shape, then bind and glue to the undercarriage platform as shown on the plan and thereafter, glue this assembly back in place to the underside of the fuselage. Note that the wire should be able to travel up the slots in the fuselage sides to cope with landing loads.

Engine struts

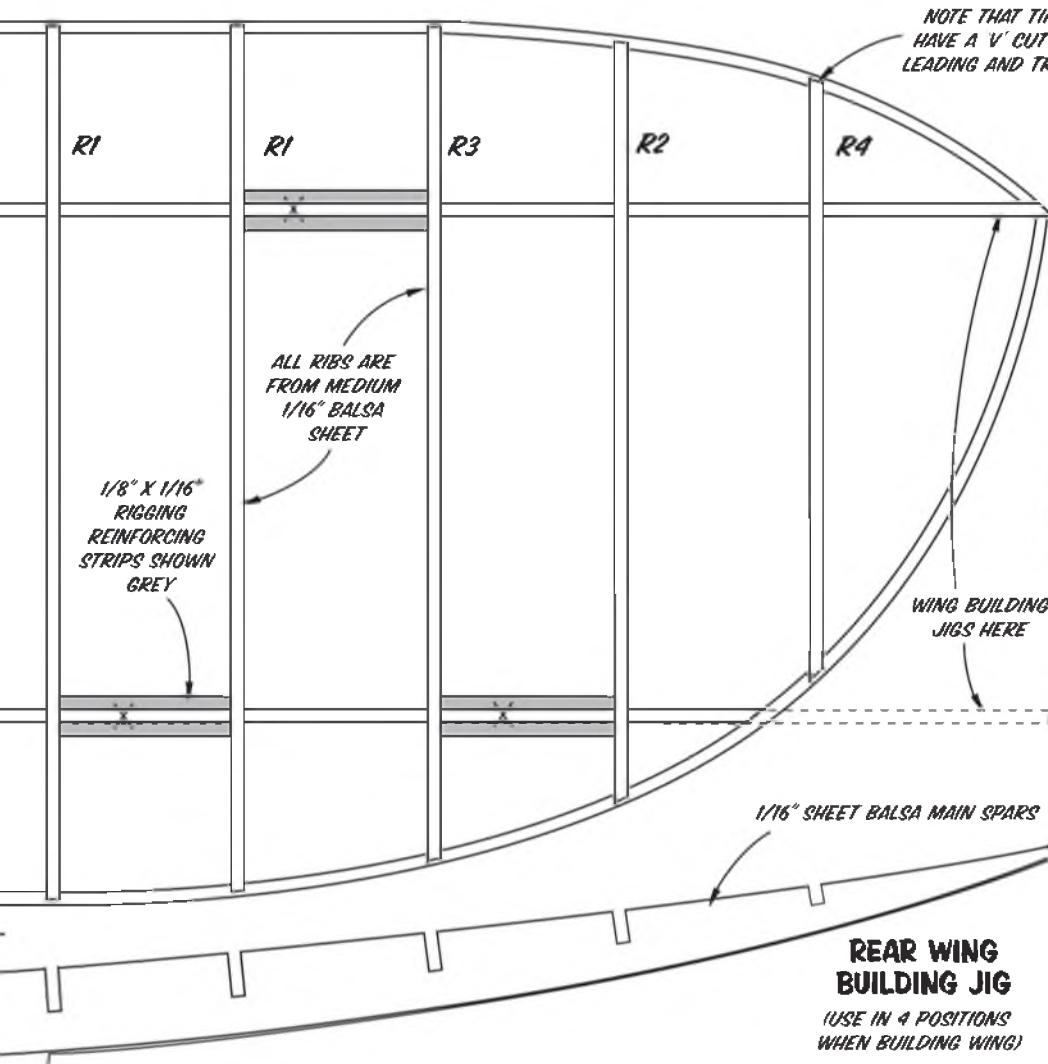
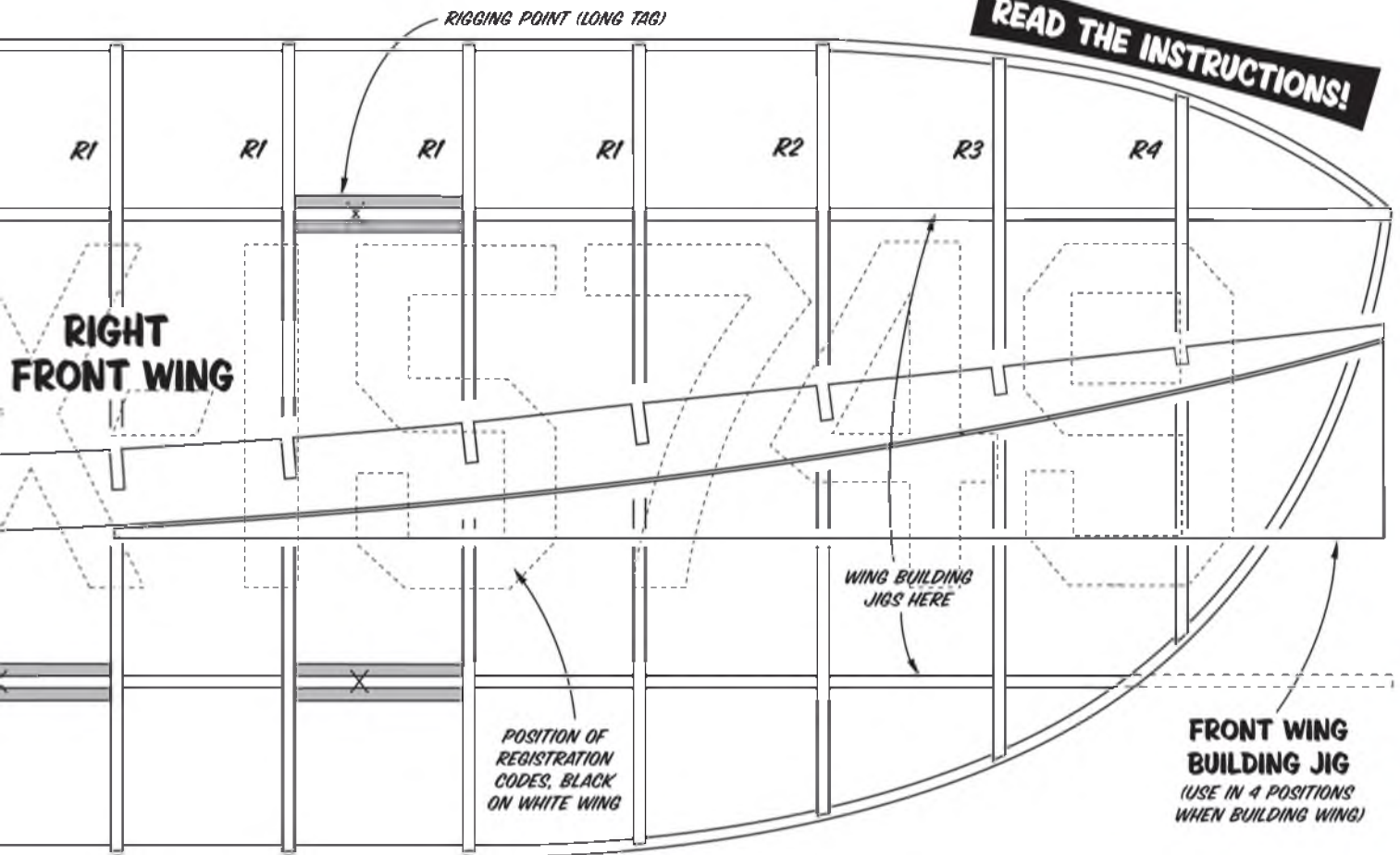
All of the engine struts are made up out of 1/16" dia. bamboo strip. I could not

find the correct thickness of bamboo, so I thinned down some 3/32" skewers that I had, but if you can find the right diameter it will save you some effort, as the wing outlines use the same diameter too.

Make up the basic engine support over the plan (sheet 3) using bamboo dowel and the 1/32" ply disc using epoxy on all joints. When dry, glue in place on the upper deck, ensuring it sits at the right angle of downthrust as shown on the



READ THE INSTRUCTIONS!



NOTE THAT TIPS OF RIBS HAVE A 'V' CUT TO RECEIVE LEADING AND TRAILING EDGES

WING BUILDING JIGS ARE PINNED TO THE BUILDING BOARD DIRECTLY UNDER THE FRONT AND REAR SPAR POSITIONS

WING OUTLINES ARE THINNED BAMBOO SKEWERS, HEATED WITH SOLDERING IRON TO OBTAIN CORRECT CURVES

OF 3
SHEET **2**

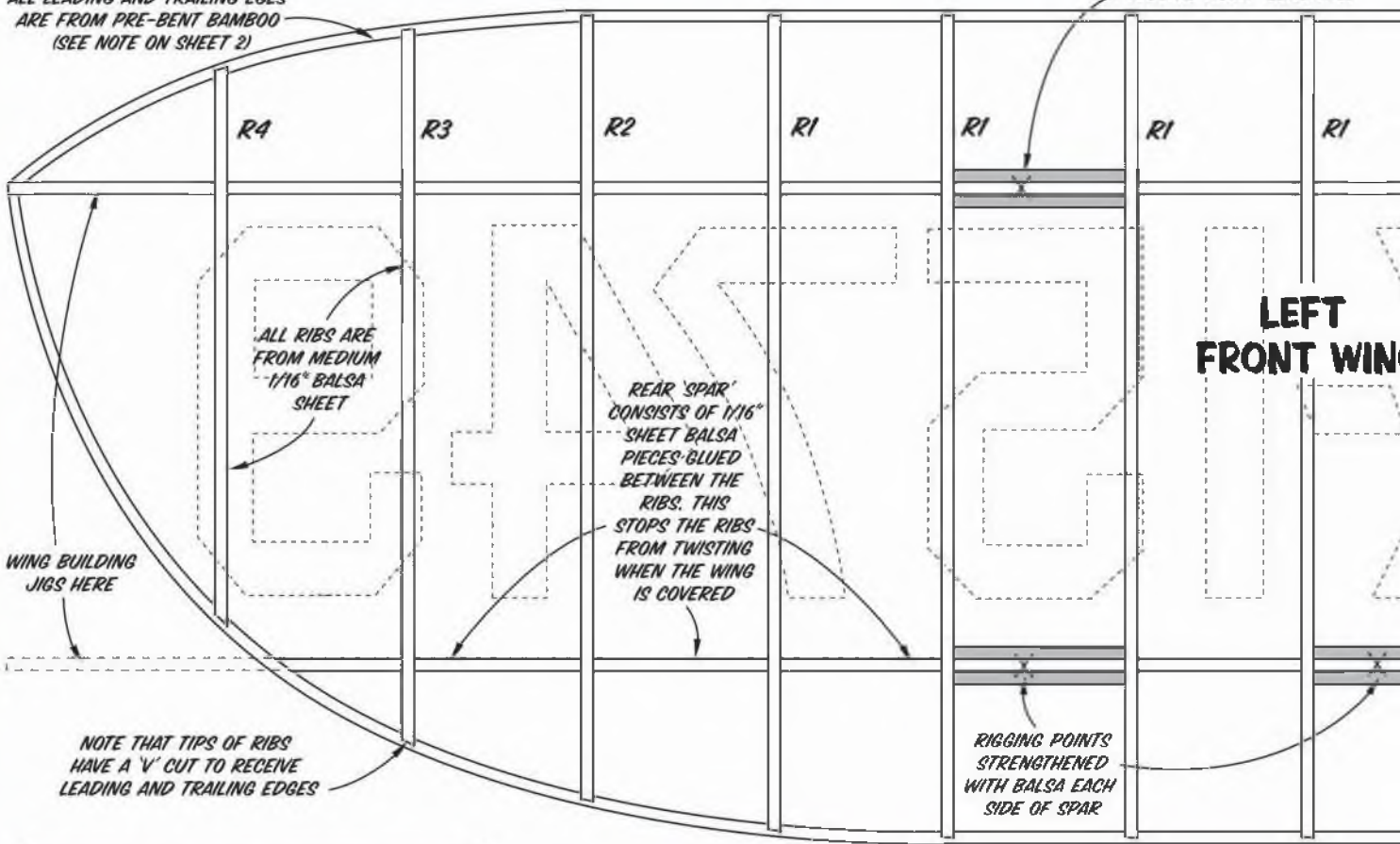
1/12 SCALE
MIGNET POU-DU-CIEL

THE FLYING FLEA

DESIGNED & DRAWN BY
Richard Crossley

ALL LEADING AND TRAILING EDGES ARE FROM PRE-BENT BAMBOO (SEE NOTE ON SHEET 2)

RIGGING POINT (LONG TAG)



ALL RIBS ARE FROM MEDIUM 1/16" Balsa SHEET

REAR 'SPAR' CONSISTS OF 1/16" SHEET Balsa PIECES-GLUED BETWEEN THE RIBS. THIS STOPS THE RIBS FROM TWISTING WHEN THE WING IS COVERED

LEFT FRONT WING

WING BUILDING JIGS HERE

NOTE THAT TIPS OF RIBS HAVE A 'V' CUT TO RECEIVE LEADING AND TRAILING EDGES

RIGGING POINTS STRENGTHENED WITH Balsa EACH SIDE OF SPAR

RIGGING AND FLYING ANGLES

ATOMIC WORKSHOP Voodoo 25 MOTOR SCREWS INTO LOWER HALF OF Balsa BLOCK CRANKCASE. HOLLOW TOP HALF AND TACK IN PLACE

BALANCE HERE (MODEL BALANCES AT 25% TOTAL WING CHORD (BOTH WINGS!))

FRONT WING REQUIRES 1.5-2 DEGREES POSITIVE

WING IS FREE TO PIVOT AT TOP OF TRIPOD (AS PER FULL SIZE) REAR WIRE STAY SECURES WING

SET CORRECT FRONT WING INCIDENCE USING THIS WIRE STAY

DATUM LINE

ENGINE REQUIRES ABOUT 2.5 DEGREES DOWNTHRUST

ACETATE WINDSCREEN

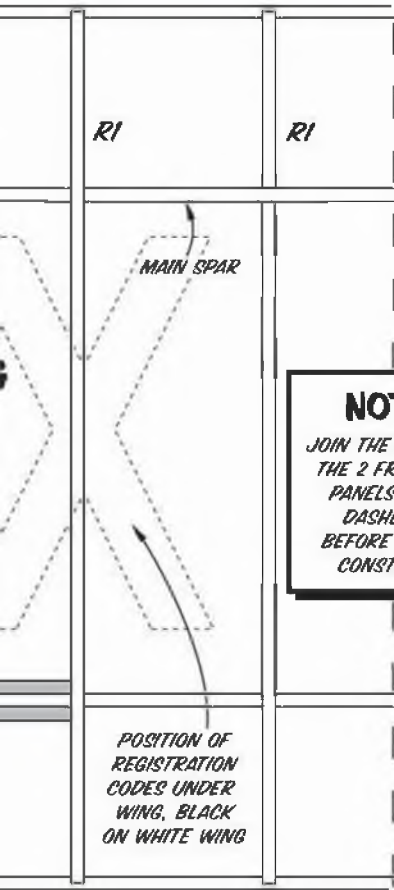
ZOMBIE FLIGHT PROFILER WITH ACCESS HATCH BELOW

FILL AREA IN FRONT OF LIPO CELL WITH PLASTICINE AND LEAD

ATOMIC WORKSHOP 130 MAH ULTRA HI DISCHARGE LIPO CELL (200 MAH FOR RADIO CONTROL)

WING ANGLE LEVER (BOTH SIDES) THIS WAS USED ON THE FULL SIZE AIRCRAFT TO PULL THE REAR OF THE WING DOWN. BUNGEE STRAPS ON THE LEADING EDGE PULLED AGAINST THIS ACTION TO PROVIDE PITCH CONTROL. MAKE FROM ALLOY TUBE (SEE PHOTOS FOR CORRECT SHAPE)

RIGGING USE T PAIR

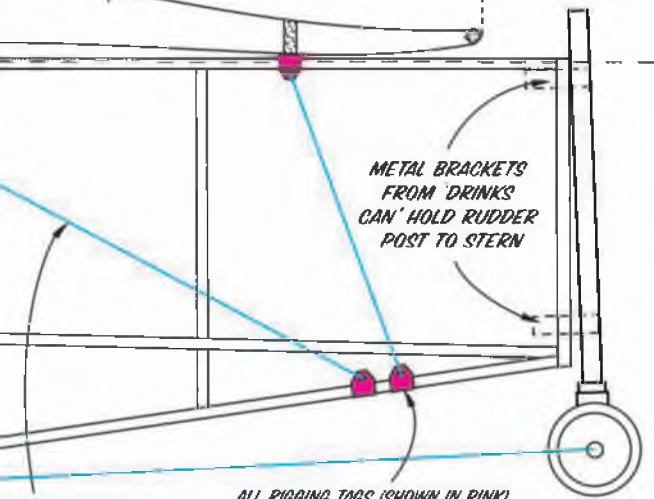


NOTE...
 JOIN THE PLANS FOR THE 2 FRONT WING PANELS ON THIS DASHED LINE BEFORE STARTING CONSTRUCTION

INCIDENCE

IMPORTANT
 THE 4 CRITICAL POINTS FOR A STABLE FLYING MODEL ARE SHOWN IN YELLOW BOXES

REAR WING SITS ON THE DATUM (ZERO DEGREES INCIDENCE)

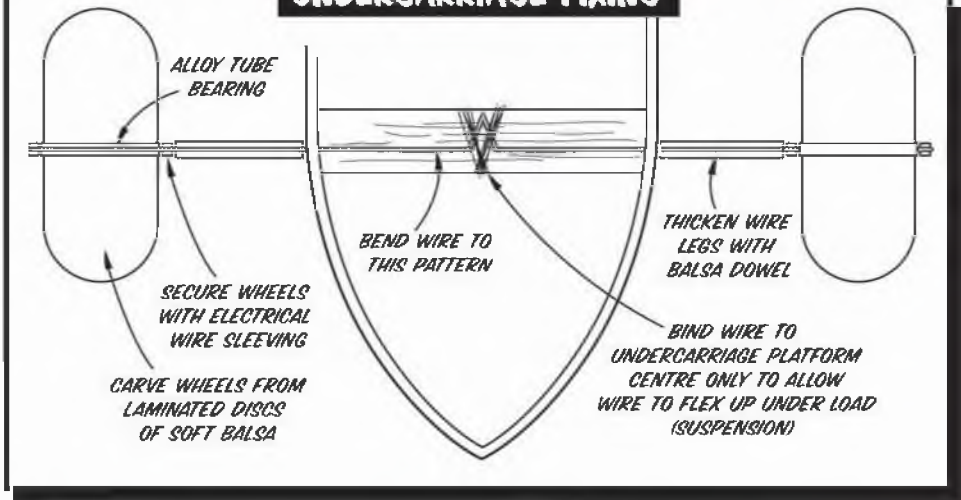


3 SHOWN IN BLUE. IS NON-FUNCTIONAL. IN LYDRA THREAD. ED SILVER/GREY

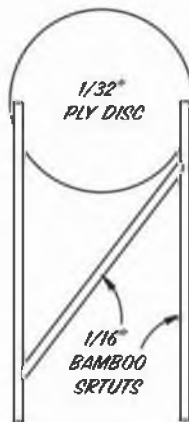
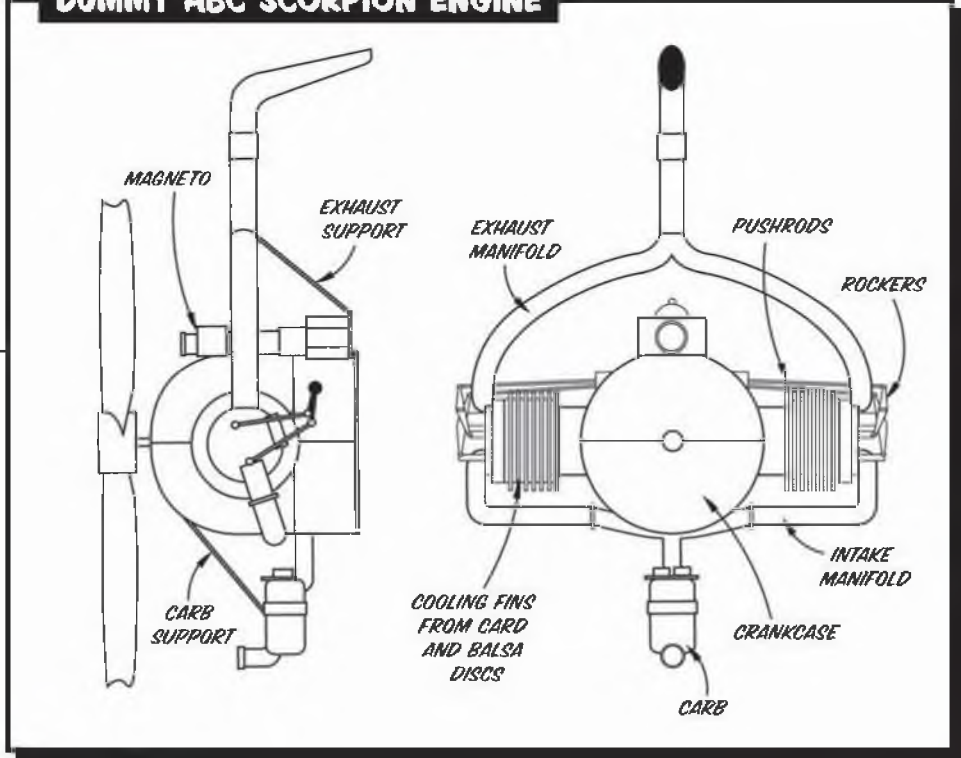
ALL RIGGING TAGS (SHOWN IN PINK) ARE FROM THIN METAL SHEET (LITHO PLATE OR DRINKS CAN). NOTE ALSO THE RIGGING POINTS SHOWN ON THE WING PLANS.

- FUSELAGE TAGS 12 REQ.
- WING TAGS (LONG) 2 REQ.
- WING TAGS 10 REQ.

UNDERCARRIAGE FIXING



DUMMY ABC SCORPION ENGINE



MAIN ENGINE SUPPORT

BUILD OVER THIS PLAN. ASSEMBLE TO TOP OF NOSE IN HOLES SHOWN IN N1/N2. NOTE THE 2 EXTRA STEADYING STRUTS THAT ARE REQUIRED EACH SIDE TO COMPLETE THE SUPPORT (SEE SIDE VIEW) USE EPOXY GLUE ON ALL BAMBOO JOINTS.

OF 3
SHEET 3

1/12 SCALE
MIGNET POU-DU-CIEL

THE FLYING FLEA

DESIGNED & DRAWN BY

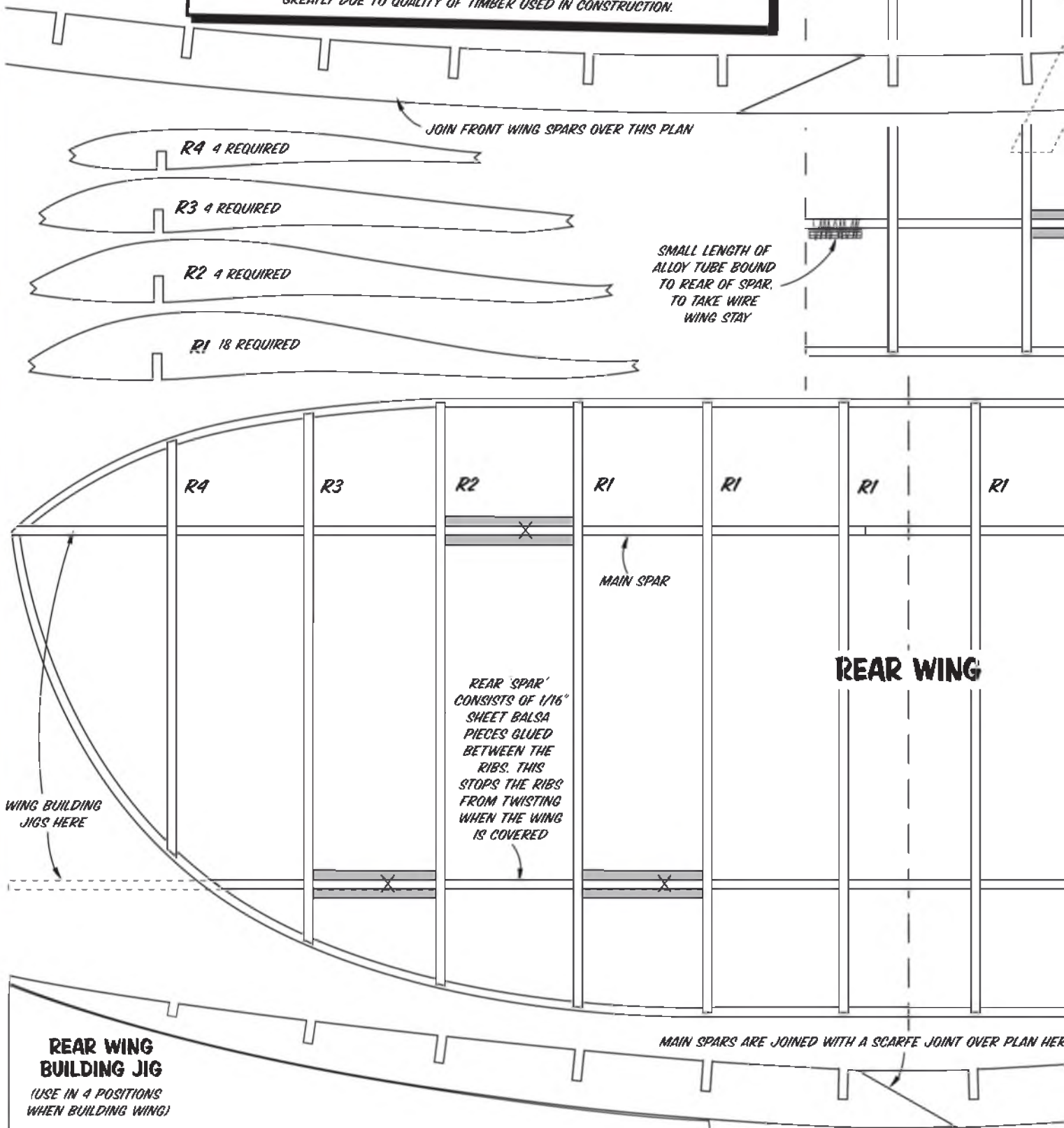
Richard Crossley

THOSE CURVED LEADING AND TRAILING EDGES!

THE FLEA IS UNUSUAL IN THAT THE OUTLINES OF THE WINGS CURVE UPWARDS AS WELL AS CURVING IN PLAN VIEW. THE OUTLINES ON THIS DESIGN ARE MADE FROM BAMBOO. BAMBOO CAN BE EASILY BENT BY CAREFULLY APPLYING HEAT USING THE SHAFT OF A SOLDERING IRON. I USED BAMBOO SKEWERS STRIPPED DOWN TO ABOUT 1/16" DIA. I BENT THEM IN PLAN VIEW FIRST, THEN IN FRONT VIEW. PRACTISE USING SOME TEST PIECES FIRST - ITS EASIER THAN IT SOUNDS!

THE CROSLLEY FLEA

THIS FLEA WAS BUILT IN 1935 AT THE HEIGHT OF THE 'FLEA CRAZE'. IT WAS BUILT FOR PROMINENT CINCINNATI BUSINESSMAN POWEL CROSLLEY JR. BY HIS CORPORATE PILOT, ED NIRMAYER AND 2 MECHANICS IN JUST 30 DAYS. IT IS CURRENTLY ON DISPLAY IN THE SMITHSONIAN AIR AND SPACE MUSEUM, USA. THE DIHEDRAL ON THE CROSLLEY FLEA DIFFERS SLIGHTLY FROM 'NORMAL' FLEAS IN THAT IT HAS TAKEN ON A SMOOTH CURVE FROM TIP TO TIP. THE DIHEDRAL WAS APPLIED BY PULLING ON A CHORD ATTACHED TO THE WINGTIP, THEN THE TOP SPAR WAS BONDED IN PLACE. THE RESULTS VARIED GREATLY DUE TO QUALITY OF TIMBER USED IN CONSTRUCTION.



JOIN FRONT WING SPARS OVER THIS PLAN

R4 4 REQUIRED

R3 4 REQUIRED

R2 4 REQUIRED

R1 18 REQUIRED

SMALL LENGTH OF ALLOY TUBE BOUND TO REAR OF SPAR TO TAKE WIRE WING STAY

R4

R3

R2

R1

R1

R1

R1

MAIN SPAR

REAR WING

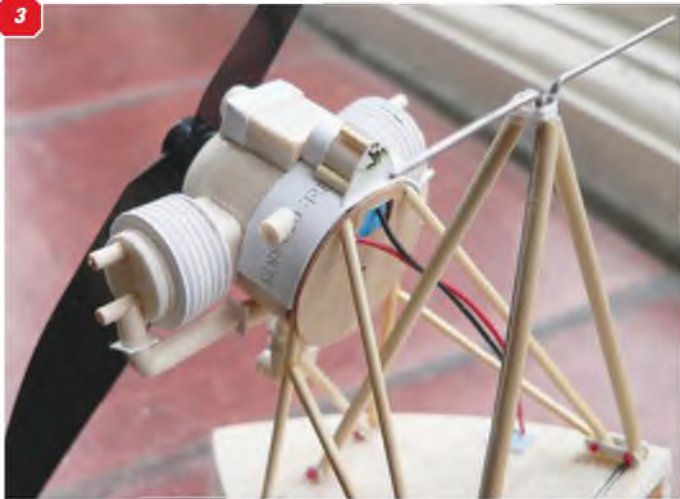
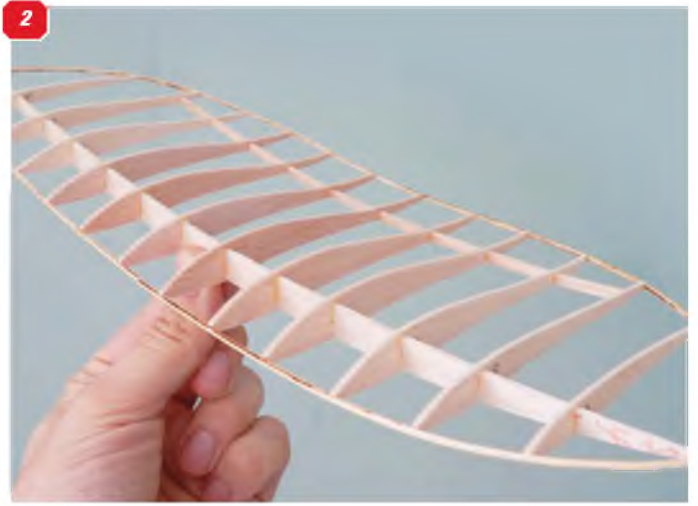
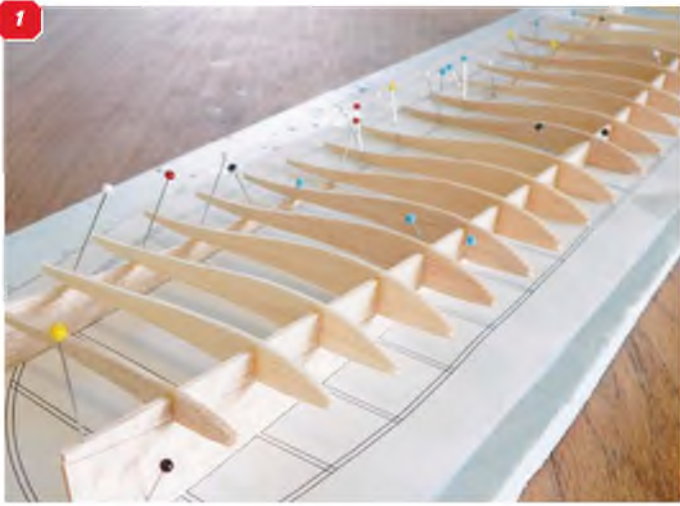
WING BUILDING JIGS HERE

REAR SPAR CONSISTS OF 1/16" SHEET Balsa PIECES GLUED BETWEEN THE RIBS. THIS STOPS THE RIBS FROM TWISTING WHEN THE WING IS COVERED

MAIN SPARS ARE JOINED WITH A SCARFE JOINT OVER PLAN HERE

REAR WING BUILDING JIG

(USE IN 4 POSITIONS WHEN BUILDING WING)



1: Using the curved supports and matching full-depth spars makes the usually complex, curved wing easy to build. Above is the front wing under construction. Note the wing jigs in place on the building board. The main spar is sitting over the front jig and the ribs are pinned to the rear jig. Next stage will be fitting the short rear spar sections between the ribs. Modellers wishing to build other flying flea's (Old Warden aerodrome have a nice one) can easily re-trace the main spars to give a flatter centre section to the wings. **2:** Here is the almost complete rear wing. Note the burn marks on the bamboo leading and trailing edges caused by the soldering iron. The bamboo should be glued to the ribs with cyano for best results. **3:** The dummy engine taking shape. Cooling fins are from card laminated with 1/32 balsa discs in between. I think that's a Magneto sitting on top of the Crankcase? The Voodoo 25 electric engine only just fits in - the blue that you can see through the back of the dummy engine is the electric motor. Note the engine wires exiting the rear of the ply disc and passing through the top of the fuselage. - its a tight fit! **4:** The finished engine looks nice after the application of some paint. To simulate oil and grime I used artists oils paints, smeared and rubbed on to a base of Humbrol enamels.

plan. Finally glue in place the remaining four struts that run back towards the base of the wing support.

Let's leave the fiddly bits for a while and get back into some proper building with the wings.

Wings

I will cover the building sequence of the smaller rear wing; the front wing is built in a similar way.

The wing is built up over the plan using the wing building jigs to obtain the correct curved dihedral.

Firstly, join the two rear spar pieces together over the plan. Next, pin in position on the building board directly over the plan the four rear building jigs, ensuring that these are upright. Pin the assembled main spar in position over the jigs.

Next, glue all of the ribs into position into the slots on the main spar, checking that these are pushed home and that the lower edge is flush with the bottom of the spar. You will need to pin the rear of the ribs to the rear jigs to hold them down. The rear spar is really a 'false spar' and is made up of short lengths of 1/16" x 1/8" balsa cut-to-fit and glued between the ribs. Again, make sure these pieces are flush with the lower edges of the ribs as they should not be visible on

top of the wing once covered with tissue.

Then, pre-bend the bamboo leading and trailing edges. For the rear wing, you should find bamboo long enough to do the leading edge and the trailing edge in one piece (for the larger front wing I had to join the pieces in the centre).

Start with the leading edge (LE), it's easier as it has less curvature. Your bamboo should be slightly over-length; trim to fit after it is bent. Whilst holding the bamboo in a slight curve where needed, stroke the inside of the curve with the shaft of a soldering iron (not the tip) You will find that as heat is applied, the bamboo will take on a curve. Eye-up the bamboo over the plan and then re-apply heat until it matches the curve of the LE in the plan view. When you are happy, curve the LE up slightly too to match the front view of the spar shown on Sheet 2. As long as the LE is fairly close to the shape required, it does not need to be exact as the 'V' cuts in the ribs will centre the bamboo. Glue the LE in place - I used cyano for this - if you damp the LE slightly, it will bond quickly.

Repeat for the trailing edge and when set, remove the wing from the plan.

The front wing is built in exactly the same way (note that you will have to cut and join the plan on the dashed lines)

Sand both wings smooth. Now add the

1/8" x 1/16" balsa reinforcing strips either side of the front and rear spars in 12 places. These will take the rigging tags later and should be flush with the lower edge of the wing. Finally, bind and glue in place the small length of alloy tube to the rear spar that takes the wire wing stay.

Assembly

You probably need to decide what colour scheme you are choosing now, as it is time to paint the fuselage. There are many Fleas in museums around the world, so the choice is yours - I will cover how to paint up and detail the Crosley Flea.

Once everything is doped and smooth, spray the sides of the fuselage gloss white. When dry, mask off the long 'teardrop' shape down the fuselage sides with masking tape. Now spray the entire fuselage and rudder blood red. When the tape is removed, you should have a nice white flash. I printed my own decals for my Flea, which took all the hard work out of the lettering. As long as you have a gloss finish, waterslide decals will take really well to the surface. Laser printers print perfectly onto clear decal sheet, and A4 or 'letter' size sheets of clear decals material should be available online. If you would like an A4 size digital print-ready pdf file featuring all of the

5



markings for the 'Crosley Flea', then email me direct at richardcrossley@btconnect.com and I will email you a pdf file. If you have used decals, now is the time to add the fuselage and fin text.

Before you cover the front wing, it needs to be fixed to the wing tripod: Slip the two short lengths of alloy tube over the wire extensions and bind to the rear lower face of the main spar. Making sure that the wing is level when viewed from the front and top - bend the wire slightly if required. I sheeted-in the centre bay of the wing with balsa, flush with the upper edge only. This represents the fuel

tank on the real aircraft. Cover, shrink and dope both wings. Spray both wings white (you will have to mask off the fuselage when spraying the front wing). Note the large black registration number that should now be applied to the Crosley Flea.

There are twelve rigging points under the wings. These are straight pieces of thin metal (drinks can or litho plate), shaped and pre-drilled. Slit into the rigging points with a blade at the correct angle, and slide the rigging tags in place, using cyano to fix.

Bend the wire stay that holds the correct incidence (see plan), and push into the alloy tubes in the wing and fuselage. Apply the

wing codes to the top right and lower left of the front wing. Fix the rear wing in place on top of the fuselage with thin strips of double-sided tape, applied under the spars. There are numerous small details not shown on the plan, these should be added now if desired. Take a look at the photos supplied for further reference.

Dummy engine and details

The dummy engine shown on the plan is a simplified version of the ABC Scorpion. Start by making the basic crankcase out of medium or heavy block balsa. It is then cut in half and the Voodoo 25 motor can be screwed directly into the lower half. The top half should be hollowed out to allow clearance for the top of the motor. Add all the other engine details noted, the cylinders are stuck to the top removable section only. Paint the motor as shown in the photographs and stick in place to the ply disc at the top of the engine mount. Make up the wheels from balsa laminations or foam (Trexlar wheels would look super, but these are heavy for a model this size) and secure with plastic insulation striped from thin electric wire. There are other details to be added if you wish; they varied from Flea to Flea as did the engine type and mounting arrangement. The Crosley flea featured tubular rods to actuate the tilting wing mechanism, see my photos for details.

Wire up the engine and test run the system. The model should be rigged with thin lycra thread (available from SAMS models - www.samsmodels.com) after it has been flight tested.

5: A pilot really does make a difference in the model as he is so big. I carefully carved my dummy pilot from white foam. You can use the pilot on the plan as a starting point. If you really can't face carving your own pilot, then you might be able to find a commercial one, but it must be very light. At a push you could colour up the one on the plan and have a profile pilot. 6: Basic structure is very pretty, and although true scale, it's a fairly simple one to build. Most full size 'Flea' projects did not progress much further than this stage, and could be found gathering dust in barns all over the country!

6





8: Detail can be added like these brackets and nuts at the base of the struts. I used card for the brackets, and insulation stripped from electrical wire for the nuts. The oil and grime is done using pencil lead and oil paints. **9:** There is a bit more detail on the right side. The longer black bar is a pushrod that connects the wing lever to the end of the control stick via another crank. Note the rigging tags and lycra thread - available from SAMS models, and yet to be painted silver/grey in this photo. I used Humbrol gloss enamel paints to airbrush my model.

The flea would make an outstanding 'Radio' model too if that's your thing. A pushrod could be used to operate the scale wing mechanism. Keep all the gear in the nose to maintain balance though.

Flying the Flea

I have to say that I nearly gave up on trimming my Flea. I guessed at all of the flying angles, thrustlines and the balance point, but eventually, and very slowly, after what seemed like hundreds of test glides, I finally hit on the magic formula!

First thing to check is that the model balances at the point shown on the plan. When this is correct, ensure that the front wing angle is as noted on the plan too. To check this, try attaching a straight piece of balsa strip to the lower side of the rear wing with bands, so that the strip runs forward underneath the front wing. You can then take measurements from the wood up the leading and trailing edge of the front wing.

When all is OK, try a few test glides. Gently launch into any breeze, preferably over something soft. If the model stalls, try adding a little Plasticine to the nose. If this does not work, you can bend up another wire stay for the rear wing that is 'slightly' longer. This will reduce the incidence, and help keep the nose down.

If the model dives from the hand launch, then you probably need more incidence - try a slightly shorter wire wing stay. I ended up with quite a collection of these wire stays, by the time my model was trimmed.

When you are ready, try a powered flight. If using a Voodoo 25 motor, start off with about 75% power for just five seconds. The model should drone along quite happily. You will need full power for a decent flight.

Any stalling under power can be corrected by adding a little downthrust to the motor.

Once trimmed, you can complete all the little details like rigging, pilot etc. My Flea has made many flights over the last few years when it has competed indoors at the UK Nationals and also abroad in the Netherlands. It always puts on a good show and is a real crowd-pleaser.

Good luck with your little Pou! ■

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FLYING FLEA

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Martin MO

PART 2

The concluding part of the construction guide for the Martin MO-1 designed by Peter Rake and built and described by Tim New.

With the wings and tail surfaces built (as detailed last month) it must be time to look at something to attach them to. Therefore, let's hand over to Tim to describe how he built the fuselage, finished the model and, most important of all, how the model flies. Over to you Tim ...

Fuselage

The fuselage is comprised of two sections; the front 'box' section and the rear stick section. The sections are built separately, then joined. Each side of the front section is made of two balsa pieces glued

together. Then epoxy the doublers D1 and D2 on the insides of the fuselage assemblies.

Since the forward fuselage is pinched in to form the nose, score the inside of the assemblies in front of F2. (Preferably

before there are any actual formers glued to the sides, to aid getting it done accurately. I have seen people attempt it after the formers are glued in place, only to discover a layer of glue precisely where they want to score. *(Personally I like to cut*



Covered with SIG Coverall and spray painted the Martin only needs minimal detail to become a very attractive model and Tim's is certainly that.

0-1

a shallow line precisely on the score line, which is where the front face of the former will go. Be very careful not to cut all the way through the balsa side. Then I make another shallow cut at 45 degrees to the first, so a small triangular wedge is removed. When it comes time to pull in the nose, fill this groove with glue to reinforce the angle. PR)

One side is laid flat and formers F2 and F4 and the battery tray (BT) are glued on using 90 degree angles to ensure everything is straight and true. M, MR, ML and MT form the motor mount box, which has the side and down thrust designed in. So simple! (As long as you glue them together the right way round. The last thing you want is up thrust and left side thrust. PR).

The motor mount box is attached to F2. At this point I attached the forward and aft brass bolt straps to the ply wing mounts (WM). Because the brass straps attached to WM extend past the fuselage sides, the assembly needs to be raised when the wing mounts are epoxied to the inner fuselage side. While raised, the other side is glued on top and the assembly is rotated top side up and squares are again used to make certain that everything lines up. Flip the box over and glue in the under carriage (UCs) ply pieces. The typical P. Rake forward fuselage box is complete.

The aft section is made up of two sides formed from 3/16" square bass longerons and 3/16" square balsa crosspieces, built over the plan. I glued the aft sides to the front box section. After carefully aligning it all up, the tail tips are joined together with the ply tailskid mount.

The aft end of the MO-1 pinches in abruptly so each longeron needs to have a 'V'-cut in it just past the last crosspiece. I used the ply tailskid piece (TS) as a guide to ensure everything lined up correctly. The cross braces are then glued in. You can also complete the rear half before joining it to the front section. Prior to moving back onto the front, I glued in plastic tubing where the pushrods exit the fuselage. (Whether or not you fit tubes



The obligatory naked model shot reveals just how straightforward a build this is. Absolutely nothing other than basic modelling.

here is a matter of personal taste. The openings themselves are adequate, but fitting the tubes will reinforce the balsa if it is in the least on the soft side. Be careful though; a little weight this far back can take a lot of weight at the front to balance it out. PR)

After temporarily installing my motor to ensure everything fits, I squeezed in the formers and aligned them over the plans. The sides should crack nicely along the previously scored lines. F1 keeps the sides in place. Glue in F3 and the 1/16" balsa sheeting that covers the top and the forward fuselage is basically done. I tack glued the motor cowl block to F1 and sanded it to shape using patterns as reference guides. I use masking tape to protect what I don't want sanded.

The top of the middle section of the fuselage is the battery hatch. H1, H2 and two H3s comprise the balsa frame that is topped with 1/8" in balsa sheeting. For added strength I did have to add an extra crosspiece where the curved and straight sheets join. Later I cut out the cockpit area and installed a 'floor' for the pilot to sit on. The battery hatch is held in place by magnets. Because it slides down into the fuselage, the hatch isn't going anywhere.

Landing gear

The undercarriage legs on the MO-1 are quite simple. Two 10 swg wire sections are bent as per the plans and then soldered together at the axle ends. A 'V'-shaped piece of 16 swg wire is soldered between the front strut and axle. As I said it is very

straightforward, and taking the extra time to build a jig makes this step even easier.

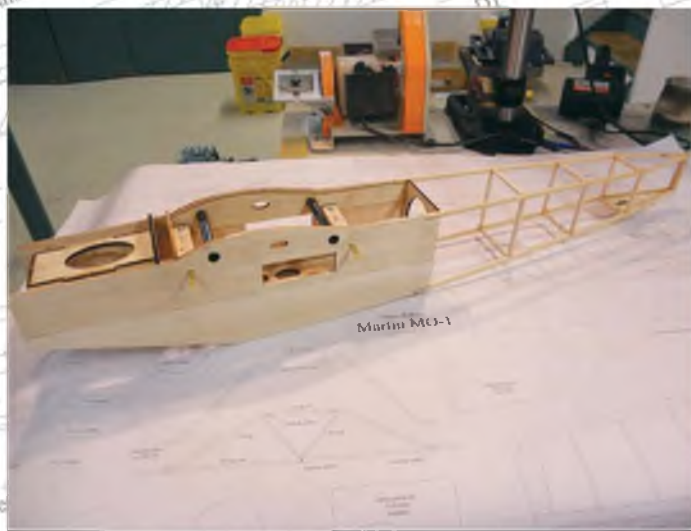
Because I wanted a sprung axle, I soldered an additional bit of wire that connects the low-end of the undercarriage legs and forms a 'hard loop' that keeps the axle connected to the undercarriage in case the elastic cord breaks. The elastic cord secures the axle to the soldered ends and the wheels spin freely on the axle. Or the axle can be soldered to the legs as shown on the plan.

After soldering the leg ends together, I epoxied grooved ply fairings to the wire legs and then wrapped the legs in fibreglass cloth and smeared thin epoxy all over. Metal straps attach the legs to the fuselage. The 3.5 in. wheels are typical (there's that word again) P. Rake balsa and ply sandwiches with brass sleeves and sponge rubber cord tires.

Covering and finishig

After a final sanding and wipe down I was ready to start covering. Since the full size was covered with fabric I wanted my model to follow suit. I think the look of fabric, when appropriate, can't be beaten. My favourite fabric covering is SIG Koverall. I find that it paints well and compound curves are quite painless. Koverall does shrink aggressively, so you need to keep your iron temp as low as possible while still getting a good bond. I set my iron temp to 200 degrees F for sticking and 250 degrees F for shrinking.

Because there is no adhesive on Koverall, overlaps and seams must have additional adhesive applied. For adhesion



Front and rear fuselage assemblies joined before the messy part begins.



Decking in place and templates used to assist with shaping the nose block. It's definitely starting to look like a Martin MO-1.

I have previously used Balsarite, but it is expensive and not readily available. I was on the lookout for an alternative and after testing several glues I found a winner. Mod Podge works as well as Balsarite at a fraction of the cost and is available in most craft stores. I use a sponge brush to apply the Mod Podge to the bare bones airframe. Once the model is covered, three light coats of a water-based polycrylic seals the weave.

Light sanding with fine sandpaper will clean up any fuzziness and you're ready to paint. On the MO-1 I used inexpensive spray can paint. I've had good results using acrylic paints and an airbrush too. The wing stars were painted on with the same spray paint while the lettering is a combination of printed tissue and water-slide decals.

While there are plenty of opportunities to really 'scale' up the MO-1, I decided to keep it simple because I plan on flying it as often as possible and want to limit the amount of stuff that can fall off. I knew though that I had to have engine exhaust

pipes, a windscreen and a .30 cal machine gun. The exhaust pipes are made from a plastic hose. It was sectioned into 24 equal lengths and the pieces were heated to shape. The pieces were then glued together with epoxy and attached to a faux balsa engine block that was glued into the nose. The windscreen is a trimmed and painted piece of clear plastic that originally was part of a servo package. The Browning machine gun was made from scrap balsa, painted and then glued to the gun ring. The pilot and gunner are painted figures from *Parkflyer Plastics*. The observer is busy inside!

Assembly

As simple as the build is, final assembling is just as uncomplicated and straightforward. There isn't much to putting it all together. Using levels, straight edges and the string method, I ensured the horizontal stabiliser was straight and true before gluing it to the fuselage. The vertical stabiliser was glued to the horizontal stabiliser - slot and tab aid

alignment. The tail control surface horns were glued in and the pushrods pushed through the fuselage tubes and attached to the proper servo. These servos are mounted on the battery tray. The large battery tray and hatch makes hooking up the electronics effortless. There is plenty of room. The aileron servos are attached to the servo covers. I use silicone. The servo wire and extensions are pulled through the wing sections and the covers are screwed to the hardwood rails in the wing. I used CA hinges to attach the ailerons.

After the motor installation and test I was ready to fly. Well, not really. When I checked the balance I found the MO-1 was tail-heavy. I had to add 2.2 oz of lead to the nose. There is plenty of space under the motor mount box for the weights. I considered moving the battery there but with so much wing area I don't think the extra weight is an issue.

Flying

At the field I slid the wing sections onto the



I'm convinced the gunner is eyeing up that model in the background as the Martin makes a low pass for the camera.



Nothing about the tail surface construction to cause any headaches. Not even any laminated outlines.

tubes and attached the aileron servo connectors. Small wood screws through the brass strips lock the wings in place. The battery was plugged in, the CG checked again and she was ready. I pointed her into the light breeze, throttled up and after 25 ft. she was airborne. A couple of down and left aileron clicks and she was flying nice and smooth. After a few minutes of lazy ovals, I lined her up, throttled down and let her settle down onto the ground.

Subsequent flights in windier conditions demonstrate that she can hold her own in a strong breeze. The control surfaces are very effective. She'll loop and roll. Although the roll is the ugliest roll I've ever seen and I'll probably never do another. The MO-1 slows down well, but the speed does need to be kept up going into a turn or she'll want to spin out in the opposite direction. Although the large rudder provides plenty of ground control I'm contemplating adding a tail wheel because the full size had one.

I think she has great presence in the air and doing a slow pass down the runway always puts a smile on my face. All in all she flies much like my smaller one did which is a good thing and exactly what I was hoping for. Thanks Pete!



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Martin MO-1

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Miles Ahead of the Rest 1

MILES M.5 SPAR

Ken Burke's 84", 1/4 scale models of the 1935 King's Cup air racer, designed for 1.08 – 1.20 cu.in en

This Sparrowhawk is hardly a tyro's model, though it is not a complex one by scale standards. Modellers likely to build this model will not need detailed instruction on constructing a box fuselage or a spar and rib

wing. Instead I will concentrate on the areas that are specific to this model or that I feel may require more detail than the plan or accompanying photographs can provide.

Before commencing construction of the Sparrowhawk, take some time to go over

the plan and familiarise yourself with the options and the construction techniques. Once you have made your choice it is time to cut wood.

And keep it light, especially aft of the CG. The prototype weight in at 12 lbs.



Designer Ken Burke claims that his wife, Liz, almost got him fully in the frame on the pic!



ROWHAWK

Engines and 4-5 function R/C systems

Wing

Before commencing construction of the wing there are two main options to be considered: the undercarriage and the flaps. Are you going the way of the full-scale undercarriage and are you going to fit

flaps? I decided on the simple wire undercarriage, but also decided to fit the flaps. Full details of the twin strut undercarriage and moulded glass pants are shown on the plan. I have used this undercarriage on previous Hawks and found it

works very well, but adds considerably to the building time. I elected to fit the flaps, even though these also increase the building time very considerably. Previous experience has shown that on calm days the Hawks need a long flat approach if flaps are not fitted.

How's this for a back garden view! Ken Burke's quarter scale Miles Sparrowhawk poses with the Sydney skyline as a background. The 'Hawk' is equally impressive when in its natural element.

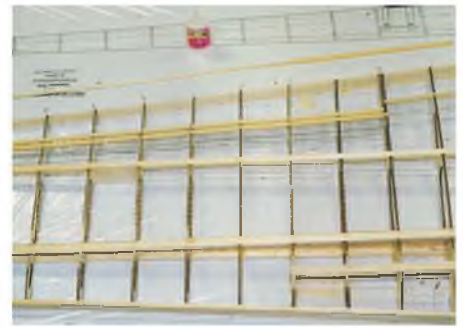




Laser cut wing ribs are more accurate and make construction easier.



Showing how wing joiner fits into undercarriage spar.



Wing framed up, with undercarriage spar and joiner fitted.



The block wing tip hollowed out and ready for fitting.



Basic assembled fuselage, note the laser cut edges.



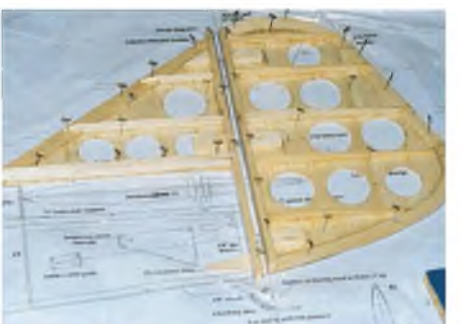
Cutting and fitting the foam decking.



Plywood sheeted cowling, 0.4mm to sides, 0.4mm on top.



Foam covered tailplane and elevator, the two spars are pre-drilled for the hinges.



Initial construction of the fin and rudder; the other side is built in the air.

Trousers

The trousers are never a problem if you fly from smooth grass or asphalt. Under these conditions I would opt for moulded glass pants because they score better in static judging. As I don't enjoy such luxury, I have experimentally fitted trousers cut from 3 mm wet suit material. Whilst they do not stand very close inspection, at three meters they look pretty good and in the air no one can pick the difference. To obtain a smooth finish in keeping with the rest of the model Ora cover (Profilm) is ironed on at a low temperature and painted to match the model. To date they have worked well. I have recently seen art paper used on one of my earlier Speed Sixes designs, and this looked and worked really well until it got wet.



Hand cutting wing ribs for a tapered wing is time consuming, and not all that entertaining, so I elected to have them laser cut. The inherent accuracy of ribs cut this way ensures the wing goes together truly and very quickly.

The undercarriage spar is built up from pine with the twin strut scale undercarriage in mind as I reasoned most scale junkies would build this version. If you are going the wire way, it could be simplified considerably.

Once the centre section and both outer panels are up to the sheeting stage the wing is joined and all the internal aileron hardware installed, including the servos.

Check that every thing works correctly and freely.

The flaps are next. The system used on the prototype Sparrowhawk is different in one unique way from any other split flap system I have ever encountered. The centre flap, although hinged on the same line as the outboard flaps, is hinged at the rear and comes down from the front. The reason for this is that the normal front hinged split flaps on the earlier Hawks were virtually impossible to deploy at normal landing speeds. The muscle power of the right arm being insufficient to overcome the 70 mph headwind created by the aircraft. To



At last - the finished airframe ready to cover and paint.



Joining the wing panels.



Fitting servos, rods and horns prior to skimming wing.



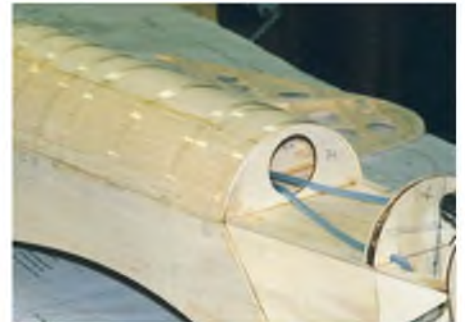
Fitting the flap mechanism. Inset - the bellcrank and bracket.



Building the wing fillet (note the styrene sheet fuselage protector).



Fuselage cowling framework in position.



Sheeting the nose section - later it will be covered and epoxied to strengthen the balsa sheeted.



Trial fitting of the tail surfaces to facilitate the control linkages and fittings.



Fitting the control cables and elevator rod - before fitting the cross bracing.



Setting the wing incidence - note the packing piece to 'square' the aileron spar.

overcome this problem without electric or hydraulic augmentation, Miles devised the servo flap, which was connected in opposition to the wing flaps, considerably reducing the muscle needed to lower the flaps.

Previously, I have used ply for the flaps, and have always had trouble with them warping and being affected by atmospheric conditions. To overcome this problem I decided to make the flaps from 1mm epoxy glass circuit board. Unfortunately I couldn't obtain any when I needed it, so I ended up making them from carbon fibre which I laid up with epoxy on a sheet of glass covered with car wax as a release agent. Hinging the flaps again follows full size Miles practice. Short lengths of piano hinge attached with wood screws to the outside of the flap and flap spar. Miles used the same system on the ailerons. Crude, cheap and effective.

The model replicates this system with one-inch sections of *Scale Aviation* piano hinge. I could not find a suitable commercial horn for the outer flaps, so I made them from 1/16" x 1" aluminium angle. The operating system is shown on the plan and may take a bit of fiddling to get the three flaps to work in unison. The flap system should be completed, and checked functionally, before the wing skins are fitted.

On the full-size Sparrowhawk a ten-gallon tank is fitted between the spars in the root of each wing. The fuel gauges and tank fillers

are mounted directly on the top of the tanks, and are accessed through holes cut in the wing skin. An aluminium surround was fitted to the wing to cover the raw cutouts. As the petrol gauges, and the petrol and oil filler caps are major features of the wing, it is perhaps worth the time to produce a reasonably realistic reproduction in the model. The gauges are made in the same way as those fitted to the instrument panel, except that the dials are printed on white paper and the pointers are red. The petrol filler cap is cut from litho plate or styrene, and likewise the surround.

The method I used to mount the petrol gauge and filler was to cut two one inch holes in a piece of soft 3/8" sheet balsa which I then glued to the wing frame, and shaped to the wing section, before the top sheeting is applied. Before sheeting the bottom, cut out the top sheeting through the two holes, and then glue the 1/16" balsa to the bottom of the 3/8" sheet. Nothing more needs to be done until the wing is finished completely except to paint the holes matt-black. After the wing is covered and painted cut the covering from over the holes and fit the petrol gauge in the rear hole so that it is about level with the middle of the wing skin: about a millimetre below the surface. The petrol filler cap, which can be made from lithoplate or styrene sheet, is mounted on piece of 3/4" dowel, so that the disk is flush with the wing surface. Ensure that the gauge and the cap are concentric

with the hole. The reason for the holes will now be apparent: they give gauge and filler the appearance of being mounted on the tank, and not just being stuck onto the wing as an after thought.

The oil cap is mounted directly on the wing skin as the oil tank formed the leading edge of the wing at the port root. Unlike the petrol filler caps, which had the flat fairing plate, screwed to the normal screw-on cap; the oil filler was a stock Hawk Major item. But I am getting ahead of myself.

The next step is sheeting the wings. Sheet the top first. Block up the centre section, and make a jig to hold the tip and give the desired washout. The lower skin is applied similarly followed by the tips. Leave the bottom of the centre section behind the spar unsheeted, as the blind nuts for the wing bolts cannot be fitted till later. Reinforce the area below the trousers with 0.4 mm ply. This is desirable regardless of the type of undercarriage or pants fitted, as it reduces damage to the wing skin from that occasional not-so-perfect landing.

Undercarriage

3/16" piano wire main legs require a powerful bender to shape it. If such a device is unavailable you could use the main legs from the Pica 1/5th scale T-28B kit.

The tailskid is a self-contained unit and can be built at any time you have a few spare moments. Shaping the aluminium shoe may seem like a hassle, but with a little help from



Ken Burke's original model in action.

Dremel it doesn't take long. The construction is detailed on the plan. What may not be clear, is that the whole assembly slides into the rear fuselage cut-out, and is held in place by one self-tapping screw at the front.

Fuselage

Phillips & Powis (manufacturers of the Miles range of aircraft) were not noted for their sophisticated construction methods or for the fit and finish of their production aircraft. But what they lacked in sophistication, they more than made up for with strength, reliability, and ease of maintenance. In the model this equates to simple and quick building.

As with the wing, I decided to have all the basic fuselage parts laser cut. The bulkheads and fuselage sides have locating tabs and matching slots to ensure perfect alignment. Again like the wing, the basic structure went together in a very short time. The rear deck is a straight taper so ply covered foam seemed the lightest and strongest way of getting the desired result. Keep in mind that the M.5 has a long tail moment, so every effort should be made to keep the back end light. The front deck has compound curves so balsa planking was used and applied damp. After the front bulkheads are fitted, but before the section is sheeted, it is a good idea to trial fit the tank, fuel tubes, instrument panel, and cockpit floor. Fitting the engine, throttle control rod, and designing the exhaust system is also easier if done now. The predrilled wing mounting blocks should now be permanently epoxied in place.

Tailassembly

Different methods of construction are used for the vertical and horizontal components. The fin and rudder use simple built-up construction while the stabiliser and elevator use a balsa sheeted foam core with cap-strips to simulate the ribs. Originally both were built up structures, but I felt the stab wasn't stiff enough. Finish up to covering stage, then fit the 1/4" balsa saddles for the stabiliser to the fuselage. On the centre line of the stab, about 40% back, drill a 3/8" hole and epoxy in a 3/8" dowel counter-bored to take a 4-40 screw. Fit a mating blind nut to the fuselage.

After exactly positioning the stabiliser, add a locating dowel to the rear so that the stab. is removable yet will always take up the correct position when refitted. Hinge the rudder and elevator, and fit their servos. Make up and trial fit the rudder control cables and elevator rod. Glue the balsa elevator rod guide in place in the rear

fuselage, about half way along the length of the elevator rod. This will ensure there is no bending of the rod under heavy loads. Once all the systems are working to your satisfaction they can be removed and the empennage put aside to cover once you have a spare moment.

Wing fillets

The wing fillets are structural, so make sure they are a good fit to the fuselage sides. Commence by fitting the wing to the fuselage and adjusting the seat so that it is symmetrical about the fuselage and tail plane, ensuring that it has the correct incidence in relationship to the horizontal stabiliser plus 1.5 degrees. Once you are happy with the fit and symmetry of the wing, tack glue it in place. Then from the top, using a long drill and the predrilled blocks in the fuselage as a guide, drill the blocks in the wing to take the blind nuts for the 3/16 W (or 5mm) cap head screws that will secure the wing to the fuselage. Press the blind nuts into place and seat them by pulling them into position with the wing bolts. Epoxy these in place. Remove the wing and fit the lower rear centre section sheeting.

Cover the centre of the wing with Glad Wrap and refit the wing with the 0.4mm ply saddles in place. Secure the wing with the 3/16 W screws. Once the saddles are correctly fitted, Zap these in place. Build the fillets from very soft balsa sheet except for the 1/32" inner piece which should be hard balsa. Use sandable Aliphatic glue throughout.

On the next bright breezy sunny day, take the fuselage and a selection of round sanding bats outdoors, and shape the fillets. To protect the fuselage sides from the sanding bat, I cut the outline shape of the fillet from styrene sheet and tape it to the fuselage before I start sanding.

Cowling

The hinge that allows the side panels to be raised for engine access on the prototype is replicated in the model by lengths of *Scale Aviation* hinge. A piece of 1/2" x 1/8" ply in into which a recess 1/4in wide and .02" deep has been cut along one edge is glued, recess down, to the outer edge of the top fuselage member between the front and rear of the cowling. The hinge can then be slid into this recess and Zapped just prior to painting the fuselage. Only one side of the hinge is used and the gaps filled with short pieces of nylon tube, held in place with the normal wire hinge-pin. The piece of ply that holds the hinge also acts as the attachment for the edge of 0.6mm ply that forms the fixed top section of the cowling.

The plan shows the built up wooden cowling. A moulded glass nosebowl and oil pan were used on my model. The whole cowling could be moulded using the lost-foam method, and this would probably be quicker. I have moulded the nosebowl and oil pan using a balsa plug from which a vac-formed styrene mould was made. In case of damage replacements are easily produced.

It is advantageous to have the spinner on hand before you commence the cowling, so that the nosebowl can be faired to the spinner. The only tricky bit on the cowl is the method of securing it: a 4-40 screw through pine blocks on each side, accessed through the curved rear edge of the cowling. The reason for the angled blocks is to pull the cowling back and up, thus putting a little tension on the locating dowel, and reducing the chance of vibration loosening the cowl. Ensure the blocks are positioned so that a ball driver can be used with the wing attached. The holes for the exhaust stubs are drilled and the stubs trial fitted. They are not glued into place until after the model is painted.

Engine

I chose an O.S. 108 two stroke as it has adequate power without being unduly heavy. The only drawback is the side exhaust. There is not a lot of width in the front of the cowling so a special exhaust system has to be fabricated. To gain every bit of space, the motor is rotated as far as possible around its centre line away from the exhaust. The photographs show this clearly. The exhaust is fabricated from 1/8" thin wall steel tube. The bends are made after filling the tube with dry sand and heating the tube to a bright red heat. The engine flange is fabricated from 1/8" mild steel, and is mated to the engine before welding the pipe to it. The face will probably have to be re-machined to obtain a gas tight fit with the engine. The location of the actual 8mm exhaust outlet pipe wasn't marked until the engine was finally installed and the cowling in place. This ensured the exhaust pipe was correctly located between the fuselage and the lower edge of the oil pan. With a little extra work the exhaust can be directed down the stubs. This, I have found, doesn't equate to a higher score in a scale contest, so I no longer bother.

In the next issue Ken gives you the low down on scale detailing, covering, radio installation and flying, plus a few afterthoughts. ■

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Surviving Scale

New series Part 1: Building, trimming and flying tips by Andrew Hewitt

If you build a well-designed scale model correctly, it has nearly unlimited space in which to fly, climb and glide to the sound of skylarks and cool summer breezes. Sounds good so far, but what if it's a stiff breeze? What if it's raining? A well-designed model can fly in a stiff breeze and rain, since this is what they are designed to do - even a two-and-a-half pound diesel or electric powered biplane is rarely knocked out of a competition, even following a crash on a concrete runway!

But very infrequently do competition dates coincide with favourable weather conditions, so our models have evolved to suit the 'Average British Summer' - in fact, a correctly built, well trimmed model can be competitive for over a decade!

For the uninitiated, scale outdoor free flight is for models powered by rubber, electric, Co2 gas, diesel or glow engines. These models are carefully trimmed to fly as

realistically as possible, in the manner of the full-size prototype modelled, but they do this without the aid of radio control or any external means, once released from its often weak-kneed owner. One good flight repays all the pain and tears involved in a new project and feelings of jubilation take many days to disappear after a successful flying session.

Flight Trimming

The foregoing may seem rather an odd way to start a 'how-to-do-it' series on Outdoor Scale, but since most of you out there who are seriously interested already have suitable models, or have had an unsuccessful dabble, I want you to dust down your never-flown masterpiece, or that model which never behaved itself - and have a go.

Prior to any flying or initial trimming, scrutinise your model on the kitchen table. First of all, establish the balance point of

your model - it should be roughly at 20-30% of the wing's average chord - adding this ballast to the nose or tail to achieve this. A good method is to hang your model in a loop of string around the nose and tail, holding the loop at your desired balance point, the model, when correctly balanced, will hang in its level flying position.

Having done this, now check the incidence of the wing(s) in relation to the tailplane. This is very important. There should be 3-5 degrees decalage (**fig.1**), i.e. the wing should be at a positive incidence of 3.5 deg, and the tail at zero, or wing at 2 deg, positive and the tail at minus 1.5 deg, etc. (**fig.2**). If your model does not have much decalage, then you may need to take a bin bag to the flying field!

Decalage is very important in correcting the model's attitude when hit by wind gusts, so I recommend that if your model's decalage is outside this range (unless clearly

1: Scale tail surfaces are generally huge, needing very small deflections to instigate serious changes of trim. Keep all adjustments during trimming 'a little at a time'. Keep a record of the deflections - and check before each flight. **2:** Right side thrust is normally mandatory on a power scale model to combat the motor's torque effect. Note the differing distance of each prop blade from the front of the cowl on Andrew's Fokker, giving a clear indication of the built-in side thrust.



Andy definitely practices what he preaches - here is his 2000 Nats Airco DH4 entry - a feast of detail, eye-catching colour scheme, good documentation - and good flight preparation!



specified on the plan), you remove the tail and adjust its angle to attain the correct setting before any attempt at flying.

If the model is a biplane, check that both wings are either at the same incidence, or that the most forward wing has 1 or 2 deg. more incidence than the other wing (fig.3). Doing this, will always allow the forward wing to stall first, and hence drop the nose of the aircraft to enable it to pick up flying speed again. If the other wing has more incidence than the front, you may need the bin bag again, since the rearward wing stalling first, will accentuate a stalling condition, by raising the nose of the aircraft (in effect the model becomes tail-heavy as the rearward wing stops flying). This feature may be difficult to correct on a finished model, but is essential for successful flying.

Whilst we are looking at the side of the model, check to see if the tailplane has a lifting section - if it has, put it in the bin and build a symmetrical section tailplane! Lifting sections produce different effects at different speeds and cause all manner of trimming problems. We want a heavily damped and stable model and I am afraid a lifting tail is NOT the answer. Also, whilst looking at the side, check that you have some downthrust (fig. 4).

It is difficult to judge each model's specific requirements - normally low wing aircraft need zero downthrust, but mid wing, high wing, biplanes and triplanes need plenty. I start with about 3 degrees built into the

FIG.1: Dacalage (zero tail)

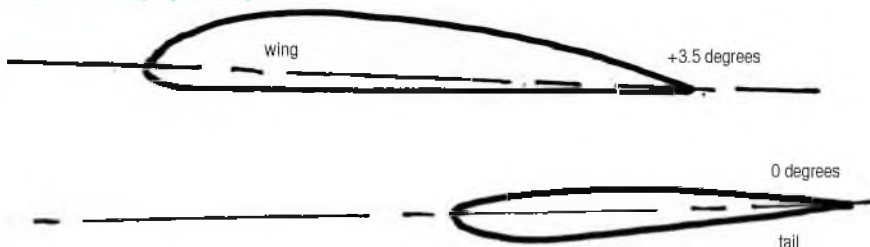
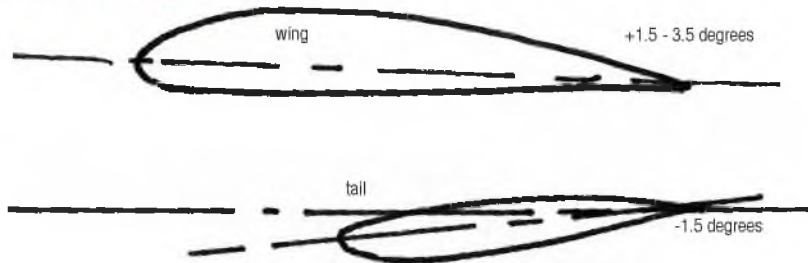


FIG.2: Decalage (negative tail)



model, then use thin washers to adjust for more or less - usually more is required. Do not omit downthrust for first flights, or you may need a spade to retrieve your engine!

The Twist in the tail

Having checked the side of your model, now check for warps. Tail warps are particularly deadly, so put the kettle on, make a coffee and steam ALL your warps out with the remaining water, especially 'wash-in' on wing panels, or extensive 'wash-out' (fig.5). Having finished your coffee and put salt on your scalded fingers, check that your dihedral is equal for both wings, and that

your tail is not tilted to one side or the other. Looking down on the nose of the model, check that 2-4 degrees of engine 'right-thrust' has been incorporated (fig.6) - if not, put some in; cut out a new engine plate, or file slots for the engine mounting, if necessary. If you don't incorporate some sidethrust, you will treat yourself to a spectacular roll to the left or knife edge flight, which will only end in needing new wing tips.

Are you comfortable?

Having checked and adjusted the model, you have now reached a 90% chance of

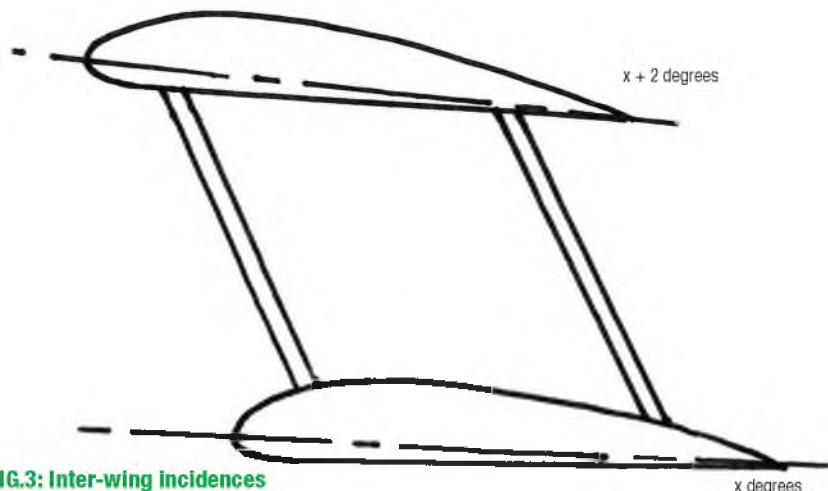


FIG.3: Inter-wing incidences

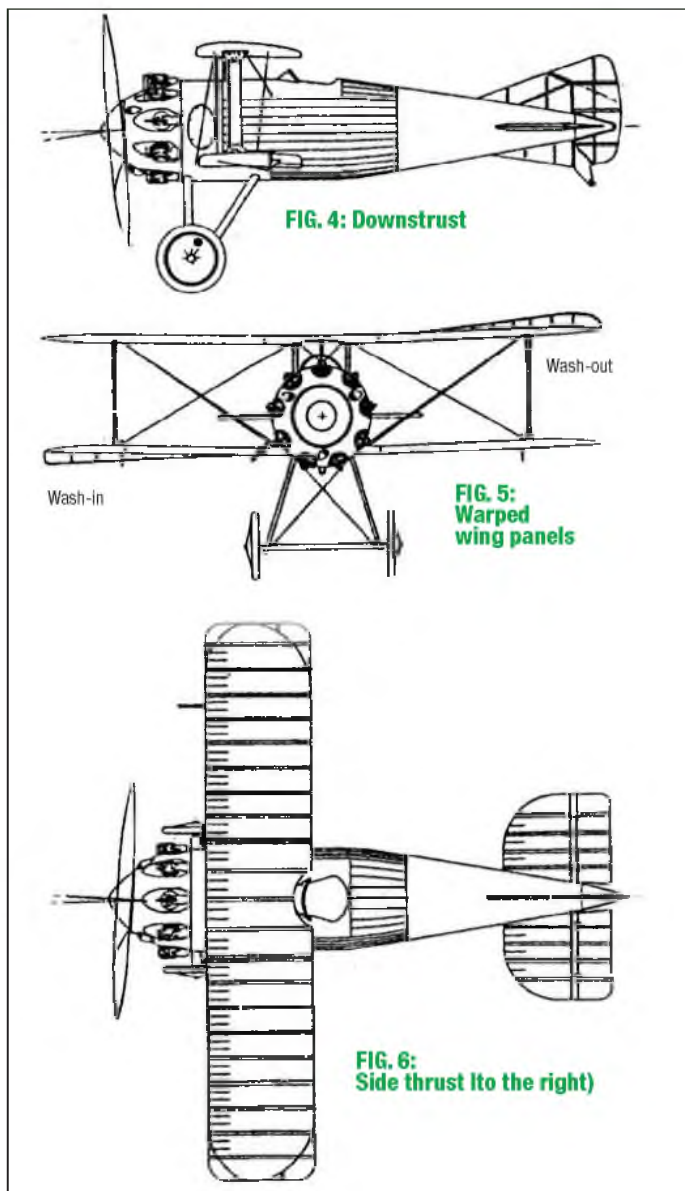


FIG. 4: Downstrut

FIG. 5: Warped wing panels

FIG. 6: Side thrust (to the right)

safe flight. These checks and settings are applicable to all free flight scale models and should be conducted before - and after - each flight, since settings are often knocked around in heavy landings. The next stage is done in the back garden or yard. Practice charging, fuelling, flicking, starting and setting your engine, or winding the rubber motor up. You must get comfortable with the quirks of holding your model during starting and adjusting the engine whilst it is running, as well as replacing cowlings,

attaching the propeller block to the wound rubber, etc., etc. You may solve many problems this way, which could have led to frustration on the flying field, resulting in to a wasted journey.

Practice measuring the fuel quantity or charging time, so that accurate duration engine runs are known; ten seconds, 15 seconds etc, and can be achieved consistently.

Now you are relaxed about starting and running your engine in your model, you have reached a 94% chance of successful flight stage - time

“If the model stalls under power, then more down thrust is required, rather than down elevator...”

to wash your hands now and have another coffee!

Hints and tips for the budding contest flyers

Having had many first-hand experiences of the problems of competition flying, I feel I must pass on some advice to those planning on a competition entry. Assuming you have completed your masterpiece, please try and trim it out PRIOR to the competition, or at least, let the paint dry! I must admit I have trimmed out new models at competitions, but it is NOT recommended, since all your eggs are in one basket and like eggs, they are easy to break! With all the nervous energy involved in flying a scale model, the added pressures of trying out a new engine/tank installation and airframe, under the eyes of the public and judges, is enough to send most modelers to the funny farm!

To prevent such excesses of distress and to turn the competition into a pleasurable experience, I recommend the following :-

1. Be totally familiar with the operating quirks of your installation and running practices of the engine, prior to any fitting or competition session.
2. Test glide and trim your model out at the first opportunity, giving you plenty of time to amend the bumps and grazes prior to a competition.

With these two things done, you can reduce stress levels and concentrate on obtaining the best results from your model and hopefully, a place in the competition. The UK top flyers, such as Terry Manley and Bill Dennis, always feature in the results, because they do plenty of flying with their models and know all their quirks.

Up the hill

For outdoor models, a good glide is essential, since outdoor models can go very high and have a long way to fall! To

check it out, I look for a steepish slope on a breezy day, about 50metre square and hopefully covered in weeds and long grass, with the breeze travelling roughly up the slope. Check the area for old Fords, shopping trolleys, rubble, etc., and try to avoid them like the plague. Because launching your model can be quite difficult, it very useful if you have a helper along with you, to tell you if you are launching correctly - it is very easy to push the model up and stall - which would lead you to think it needs down elevator, or nose weight - but if you have a helper, he or she can tell you if your are launching correctly. The slight breeze will help the 'draggy' scale model reach flying speed, and the slope allows the model to be airborne for much longer, thus you have a greater chance of observing its flight pattern. Assuming your model balances correctly and you have built adjustable elevators and rudders on stiff timplate hinges, or have some smaller trim tabs, then trimming for positive glide is a simple matter of adjustment of these surfaces. Do not try to obtain a super flat glide, though, because the model will not behave itself under power, a steepish, straight, or right glide is what you are aiming for.

If you have made the golden mistake of building too small a model with no adjustable surfaces, you may be trying the impossible - small models are very sensitive to tiny warps and the slightest of gusts - larger models tend to be much more docile to trim.

Flexibility

You may have found out by now, that knock-off wings and tails are of little use, as any part which knocks off usually punches holes in other areas of your model before being lost in the grass.

The flexible model which stays together, is far better at resisting

3: A host of scale detail on Alan's Sopwith Tabloid. Note that downthrust is clearly built-in, with the ED Bee sitting in front of the dummy rotary engine. Note also the rubber band 'sprung' U/C. On models of this type, having both wheels fixed to the axle, running in a tube full track, can reduce ground-looping tendencies. **4:** Adjustable ailerons can be a great help in flight trimming - be careful, however, not to induce adverse yaw with too much 'down' deflection on the inside of the turn (wing structure shown here is an indoor scale model). **5:** Scale competitions are the best place to gain practical experience and a great place to pick up practical advice, tips - even inspiration. Here are two more entries in the 2000 BMFA Nats, a pair of Bristol M1s, an MTD by Fernando Ramos (foreground) and an M1C by Derek Knight.

a crash (more about that in a later part of the series). Finally, the hour that you have spent test gliding should not be wasted, so record the tail settings in a note book, to be able to that you can reset them exactly - and wait for the next calm day at your flying field.

Turning up the power

Powered flying your model is the next step. Since you know the model glides, only small movements of tail surfaces should be required to cure power problems. If larger deflections are required, then it is your thrust line that is incorrect, not your tail settings. With rubber-powered models, aim for a right hand turn under power, gradually increasing the turns and observing the results. Packing on the nose block should be used to produce right side thrust and hence, a climbing right hand turn. Normally, as the power is increased, the tendency to power-stall becomes apparent. This problem is solved using more downthrust, packing the top of the nose block.

Generally it is better to overpower a rubber powered model and use less turns, rather than use a smaller motor wound to breaking point.

Left turn

For the CO2 model, try low-powered flights. Again, the thrust line will trim your model if larger tail surface movements are required, but these models, together with electric and diesel models, MUST turn left with the torque. To tame the power source, try putting the propeller on backwards, reducing its thrust drastically and enabling those gremlins to be seen at lower speed!!

Initially, a powered glide is desired. When you are satisfied, having gradually increased the power, turn the propeller round - and off you go. If the model stalls under power, then more downthrust is required rather down elevator, since once the engine stops, the elevator will dive the model into the only spot of concrete on your flying field - that's guaranteed!

For the heavier diesel and electric models, more caution is required, since these are capable of doing more damage to themselves and to bystanders. Initial tests are conducted with the propeller reversed and the motor at low power, again, the object being a powered glide, so launches should be smooth and slightly down. Depending on the size of the model, you may need a running launch - again, your helper can advise on launch attitudes. With a powered glide successfully achieved, mount the propeller the correct way round and launch again on LOW power. As before, any sign of a powered stall should be corrected with

down thrust, NOT elevator. Small washers under your engine lugs should be enough to achieve this. Any tail surface movements should be done in about 1/64 in. increments, since large tail surfaces are very powerful when blown by the propeller.

If the model flies in tightly banked left circuits under power, right rudder cannot be used to correct this without incurring a right hand spin on the glide, so more engine right thrust is required. If you have the luxury of moveable ailerons, these can be quite handy for power trimming, but be WARNED - a drooped aileron can create more drag than lift on a slow-flying model, resulting in the opposite effect to that desired. It is best to bend the aileron on the outside of the turn up - and leave the aileron on the inside of the turn alone.

Right off the ground

Once you have the model flying, then you can relax and enjoy the beast in the air - and reap the rewards for all your endeavours. If you are feeling really brave, a take-off is the next step. Unfortunately, not all subjects take off easily. Generally, single-seater fighters, having a short nose and large ground angle, are very susceptible to ground looping and will chase you all over the tarmac at alarming speeds. Some require a breeze to keep them straight and some can't help but take off beautifully. Check that the undercarriage is true, and as free-running as possible. A few drops of oil on the axles helps and, if you can arrange some toe-in on the wheels too,

your chances of success will be better.

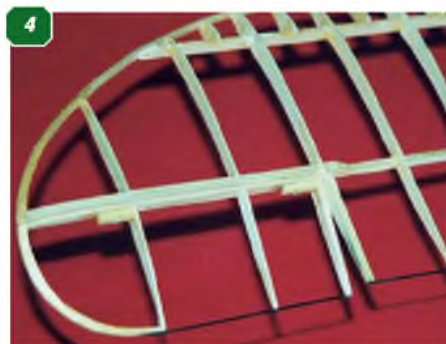
Scale competitions

For help with trimming models, you can do no better than attend a Scale Competition and talk to the people who do this for relaxation(?) and pleasure - they have the experience and interest to help with all kinds of hints and tips. This is the best environment for learning your apprenticeship in free flight scale. In competition, with knees and fingers trembling, I was coached through my first Nationals by such very helpful people. I hung on to every word of advice they gave - and finally managed a qualifying flight, which left me with the feeling of having won the World Cup, even though I was placed nearly last in the competition!

The wonderful thing about competing is that you get to mix with like-minded scale fans, swap ideas and stories, plus the immense satisfaction of having taken part and shown your wares to an appreciative audience. There really are no losers in a competition, just winners - and it is really quite amazing how much fellow competitors will help each other to get the best out of their models.

Next month

The next part of this series will deal with the design and construction of free flight scale models. Good luck with trimming your 'old master' and clear your building board ready for your new creation, which will be better, more accurate and probably far more practical. ■



SPRING IN THE AIR

The Northern Modelling Exhibition 2013

Alex Whittaker zeros in on the scale aircraft exhibited at this winter event

Until recently, the LMA held its celebrated Spring Symposium as a stand-alone event. Times change, and for the last two years, the LMA have thrown in their lot with the winter Northern Modelling Exhibition. This is held at Shopping City, over the road from the Trafford Centre, in darkest Mancunia. So, road communications from the North, North West, the Midlands, North Wales, and even Scotland are pretty good.

The venue is spacious, with free parking, and this year, the atmosphere was very engaging. In short, it felt like an event that had hit its stride.

LMA

Of course, the main draw for scale modellers such as ourselves was the extensive Large Model Association presence. This was easily the biggest aeromodelling input at the event. There really was a lot to see, much of it evidence of last winter's prolonged building season. Of course, many of these

models will appear in a month or two on the LMA show circuit, so it was doubly fascinating to examine so many flying scale aircraft almost complete.

Britten Norman Islander

The first new scale model that greeted me was David Bell's imposing 1/3 rd scale / 5 metre span Britten Norman Islander. (Much, much bigger than the pioneering electric version by MFA, or the Svenson Kit (remember them, all those years ago!). When complete, she should weigh in at around 85 lbs. She was designed by Richard Hughes of *Falcon Aviation*, so the CNC cutting of this kit is excellent. As soon as she shows up at an LMA event this year, I'll be there on your behalf with my camera.

Handley Page HP 52 Hampden

Mike Eccles is no stranger to these columns, and his latest magnum opus is a cracker! It's a huge Handley page HP 52 twin from the thirties, powered by two Zenoah 62s. It is almost completed, and

just needs a few jobs, including the trademark nose cone. This really is a very impressive large model, and will look fine in the air. On a poignant note, the retracts were designed and hand-built by the late and great Ray Slack. Again, expect a full walk around plus flying shots in due course.

Fieseler Storch

Everyone likes a Storch, and Mr Franks' 1/6th scale example on the LMA stand was very crisp indeed. It is fitted with a 15cc petrol engine and spans 93 inches. Unfortunately no other details were offered, so I cannot say whether it is scratch, kit, or plan-built, though it could be my old mucker Gary Protheroe's 112" Fieseler 156 Storch. If so, the model is built from the Ed Newman plan

Handley Page HP 42 'Helena'

Ian Redshaw's refurbishment of Peter Neate's well-known HP 42 is now complete. The model has been successfully test flown over the winter,

1: Horizon Hobbies had a full range of engines on display, including these Evolution Radials. **2:** Horizon Hobbies new Me 109 ARTF electric model. **3:** Probably complete by the time you read this, Mike Eccles magisterial Handley Page Hampden. Full walk around soon.





4: Now in its Royal Air Force livery, the Buck's Composites astounding VC 10. 16 feet span / four Wren gas turbines. Wow! **5:** Mike Eccles strikes again! Another view of his new HP 52 Hampden. **6:** Mr. Protheroe's very neat Fieseler Storch. **7:** Built by Peter Neate, and now refurbished by Ian Redshaw, HP 42 Helena. **8:** Dave Lowe's percival Provost. Built in 2000. 86" in span, and Moki 45cc petrol powered. **9:** Dave Bailey's well-known Bleriot, built to 1/3rd scale, spans 120", weighs 50 lbs.

and I should have flying photos for you soon. Incidentally, did you know that the LMA has two more large HP 42s (from Alf Machin) about to hit the circuit? Yup. That will be three.

Hunting Percival Provost T.Mk I

Now this really is a treat! A rare and wonderful Provost was on display, almost completed, and just needed finishing.

Dave Lowe, scratch built it from full-size data and photos. (He's an ex-Provost pilot). It was built in 2000, with foam wing and tailplane, light ply fuselage sides, then fibreglassed and Ronsealed. The undercarriage is home made, the model is 86 in span, and is Moki 45cc petrol powered. The Provost has flown, but no needs final finishing this year.

Fournier RF-4D

It was good to see an elegant 152" span Fournier motor glider being modelled. I am old enough to remember Mick Reeves' 1978 World Scale Champion version, which had a radio that actually tuned to the BBC! Alan Cantwell's Fournier was built from the new ADFA Models kit to 1/3rd scale. This is powered by a MVVS 26cc petrol engine driving an 18x6 prop, and weighs in at around 23 lbs.

Interestingly, the tail wheel has a mechanical retract. CNC-cut, this model is of all-wood traditional construction. To get as far as the photos show, took 180 building hours.

Bleriot Militaire

My old mate Dave Bailey was displaying his well-known Bleriot monoplane, first built by

much-missed Arthur Searle. The blue bit of the roundel gives it away as the French Militaire version. This is one of my favourite flying scale models. It is meticulously built, yet looks like it is still in service. She flies beautifully too. The Bleriot is built to 1/3rd scale, spans 120" and weighs 50 lbs. It is little known fact of UK modelling trivia that this model's engine began life in a Snowmobile.

Messerschmitt Bf 110D

Nicknamed Zersterer ('Destroyer') by the

Luftwaffe in WWII, the Bf 110 did well everywhere during the opening rounds of WW2 blitzkrieg, except when it came up against the RAF during the Battle of Britain. This splendid 110D was built by large scale maestro John Greenfield many moons ago, then recently restored by Neil Armstrong and Ian Reshaw. The model is built to 1/4 scale, is 156" in span, and is powered by four Quadra 42cc petrol engines. She looks very smart indeed in her new livery.





10: Messerschmitt Bf 110D was built by large scale maestro John Greenfield, and recently restored by Neil Armstrong and Ian Redshaw. **11:** Ken Dallow's Sopwith Pup spans 108", weighs 32.5 lbs and is powered by a DLE 111cc twin. **12:** Ken Ritchie's one third scale Me 109, which first flew ten years ago. **13:** RC Choppers, the only aeromodelling stall I could find at the show. **14:** Stunning (Sebart ARTF) Macchi-Castoldi MC 72 Schneider Racer.

Sopwith Pup

Ken Dallow was displaying his very fine one-third scale Sopwith Pup which spans 108" and weighs 32.5 lbs. Powered source is a DLE 111cc twin. Flying area is over thirty square feet and was built from the respected Mick Reeves kit, finished in SolarTex and Flair Spectrum paints, then fuel proofed with thinned satin polyurethane varnish.

Ken tells me he is sourcing a more accurate dummy engine, though he had to point this fact out to me since I had not noticed.

Me 109

Ken Ritchie brought along his attractive 1/3rd scale Me 109, which first flew ten years ago. This weighs 78 lbs and is powered by a 150cc petrol in-like twin.

Dave Johnson usually handles the sticks at the LMA shows.

PZL Wilga

Shelagh Russell was displaying her very bright 1/3 rd scale PZL Wilga aerotug. This innovative model spans 110 inches, weighs just 25 lbs, and is powered by a Zenodh 62cc petrol engine. The model features a very interesting lightweight



The LMA Vulcan really makes a statement!

construction, incorporating XPS foam covered in wallpaper backing paper, then finished in Solarflex. The cowl was made from XPS foam and 1/16" plywood. The wings are fitted with flaps. Very impressive, and looks eminently fit for purpose.

Stinson Voyager 150

OK, let's all stand back and take this lovely model in, and say Aaaaah! If you love scale models of US light aircraft, and you can remember your Keil Kraft days, here was a pukka red and white Stinson Voyager, only very much bigger! One of the most elegant light aircraft ever to take to the skies. Regretfully, no other details were supplied on the day. I'll remedy that down the line for you.

Cessna 182 Skylane

Another seminal light aircraft, this time with handsome, timeless looks. This one was displayed by Ian Russell and was built to 1/3rd scale. She spans 120", weighs 31 lbs. and is powered by a CRRC 55cc engine. A very nicely executed model of one of the all-time American Greats.

Cessna Bird Dog

Shed maestros Harold Dowbekin and Phil Cross were exhibiting their very impressive 1/3rd scale L-19 Bird Dog. This had all the appearance of a real metal light aircraft, with very crisp detailing. The panels, rivets, fastenings, and paint looked utterly convincing.

DH 100 Vampire

A real classic! This 1/5th scale model was built as a commission by Dave Jones from the Kerry Sterner plan and Belair Short kit.

It is of traditional wooden construction, finished in glass cloth and epoxy resin and is fitted with Sierra retractable



15: Bury Clubman Dave Wilson exhibited this wonderfully flashy Air Racing Texan. 16: E-Flite Piper Cub, 62" span, 3lbs 2 ozs and owned by Christine Evans.

undercarriage. Power source will be powered by a Wren Gas Turbine in the 80-120 size. She weighs 25 lbs and is 94 inches in span. To get this far took 450 hours.

Grumman F9F Panther

This quarter-scale gas turbine model from Dave Swarbrick looked very sharp in its US Navy scheme. The Panther spans 116 inches and was fitted with a 48lbs thrust engine. It weighs 56 lbs.

The Tyldesley Club

There were a number of other very appealing scale models dotted around the hall, beyond the LMA area. One excellent stand was the Tyldesley Club's camp. My mate Andy Ellison (better known for his gliders these days) and teenage son Daniel Goulding-Ellison (best known for his cool hairstyle) brought along two very nice scale models.

The first was a 2.4metre span Stolp Starlet, owned by Dan-The-Man, built to

one-third scale, and powered by a 33cc petrol engine. Further along their extensive Club stand, was Dad's Extra 300SX. This was 2.4 metres in span, weighed "11500 grams" (!) and was fitted with a 100cc petrol engine. Really it is semi-scale, but it was so cute, that was alright with me.

The Bury Club

The Bury Club had another excellent stand, full of great models. However, one scale aircraft that took my eye was Mike Walters' Saito .70 FS powered RAE Be 2c. This was the camera plane variant, so I took its picture! Another scale model - and extremely rare - was a 1931 Pitcairn PCA-2 Autogyro. Apparently, famed Amelia Earhardt flew one from coast to coast in the USA in the Thirties. This excellent (uncredited) model was built from the Whirlybird Aviation kit and is powered by an O.S. 81 Alpha four stroke. It is traditionally built and awaiting its



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maiden flight. A lovely, inspiring model. By the way, Bury Clubman Dave Wilson had a wonderfully flashy Air Racing North American Texan. This glossed up AT-6 really did look a treat!

Wet Wings Club

Wet Wings is a brand new floatplane club in the North West of England, with its home waters at Carr Mill and Taylor Park, St. Helens, Lancashire. (For environmental reasons, they are an all-electric Club). Interestingly, one scale model was a Sunderland Flying Boat. There was also a truly exquisite (Sebart) Macchi-Castoldi MC 72 Schneider Racer. This spanned 60 inches and weighed in at 6lb 5 ozs. Another colourful model was a Dynam ARTF 1/24th scale Catalina Flying Boat. More details soon because I am

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scheduled to visit this refreshing Club in the next few weeks. Stay tuned for some wet, wet, wet, scale action!

Trade support

Once again Horizon Hobbies demonstrated their support for aeromodellers at such shows by providing oodles of eye-catching ARTF models, many of them scale. Their little Spitfire foamie was especially cute. Of course this is a Distributor's Stand, so nothing is for sale, but the Horizon staff answered all my questions cheerfully and with good product knowledge. I was also delighted to see the full range of their Zenoh petrols and Evolution radials on show. They even had their new 10cc Evolution petrol engine. This little gem must surely have a bright and economic

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future in scale modelling!

Sole Trader

There were lots of tool and model engineering tooling stands that caused me to splash lots of my carefully husbanded 'workshop' money. However the only trader with any aeromodelling connections I spotted was RC Choppers - not our scale side of the street, but full marks to them for attending.

The verdict

I really enjoyed my day out. I paid to get in with my own money, the catering was not too expensive, and there were immaculate toilets en suite. There were ample places to sit down, and I spent a lot of moolah across a wide variety of stalls. The range of scale models was impressive,

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17: Daniel Goulding-Ellison's 2.4 metre span Stalp Starlet; one-third scale, powered by a 33cc petrol engine. **18:** Uncredited, colourful Dynam ARTF 1/24th scale Catalina Flying Boat on the Wet Wings Club stand. **19:** Wilga Glider Tug by Shelagh Russell. 1/3rd scale model spans 110 inches, weighs just 25 lbs, and is powered by a Zenoh 62cc petrol engine. **20:** Stunningly lovely Stinson Voyager 150 on the LMA stand. Love it, love it, love it. **21:** Ian Russell's excellent Cessna 182 .1/3rd scale, 120" and weighs 31 lbs. Powered by a CRRC 55cc petrol engine. **22:** Harold Dowbekin and Phil Cross were exhibiting this very impressive 1/3rd scale Cessna L-19 Bird Dog. **23:** This 1/5th scale DH Vampire was built as a commission by Dave Jones from the Kerry Sterner plan and Belair Short kit. **24:** Cute ARTF electric Spitfire I snaffled for the photo from the Horizon Hobbies stand.



25 Mike Walters' Saito .70 FS powered Royal Aircraft Factory Be 2c. This is the camera plane variant. **26** Dave Swarbrick's Panther spans 116 inches and was fitted with a 48lbs thrust engine. Weighs 56 lbs. **27** Hugely impressive BN Islander from David Bell. 1/3 rd scale / 5 metre span, and weighs 85 lbs. Designed by Richard Hughes of Falcon Aviation. **28** This new Evolution 10cc 'small block' petrol engine from Horizon will make waves!

and the parking was adjacent and free. What more do you want from a commercial show?

Footnote

Word has come down from Meridienne, the event organisers, that this show will not run next year. This was a surprise to many, since this year's Exhibition appeared to be so well organised, and so well attended. This also begs the question about what the LMA will do - if anything - for next Spring's LMA Season Starter. It seems that a return to the Bradford venue is not on the cards, and Haigh Hall is too small. So we scale types 'Oop North' will have to be patient, and see what emerges. Naturally, we have to accept that the LMA has to take a realistic view of costs, logistics, and expected attendances. Personally, I miss the feeling of 'occasion' fostered by the LMA's traditional, northern and dedicated LMA Spring Symposium. We shall see. ■

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Techno Scale

Mike Evatt br

The DH Vampire was the 2nd jet to enter service with the RAF and was unusual for the time in that it was powered by a single jet engine, this allowed for a small and lightweight fighter aircraft.

HobbyKing at www.hobbyking.com have the passion to drive them to bring you the very latest at the best price possible. The Durafly Vampire, available from HobbyKing, is made from tough EPO foam and is superbly finished with water-slide decals. As well as looking the part, it is easy to assemble, being Plug N Fly, the EDF unit, ESC, UBEC and servo's are all pre-installed. Jets are about performance and the Durafly Vampire will not disappoint.

Gordon 'Tim' McKay is passionate about micro electric powered radio control model airplanes and has devised a website at

<http://indoorflyingmodel.com> to help you make the most of these amazing models. Indoor aircraft, with their low vibration electric motors and slow flight characteristics in the no wind environment of a typical indoor flight venue, are

ideal candidates for scale model airplanes.

Tim's website, which has over 200 pages of original content, will help you to understand this new breed of radio control model aircraft. A discussion is included reviewing what full size aircraft would make great indoor scale models.

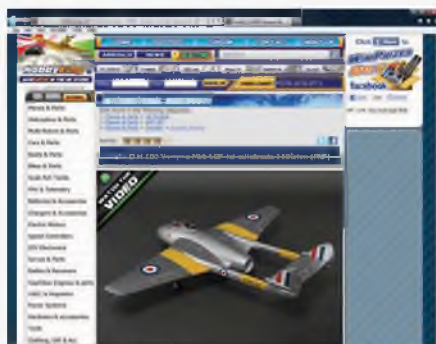
Profil2 is a software developed to help the 'do it yourself' modeller to find the correct airfoil for their application, drawing, plotting or printing ribs for wings with complex geometry and much more. However the website at www.profil2.com does offer something more! It has a plan library which allows free downloads. A quick browse allowed me to find the plan of the German 'Fafnir' Scale Sailplane dating the 1930. What will your search reveal?

South East Berkshire Radio Flying Club is a group of like-minded individuals who enjoy the common interest of flying radio controlled model aircraft. They fly both conventional IC and electric models and there are two members with jet powered models. The club is affiliated to the British Model Flying Association and fully

subscribes to its rules. The club has eleven resident instructors and five examiners. Their web presence at www.sebrfc.org.uk reveals lots of excellent extensive photo galleries with lots of scale content.

Jet Model Products with a web address of <http://jetmodelproducts.com> are well worth a visit for their excellent 85 inch span T-33 Turbine powered model. It is not cheap but it is truly astonishing. If that wasn't enough their latest venture is not a jet! It is the Douglas SBD Dauntless scout/dive-bomber which became forever famous during the Battle of Midway. JMP has taken on the challenge to create the finest all-composite warbird kits ever produced. A 5-cylinder RCS 400cc radial engine will power the SBD. The 39" x 30" pitch 3-blade flying scale propeller is accurately shaped in profile and diameter, with an exact reproduction of the Hamilton Standard hub.

Thinking of making your own jet turbine? Then visit **John Tomlinson's Jet Engine Plan** pages at www.john-tom.com This website offers much basic information about jet



The Durafly Vampire, available from HobbyKing is made from tough EPO foam.



Tim McKay is passionate about micro electric powered radio control model airplanes.



The plan of the German 'Fafnir' Scale Sailplane is found on the Profil2 web pages.



Lots of scale content on the South East Berkshire Radio Flying Club's website.



The Douglas SBD Dauntless is Jet Model Products latest venture.



Thinking of making your own jet turbine? Then look no further!

Browses the web for more TechnoScale Topics...

turbines and their design and manufacture. There is also information about pulse jets, ram jets and pressure jets, as well as plans for a reproduction German V1 Pulse Jet Engine. This type of Pulse Jet was used to propel the V1 flying bombs during WW2 - which was the predecessor to the modern Cruise Missile.

Larry D. Wolfe, President of **Jet Hangar International, Inc.**, has been in general aircraft modelling for over 40 years, and with ducted fan modelling for approximately 35 years. His website at www.jethangar.com reveals a beautifully detailed ARF MiG-15 from N-Tech Jets. This is a high-performance model! The MiG-15 is designed for experienced pilots and builders. And while it is an ARF, it does require a degree of setup and assembly knowledge. You do not have to be a Jet Pilot to fly the MiG-15, but you need to be an experienced R/C pilot.

Staying with jets of yesteryear a little longer - log-on to **Boomerang Jets** at www.boomerang-jets.com and take a look at their superb 1/6th scale replica of the world famous Hawker Hunter. This delight is of fully moulded composite

construction and is designed to suit turbines of 100 to 120 Newtons thrust. Developed from the original design of world famous scale modeller Mick Reeves, a great deal of work has been expended to produce an accurate scale model that can be owned and flown by any competent model jet pilot.

www.hooked-on-rc-airplanes.com is the web creation of **Matt Brown**, a self-confessed aeromodelling obsessive. As Matt says - he doesn't claim to know everything about flying RC airplanes and is far from being a great pilot. But he can say that he is completely addicted to flying RC airplanes and loves promoting the hobby. To that end this website works on many levels. It is the ideal information source for the novice scale enthusiast. The screen-shot shows a superb 1/6 scale version of the Royal Aircraft Factory S.E.5 WW1 British fighter.

I also enjoy returning to the **Icare** website at www.icare-rc.com This Canadian venture always surprised me with something that I had previously missed such as their 1/4 scale Lunak. The Lunak was built in the early 50's, in

the Czech Rep. It was used as a trainer for future jet pilots or in local clubs for gliding and aerobatics. It had very impressive flying characteristics with a win at the World Championship. Only five aircraft are still in existence around the world from over 200 built.

www.creativesweb.co.uk/clayton is the new URL of Clayton Green Indoor Fliers. Indoor model aircraft flying has taken place at Clayton Green for many years, well before indoor radio flying was a real possibility. The group is made up of like-minded model aircraft fanatics who come together between the months of September to April to have FUN! Clayton and meetings at the Manchester Velodrome are literally the last foothold that free flight competition and lightweight flyers have in the North West of England, so they hold friendly competitions at the meetings and the number of flyers participating is growing. Younger flyers are also joining in, which is really encouraging. More power to their elbow!



A beautifully detailed ARF MiG-15 from N-Tech Jets.



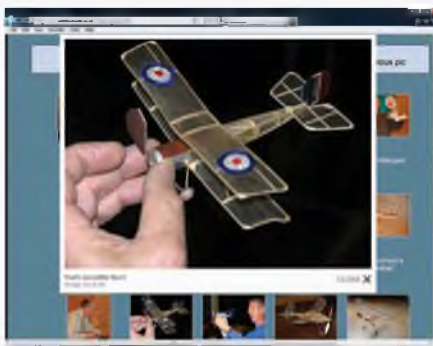
1/6th scale replica of the world famous Hawker Hunter available from Boomerang Jets.



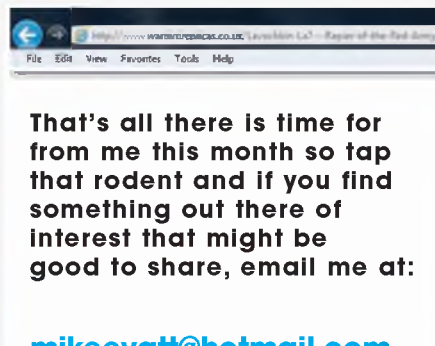
A superb 1/6th scale version of the Royal Aircraft Factory S.E.5 WW1 British fighter.



A 1/4 scale Lunak from Icare.



Clayton Green Indoor Fliers have a new web address.



That's all there is time for from me this month so tap that rodent and if you find something out there of interest that might be good to share, email me at:

mikeewatt@hotmail.com

THE QUIET ZONE

R/C SCALE ELECTRICS BY PETER RAKE

Yes, it's no use you complaining, that flippin' bloke is back again to bend your ear about the joys of electric flight. Although, with that said, about the only 'joy' at the moment is that small electric models can be flown in the relative comfort of indoor venues. Spring has, supposedly sprung, without actually looking in the least different to winter. In fact as I write this, there is only one day to go before we alter the clocks to BST. Good grief, someone has to be taking the Mickey somewhere. No, just for a change, it isn't me.

Anyhoo, what delights do we have lined

up for you this month? Well, no doubt the experienced builders amongst you will be relieved to hear that it doesn't involve advice for novice electrolytes. Then again, you may not be quite so pleased to hear that I feel it's about time for an update about what you can expect to see by way of plan articles over the coming months. Oh well, you can't win 'em all. Besides, it's what you're getting, so learn to live with it.

At Rake towers...

Towers, Manor, who cares? I change it almost as frequently as I change my socks - at least twice a year. (Even when they

don't need changing.)

I must admit to being somewhat remiss of late when it comes to getting plan articles sorted out and submitted. They're all here on my computer; plans, articles and photos by the hundred. It's just that I seem to have been a bit distracted lately and haven't gotten around to sorting them all out into any sort of meaningful order. I know, it's terrible of me to ignore them in this way. However, I've been building models of my own and, since this is actually supposed to be my hobby (not annoying you lot, as you thought it might be) I decided to take time out from drawing plans for others to build and draw up some models I wanted to build. At least then, if they don't get built I only have myself to blame.

The down side of all this frantic drawing and building activity is that the models I want to build are quite small. For me the advantage is that they are quick to build and don't take up vast amounts of space once they are built. The disadvantage, as far as the wife is concerned, is that they tend to be coffee table building projects. No you twit, I'm not building dozens of coffee tables, just building models on the one coffee table we already have. Oh, alright then, I'll confess. The coffee table, the computer desk and the dining table have all been pressed into service at one point or another. In fact, at the moment I have one completed model sitting on my printer, along with a partially finished little foamie and six other foamies, in various stages of completion alongside the desk. As for the dining table, it's just as well we usually eat at the coffee table. You can barely see it for bits of Depron, scales, assorted micro radio and transmitters. Yes, my wife is truly a saint to put up with my foibles. So far I've been lucky, I was able to convince her that since it's column related, it counts as work. Sneaky, or what? Not, of course, that I'm at all convinced that the lunacy that passes as any column I write can really be considered work.

So, having briefly described the mayhem that has taken over our dining room, I suppose I'd better get onto models you can expect to see featured here in the

JUST A FEW OF THOSE PESKY FOAM MODELS THAT HAVE BEEN GETTING IN THE WAY OF SORTING OUT CONSTRUCTION ARTICLES. THE LARGEST, THE MORANE, IS AROUND 12" SPAN.





ABOVE: Somehow I don't think Richard's Waco will get off from that terrain. The 36" model took a while from being drawn up to getting built. **RIGHT:** A smooth and stable flier, the little Waco 9 shows off her attractive lines.

not-too-distant future. I solemnly promise to get on with preparing the articles, but can make no promises about what will appear, when it will appear and whether it will appear as a free plan or just a plan article. The trouble with people asking for bigger models is that they can't always be persuaded to fit into the right size sheets to be free plans. The first one we look at, however, not only fits free plan format, but is all sorted out and submitted to the editor. True, only just before I started writing this, but it is submitted. Now get off my back and let me get on with the matter at hand.

Waco 9

The route to this model was actually slightly convoluted. (What, in my life, isn't?) It began with a request for a 45" model, which was duly drawn up but has yet to actually reach completion. Not too long after that, someone else asked if it would be possible to scale it down to 36" span, and solemnly promised to build the prototype if I would prepare the plans - you know how it goes from here, the plans were drawn and files sent to the prospective builder - who promptly dropped off the face of the earth. Which is what I was referring to with the comment about only having myself to blame if models I draw

specifically for myself don't get built.

Anyway, the plan hung around for what seemed like an age and then Richard Hopkinson came to the rescue with an offer to build the prototype model. Eventually, almost two years after the design was drawn up, I was able to submit the finished article to the publishers.

Richard's model is, as you may have gathered, 36" wingspan and uses four function control to guide it through the skies. Covered using *Polyspan*, an interfacing type material that you glue to the structure, heat shrink and seal with dope (or something similar), the model is finished using *Humbrol* paints.

Richard is very happy with the way his model has turned out and the result is an

attractive looking little biplane with enough detail to add interest to what could be an otherwise fairly plain model. His dummy engine, radiator and rigging really set it off nicely. The glassed foam spinner proved relatively simple to produce (albeit somewhat messy) and proved not to require balancing for it to work well. The secret with these items is not to be tempted to use beaded foam. If you do, you are likely to find beads of foam pulling out during the shaping process. Then, of course, when you glass the spinner those voids fill with resin and cause all sorts of balancing issues..

As regards how the model flies you'll have to wait for the article to appear to get the full story. However, let it suffice to say that Richard was sufficiently happy with the



ABOVE: An exercise in printed tissue technique, lightweight building and imaginary detail, the author's 18" span Eastbourne Monoplane. **RIGHT:** As you see, the weather did improve and I was able to test fly the mini Eastbourne and it performed pretty much as anticipated. Some models fly well no matter what size they are.



result to take on another prototyping task for me. The Waco is smooth, stable and capable of mild aerobatics, should the mood take you.

Over to me

As I said, I've been working on some small models, and the one I'm about to refer to is actually sufficiently small that the plan could appear as a centre spread style item. When I say *small*, that's precisely what I mean. This 18" span Eastbourne Monoplane is actually the model I mentioned as currently sitting on my printer.

As with others of its ilk, it is really nothing more than a reduced size version, suitably modified, of another of my designs. I had rather enjoyed drawing up and building another similar sized model and, remembering how really nicely the original Eastbourne model flew, decided I had to try a smaller one.

Tipping the scales at a mere 30.5 grams ready-to-fly, it features a Vapor 'brick' for control and a geared 7 mm motor for power. A nondescript single cell LiPo (salvaged from a little helicopter that had seen better days) provides the energy and the puff comes from a GWS style 4.5x3 prop.

Pushrods are just carbon rods, with wire ends held in place with heat-shrink tube

and CA. The wheels are some wooden ones I discovered hiding in a box of bits (while actually looking for something else) and the rigging cables are nothing more technical than sewing thread. The landing gear and rigging pylons are more carbon rods, bound with thread and glued with CA to prevent them falling apart.

The model is quite simple to build and has been deliberately kept simple in appearance. Detail is minimal and the model was actually used as a test-bed for some printed tissue experiments I'd been carrying out. As such, the dummy engine is nothing more than a piece cut from a lip-gloss tube (the wife's, not mine - the shade didn't suit me) with some Peck Polymer cylinders glued to it. Very basic, but it fills the space where the engine should be. Similarly, the instrument panel (about which I could find no information) is just something I drew up on the computer, printed and stuck in place using glue stick.

I'm really enjoying playing around with printed tissue finishes. Using lightweight Esaki tissue and waterproof ink (I have an Epson printer that uses DuraBrite ink) is really good for these little tiddlers. You can apply as much 'detail' as you like without adding weight and the waterproof ink makes water shrinking the covering a simple matter.

Therefore my little model features stitching (not actually on the full-size aircraft) wood grain areas, panel lines and rivet/bolt detail, all printed onto white tissue. I love the obvious 'model' nature of the finish and can see more of these in my future modelling projects.

Unfortunately, I'm still awaiting a break in the terrible weather before I can test fly the model. However, every other size of the design has performed nicely, so I doubt this one will be any different. In fact, given a little reinforcing at the rear (for the motor peg) I actually think this might make a rather nice little rubber power model. Maybe I'll try one myself.

Getting bigger again

Yes, it's yet another re-sized version of a model I've already designed. Sorry, sometimes it's just quicker to do that when someone asks for a model to prototype. Besides, at just 36" span the original design may well have proven too small for a lot of people. With that in mind, when asked for more designs, it was a relatively obvious move to increase the size to 45" span. I built the 36" version and found it to be a very nice flyer on calm days. This one just had to be as nice, but better suited to less than ideal conditions.



The enlarged version of my Moska MB bis design, built by Clancy Klein. At 45" span this is another model that scales well and may yet end up as another 18" tiddler.



ANOTHER SMOOTH FLYING MODEL, ALTHOUGH THERE WERE SOME BALANCING ISSUES TO BEGIN WITH.

What model am I talking about, the *Moska MB bis*, of course. This time around though it was built by Clancy Klein. The original aircraft was a Russian, WW1 scout with folding wings and tailplane halves so it could be transported on a cart. Armament was whatever could be obtained mounted on whatever they could come up with. In the case of the prototype for the smaller model, this was a bipod style bracket with the gun angled upwards at about 45 degrees to clear the prop. Clancy, by way of contrast, has left his unarmed.

Although the original aircraft featured folding wings and tail, the model most definitely does not. It is a nice simple model to build, with the only real complications involving the laminated outlines of the tail surfaces and the linked twin rudders. However, since neither posed a problem with the smaller model, I could see no reason for them to do so at the larger size. As anticipated, they did no such thing.

Covered with *Lifespan* (or its' US equivalent) the model has turned out rather nicely. I've seen videos of it flying

and, after initial balance issues, it flies every bit as nicely as my original model. Clancy's flying partner, his dog 'Bear', obviously agrees because in every video I've seen he's there chasing it as it takes off. Definitely an experienced flier, 'Bear' never actually catches the model, being content just to chase it until it's airborne.

And finally...

No, you aren't sufficiently lucky that this will be the final, final comment. Just the final part of this particular edition of the column. Sorry, it's a hard old life, isn't it.

Since I've mentioned 'scaling' a design, and people asking about that, I thought I'd just explain why it isn't the simple task many seem to think it is.

Okay, if it's a pretty simple, slab sided model it isn't that bad. It's the more complicated structures that make it a complete pain to do. A lot of people seem to think that because a plan is drawn using CAD you only have to resize it for it to work. All CAD really is, is another way of drawing that doesn't involve pencils, pens and reams

of paper. The basic result is exactly the same as a paper drawing, but without the paper.

When you scale a CAD drawing, everything except line thickness changes. Unfortunately, it almost never changes to an actual wood size. So, unless you are really keen on stripping all your own wood to non standard sizes, every slot, notch and cut-out has to be redrawn to suit sizes of wood that do actually exist. Basically, the only parts of the original drawing that remain useable are the outlines.

Absolutely all the structure has to be drawn again if it is to result in a model that can actually be built using stock wood. Stock wood of a size actually suited to the model, which may not necessarily be the size the original scaled to. CAD is a wonderful tool, but it doesn't perform miracles. That, I'm afraid, is down to the person using it.

Should you wish to contact me, even if only to tell me to shut up (not that I'll take any notice), you'll find me at PETERRAKE@aol.com



Come on Bear, you wouldn't know what to do with it if you did catch it.



No, not posed among boulders, just the concrete path landing scale to the little Eastbourne Monoplane.

Classifieds



For Sale

Soviet Aircraft and Aviation 1917-1941, by Lennart Andersson (Putnam 1994). Very good condition.

Price: £20 inc., postage.
Contact 01484 711406

SKYWAYS Magazine. The Journal of the Airplane 1920-1940. Packed with Early Aviation Information. 11 Issues 1 - 12. No issue 6. Offers and more details a_c_usher@yahoo.co.uk

ENGINES -

E.D.Bee, paw 1.49, Am

25 and cox texaco 0.049,
All £25

Co2 motors -
Cox 0.49 With co2
conversion £25. New model
teknik gm-300t twin with r/c
throttle £60

Gasperin g-24 (new) £25
Brown campus a-23 (new)
£30. 2 Telco co2 motors £15
each. Ceto micro receiver
& 4 servo to work with
futaba transmitter £50
13 Scale aircrafts 18-28 inch
spans suitable for rubber or
co2 power - £50 the lot

All items collectable or plus
p&p

Contact: Malcolm wallis
01262 420611 (east yorkshire)

Model aircraft, Hi Boy
62.5" wingspan with engine
and servos, concept 3D
helicopter with engine, servos
and gyro. PCM high quality
5 channel radio model Net
J35P electric engine starter,
purpose made spares
tray, control panel, fuel
pump used very little and
in excellent condition. New
batteries needed.

Price: £350 ono.

Contact: 01787 228133.

Wanted

Rustler Tiger Mk3 in
excellent condition.

Contact: 07876 447246.
steve@drennan999@
btinternet.com

KeilKraft "3/9P" kits
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Chevron boxes only. High
prices paid. Plan copies
would be helpful if kits
unavailable.

Contact: 02392 527202.

Can you help? Old FSM's needed!

We need your help! Here at the Flying Scale Models office we get questions everyday from readers about past articles we have featured - but unfortunately we do not have a full set of back issues from the previous publisher - can you help us with any issues you might have? We are looking for the below issues please - if you can please email: alan@adhpublishing.com or call 01525 222573.



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