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LUTON BUZZARD



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P-51D Mustang 40 ARF

The Hangar® 9 P-51D Mustang 40 ARF is a unique take on the historic fighter. It's modeled after the Mustangs flown over Europe with the 357th Fighter Squadron who escorted allied bombers and attacked targets of opportunity during the final months of WWII. Along with its authentic trim scheme and decals, it includes an impressive list of scale details usually only available on more expensive kits.

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SPECIFICATIONS | HAN5035

Wingspan	1430mm (56.0 inch)
Overall Length	1260mm (49.5 inch)
Wing Area	36.14 sq. dm (560.0 sq. inch)
Flying Weight	2.8 - 3.1kg (6.25-6.75 lbs)
Engine Size (Glow)	.46-.52 two stroke .72-.82 4-stroke
Engine size (Petrol)	10cc 2-stroke
Motor Size (EP)	E-flite Power 46
Minimum Radio	4 + channel - 6 if using flaps/retracts
Servos	5 mini (4 for electric)
Prop Size	11x6 (glow 2-stroke) 13x6.5 (EP)
Spinner Size	82.6mm (3.25 inch)

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More about this WWII fighter classic can be found on horizonhobby.co.uk

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ON THE COVER

You have to admit - it has 'character'. Dennis Richardson's 1/13th scale, 69" (1753mm) wingspan Handley-Page Heyford bomber is powered by two O.S.30 engines, models the aircraft on which was father was a crew member during the late 1930s.

(Photo: Alex Whittaker)

NOVEMBER 2013 NO.168

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Dennis Richardson's father crewed Heyfords in pre-WW2 RAF, so it had to be on his 'must-build' scale modelling list. Alex Whittaker reports the result.

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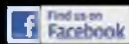
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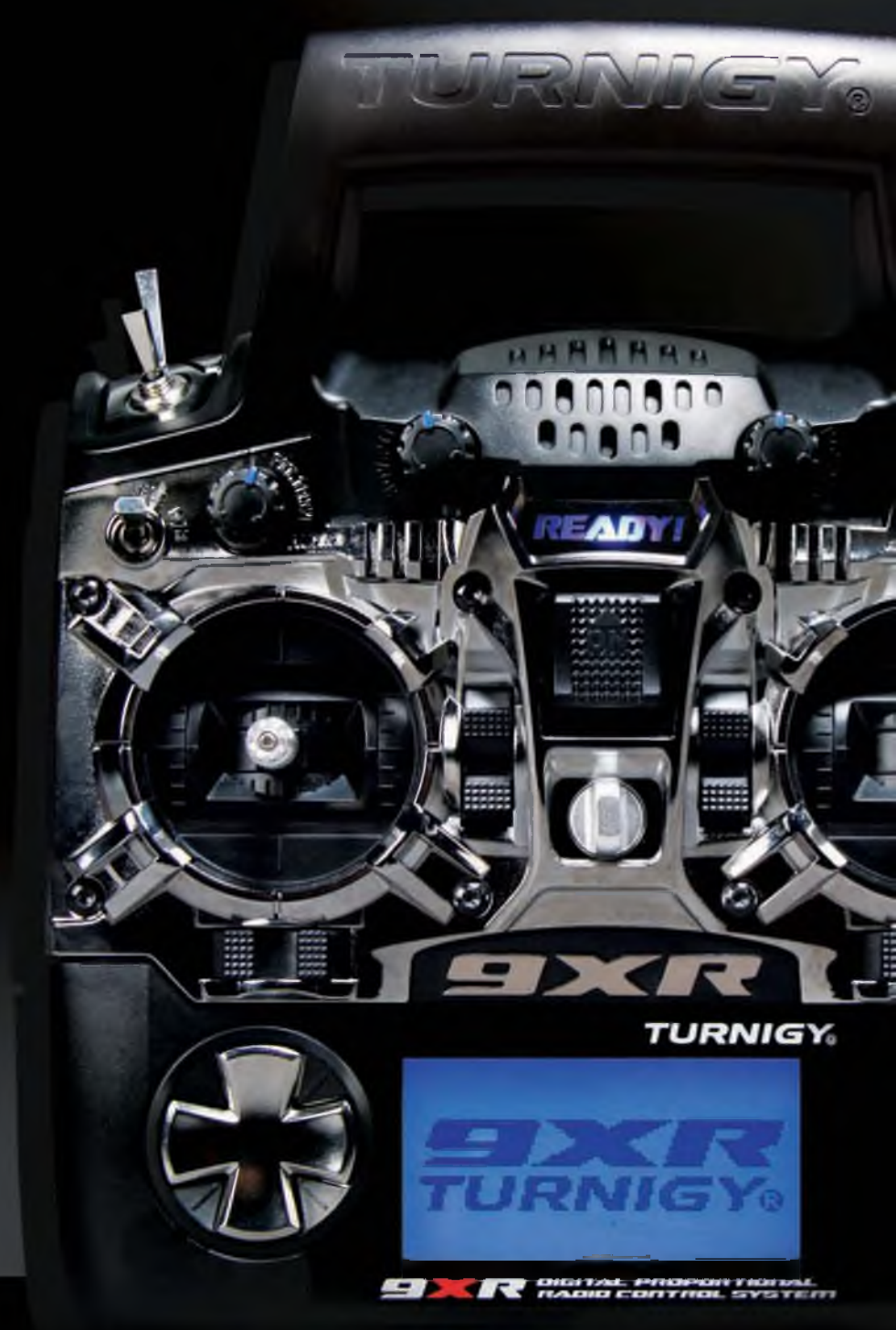


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CONTACT

GETTING THE BUZZ

Back in the May issue of FSM we appealed for photos of the full size Luton Buzzard. A number of readers kindly responded, and those responses were much appreciated. We were not immediately able to accumulate what was needed to produce the kind of 'Subjects for Scale' feature we wanted but finally, via a somewhat tortuous route, we managed to get what we needed, first through a tip-from Mike Oakey, who, some of our readers will remember as a previous editor of *Aeroplane* magazine. Mike kindly passed on our request to Richard Riding, the launch editor of *Aeroplane* and Richard came of what was needed to enable our presentation in this issue of FSM of this interesting and distinctively shaped little 1930s light aircraft that drew upon the technology of gliders and sailplanes of that era, to produce a low cost aircraft for private sport flying.

We hope someone will rise to the challenge modelling this subject and meanwhile, our thanks are due to all who responded to the call.

NEXT MONTH IN FSM

The Fokker Dr.1 Triplane has, so far, escaped FSM as a major construction feature. Finally, we have one, from the ever-busy drawing board of Peter Rake.

Peter's model may not sound all that large, with a wingspan of 47" (1194mm), but it is quite big at 1/6th scale, and the tailplane alone, spans 20" (508mm). So due to its size, this FREE PLAN feature will run over three parts, commencing in the December issue. As with all Peter's designs, it is electric powered and we plan to make a set of laser-cut wood parts to complement the plans - nicely timed for the winter building season.

***That's in FSM December issue, on sale from
Thursday November 14th.***



CONTEMPORARY GIANT-SCALE



Cirrus SR22T 30cc ARF

Unlike many smaller scale civilian aircraft the Cirrus SR22T has size on its side, with its generous 2.46m (96.75inch) wingspan and handsome looks the model really stands out on the flight line and looks even more impressive in the air.

For ease of transport and assembly at the flying site the model features a two-piece wing, whilst the landing gear remains mounted to the fuselage for simplicity and ease of operation. With a relatively large cowling the model can accommodate medium sized petrol engines such as the Evolution 33cc or ZP 38cc with ease, or can be powered by an electric motor. The E-flite Power 160 brushless provides plenty of power and is an ideal choice for realistic scale flights. Further aids to scale fidelity are the correctly profiled aluminium spinner that is included with the comprehensive hardware pack, along with the option to fit exterior lighting to the model using E-flite LED's. The cabin features a detailed instrument panel whilst the full-bodied pilot figure (included) adds even more realism.

Operational scale flaps enhance take off and landings whilst the tricycle landing gear with steerable nose leg ensures positive ground handling. The accurate white and silver colour scheme is both subtle and understated and adds the final touch of class to this superb model.

SPECIFICATIONS | HAN5020

Wingspan	2.46m (96.75inch)
Length	1.67m (65.75inch)
Wing Area	60sq dm (930.2sq-inch)
Weight	7.3 - 8.3kg (16 - 18.25 lb)
Engine	33cc Evolution petrol 38cc ZP petrol
Electric Motor	E-flite Power 160 brushless
Motor battery	10s (2 x 5S 5000mAh)
Speed control	80 Amp (HV) minimum
Transmitter	6 + channel minimum
Servos	9 for petrol 8 for electric

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SERIOUS FUN.™

Biplane Bomber: **HP Heyford**

Clubman scale guru Dennis Richardson's Dad flew in a Heyford, so it was next on the building list...

Dennis Richardson is a fine scale modeller and handy pilot, well known on the UK Warbirds circuit. He is also renowned for building his models on Mrs Richardson's kitchen table. However, the big scale news is that Dennis graduated to Mrs

Richardson's dining room table to tackle his ambitious new Handley Page Heyford.

Biplane Bomber

Looking old before its time, the HP Heyford was the last biplane bomber to serve in the RAF. It was built to an Air



Ministry specification for a heavy night bomber to supersede the unimpressive Vickers Virginia. The specification required a bomber able to carry 1,546 lbs of bombs over 920 miles at 118 mph. The Fairey Hendon, the Vickers types 150 and 163, and Handley page's existing HP 38 were the Heyford's competitors. The Heyford was designed by HP's top man, G.R. Volkert. It first flew on 12 June 1930 at the HP factory at Radlett. It was powered by two Rolls Royce

Kestrel engines each developing 525hp when driving two-bladed propellers. The fuselage was an aluminium monocoque, and the wings were metal-framed, but fabric covered. The configuration was odd, with the fuselage attached to the upper wings, and the bomb bay being an extension of the thickened lower wing.

The crew of four comprised pilot, a bomb aimer/navigator/ gunner, a radio operator and a dorsal/ ventral gunner. The dustbin

turret on the nose was retractable, and the undercarriage was fixed, with massive trade-mark Heyford spats. In all, 125 were built before the Heyford fleet were retired from service as obsolete in 1941.

Despite this, the HP Heyford with its enormous spats and biplane layout is an undeniably characterful and quirky scale subject. It is a little known fact of aviation history, that some amateur air-historians still claim that two Heyfords were buried in the

The HP Heyford is powered by twin G.I. .30 four-stroke glow engines.



The HP Heyford is a wonderfully off-beat aerodyne.



landing at RAF Wittering, Dennis does a roller, and avoids pecking the nose.



Impressive in the air: pukka twin glow power.

MODEL SPECIFICATION

Built from the Gerry Rathband plan but enlarged to accommodate glow power.

Scale: 1/13th
Wingspan: 69"
Weight: 6 1/2 lbs
Engines: 2 x O.S. 30 Four Stroke glow engine

vicinity of RAF Cosford at the conclusion of WWII, sadly, no trace of them has come to light.

Family connection

The appealing and rather dinosaur-ish HP Heyford is a scandalously under-modelled scale subject, and how Dennis came to build his own example is a very interesting story. The fact is that Dennis is currently working his way through his Dad's RAF steeds. Richardson Senior joined the RAF in

1936, and trained as Aircrew (Wireless Operator / Air Gunner), firstly in 99 Squadron and later 149 Squadron, both flying HP Heyfords. In fact, Dennis still has his father's RAF Logbook which contains many interesting entries including a crash at night when they ran out of fuel and landed in a wood. The aircraft was written off and his father was admitted to hospital, but thank fully he was not seriously hurt.

The Model

The model is based on an original Plan drawn up by Gerry Rathband. In fact, the original was 57" in span and designed and for electric motors. Dennis enlarged the plan by 20%, yielding a span of 69" and a scale of around 1/13th. Dennis made modifications to the nacelles to take the fuel tanks and O.S. 30FS glow motors.

Construction

Traditional construction, mostly balsa and birch ply, with some cyparis wood for high load bearing components.

Wings

Dennis made the wings 'plug in', just outboard of the nacelles for ease of transport. Wing construction is of traditional balsa and ply, and the wing ribs are of a Clark-Y flat bottomed section. The original electric plan shows the ribs threaded onto carbon rods, but Dennis chose to use 1/4" square Cyparis spars top and bottom. This enabled him to use



This angle displays the quite high aspect ratio of the wing.



1/4" ply wing joiners that slide between the spars.

Hard points

One of the key building assemblies is the conjunction of the central spar, undercarriage strut, engine nacelle, and upper and lower wing rib formers. All those elements are cut from a single piece of 1/8" Birch ply.

Undercarriage

The undercarriage struts were reinforced with 12g piano wire and doubled over with 1/8" ply, then sanded to shape.

Everything was assembled around these two main formers.

Covering

The whole airframe is covered in Natural *Solartex*, primed with *Halfords* grey primer. The model was then painted using *Warbirds* colours, made up of various half used tins of UK / Italian and German paint, to attempt the original RAF 'NIVO' colour - Night Invisible Orfordness (!) Hard to find exactly the shade, but Dennis is content with the outcome. Dennis reckons that his Solartexing is not the best, and on the warm day it bubbles and stretches a bit.

Legending

Roundels are hand painted. Squadron insignia, letters, decals, and

numbers were sourced from *Flightline Graphics*, whose service Dennis describes as "excellent".

Crew

These are characterful 1/12 scale resin figures from famed Pete Richardson at *Pete's Pilots*. Maybe slightly large, but not enough to stand out. Dennis fabricated the scale Lewis guns from scrap.

Radio installation

Due to the long tail moment and the two mini servos that operate the rudders being buried in the base of the fins, the model required 20oz of lead right up in the nose, under the front gunner's feet. This was a bit worrying, and after the first flight 4oz was removed.

Flying impressions

Removing some lead noseweight improved the flying characteristics markedly. On the first flight of the Heyford, Dennis didn't feel comfortable flying it slowly. Also, on landing, Dennis had trouble keeping the nose up, and she ran out of up elevator. Removing the lead made the Heyford much more pleasant to fly. It also made it possible to hold her off the runway with elevator as the airspeed bled away. Quoth Dennis:

"Thank goodness it never met any Me109's... !"

The inverted OS .30 four stroke glow engines are neatly contained in the nacelles.



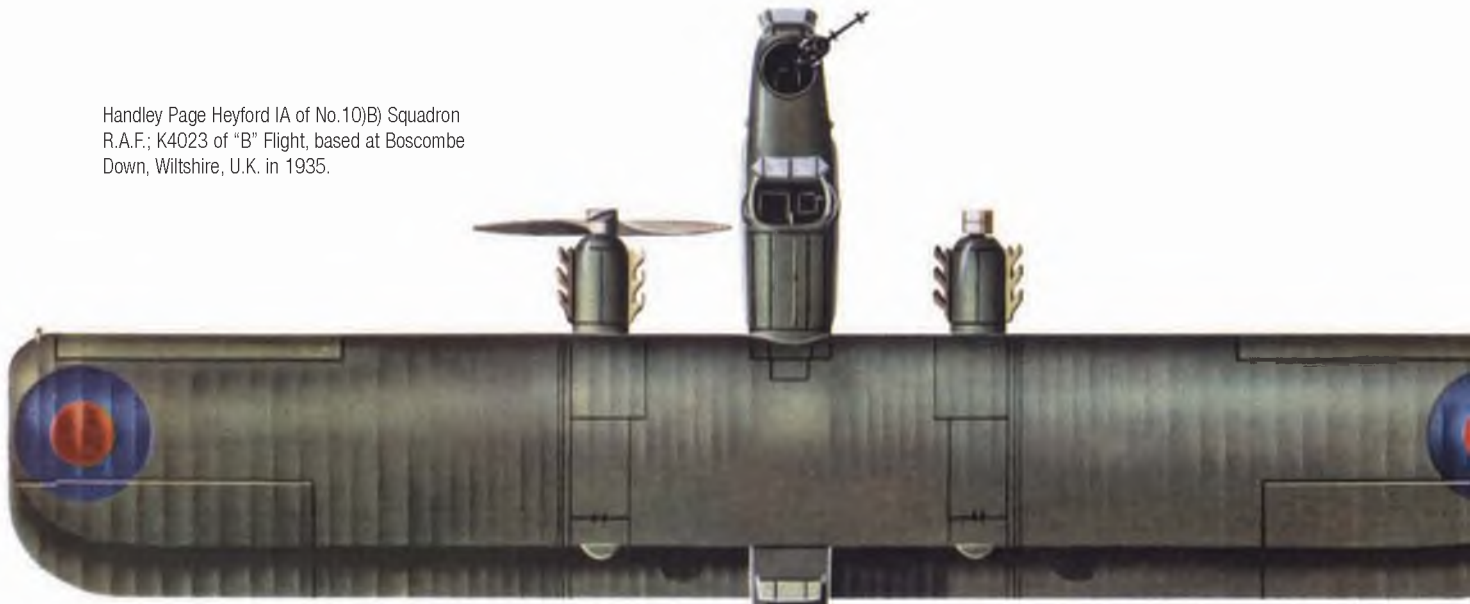
Enormous trademark spats on the HP Heyford.



The nose gunner does look a bit exposed and forlorn!



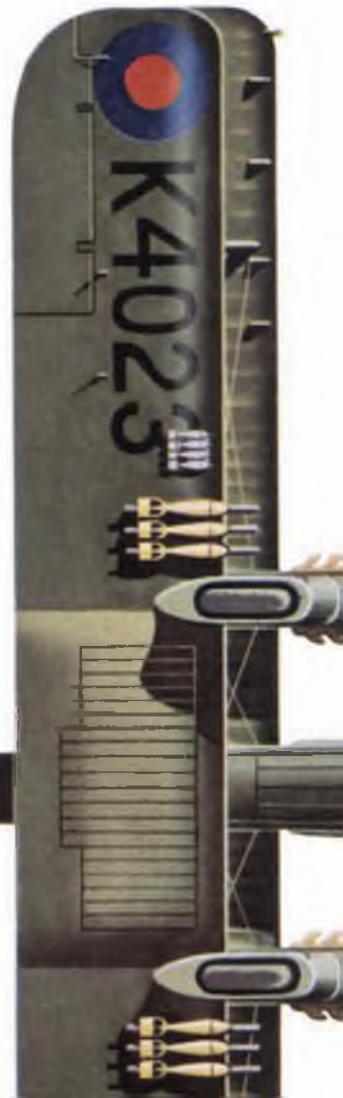
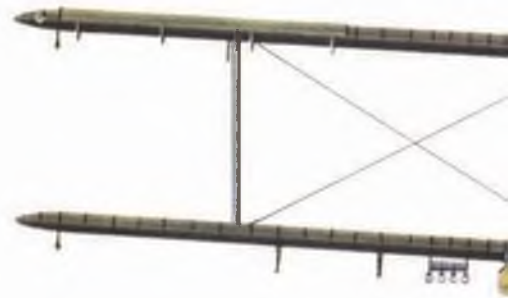
Handley Page Heyford IA of No.10(B) Squadron
R.A.F.; K4023 of "B" Flight, based at Boscombe
Down, Wiltshire, U.K. in 1935.



The unofficial badge of No. 10(B) Sqn.; extensive research has failed to produce absolute confirmation of the colours of the shield, but this is believed to be an authentic representation

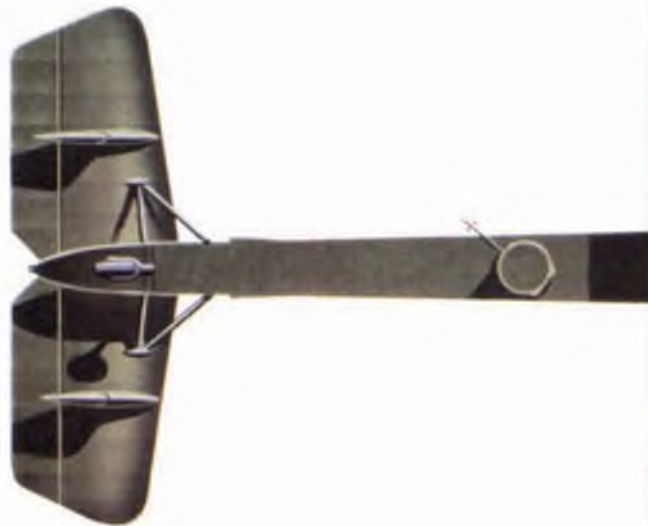


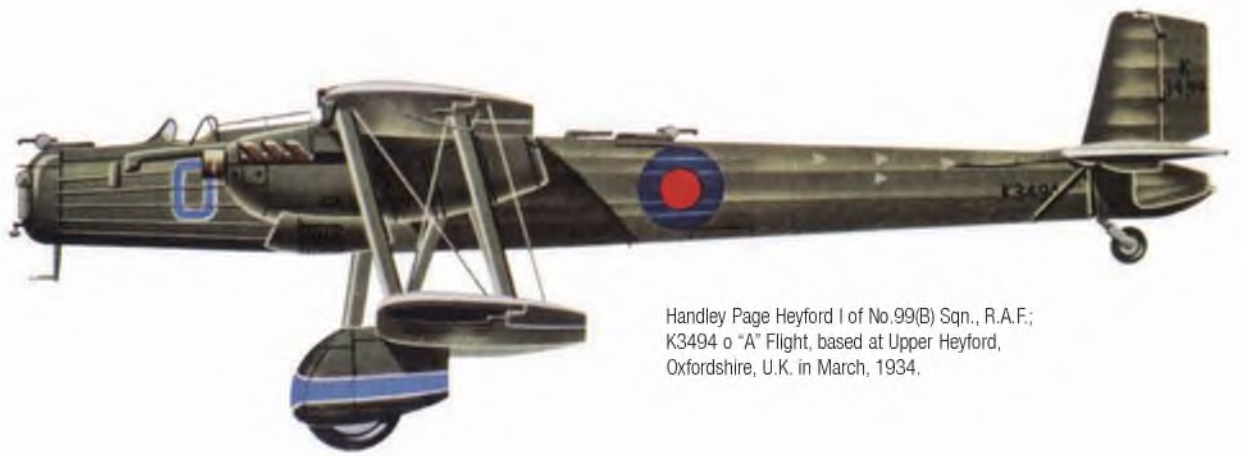
The unofficial badge of No.7(B) Sqn.



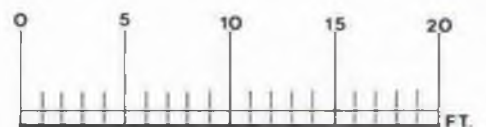
Underwing load shown here comprises six 120lb., bombs and eight 8lb., practice bombs; 20lb., bombs and flares could also be carried on the outer racks.

HP Heyford
Flying Colours





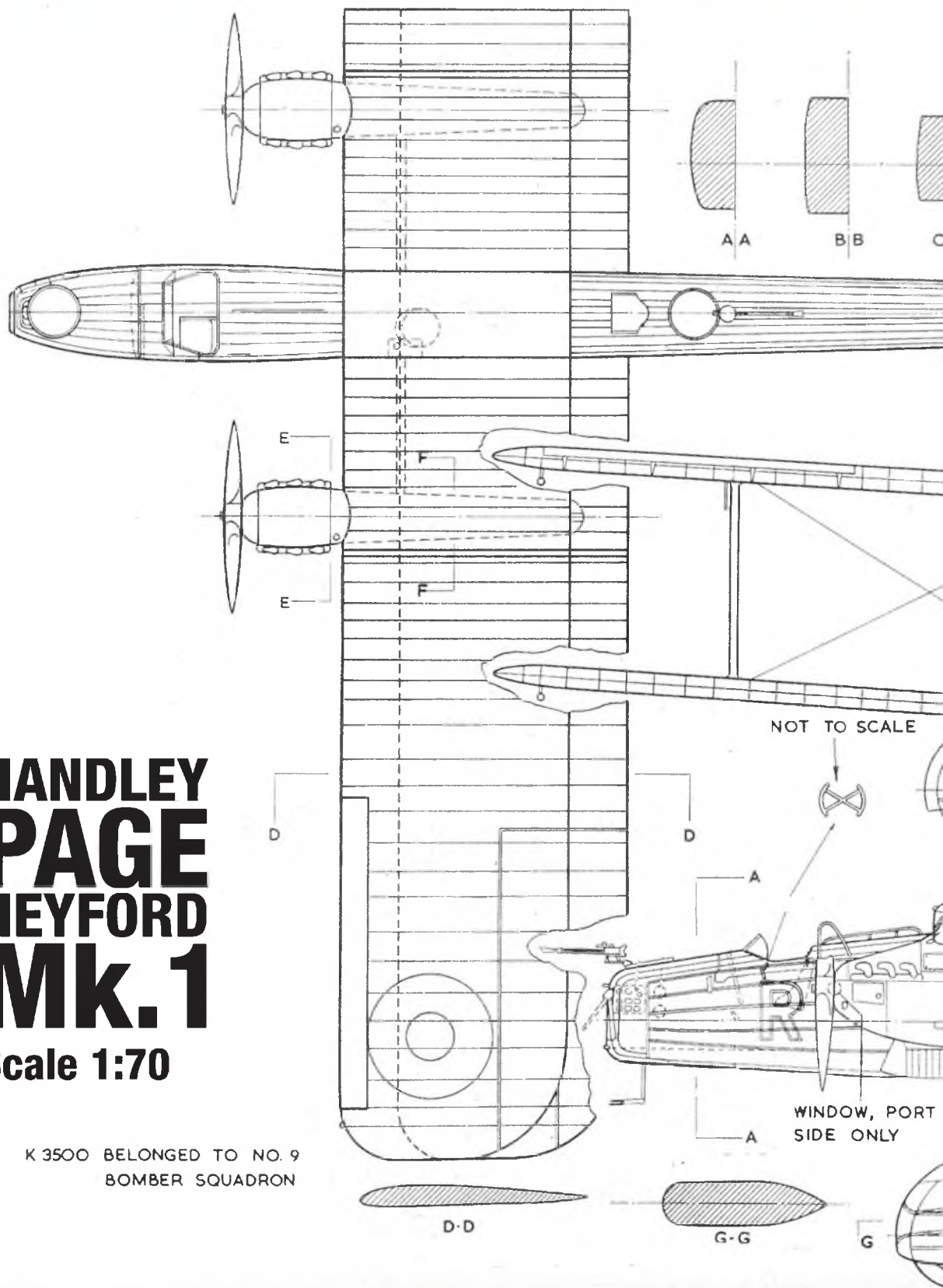
Handley Page Heyford I of No.99(B) Sqn., R.A.F.;
K349 of "A" Flight, based at Upper Heyford,
Oxfordshire, U.K. in March, 1934.

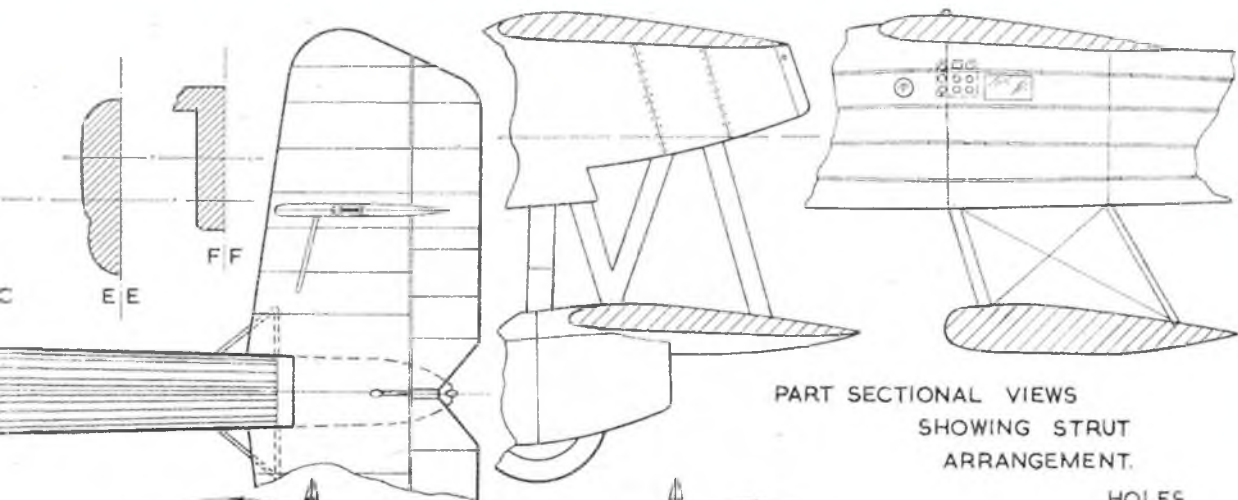


HANDLEY PAGE HEYFORD Mk.1

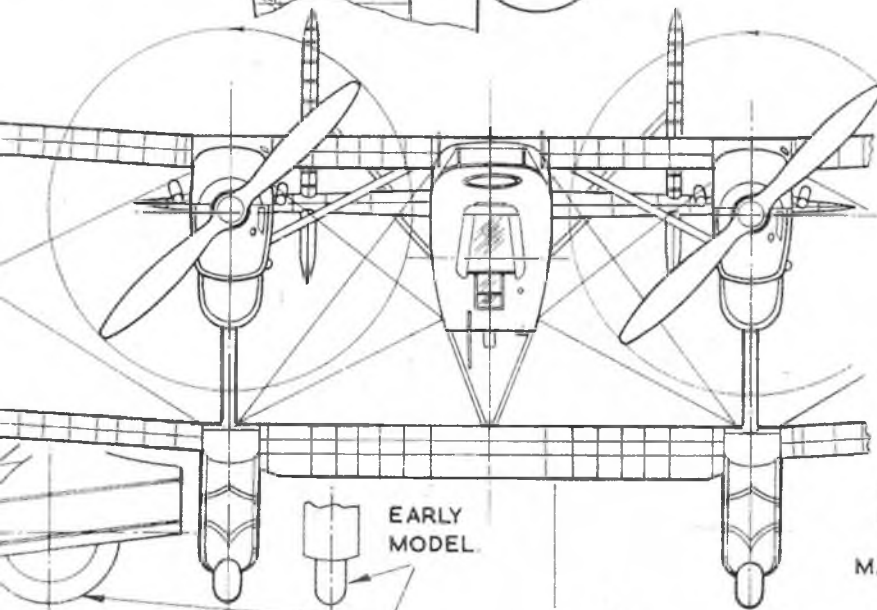
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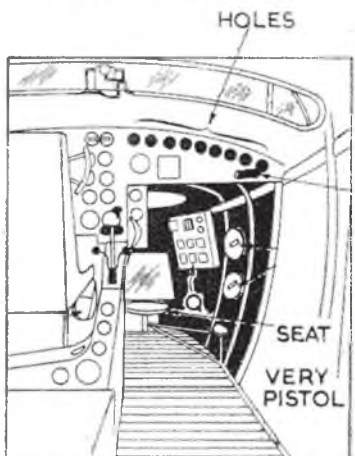




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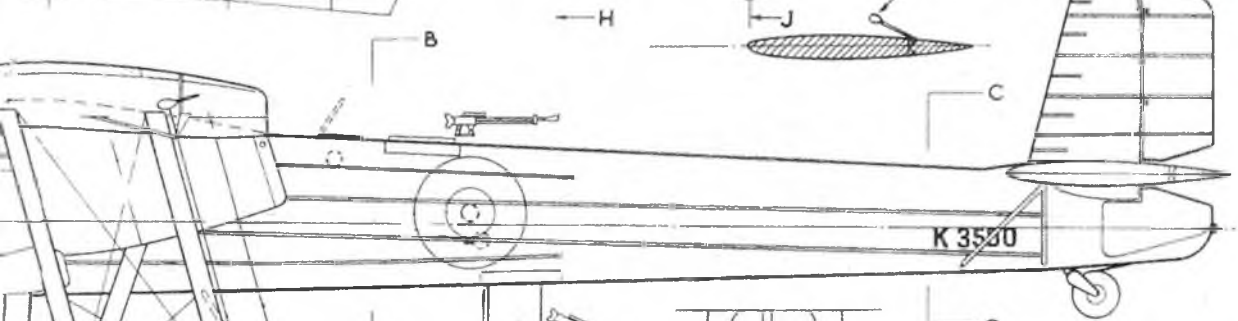
EARLY
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SEAT
VERY
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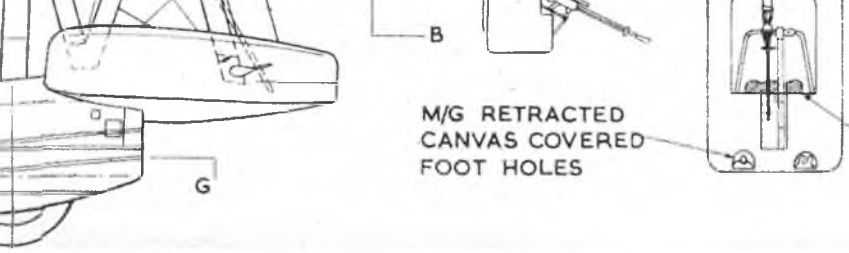
INTERIOR VIEW LOOKING
FORWARD FROM W/OP'S
SEAT



K 3500

REAR VIEW, TWICE FULL
SIZE, OF RETRACTABLE
'DUSTBIN'

PADDED SEAT



M/G RETRACTED
CANVAS COVERED
FOOT HOLES



Handley Page
Heyford

The last of the Royal Air Force biplane bombers

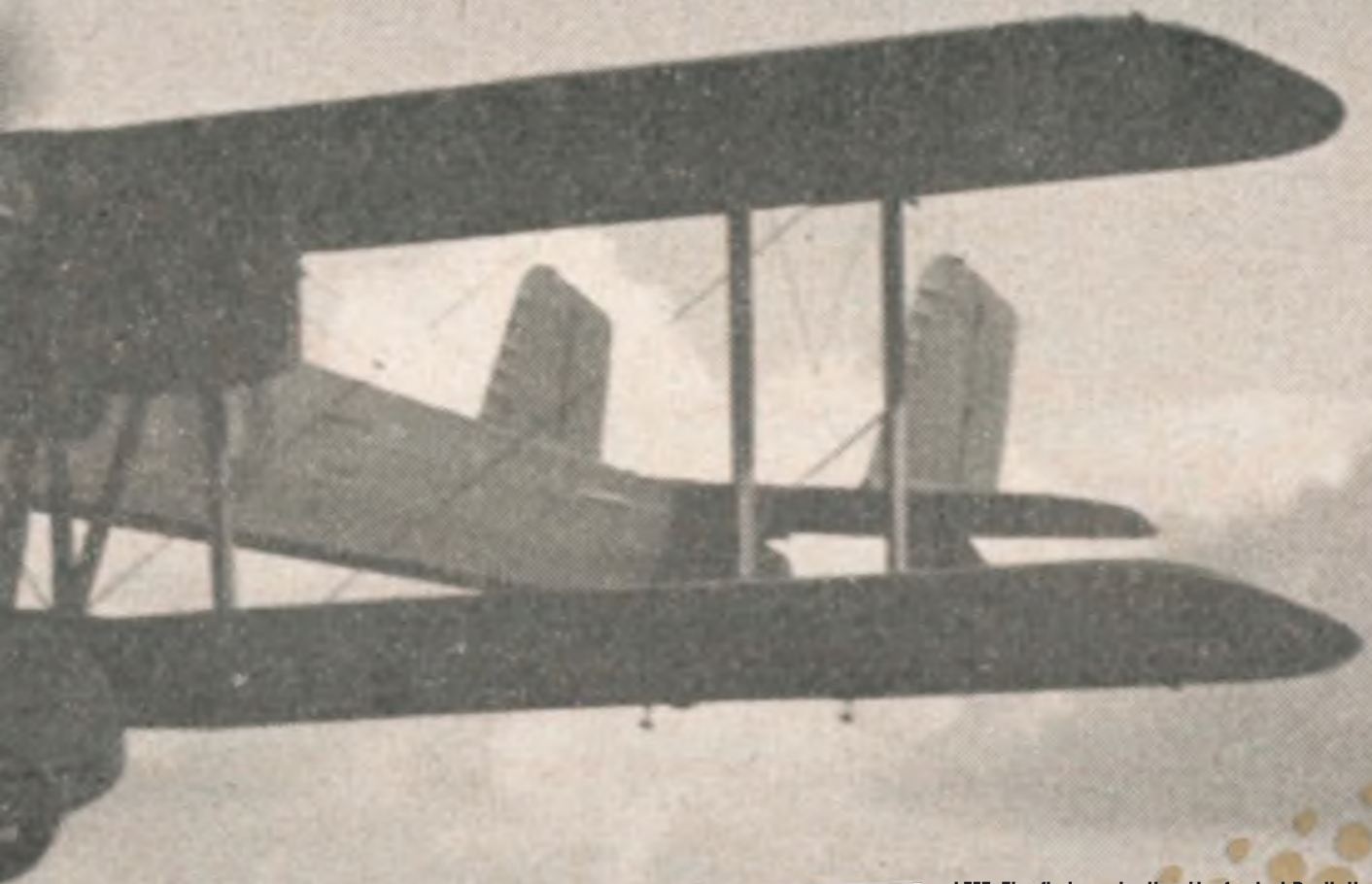
Hindsight is, as they say, a wonderful thing - but anyone faced with the shape of the Handley Page Heyford for the first time ever today, might surely be forgiven for wondering why and how this aircraft got as far as it did, at the time that it did, and then serve in Royal Air Force squadrons for a surprising length of time.

Taken in context of the time of its inception, one wonders why this visual throw-back from the 1918 days of the Handley Page O/400 and Vickers Vimy could be contemplated when, at the other side of the Atlantic, the U.S. Army Air Corps was pursuing the Glen L. Martin Company's sleek twin engine, retractable undercarriage, monoplane B-10, which entered Air Corps Service at much the

same time as the Heyford. Furthermore, Boeing's first version of the B-17 was only two or three years down the line!

However, in the order-starved 1920s and 1930s, aircraft manufacturers were rarely moved to take much commercial risk and in the Heyford, 'Their Airships' at the British Air Ministry got what they asked for in Air Ministry specification B.19/27 issued to interested parties in the British aviation industry in 1928. It called for a 'heavy night bomber' capable of delivering a 1,500 lbs bomb load over a distance of 900 miles at 115 mph (later

improved to 145 mph in later versions). But given that the Handley Page O/400 of 1918 could deliver much the same bomb load over a range of 700 miles at 95 mph, the new operational requirement might perhaps be considered unambitious!

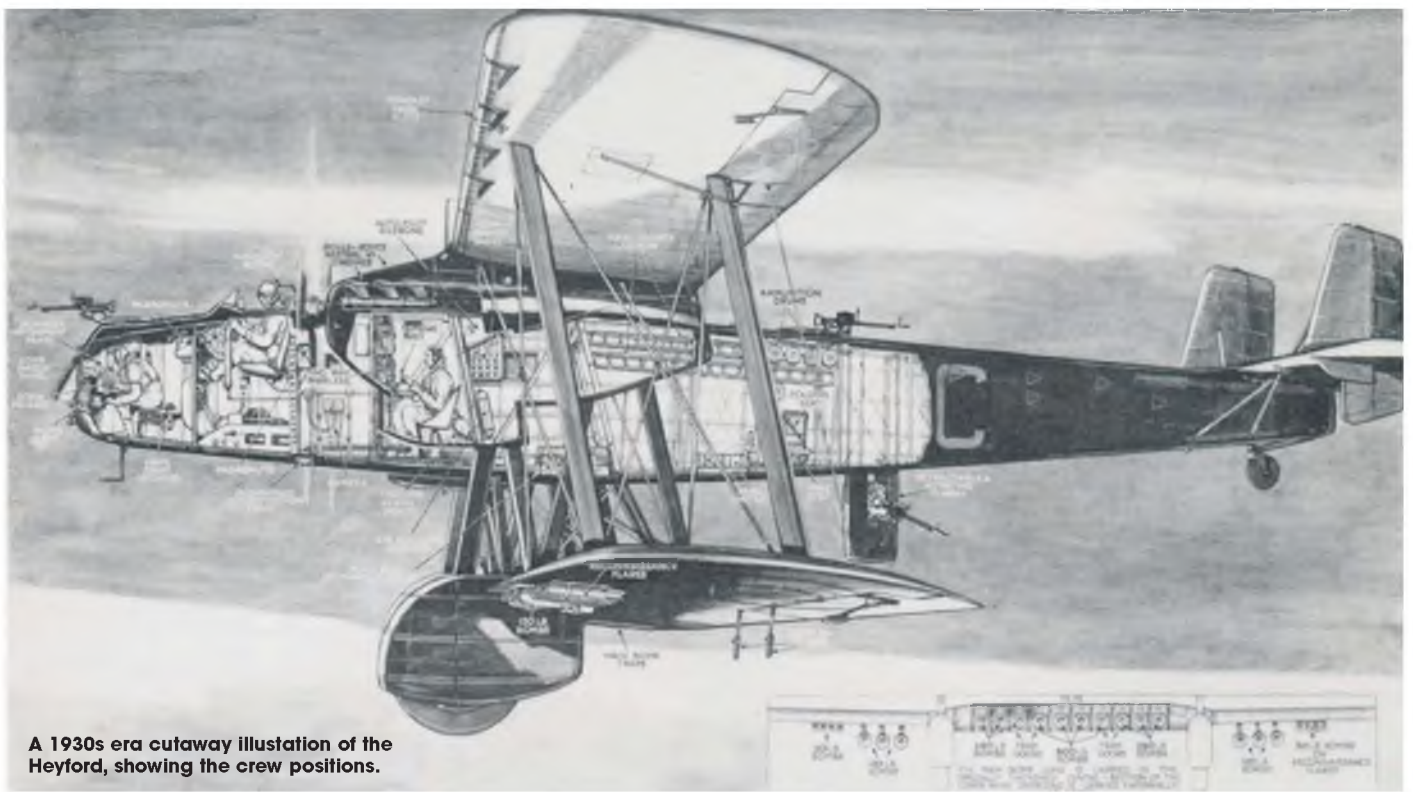


LEFT: The first production Heyford at Radlett, November 1933. Mk.1 aircraft like this, were originally fitted with two-blade propellers, subsequently replaced with four-bladers.

BELOW: Bombing up a Heyford, using special winches.

BOTTOM: A Mk.II Heyford, with semi-enclosed cockpit canopy.





A 1930s era cutaway illustration of the Heyford, showing the crew positions.

The Air Ministry's invitation to tender drew proposals from Fairey Aviation and Vickers in addition to Handley Page, of which the latter's HP 38 was the successful submission and first flew in June 1930, powered by two Rolls Royce Kestrel II engines, each capable of delivering 525 hp. The aircraft was of mixed construction having fabric-covered, two-bay metal-frame wings, while the fuselage had an aluminium monocoque forward section with a fabric-covered frame to the rear, it had a crew of four, consisting of a pilot, a

bomb aimer/navigator/gunner, a radio operator and a dorsal/ventral gunner. Open positions were provided for the pilot and both the nose and dorsal gunners. The Heyford had a novel configuration, with the fuselage attached to the upper wing and the bomb bay in the thickened centre lower wing. This provided a good defensive field of fire for the nose and dorsal guns as well as the ventral retractable 'dustbin' turret, each equipped with a single 0.303 in (7.7 mm) Lewis Gun. The fixed undercarriage consisted of large, spat-covered wheels. The design allowed ground crews to safely attach bombs while the engines were running, but the result was that the pilot was some 17 ft (5 m) off the ground.

The HP.38 proved successful during service trials at Martlesham Heath and in additional trials with No. 10 Squadron RAF and was chosen as the winner of the B19/27 competition, being ordered into production as the HP.50 Heyford. Production Heyford Is were fitted with 575 hp (429 kW) Kestrel III engines and retained the two-blade propellers, while the IAs had four-blade propellers. Engine variations marked the subsequent main Mk II and III differences; the former being equipped with 640 hp (480 kW) Kestrel IVs, supercharged to 695 hp (518 kW) in the Heyford III.

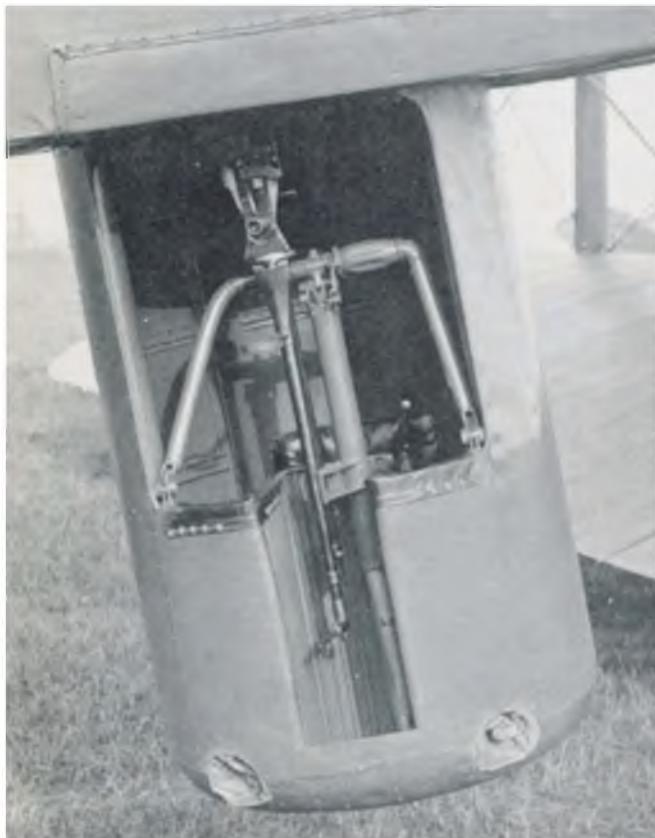
Into service

The Heyford I entered service with No. 99 Squadron RAF, somewhat appropriately at RAF Upper Heyford, Oxfordshire in November 1933, and later with No. 10 Squadron and 7 Squadron, re-equipping with the Heyford IA and II in August 1934 and April 1935 respectively. As part of the RAF's Expansion Scheme, orders were placed for 70 Heyford IIIs in 1936, with steam condenser-cooled Rolls-Royce Kestrel VI engines. The delivery of these aircraft allowed the RAF to have nine operational Heyford Squadrons by the end of 1936.

These squadrons of Heyfords formed the major part of Bomber Command's night bomber strength in the late 1930s. Heyfords flew many long night exercises, sometimes flying mock attacks against targets in France. Disaster struck on one of these long-range exercises on 12 December 1936, when a flight of seven Heyfords of No. 102 Squadron RAF flying from Northern Ireland, encountered fog and icy weather conditions as they approached their base at RAF Finningley, Yorkshire. Four crashed and two had to make forced landings, resulting in three crewmen killed and three injured.

The Heyford started to be replaced in 1937, with the arrival in service of Armstrong Whitworth Whitleys and Vickers Wellesleys finally being retired from frontline service in 1939. Some remained flying until 1940 as bombing and gunnery trainers, being declared obsolete in July 1939, with two used as glider tugs until April 1941.

Other examples found experimental use, one loaned to Flight Refuelling Ltd for in-flight refuelling experiments during 1939. Earlier, in 1936 British scientists were striving to create radar equipment to a size and weight cable of being installed and operated in an aircraft - at a time when existing ground-based equipment weight tons and required an aerial up to 240 ft in height. During early 1937 a workable RDF (radar) transmitter was successfully installed in a Heyford for the purpose of detecting



Precarious perch! The fuselage underside 'dustbin' gun turret could be retracted into the fuselage. Single machine gun is stowed vertically.



ABOVE: Low level beat-up! The first production Heyford Mk.1 low over Handley Page's (then) new airfield at Radlett, in Hertfordshire.

BELOW: Fully manned prototype Heyford, lining up for take-off during the R.A.F.'s 1932 Air Display at the all-grass Hendon airfield in north London.



other aircraft. Further experiments using other aircraft types led to the development of the first Air-to-Surface (ASV) radars that subsequently played a major part in RAF Coastal Command's war against U-boats during the Battle of the Atlantic.

End of an era

The Heyford was the last of the RAF's biplane heavy bombers. From the time of the prototype's first flight in June 1930, a total of 124 of three main marks were delivered from June 1933 up until July 1936, serving with 11 squadrons.

All versions were well liked in service, being easy to maintain, sturdy and agile and they could even be looped, as was done at the 1935 Hendon Air Pageant.

At the time of the Munich crisis in 1938, the RAF still had six squadrons of 22.9m (75ft) span, 142 mph Heyfords in Bomber Command; they were brought to readiness with full bomb-loads and armament during

the crisis, but never dropped a bomb or fired a shot in anger in their entire careers.

The last front line Heyford did not leave No.166 Squadron at Leconfield in Yorkshire until 2 September 1939 (the day before Britain declared war on Germany), being replaced by Armstrong Whitworth Whitleys. This left 40 still serving mainly as bombing and gunnery trainers until August 1940.

The last two airworthy survivors, including K5184, flew on until April/May 1941 as glider tugs on trials with the General Aircraft Hotspur I assault glider. One account suggests K5184 was still airworthy on trials

work in August 1944, being under armed guard at RAF Cardington! This was despite the Heyford being officially declared obsolete in July 1941.

Sadly the two derelict wingless specimens lying at RAF Cardington, Bedfordshire in 1950, perhaps including K5184, did not survive either. Tales of dumped Heyfords buried near RAF Cosford have not been proved, despite some explorations. ■

DH6

Part 2: Concluding the construction article for the 48" span electric powered model designed by Peter Rake and built by Bjørn Terje Hansebråten

Last time we left you with a fuselage built and equipped with a cowl and landing gear. This time we'll ease you back into things gently with a simple building task.

Tail surfaces

Honestly, building the tail surfaces could not be made much simpler if I tried. Assemble these over the plan using strip balsa and the few cut parts, sand overall and the job is just about done.

I like to build these areas as single units

(tailplane and elevators/fin and rudder) and only separate the control surfaces after the basic sanding is completed. That way you know they are all sanded evenly and that the rounded edges will be the same each side of a hinge line. A further aid to elevator alignment is to make the leading edge piece continuous across the gap. Then you can fit the wire joiner without having to worry that you'll get the spacing wrong. Cut out the gap after the joiner is securely glued in place and sand the wood to match the rest of the outline.

This way it doesn't matter if your wire bending wasn't 100% accurate, as long as your hole drilling matches your wire joiner you can't get the spacing wrong.

Note the nylon tubes through which the control cables will run. Yje cables, and the control horns are fitted after covering is complete.

Wings

Both upper and lower wings are basically the same, with certain minor differences that I'll explain before going on to

Although the builder added more engine detail later, even this basic level of detailing brings the model to 'life'.





describe the construction. The upper panels are fairly basic and have no root bay sheeting, while the lower panels have root bay sheeting, cable holes in the ribs (marked 'X' on the plan) and ply plates for installing the aileron servos. Additionally, the lower panels have horn plates and hardwood rails to which the servo plates are screwed.

The root ribs, R3T, R4T, R3B and R4B, have holes for the joiner tubes but it is important to get the correct rib in the right location because the holes are not in the same place on R3 T/B and R4T/B. The hole locations were worked out at the drawing stage to provide the correct dihedral when the panels are plugged onto their respective joiners. So, if you aren't working with the laser cut parts, please take extreme care to get those holes exactly as shown on the plan, otherwise I make no guarantee that you will end up with even dihedral on all four wing panels, or the same incidence on all panels. As you can possibly imagine, either situation will do nothing for the way your model flies - or looks for that matter!

A side-effect of this system of wing mounting is that you have a choice between either removable wing cells (four struts to a pair of wings make for a fairly rigid assembly that can be removed as a complete unit) or make the model a one-piece airframe. At 48" span it is hardly huge, so a one-piece structure isn't out of the question and does speed up things at the flying field. The only proviso I make involves removable wings on a model without rigging to hold them in place while the model is flying. Simple hooks let into the fuselage, with small fishing swivels on the innermost cables, is one way of holding the wings in place. Another, and possibly better method, is to install hardwood blocks in the lower wing roots and run a brass strap across the fuselage.

A couple of small screws will secure the lower panels to the strap and, because the loads will be positive G (unless you fly your model like Bjorn) neither set of wings can move outwards on their joiners. In this instance, the rigging can terminate at each root rib, providing you with completely rigged cells that slide on and off the model without the need for functional rigging. If, however, you do intend to attempt the extreme aerobatics opted for, I sincerely urge you to secure both upper and lower wing roots.

Top wings

As I'm sure you've spotted, there is a centre section (c/s) for the top wing. Build this over the plan in the usual manner, with all ribs upright. Note that ribs R1 are shaped to fit the c/s struts you took such care to get accurately aligned. This means that once completed and covered, the



Tail surfaces really don't get any easier than this. Nothing but straight bits of wood as far as the eye can see.



The top wing centre section, complete with joiner tubes and carbon rod wing dowels.



The wing tip packed up while the root rib is glued in place at the correct angle for dihedral. (all four panels)



A good shot showing how the strut sockets are created and how the servo tray fits into the bottom wings. No servo arm exit slot yet though.

c/s can simply be epoxied onto the struts. The joys of drawing in CAD, and the extreme accuracy it allows (if the person doing the drawing gets it right) means that the simple gluing in place task will automatically set up the correct incidence. Therefore, assuming a similar accuracy about the joiner tube positions, the wing panels have to plug on at the correct incidence angle too.

If you do intend to aerobate your poor little DH6 I strongly recommend that you replace the carbon joiners with 3mm piano wire.

Begin the wing panels by adding the scrap balsa pieces to R6T and R9T. These form the sockets into which the interplane struts will fit.

With that done, proceed to build the wing panels in much the same way as you

built the c/s. Add the root rib last, with the wing panel propped up at the correct dihedral angle. A much more accurate method of setting the root rib angle than trying to lean it while the wing is flat on the board. Epoxy in place the wing tubes last of all. So you can be absolutely sure they'll align perfectly with those in the c/s, slip the wings onto the joiners fitted to said c/s while the glue dries. Just make sure you don't glue the tubes to the joiners, or the wings to the c/s. Otherwise you have inadvertently opted for a one-piece model.

Bottom wings

These are built in precisely the same manner as the top wing panels, but have horn plates and servo hatch rails fitted. The rails should be recessed so that the ply



Passing gently overhead the model shows off the scale overlap between upper and lower surface covering. Those ironed on roundels work well too.

plates will fit flush with the lower surface of the wings.

Covering and finishing

Although virtually any lightweight covering could be used, Bjorn chose to cover his model using dark green and cream coloured *Litespan*. Although the green isn't exactly right for a WW1 type (it's Olive Drab I believe), it is a quick, simple way to arrive at an approximation of the PC 10 used on these aircraft. The cream is perfect for simulating a clear doped linen finish.

The rudder was covered using white *Litespan* and had the rudder stripes painted on. However, it was for the roundels that Bjorn used a technique I've never seen before. Rather than mask and paint directly onto the wings and fuselage, Bjorn painted the roundels onto white *Litespan*, cut them out and ironed them onto the model. He too was using the

Albatros Datafile as reference and positioned his wing marking close to the tip (as shown in the three-view). Study of some of the other photos, however, shows them further inboard, which would have made his life a whole lot simpler.

Rudder serials were printed onto plain paper, carefully cut out to provide a white outline and then stuck onto the model.

Assembly

As intimated earlier, much of the assembly is self-aligning. The wing joiners set up both incidence and dihedral and the strut sockets mean the incidence will continue for the entire length of each wing panel. All you have to do is make sure you don't induce any twist as you rig the model. Bjorn wisely opted for functional rigging, with wire loops at the fuselage and struts and metal snap links on the detachable ends of the rigging cables - those ends that attach the wings to the fuselage.

Glue the top wing c/s accurately onto the c/s struts. Having the wing panels fitted will assist with checking correct alignment but ensuring the glue joints are pushed fully home should take care of that. It just depends how accurately you got the struts set up while building the fuselage. Once that assembly is completely set, plug on the lower panels and glue the interplane (i/p) struts into their sockets. I think we can take it as read that Bjorn has proven that glued in struts are amply strong enough to withstand flight loads for anything we care to throw at the model.

Now use the wing/fuselage assembly as a guide to alignment while gluing on the tail surfaces. That part is entirely down to you to get aligned correctly, so spend a little time getting it right. Accurately aligned models fly so much nicer than ones that need trim just to counter inaccurate assembly.

Control runs for rudder and elevators are closed loop arrangements. The cables run directly from the servo output arms, through the nylon bearing tubes in the fuselage sides and to the control horns. The elevator cables cross over en route, and then go through those bearing tubes fitted to the tailplane leading edge. Choice of cable material is a matter of personal taste, but nylon coated trace wire works very well indeed. Each end of the cable being secured by a tube crimp and spot of CA. These cables tend not to stretch, so adjustment isn't really needed. However, if you want to include some, those little fittings that secure pushrods to servo arms with a grub screw work just as well with a split-pin (cotter pin) attached to the cable end.



The obligatory naked model photo demonstrates how straightforward to build the model is.



With the sheet decking trimmed to clear them, Bjørn uses the c/s to aid alignment as the struts are glued in place. Note how they fit into the c/s.

The drawings show quite clearly how the aileron linkages are effected so I won't bore you by repeating what is on the plan. The only comment I'll make is to ensure that the split-pin glued into the ailerons is bent over and glued into a groove so it isn't visible on the finished model. The aileron t/e being bass, rather than balsa, helps to ensure they can't pull right through. If you stress them that much, I doubt that loose aileron linkages is going to be the greatest of your problems.

Motor notes

The plan shows an AXI 2814/20 and 2S LiPo. This is perfectly adequate for scale-like performance in most conditions. Bjørn, knowing how he intended to fly the model, fitted a Turnigy D3536/8 to his DH6, powered by a 3S 2200 mAh pack. To say he has slightly more power than the model requires is to understate the matter somewhat.

Contrary to popular belief, you CAN have too much power. Bjørn got it about right for what he wanted, but others have been less fortunate. A chap who'd built my 36" SPAD XIII couldn't understand why it wanted to climb like a lunatic even at low throttle, but glided well. Having a potential 150 watts/lb of power had a great deal to do with it. Even throttled right back the motor was still producing too much power for the model. That's an extreme case, but too much power can make landing a nightmare. One single click of trim may be all it takes between reasonably steady, if fast, flight and a model that wants to climb. If the model has lots of drag, like the DH6 you get three spots on the throttle trim; flying too fast, climb like a mad thing and stop as if it's hit a wall. It really is quite a fine line. I had a Flair Taube with an O.S.48 Surpass that did just that, but with an old 40FS became a pleasure to land.

Flying

As you've already gathered Bjørn has been thoroughly enjoying his DH6 model with the power level he chose. Not necessarily flying it like a DH6 all the time, but having fun nonetheless. Balanced as indicated the model just required a couple of clicks of down and aileron trim to be flying nicely. So nicely, in fact that even during the 6 minute maiden flight he felt confident enough to try loops and rolls with her. That 6 minute flight used 900 mA from his pack, so 12 minutes is easily possible, even with his set-up. Flown more sedately on a 2S pack flight times should become considerably longer than that because of the lower current draw.

The prototype model ended up weighing in the region of 3lbs; not particularly lightweight, and flies really well. For gentle stooing, as befits the prototype, the reduced weight of a 2S pack will make this a wonderful model for those calm summer evenings and autumn mornings after the mist clears. Even with the reduced power set-up, loops and stall turns are well within the model's scope and low fly pasts will really show off its' rather quirky outline. Exactly the things I loved about this model's smaller sister. ■

CUT PARTS SET FOR THE

DH6

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Westland Lysander

USA's Frank S. Mizer presents this 87.5" (2223mm) span, 1/8th: 1ft R/C scale model for .50-.60 size two-stroke motors



Dummy scale propeller, with prop. boss.

A Lysander Mark III sitting in the annex across the field at the U.S. Air Force Museum in Dayton, Ohio captured my imagination more than 20 years ago. The aircraft is a restored example and in the colours of 138 Squadron 'Special Duties' aircraft used in World War II. Special agents were picked up and delivered to England from France using this short-land-and-take-off aircraft. Other agents were delivered to France from England. It served the French 'Underground' very well.

I am a veteran waist gunner from the 381st Bomb group of WWII 1944, flying B-17s based near Ridgewell. Only three missions were made by our crew, before we were captured by the Germans and became POWs.

When we were liberated at the end of WWII, a British camp treated us generously. They brought us back to civilization. Canadian boys from a Tank division, told us where the British camp was located.

My son and I took pictures of the interior and exterior of the Lysander in the Dayton Air Force Museum annex hangar and pictures were also acquired from Scale Plans and Photo Service in North Carolina and the Westland Aircraft Co.

Construction plans were drawn from G. Duval, and R.A.F. Museum, England. These are three-view drawings. Model construction follows the full size aircraft. From pencil and paper to the finished model took two years.

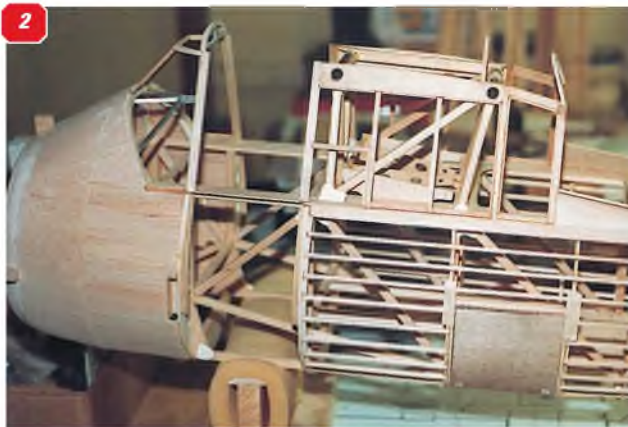
The model uses balsa, lite plywood, thin aircraft plywoods, basswood, aluminum tubing, brass tubing and card stock.

Construction

At 1/8th scale, this model is not huge, but the wings are separated from the fuselage, just like the full scale Lysander. It makes for a little easier transport in your car. The model follows actual construction spacing throughout all areas.

Good selection of wood and plys are very important. You must take time to





1: Model features scale stringer spacing throughout fuselage. Wing Structure uses 1/4" sq. spruce or hard basswood. Two wing tubes glued and taped to structure. 2: Sheeted area ahead of cockpit forward to firewall. Undercarriage anchors at bottom. Battery and first-aid hatch is thin plywood. 3: Engine cowl and cowl ring, make from in wood - no glass fibre moulding! Formers are wrapped with 1/32" plywood in four layers.

sand and shape all wood as shown on the plans - a little at a time, and keep checking the different views is a must.

To keep the model light as possible, liteply was used for the fuselage formers from front and back to the tail section where balsa was used on the formers.

Depending on the builder, more or less detail can be applied. I enjoyed building the most detail that I could find in the full size Lysander, this one is the 'Special Duties' Mark III.

Fuselage

Again, this fuselage structure mimics the full size Lysander. Starting with the two side frames, which must be identical to each other, from the nose firewall to the splice in the climb up ladder, I used hardwood or basswood 1/4" square. This is at the top and bottom of the side frames. From the splice going back to the tail section I use 1/4" square balsa.

Fuselage stringers are 1/8" square, selected with great care (no bows). Wing plug-in section used 1/4" hardwood or basswood square. These are glued with threaded rod into the fuselage. Card stock shapes are dampened and glued over wing plug-in areas. White glue drops are used for rivets in these areas of card stock. Inside, the cockpit area British green is painted over this assembly, including the navigator's table.

The fuselage firewall is made up with one 1/8" aircraft plywood, and two 1/4" lite ply layers which can be bolted and removed with hex bolts. Between the bottom formers 2 and 3 is a removable section for servos.

CUT PARTS
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WESTLAND LYSANDER

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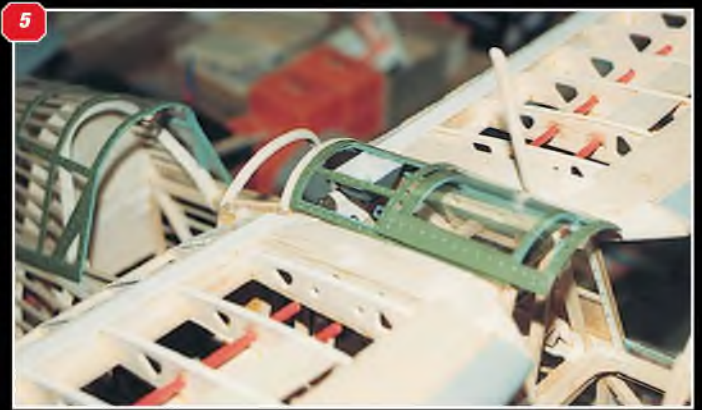
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4: Engine cowl complete and fitted. Note cardboard over cockpit area for marking off 'green-house' frames, to be made in clear plastic. **5:** The sliding section of the forward cockpit frame is removed to facilitate wing attachment. Aileron tubes are inserted. **6:** Finished dummy Bristol Mercury radial engine hides .56 two-stroke engine, mounted side-winder. **7:** The fully finished with dummy exhaust stack, cowl dummy engine and pilot's bucket seat. **8:** Nose, showing the dummy Bristol Mercury engine in place and dummy scale propeller fitted.

I used aliphatic resin glue throughout the wood construction areas. It slows things down because of drying, but allows more time for you to think about the next construction stage.

Cockpit greenhouse

The pilot and navigator area is challenging, but rewarding. Most of the glass uses clear, heat-bending acetate. A small area to deal with is above the pilot's instrument panel. I found a commercial canopy and cut this down to fit this area. It worked quite well. Frames are cut from card stock and impressed with a sharpened brass tube for flush rivets. Sliding canopy parts are not too difficult,

but do take time. The secret is to capture movable parts in their tracks.

In the centre of the wing (top of fuselage), glue two rails, starting from the forward tube back to the third hole. These are for mounting the two servos for the ailerons.

Elevator and rudder

The elevator uses 3/32" sheet balsa for ribs and sheeting (sheeting simulates metal). Use rectangular sheeting, and then sand to streamline shape. Rib stitching on fabric areas consists of card stock strips 3/16" wide with stitch bumps 1/4" apart. This can be done with a 3/32" screwdriver embossed from underneath. All metal

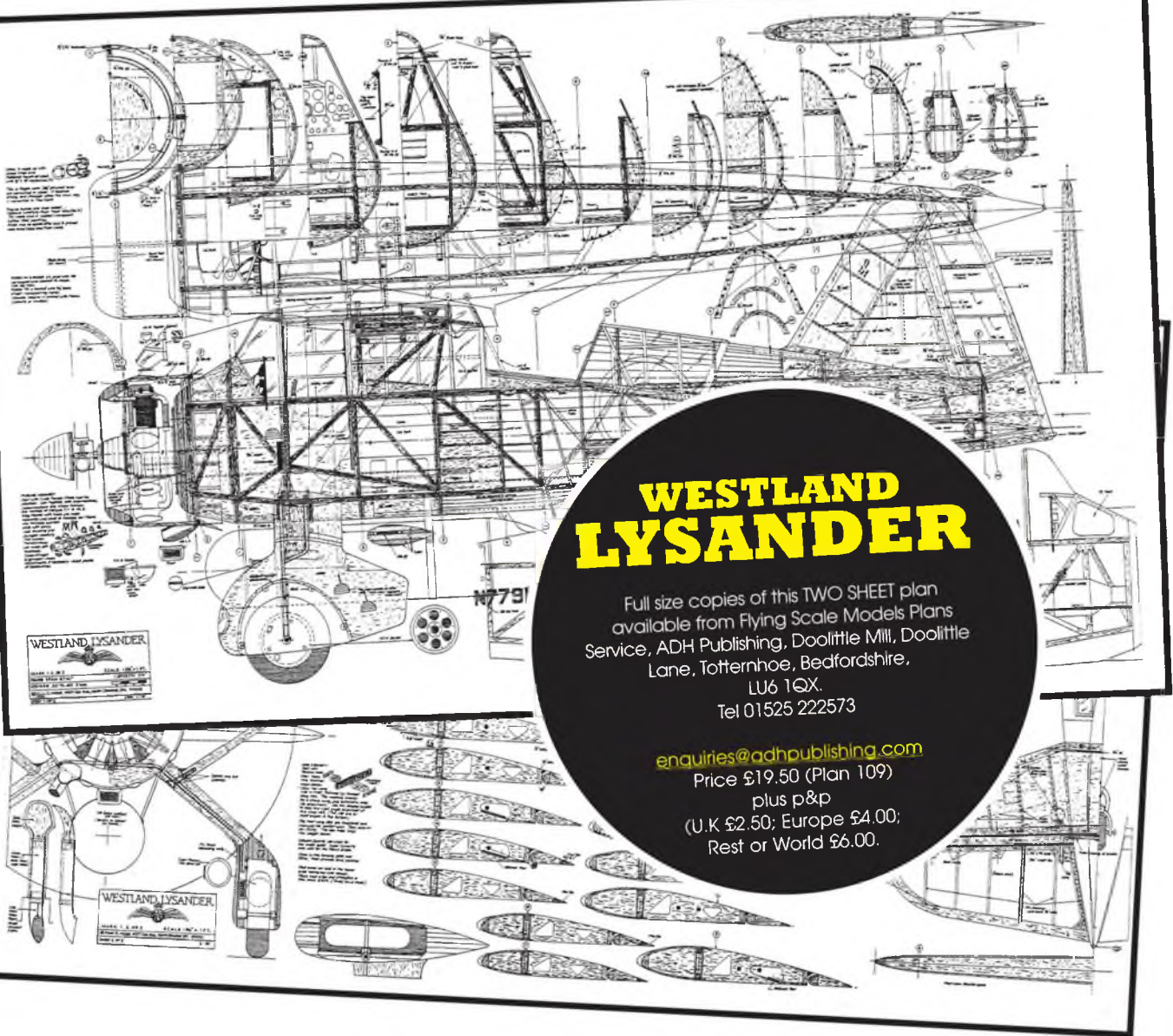
surfaces have flush rivets. The elevator is set at zero degrees.

The rudder is similar to the elevator in the construction. That is, rectangular shapes finally sanded to streamline profile. The rudder is linked to the steerable tail wheel through two attachable horns.

Front cowl

Five layers of 1/4" medium balsa are glued together for the front opening ring of the cowl. After this is dry, a rounded shape is sanded. 1/8" and 1/4" lite ply rings are joined with four 1/4" x 1/8" hardwood pieces glued to the rings. On top of this assembly, you glue four panels of 1/32" plywood. I used several small





WESTLAND LYSANDER

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dowels to line up and glue the front ring to this drum. The whole assembly is held to the firewall by four small flathead screws. Cowl gills attach (glued) to the rear of the drum. These are 1/32" plywood pieces, held together with heavy paper strips. These air flaps are in a slight open position. The rocker box fairings on the cowl are basswood.

Landing gear

The 5/32" main undercarriage wire has to be shaped according to the front view and side view on the plans. A second wire strut is soldered to the rear of the front wire and the space between is filled with lite ply. This allows captive wing bolts (nylon) to come through the landing gear to the wing strut. (As shown on front view on plan). 1/2" and 1/4" balsa surround this wire, and near the wheel well I used six 1/4" balsa sheet with in-fill where needed. At the wheel area, I used a commercial shock absorbing spring unit.

Do not glue landing gear where it meets the fuselage. Leave a 1/64" air gap. Two formers are clamped to the gear and

then glued up into fuselage, but not glued like I said where a nylon bolt goes (meeting fuselage).

Dummy scale engine

This simulates the Bristol Mercury nine-cylinder engine that powered the full size aircraft, with one cylinder removed and some areas of two other cylinders. Most of the dummy engine on my model was made from basswood, aluminum tubes, small springs, wire, and small hex bolts. The muffler was made from a cigar

aluminum tube that somebody gave me.

Wing and struts

Scale spacing is what we have here in the wing construction. Holes in the middle of ribs serve to lighten, yet retain strength. The main spars are built first with webs on both sides. Ribs are 3/32" balsa sheet. Front ribs and middle ribs are put together with the main spar on the board, then the flaps and ailerons are added. Sheeting at the front represents metal leading edge surface



9: Main undercarriage 'trousers', built from layers of sheet balsa. **10:** The fully finished main undercarriage. Side covers, as per full size, removed to reveal the wheel.





skin, and ribs visible to the rear are fabric covered. Dowel plugs must be glued accurately. Front spoilers are optional for slight movement, open or closed.

Struts have liteply in the centre and basswood on the outside. Sand to a nice streamline shape. There is a 1/4" threading at the base of the strut that accepts the nylon bolt. On the other end I use 4/40 hex bolts that I thread in the wing. Epoxy glue the retaining nuts in the wing block.

Covering on the prototype model was with *Super Coverite* and balsa sheet, plus thin plywood. Acrylic lacquer in three light, flat coats and hand painted markings in enamel were used.

Many thanks again to the Westland

Aircraft Co. in Yeovil for supplying much information.

Flying

The Pilot's Handbook for the full size machine states that aerobatics with this aircraft were forbidden. The flying of this model was smooth and stable, gentle and forgiving. Take-offs with gradual power to almost open throttle were quite realistic. Landings with gradual power and slight flaps simulate realism.

Flying the Lysander like a bomber is the



way to go. I've always loved aviation and model building.

Prop-driven planes have held a fascination for me. I believe a good R/C scale model aircraft should take you back to the time it was used.

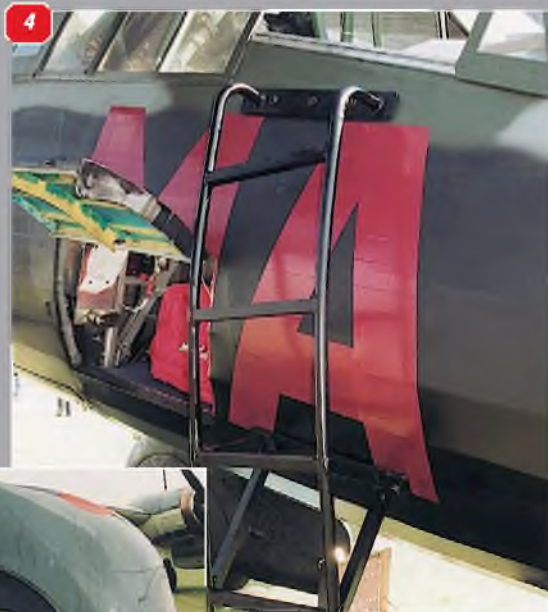
Building an aircraft like the Lysander is unique, and will reward you with a re-visit in time.

I want to thank *Flying Scale Models* for a chance to explore the Lysander again, and to be part of the British family. ■



11-16: With so much cabin area exposed to view, it's internal detail that made the difference to Frank Mizer's model.

WESTLAND LYSANDER



1: The multi-framed rear cabin canopy, showing the canopy guide rail.

2: Left side access panel.

3: Rear fuselage side, again showing the canopy guide rail and the cabin access mounting stirrup.

4: Rear cabin access ladder, left fuselage side.

5: The large mainwheel fairing with outer side access panel removed. Note landing light.

6: Inner side view of the main undercarriage, again with access panel removed.

7: Propeller boss and spinner.

8: Engine cowl ring.



9

9 & 10: Left and right sides of the fuselage tail cone, showing rudder horn fairings.

11: The variable-incidence tailplane, showing settings stencilled on fuselage side.

12 & 13: Two views of the tailwheel unit.

14: The rear fuselage under the tailplane showing the relief in the panel to allow tailplane to assume the low-speed incidence setting.

15: Right side fuselage just ahead of the tailplane showing panel lines and clear view inspection panel.

16: The 'glass-house' cockpit and cabin canopy, showing the multiple panel frames.

17: close-up of the mounting stirrup on the right hand fuselage side below the rear cockpit position.



10



11



12



14



15



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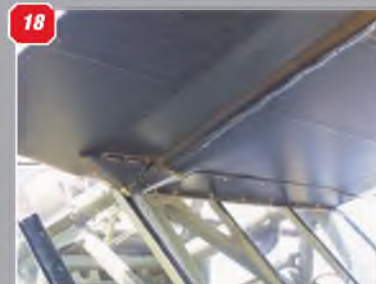


16

18: Detail of the wing root at the fuselage cabin.
19: Fixed, welded tube step on the right hand fuselage side for rear cabin access.
20: Lower anchor point of the wing strut at the top of the main undercarriage fairing.



17



18



19



20



21: Fairing over the upper front wing strut anchor point on the wing undersurface.

22 & 23: Two views of the rear wing upper strut anchor point, showing the 'gaiter' fairing and the flap control rod attachment.

24 & 25: Two views of the wing leading edge slats, with their anchor points.

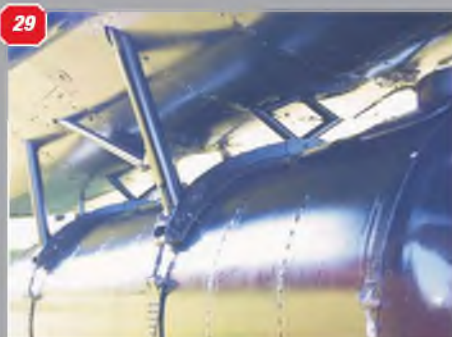
26: A view of the main undercarriage 'trouser', with the access panel in place.

27: Detail of the interlinked cooling gills at the rear of the engine cowl.

28: Engine exhaust pipe, right hand fuselage side.

29 & 30: The long-range fuel tank, slung externally, under the cockpit position between the main undercarriage legs.

31: A further view of the lower end attachment point of the V-shaped wing strut, anchored to the main undercarriage strut.



Westland Lysander

The Lysander was designed in 1935 to Air Ministry Specification A.39/34, which called for an Army Co-operation aircraft to replace the Hawker Hart variants - Audax, and later Hector. An intensive study of operational requirements and discussion with Army Co-operation aircrews resulted in a radical departure from the previous practice of equipping a largely standard machine for this role producing, instead, an aircraft with tailor-made performance for its duties. The success in this may be judged by the fact that the Lysander, a fifty-foot span monoplane weighing six thousand pounds loaded, could operate with ease from an area the size of a football pitch. The secret lay in the aerodynamically operated slots and flaps of the wings, giving a speed range of 55-230 m.p.h.

The prototype, K6127, first flew in June 1936 and a second machine, K6128, following at the end of the year, both being powered by the 840 h.p. Bristol Mercury IX engine. In September 1938, a contract was placed for 144 Mk.I Lysanders, the production machines having 890 h.p. Mercury XII engines driving a D.H. two-pitch propeller; a revised gunner's canopy, and a tailplane trimmable to large negative angles.

No. 16 Squadron exchanged its Hawker Hectors for Lysanders in June 1938, followed by No. 2 Squadron in July, and tropical trials on K6128 having proved satisfactory, the next batch was sent to the Middle East for the eventual re-equipment of Nos. 6 and 208 Squadrons which later operated them, together with Hurricanes, in the Western Desert and Greek campaigns. Nos. 20 and 28 Squadrons flew Lysanders during the India/Burma campaign, receiving their machines in late-1941.

Meanwhile, in November 1938, a decision was made to fit the remaining aircraft of the order with 905 h.p. Bristol Perseus XII sleeve-valve engines and these Lysander Mk.IIs, distinguished externally by short-chord engine cowlings without rocker box fairings and by modified tailplanes, re-equipped Nos. 4, 13, 16, and 26 Squadrons by early 1939, No. 2 Squadron receiving its Mk. II's in February 1940.

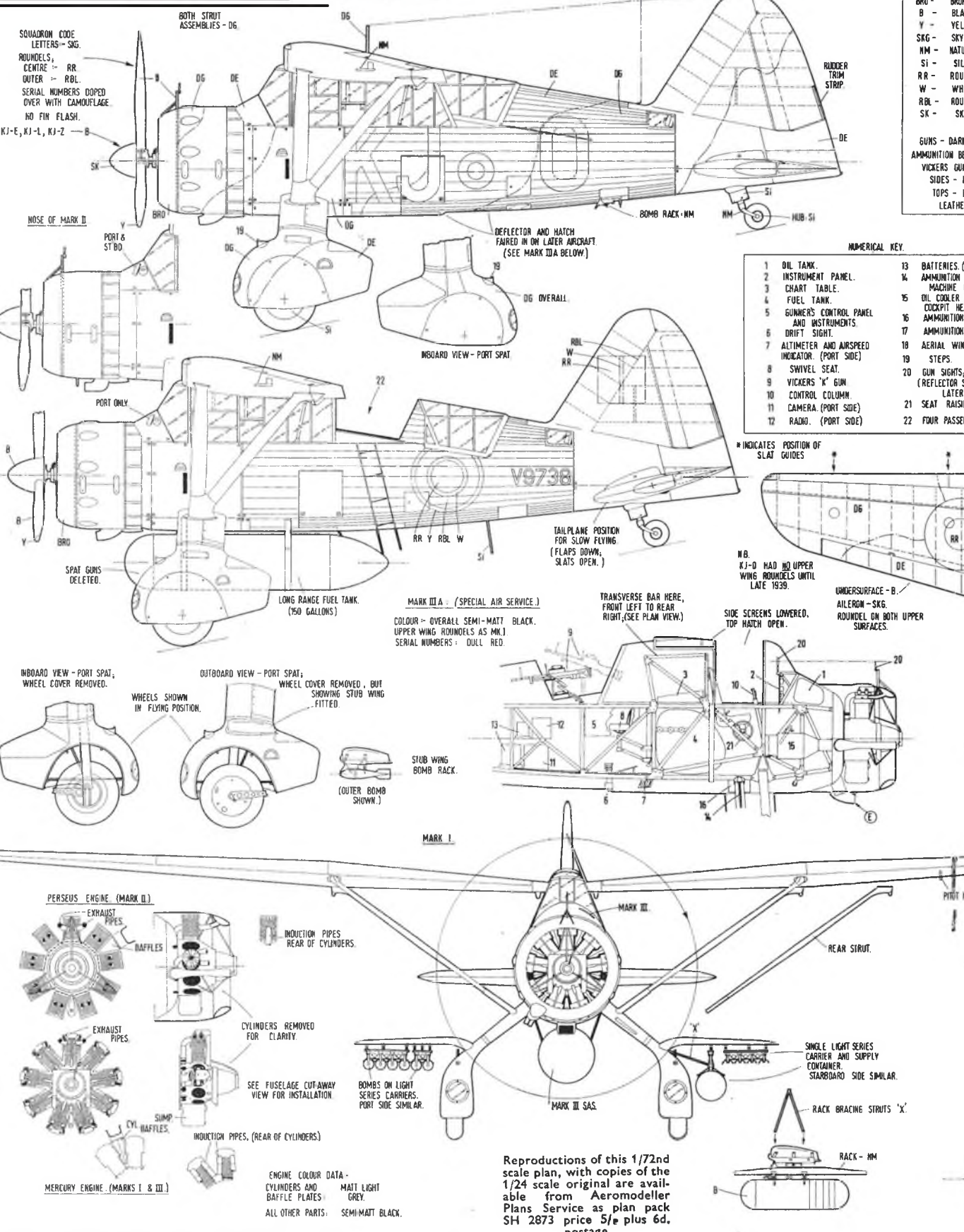
At the outbreak of WW2 in September 1939, Nos. 2, 4, 13 and 26 Squadrons joined the Air Component of the B.E.F. in France, No. 16 following later, all enduring the boredom of the so-called 'Phoney War' and the bitter winter of that year, during which the wheel-spats side plates of the Lysanders were removed after several incidents caused by semi-frozen slush-jammed wheels. On the 10th of May 1940, the German Army began its massive assault and immediately the Lysander Squadrons lost the protection of air supremacy under which they were designed to operate. They fought many gallant actions, notably those in support of the besieged Calais garrison, but losses were



SCALE DRAWING

MARK I, Nº 16 SQUADRON, R.A.F. - 1939

COLOUR	CODE
DE	- DARK
DG	- DARK
BRG	- BRONZE
B	- BLACK
Y	- YELLOW
SKG	- SKY G
NM	- NATURAL
SI	- SILVER
RR	- ROUND
W	- WHITE
RBL	- ROUND
SK	- SKY
GUN	- DARK
AMMUNITION BELT	
VICKERS GUN	
SIDES - NM	
TOPS - B	
LEATHER	



NUMERICAL KEY.

1	OIL TANK.	13	BATTERIES (70)
2	INSTRUMENT PANEL.	14	AMMUNITION P.
3	CHART TABLE.	15	MACHINE GUN
4	FUEL TANK.	16	OIL COOLER AND
5	GUNNER'S CONTROL PANEL	17	COCKPIT HEAT
6	AND INSTRUMENTS	18	AMMUNITION T
7	DRIFT SIGHT.	19	AMMUNITION
8	ALTITUDE AND AIRSPEED	20	AERIAL WINCH
9	INDICATOR. (PORT SIDE)	21	STEPS.
10	SWIVEL SEAT.	22	GUN SIGHTS;
11	CONTROL COLUMN.		(REFLECTOR SW
12	CAMERA. (PORT SIDE)		LATER)
			21 SEAT RAISING
			22 FOUR PASSENGE

* INDICATES POSITION OF SLAT GUIDES

N.B. KJ-D HAD NO UPPER WING ROUNDELS UNTIL LATE 1939.

UNDERSURFACE - B
AILERON - SKG
ROUND ON BOTH UPPER SURFACES.

MARK III A - (SPECIAL AIR SERVICE)
COLOUR - OVERALL SEMI-MATT BLACK.
UPPER WING ROUNDELS AS MK I.
SERIAL NUMBERS - DULL RED.

TRANSVERSE BAR HERE, FRONT LEFT TO REAR RIGHT, (SEE PLAN VIEW.)

SIDE SCREENS LOWERED, TOP HATCH OPEN.

SQUADRON CODE LETTERS - SKG.
ROUNDLES, CENTRE - RR
OUTER - RBL
SERIAL NUMBERS DOPED OVER WITH CAMOUFLAGE
NO FIN FLASH.

BOTH STRUT ASSEMBLIES - DG

NOSE OF MARK II

PORT & ST BD

PORT ONLY

SPAT GUNS DELETED.

LONG RANGE FUEL TANK. (50 GALLONS)

MARK III A - (SPECIAL AIR SERVICE)
COLOUR - OVERALL SEMI-MATT BLACK.
UPPER WING ROUNDELS AS MK I.
SERIAL NUMBERS - DULL RED.

TRANSVERSE BAR HERE, FRONT LEFT TO REAR RIGHT, (SEE PLAN VIEW.)

SIDE SCREENS LOWERED, TOP HATCH OPEN.

INBOARD VIEW - PORT SPAT, WHEEL COVER REMOVED.

OUTBOARD VIEW - PORT SPAT, WHEEL COVER REMOVED, BUT SHOWING STUB WING FITTED.

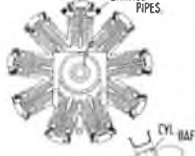
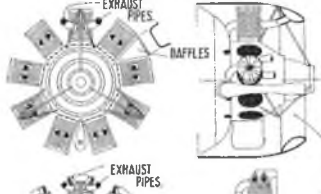
WHEELS SHOWN IN FLYING POSITION.

WHEEL COVER REMOVED, BUT SHOWING STUB WING FITTED.

STUB WING BOMB RACK. (OUTER BOMB SHOWN.)

MARK I

PERSEUS ENGINE (MARK II)



INDUCTION PIPES REAR OF CYLINDERS.

CYLINDERS REMOVED FOR CLARITY.

SEE FUSELAGE CUT-AWAY VIEW FOR INSTALLATION

INDUCTION PIPES, (REAR OF CYLINDERS)

ENGINE COLOUR DATA -
CYLINDERS AND BAFFLE PLATES - MATT LIGHT GREY.
ALL OTHER PARTS - SEMI-MATT BLACK.

BOMBS ON LIGHT SERIES CARRIERS. PORT SIDE SIMILAR.

MARK III SAS

SINGLE LIGHT SERIES CARRIER AND SUPPLY CONTAINER, STARBOARD SIDE SIMILAR.

RACK BRACING STRUTS 'X'

RACK - MM

Reproductions of this 1/72nd scale plan, with copies of the 1/24 scale original are available from Aeromodeller Plans Service as plan pack SH 2873 price 5/6 plus 6d. postage.

N.B. FOR ALTERNATIVE CAMOUFLAGE PATTERN APPLY STARBOARD SIDE SCHEME TO PORT SIDE, (INCLUDING THE TAILPLANE PATTERN) AND VICE VERSA. WING PATTERN IS "MIRROR IMAGE."

ORTH.
EN.

V.
METAL.

RED.

BLUE.
CK EGG
BLUE.)

EY.
NM.
MS.

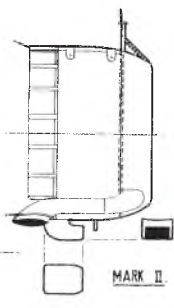
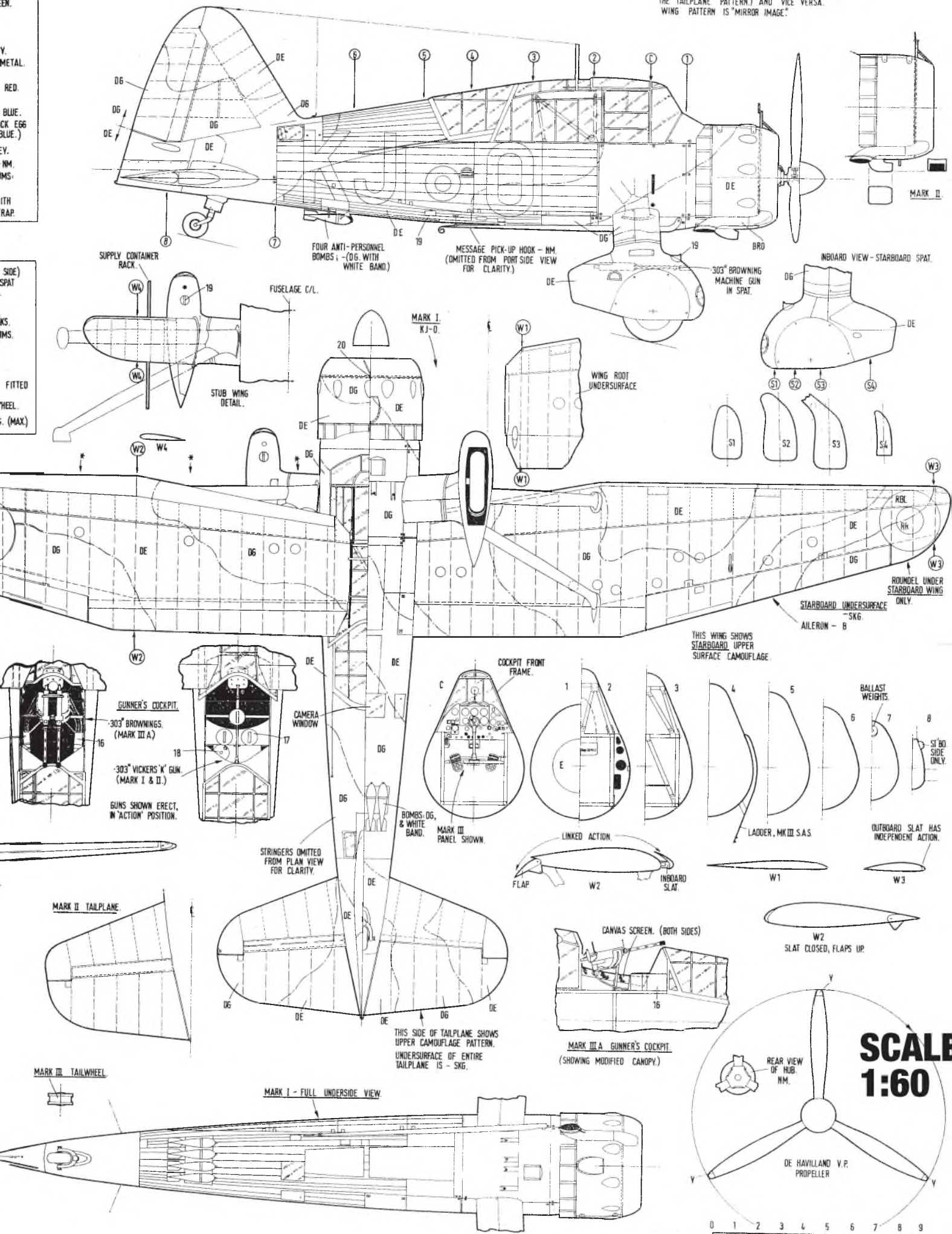
ITH
RAP.

(SIDE)
SPAT

KS.
MS.

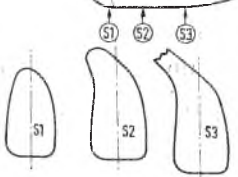
FITTED

HEEL.
G. (MAX.)



MARK II

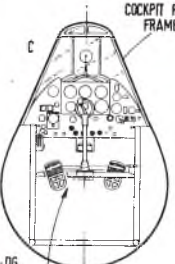
INBOARD VIEW - STARBOARD SPAT



WING ROOT UNDERSURFACE

STARBOARD UNDERSURFACE - SKG AILERON - B

THIS WING SHOWS STARBOARD UPPER SURFACE CAMOUFLAGE.



COCKPIT FRONT FRAME

GUNNER'S COCKPIT. 303 BROWNING (MARK III A). 303 VICKERS 'K' GUN (MARK I & II). GUNS SHOWN ERECT, IN 'ACTION' POSITION.

STRINGERS OMITTED FROM PLAN VIEW FOR CLARITY.

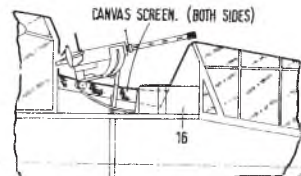
BOMBS, DG, & WHITE BAND. MARK III PANEL SHOWN

LINKED ACTION FLAP W2

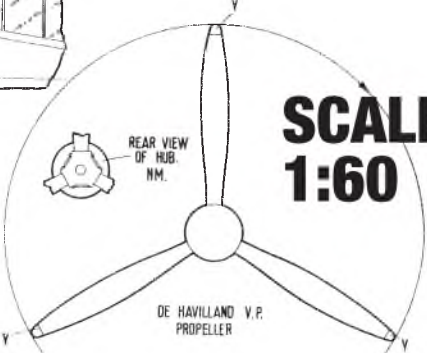
INBOARD SLAT W3

OUTBOARD SLAT HAS INDEPENDENT ACTION. W1

W2 SLAT CLOSED, FLAPS UP. BALLAST WEIGHTS 6 7 8

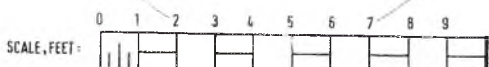


MARK III A GUNNER'S COCKPIT (SHOWING MODIFIED CANOPY)



REAR VIEW OF HUB N.M. DE HAVILLAND V.P. PROPPELLER

SCALE 1:60





© JAMES GOULDING

SPECIFICATION

Dimensions:

Span: 30 ft., 6 in.

Length: 30 ft., 6 in.

Loaded weight: Mk. I-5,920 lbs.

Mk. II-6,015 lbs.

Mk. III-6,318 lbs.

Performance:

Max. speed: Mk. I-219 m.p.h.

Mk. II-230 m.p.h.

Mk. III-212 m.p.h.

Min. speed: 55 m.p.h.
(fully loaded)

Take-off run to 50 ft.:

250 to 300 yds. (zero wind)

Landing run from 50 ft.:

310 to 340 yds. (zero wind)

heavy and by the end of May, the survivors were back in Britain with about 50 aircraft left from the original 174.

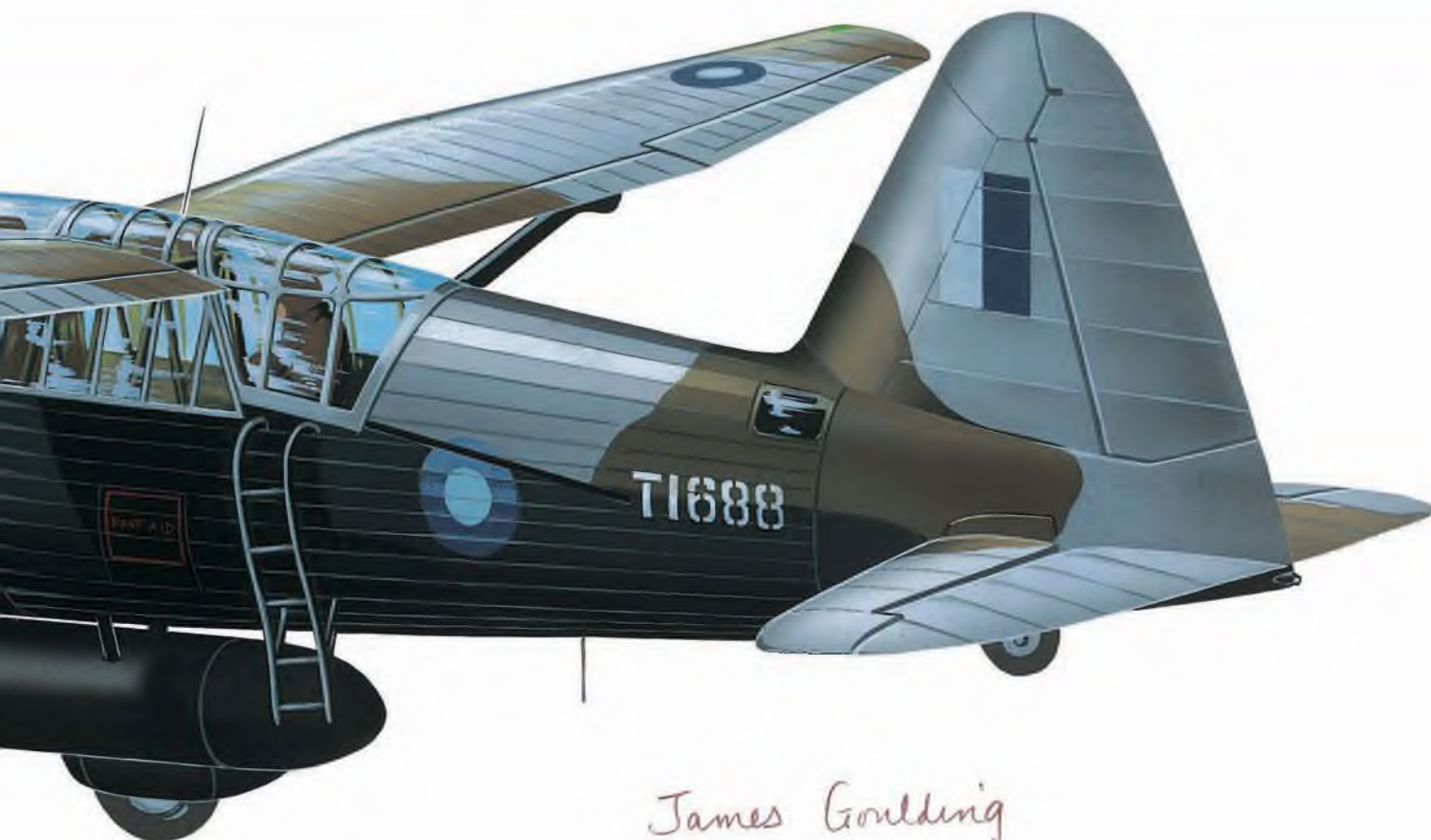
For all this, production of the Lysander continued, but various problems concerning the Perseus engine dictated a change back to the reliable Mercury and the Lysander Mk. III emerged, powered by the Mercury XX or 30, driving a D.H. variable pitch propeller. A number of Mk. III's, together with some Mk. I's and II's were fitted with twin .303 in. Browning guns in the rear cockpit, others being modified for towing targets, or Handley Page Hotspur training gliders.

At the beginning of the Battle of Britain in June 1940, Lysanders were used for

anti-invasion patrols, but at the end of July, they commenced Air Sea Rescue duties and a year later four Squadrons were employed on this work, their morale uplifted by the twin Brownings and an escort of Spitfires!

On the night of 4th/5th September, 1941, the unique capabilities of the Lysander came into their own again as a black-painted specimen landed in a French field, disgorged one secret agent, picked up another and returned to England. This single operation heralded the hazardous work of Nos. 138 and 161 Squadrons which, over the next three years, delivered 293 persons to torch-signalled French landing places and





James Goulding

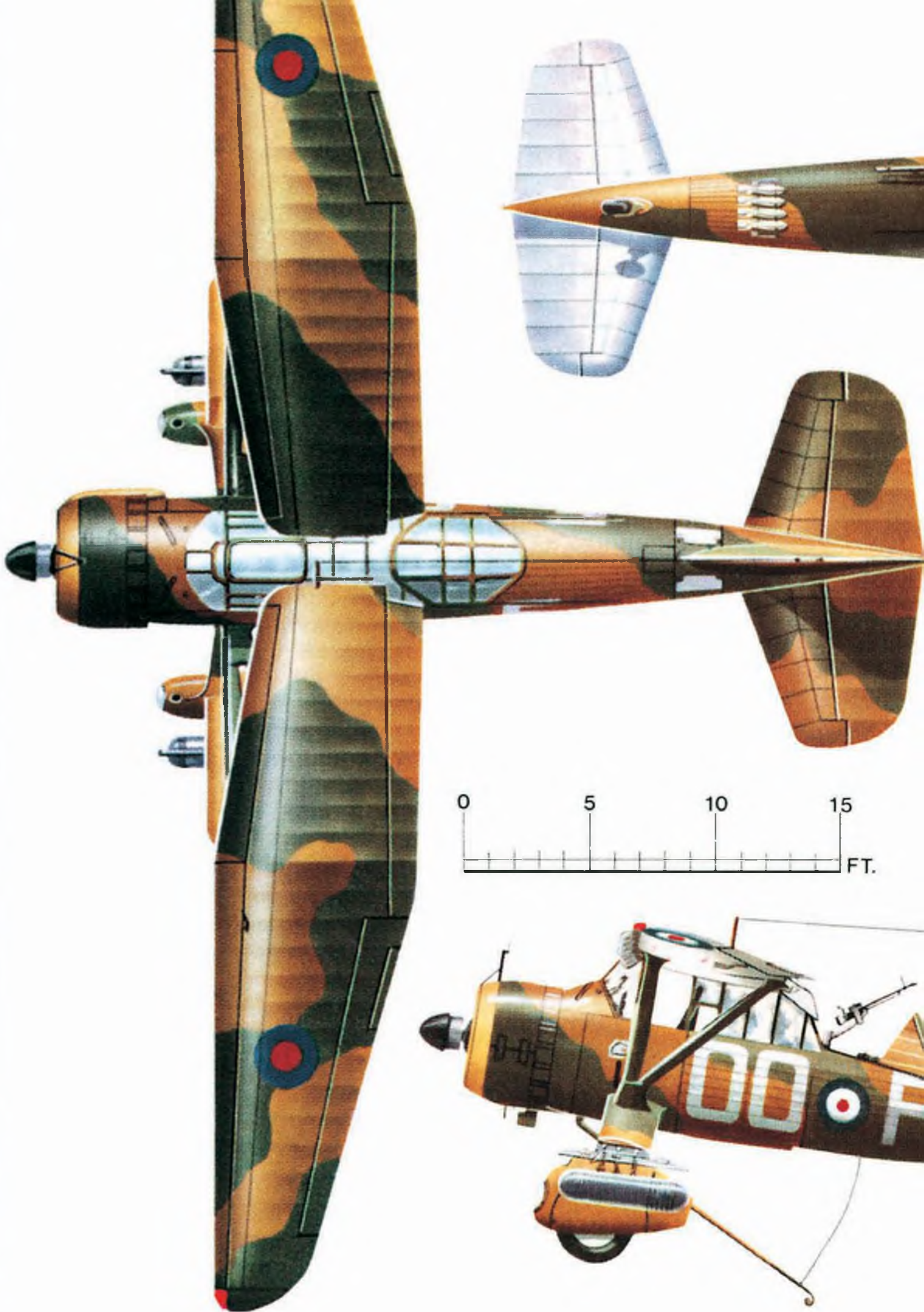
brought more than 500 persons out, some of whom were shot-down aircrew. On more than one occasion the Germans ambushed the Lysanders and one pilot managed to fly a bullet-riddled machine all the way back to base with one hand on the controls and the other stemming the flow of blood from a neck wound.

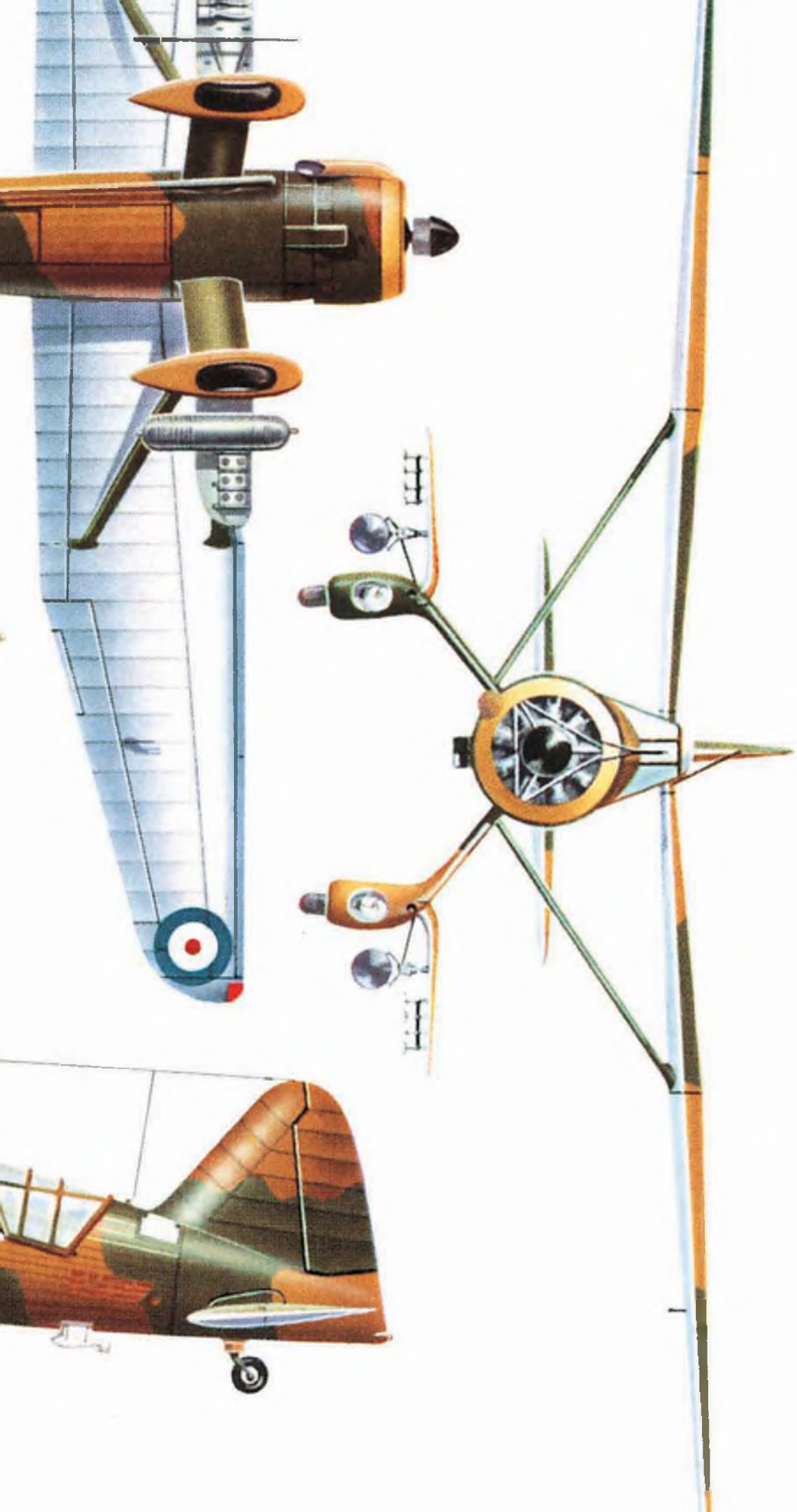
In Italy, No. 148 Squadron carried out similar clandestine work, as did other Lysanders in the Far East, all these activities being assisted by the fitting of a 150-gallon overload fuel tank and an external ladder.

During 1940/41, some Lysanders were modified for experimental purposes, the first three being anti-invasion machines. The original prototype, K 6127, was fitted with a Delanne tandem wing and a mockup Boulton-Paul four-gun turret. L4673 had a four .303 in. belly gun pack, and both K6127 (in standard form) and L4673 (standard) were fitted with a pair of 20 mm. Madsen cannons on the undercarriage legs, P1723 undergoing tests with a power-driven turret off of the mainplane. Another machine carried bench-type air brakes, while T1443 received a Dowty castoring undercarriage for cross wind landing trials. P9105 was fitted with a Steiger highlift wing, incorporating full span slots and flaps without ailerons, lateral control being achieved by spoilers.

Lysander production ceased in January, 1942, after 1,368 machines had been built in this country and a further 225 in Canada. Apart from its virtually worldwide operation by the R.A.F., the Lysander served with the Air Forces of the Canadians, Irish, Free French, Turks, Egyptians, Finns, South Africans, and Portuguese. ■







Westland Lysander Flying Colours

L4767, of No. 13 (Army Co-operation) Squadron, Monsen-Chausee, France, 1939.

Westland Lysander

Lysander Mk. II of Free French Air Force; support aircraft with Gen. Leclerc's Free French Saharan forces, 1941-42.



Wing detail.



Cross of Lorraine.



Free French A.F.; four wing positions.

Wing detail starboard.



port.

Lysander Mk. III of C.O., 'C' Flight (Special), No. 357 (SD) Sqdn., attached to 14th Army, South East Asia Command.



Personal 'spider' insignia on S.E.A.C. roundel.

Lysander TT. III., Royal Canadian Air Force.



Campaign insignia (Burma).



Lysander Mk. I. of Tielv. 16, Finnish Air Force. Continuation War markings.



Eire.



Finland.

Lysander Mk. II of Irish Air Corps. "A" and "B" schemes applied to alternate aircraft.



Eire: four wing positions.

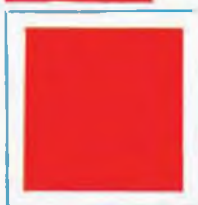
Lysander Mk. II of Turkish Air Force.



Turkey, rudder.



Turkey, wings.



Egypt.



Lysander Mk. I of Egyptian Air Force.

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With photos from the
Richard Riding Collection

Luton Buzzard

A one-off British ultra-light aircraft, no really a powered glider but based on 1930s sailplane principles

Although best known for their 'Minor', Luton Aircraft Ltd. had previously designed and built another very light aircraft, which was the 'Buzzard'. As with the 'Minor', the aim was a machine that would provide powered flying at minimum cost, but in the case of the Buzzard, the approach was different.

Here, the logic was to take advantage of the glider's aerodynamic efficiency and combine this with a low-powered engine, in order to minimise the cost of operation as close to that of a glider which was being the cheapest form of flying. It thus follows that a glider so enlivened would result in powered flying at its cheapest. It was this the idea during

the 1930s era which, in brief, resulted in several ultra-lights, best known of which were the 'Drones'. However, the 'Buzzard' was a greater refinement of this theme.

C. H. Lattimer-Needham designed the Buzzard, and it was built during the winter of 1935 at an airfield at Barton, in Bedfordshire. Originally the Buzzard was an open cockpit, and was clearly built on



This view of the Buzzard Mk I shows the fairly basic streamlining of the Anzani engine in complete contrast to the rather pleasing lines of the rest of the aircraft. The centre-section was built integral with the fuselage and braced above by the single sloping struts. The wings were detachable.

sailplane lines but with the wing positioned low down to accommodate the undercarriage, and a distinctive single strut wing brace at the wingcentre section on either side.

This largely relieved the centre section of bending loads from the long outer wing panels and also took landing shocks. The design also featured an all-flying tailplane devoid of conventional elevators.

The engine chosen to power the Buzzard

was the 30 h.p. Luton Anzani inverted aircooled twin, modified for the pusher layout and was mounted on a cowled pylon which also carried the gravity-feed fuel tank. An unexpected luxury (for the 1930s era light aircraft) was the manually operated, split flaps beneath the centre section. The long glider-type wings were of considerable span for a small aeroplane but the outer panels were made easily detachable and on

replacement the aileron push-pull control rods engaged simply and required no adjustments.

Registered G-ADYX, the one and only Buzzard was not destined to remain in that form and it was later transformed from a sparse open cockpit, but sporty looking machine, into a far more elegant cabin aircraft.

The building up of a cabin, with canopy hinging to starboard, and raising of the



This view of the Buzzard in its original format reveals the semi-enclosed nature of the pusher engine installation.



This early airborne view of Luton L.A.1 Buzzard Mk I G-ADYX shows the rather ugly initial installation of the 35 hp Anzani engine.





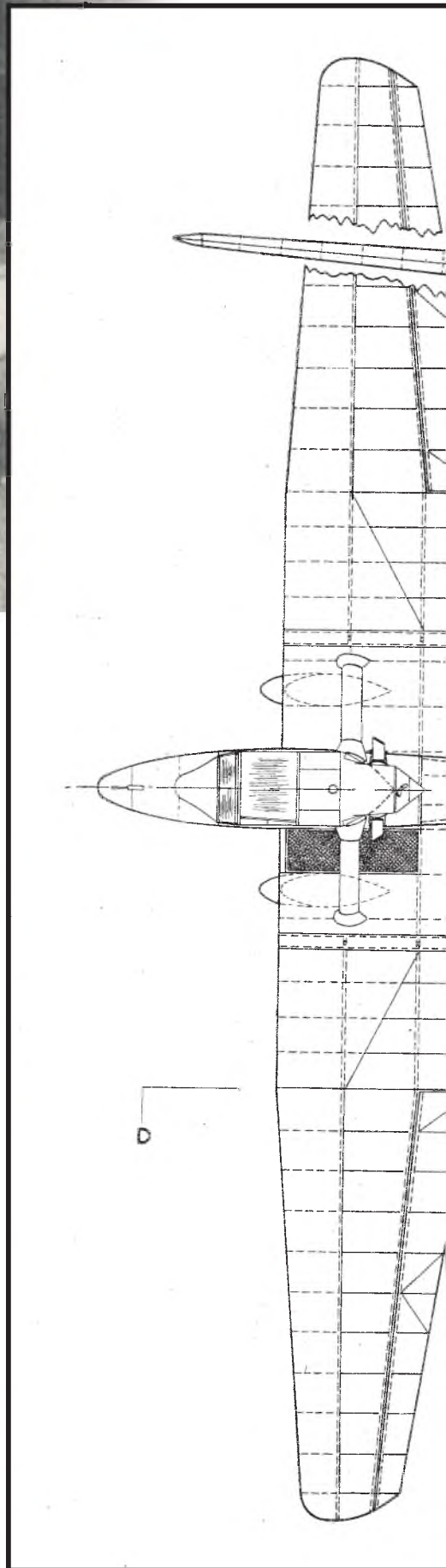
The Buzzard Mk.II's enclosed cockpit was a feature seldom applied to light aircraft of the 1930s.

instrument panel was the major modification, but the rebuild went further than this and much other work was done. At the rear, a conventional tailplane and

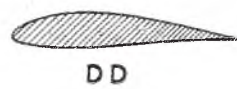
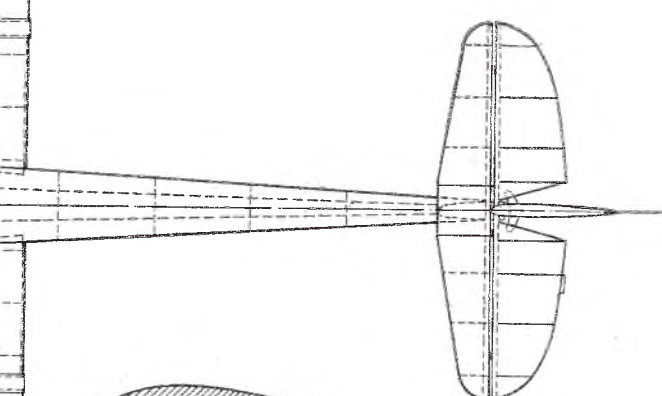
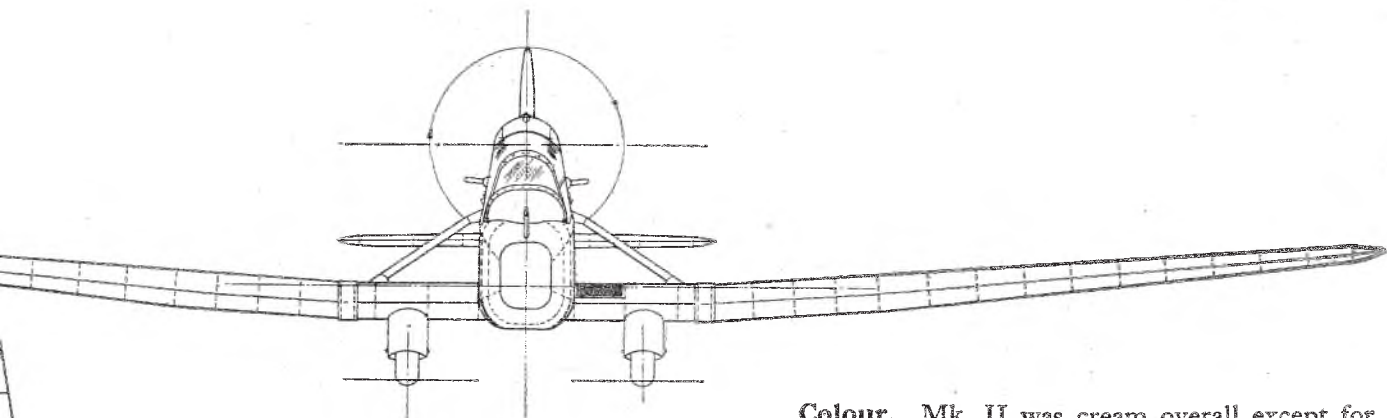
elevator of greater area were fitted, the rudder's horn balance was decreased and the tailskid fairing was deleted. The engine was given a new cowling and a



During a demonstration of the Buzzard Mk II at the Royal Aeronautical Society's Garden Party at Heathrow on 8 May 1938, Robert Kronfeld landed badly after being baulked by another aircraft. The damaged aircraft was taken back by road to the company's Phoenix Works at Gerrards Cross where it was repaired and flown again only to be consumed in the disastrous fire that destroyed the Works in 1943.



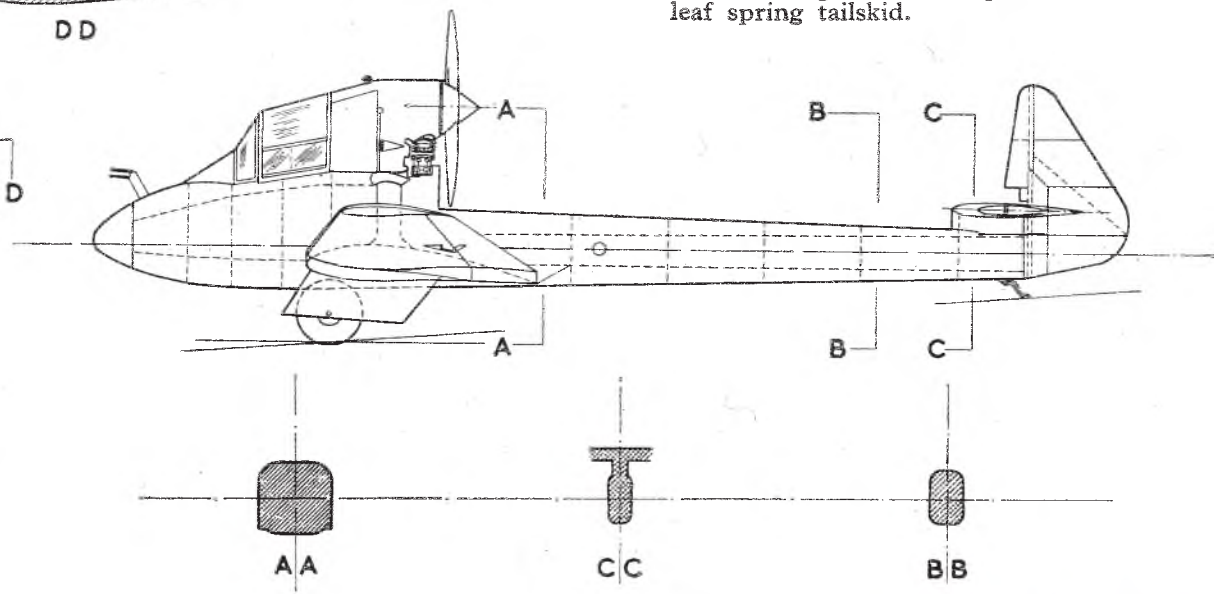
Following the crash of the Buzzard Mk I in November 1936 the aircraft was rebuilt and extensively modified. The new aircraft, known as the Mk II but carrying the same registration letters, had a slightly longer fuselage, shorter span wings, a streamlined engine pod, an enclosed cockpit and better undercarriage fairings. In this form it was first flown in 1938.



Colour. Mk. II was cream overall except for aluminium doped control surfaces. Nose-cap of light green outlined in olive green. Outline registration letters (none on wings) and strips at fabric-to-ply join on rudder also in olive green. "Luton Aircraft Ltd." in small olive letters on boom beneath tailplane.

Specification. Span 35 ft. 6 in. Length 21 ft. 6 in. Wing Area 137 sq. ft. Empty Weight 400 lbs. Loaded Weight 620 lbs. Max. speed 90 m.p.h. Cruising speed 75 m.p.h. Landing speed 30 m.p.h. Initial climb, 400 ft. per min. Take off run 100 yds. Landing run 30 yds.

Construction. All wood. Forward fuselage has four spruce longerons with ply covering. Rear fuselage boom has top and bottom keel members of $\frac{3}{4}$ in. sq. spruce with 8 additional stringers at ends of corner radii. Frames are of $\frac{1}{4}$ in. ply and are lightened. Steel tube engine bearers mounted on main bulkhead. Engine bay is enclosed with aluminium cowling, with gravity tank forward of engine. Wings are of conventional two spar construction with ply covered leading edge and centre section. Compression struts extend from centre section to fuselage. Outer panels detachable with horizontal pins, two at front spar, one at rear. Flaps hinged to rear spar. Tail unit has ply covered tailplane and leading edge of rudder. Undercarriage has low pressure wheels and leaf spring tailskid.



large spinner was fitted to the prop., more roomy trousers enclosed the wheels, wing fairings were cleaned up and the span was reduced from its original 40 ft. Re-painted, the Buzzard II, as it now became, was a smart and sturdy

machine but progressed no further than this stage. Instead, Luton Aircraft went ahead with the cheaper and simpler 'Minor' which had a wider appeal, being eminently suited for home-built construction.



A photograph showing the installation of the inverted Vee air-cooled 35 hp 'Luton' Anzani engine in the Luton Buzzard modified for pusher layout by having an additional thrust race.

On Silent Wings by Chris Williams

SCALE SOARING

Every summer the various vintage glider clubs in Europe get together for their International Rally, and this year it was held at Lasham in Hampshire, which was extra lucky for us, as it was only a couple of years since the annual event was held at Tibenham in Norfolk. Lasham is reputedly one of the largest gliding clubs in Europe, and when my pal Motley and I arrived one beautiful sunny day in the middle of the week, that was certainly the impression we got when we saw that the flight line was a speck of small dots far away in the shimmering distance.

When we arrived at the scene of action, panting and footsore, it was all worth it, for the area was packed with vintage sailplanes of all shapes and sizes. The foot-slogging didn't end there, though, because a bit further on we could see the outlines of the new VGC Heritage Centre. The

building that will eventually house a fine collection of vintage machines is named the Chris Wills Heritage Hangar, named after the founder of the Vintage Gliding Club who had sadly passed away quite recently. CW, as he was known, was a living repository of gliding history, and looking at the part-collection of gliders already assembled, this will indeed be a fitting tribute to his contribution to the club over so many years.

It was after we had inspected and photographed to death the machines inside and we were walking back to the flight line that a Slingsby T31 Tandem Tutor appeared overhead at a seemingly low altitude. Obviously, the pilot had run out of altitude and was taking a short cut to get back to the active part of the field. In doing so, the handbrake turn he had initiated put the glider into a steep bank over our heads, and as he did so, one of the two occupants

let out a hearty 'wooh-hooo!', which could be clearly heard from the ground. Motley and I looked at each other in mutual agreement...that pretty much summed up the whole day.

As a Minimoa enthusiast (I may well hold the world record for the number of models I have built of this iconic machine) it was a pleasure indeed to see the only airworthy example in the UK in action, having only seen her rigged at the previous International rally. It was a busy day indeed, with much hiking around the airfield environs, but I went home with an SD card full of photographs, some of which I'm sure will be the subject of future projects.

White Horse aerotow

The White Horse Club's flying site sits astride the top of a hill near Lambourn, where the racehorses gallop. When first formed, it was one of the earliest clubs to engage in the, then, new art of aerotow.

The only airworthy Minimoa in the UK.





The new VGC Heritage Centre is under construction.



The Chris Wills Memorial Hangar (Replica Colditz Cock in the background).



Primary glider goes up on the winch.



Another primary, the Hols De Teufel.

Although not on the curriculum for many years, The club decided to hold an aerotow event to mark the club's 40th anniversary. An invitation was extended on the Scale Soaring UK forum, and was eagerly accepted by the forum dwellers therein.

It was no surprise, therefore, that when the day dawned bright and sunny, a lot of the usual suspects were to be found rigging in the car park. Bright and sunny it may have been, but it came with a side

order of wind, and this wind was blowing in the worst possible direction, coming directly over the trees. To make matters worse, the vast, open plain that used to confront us in the olden days, is now criss-crossed with fences. This meant that when it was time to land, any turn into finals that was too far downwind, created the possibility of straddling one of these fences, all of which added a frisson of excitement to the festivities.

Given the conditions, then, it was with

some surprise that I saw Bob Blackmore happily flying one of my old designs, a Slingsby T21, built to 1/4 scale. Affectionately known as the 'barge' by its exponents, this glider has all the glide angle of a grand piano with the lid open, but seemed to be coping very well in the robust conditions. Flying equally well was Cliff Evans' new o/d Slingsby Capstan, one of the less modelled variants from the Slingsby stable. Cliff runs his own laser cutting business, and promises a



Scene at the busy flight line: Eon Olympia in the foreground.



Cliff Evans displays his o/d Slingsby Capstan.



Ian Davis goes fence hopping with RFD2 at White Horse.

for the Capstan in the near future. One of the few models I saw on the day that had flown here all those years ago was Ian Davis' RFD2. Given that this glider has no form of braking system, Ian was brave indeed to give it a go, and it came as no surprise when he ended up fence-hopping in the far distance when it came to landing time.

I gave it a go, too, with my recently constructed 1:3.5 scale Rhoadler and was pleasantly pleased and surprised in equal proportion to make it back to the patch almost every time, despite the massively thick scale wing section at the root. Given the conditions, a relatively small proportion of the attendees were keen to fly, but for those who were, the tug pilots were always on hand, and thanks must go to them and to Simon Jones of the host club for making what turned out for many of us to be a very enjoyable day.

TVSA aerotow, Siege Cross Farm
2013 may well stand out be a bumper year

when it comes the arrival of new models and their subsequent maiden flights. First up at the TVSA concern's event saw Terry Holland proudly displaying the results of his winter efforts in the form of the Luffikus, built to 1/4 scale. This took to the air without fuss in the capable hands of Dave Stokes and, with it's HQ airfoils, proceeded to float around quite prettily indeed.

Also maidenied on the day was the Slingsby Sky built by Neville Mattingley. Built to 1/4 scale from the free plan by Jim Owen, which is downloadable from the SSUK website, this is an attractive bird indeed in its red & white livery. Neville seemed initially reluctant to commit her to the air, a reasonable enough emotion given all the work involved in her construction, but before too long she was airborne and really looking the part in the air.

Another model maidenied on the day, was Mel Gigg's new Phoenix models Ka8. Whatever your views on the range of Chinese ARTFs that are increasingly available these days, some of them fly very

well indeed. Having reviewed an example of this particular model, I can confirm that the Ka8 is a nice performer, lacking airbrakes and somewhat flimsily constructed, but with the safe handling that comes with its extremely light weight. The wing joiners consist of two hollow aluminium rods, and although I didn't see exactly what happened, I couldn't help but notice that somehow Mel had managed to increase the dihedral to free-flight proportions!

Altogether an excellent (and extremely warm) day, with an occasional shortage of tugs, perhaps they were busy looking for an ice cream van. The usual thanks to the tug pilots and TVSA crew for continuing to provide the facilities that we glider pilots like to enjoy...

Slingsby T.61E project conclusion

I made mention of my pal Motley previously, well he, too, enjoyed a maiden flight during the busy summer season. The T.61E was a licensed-built version of the German Scheibe SF-25 two-seat side-by-

Bob Blackmore's Slingsby T21 at the White Horse event.





Neville Mattingley displays his new 1/4 scale Slingsby Sky at the TVSA event.



Terry Holland with his 1/4 scale o/d Luffikus.



The Sky in action at Siege Cross Farm.

side motorglider, and there are many examples to be found, usually one at just about every operational flying club. I once built a version from the Cliff Charlesworth plan (it's the blue and white one in the ad page) and was given the opportunity to have a flight in the full size.

The pilot, well stricken in years, had a duff hip and, unbelievably, this particular T61 had a pull-start, rather like a lawn mower. It was kept, and flown from, a farmer's field and thanks to his recalcitrant hip the pilot found it extremely difficult to pull the cord. She started eventually, after much 'effing & blinding, and we were off.

After a while, somewhat to my consternation, he switched the fan off and we were in soaring mode. Thereafter, the buildings and trees below started to loom large he and switched the ignition on. Grunting and straining he pulled on the cord, but to no avail. Instead, the cursing sprang to life. I gulped, and tested the integrity of my harness by nervously pulling on it. Soon it was possible to discern individual leaves and roof tiles. The sound of the engine finally coming to life was a sweet one indeed, and to this day I have never fitted an on-board starter to my motor gliders in honour of that occasion.

Motley's version is built to 3rd scale, and

the fuselage and empennage simply scaled up from the Charlesworth plan. The reason he wanted to build one in the first place was the pleasure he had gained from flying my 1/3rd scale C-Falke, so to keep things as similar as possible, the wings were designed with the same HQ wing sections and construction methods. Power is similarly provided with a Zenoah 38, that sweetest of engines, and thus it was at the beginning of July that we found ourselves at the site of the County Model Flying Club ready to put theory into practice.

Sneakily, he handed the Tx over to me, so having got him to sign the obligatory disclaimer notice, I opened the taps and we were off. Sure enough, the flying characteristics were uncannily similar to mine, and I poled her around for a few minutes before handing the Tx to Motley. There is an expression that comes to the face of those that have sailed the stormy seas of construction and arrived at the harbour of airborne manipulation that consists of a subtle blend of satisfaction, relief and excitement, and this was the state of Motley's face in those moments. When I was sure he was happy to carry on, I fired up my C-Falke and we were treated to the sublime sound of two Z38's in perfect synchronisation.

There is a lot to be said for the motorglider...not only can you fly the usual up & down the flight line display of any powered scale model, you can also climb to altitude, hit the kill switch, and enjoy the sublime experience of flying a large glider in search of rising air. When the wind refuses to blow on the slope and the tug pilots all indisposed, Motley & I tend to do this a lot...

(To see the T.61 in action, just Google MOTOGLIDERS AT DAWN)

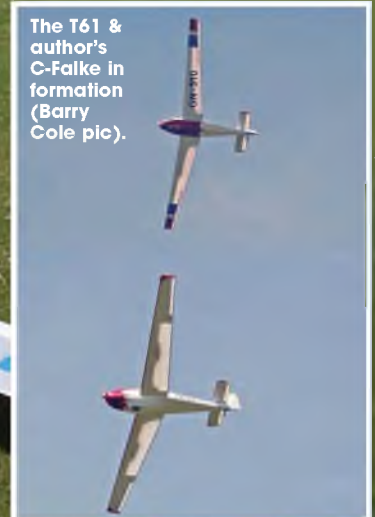
Tailpiece

When 2013 came into being, a bunch of us foregathered on White Sheet hill and had a glorious day's flying. I unwisely commented that this was a good omen for what was to come. What actually came was four months of freezing weather, with biting Easterly winds and precious little flying. Then miraculously, it all turned around, and up to date we have enjoyed the sort of summers that old men dream about. With all the flying that has subsequently taken place, my reports have been somewhat brief in order to fit everything into one column...long may it continue!

c_williams30@sky.com



The T61 in action at the County Model Flying Club.



The T61 & author's C-Falke in formation (Barry Cole pic).

Geoff Crew before the maiden flight of Slingsby T61E.

Surviving Free-flight

Part 6 - Andrew Hewitt looks at other power sources for scale...

Rubber powered scale free flight models for the great outdoors require a very different approach to design than the IC-powered scale free flight models on which I have previously concentrated. Success can be far more elusive, unless basic principles are adhered to.

The attraction of using rubber power is hard to describe, but a calm summer evening with a light scale model flittering around your local park is quite hard to beat for simple enjoyment. Free flight rubber and glider models are the only ones allowed in most parks today - often attracting a group of interested admirers, rather than complaints.

Although there are kits available, these are nearly all of the terminal variety, designed with flying as the last priority. They are generally much too small, at under 24" span, often structurally complex - and therefore heavy. For example, the typical World War II fighters, which entice the beginner into total failure - dozens of tiny fiddly bits need to be cut out of rock hard balsa suitable only for packing cases.

By far the best kit on the market today, for near guaranteed success, is the West Wings Piper Cub. At 36" span, with machine cut parts, it makes an excellent value kit at a reasonable price. This design also has removable wings and therefore some built-in flexibility which most other kits lack. As it stands, the design is a good scale model and with a little research and paint, it can be built into an accurate competitive model. So, if you are new to Scale rubber models, this makes an

excellent first project - and one on which you could enjoy competitive flying.

Picking your subject

If you have ever built a Keil Kraft Ajax, Senator or Gypsy, then you should know how well they perform, so common sense says that subjects of similar plan form, should also fly well. Hence the recommendation for the Piper Cub type of aircraft. General considerations are: good tail areas, long noses (for plenty of rubber, rather than church roof ballast), preferably long undercarriage (allowing a large propeller) and a simple structure (to keep the airframe weight to a minimum). This all points to subjects like the Westland Widgeon, Piliatas Turbo Porter, DH Beaver, Austers - and any of the DH Moths. In fact, you are only limited by your own imagination and ability to trim models to fly - but some are bound to incur penalties on duration, because of a lack of room for any rubber, or decent-sized props.

Size is Important

The size of your model is important - below 24" span you will be struggling with mother nature's little breezes, and unscale-like flying characteristics will result. Larger models fly better and this is especially true for rubber models. Aim for between 30" and 50" wingspan and an all-up weight not to exceed 12 ounces - these sizes compare favourably with vintage Wakefield's - and they have no problems flying!

LEFT: Derek Knight takes time off from electrics to fly this rubber-powered Fairchild Ranger. Just to prove how well they can fly, from this launch it promptly went OOS!

MAIN: Barry Hetherington at the helm! A super launch of a super rubber model! High, large area wing, large prop, nice size - all the ingredients of a fine flier. The masochistic streak, common to all free flight scale modellers, remains however - look at that spindly, wing strut-braced undercarriage!



Scale

by Andrew Hewitt

Construction

The most important part of your model is the propeller; there are no suitable plastic commercial items available big enough, so you will have to carve your own. The length of the undercarriage fixes the diameter (for ROGs), but you can play tunes on the pitch of the blades. Do not be put off by a little carving, since propeller production is quick and very therapeutic. **Fig.1** shows a typical 13" diameter propeller blank, suitable for models up to 40 inch span, which can be scaled up or down for larger or smaller

designs. For extra durability, the blades can be double covered in tissue, or even glass clothed. The noseblock sketch (**Fig.2**) gives details of a very simple freewheel, which will help improve the glide of your model considerably. The washers can be steel, PTFE - or better - a thrust race (these items are available from SAMS, Mike Woodhouse and Knight & Pridham in the UK).

The airframe construction should be as light as practically possible; we should also incorporate some flexibility in the form of removable wings and sprung undercarriage, as detailed in previous 'survival' articles. It is also important to incorporate moving scale tail surfaces for flight trimming and not to rely on warping surfaces, which do not remain set. Stiff hinges cut from soft drinks cans, having first drunk the contents, make excellent hinges.

Finishes

The model needs to be covered in something very light and strong to give the required airframe rigidity. For this we use 'Jap' tissue, or lightweight 'Modelspan' tissue. Very sparing use of dope, thinned 80% with thinners - and only two coats - will prevent warps. For colouring, we use coloured tissue, or a very light sprayed finish of dope, enamels or acrylics. You must think of nothing other than weight - and as little of it as possible. This is especially true of the scale details, wheels, dummy engines etc.

Rubber - how much to use?

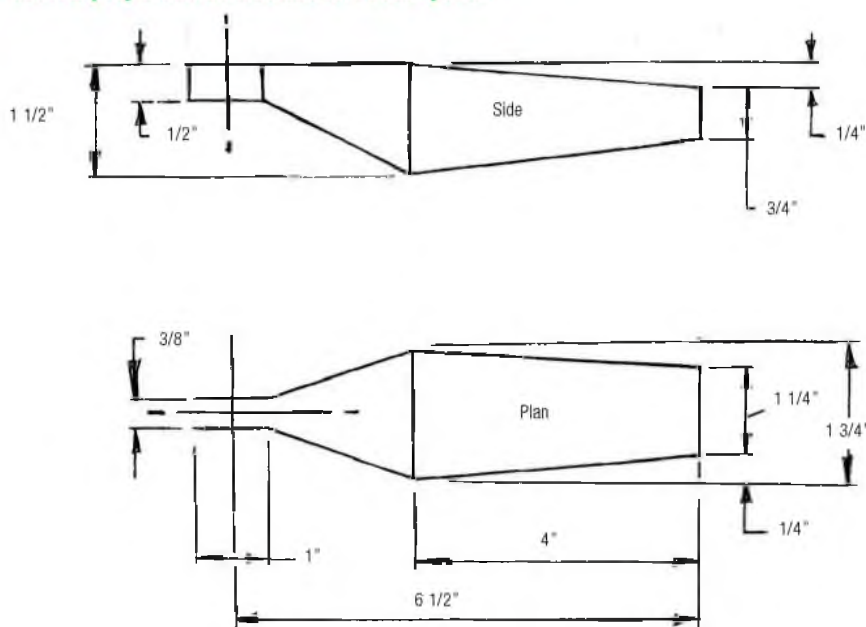
Many rubber scale models appear to fail because of a lack of motive power, resulting in low-powered stally flights at low level - very prone to damage. Generally, the amount of rubber to be used has to be



BELOW: Author Andrew Hewitt recommends the West Wings (Pro-Scale) 36" wingspan Piper J-3 Cub kit as an ideal starting point for those taking up rubber powered free flight scale.



FIG. 1:
General prop blank dimensions for rubber power



at least 25% of the total all up flying weight and, for maximum performance, 50% of the all up weight. Thus, if your completed airframe weighs 8oz, then 2 to 4oz. of rubber are required. This mass of rubber needs to be made into a multi-strand motor about 1.5 times the length between the noseblock and rear peg. This can then be pre-tensioned to fit the fuselage. I prefer to use many stranded motors of 1/8" by 1/20" section, rather than the usual 1/4" by 1/20" section rubber, as they tend to knot smoother on winding and breaking a few strands is not so catastrophic.

Flying

After initial glide trimming, adjusting the moveable tail surfaces for a smooth glide, all powered trimming should be done on

thrust line adjustments, and by tiny movements of the tail surfaces. A right-handed flight pattern is aimed for, usually achieved by slight right thrust and right rudder. For a scale flight pattern, then plenty of down thrust will be required, alternatively, by using less down thrust and more power, a high climbing flight pattern will result. The motor should be well-lubricated with Castor oil or Glycerine, which helps the knots to evenly distribute themselves and hence prevent bunching

Hisses and Sparks

At the start of this article, I may have been a little critical of the majority of small scale kits available. To make amends it is fair to say that these kits do make good CO2 or Electric model conversions. These power

sources are compact and light and can often reduce the all up weight of one of these Keil Kraft-sized models, since the mass of the unit can be concentrated where you require it. For example, the perennial favourite of an early mark Spitfire or Hurricane can easily be converted to CO2 power and successfully flown. Hence lots of unsuitable subjects become possible, especially the nasally-challenged subjects such as Sopwith Camels or Pups, Fokker fighters and any of the structurally more complex - and hence heavy - World War II subjects. All the difficult subjects are now much more feasible.

For both CO2 and Electric, the conversion is simply the addition of a ply-faced former with the appropriate fixtures to accept the power unit and tank or batteries. Do not forget to incorporate some down and right thrust, with provision for more alterations later, in line with my recommendations on flight trimming in my first two 'survival' articles. If you prefer the sparks to the fizzes, then the scope for converting the larger rubber scale kits into electric subjects is completely feasible. The best unit on the market for these is the Knight and Pridham KP O2 motor, which is suitable for models up to 40", span if built lightly. The beauty of this product is that you can buy a complete flight system - charger, batteries and motor - and easily operate it with very limited prior knowledge, simply follow the instructions - an excellent British modelling product. Otherwise, you could cobble together your own system, if you have the knowledge and soldering iron.

If you would like to design your own scale models, the basic principles for the smaller (under 24" span models) follows very closely that of scale rubber models, as described above, i.e. keep it light and true, but don't put the rubber motor peg in! For electric-powered models, you can afford to beef-up the structure at key areas since



David Causer's CO2 powered Avro 504K (the Aerographics kit prototype) cruises by at Old Warden - how more realistic can you get?



Large rubber scale gives unusual prototypes a good chance of success - this early WW2 German transport is a good example (modeller and model unknown).



Derek Knight's dream combination! A Tiger Moth, powered by one of his KP electric units - and doesn't it fly well!



Lindsey Smith enjoys the challenge of difficult-to-trim prototypes. His Tempest was trimmed and flown here at Old Warden.

you have more power available. This is especially true for the larger models where construction techniques can be similar to those used for diesel-powered models, as already described in earlier 'survival' pieces.

To boldly go...

CO2 and Electric power sources are ideal for multi-engined subjects. CO2 is a little trickier, since the power sources available are short on power and hence, smaller models have to be built. However, success can be achieved without the worry of one engine stopping before the other, by running the two motors from one tank, or by linking the two tanks with a balance pipe. SAMS indoor supplies has a large selection of different tanks to suit your requirements. It is easy to balance the engine revolutions by simply listening to them beat. It is not necessary to have opposite rotation on each engine - it is far easier to have down and right thrust, as you would any other single engine subject.

Electric gives the better scope for multi-subjects. In recent times, there have been few built and flown, despite an attractive flight bonus. One brave contender was Mike Smith who built and flew an Airspeed Ferry trimotor, which won the CO2/ Electric cup at the British Nationals several years ago. This was a large 1/12 scale airliner of about 60" span, built along diesel-powered lines, from spruce and balsa, the flying weight was a mammoth three pounds. The motors were two standard geared 360's with a hot 360 direct drive in the top central nacelle, the battery bomb load being eight pencils. Despite sounding like a flying hair salon, this model was an awesome sight to be hold in

the air, and was very competitive.

Another pioneer in the scale electric multi scene was Brian Waterland and his memorable Avro Lancaster, in the mid '90s. Four KP O1 motors powered this, and after much badgering and coaxing, Brian entered several competitions and nearly won them all! This model could claim a 25% scale flight bonus and with its superbly realistic flight performance, it was very difficult to beat with a conventional single engine model. The plans for this model are available through the Aeromodellor plans range and are well worth examining if you are contemplating building a multi. Brian's model is 44" span, weighed 12oz. ready to

bomb and required 3 x 279mAh cells for power. All the engines rotate in the same direction, no problems were encountered provided each engine had some down and right thrust to counter the torque.

In more recent times, Steven Glass has come to the forefront in F/F multi scale, with his superb EDF models (electric ducted fan), notably the VC10 and Gloster Javelin. Mr K&P himself, Derek Knight has had success also with a B-17 powered a la Waterland, with 4 of his KP01s.

The power sources are becoming more diverse, but the building and flying techniques remain the same, however, build light, build true - and trim carefully! ■

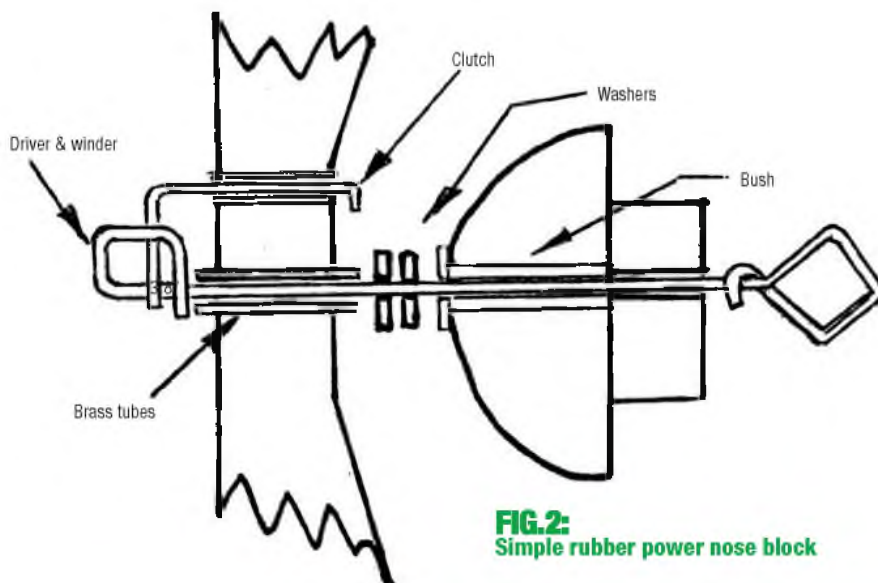


FIG.2: Simple rubber power nose block

BMFA Scale Nat

Alex Whittaker takes his camera to the festival of Scale at RAF Barkston Heath



s 2013

Most of us in Britain are in shock at such a pleasant summer. In my part of the country we had weeks of warm weather, so I confidently expected the weatherman's

predictions of warm and sunny weather over The Nats Weekend to come true. You can guess what happened: the warm sunny weather was interrupted and delayed. Although we had some sunny spells, we had an awful lot of blustery wind,

some torrential overnight rain, and gloomy skies too.

Luckily flying was hardly interrupted, though cross-winds caused a change of runway. This meant that pilots had sunshine almost directly in their eyes, and my photos



The Scale Nats is the place to be!



Dave Gibbs' 1/5th scale Grumman F6F-5 Hellcat in Flying Only Class. MVVS .58 power.



Mike Sollitt's re-schemed and glass-cloth covered 1/4 scale Ryan STA (originally an ARTF). OS 200 FS with spark ignition, running on glow fuel!



Westland Wyvern in 1/5th scale ARTF from Peter Fullard. Laser 300 V power.

of models could turn out as silhouettes. Thankfully, it did buck up on Nats Monday. Overall, we did well, even though the weather was a bit disappointing.

Events and Classes

To refresh your memory, there are now three classes at the BMFA Scale National Competitions:

1. Flying Only

No Static Judging of the models. Only flying is judged. You do not have to have built the model.

2. Stand Off Scale

Static Judging of the model does take

place, but it is a relaxed affair. You do not have to have built the model, but you have to certify that you have applied the colour scheme and the markings.

3. International Scale Class, F4C

Builder of the Model Role (BOM) applies. Models built and flown to the highest standards.

Entries 2013

Of late, the BMFA Scale Technical Committee has introduced a number of well considered initiatives designed to increase entries to The Nats. The Flying Only Class is now well established, and the entries to

the new Stand Off Scale Class are encouraging:-

Flying Only:	13
Stand-Off Scale:	6
F4C:	11

Models of note

I hope the photos give you a feeling of being at The Nats. However, one or two models deserve a brief jotting. Last year we saw Jim Reeves' lovely electric powered Bristol M.1c Monoplane in a red and silver scheme. (Naturally, this model is also a Mick Reeves kit). This year Jim had re-schemed it, and to my eyes it looked even better. At the other end of the monoplane spectrum, Jim Mc Call's gleaming Spacewalker was everything an attractive American home-built should be. Speaking of Yankee planes, David Fisher's immaculate Stinson Reliant was cracker, in smashing American Airlines Route Survey Plane scheme. Then, there was Brian Wood's re-built and re-schemed Brian Taylor P-51D Mustang. This is an exquisite scale model, also electric powered, which looked superb in the air.

Scottish competitor Graham Robertson's four-engined Avro Lancaster was



LEFT: Bombs away! Graham Robertson's Lancaster.

BELOW: Graham Robertson's 1/10th scale Lancaster. Powered by 4xOS .72 four stroke glow engines.





John Thomas landed his Diablo despite droopy spats



Dave Cossins with his white tailed Spitfire VIII. Laser 150 powered, 1/5th scale. East Asia Command scheme.

breath-takingly ambitious. This was pukka trad. Brit. modelling at its very best, with four O.S. glow-engines, none of that Southern jessie electric stuff! By the way, his starting cradle, made of white plastic plumbing pipes and elbows, was a work of art. Another model that charmed the crowd, even though we have seen it many, many, times before, was Jeremy Collins' pretty DH 53 Hummingbird. This

looked really convincing battling a headwind on a low pass.

Besides his announcer's skills, John Carpenter is an accomplished builder. I thought that his Comper Swift was an utter delight. Then there was Mike Sollit's intriguing Ryan. This model marked an emerging class of Nats competition model, designed to meet the ARTF challenge head-on. In fact, Mike's Ryan

was an ARTF model that had been stripped, re-covered, re-schemed, re-detailed, and re-legended for the competition. Mark my words, we shall be seeing more of this technique for Stand-Off Scale in the future.

Scots contingent

It seems that, as we get ever nearer to a Scottish Referendum, the Scots contingent

BMFA Official Results 2013

F4C

- | | |
|--------------------|------------------------|
| 1. Dave Womersley | DHC1 Chipmunk. |
| 2. Mick Henderson | Airco DH 9a |
| 3. Dave Knott | Hawker Hurricane Mk.1 |
| 4. Mick Reeves | Sopwith 1.1/2 Strutter |
| 5. Dave Toyer | Miles Messenger |
| 6. Jim Reeves | Bristol M.1c |
| 7. Steve Jackson | Avro 504k |
| 8. Richard Crapp | Westland Wessex |
| 9. John Carpenter | Comper Swift |
| 10. Terry Manley | Blackburn |
| 11. Jeremy Collins | DH 53 Hummingbird |

Stand-Off Scale

- | | |
|-------------------|-------------------|
| 1. Andrew Bowman | Stampe SV4a |
| 2. Alex Kennedy | Tiger Moth |
| 3. Jim McCall | Spacewalker |
| 4. Brian Wood | N.A.P-51D Mustang |
| 5. Martin Fardell | Fairey III F |
| 6. Jim Currie | Tiger Moth |

Flying Only

- | | |
|------------------------|----------------------|
| 1. Dave Charles | Spitfire IX |
| 2. Peter Fullard | Westland Wyvern |
| 3. Richard Scarborough | North American P-51D |
| 4. John Elkington | Cessna 182 |
| 5. David Cossins | Spitfire Mk VIII |
| 6. Mike Sollit | Ryan STA |
| 7. David Fisher | Stinson Reliant |
| 8. Dave Gibbs | Grumman Hellcat |
| 9. John Thomas | Diablo |
| 10. Graham Robertson | Avro Lancaster |
| 11. Willie Young | Auster |
| 12. Alan Glover | Hawker Hurricane |
| 13. Tim Ruck | DH Mosquito |



P-51 Mustang by Richard Scarborough from the Nick Zirolli plan. 3W 60 petrol power, and glasscloth covered.



Spitfire IX by Dave Charles, 1:5.2 scale, Laser 150 power. Built from the Brian Taylor plan, in Johnny Johnson's scheme.



Brian Wood's 1/5th scale P-51D Mustang from the Brian Taylor plan. Electric power. Finished in Spectrum paint.



John Carpenter's new Comper Swift one-third scale, Laser 180 powered, covered in Solartex.



Nifty dummy Pobjoy radial on John Carpenter's 1/4 scale Comper Swift effectively hides the Laser 180 FS underneath!

Tiger Moth, 1/4 scale by Jim Currie. Powered by an SC 180 four stroke engine. Painted in Solarlac.



Dave Fisher's one-third scale Stinson on a low fly-by. Moki 30cc power.



1/3rd scale Spacewalker (Hazel Sigafoose replica) by Jim McCall. MVVS 40cc petrol powered.



Graham Robertson's amazing plumbing! Supports his Lancaster for inverted starting.



Look at that body language! Brian Wood fettling his superb Mustang P-51 D.

at the BMFA Nats grows ever larger! My theory is that their models are so well-built because of those long dark Hibernian winters. Many in the pits remarked that there were now so many canny Scots competing, that The Nats would be much poorer without them. This is true. Naturally, the Referendum decision is for our Scots brethren to make for themselves. Personally, I do not wish to see the British family become estranged. To me the The Nats provide an illuminating national parable: we are clearly stronger together.

Also note, that our highly efficient and effective young CD, Graham Kennedy, is a Scotsman, and some of these keen Scots competitors had travelled eight hours one-way to be at The Nats. I only travelled four from Wales, so theirs is some commitment. Incidentally, there were no overseas competitors this year.

Happenings

The weekend was not without events. Richard Crapp had aileron problems with his mighty Westland Wessex, due to a transmitter issue. Brian Wood's beautifully refinished Mustang ground-looped alarmingly, though this year it did not attack any Judge's boots. Graham Robertson's new and hugely impressive glow-powered Lancaster bomber lost an inner engine mid-flight. This was serious, and no-one breathed until the Lanc was nursed in to land. All three models survived due to superior piloting skills under stress, but trust me, it really was gripping stuff. There was a lighter incident when Dave Gibbs' Hellcat, fighting the nasty cross-wind, almost hit a traffic cone. It regained the runway by inches. There was a roar of jammy laughter from the crowd, relieved there was no damage.

Irrepressible Scotsman Willie Young suffered a number of inexplicable flame-outs on his nifty Auster, usually just on take-off. I am not sure if he got to the bottom of the problem, though he changed all the fuel tubes and filters. Later on, David Cossins lost a tailwheel assembly from his Spitfire Mk.VIII before his slot. Since this was The Nats, it was do or die so Doughty Dave decided to fly on. You could hear the intense grinding as the rear fuz



Willie Young (left) suffered from the engine gremlins all weekend. Mike Sollitt assists.



Andrew Bowman's 1/4 scale Stampe SV4b from the Svenson kit, bought in 1982. SC 180 power driving a 18"x8" prop.



Contest Director Graham Kennedy moving his father Alex's 1/4 scale Tiger Moth up to the flight line. Laser 180 powered.



Richard Scarborough's 1/5th scale P-51D Mustang from the Nick Zirolli plan. 3W 60 petrol power.



Scraping her rear fuz whilst she takes off with no tailwheel - Dave Cousins Spitfire VIII.



Utterly stunning 1/3 scale (Mick Reeves kit) Bristol M1 C by Jim Reeves. Re-schemed for this year. Electric powered, 9hp.

scrubbed the RAF tarmac. I noticed that in flight, its white tail almost disappeared against the cloud.

Another funny turn was when John Thomas's Diablo decided to droop both its wheel spats. It was flying round in this limp-wristed fashion for most of the slot, but the accomplished Welshman brought the model back alive. The landing was upright as on water skis: she did not tip over.

Over-flying

There was a lot of overflying by pilots on all the Nats flight lines (our Scale Line included) so I apportion no specific blame. However, overflying does tend to increase the likelihood of a mid-air. At one point I thought we had a jet competing in F4C, and I dutifully took a snap of it, before I realised it was an overflight from the Showline! Our scale models did violate Heil Line airspace. CD Graham Kennedy spent

a lot of time on his hand-held radio dealing with such issues.

Then there was a jet crash. I was so engrossed in one scale flight, that I completely missed an expensive jet from the Showline going in, just a few hundred yards across the grass from where The Judges and we in the Press Corps had set up camp. (The jet crashed due to equipment failure rather than pilot error). There was no noise, and no shockwave. There was just a huge but short-lived flash of fuel burning off, and then a pall of dense black smoke. This close call troubled me all day. It was observed that on, a different flightpath, the jet might have landed in the crowd. Hmmm.

The verdict

A very absorbing Scale Nats with a number of interesting new models and some new faces. The quality of Judging

was also high, with clear adherence to agreed standards. Our Contest Director Graham Kennedy was ubiquitous throughout the weekend, whizzing about on our behalf with his hand-held radio, dealing with the many and varied issues raised in running three contests over a single weekend. The BMFA is to be congratulated on such a smooth and rewarding competition, in defiance of uncooperative weather.

Acknowledgements

As ever, Gordon Warburton FSMA worked his little cotton socks off all weekend, and then spent even more time at home cataloging the Official Results for publication. We are grateful. I thought the Public Address Team got it absolutely right. They were informative, knowledgeable, and entertaining, without ever being intrusive. Other big shows please take note. ■



Dave Knoll's 1/6th scale Hawker Hurricane, Mk.1, Laser 120 powered.



Yes, that b****y man is back to bend your ear with more electric flight nonsense. If you are a regular reader (there must be some out there somewhere), you'll know it's time to finish of the construction article for the little Sperry Monoplane. Since the remaining plan page takes up a fair chunk of this month's column I'll dispense with my usual, entertaining

waffle (I think it's entertaining, at any rate) and plunge straight into completing the build of our little model.

Winging it

Put basically, building the wings is dead simple (providing you have the right wood to begin with).

Build the dihedral brace into the centre section (c/s), angle the wing root ribs to match the dihedral (using

the guides shown) and allow the glue to dry. There isn't really much more to it than that. The plan shows quite clearly what goes where, so I won't bother telling you what order to glue them in place

Take care while shaping the leading and trailing edges. It doesn't take much effort to snag something and break wing ribs. Join the wing panels to the centre section and a little sanding later we have a model pretty much ready to cover.

It's a cover up

Yeah, I know these section titles don't get any better. Still, you can't have everything. Shame on you for being so picky.

When I built this model, I was still perfecting (?) the art of printing onto tissue. As you'll notice from a couple of smudges on the fuselage, I hadn't quite got the hang of it at this point. I have since discovered that an inkjet label, suitably de-sticked, makes an excellent carrier to which to attach the tissue for feeding it through the printer.

Simply apply the label to an available carpet and peel it off again. Repeat this until the label is only just sticky enough to hold the tissue in place, but still allow the printed tissue to be carefully peeled off again and you have it about right. Until then, I'd been using a glue stick to attach the edges of the tissue to a card carrier. Unfortunately, as the ink hits the unsupported area of tissue, it causes it to swell slightly and it can foul the print head, causing those smudges.

For covering models of this type I like to use lightweight Esaki tissue, printed using waterproof ink. You can use cheaper inks, but don't blame me if all your artwork runs when you attempt to do the initial shrinking - prior to dopping. Water shrinking is obviously not

PETER RAKE PRESENTS THE CONCLUDING PART OF HIS PINT-SIZE SPERRY MONOPLANE, WITH FULL SIZE PULL-OUT PLAN SHEET FOR THE WINGS.



The colour scheme was inspired by something someone did with a larger version of this design. It's whimsical and looks good.



Wing construction follows the usual practice of building over the plan.



You can't have a construction article without a naked model photo.



The wings all trimmed and sanded ready for joining to the c/s. Those 1/32 ribs and soft balsa trailing edges played havoc with the shrinking.

an option with these inks, but careful steam shrinking does work fairly well. Waterproof ink is definitely the best option, although they are somewhat more costly than the after market alternatives.

To attach the tissue there are several options. Tissue paste, wallpaper paste and dope are all viable, but probably not all suited to non-waterproof inks. Personally, I like to apply the tissue wet, doping it in place - definitely only suited to waterproof inks. However, on this model I tried something a little different. A quick visit to our local W.H. Smiths procured an 'extra strong' glue stick and that was used to attach the tissue to the framework. You have to be a little careful using this method because it 'grabs' quite quickly.

If you need precise alignment (and you will if using printed tissue) I find it best to stick just a small area and tease the tissue into place before gluing the rest of the panel. Apply it to a small section of frame at a time and smooth the tissue into place as you go. Try to get it on as wrinkle free as you possibly can before the glue does what it's there for - sticking the covering firmly in place.

Once that's done, and initial shrinking completed, it's just a case of applying a few coats of your favourite finish. My model got three coats of very thin dope, mixed about 30% cellulose dope to 70% thinners. That's enough to seal the tissue and provide a reasonably durable (as durable as lightweight tissue gets) finish.

You could, of course use a lightweight film covering, but you'd have to be very careful not to warp the flying surfaces or distort the fuselage. (Yes, that probably does mean that Solartex is out of the question!). Litespan might work okay though, and would retain the tissue-like appearance without adding too much weight. You can't, however, print directly onto Litespan, so detailing would add weight.

Installation

Although this will depend on what equipment you are installing, the installation should go fairly easily. I'll assume you're using a Vapor style 'brick' for the purpose of this article and describe accordingly. If not (why not?), you're on your own.

What I describe here is something I

learned the hard way when I installed the gear in this model. I tried using pushrods of the correct length and, believe me, it was an absolute pain trying to feed them into the fuselage without feeding them through the tissue at the same time. To save you having the same problem I'm detailing how I did it on subsequent models. It wastes a little carbon rod, but that's infinitely better than poking holes in your carefully applied tissue.

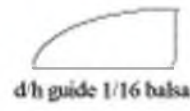
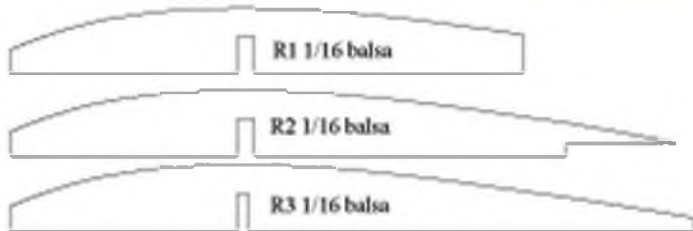
Make up the pushrods from 1 mm carbon rod, 0.02" wire and heat-shrink tube, but only at the receiver end. Leave the rods over-length, with one of them a lot over-length. Slip the made up ends into the servo arms and then feed the rods through the fuselage. The very long one is easily guided into its exit plate, and because it's so long, there is no fear of the shorter rod poking holes in the tissue. Guide the second rod into position and glue (UHU Por) or servo tape the receiver to the rails as shown. Make up the other end of the pushrods, but do not glue them yet. Trim pushrods to approximate length.

With the gear in place, we need to assemble the model before making the final pushrod connections. Glue the

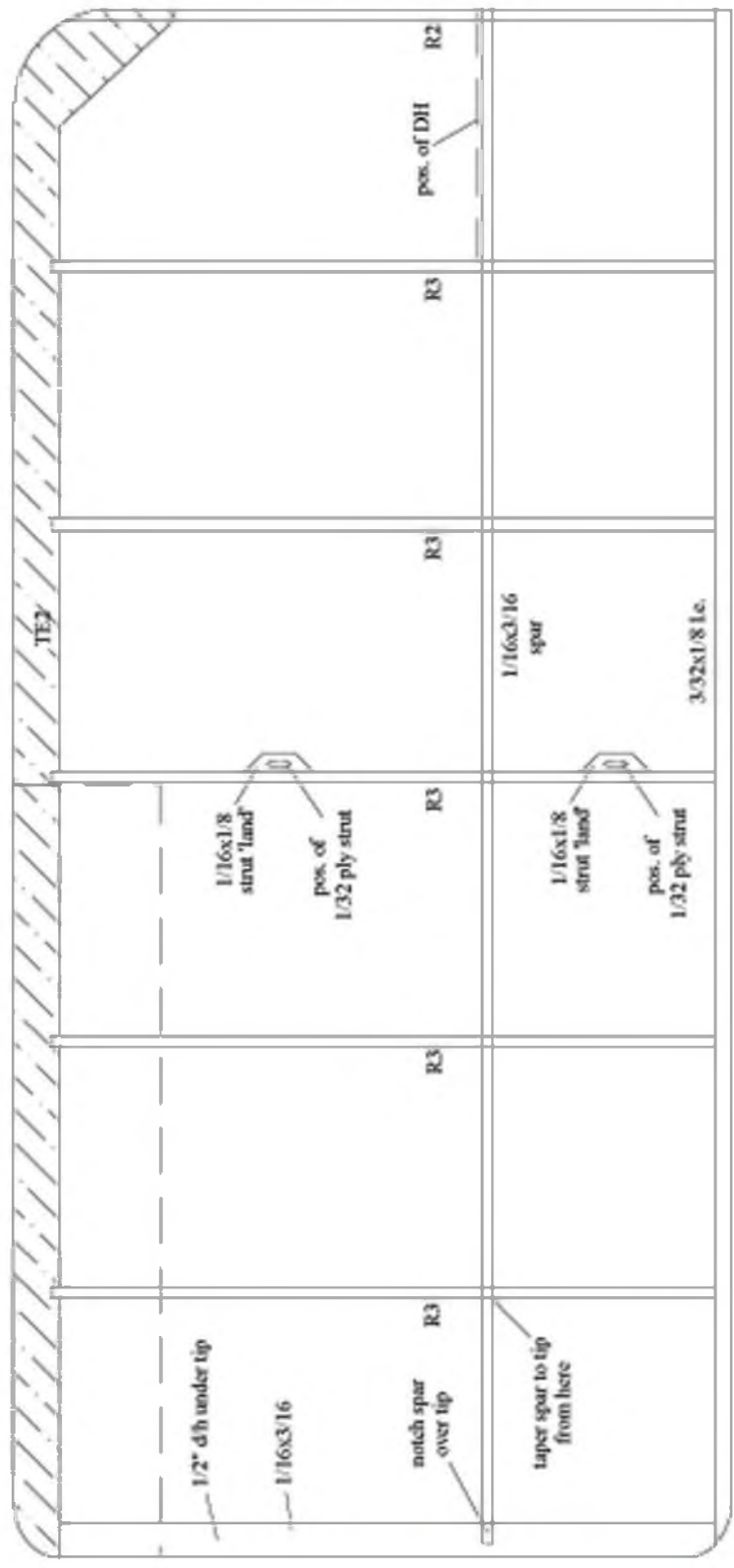
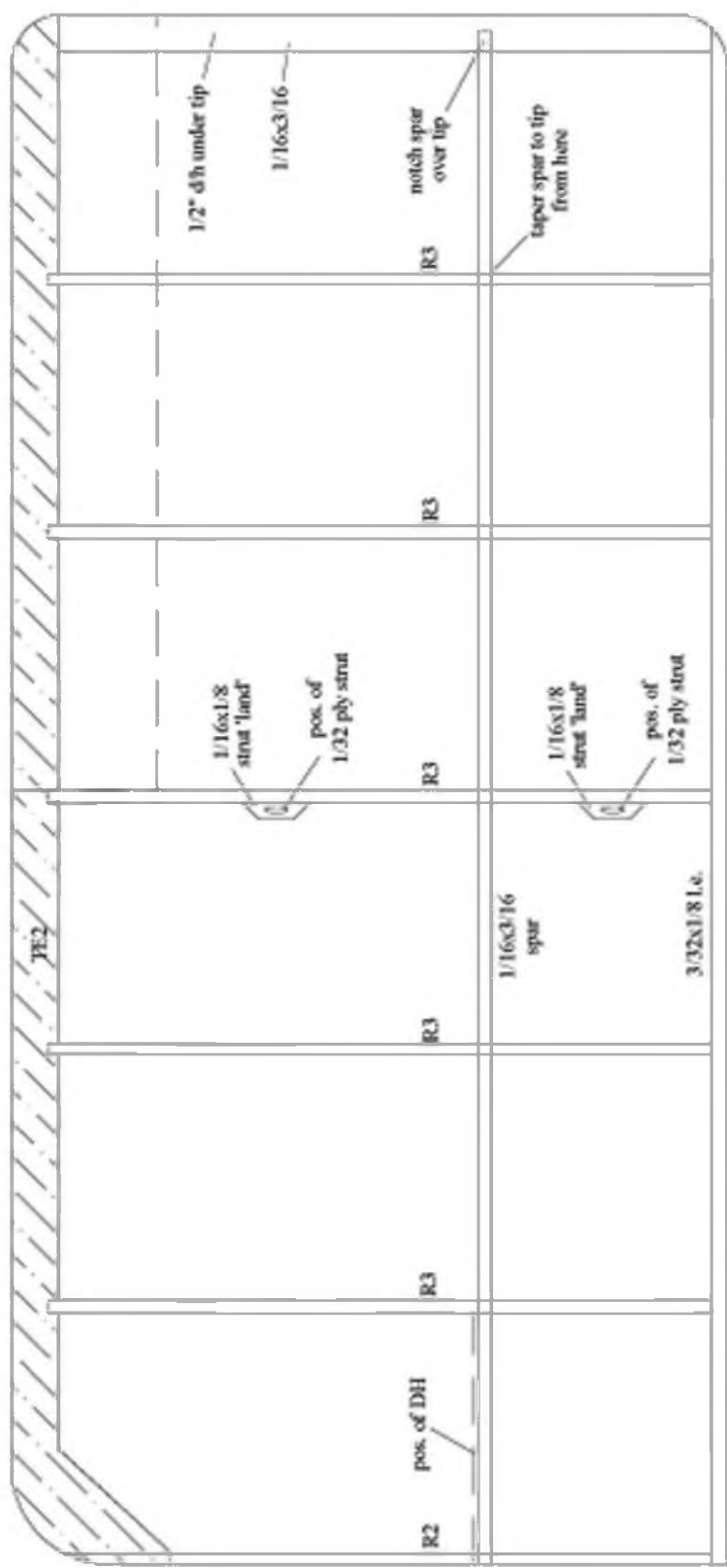
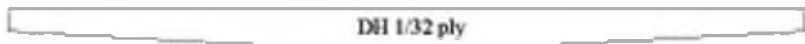
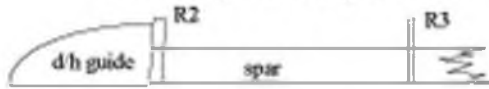
Climbing gently away from a hand launch. The model has proved stable and reasonably easy to fly.



**PR Designs
Sperry
Monoplane**
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use dihedral guide to set angle of root rib



wing onto the c/s struts, checking for alignment, and fit the struts. These struts are purely cosmetic, but should be made up as matched pairs (front and rear) to avoid building in warps as they are fitted. Use this assembly to aid aligning the tail surfaces.

Flexi-hinges

Before continuing, a brief word about hinges is in order. As I said in the first part of this article, I used scuffed up floppy disc material for the hinges on my model. Because the 'brick' servos aren't exactly what you'd call hugely powerful, whatever hinge material you use will need to be pretty flexible - and thin enough to slot into the 1/16" tail surfaces without destroying them.

Normal hinge strip is usually too thick for this, so we need to find alternatives. Sticking to the modeller's adage of never throwing away anything that looks even vaguely useful, I still have several computer floppy discs but not everyone will. Sewn hinges work well but don't always look that pretty. Thin plastic film is the best, but it still needs to be stiff enough to insert into the slots you cut for it. Floppy discs, thin packaging material and overhead projector films are all viable options. Use narrow strips (1/8" wide) and be careful not to get glue in the hinge line and you shouldn't have any problems.

So where do we go from here?

Oh yes, about to complete the pushrod installation. Slip the control horns onto the pushrods and glue them into the rudder and elevator slots. Now you can centre your servos and adjust the pushrod length until your surfaces are centred too. Then glue the pushrod ends to the carbon rod - ONLY TO THE CARBON ROD!!!!

Adjust the position of the battery to assist with balancing the model and you have a finished Sperry Monoplane - albeit a diminutive one. Pretty as the spoked wheels on my model look, they are both expensive (over £20 a pair) and fragile. I would recommend something less delicate for your model. My wheels died the death when the model was minding its own business on the dining table as the wife walked by. Just managing to brush the model as she passed, it rolled off the table. Yes, that's right; the first thing to hit the ground was one of those very costly wheels. It didn't survive the experience.

Flying

As with this model's predecessors, test flying is pretty much a non-event. Its proportions are ideally suited to a stable, easy-to-fly model and that's exactly what it turned out to be. Yes, it does require calm conditions, but you'd expect that from a model weighing very little more than an ounce.

The AEO 7 mm motor and GWS 4.5x3 prop provide ample power for gently stoozing around and, if you work at it, the occasional loop. Gentle circuits, figure eight patterns and low, slow passes are where the model excels. Since that was the aim, I'm more than happy with the end result. The more powerful motor would provide a slightly more spirited performance, but bear in mind that the original aircraft was designed to carry three passengers. We really don't want them being sick all over our printed tissue.

Next time we'll be taking another look at that previously featured Sopwith Camel model. If you'd like to contact me, other than for abuse, you'll find me at PETERRAKE@aol.com



How I fitted the battery to my model. Needing nose weight I used a 210 mAh helicopter battery to assist balancing.

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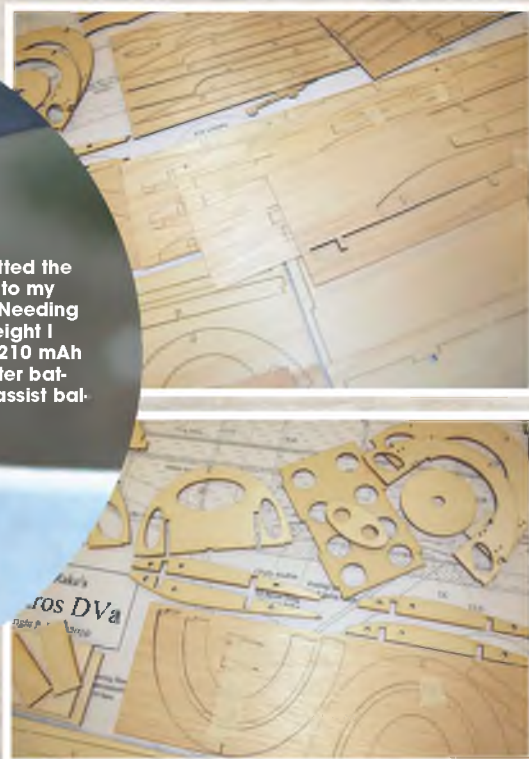
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Techno Scale

Mike Evatt has

The **Bundaberg Aeromodellers Inc** in Australia maintain a website at www.bundabergaeromodellers.weebly.com. The club has been operating continuously for over 70 years, from the days of rubber powered models and hand thrown gliders to the present time when sophisticated full scale radio controlled model replicas of jet aircraft are now commonplace. The club provides what is arguably one of the best model facilities of it's kind in Australia and amongst the best in the World, so much so that the club facilities have attracted Regional, State, National and International events to Bundaberg. It is well worth a click for the excellent scale content.

Also in the antipodes, the **New South Wales Scale Aircraft Society Inc.** was formed in November 2001 and is recognised as the Scale Special Interest Group for that state. They work to encourage and develop flying scale aircraft modelling activity in all its forms - building, competing and rally flying in radio control. Their website at www.nswsas.com.au reveals that their

members don't just fly ready-built or 'ARF' aircraft, but that a significant number of them are scratch-building or using kits to further their hobby.

If you are an aero-modeller and you want to buy an airplane kit to assemble, or you are looking an outlet to produce your new airplane model, you have found the right place. **Scale Aviation Manufacture and Custom Kit Cutters** at <http://scaleaviation.com> offer a plethora of interesting short kits, examples include, the Dornier Do 335 Pfeil and the Blohm & Voss BV P.215 from an impressive array of designers. They started their facility to create their own models, they tried many techniques, they assembled many kits, they smashed many planes and now, they are producing kits for you.

Den's Model Supplies with a web presence at www.densmodelsupplies.co.uk and a base on the Isle of Wight is a shop for the traditional modeller. This shop is dedicated to the backbone of the modelling fraternity, the sport modeller. No fancy competition items here, no ready to fly's, just good old fashioned,

build it yourself satisfaction and fun. So if you are looking for traditional Control Line and Free Flight Kits from the 40s 50s and 60s then this is the place for you! For the scale enthusiast there is a delightful Walt Musciano designed S.E.5a. Black Hawk Models faithfully reproduces this historic aircraft which will turn heads at the flying field.

The Dambusters - there's an App for that! The Dambusters App allows you fly *Operation Chastise*, the famous mission from May 16th/17th 1943 in which 617 Squadron used Barnes Wallis' bouncing bomb to breach the mighty Ruhr dams. The first part of your mission is to fly the 27.5 ton, 102' wide Lancaster at ridiculously low heights through occupied territory, under, over or around bridges, cables, barrage balloons and various obstacles while avoiding searchlights and the flak. Then, breach the massive Mohne, Eder and Sorpe dams and return home. Visit www.thedambusters.co.uk for full details of this flying scale 'computer' model for iPad and iPhone.

ROTOmotor Ltd. is based at Hronov in the Czech Republic and has a website at



The Bundaberg Aeromodellers Inc website has excellent scale content



The New South Wales Scale Aircraft Society Inc. has excellent facilities



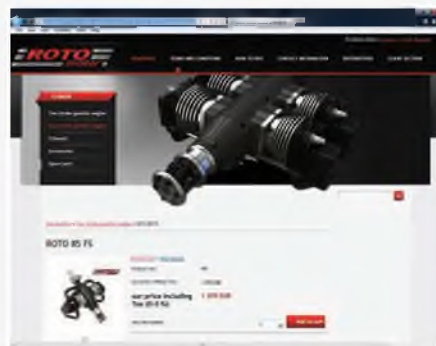
Scale Aviation Manufacture and Custom Kit Cutters offer a plethora of interesting short kits



Den's Model Supplies is dedicated to the sport modeller



The Dambusters - there's an App for that!



ROTOmotor Ltd. is based at Hronov manufactures some excellent petrol engines

Invests the web for more TechnoScale Topics...

www.rotomotor.cz This company manufactures a range of large petrol ignition engines. There are both 2 stroke and 4 stroke examples, single, twin and quad formats with capacities ranging from 25cc to 170cc. Just the job for that next scale project.

The superb 1/6th scale replica of the world famous Hawker Hunter shown in the screen-shot is a Flying Legend model from Ripmax. This model of fully moulded composite construction and is designed to suit turbines of 80 to 120 Newtons thrust levels. Developed from the original design of world famous scale modeller Mick Reeves, a great deal of work has been expended to produce an accurate scale model that can be owned and flown by any competent model jet pilot.

Check it out at www2.ripmax.net

CARF Models Scale Jets have been described as the 'Jewels of modelling'! Their scale jets were revolutionising the market 10 years ago, when they were first introduced, and they are still setting the standards today! They keep every single kit up-to-date with care, so also the "classic" planes always have the latest accessories.

The all-new CARF-Models MiG-15 has been significantly upgraded over the original version. Increased prefabrication, design changes for turbine position, main fuselage hatch and landing gear mount make it overall a much better kit, representing CARF's level of quality and perfection. The CARF MiG15 is back! This is a big beast with a span of 2m. - take a peek at www.carf-models.com

If you are interested in Scale slope soaring and aero-towing then www.rcaerotowing.com is a must visit website. **RCAeroTowing.com** is a site created by and for the thermal and slope scale soaring and aero-tow community. They focus mainly on scale sailplanes and the tow planes or "tugs" that bring them to altitude and have assembled several videos and photo illustrated step-by-step directions to help get you started. If you follow the simple steps outlined, you will soon be joining the rapidly growing aero-towing community.

Pegasus Models at www.pegasusmodels.co.uk was established in 1982 mainly to fill the demands for quality model aircraft kits.

Initially the business was done mainly via Mail Order, but when the opportunity arose to buy what was Galaxy Models in Norwich it made sense to have a retail shop as well. Over the past few years, they have gone through some new changes mainly being the new shop, more than doubling its available shop floor space and a new website. I was taken by their ME109 shown in the screen-shot. This is a 61inch span beauty designed for 61/75 2 strokes, 61/91 4 strokes and 4/5 channel radio.

This website at www.stephensmodellingsite.co.uk will show the fun you can have being interested in the modelling hobby. This is Stephen's personal journey into the joy of aero-modelling.

I particularly liked the entry concerning his Alsema Sagitta 1/4 Scale Glider. The original Alsema Sagitta was designed in the 60's and was the first standard class wooden glider and the only glider to come from Holland. Only 20 were made, now there are only 6 of them still flying and they are in America. His model Sagitta was based on serial number 008 out of the 20 that were made.



A superb 1/6th scale replica of the Hawker Hunter from Ripmax



The CARF MiG-15 is back! This is a big beast with a span of 2m



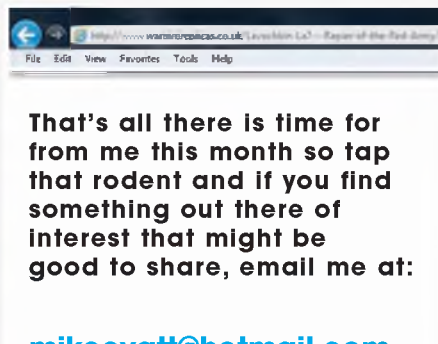
RCAeroTowing.com is a site created by and for the thermal and slope scale soaring fraternity



Pegasus Models' ME109 is a 61inch span beauty designed for petrol power



A wonderful Alsema Sagitta 1/4 Scale Glider



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

mikeevatt@hotmail.com

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