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09

Flying Scale Models

09/11

GLOSTER GAUNTLET

Jeff Hartnoll's 1/5th scale masterpiece

PART 2

SUBJECTS FOR SCALE...

BOEING P-26 'PEASHOOTER'

With: Scale Drawings & Colour Schemes

FLYING LEGENDS 2011

HOW TO ...

PRINT WW1 'LOZENGE' CAMO ONTO FABRIC COVERING

PLUS: LOZENGE CAMOUFLAGE CONUNDRUM
Authenticating the system

MASTER MODELS

MONTY'S MILES MESSENGER
Communications aircraft

LOOMING LARGE!

LMA COSFORD SHOW ACTION

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FLYING SCALE MODELS - THE WORLD'S ONLY

ON THE COVER

The Boeing P-26 'Peashooter' was one of the early heralds of the end of the fighter biplane era. It is an aircraft full of 'character' and well worth consideration as a subject for scale modelling and one much overlooked. Our artwork depicts an example airborn over a smog-bound skyscraper skyline.

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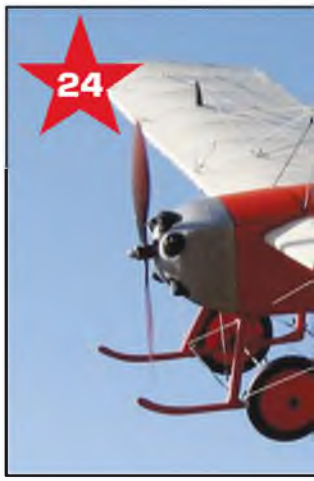


on...

MAGAZINE FOR SCALE MODEL FLYERS September 2011 No.142

Contact

The truly creative among the Scale modelling movement are constantly searching for new subjects to replicate in miniature that will take them beyond the staple 'norms' of Spitfires, Mustangs and Me 109s – or – if you are a WW1 era buff, the SE5a, Sopwith Camel or Fokker D.VII.

So we commend to all the creative types out there this month's *'Subjects for Scale'* presentation, the Boeing P-26 'Peashooter'. This was USA's first ever monoplane fighter to enter service and has a real 'presence' about it that is really worthy of consideration.

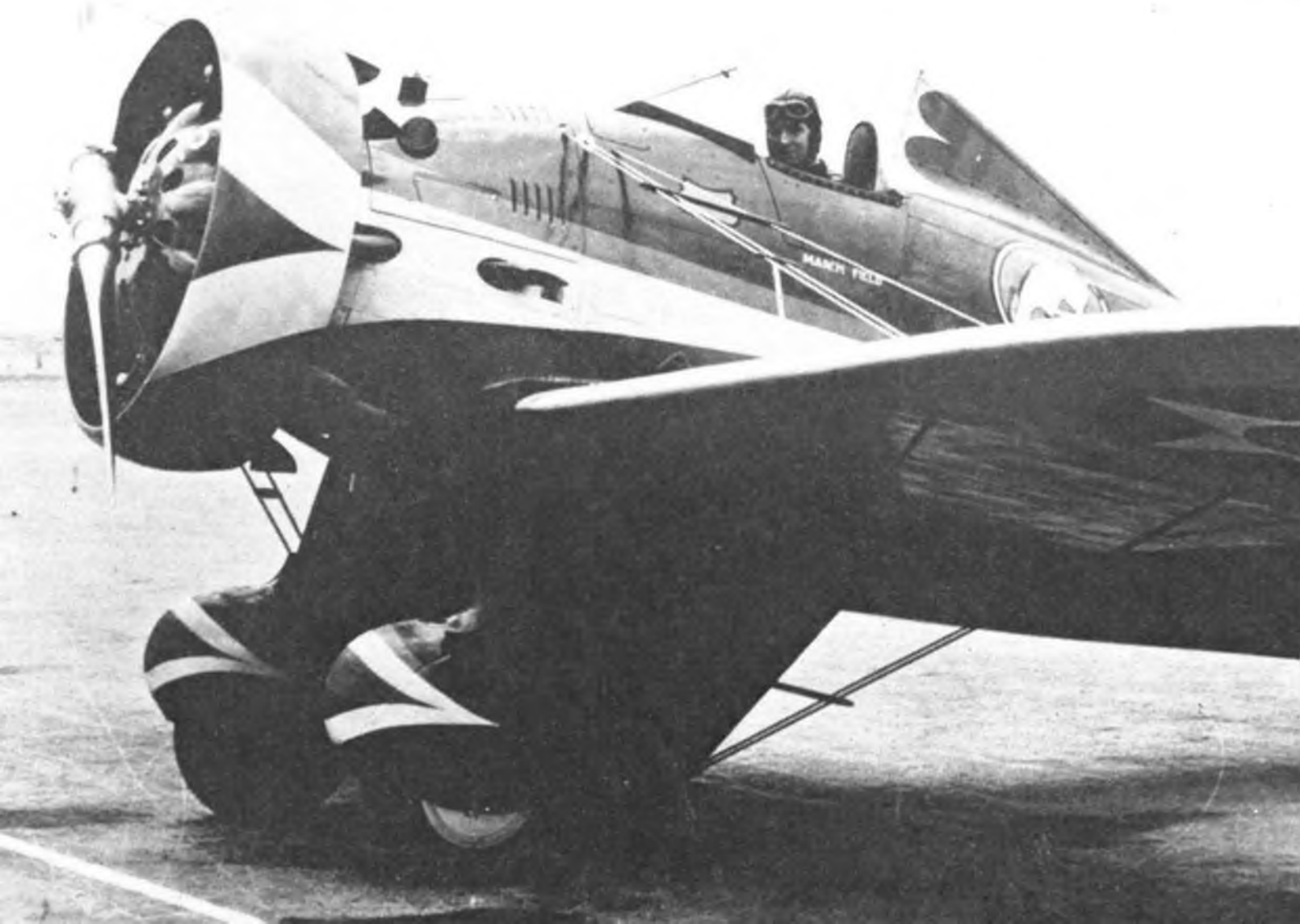
We've not seen a flying model of the P-26 since the first ever World R/C Scale Champs, held at Cranfield, UK, in 1972 when one of the German Team (it was actually West Germany back then) entered one. Will anyone give it a go?

The conundrum of the German WW1 'Lozenge' camouflage pattern has been raked over for decades and much careful and detail investigation has been undertaken by dedicated experts. In recent years fabric covering material has been made available for scale modellers but the range of scales in which the fabric can be supplied has been limited to 1/4 and 1/3rd scales.

Peter Rake's column this month has been given over to the technique of successfully printing the Lozenge pattern onto iron-on type fabric covering material using a common bubble-jet printer. Darrin Covington, who developed the technique, is to be roundly congratulated for this development.

As an addendum to the whole question of Lozenge camouflage, we've re-run the late Ron Moulton's piece on the subject that first appeared in FSM Jan/Feb 2001 issue and it is well worth repeating. Ron was something of an authority on this subject and went to great lengths to draw together avenues of research from many quarters to get a definitive answer.

One final word we would like to add to this particular subject concerns the practical expediencies of war that would have applied during the 1914-1918 period when the need the 'keep 'em flying' would have been infinitely more important than meticulous adherence to military standardisation. Thus, the 'fog of time' risks establishing expedient variations as part of that norm.



Stand-off Scale

One of the vexed questions of the R/C Scale circuit has been that of stimulating interest in competition events when many who might, perhaps like to have a go, tend to be discouraged by the works of the top experts, whose standards tend to be unattainable among us 'lesser mortals'.

One of the now discarded attempts has been 'Clubman Scale', that has now run its course and has been discarded from BMFA scale competition.

Now, a further attempt being developed by the BMFA's Scale Technical Committee is *'Stand-Off Scale'*. The term was originally coined by ex-pat Brit Dave Platt way back in the early 1970s as the principle of a less exacting Scale competition class, in which the model was static judged from a reasonable distance against pictorial documentation. The idea gained wide acceptance, particularly in USA. Now, a new set of rules for a Stand-Off Scale class is presently being formulated, hopefully for inclusion in next year's BMFA Nationals.

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Key Publishing is pleased to announce the launch of an exciting new aviation special magazine. RAF Salute 2011 is a 100-page tribute to the incredible heritage of the RAF. Produced by Key Publishing's industry-respected team and covering topics from the first UK Jet to the last of the Spitfires, RAF Salute 2011 presents a unique blending of the history of the RAF and its present-day capabilities and assets.
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Next month in... FLYING SCALE MODELS

Our major feature for the October issue of FSM will be Gary Sunderland's 1/4 scale model of the elegant Nieuport 27, that sharp little WW1 fighter with all the neatness of the Nieuport 17, but with a rounded fuselage. We'll be backing it up with scale drawings and the history of the full size and also hope to offer a set of cut parts for those keen to get a head-start on a worthwhile winter building project. A reduced size plan set, at 1/5th scale, for those who want something a bit smaller, will also be available.

FSM OCTOBER ISSUE – ONE SALE FROM SEPTEMBER 8TH

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CLUBMAN SC

Mon

Chris Peers' fabulous 122" span Miles Messenger.

ty's Messenger

Chris Peers' stunning Miles Messenger communications aircraft in the colours of Field Marshal Mongonery's personal aircraft

Let's start with a mystery. Chris Peers did not build this fabulous model alone. He had a mysterious and elusive co-builder, who wishes to remain anonymous. Now, as it happens, as an ace reporter, I tracked down the chap in question. He's a great bloke, and a very gifted aeromodeller, but his identity must forever remain a secret! (Like The Stigg really!)

Miles better

George Frederick Miles is one of the creative genii of British aviation. Look at just a few examples from his back catalogue if you doubt me: the Miles Magister, the Miles Hawk, the Miles M.20, the Miles Martinet, and the Miles Master. Clearly, Miles was never frightened to push the envelope of the possible, and some of his designs, like the Miles Libellula, were downright quirky.

However, they all flew well, and some. like the Miles M.20, could match the performance of a Spit or a Hurricane, despite having fixed landing gear! Next to that, the Messenger series was almost conventional. They came from the existing Miles Mercury bloodline. This led to a cantilever low wing design, expressly conceived as an observation and communications aircraft. To match British Army requirements, it had to be tough, economic, and low in maintenance costs. It was originally powered by the De Haviland Gypsy 1D in-line engine, and proved to have good small-field performance. Unfortunately, when official orders came, they were light, and only a few were bought by the RAF. Their most illustrious passenger was Field Marshall Sir Bernard Montgomery, who used a Messenger as his personal communications aircraft. Lord Tedder also had a Messenger.

After WW2, the surviving examples were returned to the civilian register. Indeed, a Messenger won the Kings Cup Air race in 1954, at a speed of 133 mph. The Messenger is closely related to the Gemini Twin and the later Aerovan series of designs.

The model

This Messenger is entirely scratch built. She weighs 38 lbs, and spans 122". She is modelled on, and finished in the colours of Monty's famous aircraft. The whole construction is entirely traditional with lots of balsa and some ply, and one or two glass reinforced plastic mouldings. The Messenger demonstrates that although the

The bold invasion stripes add just a bit more military drama to a superb light aircraft.

Corr! Chris and his mysterious mate have produced a truly fabulous model aircraft.

Traditional dope and tissue finished with enamels cannot be bettered.

Distinctive Miles flaps; note footwell inboard.

Accurate dual venturis, a feature of Field Marshall Montgomery's personal transport are fabricated from tin sheet.

All the fastenings on the Messenger, like these panel securing screws, are faithfully executed.

The model has been very carefully thought out in terms of structural integrity to support such a huge door apertures.

This flying shot shows the distinctive flaps to good effect. A later marque had fully retracting flaps.

quality of traditional building methods may sometimes be approached by newer methods, they cannot be excelled.

Cowl

This is a home made fibreglass moulding made from a hand-carved plug. The neatly executed piano hinge is real and not simulated.

Canopy

This too was carved from block balsa, and then the transparent sheet plastic was heated, and hand drawn over the block to take up the shape.

Undercarriage

Much of the scale fixed undercarriage, complete with dampers and shock absorbers, is fabricated on a Myford ML7 lathe. The milling and some larger items were accomplished on a 3-in-1 Lathe / Milling Machine. The steerable tailwheel assembly is fabricated from steel strip and rod. The wheels are *Sullivan Skylites*, with home made scale hubs.

Dummy pilot

This is a modified Hangar 9 pilot from a 1/4 scale Cub.

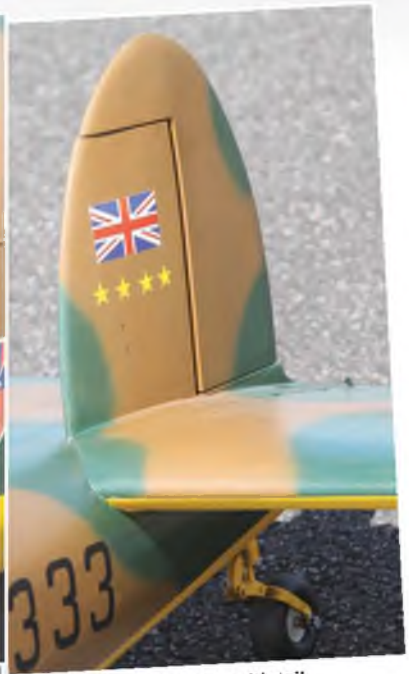
Engine

The Messenger is fitted with a CRRC 50 petrol engine driving a 22"x10" propelle and with that set-up, is not underpowered. The home-made, totally-enclosed exhaust is fabricated from 2" brass tubing and commercial end caps. There is a small aluminium baffle to direct cooling air over the

The Messenger's distinctive trade mark triple fins and triple rudders.

Exact and completely functional oleos and drag link. Made on a Myford lathe and a multi-purpose mill /lathe.

Within the slim cowl: the CRRC 50 petrol engine and its totally enclosed fabricated brass silencer. 22"x10" prop.



Central fin and rudder with tail-wheel below.

ABOVE: Only the venturi gives it away.
BELOW: Miles Messenger taxying back from the runway.

engine fins. The engine does not overheat.

Radio control system

Control is achieved via aileron, engine, throttle, rudder, and flaps. The working flaps have full-scale operation

Painting and finishing

The model has a traditional dope and tissue finish, with many coats of sanding sealer and, quoth Chris: "Weeks and weeks of interminable sanding down". The Messenger is painted with Flair enamels, and fuel proofed and sealed with Ronseal Satin Varnish, which clearly does what it says on the tin! This was thinned down

MILES MESSENGER FULL SIZE

ROLE: Liaison and private owner aircraft
MANUFACTURER: Miles Aircraft
FIRST FLIGHT: 12 September 1942
STATUS: There are examples still flying
PRIMARY USERS: Royal Air Force, Private owner pilots
PRODUCED: 1942-1948
NUMBER BUILT: 93
DEVELOPED FROM: Miles M.28 Mercury

Huge amount of scale detail around the cabin exterior distinctive flaps to good advantage.

Model Specification

Span:	122"
Weight:	38lbs
Engine:	CRRC 50 petrol
Propeller:	22"x10"

and sprayed on.

The non-slip tread panels on the wing are cunningly made from emery paper, applied with Evo-Stick. Rivet detailing is achieved by heating up a brass tube held on the tip of a soldering iron, and then pressing it into the paint finish. The impressive under wing venturis are fully fabricated from tin sheet. The prototype had two ASIs and two venturis.

Pilot's notes

Chris reports that it soon became apparent on her maiden flight that she would fly like a trainer. When the flaps are depressed, she adopts a slightly nose-down attitude, but approaches can be achieved at little more than a walking pace. Chris reports that the controls are nicely harmonised, although to be truthful, she has a much broader speed range than the prototype. She has all the advantages of a warbird with all the charm of alight aircraft, plus that fascinating historical connection with Monty. ■

Chris and his Messenger at RAF Barkston Heath.

Literally, thousands of man-hours have produced a scale masterpiece.

Every last detail is accurately reproduced.

Meticulous rivet detailing around the cockpit, reproduced pressing a hot brass tube into the paint finish.

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Flying Legends 20

The annual *Flying Legends* event at Duxford is one of the pinacles of the of the summer air show season that draws a worldwide attendance. This year's show stepped a bit further 'out the the box' of WW2 warbird domination, with a welcome partcipation of pre-WW2 types that included a superb formaton display of 1930s Hawker biplanes with two Hawker Nimrod naval fighters, together with Hawker Hind and Hawker Demon all formating to the tune of Rolls Royce Kestrel engines! Meanwhile, in Hargar No.5, visitors were able to admire the superbly restored genuine Hawker Fury biplane, currently awaiting CAA clearance to fly.

Representative of the WW1 era were the Fokker Dr.1 Triplanes of Paul Ford, John Day and (over from Sweden) Mikael Carlson, plus a Nieuport 17, all replcas, but a very welcome sight in the air.

1: Hangar-bound at 'Legends' awaiting flight clearance, fully restored authentic Hawker Fury. Something to look forward too! 2: One of the three Hisapno HA 1109 'Buchons' that flew formation. 3: Rare F4U-7 Corsair, distinguishable by the twin 'lip' air intakes in the lower edge of the engine cowl. 4: One of the two Hawker Nimrods that performed at this year's show. 5: Replica Nieuport 17 demonstrated how little sky these WWI types used during manoeuvres. 6: The Red Bull Lockheed P-38L Lighning tucks away its reardward folding undercarriage.

7

7: This year's Flying Legends gathered a trio of Douglas A4 Skyraiders - a thunderous fly past!

A more stately reminder of 1930s avaition on hand were the two DH 84 Dragons of Norman Aeroplane Trust and Aer Lingus, that formated with a DH 89A Dragon Rapide.

Notable this year among the 'heavier metal' of WW2 were four Curtiss Hawks, including *The Fighter Collection's*, Hawk 75, P-40B and P-40F, plus French registered P-40N. Another notable airborne sight were three HA-1112-M1L 'Buchons' (Spanish manufactured Messerschmitt Me 109s) and a very rare F4U-7 Corsair.

Another welcome sight, after an absense of probably 15 years was a P-38 Lightning, in the form of Red Bull's 'L' version.

Add eight P-51D Mustangs and nine Spitfires, ranging from Mk.1a to Mk.XIX and it all makes for a feast of classic aviation action. ■

8: 'Battle of Britain' show opener; Hurricanes, Spitfires and Me 109s en-masse! 9: Spitfire Mk.V tucks away its wheels in characteristic one-before-the-other fashion. 10: Trio of Haspano HA 1109s in tight formation display interesting variations of colour schemes. 11: De Havilland DH 84 Dragon, one of two in action at Duxford. 12 & 13: The BBMF Avro Lancaster made a solo appearance at the Sunday Show. 14: Awaiting the call to action; Nieuport 17 and Fokker D.VIIs - all replicas.

15: Keeping it neat and tidy - P-51D Mustang four-formation. 16: Hawker biplane resurrection - Nimrods (with the yellow bands), plus Hind and Demon two seaters. 17: Mikael Carlson's Fokker Dr.1 replica showed off its tight manoevrability in solo display after tail-chase with Nieuport 17 in pic. 18.
19 Red Bull's highly polished Lockheed P38L Lightning.

Scale Soaring

Spalinger flown; but not without drama and a realisation that there is no such thing as 'standard aileron differential

Maiden over...

The last time around we saw the 1:3.5 scale Spalinger S25a 2-seater languishing in the hangar, waiting for the weather to show some spirit of co-operation. The next possible opportunity was the occasion of the first of the White Sheet club's scale fly-ins at the beginning of May. Precipitation there was none, but there was no shortage of the ever-present wind, blowing in excess of 20 mph. (Funny how the wind is always double the value predicted in the forecast?) As a consequence, the Spalinger spent the day ground-bound until the desire to get-it-over-with overwhelmed the need to take-her-home-in-one-piece.

Thus it was that towards the end of the day she was removed from the relative safety of Terra Firma and thrust into the arms of the Laws of Fluid Dynamics. It

Scene from the author's 'SPALINGER REPRISE' video.

View of White Sheet from the Spalinger 2-seater.

was immediately obvious that my CG calculations in relation to the strange wing planform were somewhat out of the ball park, as she was somewhat 'tender' in pitch. No need for adult diapers though, as she was still reasonably controllable, enough for a couple of low passes for the camera before a nervously careful landing. A couple of evenings later saw her at my favourite local slope with an extra 1lb of lead up the blunt end. This time all was well, and the Spalinger proved to be a very nice beastie indeed, with no low-speed vices and capable of those delicious long, floaty landings that are such a feature of the particular Quabeck wing section I use on most of my designs. All the big questions about the wing-to-fuselage joiner arrangements have been answered and they have proved to work very well, and will no doubt feature in some future projects. As the next few weeks went by, opportunities to film the new machine arose and were gratefully taken, the result being, of course, uploaded to *YouTube*. So should your curiosity be aroused, you can see for yourself by

The S25a on its maiden flight.

ABOVE LEFT: **South African trio at Middle Wallop: left to right: Bobby Purnell, Dave Connelly and William Hoek.**
ABOVE RIGHT: **Dave Connelly's immaculate Olympia 2b in action.**

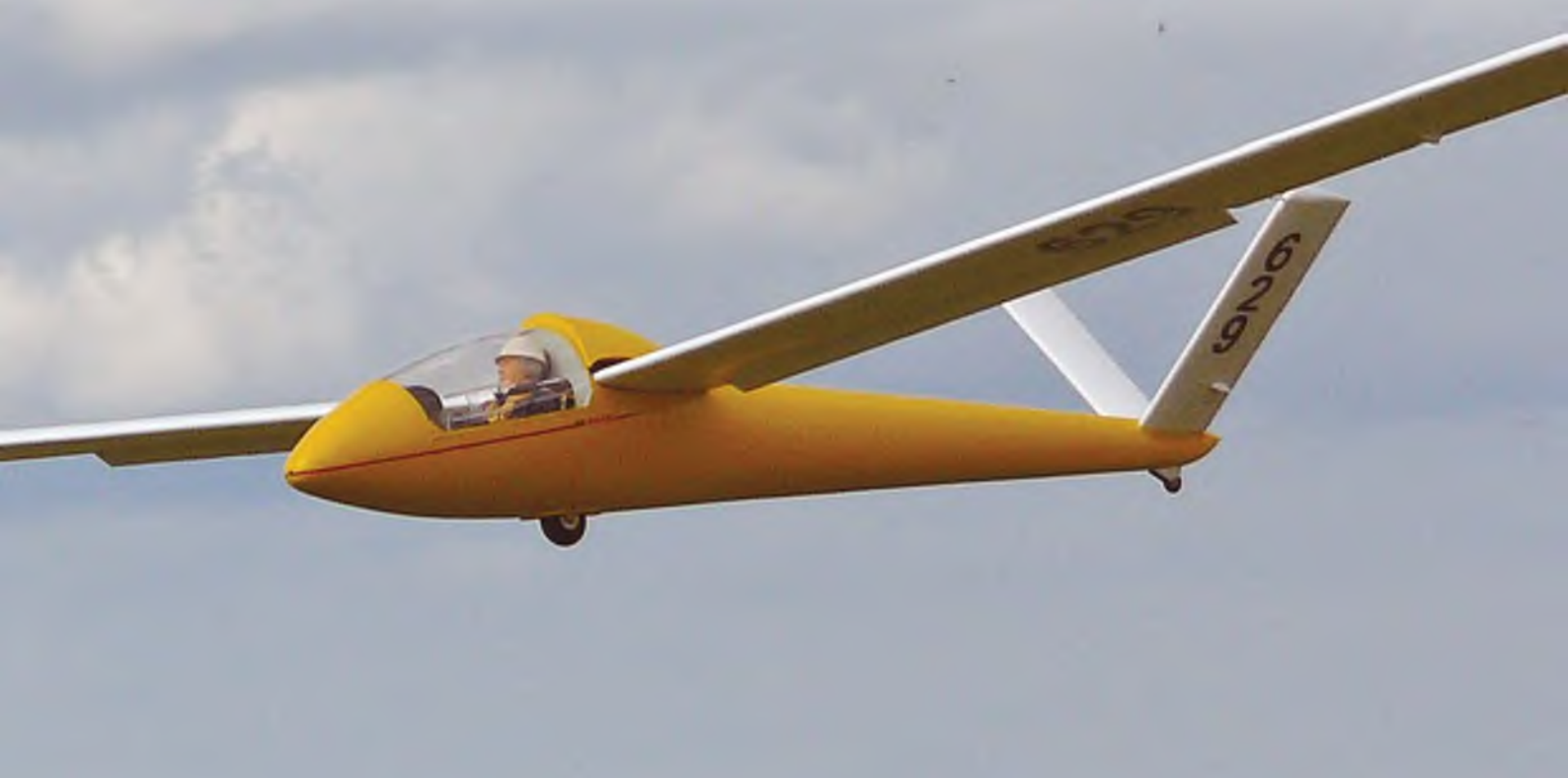
putting SPALINGER @ WHITE SHEET and SPALINGER REPRISE into the search box. (The second one features some beautiful views of the Dorset countryside at sunset).

TVSA Aerotow, Middle Wallop, 18-19th June 2011

True, once again, to their 2011 form, the treacherous Weather Gods did their utmost to curse the TVSA's best efforts with their Middle Wallop events. This time around, the forecast was so bad that the Saturday was cancelled altogether, the hopes instead pinned on the Sunday. As it turned out, the sun came out to play, and the ever-present wind took a breather in the afternoon, allowing some decent soaring to take place. This event has often had a world-wide draw for fellow enthusiasts, and this time around, the trio from South Africa seriously trumped Brian Sharp, who's journey merely commenced in Scotland. Dave Connelly is no stranger to these shores, and has entertained us with his very pretty Hall Cherokee for a while now, but as well has his SA pals Bobby Purnell and William Hoek, he had brought along a new Oly 2b, built to 1/4 scale and as immaculate as his Cherokee.

Brian had brought along his newly-repaired Moore Gypsy, a model that met its nemesis at this same event last year in a manner so dramatic that it snapped one of the steel joiner bars at the wing root, not a sight you see every day! I'm glad to be able to report that the Gypsy is flying as well as she did before. Over the winter we had been following the build of Clive Learwood's HW-4 Flamingo with some interest; none more than me as this looked to be the first one to be completed from my plan. In the event, despite some understandable pre-flight nerves, for the construction of such a machine is not for the faint-hearted, the maiden went off without a hitch, and Clive was able to clock up some serious air-time with his new glider. I look forward to seeing her in her final livery. Richard Alford has chosen to build a Rhonsperber representing the same full-size machine as mine, the only difference being that his is to 1/4 scale, and mine is to third. Although his is built from the Glyn Fontenau plan, he has chosen to use the same Quabeck wing section as I had, and it was interesting to compare notes. One common theme stood out:

Scottish modeller Brian Sharp's Moore Gypsy at Middle Wallop.



neither machine could be described, at least initially, as 'groovy' in flight, needing a fair bit of stick and rudder work to get a smooth-looking result. I have noticed this before with gliders that have a very short nose, as these examples do.

It was around about this time that I was having problems getting the Spalinger to turn smoothly and discovered, or rather, rediscovered something. With long wings, and large ailerons, vintage gliders are very prone to suffer from adverse yaw, and to counter this they are usually set up with differential on the ailerons. Without differential the down going aileron pushing into the higher pressure air under the wing creates more drag than the up-going aileron on the other wing, and this cause yaw in the opposite direction to the turn; in effect the glider looks nose-high as it turns. This was what was happening to the Spalinger, and I fell to musing about my blanket assumption that all gliders had a differential of 2:1, that is to say - twice as much up movement as down. I was more than a little surprised that when I programmed a 3:1 differential on the Spalinger, the turns were then transformed. Using coupled aileron/rudder is another issue, one that sometimes causes howls of protest, but tweaking this setting can have interesting consequences, too.

The upshot was that the Rhonsperber underwent a programme of fiddling-about-with that has ended up turning her in a proper, 'groovy' lady.

Talking of ladies, Antonia Gigg had brought her new, diminutive DG1001M to the White Sheet scale slope fly-in earlier in the year, where it was pretty much grounded due to an excess of breeze. This time around things looked a little more promising, and with the help of John Greenfield, this pretty little machine successfully took to the skies via a hand-launch. As if that weren't enough, she then went on to prove that ROG was perfectly possible with her patented foot-releasable bungee. As is usual on the Sunday at Middle Wallop, as the day draws to a close, and those with long distances to travel have wended their way home, the usual die-hards start to take advantage of the lack of queues and do some serious flying. I'm glad to be able to report that I was one of that happy brigade, and one couldn't help but reflect afterwards how lucky we had been to have had this brief oasis of calm in the unrelenting windiness that characterised the 2011 season thus far.

Congratulations, then, to the TVSA crowd for pulling it off, and for the excellent and hard-working tug pilots for pulling us up. The last Middle Wallop event of the season is scheduled for September, a month which, according to the poet John Keats, is a 'season of mists and mellow fruitfulness', well...we'll see, wont we?

Antonia Gigg's DG 1001M gets its first mini-bungee launch.

Clive Learwood's new and unfinished HW-4 Flamingo on its maiden flight.

End-of-the-day view of the MW event from author's 3rd scale Rhonsperber.

The Flamingo prior to the unlucky landing (Geoff Crew pic).

The law of unintended consequences

One advantage of the windy season so far has been that there have been plenty of opportunities for some late evening after-work slope sessions in the nearby Dorset hills. One such evening saw the HW-4 Flamingo and I on a less-than-well-regarded hill where the landing area was extremely restricted, thanks to a combination of animals, fences and crops. The only option was to crab across wind and attempt to land right on the edge of the crop next to the narrow path and avoid carrying on into the fence. I had every faith that the Flamingo was up to the task, but the job of reuniting her with Mother Earth did not make for pretty viewing! Eventually, I pushed my luck too far and the tailplane caught in some sort of obstacle and some damage to the rear of the fuselage was the result.

The tailplane is bolted on to the fuselage with one bolt, and retains its lateral position by means of a small steel peg that drops into a corresponding hole in the tailplane mount on the fuselage. here is the irony: had the peg been a mere 6mm smaller, that is, just protruding from the tailplane enough to do the job of locating it and no more, then the damage would have been minimal. Because it was too long, it was able to rip the side of the fuselage apart when the tailplane was knocked sideways, so herein is the lesson: let any locating peg be minimally sized to do its job, without any extra addition. I'm glad to say that the Flamingo was soon repaired and back in action, but I won't be flying scale on that slope again any time soon...! ■

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Antonia Gigg's diminutive DG 1001M.

Gull-wings galore: Richard Alford's 1/4 scale Rhonsperber in the foreground.

Damage to the HW-4 Flamingo.

 by Peter Rake & Matt Haugh

WZ-XI 'Kogutek'

A scale electric powered model designed by Peter Rake, the prototype model being built from laser cut parts, described and flown by Matt Haugh

When Peter first presented me with three views and a small artist's rendering of the Samolot Kogutek (that's Polish for *Rooster*), I was immediately intrigued by the graceful curves, seemingly endless rigging and odd birdlike empennage outlines from which the type derives its name. A bit of searching on the web revealed a fascinating back story.

Mr. Zalewski, the designer, having little money, but apparently no shortage of ingenuity and willpower, built the original engine for the *Rooster* over the course of three years, beginning in 1921. With no real workshop, Zalewski was forced to work in his kitchen (and we think WE have patient spouses!) where he fashioned five cylinders from an old truck axle into what would become, in 1924, the first Polish designed aircraft engine to successfully pull a Polish airplane though the sky, though the actual maiden flight was delayed by funding shortages until 1927. Zalewski's power plant generated just 18 hp, so we can understand why the *Rooster* was such a delicate, gossamer aircraft, though she flew for several years all over Poland and was reportedly very durable and easy to fly.

Tail section

The unusual curves in the tail section are assembled like a jigsaw puzzle. Before applying glue, care should be taken to align and secure the pieces, some of which are very small and easy to misplace or damage. I built the horizontal and vertical tail directly over the plans. Using old photos as a guide, I added a couple of extra light balsa sticks in the hope of achieving scale detail without incurring too much of a weight penalty aft, where it really hurts. I also added tiny balsa blocks in the elevator and rudder to receive non-functional rigging wires. These are not called for in the plans (as they are in the wing) but were another attempt at achieving a somewhat more scale appearance. After allowing the glue to dry completely, I gave the four empennage sections a careful light sanding, rounding over the edges, then set them aside in a safe place and proceeded on to the fuselage.

Fuselage

I began by assembling the fuselage sides directly over the plans, joining the laser cut forward and aft sheet parts with 'ladders' comprised of hard balsa longerons and vertical posts (spacers). I used parchment paper to protect the plans, and placed a second layer of parchment over the first completed fuse

All ready for her maiden flight, the little Kogutek nestles in the grass.

Ample rigging and a simple dummy engine help lend a convincing air to the model. I hope that wasn't really how close the model was.

side, which allowed me to build an identical second fuse side directly atop the first. After letting the glue dry overnight, I carefully separated the two sides, knocked off any obvious excess glue, then lined them up alongside one another with the inside of the fuse walls facing up. Using a sharp pencil, I marked the firewall and former positions. This step aids tremendously in aligning those bits later on.

Working fore to aft, using various combinations of squares and machinist's 1-2-3 blocks, I glued in the formers (with F2 being built up from strip) followed by aft top and bottom cross pieces that grew shorter and so gradually pulled the fuselage together to where it terminates at the chamfered tail post. The bottom aft fuse is further supported and strengthened by a laser cut sheet piece that receives the tail skid. This work was all performed over the plans, and when the tail posts were joined into one, they aligned perfectly to the centre line on the plans, happily indicating that I was not building a banana.

Next I added small curved top formers to receive the light balsa turtle deck sheeting, which was glued in place with pins, rubber bands, and a bit of tape. Using soft balsa sheet from the scrap pile, I crafted simple fairing blocks which brace both sides of the vertical tail. These were attached to a piece which I created from soft balsa sheet that is a mirror image of the aft bottom support that receives the tail skid. This was not strictly necessary, but it allowed me to gather the thin top aft fuse side pieces together where they form a slot for the horizontal tail, thus making vertical tail assembly go more smoothly.

While the glue dried, I spent some quality time assembling the dummy engine cylinders on the ends of hardwood dowels, a fiddly job to be sure, but the reward is a very convincing little motor. This was also a good time to assemble the wheels, which are simply laminated ply outer skins with a soft balsa disk of slightly smaller diameter to form the rim, which receives black foam cord tyre material held in place with a few drops of CA.

Soft balsa vertical tail fairing/support blocks are called for on the plans. Using a technique borrowed from Pat Lynch, I crafted a sacrificial T-shaped piece that stands in for the horizontal and vertical tail, and describes both the fuselage and turtle deck taper. I used double sided clear tape to temporarily secure the sacrificial piece to the fuse, and also to hold the soft scrap balsa blocks in place while sanding. I also used blue painter's masking tape to protect the fuse and turtle deck from the sanding block. After careful sanding, I binned the sacrificial jig and confirmed that the fairing blocks were a perfect fit with the horizontal and vertical tail.

Wire bits

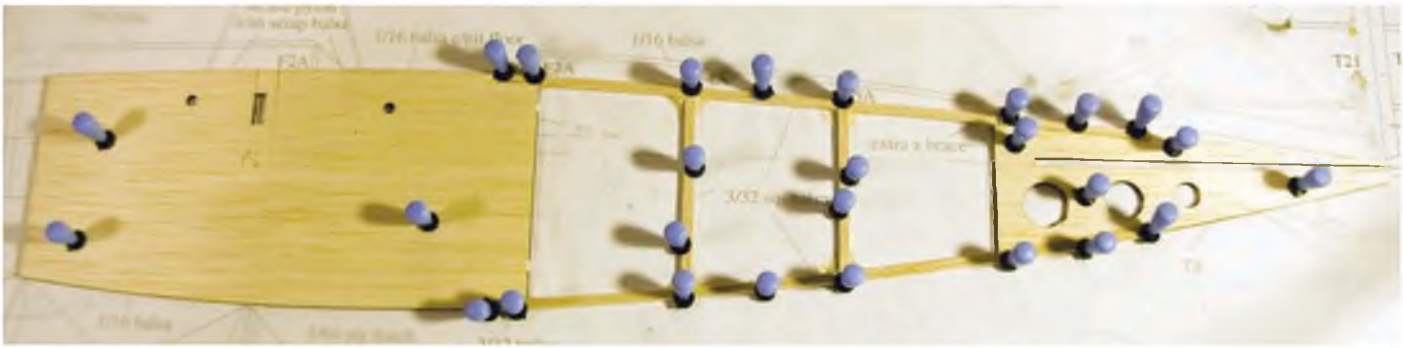
I decided to go with a pull-pull system for the rudder and elevator. Because the rudder has just a single control horn, it was a simple matter of mounting the servo to rails set wall-to-wall inside the fuselage, then running a single control wire (braided 20# fishing line) forward from one side of the rudder horn, through one end of the servo horn, under the retaining screw, then through the opposite hole in the servo horn and aft to the other rudder horn. After taking the slack out of the system and crimping the wire forward of the rudder horns, I tightened the servo retaining screw down onto the wire to prevent slipping. This makes for a simple, tight, and secure set-up.

The elevator has two control horns, which makes rigging it slightly more complicated. I made up a simple crank system to fit on the fuselage centre line. The elevator cables attach to the crank and the crank is operated by a pushrod to the servo. A simple and effective way to ensure that both sides are of equal length, for even throw.

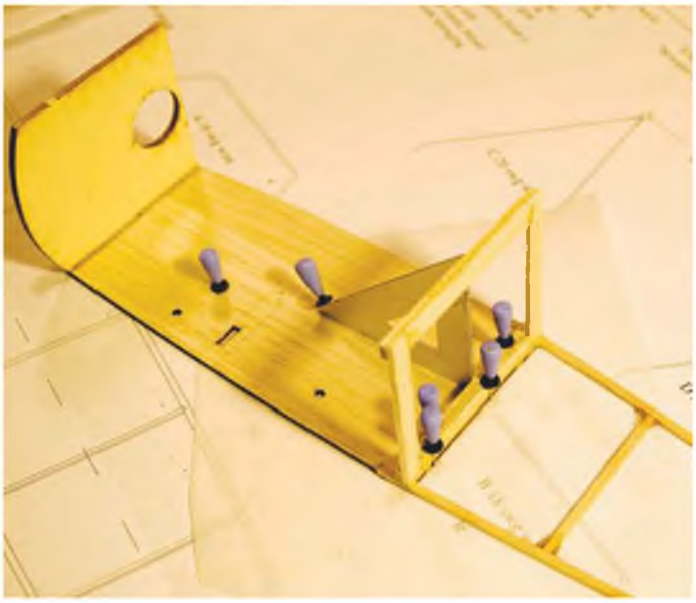
Throws were set at about 1/2" each way on the rudder and elevator, which proved to be adequate.

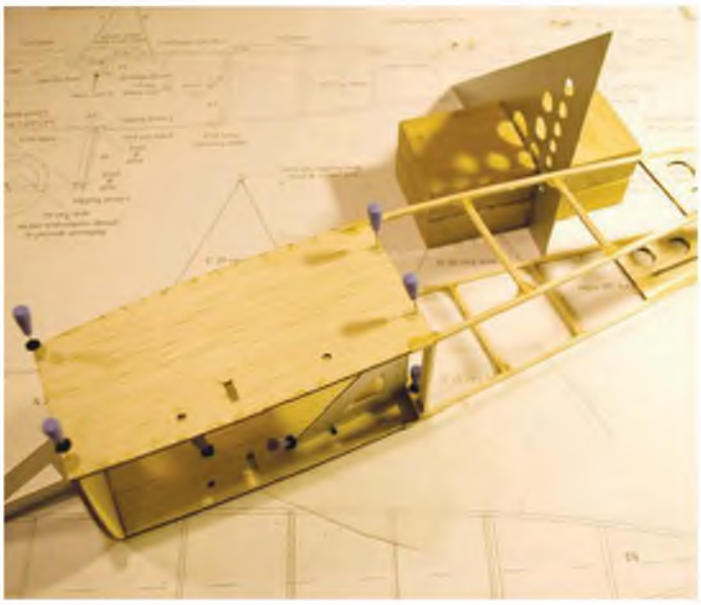
Landing gear and rigging mast wire were shaped using the plans as a guide and joined using tightly wound cotton thread, held fast with CA wicked into each joint (in lieu of soldering). All were painted flat black.

The rigging mast is held in place by sleeves made from four short bits of small diameter plastic cocktail straws, which are CA'd into the inside of the fuse walls at the



Fuselage construction begins in the time honoured manner, fuselage side frames are built over the plan.





ABOVE LEFT: Set-squares and pins ensure the formers are glued accurately to a fuselage side.
ABOVE RIGHT: Still using squares to ensure accurate alignment on the two side frames.

positions marked on the plans. The plans call for simple wood blocks to secure the legs, but I opted for the cleaner if slightly more complex approach.

I created undercarriage skids from basswood and rounded all edges with sandpaper. *(If you haven't tried stripped bamboo cane, I strongly recommend using it here, it's MUCH stronger. PR)* I 'sewed' the forward and aft top LG crossbars to small plates which were then epoxied to the bottom of F1 and the aft cross piece as described on the plans. Thin balsa sheet was glued to the bottom forward fuse, locking in the U/C and forming the battery and radio compartment floor. In the interest of strength and further scale detail, I added an additional cross piece forward and aft, just above the U/C skids. The final step was to create wood skins for the U/C legs, to which small metal beading eyes were added before gluing. These eyes will later become rigging attach points. The finished LG looks very much like the full scale airplane, and is quite strong—a requirement for my rough field.

The front end

I sanded right and down thrust into the motor mount plate, then screwed and epoxied it to the back of my aluminium motor mount before epoxying the completed assembly to the firewall. With thrust angles confirmed, I then attached my cheap brushless outrunner, which needs to be in place when fitting the cowl.

The cowl is comprised of a series of soft balsa pieces that are simply laminated together and then sanded to shape. I marked and rough cut holes to receive the five dummy cylinders, then used my *Dremel* tool to hollow out the inside of the cowl to clear my motor. This requires a bit of trial and error, but goes quickly. During finishing, the cowl was sanded smooth, filled with lightweight spackle, sanded still more, then painted with Krlyon flat aluminium. The dummy cylinders (shortened on the inside to clear my motor) were painted flat black and glued into place. Small, powerful magnets hold the cowl to the firewall, with two alignment dowels to keep it positioned.

Lots of small parts are needed to replicate that 'interesting' tailplane outline.

Not so many parts in the fin/rudder, but still an interesting shape.

A typical wing panel, showing the numerous rigging attachment blocks required.

Wings

After fabricating main spars (laminated from balsa capped with thin basswood top and bottom) and leading edges, I located and laid out all of the wing ribs to ensure everything was present, fit right and tight, and was ready to assemble. I carefully glued each rib in sequence, using a syringe and wood glue to apply a small fillet to all seams. I used the included laser cut dihedral gauge to set the R1 dihedral angle. I then added hard balsa rigging blocks as described on the plans (7 per panel!) and built up the small box to receive the king posts. Leading and trailing edges were sanded to their final shape. Two alignment dowels were glued into holes in R1, and with that the wings were ready to be covered. I covered the wings with lightweight Mylar laminating film followed by *Silkspan*. Scale rib tapes were then added, which I created by running a scrap of *Silkspan* through my paper shredder.

After successfully test fitting the wings, both were epoxied into place and left to harden overnight. After covering the tail pieces like the main wings, they too were epoxied into place, then the rudder and elevator were hinged with Blenderm surgical tape.

Covering, rigging and final steps

I covered the Rooster with *Silkspan*, doped with Minwax water based polyurethane. Paint (orange for the fuse and LG wood, cream for the wings and empennage) is inexpensive rattle can, and the registration numbers are water slide decals printed on a photo-copier.

The underside servo hatch cover is held in place with small cowl screws set into diagonal blocks scabbed into the corners of the hatch opening.

Rigging the Rooster was time consuming, but I believe it really makes this model shine and was worth the time and tedium. I began by drilling out all of the wing and tail rigging points with a pin vice. Then I created the myriad rigging points by shortening beading wire eyes, which I then CA'd into the pre-drilled

holes. Once all the rigging points were in place, rigging was a fairly simple matter of carefully studying the plans, then running wire and crimping, crimping, crimping. As a finishing touch, I painted all of the black crimps sliver using a metallic Sharpie pen. This entire process was made easier with the help of a quality set of beading pliers with crimper, peaceful music, and a glass or two of good wine. In all, I used nearly 50 feet of fishing line!

Other details

I crafted a windscreen template from manila file folder, then transferred the perfected outline to a scrap of clear plastic which I then cut out, carefully sanded to final shape, and affixed to the fuselage with clear canopy glue.

A simple tail skid with supporting post was fashioned with the help of a toothpick and more cotton thread secured with CA, all of which was sprayed flat black.

I created a removable cockpit floor to allow access to the servos from the top. This was done in addition to the bottom hatch called for in the plans, and allowed me maximum access to my pull-pull system. I used a brown Sharpie pen to add a moustache to Mr. Babinski (the original Kogutek pilot) than attached him to my cockpit floor hatch with a screw from underneath. Mr. B. thus serves double duty as pilot and handle for sliding the hatch aft and up, out of its retaining slots, which are simple balsa rails. All in all a very slick system.

Although I built the kit wheels, my field is quite rough, so I opted to upgrade to factory-made wheels with a diameter slightly larger than true scale. The wheels are held on with simple collars and grub screws, all painted black.

The small 3S LiPo battery sits diagonally just behind the firewall, beneath the hatch that I created to avoid inverting the airplane to install and remove batteries. Just aft of the battery, the receiver is held to one side of the fuselage wall with double sided rubber tape, and the ESC is similarly affixed to the opposite wall. A small piece of thin flexible foam sits under the battery, and folds up just a bit behind it, effectively making a nest where the battery rests without the need for further restraint.

The elevator is clamped level while the closed loop cables are connected. The rudder receives similar treatment.

I had to add 1.5 ounces ounce of nose weight (in the form of lead and small steel plates) to balance the Rooster just forward of her main spars. As is my (bad) habit, I used copious paint aft on this model, so the nose weight came as no surprise. Takeoff weight is just under 17 ounces, which is still less than the average clucking rooster but perhaps a hair heavy for a model of this size.

Maiden flight

The Rooster is a relatively short coupled airplane, so I was a bit nervous about her being pitch twitchy as I prepared for the maiden. It turns out my fears were largely unfounded. On the glorious calm morning that I sent her up, she turned out to be a real pussycat, requiring jut a touch of up elevator to maintain level flight after a short takeoff run. Generous dihedral makes her stable through turns, and landings are a simple matter of throttling back and floating her in. Copious rigging plus Mr. B.'s white scarf flapping in the prop wash combined to give the Rooster a decidedly scale appearance in flight, and she garnered lots of positive remarks from my fellow fliers. I've even managed some simple aerobatics (loops from level flight, stall turns) but this a model that looks and feels best just tooling around the sky at half throttle, showing off her cute lines and funky empennage with the occasional low pass. ■

Coming gently round in a low pass for the camera the 'Rooster' shows off her attractive lines.

GENERAL SPECIFICATION

LENGTH: 23 ft 7 in (7.18 m)
WINGSPAN: 28 ft (8.50 m)
HEIGHT: 10 ft 0 in (3.04 m)
POWERPLANT: 1x Pratt & Whitney R-1340-7 'Wasp' radial engine, 600 hp (440 kW)

PERFORMANCE

MAXIMUM SPEED: 234 mph (203 knots, 377 km/h) at 6,000 ft (1,800 m)
Combat radius: 360 mi (310 nmi, 580 km)
SERVICE CEILING: 27,400 (8,350 m)

ARMAMENT

GUNS: 2 x .30 in (7.62 mm) M1919 Browning machine guns
BOMBS: 1x 200 lb (91 kg) bomb

BOEING P-26A

BOEING'S 'WINGED MESSENGER' OF THE END OF THE FIGHTER BIPLANE ERA, MUCH LOVED BY THOSE WHO FLEW IT.

By the end of the 1920s, it was becoming clear to those involved in the design and manufacture of fighter type aircraft, that the biplane configuration had reached its performance zenith. Even the most sleak, streamlined types like the Hawker Fury and Fairey Fantome, in which every practical effort at airframe drag minimalisation had been applied, demonstrated that something different would be needed for the next step forward.

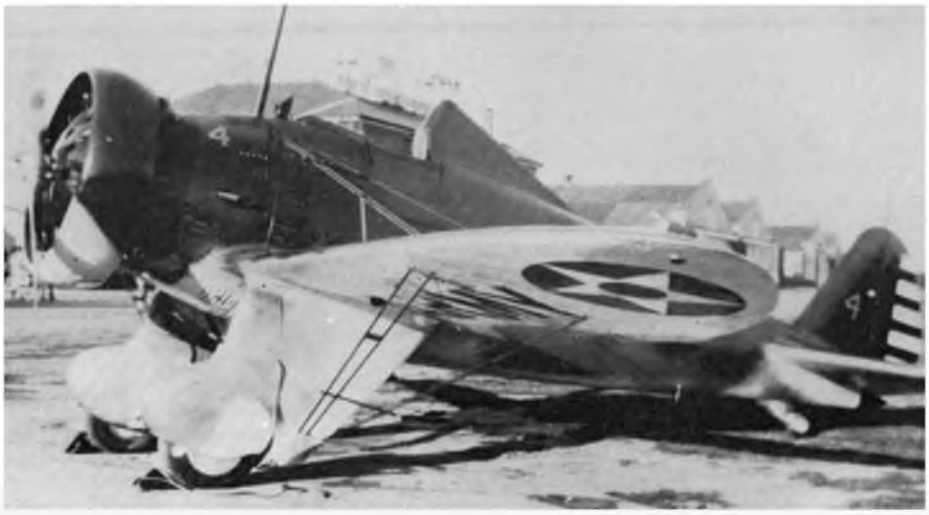
At the time, Boeing were the leading suppliers of fighters in U.S.A. Production of their F4B and P-12 biplanes (see FSM July issue) for the U.S. Navy, U.S. Army Air Corps and U.S. Marine Corps was in full swing, but it was also clear that the, then, new Martin B-10 bomber would be faster that those fighter types. Something with an improved performance was required to counter this.

To maintain their ascendancy in the fighter business, the main thinkers at Boeing began a series of discussions with the Army Air Corps and then commenced design work in mid 1931, on something that would stretch beyond the prevalent biplane configuration.

The proposed new design was an all-metal, externally braced low-wing monoplane, the projected performance of which immediately raised the interest of the Military whose only problem was ... no money! Thus, at the end of 1931 a deal was struck whereby Boeing would produce three prototype airframe of their Model 248 (soon re-designated XP-926) at their own expense, for which the Army would supply other equipment including engines and instrumentation.

Fortunately Boeing, doing well (by the standards of the time) out of current fighter contracts could afford to finance their side of the deal and commenced 'maximum effort' construction work immediately, placing design staff on the shop floor alongside the construction line to speed the process. Thus, in typical American 'can-do' fashion, on March 20th 1932, just three and a half months after the initial contract was signed, the first prototype made its maiden flight – and that even after the second example had already been delivered to the Army Air Corps' Wright Field, Ohio, for static testing.

The third prototype went straight to Selfridge Field, Michigan for Service operational testing, where service test pilots were more than enthusiastic about it's performance. Thus satisfied, the Army finally paid for the three prototype aircraft and, after further revisions to the specification, based on test results, Boeing received a full production order for the newly designation P-26 for 111 examples – the largest single military aircraft contract since the early 1920s.

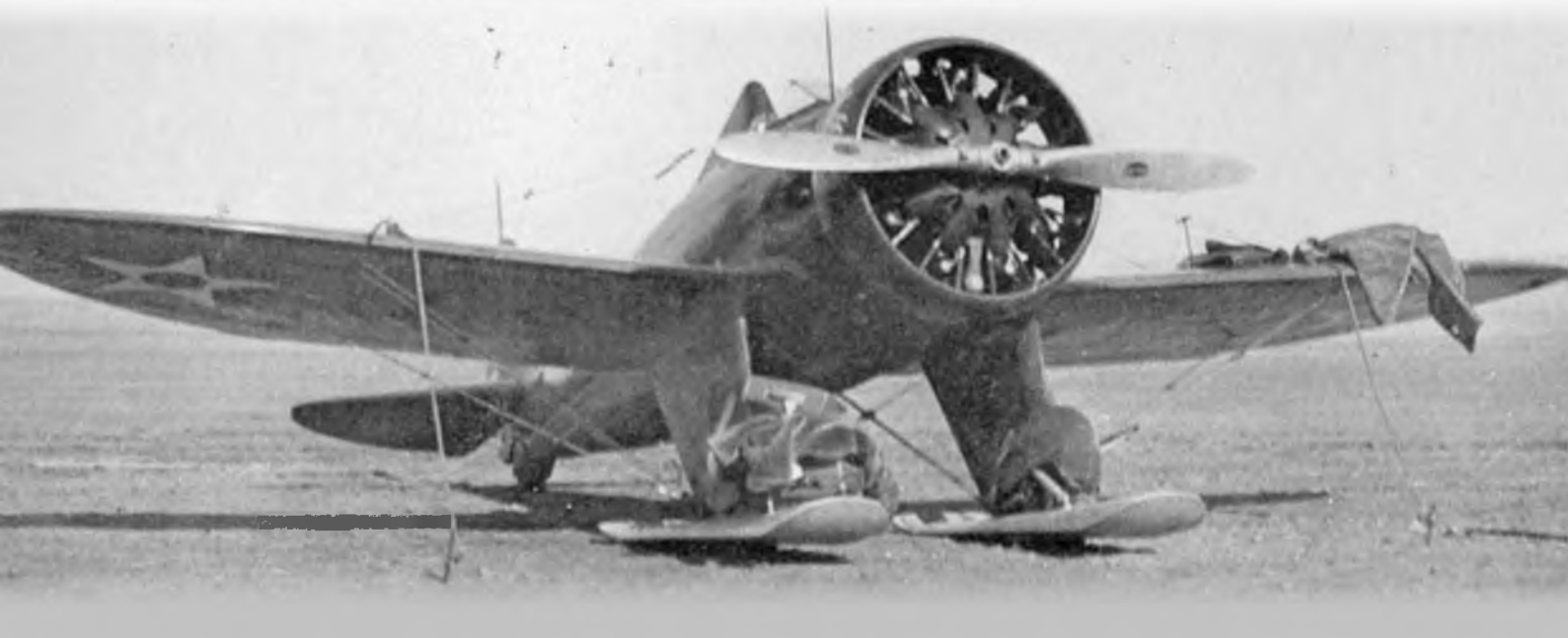


The first P-26As delivered were externally identical to the prototypes, except for the deletion of the 'bullet' fairing at the rear of the rear of the main undercarriage 'trousers'. Use of the aircraft in operational conditions soon dictated a number of modifications. After an early fatal nose-over landing accident, the headrest fairing behind the cockpit upper deck was raised for better pilot protection.

Service pilots were less than happy with the 82.5 mph landing speed of the early flapless P-26As. A single aircraft was re-

LEFT: This P-26A, seen at Selfridge Field, Michigan features an experimental camouflage scheme.

BELOW: This P-26A has been fitted with skiis in an experiment to handle snow. The wheels protrude a little below the undersurface of the skiis.



ABOVE LEFT: P-26A in the colours of the 95th Pursuit Squadron, 17th Pursuit Group - another resident of March Field, California. TOP RIGHT: A somewhat untidily parked collection of 'Peashooters' on the ramp at March Field, California. Those in the foreground belong to the 34th Attack Squadron, while at the rear are aircraft of the 73rd Pursuit Squadron. ABOVE RIGHT: This view demonstrates the geometry of the main undercarriage, normally hidden inside the bulky 'trouser' fairings that were a distinctive feature of the aircraft.

engineered with lower surface split flaps which reduced touch-down speed to 74 mph and this change was then retrospectively applied to existing P-26As and then adopted as standard for all successive P-26Bs and Cs.

Soldiering on

Boeing delivered the last P-26, a 'C' model in March1936, bringing total production to 151 including 12 examples of the export Model 281. As more modern fighter types, such as the Seversky P-35 and Curtiss P-36 began to come on stream, the 'Peashooters' were relegated to training units and to Air Corps units operating outside the continental United States, to Hawaii, to the Philippines and the Panama Canal Zone.

The Boeing P-26 was long-gone from the front-line order of battle when USA was drawn into WW2 in December 1941, but the P-26 did see combat action, from 1937 in China against Japanese forces and examples also saw action over the Phillipines in the last days of 1941 during the Japanese onslaught there.

Spanish Republican Forces received and used some P-26s during the Spanish Civil War of 1936-1939, although from where is unclear as is no recod of any combat. P-26s operating by USA in the Panama Canal Zone were passed on to Guatemala during 1942/43 and remained in service there until 1957.

Where to see one now?

Thanks to the efforts of aviation collector Mr. Ed. Maloney, two Boeing P-26As were recovered from Guatemala back in 1957 for his *Planes of Fame Museum* at Chino, California and one was eventually restored to flying condition.

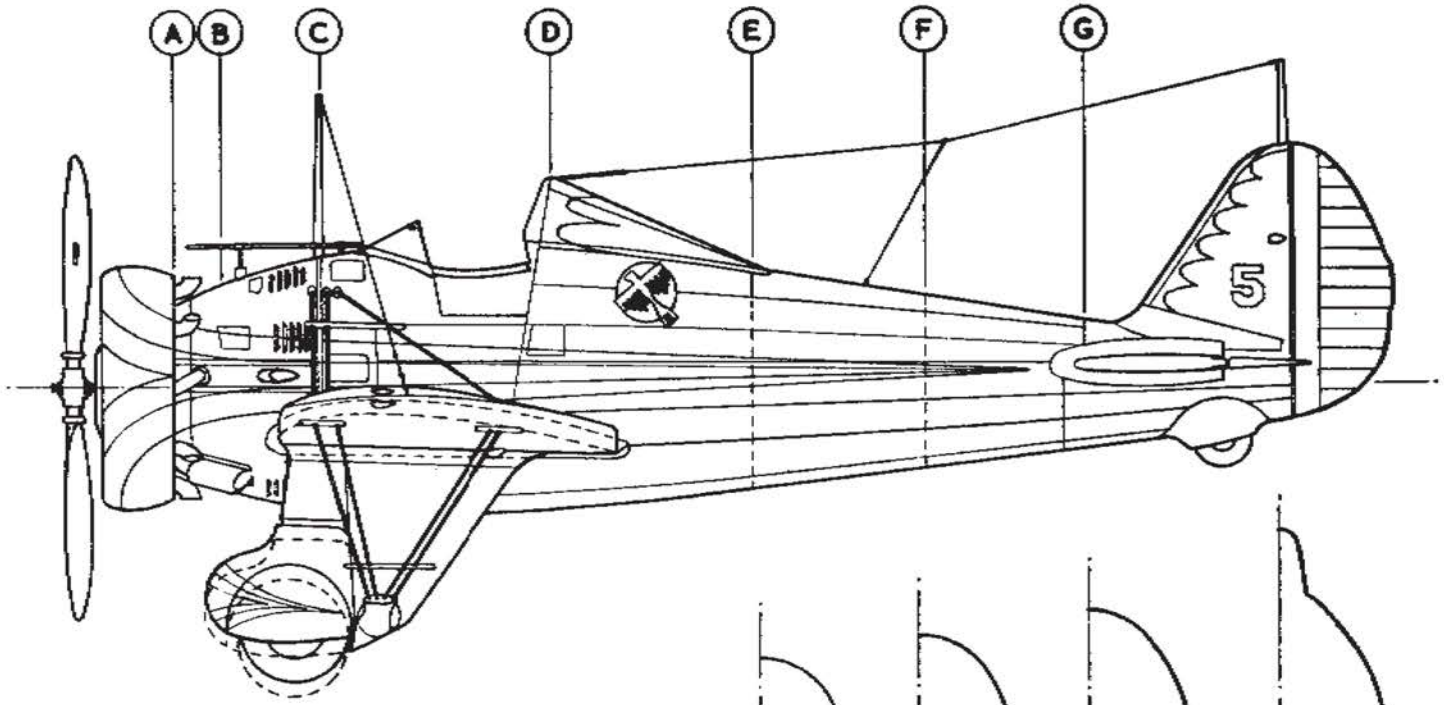
Another P-26A is on display in the collection of the *National Air and Space Museum*, Washington D.C., while a third P-26A is now on display at the *Steven F. Udvar-Hazy Center* (annex of the National Air A Space Museum at Dulles airport, also in Washington D.C.

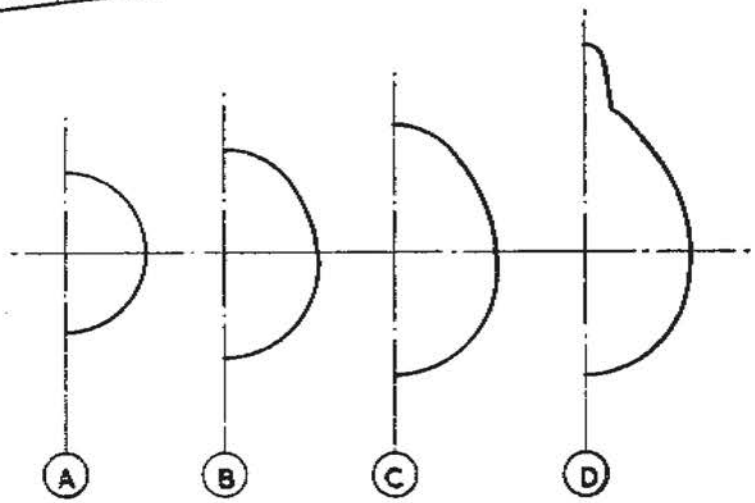
There are replicas too, a P-26A is on display at the *National Museum of the United States Air Force* in Dayton, Ohio, while the *San Diego Air & Space Museum* is making a replica of an early model from Boeing plans with the original design streamlined tailwheel and without flaps and the crossover exhaust that were later additions. ■

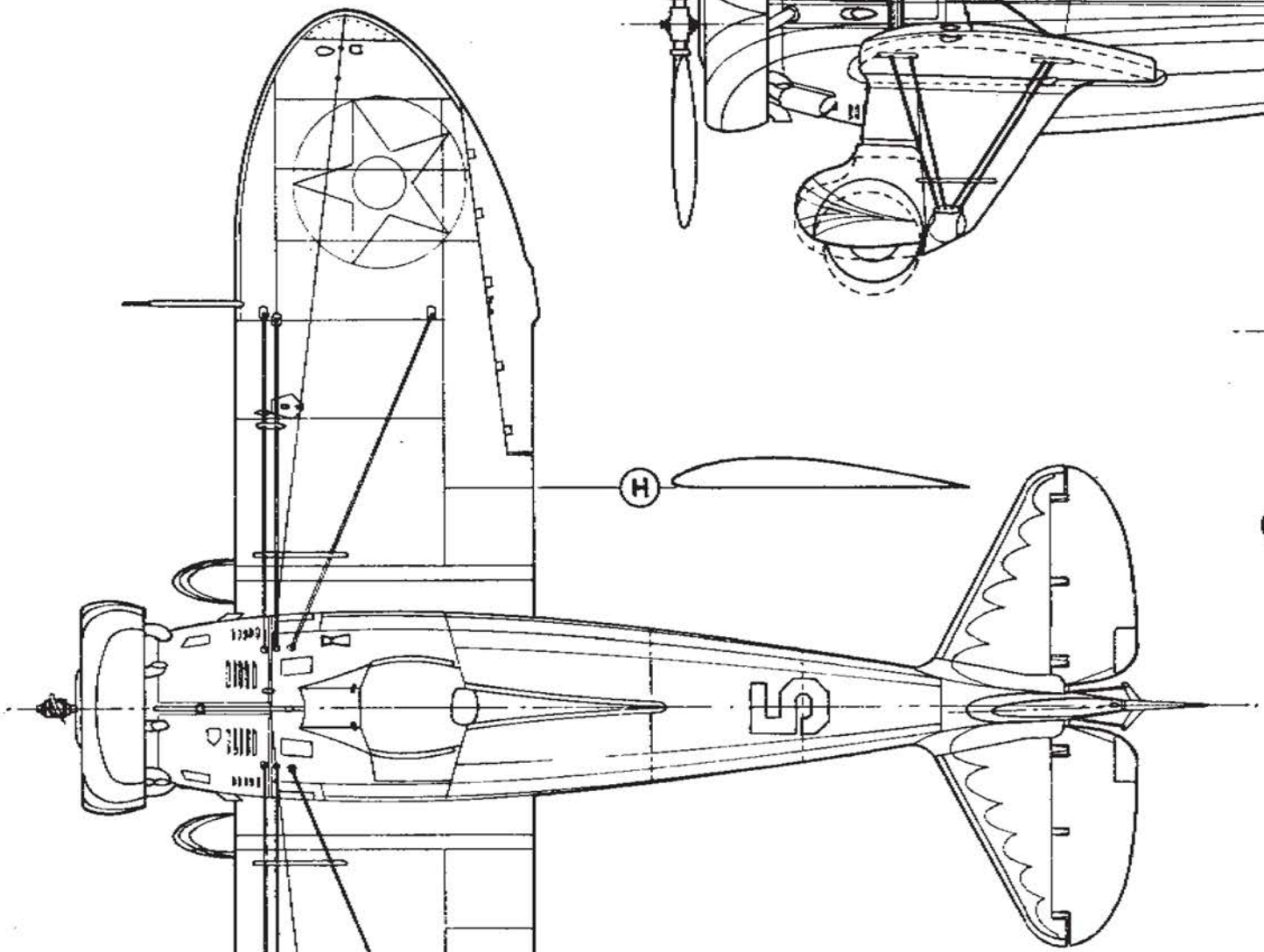
This is a P-26B seen here in Hawaiian skies. Colours are for 19th Pursuit Squadron. Wing and fuselage stripes at Flight Leader's.

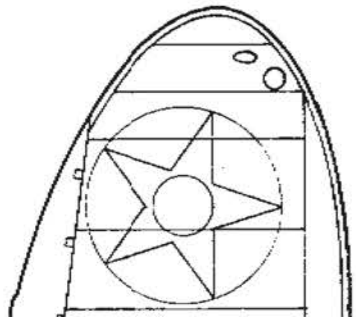
COLOUR SCHEME.

Fuselage:	Medium Blue.
Landing Gear:	Medium Blue.
Wings, Fin, Tailplane:	Yellow.
Wing Root to Dihedral Joint:	Black.
Wing Lettering:	Black.
Fuselage Numbers:	White.
Fin Numbers:	Black.
Fin & Tailplane Scallop:	Red.



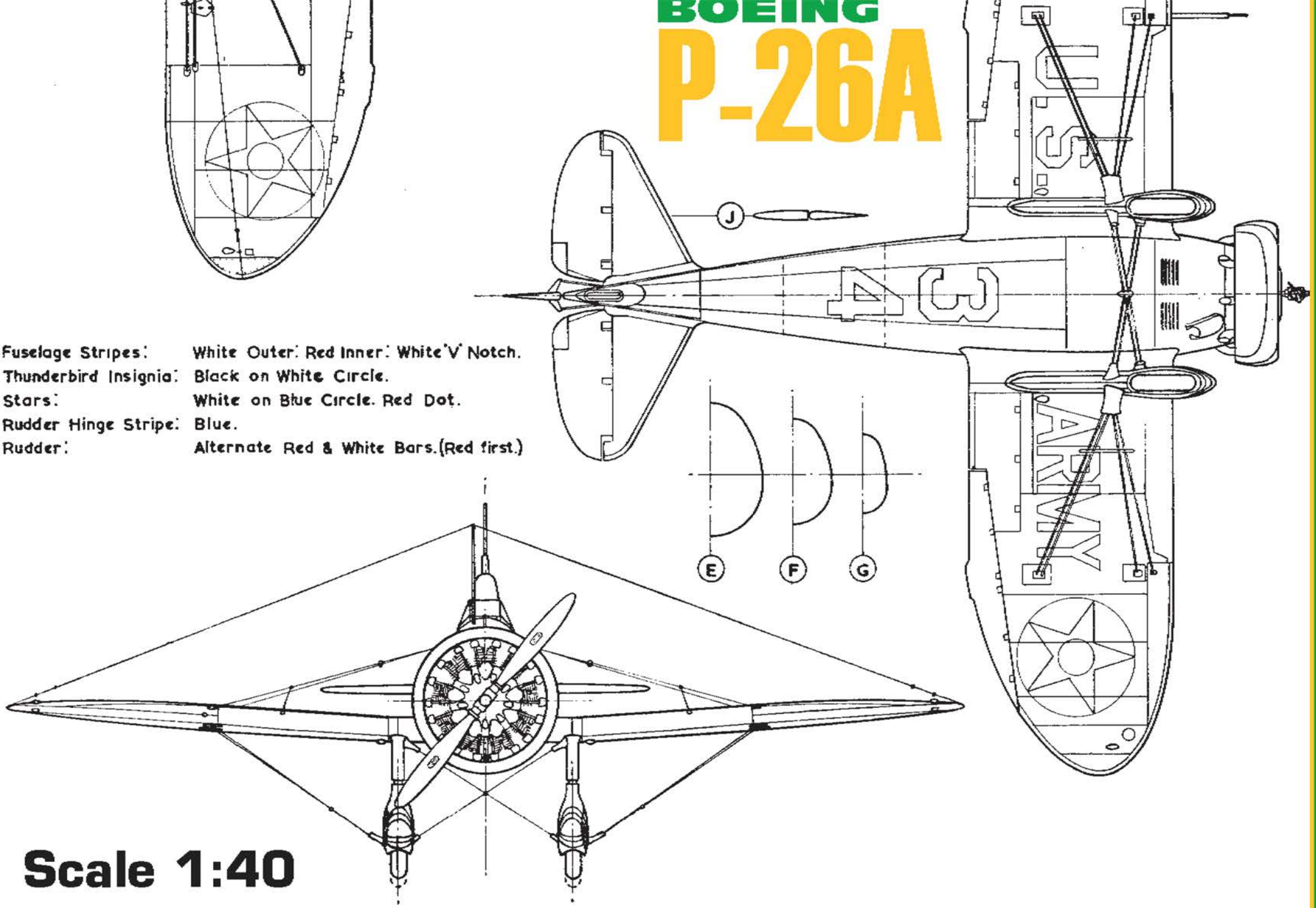






BOEING

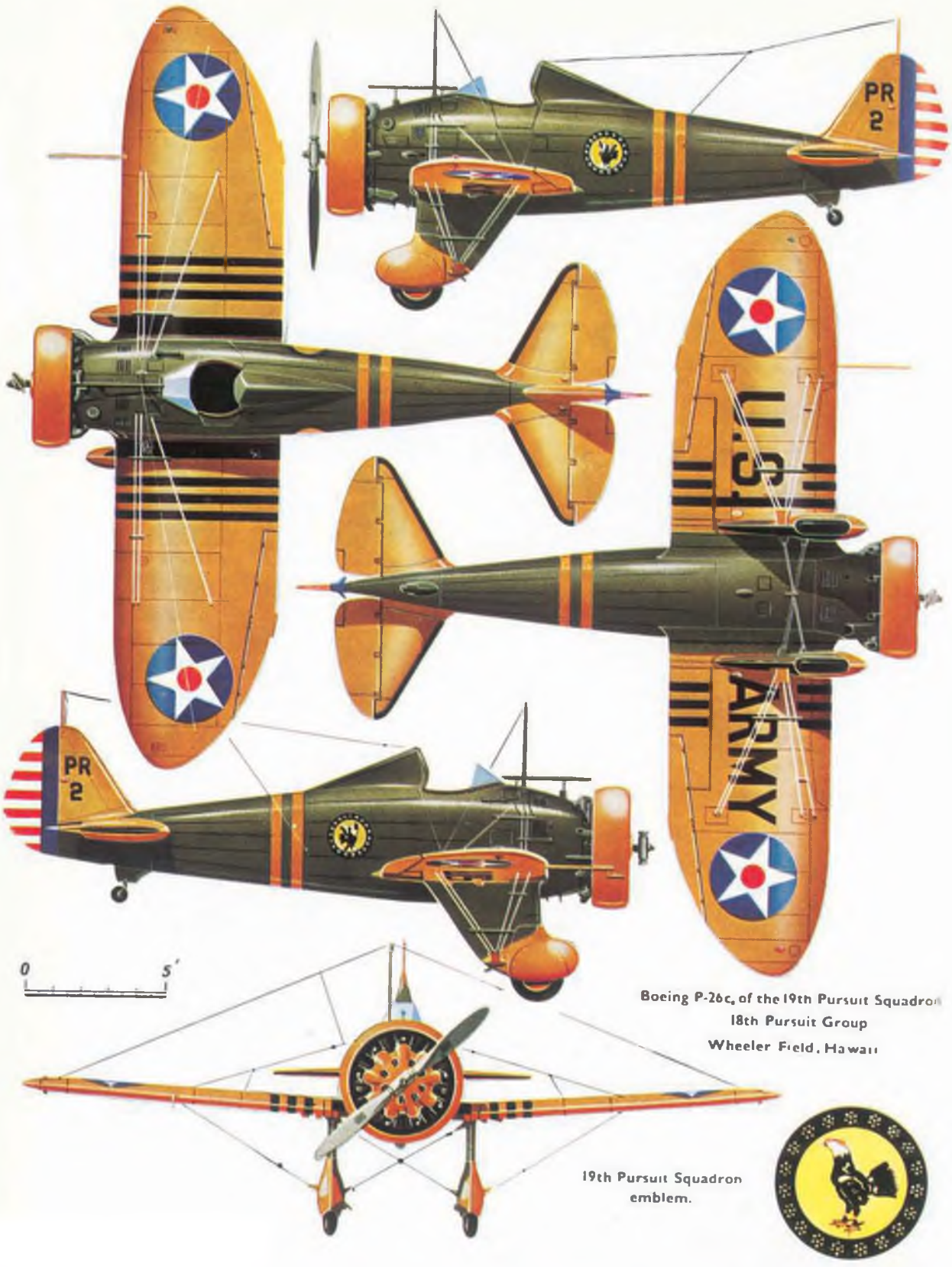
BOEING P-26A



Fuselage Stripes:	White Outer: Red Inner: White 'V' Notch.
Thunderbird Insignia:	Black on White Circle.
Stars:	White on Blue Circle. Red Dot.
Rudder Hinge Stripe:	Blue.
Rudder:	Alternate Red & White Bars. (Red first.)

Scale 1:40

BOEING P-26A



Boeing P-26c, of the 19th Pursuit Squadron
18th Pursuit Group
Wheeler Field, Hawaii

19th Pursuit Squadron emblem.

FLYING COLOURS

A Scale Veteran remembers

Frank Mizer was a B-17G waister gunner who became a P.o.W. in 1944 when his aircraft went down over Germany on its first mission. Since then he has been a life-long scale modeller and 'Best-of-Show' achiever at the annual Toledo R/C Expo

Everything was starting to change ... One Day you're a high school graduate and then, several days later, you're a young man in the U.S. Army Air Force as WWII was going on. It all happened so fast it seemed was a kid who grew up on the east side of Cleveland, Ohio. Life seemed as if things were going along just great. As far back as I can remember, I was always drawing and painting pictures and I was told that I had a special talent for art. It just seemed to fit - that's what I wanted to do; I wanted to become an artist and I was just lucky enough to know it early in life.

I was painting a picture for my sister one day and was sort of overtaken by a loud noise coming from a neighbour's yard. I jumped up and run outside to see him, Mr. Bussy, test running a model engine on his Piper Cub model. Wow!

When I saw it, I was really drawn to it and knew this was going to be part of my life - to me it was another art form. That day really drew me into the model aircraft hobby. Mr Bussy saw how taken I was with his model and ended up giving it to me. In fact, that model aircraft had influenced me into ending up in the U.S. Army Air Force after High School graduation.

I remember going to the flying field with Mr. Bussy, who showed me all the basic aspects of aeromodelling. I then started to build a model from an old *Cleveland Models* kit and, for a first-ever model; I was surprised at how well it turned out.

While in my senior year at High School art class, I was chosen to draw maps for the Military and after graduating, I continued to draw for the Military and thought this would continue for a while. But then, I was drafted and chose the Army Air Force because of my interest in aircraft.

Call up commenced with basic training in Miami, Florida, from where I quickly went on to aircraft gunnery school in the State of Nevada. During one of our actual moving target runs, one of the students almost shot the tail off the plane towing the target drogue. Luckily, the tow-plane, an AT-6 (Harvard/Texan), flown by a woman pilot, made it down safely.

The Boeing B-17G seemed to have all the attack angles covered; protection at the nose and lower side; upper sides (waist positions); underside ball - and tail positions left and right.

We were assigned to a brand new B-17G - tail unit and U.S. insignia on the wings. The aircraft was christened *'My Devotion'* by the crew, but for lack of time, that was never painted in place as nose art. The crew; pilot from Carolina; co-pilot from California; engineer/top forward gun from Louisiana; right waist 0.55 cal. Gun from Cleveland Ohio and tail gunner from New Jersey.

The first flight, Spring 1944, took us to Nova Scotia and from there to an Air Force base in U.K. We had a couple of practice


Fl. J A Kent
'91

Frank's first scale model, a free flight Cessna L-19 Bird Dog, from A Berkley Models kit

runs (milk runs) and then the third was our first combat mission during May - we were all, not surprisingly, quite scared.

The morning of this first mission was cool and calm, soon shattered by the sound of B-17s starting up and taxing into lined positions for take-off. During taxi, I could feel and hear all those B-17s taking off. As we rolled out and gained airspeed, we eased into the air, looking over beautiful countryside and I could feel the rise of the aircraft in the pit of my stomach. We were on our way!

We climbed out and into formation with other aircraft in our group, riding along cloud tops and by now well over enemy territory. We were told by a voice in our ears to take stations and keep a sharp lookout, but then we lost the no.3 engine and then, to make matters worse, no.1 engine too. We were forced to break formation and there were problems staying in the air.

We dropped all our bombs over open countryside to lighten the aircraft and then threw everything removable, guns ammo etc. overboard too, in an attempt to make it to neutral Switzerland - it was going to be close to make it.

We were losing altitude pretty quickly now and smoke was trailing from one of the engines. We thought we might have to bail out, but then we all took up positions for a wheels-up emergency landing, dropping, wheels up, into a wheat field - the pilot eased the Fortress down to a great landing - actually fairly smooth all things considered - skidding along, before coming to a stop to the sound of escaping oxygen.

As we exited the aircraft, we could smell the smoking engines and could see the propellers, bent back from the landing. No one was injured except for the ball turret gunner with slight facial injuries.

However, we did not make it into neutral Switzerland and the reception 'committee' that quickly arrived were German soldiers, for us, 'the war was over' and we were all separated and sent to Interrogation Centres, at different P.o.W. camps. For me it was Stalag 4, newly built and incomplete.

We didn't have much to eat and Red Cross packages were intercepted, chocolates and cigarettes being often removed. Cigarettes were used as money. For instance we had a guy who gave haircuts for two cigarettes, using a comb and a razor blade.

Summer 1944 turned to autumn and then winter set in. By early February 1945, the Russians were getting closer and the German guards marched us west. Along the way, we were surprised by a British Hawker Typhoon fighter aircraft that came down low and buzzed us. We hit the ditch by the side of the road.

By now, the number of German guards was thinning out and after a further few days they were gone. The 'march', now with nowhere to go, split into smaller groups as we broke into a more leisurely


Boeing B-17F


Westland Lysander as published in FSM is one of our most popular plans.


Also published in FSM, Frank's LVG C.VI.


Hawker Sea Hurricane in unusual colour scheme.


Messerschmitt Me 109G


Frank awarded 'Best of Show' at Toledo Expo with Felixstowe F.2A

pace. Still in Germany, we came across a house where the couple living there fed us cheese, bead and coffee, and then the man took us a nearby British camp in his horse and wagon.

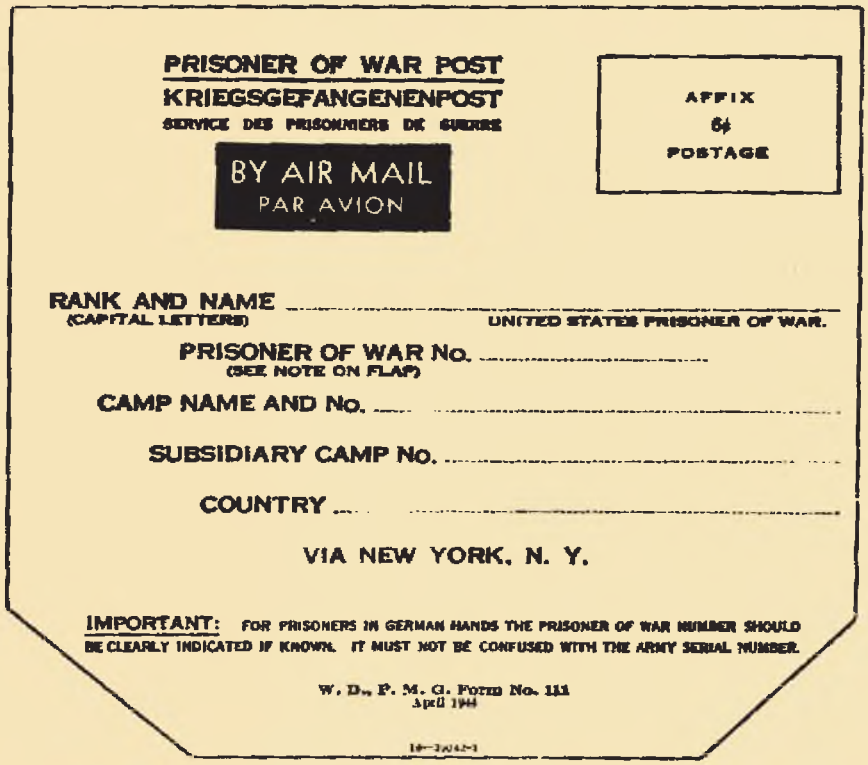
Now the war really was over for me. The Brits were wonderful to us. After several days we took a Liberty Boat - home after 1.1/2 weeks to home cooking and family. My neighbour, Mr. Busy who gave me my start in the model aircraft hobby had moved to New York.

Under the GI Bill of Rights, I was able to go to Art College for a 2.1/2 year course, where I did well, graduating and going into commercial art. It was a great time in my life and I recommenced my aeromodelling interest, getting into Scale with a Berkley Cessna Bird Dog. It flew so well that I ended up losing this free flight model when it caught a thermal and climbed out of sight. That's when I decided to get into radio control.

I built a Sterling Monocoupe, with rudder-only control. It flew really well and had a great glide performance. On one flight, I forgot to switch on the receiver before hand launching the model, but fortunately, it was a calm evening and the Monocoupe just slowly circle the field as it climbed out/ When the fuel ran out, it simply glided down, circling smoothly down nearby and landed gently, very close. It was really something to watch - there was nothing else to do the circumstances anyway!

For many years, I worked as Art Director at an Advertising Agency, but continued to build many models. Later, as scale modelling skills developed, I was able to enter and display models at the big annual Toledo Show, the Weak Signals R/C Expo run by the Toledo Weak Signals Club - and I did pretty well, won first prize several times and even won the *Best of Show* award there.

It doesn't get much better than that! ■


PRISONER OF WAR POST
KRIEGSGEFANGENENPOST
SERVICE DES PRISONNIERS DE GUERRE

BY AIR MAIL
PAR AVION

AFFIX
6¢
POSTAGE

RANK AND NAME (CAPITAL LETTERS) ..... UNITED STATES PRISONER OF WAR.

PRISONER OF WAR No. ..... (SEE NOTE ON FLAP)

CAMP NAME AND No. .....

SUBSIDIARY CAMP No. .....

COUNTRY .....

VIA NEW YORK, N. Y.

IMPORTANT: FOR PRISONERS IN GERMAN HANDS THE PRISONER OF WAR NUMBER SHOULD BE CLEARLY INDICATED IF KNOWN. IT MUST NOT BE CONFUSED WITH THE ARMY SERIAL NUMBER.

W. D., P. M. G. Form No. 111
April 1944

PART 2

Gloster GAUNTLET

Designer Jeff Harnoll finishes off construction, and includes surface detail - plus an option for glass fibre or conventional built-up wood engine cowl

Covering

To cover the fabric finished areas, I used *SIG Coverall* throughout and detailed the wings and tail with rib tapes from *Mick Reeves Models*.

Painting

The Gauntlet was in RAF squadron service during the mid-late 1930s era when individual aircraft carried the colourful identification markings then prevalent among the units of the 'Fighting Area' squadrons, usually applied over a silver based finish.

To be just a bit different, I chose Danish Air Force colours from the late 1930s which carried a camouflage scheme, that I applied using *Warbirds* paint throughout from *Fighter Aces*.

Flying

With the model completed, the test flying was done at my local Llanelli M.F.C. flying site at RAF Pembrey.

A radio check and engine run-up confirmed the model fit for flying, so there was no doing back now!

I opened the throttle gently as the Gauntlet tracked well, requiring only a touch of right rudder to hold a straight line. Then, with throttle fully open, a touch of up elevator put daylight under the wheels and the Gauntlet was airborne.

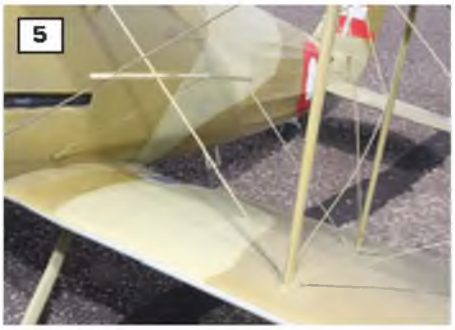
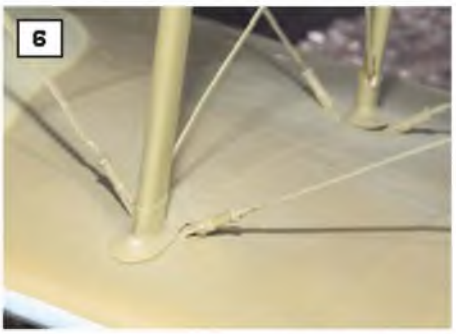
A couple of circuits were sufficient to establish correct trim for level flight and no aileron trim correction was required.

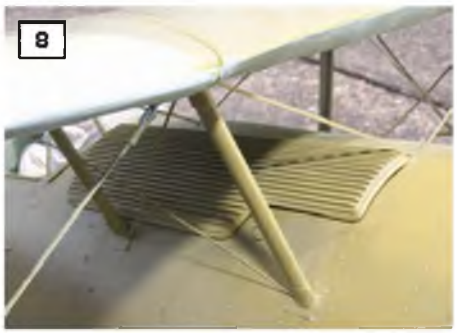
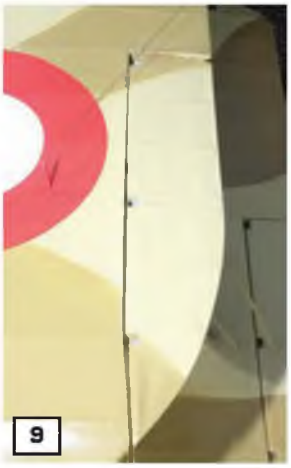
General handling proved to be fine and after some further circuits to get the general 'feel' of the machine, it was time for the landing. I lined up an approach, reduced the throttle and she came in gently - what a relief!

After post-flight check-out I was ready to further explore the characteristics of the Gauntlet which, again, lifted smoothly into the air in preparation for an exploration of aerobatic capability. Rolls, Loops and stall turns, all

1: Dummy Bristol Mercury VI engine in prototype model providss vital realism. 2: Equally important in an open cockpit biplane model, a realistic dummy pilot.



3: Main undercarriage, showing struts and axle. 4: Gun trough and machine gun in front fuselage side. 5: Wing interplane struts and rigging. 6: close-up of lower wing interplane strut attachment and and rigging clevises. 7: Pitot head mounted on left front outer wing strut. 8: Dummy radiator on fuselage upper surface between the cabane struts, ahead of the cockpit. 9: Aileron, hinged in three places. 10: Fin/rudder close-up showing the aerodynamic balance. 11: Elevator, showing the aerodynamic balance and the bracing wires. 12: Close-up detail of aileron hinge. 13: Tread plate detail, lower left wing at root. 14: Cockpit mounting stirrup, lower left fuselage side. 15 &16: Main undercarriage and dummy exhaust pipe detail. 17 & 18: Tailwheel unit. 19: Detail of underside tailplane bracing wires. 20: Elevator hinging viewed from underside.

worked well before dropping the Gauntlet in for another smooth touch-down. I was really pleased the the handling - it's a fine flyer.

Engine recommendation

I used my trusty Laser 300V in this model, which proved to be slightly overpowered, so if you have a Laser 200 or 240, or an equivalent, this should provide ample power.

Engine cowl

There are two options here. The prototype model used a glass fibre cowl made from a mould from which designer Jeff Harnoll can supply mouldings ready for use. If you decide to go that rout, then write to Jeff at 34 Vincent Street, Swansea, SA1 3TZ (email: j.hartnoll@ntlworld.com).

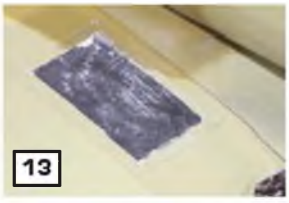
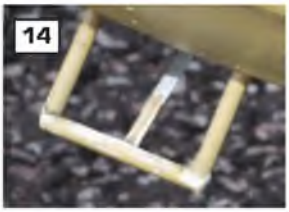
Make it in wood

The plans also show an engine cowl in balsa and plywood. If you descide to make the built-up wooden cowl, first cut out all the parts and lay down the bottom cowl ring on the building boad. Cut the stand-offs to the required size and tack-glue these to the botom ring.

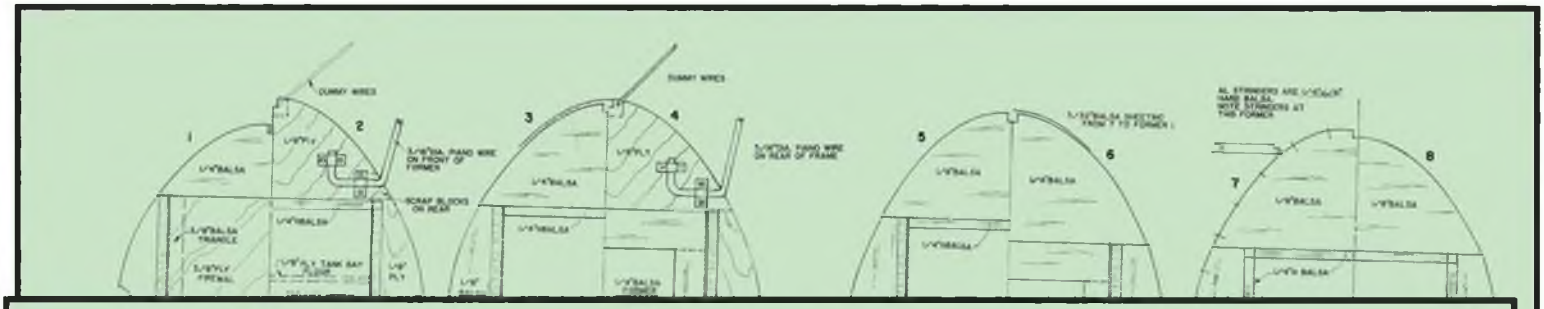
Then, lay down the next ply ring and tack-glue this to the top of the stand-offs. Repeat for all the other rings and then glue the four 1/4" supports, making suring all is aligned.

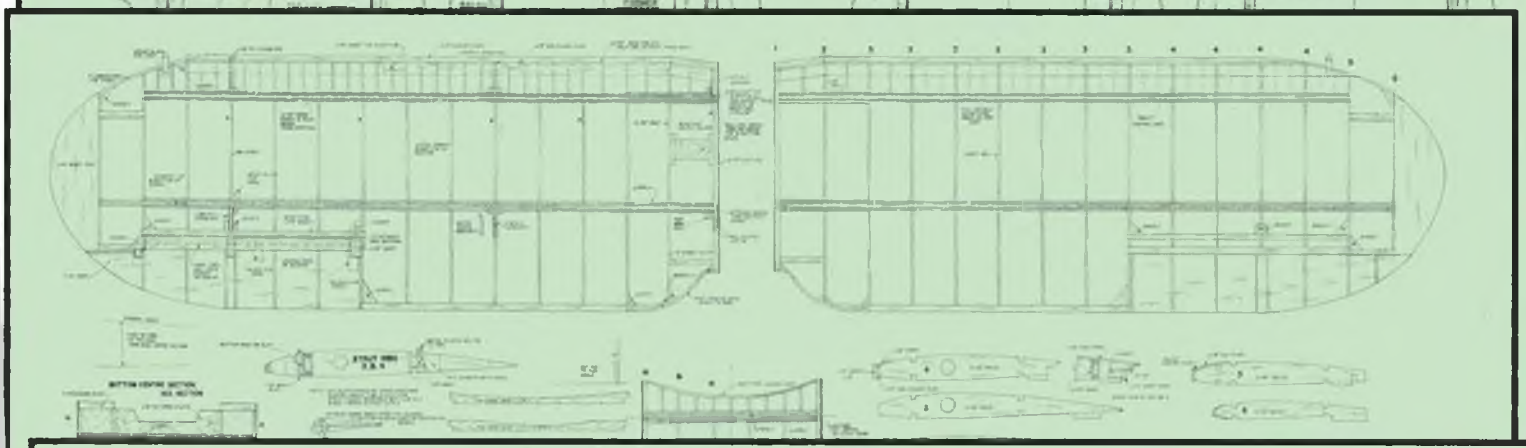
When alignement is true, then plank the cowl up to the top ring. Then, when the planking stage is complete, the balsa front ring can be can be added.

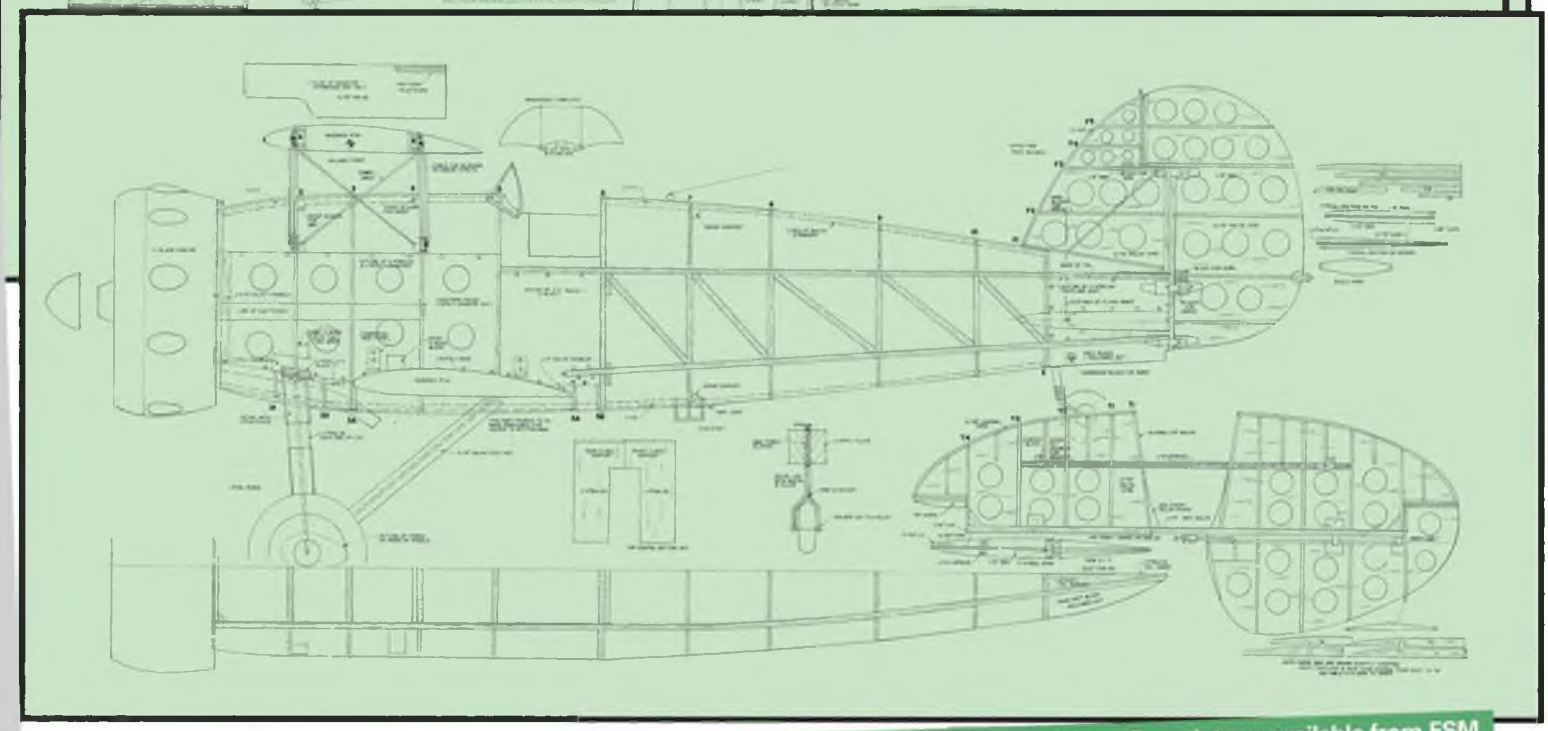
After that, when all glue has set, it is a matter of sanding the front cowl ring to shape and glass fibre covering the outer surface with lightweight glass cloth.









Copies of the three-sheet plan set for the Gloster Gauntlet are available from FSM Plans Service, Key Publishing Ltd., P.O.Box 100, Stamford, Lincolnshire, PE9 1XQ. (tel: 01780 755131).
Price £24.50 plus post & packing (UK £2.50; overseas £6.50
Please Quote Plan No.331.

When satisied with the finish, you can cut away the inside of the cowl and, apply a coat of glass fibre resin to fuelproof the wood.

Finally

If you decide to build this model, you won't be disappointed. Set up correctly, it is a lovely flyer! Happy landing to all. ■

19

20

Scale at COSFORD

Alex Whittaker takes his camera to the LMAs biggest event on the year

The thing about Cosford is its sheer size. It is our biggest show this side of The Nationals, and is backed by a large Trade presence. At Cosford you will see all the show beasts of the Large Model Association, plus a number of scale models that may have eluded you at all the other shows. True, there are some non-scale models, which we will cordially ignore but overall, Cosford is about large, hand-built scale models.

Dodgy technology

The day started badly for me. My new and outrageously expensive digital SLR camera gave up the ghost before firing a single shot. This meant I had to shoot on my single back-up camera all day. This cramped my style a bit, and I found myself swapping lenses, whilst trying to interview pilots. There were 148 of them on the day, so tracking them down for photo captions in the crowded pits was an utter nightmare. I could do with a young and glamorous apprentice to charm the details out of the pilots for me. I've applied to *Key Publishing* for assistance, so I'll tell you how I get on. Tee hee!

Models of note

This is a factual photo-report, replete with weights and spans, engines, and props, so I'll let the photos tell the fuller story. However, as usual, one or two models demanded attention.

Percival Provost

Ah, the power of an Airfix! You see, at fifty paces, I knew straightaway that a large silver model in the pits was a Percival Provost. Provosts are just so sturdy, angular, and British, in an indefinable way. This was one was hand built by Mike Lee. It is an excellent example of the builder's art, is 107" in span, and weighs 40lbs. It was powered by a MVVS 80 driving a 20 x10 prop. It looked rock-steady in the air, and on short finals had all of the bustle of the prototype.

I must mention the power source, since I have noticed that the MVVS 80 seems to be building an enviable reputation for power and reliability.

Bronco rides again

Scale man Tony Nijhuis has sold his 38%

scale Bronco Twin to noted show pilot Steve Holland. This impressive model spans 14 feet, and weighs 100 lbs. The driving force is 2x Zenoah 62 petrol engines, each turning a 22x10 prop. The new owner was flying a very vivid fashion, chucking the huge Bronco all over the sky. When he wheeled her about in tight steep circuits, and then rolled her crisply, he was actually demonstrating her ability as a weapons platform. The crowd loved it.

Breitling Babes

Remaining with with Steve, he and his show pilot Team of Sharon Styles and Richard Rawle put on a truly stunning display with their brace of immaculate Breitling Boeing Stearmans. The two bipes are fitted with cleverly articulated female wing-walkers, whose movements are carefully choreographed by Sharon, on a third transmitter. The display was captivating, and in the jargon: you suspended disbelief. The wing walkers looked real. The icing on the cake, so to speak, was the fact that we had deep blue skies against which to view their billowing smoke trails. This is a cleverly put together blend of models, technology, aesthetics, and good old fashioned nous. The overall standard of presentation is comfortably world class.

Turbulent time

The Druine Turbulent has been a scale subject beloved of generations of modellers. It is also often chosen as a first large scale subject. For many years, the big, practical, and surprisingly affordable *Precedent* kit offered a foolproof route into large scale modelling. Recently new Turbulents have been few, and far between. Therefore it was great to see Harry Harland flying his new 1/4 scale Turbulent. I excelled on low passes, though I did notice its latex pilot was bowing gently as he flew past.

Lancaster

We were treated to a full-size fly-over from the BBMF's 'City Of Lincoln', one of only two still airworthy Lancaster bombers. For the first time that I can recall, here was a real Lancaster presenting in front of my lens, with full sun on its black body, and not back-lit. I have hundreds of snaps of black blobs on grey skies, but that day was to be different. I was pleased with the snaps, especially the rivet and panel detail they revealed. Anorak heaven!

Matched pair

I was at the RAF Shawbury Fly-In earlier in the year where pals Dave Pearson and Trevor Wood flew their matched pair of F4U Corsairs in a howling gale. These are hugely impressive models, of all-moulded construction, from the well-known Composite ARF kit. They are built to 1:4.4 scale, yielding a span of 110". They weigh 55 lbs, and are fitted with Sierra retracts. The fit and finish achieved is stunning, complemented by a sublime choice of engine, for they are both fitted with the the Moki 250cc radial. For my money, no other commercial model aircraft engine

Dave Johnson's 20 foot span Avro Vulcan with full jet efflux.

Phil Clark's 'Screamin' Demon' Douglas A-24 Banshee on a flaps-down approach over the hangar.

Chris Willis and Ken Bones flew matching 106" span / Quadra 62 powered Hawker Typhoons, both built from Chris's new kit. This is Ken's Tiffie.

There was even a full-size glider tug in attendance - looks like a DHC Chipmunk re-engined with a Lycoming.

Simon Illsley's 65" span Hellcat F6F. The model is ASP .120 powered, drives a 15x8 prop, and weighs 9lb.

Look at that full-size Lanc's rivet detail!

even comes close. Mesmerising. By the way, Trevor flew Number 15 and Dave flew Number 17.

Tigercat

Andrew Crosby's highly polished and commendably sleek Grumman F7F Tigercat twin really dazzled. This is a beautiful model from the *Scale Wings* kit. Andrew did most of the building, and was assisted by his partner-in-crime from *FighterAces*, Phil Clark. I believe that Phil did the final painting and finishing which, like all he touches, is correct and immaculate. The urge is provided by twin Zenoah 62 petrols. The Tigercat spans 112" span, and weighs 60 lbs.

Assault Glider Trust

The Assault Glider Trust is based at RAF Shawbury, and leading light Frank Fletcher and his mates demonstrated an aero-tow of his Airspeed Horsa. I first read about the full-size Horsa and its exploits on the back page of the Victor comic, some time in the early Sixties, and I am still fascinated.

The towing was impressive, doubly so, given the gusty wind. You can only imagine how terrifying it must have been to be towed to the battlefield, and then perhaps crash land in one of these assault gliders.

Hanriot HD1

You may remember that I covered Ian Turney-White's huge 66.6% model in my LMA Bradford Symposium photo report, earlier in the year. Therefore, I was very eager to see her fly at Cosford. The Hanriot is a truly substantial model at 19 feet span, and a weighs of 88 kgs. She is fitted with a JPX 425cc petrol engine with a 1.93:1 reduction drive, allowing her to swing an enormous prop.

When Ian took her out on the grass and pointed her into wind, the gusts were a bit intimidating. As he opened the throttle she barely seemed to get rolling before she wafted into the air. Wow! Such large models have a weighty way of proceeding, just like the real thing. The only thing with which I could not concur, was Ian's quirky taste in balloon-headed pilots, but I'll let that pass.

However, almost immediately there was an incident. Ian shouted *"Dead Stick"* - when, confusingly, we could all still hear the geared engine whirring away. Then we noted that the engine note had slightly increased, yet she was flying more slowly. More revs and less speed could only mean one thing: a thrown

This full size Fox glider gave a great display, too.

The lad himself: Dave Johnson, tireless Chairman of the LMA.

Harry Harland's cute Turbulent.

Detail of Mike Lee's wonderful 107" span / 40 lbs / MVVS 80 powered Percival Provost.

Jez Harris's Nieuport 28S spans 104", weighs 30 lbs, and is powered by a Zenoah 38.

Frank Fletcher's Airspeed Horsa. The Assault Glider Trust, stationed at RAF Shawbury, gave a great display of military glider towing.

Hanriot DH1, scratch-built by Ian-Turney White.

Matt Harrowven's Zenoah 38 powered 1/3rd scale Fokker DVI.

Kick in that rudder! My mate Chris Poyser's Sopwith 11/2 Strutter Black Bess.

Fine SE5a, by Ken Bones, with shirt sleeves pilot, on a low pass.

Andy Johnson's 12 feet span / 75 lbs Handley Page Victor tucking her gear away whilst climbing-out on her two Wren Supersport gas turbines.

Boing! Boing! Wingwalker hand-stands on a Boeing Stearman. She's either Danielle or Lil' Sarah, but Sharon Styles is definitely calling the shots on the transmitter.

The Tony Nijhuis designed-and-built North American OV-10 Bronco on short finals. Now owned and flown by Steve Holland. 14 feet span / twin Zenoah 62s.

Robbie Skipton's massive 60% / 115lbs scale Yak 54 powered by a 3W 342iB2F TS engine.

Hun Patrol! An Siemes-Schuckert S.3 covering a Fokker Dr.1.

Fine Airspeed Courier spotted in the pits, Sorry no other details. Never fear: I'll catch up with it later in the season.

It's no show without a yellow Cub! Dave Johnson owns this one.

prop. Ian was on top of the situation and immediately brought her around and lined her up to land. It was odd hearing a motor still running when the model was clearly dead-stick. The wind made landing surprisingly difficult. She seemed to hold off in ground effect, floating on and refusing to settle. However, Ian is an excellent pilot, and he got her down on one piece, only for the wind to flip her onto her nose at the very last minute.

The crowd's long round of applause said it all. There was no damage done. Ian righted her, then strolled off to deep in the field to retrieve the massive prop.

The verdict

I had made up my mind to go, rain or shine, but the curse of a bad weather forecast kept some away. This was a crying shame since there was actually no rain, and the sun shone for a good bit of the day. True, the wind was gusty, but most pilots got in a flight. Flying was brisk and non-stop all day, so we punters were not short changed. I enjoyed the range of Display Groups, the variety of scale models, and the vast trade presence.

I like the fact that you see models at Cosford that never see the light of day elsewhere. There were other treats. I even went to visit the new Key Pavilion where back issues of this very organ were available too. As ever, LMA Cosford remains a great show and a great British modelling event. ■

Full-size surprise! One of only two remaining air-worthy Lancasters, 'City of Lincoln' flew over.

Dave Pearson and his stunning Composite ARF Corsair. Moki 250 radial power. 110 inch span.

Greg Veasey's superb Mitsubishi A6M Zero being fettled in the pits under a threatening Cosford sky.

This unlucky Albatros lost her spinner.

This pilot on this SE5a has obviously been shot.

John Townsend's well-known half-scale Magister always looks the part.

Roger Bale's ten foot span Faitey Swordfish. Those wheels are 7" diameter, and she needed 20 metres of Solartex for the covering.

The Quiet Zone

THIS MONTH: HOW TO PRINT WW1 GERMAN 'LOZENGE' CAMOUFLAGE ONTO FABRIC COVERING

Yes, here we are again, with a whole new batch of interesting 'stuff' for you. Needless to say, bearing in mind that this is, after-all, The Quiet Zone, you can also expect more than a little waffle along the way.

It appears that this month's column will be something of a finishing off edition, as long as I manage to fit it all in. Hopefully, this issue will see the conclusion, for the time being, of the 'how I design 'em' item and the concluding part of Darrin Covington's finishing techniques for his stunning Albatros D.Va model, the dreaded lozenge fabric. So, without further ado, and to enable me to determine how much room I have left, let's press on with Darrin's article.

Introduction

Building a model of a WWI German aeroplane often means running up against the dreaded lozenge camouflage. You can avoid it all together by choosing an aircraft that didn't have it, but you eliminate some beautiful schemes. You can buy pre-printed covering, if the scale you need is available, but it's expensive and printed on a fairly heavy material, usually Solartex or the like. Or you can paint the pattern on the covering, either before or after it's applied to the model. I had an electric 1/6th scale Albatros D.Va that needed covering and for which the available material is just too heavy, and painting it too labour intensive for results that just don't look authentic. No, the factory printed the fabric, and that's what I wanted to do.

Covering material & Inkaid

I usually cover my models with Coverlite (Litespan in the UK. PR); a very light non-woven polyester material that has worked very well for me. However, if you try to print on it with a typical bubble jet printer, the ink will just bead up. This is because it's sealed to be somewhat fuel proof. There is however it's brother, Airspan (also marketed as LW tissue), that is similar but is untreated. It still can't be used as supplied though, because if you print directly on it, the ink will bleed, leaving a blurry mess. What's the solution? Well, it's a Solution actually, named 'Inkaid' which is a water base emulsion designed to be applied to a variety of materials, including metal, to form a base layer that can be printed on. The outcome looks as good as if you printed on paper. If you do a search online, you'll locate a distributor for it. They have a number of products, but I used the matte white. (This is the same product I used on those little, foam, indoor models I mentioned a while ago. PR)

Preparing the covering for Inkaid

Unfortunately, Airspan comes folded up in a small package, leaving deep creases that will interfere with the application of the Inkaid and subsequent printing. The Inkaid will pool up around these creases, resulting in uneven printing. The Airspan needs to be smoothed out first. I tried ironing it flat, but the heat required to remove the creases is enough to begin shrinking the material, so you end up with a puckered mess. The solution I came up with involves attaching it to

BELOW LEFT: With the Airspan securely attached to to a frame, gentle heat is used to remove the creases. BELOW RIGHT: The magic ingredient that makes it all possible, Inkaid. I still think using bottled water to dilute it is a bit extreme. Note the paint pad used for application.

TOP LEFT: **Inkaid is, to some extent, self-levelling, providing a smooth, even base for printing.** TOP RIGHT: **A sharp blade is essential when cutting around the carrier sheet, to avoid any tears or rough edges that may foul in the printer.** ABOVE LEFT: **With the Airspan lapped around the 'leading edge' of the carrier sheet we're all ready to start producing lozenge printed covering.** ABOVE RIGHT: **And so the magic takes place. Matt white covering into the printer, lozenge fabric out.**

an open frame and applying just enough heat to pull out the creases. A simple frame made from wood is all that is needed. Size it to fit the Airspan, and make the most efficient use of it. I used masking tape to attach the Airspan, pulling it snug, but even. You don't need to completely remove the creases at this point. Once attached, use an iron and apply heat evenly to the entire area. Just enough heat to pull the creases out, and do the entire piece. Don't over shrink it now, or you'll have none available after you attach it to the model.

Applying the Inkaid

Application of the Inkaid is pretty simple and goes fast. In fact, it needs to go fast. Thin the Inkaid about 30% with water, carefully stirring it to avoid forming bubbles. Use a disposable foam brush to apply it in quick passes, across the grain of the Airspan. Don't apply a lot; you're going to do another coat later, just get it on even. Brush it out with several passes, pushing it into the material, and then leave it alone. You can speed the drying with a heat gun on low, but it will level out better if you don't. After the first coat is dry to the touch, apply a second coat. Apply it the same as the first, but with the grain. It's not difficult to accomplish, but a smooth even coat is important for the final printing to look even. I tried spraying the Inkaid, but it tends to bead up instead of level out. Allow the final coat to dry thoroughly.

Attaching the covering to the carrier

You can't run the Airspan directly through the printer because it won't feed properly, it's too flexible. It needs to be attached to a carrier sheet of paper first. I found glossy photo paper works best. The adhesive used to attach the Airspan peels easily from it and it's heavy enough to be used over and over. Look for one that has a textured finish on the back. It's designed so that the printers feed rollers can grab it. The Airspan needs to be applied to the carrier in a fashion that leaves it smooth and only temporarily attached. After all, you need to remove it before you can use it. I found a low tack spray adhesive used to mount photos, that works well. The best way to get the covering material onto the carrier is to lay the frame, with Airspan attached, face down on a smooth hard surface. Spray a light coat of the photo mount to the glossy side of the carrier paper. Then lay the carrier on the back of the Airspan, smoothing it out as you do. You don't need to apply a lot of pressure; the glue will grab and hold. Try to get it right the first time, but it can be lifted and repositioned if it's wrong. Now, take a sharp blsa knife or scalpel and trace around the perimeter of the carrier, cutting through the Airspan. On one end though, leave a tab extending out about 1/2". This tab is folded around and attached to the back with another light application of photo mount, to become the edge you feed into the printer. You should now have a piece of Airspan attached to the carrier, ready to print on.

The artwork

Now that we have our covering material ready, we need something to print on it. There's no shortage of available patterns or advice on appropriate colours for the lozenges, and I'm not going to pretend to know what is correct. (Choose your source and go for it.

Prepare the artwork at 300 dpi for good printing. I printed in widths that mimic the 52" width I'm told the original fabric came in. You'll need to make allowances so your seams will fall over ribs for attaching though. It takes some head scratching, but needs to be done for a correct look. Keep in mind, these seams will be covered by the rib tapes so the pattern match doesn't have to be perfect. You're not limited to just the lozenges here either. You can also apply markings, if you prefer. It will require some extra planning so they're located properly, but if you don't like painting them, it does work. I applied a weave texture to mine, so it looks like woven fabric. I also applied stitched seams.

Printing

Now for the easy part. Make sure you have plenty of ink, because it does eat it up, and set the printer preferences for "normal" printing. Feed the paper into the printer, however required and watch the magic happen. All of the work you've put in up to now will finally pay off. After it comes out of the printer, look it over for blemishes, and check your colours. You may need to run a few samples to fine tune it. If it all looks good, allow it to dry for an hour or so and carefully peel the Airspan from the carrier sheet. It should come apart easily, just be careful you don't tear it. Also, the back will be slightly tacky from the photo mount. Don't let it touch itself, it could stick. After it's removed, lay it to the side to fully dry, from both sides. I found stacking the printed sheets, with wax paper separators, keeps them organized and

LEFT: As you see, Darrin was able to include a fabric weave effect into his artwork, to further enhance the realism. ABOVE: Because of the spray mount used to attach the Airspan to the carrier sheets it is important not to allow the finished sheets to stick to each other. Let's hope no-one opens a door suddenly. BELOW: A bit of 'weathering' and some tapes and the covering becomes totally convincing. Markings, in this instance are painted, not printed.

safe until you're ready to cover.

Covering the model

Using the material after printing is basically the same as in its' original form. I used Sig Stix-it on the perimeter of the models' framework and a small detail iron to adhere the covering. One thing to watch out for though, the printing is somewhat delicate at this point, until it gets a coat of dope. The iron will try to rub off the printing. Use very little pressure, with more of a straight on approach, instead of dragging the iron across it. Of course, many of the edges will be eventually covered with rib tape anyway. Once all of the edges are down, shrink it with an iron. Again, use very little pressure, because the printing is still fragile. Now apply one thinned coat of nitrate dope. Apply it quickly. It will soften the Inkaid and printing slightly and you don't want a

The proof of the pudding, the very realistic wood-gain finish fuselage (detailed last month) and the printed lozenge covering combine on this super model.

smeared mess after all of this work.

Taping

My Albatros colour scheme called for salmon coloured tapes. The printing is somewhat transparent and allowed too much of the lozenge colours to show through for my tastes, so I painted Airspan sheets with latex paint and cut it into strips for the tapes. I applied it with dope. Work quickly; the dope tends to soften the latex. I suppose you could try enamel, or maybe dope, but I didn't do any experimenting with those so have no idea how they might behave. Another quick thinned coat of the dope follows the taping. Spraying is preferred for this coat.

Final finish

For a final finish I applied one tack coat, followed by a wet coat of spray can oil base Varathane polyurethane. My Albatros is electric, so fuel proofing isn't an issue. You may need a different finish if you use one of those wet propulsion systems.

Conclusion

That's the process I used to cover my Albatros. It took quite a bit of trial and error and plenty of help from others that have been down the same road. My approach is a combination of different methods already in use, along with some tweaks I came up with. So, if you have your eye on a particular paint scheme that has lozenge camouflage covering, don't be afraid, you might find this could work for you.

Back to me

Well, since I feel it was important to get that dealt with so that, once the Albatros design is published, you'll have all the information about how the model was finished. However, as I'm sure you'll have noticed, that leaves me a bit short on space to continue the design technique feature I had hoped to conclude here. So, as is often the case as far as this column is concerned, a last minute change of plan is required. It seems the design item will have to wait until next time, when I can give it the space it deserves.

To be perfectly honest, I'd rather expected many of you to find it dull and uninteresting, but it seems that isn't the case. I have received several e-mails actually thanking me for the item, from readers eager for the concluding part. To all those, I apologise for the delay getting there, but solemnly promise that I will finish it next time around. I just felt it was important to get the Albatros items published at around the same time the plan article appears, for obvious reasons.

So, rather than cram in some other item, that really deserves more space, I'll leave you with the promise that next time we'll look in some depth at how I convert a simple, traced three view drawing into an actual, workable, model aircraft plan. Well, as workable as my designs get, that is.

In the meantime, if you have a contribution to make to the column, have a query you feel I may be able to help with, or just want to talk model aeroplanes, I may be contacted at PETERRAKE@aol.com ■

Just to lend scale to the model, and show off the underside lozenge, Darrin poses with his DVa.

The LOZENGE Pattern Conundrum

The late Ron Moulton extensively researched these unusual German WW1 camouflage schemes

When Friedrich Riemschneider of Dresden applied, in 1916, for Patent 308410, for a concept of a multi polygon pattern of five colours, to be used for camouflage, he initiated a subject that has fascinated reasearchers wherever scale models, full size aircraft restorations or full-size replicas of WW1 are made.

The Patent specified Blue, Red, Yellow Green and Lilac and proposed that a pattern that did not permit the same colours to become adjacent, would provide camouflage for aircraft, balloons and ground cover for war equipment. Though fabric was printed ready for application in April 1917, the Patent granted was not distributed until August 1919, long after the armistice.

Records of the adopted paterns disappeared in the months that followed and it was not until 40 years later that any serious interest was shown in the subject. The last stocks of what would now be precious printed fabrics had been absorbed by the impoverished clothing trade in post-WW1Germany and turned into underwear, trousers and shirts!

The late Peter Gray had contributed features on German WW1 camouflage in *Aeromodeller* though 1957 and made contact with H.D.Hastings of Mt.Vernon, N.Y., who had studied the Fokker D.VII in its preserved original state at

BELOW LEFT: How stencils are used for each re-covering of the LVG C V1 in the Shuttleworth collection at Old Warden, as recorded here by Andy Preslent in this unique photo of fabric that has been pre-sewn from chordwise strips and is being stencilled as though it had been printed with unmatched joins. Dilligence indeed! BELOW RIGHT: Upper wing panel underside of the French Fokker D.VII shows an excellent example of how chordwise application of the printed fabric is not matched, wallpaper style at edge joints. This Fabric has become too strong in red, colours should not be taken as true four colour underside tones.

Knowlton in Canada. He had also obtained information on the Albatros D.Va at Canberra, Australia and from this, made the first study if the two quite different schemes. Peter compiled a feature on these findings which appeared in *Aeromodeller* April 1959 issue as *Pattern 'A'* for four colours and *Pattern 'B'* for five colours - this, over 40 years after the time when the so-called 'Lozenge' fabrics were introduced and long after generations of modellers and artists had been producing their own interpretations of the camouflage at random.

Revelations of the Don Hastings' patterns have stood the test of time, although often questioned. Independent studies have been made in USA, Canada, France and Germany, each by renowned researchers able to work from original fabrics published in Museum literature, books and authoritive journals such as *World War 1 Aero, Pegase* and the excellent story of the rebuilding of the Halberstadt CL IVs for the Berlin Museum.

All of these diagrams are very closely related, yet when tracings are superimposed, these reveal subtle differences.

Having followed the same route in tracing used fabric, either on the airframe or after it had been stripped for re-covering, I came to the conclusion that most of the variations that appeared were due to distortions during the covering and doping process. In other words they are all near enough to be considered perfect. But the Berlin pattern, as researched by Manfed Thiemeyer (who went to the extent of counting off individual thread runs to observe distortion), would be my choice.

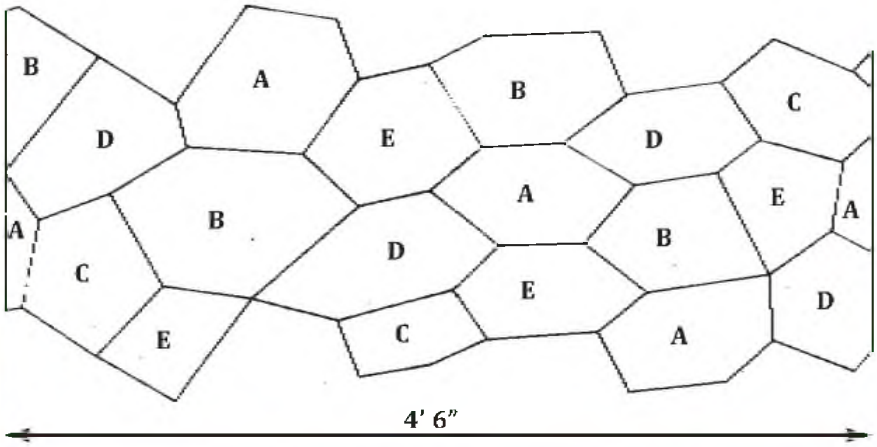
It is this fabric that was put into production in 1991 to cover the Halberstadts for the USAF Museum at Dayton, Ohio and MVT in Berlin, then purchase by the R.A.F. Museum for their Fokker D.CII at Hendon.

Two other sources of five-colour pattern fabric aremade in Franceand USA, the latter by *Vintage Aero Fabrics* at Mendon, Vermont, who offered it in 'day-dark', 'daylight' or 'night' grades

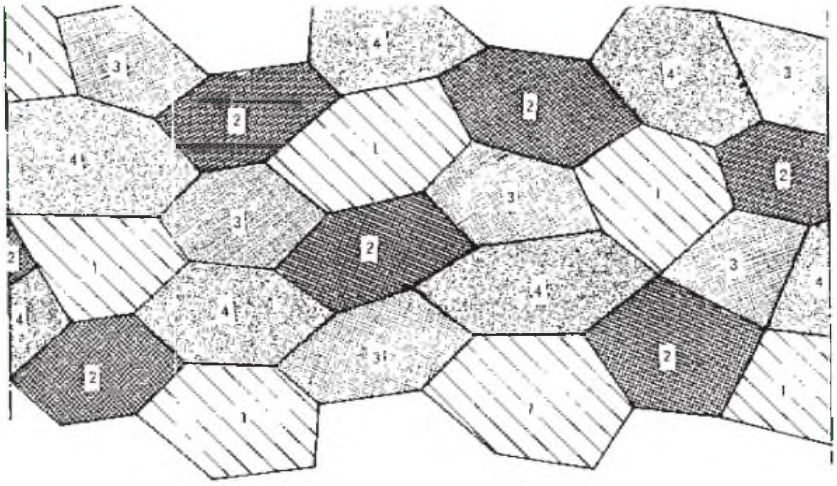
Reproduction WW1 camouflage fabric samples byMVT Berlin

BELOW LEFT: Four colour pattern on fuselage side of the Muse de lair Fokker D.VII at Le Bourget, applied lengthwise thus showing regular repeats of the four tones in lines. BELOW RIGHT: Australian War Museum at Canberra has this Pfalz D.XII with original covering on wings, elevators and fin. The latter appear to have underside fabric colours, being light in tone while the wings are darkened with the effects of ageing varnish.

Basic five-colour pattern, compare with MVT repro fabric photos.



Basic 4-colours pattern and colours



Upper Surface

Key	Colour	Methuen	FS595a	Humbrol
1	Blue	21D4	35164	67/M22 Tank Grey
2	Turquoise	24E7-25E7	34058	3/G5 Brunswick-Green + Dash 14/G6 French Blue
3	Beige	4D4-5D4	30257	62/M23 Leather + 7 Light Buff
4	Green	29D5-30D5	34227	HD1 Grey-Green

Lower Surface

Key	Colour	Methuen	FS595a	Humbrol
1	Blue	23D4	35237	HB13 Azure Blue
2	Green	26D4	34325	3/G5 Brunswick-Green + Dash HB5 Sky
3	Ochre	4C7-5C7	33613	63/M14 Sand
4	Rose	11B5	31433	61/M7 Flesh

on various materials, which conveniently brings us onto the vexed matter of colours and application.

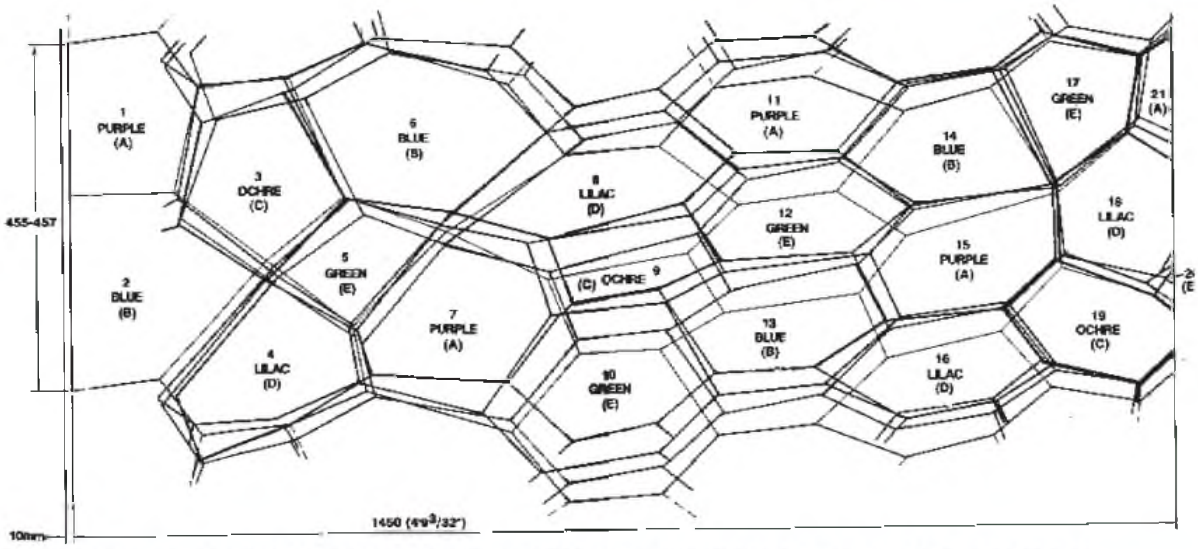
Get it right!

If the actual p[attern is defined and while most studies have been centred on the widely used five-colour scheme, (there are several others which were used on Bombers and Marine aircraft), then there are no excuses for ot getting the colours right. Apart that is, from falling foul of the hazards of colour reproduction in the many printed references.

Snips of actual fabric have been scanned specially for this article in order to capture the true colour tones (but even then it can be a lottery of the whim of the printing press machine minder as to whether the tonal values are correct), to capture the true colour values. It's an unfortunate fact that photographic processes, even in this digital are are dependent on lighting conditions and even further hurdles including the paper stock on which the printed image appears.

Time and again, we've seen well-built scale models of WW1 aircraft that have been spoiled for the purist by garish colours. Sometimes the blues are dominant, and for the upper surfaces, far too light. The coffin-shaped lozenge which should be near to Khaki on the upper surfaces and Ochre on undersides often stands out like an anti-camouflage traffic light and it spells out caution in any new application.

Overall, the iupper surfaces on all the



This diagram shows variations of measured fabrics at AWM Canberra, NASM USA, Musee De l'Air Paris and MVT Berlin.

surviving WW1 aircraft are dull, dark and dirty through long storage and inevitable breakdown of the copal varnish. Though the new repro fabrics possess the best possible adherance of even a factory fresh aircraft unless some of the brillance in the dye is shaded down by dope and any other treatment used during covering.

Application

Even when there has been an obvious diligence on the part of the modeller to achieve the true colours with scale effect (noting that the a full size sq.ft. of solid violet takes on a different hue when reduced to a fifth size or less for example) there is still a common misinterpretation of how the fabric was actually prepared for a wing.

Remember that a wing chord of 4 ft 6 in. or less would be most unusual for any German WW1 era aircraft and that this is the average dimension for the useful width of printed fsbric, less the selvedges. Having established that simple fact permanently on the human screen, then consider how a wing of greater chord would be covered. It must be obvious that the fabric had to be cut into strips and then pre-sewn on adjacent edges to make the length of a wing panel.

Okay, there are exceptions, even the Australia Albatros D.Va at Canberra, where a strip of fabric was used to make up the chord width on the underside of the lower wing, but that WAS unusual!

The strips were not always directly at 90 degrees to the leading edges, many aircraft had 45-degree panels to control warps. Nor was it a practice to match the pattern edge-to-edge. On the contrary. Fabric was too costly for it not to be wasted on pattern matches as though it was wallpaper, so at each junction, there ought to be a series of cut-off lozenges that tend to stand out as a firm line. Even then, it there was potential for a close pattern match, the double seam used as the 'bag' or 'enveloped of material was 'pre-sewn' , it woulduse up an inch or two of each edge.

All that considered, perhaps the reader will understand that a fully matched run of match pattern from wing tip to wing tip will probably not be credible 'true-scale'.

On the fuselage sides, such an uninterrupted run is a credible representation, because the fabric width would usually be sufficiently wide to span between upper and lower fuselage longerons. ■

ABOVE: Most authentic example of five colour fabric from WWI is Alex Imrie's Rampler C.IV tailplane, seen here with the maestro showing the undersides, still retaining true colours, and of course, the pattern. BELOW: RAF Museum Fokker D.VII fuselage side with five-colour fabric applied lengthwise showing regular repeated patterns in triple batches of the colours.

MVT Berlin reproduction fabric before any treatment, underside tones.

MVT Berlin reproduction fabric before any treatment, upperside tones.

Techno Scale

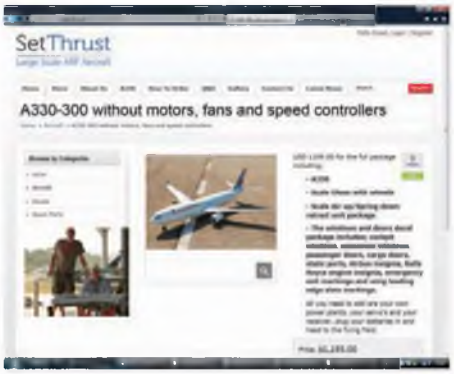
Mike Evatt searches cyberspace for more TechnoScale Topics

ABOVE LEFT: The Iron Bay Model Company's Giant Scale Precision Model Aircraft Kits.
ABOVE RIGHT: The Unlimited Scale Racing Association website.

The **Iron Bay Model Company** with a web presence at http://www.ironbaymodelcompany.com claim to provide 'The Worlds Finest Selection of Giant Scale Precision Model Aircraft Kits'. Checking out their products it does seem that they are of a very high standard. With an Iron Bay kit, the hard work has been done for you; although they are not considered an ARF, the kits assemble quickly and accurately because of the high level of prefabrication and engineering. The final product is not only accurate in appearance, but is very robust and durable for years of use.

The **Unlimited Scale Racing Association** (USRA) is an organization dedicated to the competitive sport of radio controlled (R/C) Giant Scale Racing competition capturing the thrill and excitement of the world's fastest motor sport. The USRA is the official sanctioning and rules body for the sport of Giant Scale Air Racing. Created in 1991 by Tom Easterday and Cliff Adams, Giant Scale Air Racing was modelled after the Reno National Air Races as a way to bring the excitement, sound, colour and history of air racing up close to the public and the world of radio control enthusiasts. Want to know more? Then check out the USRA at http://www.usrainfo.org

'Set Thrust' was born from a combination of both the frustration and intrigue that we had developed at not being able to find a beautifully scaled, decently sized remote control airliner anywhere on the market. Set Thrust's initial design criteria was based on the concept that the model must be easily transportable by car to the flying field and be powered by a commonly found, practical to source power setup. As for the initial aircraft type? Well, that was the easy part, as the two partners in the company both are pilots flying Airbus A330s. Their 2m long, 2m wingspan delights, may be seen on



ABOVE LEFT: Superb Airbus A330s from 'Setthrust'. ABOVE CENTRE: UH-60 Blackhawk for 600 size mechanics from RC Aerodyne.
ABOVE RIGHT: A typical Luftwaffe fighter pilot wearing Battle of Britain fight gear.

TOP LEFT: This Ole Tiger is a Peanut Scale Rubber Powered Model. TOP RIGHT: The ASM INVADER model is an exciting replica of the original A-26. ABOVE LEFT: ARC DIRECT produces superb 'Almost Ready to Cover' kits. ABOVE RIGHT: An E series Bf-109 for 300 to 400 watt brushless out-runner electric power.

their website at http://www.setthrust.com

The goal of **RC Aerodyne** at http://www.scaleflying.com is to expand and improve access to micro aviation and innovative technologies to a broad clientele worldwide. Their team of RC enthusiasts are born modellers working to continually raise the bar of quality, appearance and performance. The company sells a vast range of aircraft including a significant number of scale helicopter bodies, such as the UH-60 Blackhawk, shown in the screen-shot. This fits Trex 600 and RC Aerodyne's Chaos 600 size mechanics. This version has fully operating sliding doors and CNC Aluminium Landing gear with working struts. For those in Europe http://www.scaleflying.de may be more convenient,

Aces of Iron Productions Inc. maintains a web presence at http://www.acesof-iron.com Here you will find some amazing scale pilots such as the 1//5th scale figure shown in the screen-shot. The design is a Typical Luftwaffe fighter pilot wearing Battle of Britain fight gear. This pilot wears the leather jacket, LKpW101 helmet, model 10-6701 oxygen mask, model 306 goggles, life vest and parachute harness. This pilot is sure to dress up any Messerschimtt, Focke Wolfe, Stuka or any other German aircraft you may have in your hanger.

Retro RC at http://retrorc.us.com have a mission to design, manufacture and sell high-quality model aircraft kits which will appeal to newcomers and old hands alike. They specialize in retro-looking designs and recreations of classic models from the golden age of modelling; the 1930's & 40's. Their Ole Tiger is a Peanut Scale Rubber Powered Model, Full Kit; Laser Cut; wingspan 13". Kit includes laser cut parts; rolled plans and instructions; genuine Esaki tissue; laser cut tissue decals; waterslide decals;

The ASM **INVADER** model is an exciting replica of the original A-26. Its impressive 92-inch wingspan and 66-inch length results in a great flying model that is easy to see and fly, but because of its three-piece wing, the model breaks down to fit nicely into most vehicles.Though while not intended to be flown or built by the novice modeller, experienced modellers will find the A-26 Invader is easy to assemble and versatile enough to handle many different power systems. Take a peek at this unusual model at http://www.vqwarbirds.com

Canadian company **ARC DIRECT** produces superb 'Almost Ready to Cover' kits. Their 45% Ultimate 10 DASH 300 biplane features balsa-foam-sandwich construction with a removable 3-piece top wing and bottom, removable stab with concealed elevator servos. To complete the model s carbon reinforced fibreglass cowl, wheel pants, aluminium landing gear, and clear canopy are provided. Their assembly manual tells you what to do from A to Z to assure a successful flight with no unexpected surprises. Check them out at http://www.arcdirect.com

Now, **SIG** at http://www.sigmfg.com brings you an 'Almost Ready to Fly' warbird, modelled on the E series Bf-109s, for 300 to 400 watt brushless out-runner electric power. The model is sized to use affordable electric components, yet large enough to be a realistic flyer. With an intermediate to advanced pilot, it is capable of every scale manoeuvre that the full-scale fighters were able to do, plus some. The Bf-109 ARF has been engineered to get you into the battle as quickly as possible with an R/C model that will truly last.

If you are not sure about which electric power system to chose for your 45g-50g 3D model or 70-85g scale plane, 4-Max have done the hard work for you. Just add a receiver, prop and plane all for just £69.99. With 60g motor thrust, the new Tiger Motors micro power system is specially developed for micro 3D planes. It's perfect for 45g 3D planes and 70g normal flying. Check the system out on their burgeoning website at http://www.4-max.co.uk

An Aladdin's Cave of plans? It's not possible! Is it? For over almost 40 years Derick Scott's labour of love has been to collect plans. Note this site is primarily for swapping plans, this it not a commercial enterprise it is Derick's hobby and he only sells copies of plans which are now out of print. His website at http://www.model-plans.co.uk reveals a plethora of designs including many scale subjects.

That's all there is time for from me this month so light up that monitor and if you find something out there of interest that might be good to share, email me at mikeevatt@hotmail.com ■

ABOVE LEFT: The new Tiger Motors micro power system is specially developed for micro 3D planes.
ABOVE RIGHT: An Aladdin's Cave of plans? It's not possible! Is it?

PLANS and PARTS

BE READY TO START BUILDING AS SOON AS YOU UNFOLD THE PLANS WITH THESE LASER-CUT PARTS SETS

HEINKEL HE 51

Plan price £17.50
Plan No.80
Component Pack £125.00

A 68" (1727mm) wingspan 1:6.4 scale model of the pre-WW2 German biplane fighter for 4-function radio control and .70-.90 cu.in. four-stroke motors. Can be built without recourse to glass fibre mouldings for items like engine cowl and wheel spats. Two sheet plan.

BUCKER BU180 STUDENT

Plan price £26.50 Plan No.015
Component Pack £120.00

A big, but manageable scale model of the German pre-W.W.2 trainer, designed for .90-.120 four stroke motors and four function radio systems. Four sheet plan shows conventional wooden structure for airframe, plus alternative foam core wing.

ELECTRIC CANBERRA B(I)8

Plan price £29.50 Plan No.262
COMPONENT PACK £175.00

From the building board of electric ducted fan scale expert Chris Golds, this 84" (2,134mm) span model is the 'Interdictor' version of the famous jet bomber. Prototype used two Hacker B50-16L motors and two ten-cell 3300 NiMH power packs. Four sheet plan shows retracts and flaps. Plans are supplied complete with step-by-step written construction sequence.

DE HAVILLAND CANADA DHC-1 CHIPMUNK

PLAN NO.314
PLAN PRICE £27.50 (EITHER SCALE)
COMPONENT PACK £155.00 (EITHER SCALE)

Dave Womersley's 1/4 scale, 103" (2616mm) wingspan Nationals scale winner, for 1.8 cu.in. four stroke engines. The plans are also available in 1/5th scale; please specify which scale is required.

COMPER SWIFT

PLAN PRICE £14.50 (1/6 SCALE), £17.50 (1/4) PLAN NO.244 (1/6 SCALE) NO. 248 (1/4 SCALE).
COMPONENT PACK 1/6 £65.00. 1/4 £75.00.

The delightful 1930s British light-sport and racing aircraft built to 1/6th scale by electric R/C expert Chris Golds. Wing span is just 48" (1219mm) and model is designed for 400 brushless or 480 brushed type motors running from 10 x 1850 NiMH cells.

De HAVILLAND DH 82a TIGER MOTH

PLAN PRICE £26.50 PLAN NO.051.
COMPONENT PACK £115.00

An 80 inch (2032mm.) wingspan, 1:4.33 scale model for 1.20 cu.in. motors and four function radio control systems, No moulded cowl required - all wood construction. Three sheet plan.

FE8

PLAN PRICE £19.50
PLAN NO.267
COMPONENT PACK £88.00

Accurate 1/5th scale 75.6" (1920mm) wing span replica of the British early WW1 pusher fighter. Requires .78-.91 four stroke engines and four function radio control system. Excellent for electric conversion.

FELIXSTOWE F2A

PLAN PRICE £19.50 PLAN NO.276
COMPONENT PACK £110.00

An amazing 1/6th scale fully flyable replica of the British WW1 maritime patrol flying boat. Model spans 100.5" (2553mm) and suits two .25-.30 cu.in. two stroke engines. Can be flown from water, or from land using a take-off dolly to safely landing on its hull. Prototype model won "Best of Show" at the prestigious Toledo R/C Expo in USA. All the detail is there on the plans for an impressive model.

FOKKER D.VII

1/4 PLAN NO.241, 1/5 PLAN NO.242
PLAN PRICE (EITHER SCALE) £26.50
COMPONENT PACK 1/4 £125.00
COMPONENT PACK 1/5 £120.00

1/4 scale spans 82.5" (2095mm) for 30cc (1.8 cu.in.) two stroke engines. 1/5th scale spans 65.7/8 " (1673mm) and suits 15.cc (.90 cu.in.) four stroke engines. BE SURE TO QUOTE SCALE REQUIRED WHEN ORDERING!

HAWKER FURY

PLAN PRICE £17.50 PLAN NO.091
COMPONENT PACK £125.00

A 1/6th scale replica of the RAF's most elegant 1930's biplane fighter. 60" (1524mm) wing span model requires four function R/C gear and .60 cu.in. motor.

D.H. 103 HORNET

PLAN PRICE £22.50 PLAN NO.052
COMPONENT PACK £130.00

80" (mm) wingspan sport-scale replica of the hottest production piston engined fighter ever. Suits engines .40-.53. Original retracting undercarriage unit included with the plans.

BELL P-39Q AIRACOBRA

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