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FLYING SCALE MODELS - THE WORLD'S

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ON THE COVER

The Fokker D.VIII was one of the most outstanding fighter aircraft of WW1. It had great potential had it not been blighted by an initial airframe failure problem that was entirely avoidable. When the problem was cured, the type saw only three weeks of combat before the Nov 11th Armistice in 1918. Peter Rake's 1/8th scale replica is our full size FREE plan construction feature in this issue, backed up with scale three views, Type History, colour schemes and close-up detail study.

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CONTACT

Some scale modellers really go out on a limb when selecting a scale flying model challenge - the more difficult it seems to be, the more they are drawn in it seems.

Back in the August and September 2010 issues, regular FSM contributor Gary Sunderland in Australia related his tussle with his 1/6th scale *Voisin 1909* 'flying

machine'. Turning this project into a success required a lot of study into the way the pioneer aviators whet about getting airborne.

Gary's *Voisin* did indeed fly - and we ran the photos to prove it, but to quote Gary himself; *"This is the worst model I have ever flown, but I learned a lot from these pioneer aeroplanes."*

He did indeed; his follow-on project was

one covering the study and modelling of the Henry Farman/Bristol Boxkite types that were the immediate successors of the *Voisin*. At the time, Gary commented that *"...after the Voisin, a flying scale model of the Bristol Boxkite should be easy ..."*.

How easy it turned out to be is related in Gary's four-part story *'The Boxkite Project'* that starts with this issue of FSM.

THE WIDGEON OF OZ

The Westland Widgeon is an aircraft that seems dear to the hearts of many scale modellers and our free full size plan feature in FSM February 2012 issue prompted Australian John Lamont to make his own contribution to the 'interest value':-

"I have just read the articles on the Westland Widgeon in the February issue of FSM and thought you might be interested in the present situation of G-AUGI.

In 2008 we held a model rally on the property of Dick Smith at Bowlye in NSW, just a bit north from our national capital, Canberra. Dick Smith made a fortune by establishing a chain of stores selling electronic components, electronic hobby kits and sundry other electronic

goods before selling the whole concern to Woolworths, one of the two dominant grocery chain store operators in Australia. Smith has a great interest in aviation and some may be aware of his helicopter exploits, which included a solo flight to the North Pole. Now semi-retired and with a lot of money to spend, he has a large rural property at Bowlye with a 3,500 ft bitumen runway and a hangar full of aeroplanes and helicopters of various types.

In years gone by there was a small private flying club in the area and Dick has resurrected the period with an old style hangar and period club house. He's a bit eccentric - witness the names on the clubhouse and on his modern hangar! Among his collection is Widgeon G-AUGI and when I last saw it in 2008 it certainly looked flyable.

I've attached a few pictures of the aircraft taken at the time".

Regards, John Lamont.





AVIATION ART

A well produced painting of an aviation scene can be a powerful inspiration for scale modellers, and the annual Summer Exhibition of the Guild of Aviation Artists displays hundreds of brilliantly produced pictures that are truly inspirational.

Their 2012 Exhibition entitled 'Aviation Paintings of the Year' takes place, as previously at the Mall Galleries, The Mall, London and will be open on Monday July 16th from 5pm to 8pm, thereafter from 10 am to 5pm Tuesday 17th through to Saturday 21st (late opening until 8pm on Thursday 19th) and finally 10am-12.30pm on Sunday 22nd.

It's an exhibition well worth seeing - and it's free.

BOEING B-52 STRATOFORTRESS 'SPECIAL'

There are few military combat aircraft types in service today of which it may be said that the aircraft are older than the crews who fly them! But such is the case with the Boeing B-52 strategic bomber that first entered service with the USAF in 1955.

Superior performance at high subsonic speeds and relatively low operating costs have kept the B-52 in service despite the advent of later aircraft, including the Mach 3 North American XB-70 Valkyrie (actually it never went beyond prototype stage), the variable-geometry Rockwell B-1B Lancer, and the stealthy Northrop Grumman B-2 Spirit.

The longevity of the B-52 is such that the type marked its 50th anniversary of continuous service with its original operator way back in 2005 and after a possible upgrading between 2013 and 2015, it may well serve into the 2040s.

To mark this outstanding service record, *Key Publishing* has launched an exciting new magazine special.

Created by the team behind *AirForces* Monthly magazine, *B-52* is a 108-page publication celebrating no less than 60 remarkable years of service for the USAF's Stratofortress. With exclusive content, previously unpublished images and fascinating stories of the B-52's important role in Vietnam, the Cold War and, more recently, Iraq and Afghanistan this unique magazine special is the perfect tribute to 'The Buff'.

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Next month in... FLYING SCALE MODELS

Our major feature for **JULY FSM** will be a full size free plan feature for Peter Rake's superb 1/6th scale Albatros D.Va for electric power. We know that many FSM readers have been eagerly awaiting Peter's design for this most elegant of all the WW1 era fighter aircraft. At 48" wingspan, it's a very nice size and prospective builders may expect a cut-parts component set to



back up the plans. The feature will, as ever, be backed up with Type History, Scale three Views and colour schemes.

We will also play catch-up this issue with our 'Subjects for Scale' feature for the Arrow Active racing biplane, planned for this current issue, but unfortunately squeezed out.

THAT'S IN FSM JULY ISSUE, ON SALE JUNE 14TH

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Dave Charles'

BRIAN TAYLOR

SPITFIRE IX

CHIP OFF THE OLD BLOCK! THE SON OF THE FIRST EVER WORLD R/C SCALE CHAMPION IS ALSO A SCALE MODELLER OF NOTE

Dave Charles and his Dad Mick, like the Mick Reeves Clan, are probably the closest we have to R/C Scale royalty. Add to that Dave Charles' choice of a Spitfire plan by the illustrious Brian Taylor, and this flying scale model has shed loads of provenance.

The model

Dave made many trips to Duxford and

Hendon to take photos of full-size Spitfires. He also notes that there is a splendid scale model in the foyer at Hendon, which was good for surface detailing ideas (although that's a Mk.1 - Ed). In addition, Dave used a *Tamiya* 1/32 scale plastic kit. Plastic kits are always a good starting point when commencing a new scale project).

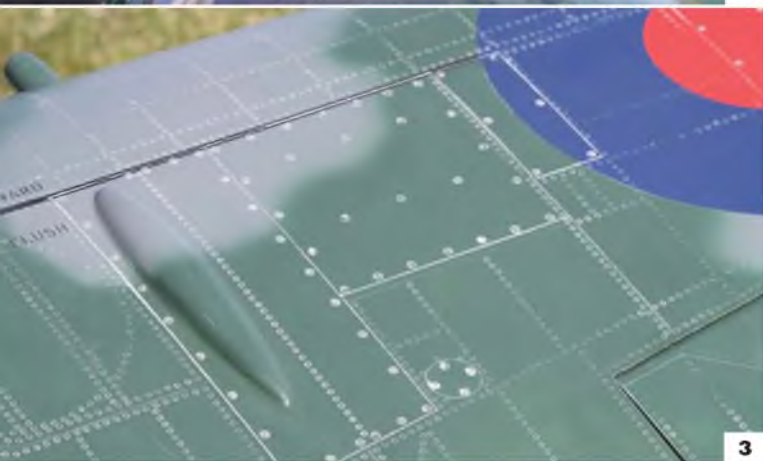
Construction

This model is traditionally built, of balsa and





**Brian Taylor's
celebrated plan
and Dave
Charels' superb
bench skills
have delivered
a magnificent
scale model.**



1: Dave uses an usual transmitter.

2: Just what you need to avoid a Hun in the sun.

3: Faithful panel, blister, and rivet detail on upper wing.

4: The line of cowl fasteners that are critical to any scale Spitfire.

5: Cockpit detail extends 3/4 of the way deep, to make room for engine cooling ducting, though you cannot tell!

6: Typically vast wing fillet.

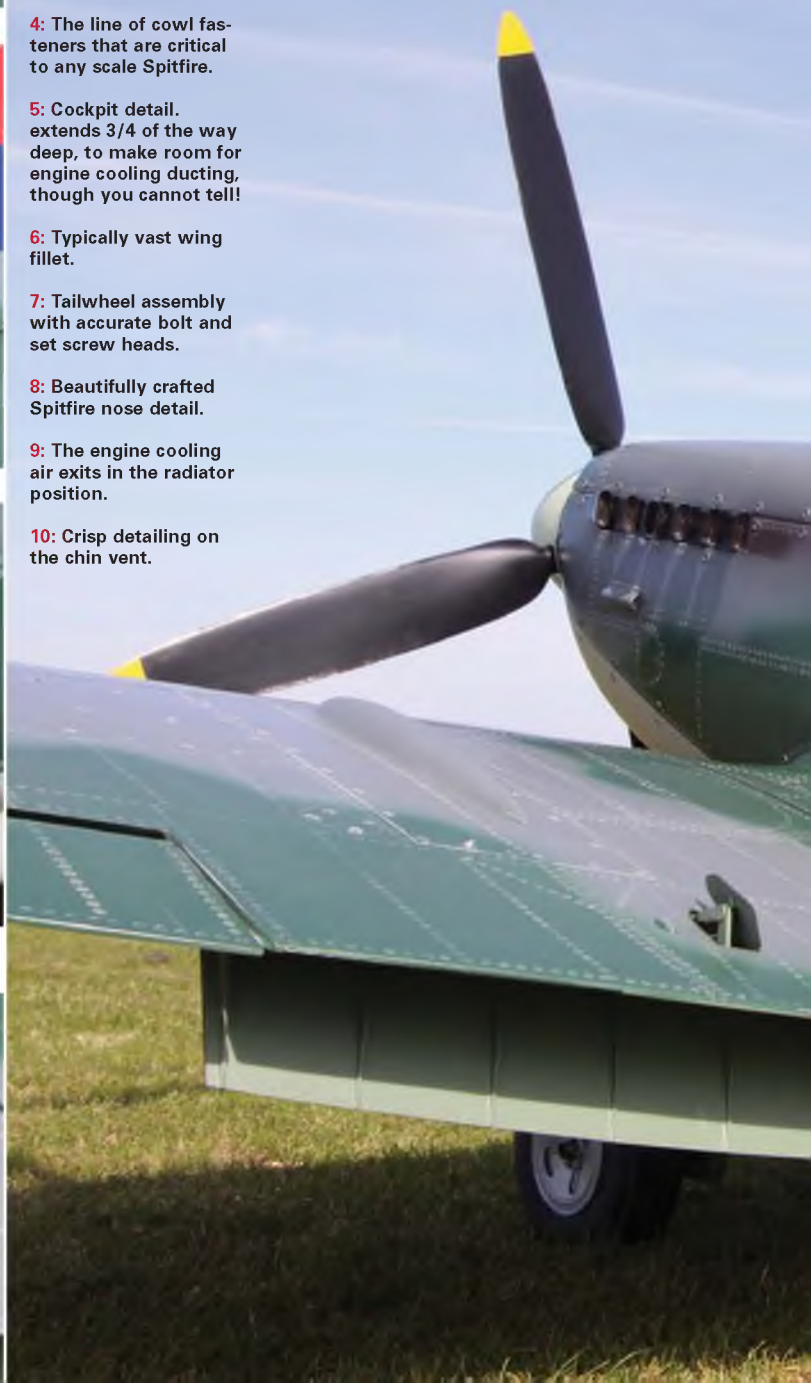
7: Tailwheel assembly with accurate bolt and set screw heads.

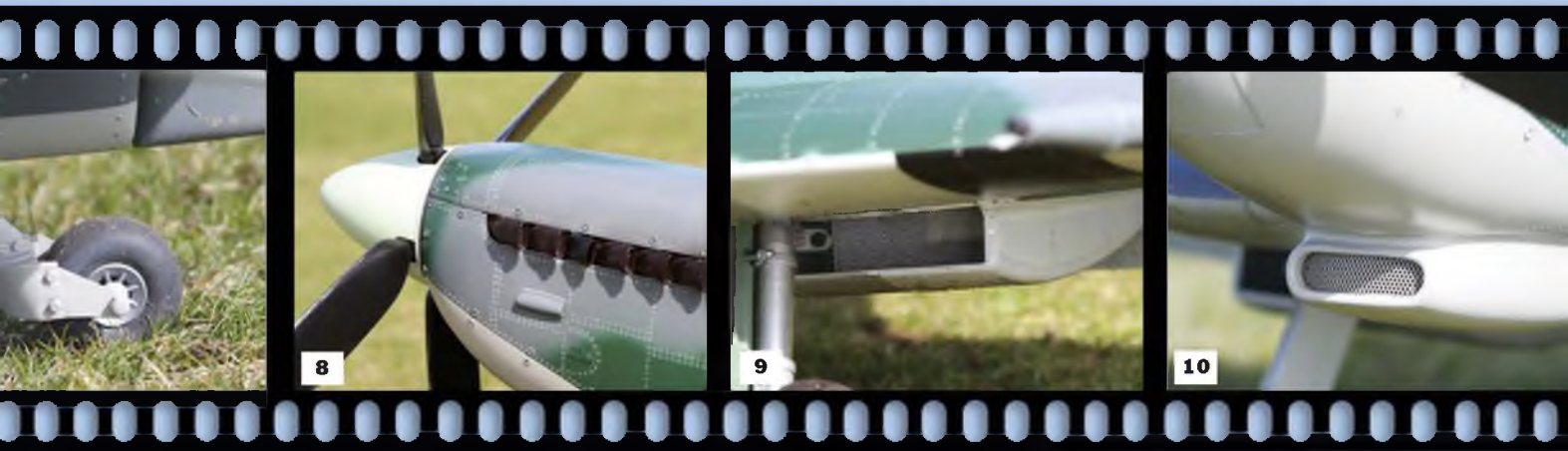
8: Beautifully crafted Spitfire nose detail.

9: The engine cooling air exits in the radiator position.

10: Crisp detailing on the chin vent.

ply, with ply doublers added to the forward fuselage and uses the BT designed fibreglass cowl. The wings are of balsa, ply, and spruce, though Dave notes that he has used much stronger spars and joiners than the original plan. The flaps were laminated from 1/64" ply and carbon cloth, with a carbon tube leading edge. The original plan





specifies wood. The tail is balsa.

Engine

The Spitfire is powered by a *Laser 150* glow engine, fitted with an in-flight mixture control and the engine also has an on-board glow system. The only down-side to these additions are two non-scale holes in the

cowling. Dave has used a 1.5" steel crankshaft extension to add 8ozs nose weight. The model uses a *Graupner Super 16x8* prop. And engine cooling is by a small hatch in the front of the cowling. This is servo operated and linked to the engine kill switch, so that it is opened whilst the engine is running. The air is ducted through the fuselage

and down into the wings, where it exits through the scale radiators.

Exhaust

Dave has kept the standard Laser silencer, but extended and adapted it with brass and copper additions so that the exhaust exits in the scale positions.



The flap detail is very convincing



MODEL SPECIFICATION

Brian Taylor plan
 Built to 1:5.2 scale
 84.5" in span
 20lbs, 8ozs in weight
 Laser 150 25cc glow engine
 On board glow
 In-flight mixture control
 Graupner Super 16"x8" prop
 Retracts
 Flaps
 10 servos

Retracts

The *Unitracts International* retracts use a servo for each individual leg, allowing staggering of the speeds of each leg for retraction.

Covering

The elevators, and rudder are covered in *Solartex* while the fuselage, wings, and tail are glass-cloth and epoxy-resin covered.

Painting

The glass-clothed areas were first finished in white primer. Raised and flush panels were delineated with various tapes, followed by eight coats of paint on top. The tapes were then removed to yield the panels, while *Aluclad* was used for wing inspection hatches.

The raised rivets on the rear fuselage were made with a syringe and resin. The rest of

the model has flush riveting. Dave used a soldering iron with a brass tube attached to the bit, to make the rivet indentions in the primer. These were then sprayed with silver paint. Each colour was then back-masked and butted up against each other - and not overlapped - so that there would be no 'ghosting' when the weathering was applied. This involved nine colours. Once all the painting was done the rivet and panel detail

ABOVE: With increased nitro in the fuel, the Spitfire is properly aerobatic.

RIGHT: Dave Charle' Spitfire IX is very impressive in the air.



was raised by rubbing with wire wool, in the direction of airflow. Insignias were all painted and masked as before. Dave used his computer to enlarge and enhance the smaller Spitfire transfers in the *Tamiya* kit, to make his own transfers. Final weathering was accomplished with an airbrush, and then the entire model was sprayed with matt Flexicote.



Cockpit

This is fully detailed 3/4 depth cockpit. The bottom 1/4 is used for Mick's clever engine cooling ducting.

Radio

Dave uses a Futaba FX40 2.4 GHz transmitter. The model requires 10 servos and the aileron servos are built into the outer wing panels, so no non-scale access hatches are required.

Flying Notes.

To quote David:

"Full-size Spits don't have any side-thrust to offset torque, they just use rudder trim. I mixed in 1/4" right rudder trim with the throt-

tle to make it automatic. Power, with the *Laser 150*, was originally a little lacking for aerobatics on low nitro fuel, so I tried some Heli 20% nitro, which added another 350 rpm. The Laser now runs cooler, and has plenty of power. A bigger engine would not have fitted the cowl".

Footnote

Mick Charles died suddenly in 2003. He is

Spit is Laser powered!

best remembered by scale modellers as the Winner of the World Scale Championships in 1970, and naturally, for his outstanding Jurca Scirocco. In case you are wondering, Dave still runs Mick Charles' Models, at Ewell, Surrey.

www.mickcharlesmodels.co.uk/ ■



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A SCALE CHALLENGE *by Gary Sunderland*

The French Military were quick to latch on to the likely eventual value of aviation in warfare. Here one of the first Farman IIs with the extended-span upper wing is being readied for flight.

THE BOXKITE PROJECT

Gary Sunderland commences a multi-part feature on the project that culminated in an R/C Scale Bristol Boxkite - but not before thorough study and research into those early, turn-of-the-century 'flying machines' that are, today, as much a challenge to scale modellers as the originals were, way back then!

because the French pronunciation of both is 'ON-REE' as distinct from the English 'EN-ER-REE'.

The boys raced bicycles, then automobiles until Henry had a bad accident. He and Maurice then turned their attention to flying machines

The pilot

Henry ordered a 'Deleagrance' type Voisin with a 50 HP Antoinette engine on June 1st 1907 and on September 30th managed a short 'hop', followed on 7th October 1907 by a 30 metre flight, thus making him the first British Subject in the British Empire to fly a powered, heavier-than-air aircraft ... or 'aeroplane'.

This Voisin was then subject to a number of modifications, to fit a monoplane elevator in place of the original biplane unit, plus other changes until it resembled what became the 'standard' 1908 type Voisin.

From the beginning, this prototype aeroplane bore a tail fin marked 'HENRI FARMAN No. 1', signifying not only that the Voisin brothers thought him to be French, but that the machine was built to his specification - or ideas (Note 1).

Finally, the machine was altered to remove the side-curtains from the wings, which were rigged to provide some dihedral, but still without ailerons or any effective means of roll control.

On January 13th 1908, Henry coaxed 'No. 1' into the air to fly

PART I

Henry and his Boxkites

Recent 'First Flight' commemorations in Europe seem to have neglected or ignored the most significant and, at the time, the most famous British pioneer pilot and constructor. Henry Harman set flying records in France and UK and his 'boxkite' design was widely copied and manufactured in France, Britain and Russia,

The man

Henry Farman was born 26th May 1874 to a British father and a French

mother. With his two brothers, Maurice and Dick (Richard?) he was brought up in Paris, where his father was the Paris correspondent for the *Tribune*.

He spoke French like a native and English with a distinct French accent. However, he was a British subject and finished his education in England. He remained a British Subject until 1937, when he became a French Citizen (Ref.1). His gravestone in Paris is inscribed 'Henry Farman'. (Ref.2). Many references record his name with the French spelling of 'Henrii', possibly



around two markers or flags set one kilometre apart for the Deutsch-Archdeacon prize. This entailed a very wide circuit of flat turns, with a landing back at the start - an actual distance flown of many kilometres, and received the 50,000 francs prize. This was the first completed circuit flown in Europe, although there were reports from USA that the Wright brothers were already flying circuits.

During this period, brother Maurice was also flying Voisins and the Brothers were awarded French Aero Club Certificates numbers 16 and 17. (Note 2). Henry Farman then established a factory to manufacture aeroplanes to his own ideas. The first two were curious tractor machines that did not fly.

This all changed when, on August 8th 1908, Wilbur Wright catapulted into the air at the Le Mans racetrack, flew a quick circuit in 1 minute, 45 seconds and landed. He flew again at Hunaudières for 50 minutes, then from the military ground at Camp d'Auvours for a world record duration of 1 hour, 31 minutes and then two passenger flights of an hour. Finally, on December 30th that year, Wilbur flew a closed circuit distance around markers 2.2 km apart for 56 laps completing a nominal distance of 123 km, although the actual distance flown was much greater.

This won Wilbur the *Michelin Cup*. A 10,000 Francs prize and the admiration of all France and Europe.

It was back to the drawing board for Henry Farman and the result the famous *Farman III* aeroplane. This retained the rugged Voisin structure of the wings, but Henry deleted the heavy nacelle and undercarriage. The pilot now sat exposed upon the lower wing leading edge and the Wright type front elevator was mounted on a light frame, with landing skid undercarriage underneath, to which wheels were applied.

Henry added four ailerons, with twin rudders and an additional rear elevator. This, first of the new Farmans was fitted with a 50 HP Vivinus V-8 engine, and the Voisin-like tail fins were clearly marked 'HENRY FARMAN No. III, H. FARMAN CONSTRUCTEUR'. Four Henry Farman IIIs were entered in the August 1909 *Great International Aviation Week* at Rheims, Henry flying his machine with the prototype 50 HP Gnome engine. This proved a winning combination and Henry won both the distance and duration vents, with 180 km flown

in 3 hours and 15 minutes. This, and later examples of the FARMAN III had dispensed with the tail fins and they now had one, two and sometimes three rudders. The emphasis now was on control rather than stability.

The next flying meeting was at Blackpool in England in windy conditions and Henry won most of the major prizes, with a flight of 47 miles in 1 Hour and 32 minutes (Ref.3). Other FARMAN III pilots were also doing well and at Doncaster, Roger Sommer won the cup with a distance of 30 miles in 45 minutes.

Toward the end of 1909, Henry Farman set two more World Records at Charlons in France, with a distance of 234 km (145 miles) in 4 hours and 17 minutes, being records for distance and duration, set in a standard Henry Farman III aeroplane powered by a 50 HP Gnome engine.

By now, just watching aeroplanes fly was no longer a novelty and the emphasis changed to distance flying. The first off once again, was Henry Farman with a flight from Bony to Reims for a distance of 27 km. This had been back in October 1909 and the next day Bleriot managed to fly from Tourey to Artenay and return, with several forced landings along the way for a total distance of 28 km.

The *Daily Mail* newspaper offered a £10,000 prize for the first pilot to fly between London and Manchester. In April 1910 this was turned into a spectacular race between Frenchman Louis Paulham and Briton Claude Grahame-White, both flying Farman III aeroplanes. During this aerial contest, Henry Farman provided technical support and advice, following the contestants by train.

The gallant Grahame-White's take-off in the dark is often reported as the first night flight, but Henry Farman had previously flown at night during one of his duration records. The French pilot won, with a time of 12 hours and the Henry Farman III was firmly established as the preferred aeroplane for duration flying.

The Farman III aeroplane

Farman copied the Voisin wing box structure, with the biplane wings formed of wood spars, struts and ribs cross-braced with piano wire. This cell structure was light, strong and rigid. When *Miles Aircraft* built a replica for the film *Those Magnificent Men in Their Flying Machines*, the engineers found that the structure met most of the current, post-WW2

design standards.

Another advantage of the cell structure was that if one or even two wires broke, which often occurred for all sorts of reasons, the cell would still remain intact, with the load re-distributed among the remaining wires. So the Voisin/Farman structure was rigid and redundant, unlike that of the Wrights and Antoinettes that were disconcertingly flexible. (Ref.4).

Farman discarded the side curtains, but retained the single fabric covering on the UNDERSIDE of the wings only, indicating that neither Voisin nor Farman knew how lift was generated. The fabric was nailed on underneath the ribs and spars and then fabric pockets were sewn over the top. Thus, the undersides of the wings were smooth and the ribs, particularly the large compression ribs at the strut locations protruded above. (Note 3).

The engine, usually a 50 HP Gnome rotary was bolted to the rear of the lower wing centre section, with the copper fuel and oil tanks in the centre and the pilot's seat at the leading edge. The controls were relatively 'modern' in featuring a rudder bar and a very long single control column or 'joystick' as it came to be known later in WW1.

Unfortunately, there was no balance cable to the ailerons and the four hung down when the machine was at rest. This would have made lateral control impossible at low speeds, but none of the pilots seem to have complained, including the modern-day test and film pilots flying the replica.

Perhaps control in roll was so bad that they hardly noticed! Rudder control was probably the main means of turning and various arrangements are evident in photographs of Henry Farmans. Some were fitted with 100 HP Gnomes, which might explain why some had three rudders.

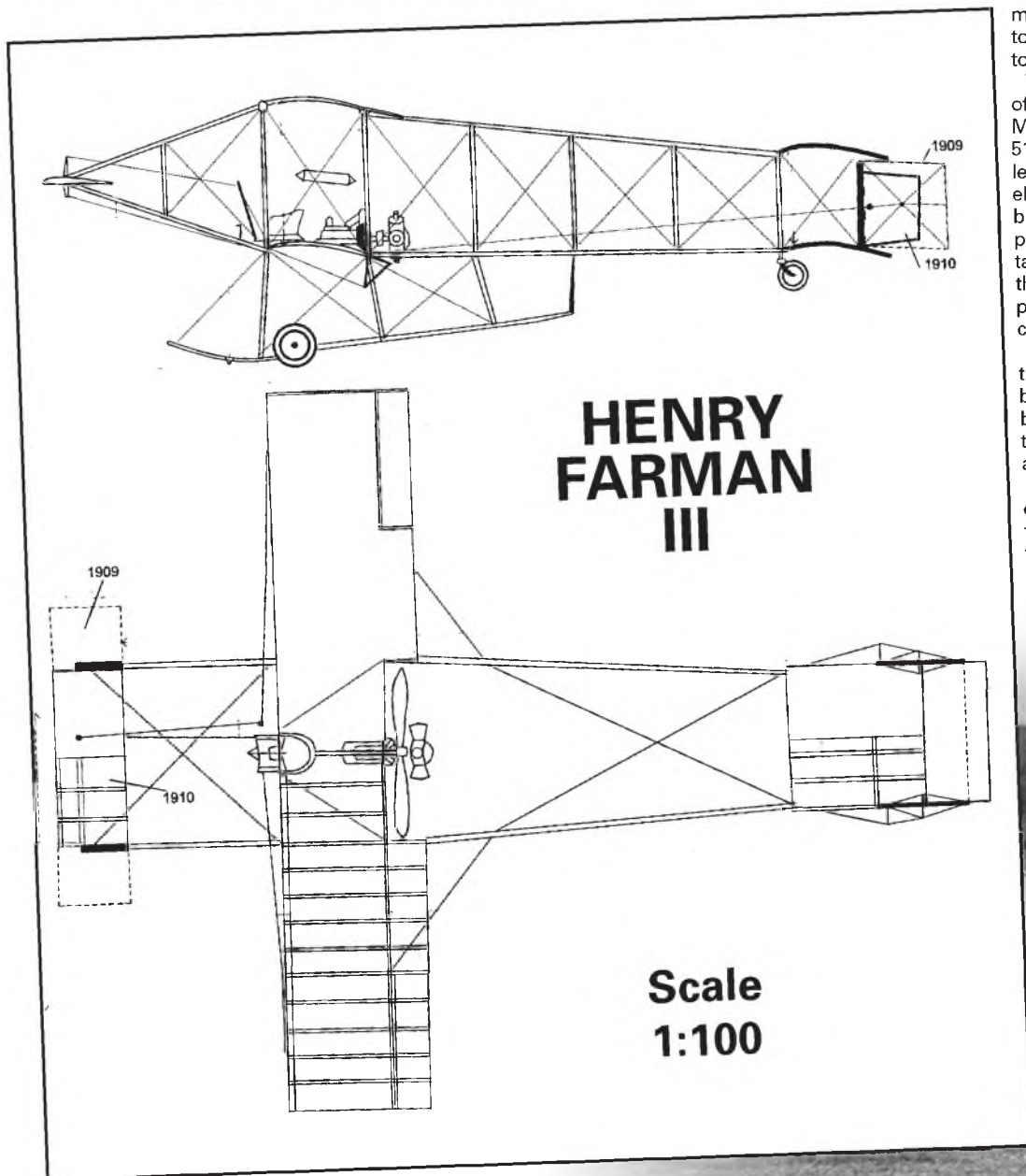
Actually, 'low speed' is a relative term, given that the Boxkite's slowest speed was 30 mph, while the best climb speed was 42 mph. With the 50 HP Gnome engine, it tends to swing to the right, the opposite of tractor configuration aeroplanes such as the Bleriot with the same engine. In the air, the Boxkite would just climb in straight flight, but any turn would decrease this climb to zero or cause the aeroplane to sink. Circuits were usually flown at 300 feet above ground, or less. Turns to the right were normal, but left turns sometimes resulted in



These two views show one of the very earliest Farman IIIs with the equi-span upper and lower wings in action at one of the early aviation meetings in Europe, where Henry Farman achieved considerable success.



A Farman III undergoing Military Trials. Note the anodized 'H. FARMAN CONSTRUCTEUR' on the rudder.



HENRY FARMAN III

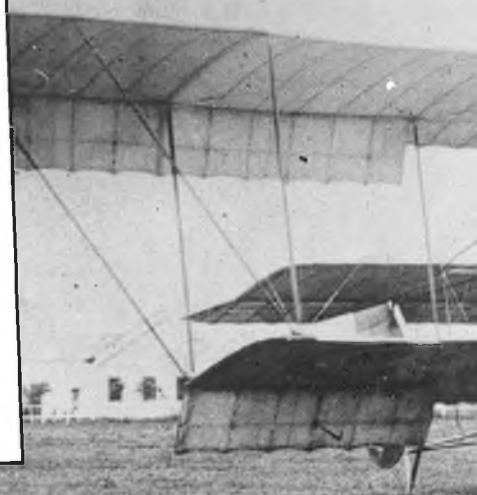
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much loss of height. Often, it was better to fly a 270-degree right turn rather than to attempt a 90-degree left!

The centre of gravity, or balance point of the Boxkite was about mid-chord. The Miles replica was flown at a C of G about 51 percent wing chord. With such an aft leading edge and with the large forward elevator, the aeroplane was very unstable in pitch (Note 4). To control the aeroplane, the pilot concentrated on maintaining attitude in pitch by reference to the foreplane position on the horizon. A piece of string nearby was used to indicate any slip, or sideways airflow.

By accurate flying, the pilot could keep the aeroplane attitude within safe limits, but accurate flying within safe limits, but accurate flying was also necessary to obtain any sort of climb performance.

Instruments were usually not fitted, except for the oil 'pulsator', a glass tube that enabled the pilot to see that the castor oil was flowing to the rotary engine. The lubrication was a total-loss system, where a large percentage of castor oil was injected into the crankcase petrol-and-air mixture and passed through the cylinders and into



The fragile nature of the airframe of this Farman is well illustrated here. Note the drooping ailerons.

the exhaust.

The main undercarriage consisted of four carriage wheels, mounted in pairs on two short axles, sprung with rubber shock cords to the main skids. In the event of a wheel failure, a reasonably common occurrence from a number of causes, the landing loads would transfer to the main skids, usually without any damage to the basic airframe. This workmanlike compromise, between the skids of the Wright machine and the wheeled undercarriage favoured by the French pioneers, was suited to training schools and explains why the Farman III aeroplanes were very soon widely adopted by the many clubs and commercial schools being set up all over Europe.

This development led, in turn, to another modification to the Henry Harman III, with a lightweight seat being installed immediately behind the pilot's seat. Here a pupil or instructor could sit behind the pilot, with one leg either side. This arrangement only made up to some extent for the lack of any dual controls. Seat belts were not usually available or installed at the time.

Military developments

French military observers attended the *Great Rheims Air Meeting* and in September 1909 the French Parliament voted funds for the purchase of two Henry Farman IIIs, two Wright Model As and one Bleriot XI for the Sapper Corps (Balloon Unit). Soon after, the Artillery ordered six two seat Antoinettes and two Farmans. (Ref.6).

This latter led to the development of another variation to the basic Henry Farman III, the upper wing span being extended with a removable section of the wing and aileron on each side, the extra span and wing area being sufficient to restore the aeroplane's rate of climb with an artillery observer on board. The span extensions were cabane braced from upper wing pylons that was also removable (Note 5).

In September 1910, aeroplanes took part in the Army manoeuvres and their use was proved a great success. A substantial new order for twenty Bleriot's and an equal number of the Henry Farman III resulted, with seven of the Farmans being two-seaters. This large order and the subsequent organisation of the Air Service, the '*Aeronautique Militaire*', founded on October 22nd 1910, led other Nations to consider the formation of similar air forces.

Copies and clones

The remarkable success of Henry Farman and the simple boxkite soon led other individuals and manufacturers to copy the

design. Among these there were the Voisin Brothers and their 1911 '*Type Militaire*'. Roger Sommer, who set a new World record of 2 hrs, 27 mins. In a Henry Farman III on August 7th 1909 went on to develop and manufacture his own boxkite design. In the spring of 1910, there were 50 Sommer aeroplanes on order.

In UK, the *Short Brothers* abandoned their development of the Wright design and copied the Farman as their *Type C.27*. This was subsequently modified to increase the wingspan, but with the extensions braced with struts and several were built for the Admiralty (Ref.7).

The *British & Colonial Aeroplane Co. Ltd* (Bristol) built their first Boxkite in July 1910. This appears to be a close copy of the Henry Farman III, right down to bad features such as drooping ailerons and fabric covering only on the underside of the wings. The only noticeable variation occurred with the *Bristol 'Military' Boxkite* of 1911, where the wing extensions were strut-braced, as on the Short S.27 development.

The *Bristol Boxkite* was a relative success and 76 were built, mainly for civilian flying schools (Ref.8). Of these, the Russian Military purchased a total of nine, while six went to the British Army, six to the Admiralty and one to the Australian Army (Note 6).

The *Dux Factory* in Russia obtained licences for the manufacture of Farman aeroplanes and the Henry Harman III was in service as an ab-initio trainer as late as 1918 (Reg.9).

Aftermath

Despite this initial success, the Boxkites were soon superseded by better aeroplanes. Maurice Farman joined his brother in designing new types and the *Maurice Farman MF 7 'Longhorn'* set new records for duration, 13 hrs, 22 mins. And distance (350 miles) in 1912. It became the standard military trainer in the early WW1 period, although obsolete. Even the Wright Brothers had abandoned the canard surface with their *Model B* of 1911.

The next generation of military aeroplanes were the nacelle pusher types, as established by the *Henry Farman HF 20* and the *Maurice Farman MF 11 'Shorthorn'*.

Both types played an important part in the early years of WW1 and saw active service with all the Allied nations. In Britain, G. Holt Thomas form the '*Aircraft Manufacturing Company*' in 1912 and built Farman trainers during the War until these were superseded by De Havilland designs.

In Australia, the CFS at Point Cook used the Boxkites and Farman MF 11 'Shorthorns' throughout WW1 as ab-initio trainers. ■

NOTES:

NOTE 1: John T.C. Moore-Brabazon became the second British Subject to fly when, on December 1908, he flew a 'standard' Voisin at Issy-les-Moulineaux in France. Brabazon subsequently made the first flight in UK with his second Voisin, name '*Bird of Passage*' on May 1st 1909. Afterwards, Brabazon became Secretary of the Royal Aero Club and awarded himself the R Ae C Certificate No. 1, thereafter advertising the event with his Rolls Royce number plate bearing the registration 'FLY 1'!

Henry Farman seems to have been 'written out' of British aviation history on the basis that 'he became a French citizen'. This change of nationality came well after the events described.

NOTE 2: These early Certificates were awarded in the period before tests were required by the *Aeroclub de France*. Not to be confused with civilian pilot licences, which were later only introduced after the Chicago Convention on Civil Aviation in 1919.

NOTE 3: Miles Aircraft reversed this arrangement slightly and covered the tops of the wings with fabric, so that only the main compression ribs protruded. Even so, the drag of the 'Magnificent Men' replica was enormous and a 90 HP engine was required to drive it through the air.

NOTE 4: Greg McLure has a radio controlled scale model of a Boxkite flying in Western Australia and reports that he experienced many problems flying it, with the model balanced at 30% chord, but by adding lead to the front, the stability is much improved and the model is now more controllable in pitch.

NOTE 5: These upper wing extensions were cabane braced with wires to a triangular pylon above. Cabane bracing-wire structures are named from the Spanish word for 'cabin', or an 'A'-frame, typical of monoplanes or biplane tip extensions; nothing to do with biplane centre section struts as commonly, and incorrectly, used nowadays!

NOTE 6: The Russian Military order, initially for eight Bristol Boxkites, has been claimed to be the "the firstplaced by any government for a quantity of aeroplanes". The larger French orders for Farmans and Bleriot's occurred the year before, so the Russian purchase could only have been the first such British order.

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PLAN PRICE £19.50 PLAN NO.286
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 A 1:3.44 scale, 79" (2006mm) wingspan replica of the late 1940s Belgian light aircraft, designed to suit .90-1.20 cu.in engines. Designed by Philip S.Kent, the model features all built-up balsa/ply construction throughout and makes an excellent entry into R/C scale modelling. Rudder, elevator, aileron and throttle controls.



AVRO AVIAN MONOPLANE
PLAN PRICE £19.50 PLAN NO.278
COMPONENT PACK £110.00
 Designed by respected R/C scale expert Philip S.Kent, this quarter scale replica of the radial engined version of the 1930s air racer spans 96" (2438mm) is an ideal/introduction to the world of large scale. The model suits 1.50 cu. in. size four stroke engines and requires four function radio control operating the basic control functions of rudder, elevator, ailerons and throttle. Conventional wood airframe structure throughout.



SOPWITH CAMEL
PLAN PRICE £14.50 PLAN NO.188
COMPONENT PACK £79.50
 1/6th scale replica of the famous RFC WW1 fighter biplane, for .24-.40 size motors and four function R/C. 56" (1422mm) wing span.



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PLAN PRICE £16.50 G/F COWL PRICE £17.50
PLAN NO.177 COMPONENT PACK £135.00
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ATTENDANCE WAS SUPERB. IT JUST GOES TO SHOW THAT YOU CANNOT RELY ON A FORECAST. INDEED, I HAVE LEARNED OVER THE YEARS, THAT WHEN IT COMES TO SCALE MODEL FLYING, YOU SHOULD GET UP EARLY AND GO, NO MATTER WHAT THE WEATHER.

Going to Sleep

Sleep is now a multi-activity airfield, but it used to be a WWII RAF base. It is in a delightfully remote corner of Shropshire, so it pays to load up your GPS with the postcode SY4 3HE, before you set off. When you get there, it is still a surprisingly long jog around the peri-track. You also have to beware the full-size traffic as you cross the live runways.

Fear not! Every time I have visited, there has been an escort vehicle to take we punters across the airfield. There is even a sign with the appropriate mobile telephone number to ring for assistance, as you join the field. All good fun.

First fly

For many it was their first warbirding event of the year. As usual, at such 'fly-wot-yer-brung' events, there was an excellent mix of scale types. And it wasn't all fast, low wing, WWII mono-planes either. I saw a

truly smashing SE5a and there was even an old favourite of mine, the venerable Flair Tripe. It was also good to see two distinct variants of Focke Wulf 190. The first I spotted was Colin Bostwick's fine hand-built Focke Wulf FW 190A. This had 72" span, Laser power, and weighs in at 13 lbs. Colin always builds a first rate model, and this was well up to par. The other hand-built Focke Wulf was a subtly different mark, and flown by by Dominic Brassey-Williams. His version was the FW 190D. Built from the Brian Taylor plan she was 66" in span, complete with an OS .90 FS driving a 14x7 APC prop. This lesser-known variant is sleeker. It slips through the air very pleasingly indeed, for a well-known killer.

Speaking of variants, both John Jackson and Ozyray Peters had built rare Aichi Vals over the winree from the new YT kit. Naturally, they were finished in very different colour schemes. I thought they were delightful.

Maiden twin

There were a number of exciting flying moments, but none more nerve-wracking than when George Shone maiden Alan Jackson's new

83" span electric powered YT Grumman F7F Tiger Cat. She was powered by two EPower 90s, backed by 4x4000s power packs, and weighed 11.5 kgs.

She flew beautifully, but Alan did not relax until she was back in his car!

Bowman's Magister

This was a blast from the past - a pukka Bowman's scale kit, complete with 90" span foam wings. This was flown by my (young) old mate, Alan Griffiths. It weighs 17 lbs and is powered by an ASP 180. This is a rare model these days, and even though a bit careworn, flew very convincingly.

New WM Tempest Mk. V ARTF

This brand new Steve Webb/ World Models ARTF was maiden by Lyndsay Todd. It is 57" in span, and designed for engines in the range of .46-.55, and their four stroke equivalents. It comes with retracts, and that thoughtful WM trademark of a spare transparent cowl, with which to mark out the engine apertures on the real cowl. A very useful feature.

It was curious that World Models had printed a small advert for their covering film, directly into the film of a supposed scale model. I imagine that they have





COLIN BOSTWICK'S FINE HAND BUILT FOCKE WULF FW 190 A. 72" SPAN, LASER POWER, WEIGHS 13 LBS.

their reasons, and all of them barmy.

Don't let this put you off this model, though. The Tempest is a handy size, and flew well, but in the bright sun, she proved a bit too shiny for my camera. A good scuffing with a plastic Scotch scourer would work wonders. I have assembled quite a few World Models over the years, all bought with my own

money, and they make a good ARTF.

I am Spartacus

Spartacus is an illustrious Midlands scale man, known for his exquisite craftsmanship. He is famously reclusive. He will not even allow his real name to be printed. He is a known associate of the Peers Brother, best known from

Langar Warbirds. We have celebrated his stunning Miles Messenger, a joint venture built with Chris Peers. It now transpires that he built a truly superb Curtiss Kittyhawk London Pride some ten years ago. Simon Illsley, who now owns it flew her at Sleaf. As you can see from the photos, she really is first rate.



Dominic Brassey-Williams floating his granddad's Hellcat in on full flap.



The Thomas Stuka also has a dive siren, and accurate bomb drop feature.



Colin Bostwick's Focke Wulf on an aggressive beat up of the flight line.



Jeff Pearson's Cub L-4 Grasshopper from the Precedent kit. 105" span, weighs 17 lbs, with Quadra 35.



Lyndsay Todd's well-known World Models ARTF Thunderbolt.



Dave Gent's Yak 11, powered by a CRRC 26 driving a 17x8 prop.



Tristan Jackson continuing the family scale tradition with his CM Pro Mustang. 68" span and weighs 6lbs. SC 120 FS power.



Chris Peers lovely 122" span, CRRC 50 powered Miles Messenger rumbling in. Weighs 38 lbs. Exquisite scratch build.



Babe Magnet Alan Griffiths' Bowman Kits Miles Magister. 90" span foam wing, ASP 180 power, weighs 17 lbs.

The Usual Suspects: NW Warbirds leading lights Ozyray Peters (left) and Lyndsay Todd (not left).

Jeff Pearson's Mitsubishi A6M Zero back tracking.

Ozyray and Lyndsay were keen to demonstrate the sortorial elegance of NW Warbirders in their new fleeces.



JOHN JACKSON'S AICHI VAL FROM THE YT INTERNATIONAL ARTF KIT, IN JOHN'S OWN SCHEME.



1: Fine SE5a in US Air Corps WW1 Expeditionary Force colours climbing out over Shropshire. Lost its tyre later! 2: First outing for Lyndsay Todd's Steve Webb / World Models ARTF Hawker Tempest Mk.V. 3: George Shone maidenied Alan Jackson's new 83" span electric powered YT Grumman F7F Tiger Cat. 4: Ozyray's P-47D from the Top Flite kit. Traditional build with a glass skin, Robarts retracts, and a Zenoah 62cc petrol engine. 5: Sleek Focke Wulf 190D, flown by Dominic Brassey-Williams. 66" span, 14x7 APC, and O.S. 90 FS.

Bomb drop

We may have seen her before, but Richard Thomas's meticulously observed Stuka put in a superbly accurate dive-bombing demo, complete with wailing sirens. Her bomben hit Sleaf's authentic WWII tarmac, right in the middle, right smack in front of the pilots!

Sartorial make-over

Never let it be said that all Warbirders are scruffy. The NW Warbirds lads have decided on a new uniform. A sensible and practical black fleece with nifty red legending. Just the gear for lying under your wing on crumbly black tarmac! There were other signs of refinement. As

always, lovely Sandra Todd fed us all with the most magnificent home-made cakes you could imagine. Then, at noon, to continue the holiday atmosphere, there were piping hot bacon butties for all. I stopped shooting, sat in a borrowed chair, and munched away with a big smile on my fizzog. A great day out! ■

Join The Fun - Check out the NW Warbirds site for the rest of the seasons' dates: <http://northwestwarbirds.webs.com/>



PHIL ROBERTSHAW'S MAGNIFICENT 1/6TH SCALE, 12 FOOT SPAN HEINKEL 111. WEIGHS 77LBS, POWERED



Stunningly good P-40 Kittyhawk scratch-built by the famously secretive "Spartacus" more than ten years ago. Now owned by Simon Illsley.

Like John Jackson, Ozyray has selected and applied his own scheme for his YT International Aichi Val.



Jim Patterson's Zenoah 26cc powered Fokker DR1 Triplane from the famed Flair kit. Weighs 15 lbs.



INDOOR FREE FLIGHT SCALE

BREWSTERS FLYING BARREL

THE FINAL BUILD OF RICHARD CROSSLEY'S 1/18TH SCALE RUBBER DRIVEN FREE FLIGHT

PART 2

Undercarriage

If you intend to fly your model outdoors, you may wish to ignore this section and build it with the gear retracted.

Using thin-nose pliers, bend the 1mm dia. wire components to shape using the plan as a guide. The inner legs are made up from one piece of wire; start bending from the wheel end and work your way up - you will need to slip the two sections of aluminium torque tube on the wire as you progress.

Next, bend the outer sections, slipping into place the tube before you make the final bend at the top. Ensure that you make a left hand and a right hand leg. Bind and solder the three sections together.

Mount the undercarriage into the model, epoxying the aluminium tubes to the wing plates (you will have to remove a section of tissue from below the wing, and patch in later). Note that the assembly also epoxyes to the rear of F1A. Thicken the gear legs with sanded scrap balsa and use thin strips of paper around the balsa to replicate the oleos etc. Use soft balsa block for the 'square sectioned' outer legs and fashion the doors from thin card.

Make the wheels from foam or laminated balsa discs and sand to shape. Note that the retainer is recessed and a balsa cover gives a streamlined 'invisible' fixing. Drill and bush with aluminium tube. The wheels are held in place with plastic coating striped from thin electrical flex before the streamlined cover is fixed in place (see plan sheet 3 for details).

Tail surfaces

This design uses laminated balsa outlines. The main benefit of laminated parts is strength with light weight. Surprisingly, these are also quicker and easier to make than using cut sheet outlines.

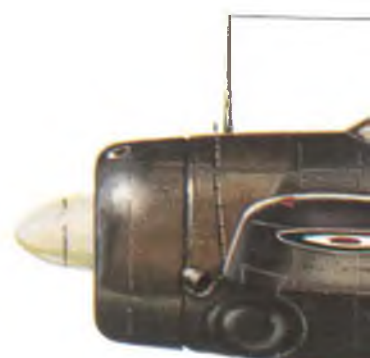
Let's build the fin first: cut three strips, 1/16" wide from a piece of 1/32" sheet balsa (these need to be long enough to go around the entire fin outline excluding the base). Whilst these are soaking in water for 10 minutes, cut out the former from balsa or mount board, which needs to be the same size as the inner line of the fin outline.

Wax the edges of the former and pin it to the building board. Dab the strips of wood dry and apply white glue between them, sticking

all three together. You should now be able to wrap the wood around the former, using pins to hold it in place. Repeat for the left and right tail outlines and once dry, build up the structure as noted on the plan. On my model I thickened the section of the fin and tailplane, using taper shaped ribs and spars. Before building, I packed up the laminated outlines clear of the plan to ensure a symmetrical section - see plan. Once complete, carefully sand the tails. Cover the tails, making sure that the grain of the tissue runs spanwise.

Cockpit canopy

You can either choose to mould the canopy, or make it up from flat acetate. A moulded one looks better, but is more difficult. I moulded my canopy using the 'plunge' method: make a balsa mould using the top, side and front views on the plan and sand to a very smooth finish. Cut the plug up into canopy sections, and mount the plugs on sticks, then plunge through some preheated acetate that has been stapled across a cut out aperture about 1/8" bigger all round than the top view of the



The Royal Navy Fleet Air Arm received Buffaloes. This one operated by 711 Squadron for trials in early 1941.



canopy. You must make sure that the material you have will stretch well with heat - some types of clear plastics will not soften enough. If in doubt, get hold of some clear vac-form packaging i.e. the stuff Easter eggs come in and heat it up until it melts back to flat. If you try a simpler sheet

acetate version, make up two laminated formers (see sections A and B); these formers will be unobtrusive, and you can glue the clear sheet to them.

Final assembly

Fix the tailcone components to your model, taking extra care that everything is true and

square.

Any gaps must be faired over with doped-on tissue strips. Add cockpit details such as the roll cage and seat backrest from scrap balsa and card. Paint the inside of the cockpit with 'cockpit green' paint.

A dummy engine will make a big difference to the realism of your model and details are shown on the plan. Note also the exhaust stubs, cowl panels, gun troughs etc - there are colour schemes presented with this feature, but if you can get a copy of the 'Squadron/Signal' book *'F2A Buffalo in action'*, it also has good colour references, three-views and photographs. The aerial is cut from 1/64" ply and mounted off-centre to starboard on the cowl top.

Make up the nose plug as shown on the plan. Use a wire shaft that matches perfectly the hole in the bearing. I bend an 'S' hook on my shafts as this stops the rubber motor wobbling on the hook. The front of the prop-shaft should be bent over at 90 degrees so that it engages in the freewheel at the front of the propeller (I used an 8" Peck prop on my model). The nose plug should be a tight fit into its aperture. Drill out the hole in the peg support to take the alu-



RAAF No.453 Squadron Buffalo 1 based at Singapore December 1941.



Brewster B-239 variant of the Finish Air Force, 1943. Aircraft of Lt. Hans Wind, top scorer with 38 1/2 victories.



Brewster B-239 variant of the Finish Air Force, 1944.



Another Brewster B-239 variant of the Finish Air Force, late 1941 -personal aircraft of Lt. Jorma Sarvanto.



U.S. Navy Brewster F2A-1 of VF-3, aboard USS Lexington late 1940.



U.S. Navy Brewster F2A-2 of VF-2, also aboard USS Lexington late 1940.

minium tube that retains the rubber motor. Make up a rubber motor from 1/8" or 3/16" flat rubber forming two loops, 22" long.

The ventral window was often painted over on the Buffalo. You can cut the frame from paper and paste to the underside of the model. Once doped, you can cut out wrinkles and add tissue panels - these will not notice if you intend to paint your model.

Colour schemes

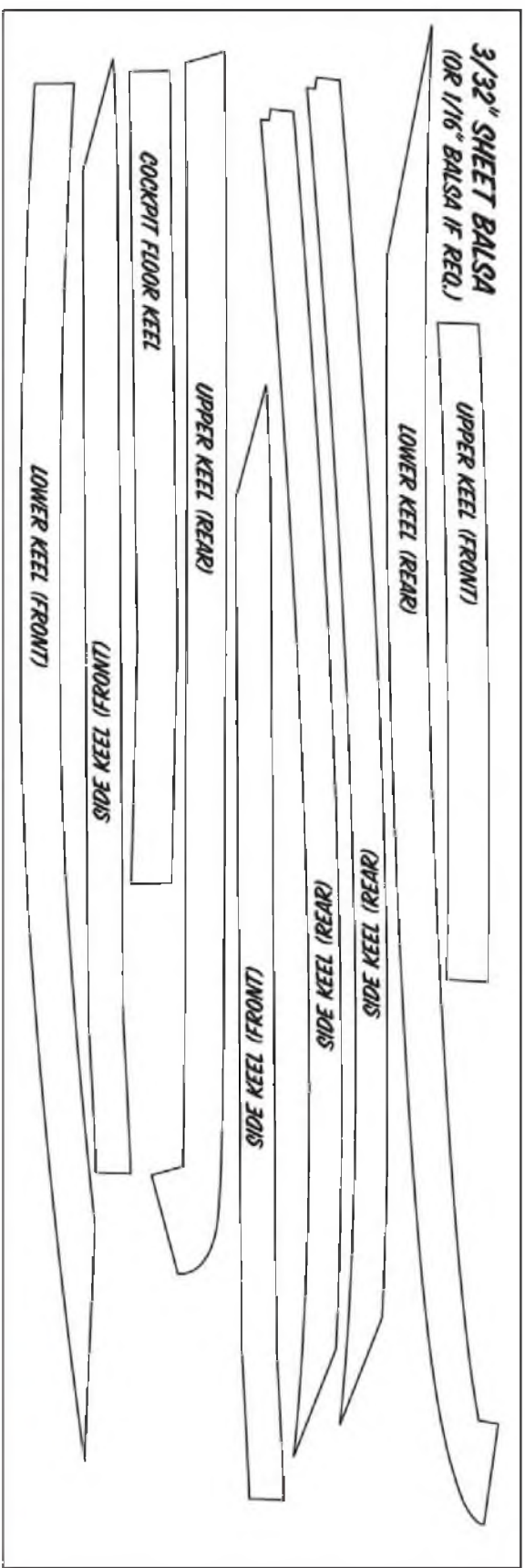
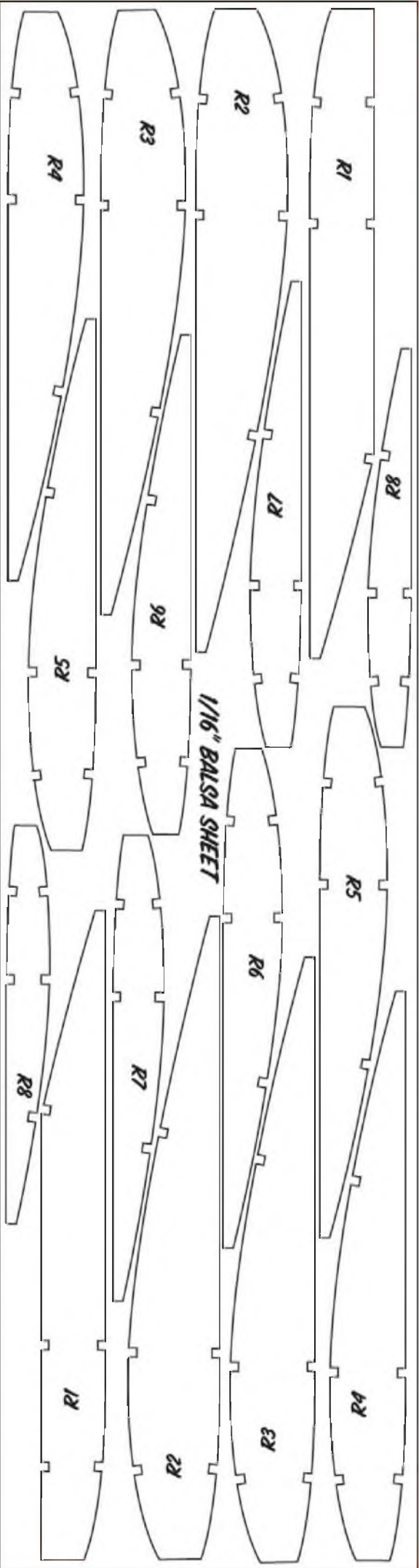
The RAF Buffalo Mk1 (or Model 339E) was camouflaged with 'Dark Earth' and 'Dark Green' on top and 'Sky' undersides at the Brewster factory. These colours varied slightly from the official RAF colours, in particular the Sky tone was more like a pale blue, closer to the German 'Hellblau'. When the Buffaloes arrived at Singapore in mid-1941, the port half of the undersides were painted matt black and a sky band (correct RAF colour) was applied to the rear fuselage.

References to National insignia are shown on the plan. The British model 339E was very similar to the US Navy F2A-2, the Dutch 339D and the Belgian 339B, so there are plenty of other colour schemes to choose from. My model was airbrushed with Humbrol enamel paints, using cellulose spirit to thin them. I find a cheap external mix airbrush best for these 'larger' models.

Flying

Balance the model before you attempt to fly it. Due to the forward position of the rear motor peg you should not need to add too much weight to the nose.





For readers looking to building Richard Crossley's Brewster Buffalo (for which Part 1 and accompanying 1st two sheets of the plan appeared in the May issue), we have a laser-cut component pack available. As emphasised before, these cut-part sets provide ready-cut pieces of all the bits that you would otherwise have to trace out onto the balsa or plywood sheets before knifing them out, thus saving a fair bit of tedious time, so that the airframe assembly process can start immediately. The parts sets do NOT include strip and sheet wood that you can get from your friendly model shop.

The parts set costs £80.00 plus £9.50 for carriage in UK. Sets can be supplied to overseas customers, with carriage costs quoted on an individual destination basis.

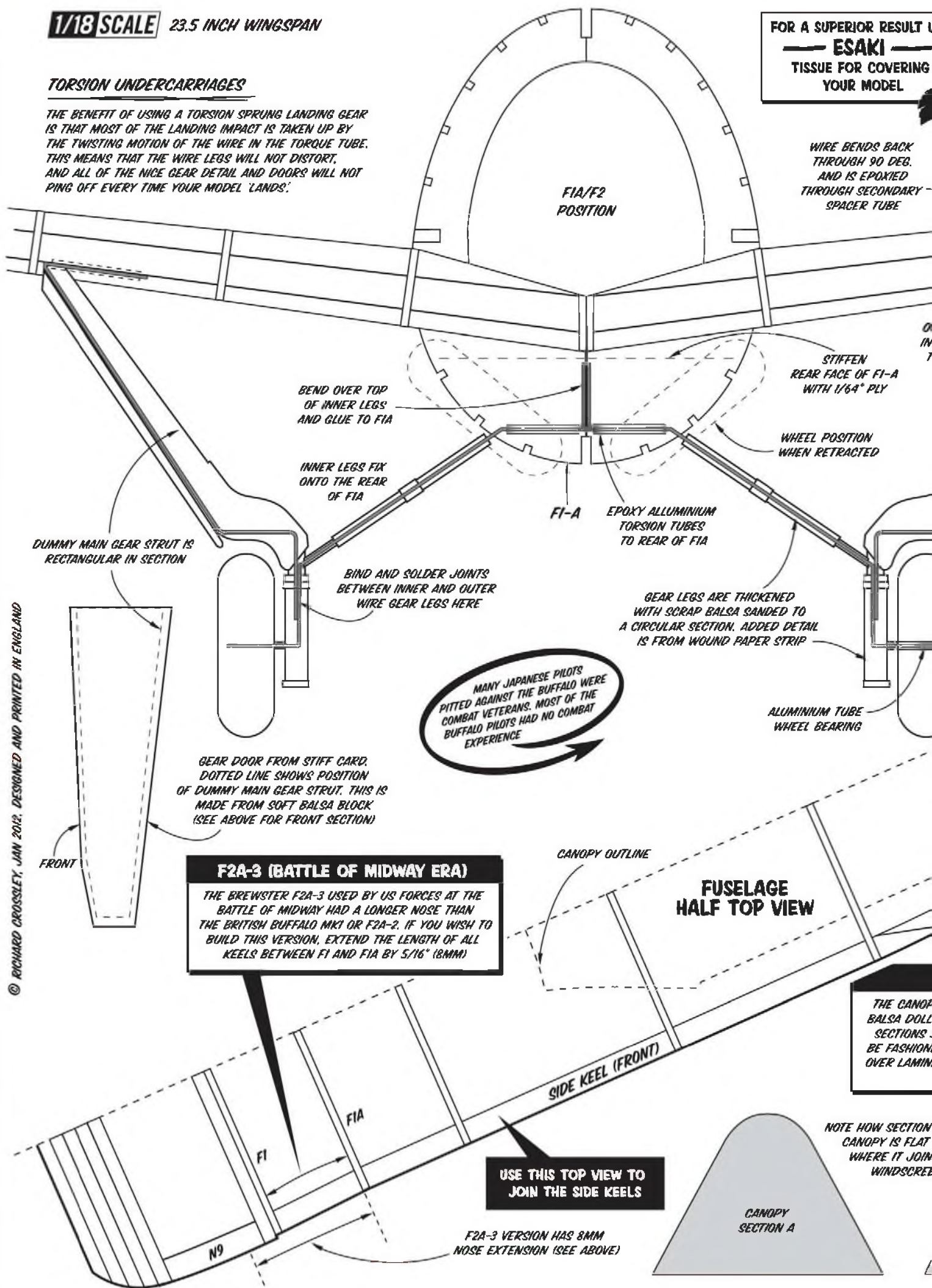
ORDER DIRECT FROM KEY PUBLISHING LTD, PO BOX 100, STAMFORD, LINCOLNSHIRE, PE9 1XQ, UK. (TEL: 0178 480404)



FOR A SUPERIOR RESULT USE
ESAKI
 TISSUE FOR COVERING
 YOUR MODEL

TORSION UNDERCARRIAGES

THE BENEFIT OF USING A TORSION SPRUNG LANDING GEAR IS THAT MOST OF THE LANDING IMPACT IS TAKEN UP BY THE TWISTING MOTION OF THE WIRE IN THE TORQUE TUBE. THIS MEANS THAT THE WIRE LEGS WILL NOT DISTORT, AND ALL OF THE NICE GEAR DETAIL AND DOORS WILL NOT PING OFF EVERY TIME YOUR MODEL 'LANDS'.



WIRE BENDS BACK THROUGH 90 DEG. AND IS EPOXIED THROUGH SECONDARY SPACER TUBE

STIFFEN REAR FACE OF FI-A WITH 1/64" PLY

WHEEL POSITION WHEN RETRACTED

BEND OVER TOP OF INNER LEGS AND GLUE TO FIA

INNER LEGS FIX ONTO THE REAR OF FIA

FI-A EPOXY ALUMINIUM TORSION TUBES TO REAR OF FIA

GEAR LEGS ARE THICKENED WITH SCRAP BALSAM SANDED TO A CIRCULAR SECTION. ADDED DETAIL IS FROM WOUND PAPER STRIP

ALUMINIUM TUBE WHEEL BEARING

MANY JAPANESE PILOTS PITTED AGAINST THE BUFFALO WERE COMBAT VETERANS. MOST OF THE BUFFALO PILOTS HAD NO COMBAT EXPERIENCE

DUMMY MAIN GEAR STRUT IS RECTANGULAR IN SECTION

BIND AND SOLDER JOINTS BETWEEN INNER AND OUTER WIRE GEAR LEGS HERE

GEAR DOOR FROM STIFF CARD. DOTTED LINE SHOWS POSITION OF DUMMY MAIN GEAR STRUT. THIS IS MADE FROM SOFT BALSAM BLOCK (SEE ABOVE FOR FRONT SECTION)

FRONT

F2A-3 (BATTLE OF MIDWAY ERA)
 THE BREWSTER F2A-3 USED BY US FORCES AT THE BATTLE OF MIDWAY HAD A LONGER NOSE THAN THE BRITISH BUFFALO MK1 OR F2A-2. IF YOU WISH TO BUILD THIS VERSION, EXTEND THE LENGTH OF ALL KEELS BETWEEN FI AND FIA BY 5/16" (8MM)

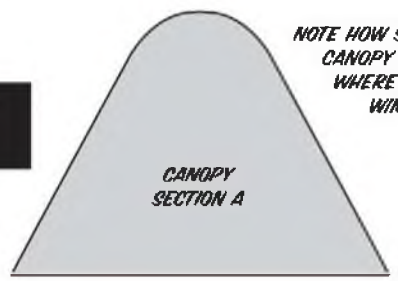
CANOPY OUTLINE

FUSELAGE HALF TOP VIEW

THE CANOPY BALSAM DOLL SECTIONS - BE FASHIONED OVER LAMINATED

USE THIS TOP VIEW TO JOIN THE SIDE KEELS

NOTE HOW SECTION CANOPY IS FLAT WHERE IT JOINS WINDSCREEN



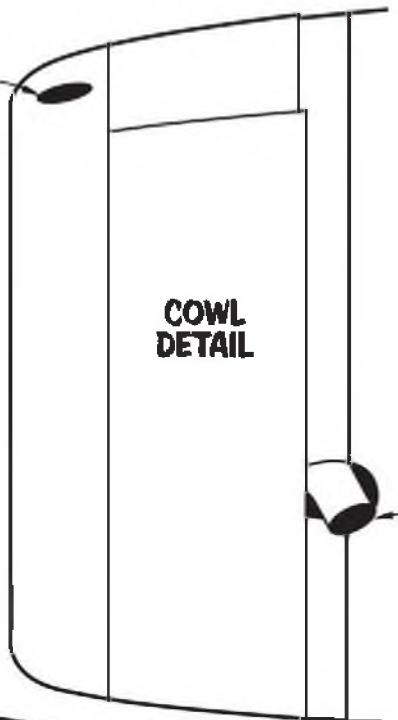
F2A-3 VERSION HAS 8MM NOSE EXTENSION (SEE ABOVE)

Brewster BUFFALO MK1

DESIGNED AND DRAWN BY
Richard Crossley

USE
TIP!

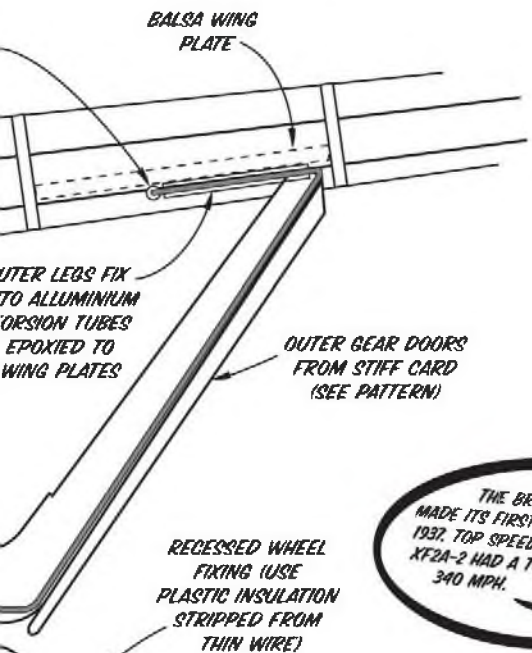
.50 CALIBRE MACHINE
GUN OUTLETS



**COWL
DETAIL**

EXHAUST STUB BOTH SIDES
(MAKE FROM SCRAP Balsa)

HOLLOWED
BLOCK Balsa



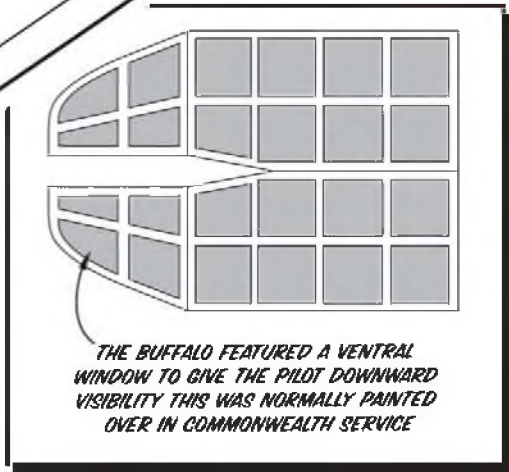
Balsa WING
PLATE

OUTER GEAR DOORS
FROM STIFF CARD
(SEE PATTERN)

RECESSED WHEEL
FIXING (USE
PLASTIC INSULATION
STRIPPED FROM
THIN WIRE)

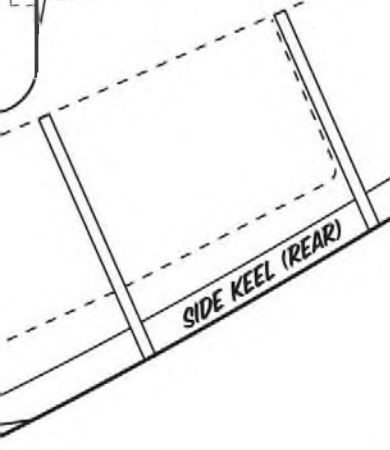
MAKE STREAMLINED
WHEEL COVER FROM
1/16" Balsa DISK

THE BREWSTER XF2A-1
MADE ITS FIRST FLIGHT IN DECEMBER
1937. TOP SPEED WAS 295 MPH. THE
XF2A-2 HAD A TOP SPEED OF
340 MPH.

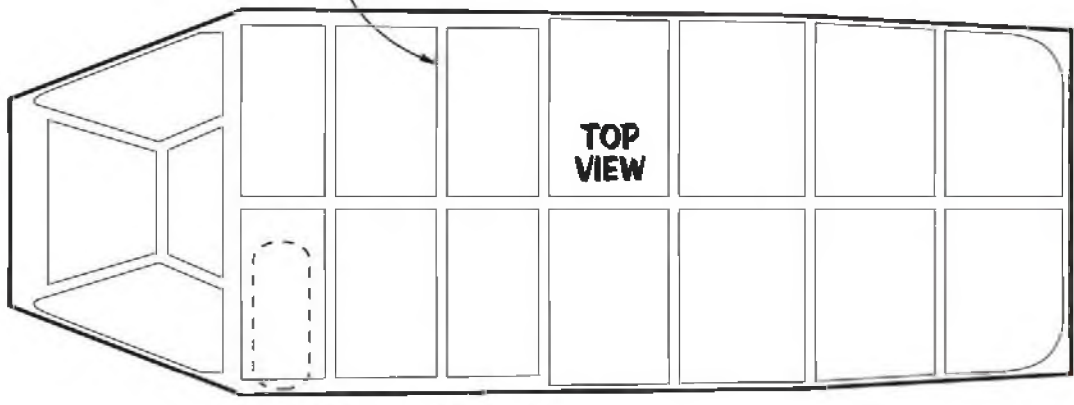


THE BUFFALO FEATURED A VENTRAL
WINDOW TO GIVE THE PILOT DOWNWARD
VISIBILITY THIS WAS NORMALLY PAINTED
OVER IN COMMONWEALTH SERVICE

NO VERTICAL FRAME LINES ON SLIDING
PART OF CANOPY ON F2A-3 VERSION

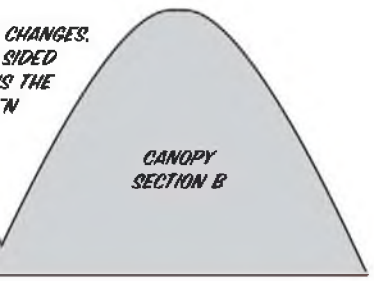


SIDE KEEL (REAR)

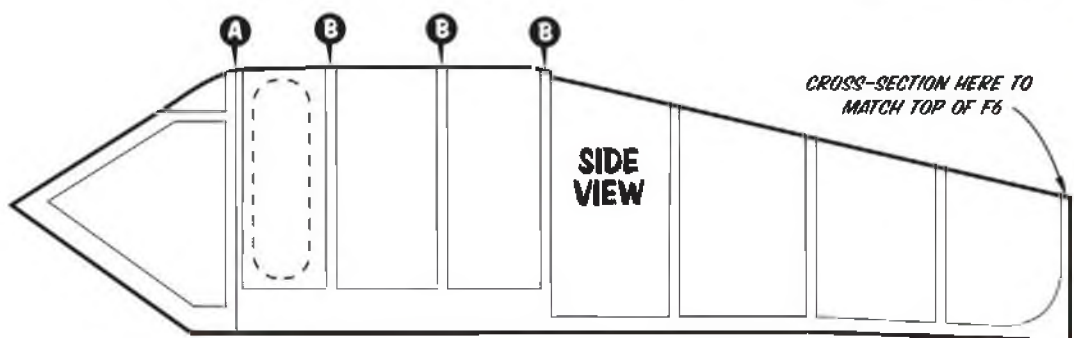


**TOP
VIEW**

CANOPY
CANOPY CAN BE MOULDED USING A CARVED
FORMER. REFER TO TOP VIEW, SIDE VIEW AND
CROSS-SECTION HERE TO MATCH TOP OF F6
AND SHOWN HERE. A SIMPLER CANOPY CAN
BE MADE USING THIN SHEET ACETATE CURVED
OVER CARVED FORMERS. USE PAPER TEMPLATES
TO DETERMINE SHAPE.

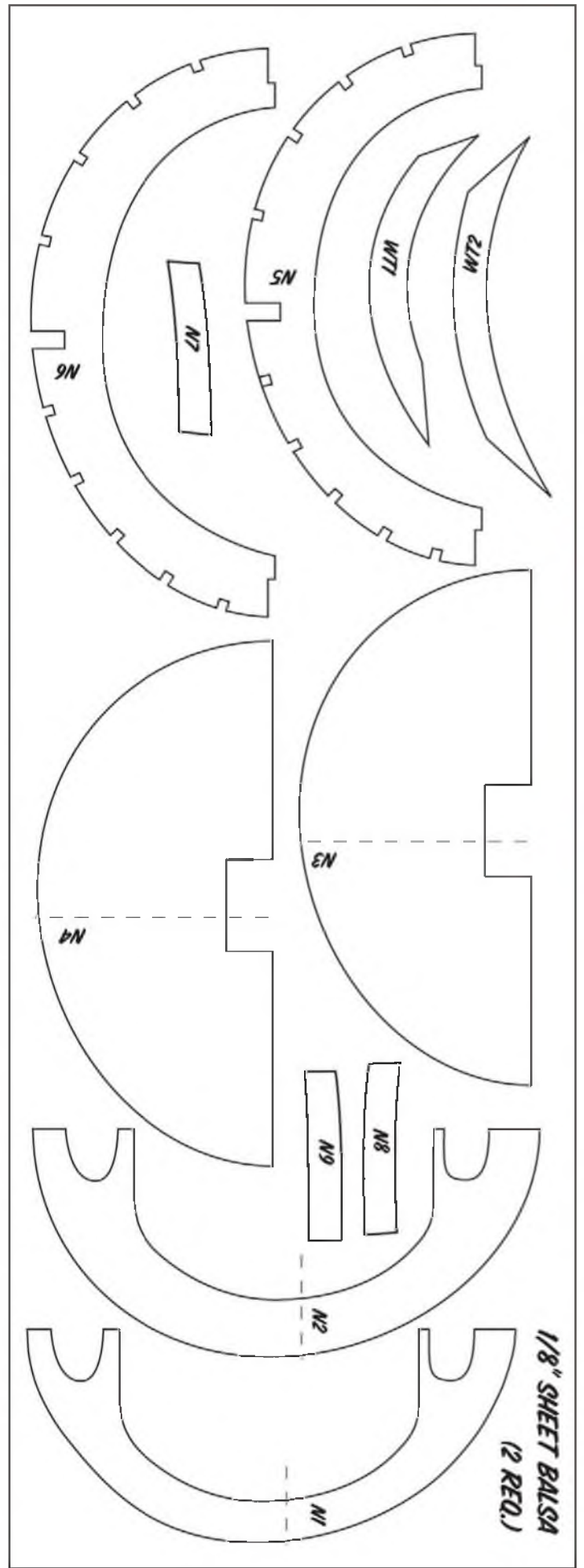
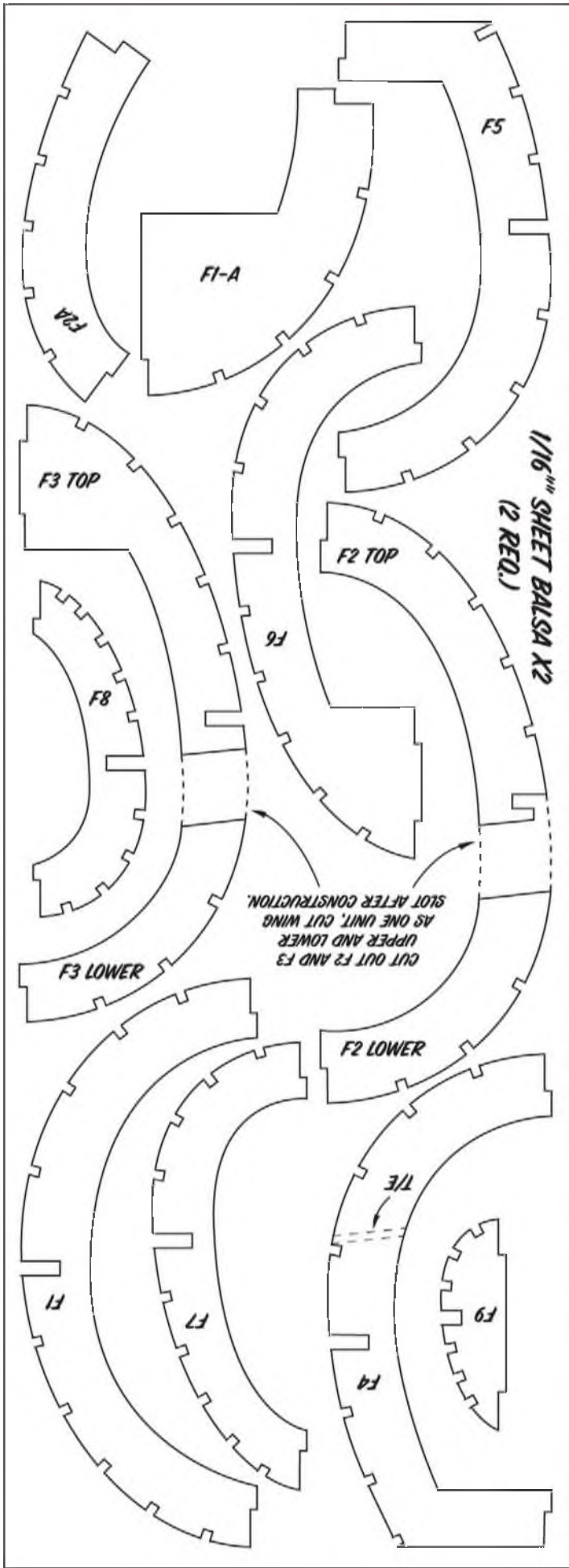


CANOPY
SECTION B



**SIDE
VIEW**

CROSS-SECTION HERE TO
MATCH TOP OF F6

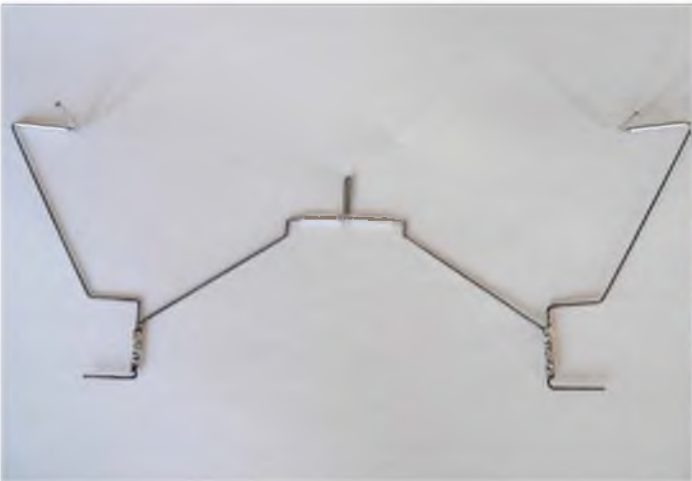




The tailplane has a slight section. Note the hollowed light balsa block tail cone.



I used blue Floormate foam for the prominent tailwheel. The core is thin wire and details are from card and balsa.



Here is the bent and soldered undercarriage wire. note the alluminium tube slid into place that acts as torque tubes. Use thin fuse wire to bind the joining parts.



Here is the gear wire temporarily in place. I have not yet installed the gear mount plates in the wings. Note also on my model the ply reinforcement plate on the rear of former F1A is not deep enough. Use epoxy resin to glue the tubes in place.

Lubricate the motor, wind on a few turns by hand and launch into any breeze. The model should achieve a stable powered-glide. If all looks good, then gradually increase the amount of turns. You may

find that as the power increases, the model tries to 'loop' or stall in the climb. If this happens try a little down-thrust. Any tendency to spiral to the left under the torque of the motor can be offset by

adding some right-thrust. Full power can only be achieved by stretch-winding the motor using a geared winder. Aim for a climbing left hand turn, after which, the model may well reverse into a right hand

descent on the glide.

The Buffalo makes up into a lovely looking model, one of my all-time favourites, I hope you enjoy building and flying yours. ■



U.S. Marine Corps Brewster F2A-3 of VMF-221, based at Eastern Island, Midway, Central Pacific, June 1942.

FULL SIZE FREE PLAN *by Peter Rake & Simon Uglow*



Low passes for the camera are simple with this stable, predictable little model.

Fokker D.VIII

A 1/8 scale electric powered model designed by Peter Rake with the prototype model built and described by Simon Uglow

The Reinhold Platz designed 'Flying Razor', as it was nicknamed by allied pilots, arrived too late to have much impact on the outcome of the air battles of World War One. Originally designated E.V (that's E.5), a series of fatal wing failures saw the parasol monoplane fighter temporarily withdrawn from service. After the problem was rectified - main spars having been found not to be to design speci-

fication - the *Idflieg* (German Air Command) ordered resumed production. Redesignated the D.VIII the 'Flying Razor' went on to claim the last aerial victory of the Great War. A total of 289 E.Vs were manufactured from an initial order of 400 machines.

The model

Peter's model is to 1/8th scale, giving a wingspan of 42". At this size, the fully assembled model fits nicely into the back

of your average family car. With excellent flying characteristics, this may just be the perfect electric scale park flyer.

Designed to use either three or four function controls, depending on which wing you build, I obtained a set of laser cut parts and construction was commenced on the three function version.

(Since this model was designed some time ago, I have updated the plan to show the option of a brushless, 'bell' style out-



runner motor in addition to the original brushed set-up. It simply requires a rectangular 1/8" ply firewall and spacers. This more closely resembles the arrangement Simon used. PR)

Tail surfaces

The tail feathers are quickly built over the plan from strip, the rudder receiving a laminated outline, of three strips of 1/16" x 1/8" balsa, formed around a foam board template. Laminating in this way produces a very strong but also light structure. Eminently suited to curves, the rudder as here, or wing and tail plane tips are easy to produce, so don't be afraid at giving this technique a go. Foam board is ideal for producing the template. Take care to not cut to the full rudder size, but 3/16" under to allow for the balsa thickness.

Protect the edges of the template with Sellotape and pin securely to your building board with cling film beneath. Pre-cut your balsa strips and allow to soak thoroughly. You may use ammonia (purchased as Cloudy Ammonia from the cleaning section of your local supermarket) added to the water if you wish, but beware the smell and the irritant effect to eyes and nose. This is especially noticeable if you use hot water for the soaking.

Once nicely pliable, run each strip through a saucer of PVA glue to coat thoroughly. Now take your three strips, stack them and then, starting at one end, work your way around the template pinning as you go. The laminates will slide over one another at this stage allowing for their different curve radii. I like to use a small strip of shim brass as a fence outside the laminates to help apply even pressure and prevent the pin indentations otherwise caused.

This detaches easily once all is dry. Several days are best here. Ply control horns are let into the control surfaces after covering, to allow hooking up to the closed loop controls. *(The plan shows pushrod operation, but closed loop is a simple upgrade. PR)*

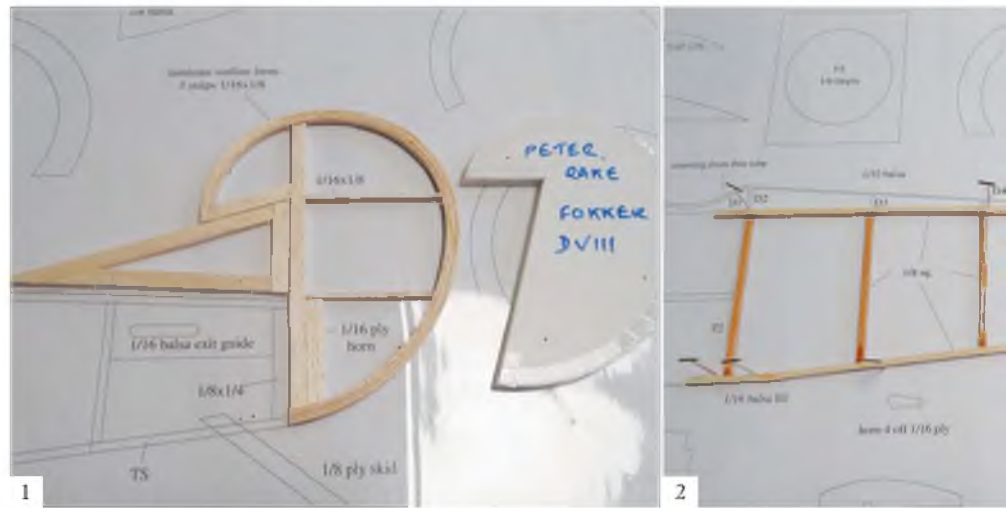
Fuselage

The fuselage follows Peter's preferred and well proven construction method: a forward fuselage box, mated to a stick built rear fuselage.

The rear fuselage is the standard build; two sides over the plan joined with these sides pinned directly over the plan. Cut the uprights for both sides when building the first and you are almost guaranteed two identical sides. Similarly so the cross pieces. Cut two of each, fitting the lower (pinned and therefore fixed) stations using the second between the top longerons for absolute squareness.

With the forward fuselage largely self-jigging using the precision of the laser cut parts, a few strategically placed supports allow this to be glued in one sitting. This is again accomplished over the plan view, on the building board, to ensure accuracy. Once joined to the rear fuselage, a series of sub formers are added to accept the rolled balsa top decking and develop the fuselage shape.

Prior to adding the top sheeting, the centre section struts need forming. All the strut lengths are accurately shown and using 1/16" piano wire the bending work isn't too arduous. The two upper struts are sewn and epoxied to 1/8" ply mounting plates. The lower strut is made a free fit into a



piece of brass tube, securely boxed in on F1b. With the fuselage attachment points fixed, the wing attachment point can be soldered in situ.

Whilst you're in the swing of things, you may as well shape the rear wing strut and undercarriage. These items are each sewn to further ply plates in the fuselage bottom, but only after covering. Using measurements taken from the plan, a simple jig was constructed at one end of the building board and the undercarriage legs soft soldered together. This same jig was used to hold the undercarriage legs for mounting the undercarriage wing and piano wire axle.

Returning to the fuselage: take the opportunity to paint the false cockpit floor (not shown on the plan) and detail the cockpit to taste whilst you still have ready access. The top decking is now added in two pieces: from the firewall to the rear of the cockpit (foremost D1 to rearmost D1) and from here to the front of the tailplane seat (D2 to the 1/8" square at the front of the tailplane).

When dry, the cockpit aperture can be marked and cut. Simplified gun troughs were also cut to later accept a pair of 1/8th scale Spandau guns, purchased from *Wright Brothers Aviation*. These are delightful additions to this model. A combi-



Pretty as a picture, the model shows off the intricately applied finish and vinyl graphics.



nation of laser cut balsa, thin card for the perforated cooling jackets and plastic rod, they assemble quickly and paint up well into light, but convincing facsimiles.

A separate cowl, formed from laser cut laminations of 1/8" balsa and ply with 1/32" ply wrapping, is next. Use balsa stand-offs to set the distance between C1 and C2 before adding the ply wrap. To aid this last step I soaked my ply overnight in a water/ammonia mix and then taped and rubber banded the ply to an appropriate sized coffee tin to pre-form the curve. This was left to dry for about ten days, (Easter intervened) and made the job of attaching the ply so much easier!

The cowl fixing was addressed at this time using the now commonplace neodymium magnets. These are recessed into the rear of C2 and the front of F1B. Glue all magnets at the same time with a piece of waxed paper between. This ensures both correct polarity and accurate alignment. This completes the basic fuselage

Wing

The last major assembly to tackle is the wing. Here you are offered a choice, for three and four function models are shown. Both are built as a single piece, albeit as three distinct panels. The single spar, itself

constructed from three pieces, sets the dihedral and wing taper. As such, the wing spars are different for the aileron equipped and non-aileron wings. The laser cut parts include the necessary pieces for either spar. The wing centre section is constructed first, followed sequentially by the outer panels, packing the unsupported structure as required.

No washout is included, so each section is built flat over the plan making for a quick and easy assembly. All the ribs are delightfully cut with the option of cutting lightening holes. These double as servo wire runs for the aileron-equipped wing. You will be required to construct the ailerons, modify-

- 1: Probably the hardest part of building the tail surfaces involves laminating the rudder outline.
- 2: The totally 'traditional' rear fuselage begins with building side frames over the plan.
- 3: Once joined with cross braces the sides make a strong, but lightweight box structure.
- 4: The forward box structure that ties together all the heavy items the model will require.

CUT PARTS SET AVAILABLE

For readers wishing to build Peter Rake's Fokker D.VIII, we have a laser-cut component pack available. We emphasise that these cut-part sets provide ready-cut pieces of all the bits that you would otherwise have to trace out onto the balsa or plywood sheets before knifing them out, thus saving a fair bit of tedious time, so that the airframe assembly process can start immediately. The parts sets do NOT include strip and sheet wood that you can get from your friendly model shop.

The parts set costs £75.00 plus £9.50 for carriage in UK. Sets can be supplied to overseas customers, with carriage costs quoted on an individual destination basis.

Order direct from Key Publishing Ltd, PO Box 100, Stamford, Lincolnshire, PE9 1XQ, U.K. (Tel: 0178 480404)





The simple modification Simon made to fit a brushless motor.

ing the appropriate wing ribs, as a common set of ribs is used for either wing. My version is the three-function model.

Installation & assembly

With all the basic structure completed, now is a good time to start the radio installation and mount the motor. My chosen power plant was an AXI 2212/34 running an 11x5.5 inch APC-E prop from a 2s 2150mAh LiPo. A Jeti 18 amp speed control and two Topaz 9gm servos completed the electronics. The plan itself doesn't show any details for mounting, but shows the location of a similar power motor.

As stated, I chose to add a false floor onto which I glued my pilot. The floor underside doubled as a mount for the receiver and speed control and acted to support the bottom of the servos. The servos themselves are mounted to conventional spruce rails. Silicon sealant was used to attach all these items. Two hatches in the fuselage underside achieve access to the radio. The forward hatch is used for battery changes. Despite the undercarriage appearing to be in the way, battery changes are fuss-free with the model supported inverted.

Drilling of the wing mounting blocks is now required. To accomplish this, support the wing inverted on a flat surface. I used some foam wedges that accommodated the wing profile and dihedral. Now lower the fuselage onto the wing, again supporting as necessary. Check and double-check the key alignments before marking where the strut attachment points locate. Allow any slight discrepancy here when comparing one side to the other as long as the wing-to-fuselage and wing-to-alignments are accurate.

Once satisfied that all is well, remove

RIGHT: Despite the compact size of the model, there is ample space in the avionics bay.



Although seen here with the aileron wing option (Simon built both wings) the little DVIII shows off the uncomplicated structure.



Although seen drifting sedately overhead, the model is capable of far more spirited flight performance - even on just three channels.



the fuselage and drill the mounting blocks slightly outboard of the strut positions.

Use your choice of screw to cut a thread, remove and reinforce the hole with thin cyano. Thin brass straps were fabricated to clamp the struts to the mounting blocks at final assembly.

Covering & finishing

I had always intended to depict one of the naval 'bumblebee' schemes on this model. After being suitably chastised on RC Groups: with accusations of wimping out and tongue-in-cheek comments of "lozenge was the only scheme used on the full size", I succumbed to pressure and chose a scheme with just enough lozenge to satisfy. As a bonus though, the scheme sported a very attractive yellow cowl, yellow wheel covers and a striped horizontal tail. The deciding factor for this scheme was undoubtedly the snake motif. This ran almost the full length of the fuselage sides. With a picture of the finished model now forming in my mind, I just had to find a way of reproducing the scheme.

Easy parts first: The cowl is simply sprayed using chrome silver as a base coat. This enables some rubbing back of the yellow topcoat to simulate wear. Canopy glue 'rivets', applied with the hypodermic-like nozzle from a bottle of Superphatic and syringe prior to painting add to the effect. The scored card wheel covers are also painted. One wheel inspection panel was left open with false piano wire spokes glued behind to add a little interest. The wing is covered with dark green *Litespan* and brush painted with thinned olive green oil paint. Both the horizontal and vertical tails are covered with white *Litespan*. The tail striping is achieved by masking off the white

stripes, with *Tamiya's* excellent kabuki masking tape, then spraying semi-gloss black enamel.

Now for the tricky bits: The fuselage received a base covering of cream litespan for all but the dark green (*Litespan*) forward panel. Each fuselage side requires three panels to accommodate the centre section (c/s) struts. *Aerodrome RC* kindly provide a series of downloadable lozenge patterns in various scales. The appropriate 1/8th scale pattern was glued to a piece of thin ply and the individual lozenges cut out as templates. Each lozenge on the model is actually a piece of doped tissue, cut using these templates; definitely a case of it taking longer to do than to describe - twenty five hours plus, for the fuselage and undercarriage wing.

A few customised lozenges were required to account for slight errors in cutting and positioning, but overall the fit was excellent. Graphics were custom cut by *Callie Graphics*.

Scale detailing proceeded, with the fitting of the Spandau guns and a dummy motor, scratch built from items to hand: 5ml syringes, suture material (guess the day job!) tape, piano wire and the bottom of a small bottle. An acetate windscreen with piano wire frame and a real leather cockpit combing applied over a spilt length of vinyl tube were added. The tubing here creates depth to the combing and simulates the padding of the full size machine.

The undercarriage legs and struts were faired with a strip of 1/16" balsa, tissue covered and painted. Weathering followed with a combination of oil paint washes and powdered pigments.

Flying

Balanced as per the plan, 1/8" in front of the spar, the morning of the maiden dawned calm and generally bright. Taking off is a thing of beauty! The model lifts its tail early, then holds that configuration until you actively ease back on the elevator. In flight the model is stable and perfectly controllable with the three functions. Some control authority was lost with reduced throttle, but this was with

low rates. Power was adequate for gentle flying and for the close-in slow passes required for the photos, which show the model off to its best advantage.

On landing, use throttle to control the descent rate. Touch down with a little power on, hold up elevator and roll out to a full stop.

The power draw with the listed setup is very modest. There is room to experiment (up to an 11"x8" propeller on 3s) if you desire a more spirited flight envelope.

Indeed later flights with a 1500mAh 3s, pack, but sticking with the original propeller have proven this point with no apparent loss in duration. Loops, stall turns and barrel rolls are now easily accomplished. (Unfortunately, Simon's flying proved a little too spirited for the relatively soft balsa spar supplied with the laser cut parts - it failed mid-flight. Since I thought you probably wouldn't want to include this 'scale' feature on your model, I have upgraded the parts to bass. PR)

If you only build one model this year, make sure it's this Fokker DVIII, she's a honey!



Lt. Theo Osterkamp, the Commanding Officer of
Marinefeldjagdstaffel 2 in relaxed mode with his
Fokker E.V serial 156/18.
(Photo from the Harry Woodman Collection)



TYPE HISTORY

Fokker E.V & D.VIII

Did the entirely avoidable problems initially experienced with this late WW1 fighter set back monoplane fighter development by more than a decade?

Back in 1914-18, the active in-service lifetime of WW1 combat aircraft could often be measured in months only, before obsolescence set in as military hierarchy, aircraft designers and manufacturers on both sides of the conflict strove to achieve or maintain superiority of combat performance over the aircraft of the enemy. Lives depended upon it!

On the German side, the latest in a succession of competitions for the supply of fighters, in early 1918, led to the selection of the Fokker D.VII, the best of a number of machines, all of which were required to use the 160/180 hp Mercedes engine.

The D.VII went into immediate production, but the German High Command were fully aware of how quickly the performance of a new aircraft could be eclipsed and immediately decided to float a further fighter design competition, the requirements of which were circularised among the manufacturers, including Albatros, Dornier, Kondor, LVG, Pfalz, Roland, Rumpler, Seimens-Schuckert and Fokker.

At the latter company, Designer Reinhold Platz had in hand a number of experimental parasol monoplane configuration designs, V26, V27 and V28. Platz was, in

this day, an extraordinary aircraft designer. Although he had no knowledge of aerodynamics, no research facilities to fall back on at Fokker's Schwerin headquarters and not even made aware of the existence of official technical publications, he was in many of his ideas ahead of his time. He was a welder by trade, skilled in metalwork but nevertheless achieved outstanding success as a designer of wooden wings. Yet he worked in the shadow of Antony Fokker and seems to have tolerated his employer's explicit claims of all credit for the aircraft that Platz had designed.

When the January 1918 competition was run off, it was leading pilots from the Jagdstaffeln in the war zones who did the comparative testing and who were the arbiters of which design would be selected as the follow-on fighter. Their short-list whittled down the choice to the Dornier D1, Seimens Schuckert and Fokker V26/V28. Finally, the Fokker design was selected, receiving the official designation E.V ('E' for Eindecker).

The production order required 400 machines, the first 20 being delivered in July 1918. Jagdstaffel 6 was the first unit to get their hands on the new fighter, receiving six in early August, but before the end of the month, three of their

pilots had been killed due to wing failures.

Initial official investigations blamed these failures on deformation under heavy in-flight wing loads, but further more practical examination revealed appallingly poor standards of construction that included the use of unseasoned wood and perished glue. But even more damning discoveries were found. To expand his manufacturing capability, Fokker had, in 1916, acquired the former *Perina Pianoforte Fabrik Company* where the facilities were turned over to airframe construction, including wings for the Fokker E.V. Examination of E.V wings off that production line revealed that these had not been made with proper jigs; that the pins to hold the surface wing skins had been so carelessly hammered in that the pins missed the rib cap strips underneath; that the depths of the spar flanges had been planed down from the designated 13mm to just 7.5mm in order to slot spars into the structure.

Not surprisingly, Fokker received the 'rocket' of his life from the *Flugzeugmeisterei* responsible for the investigation, which even recommended criminal proceedings against him.

With Reinhold Platz now responsible for management of the Perzina Works, immediate improvement in



1 (Photo: Alex Imrie Collection)



(Photo: Alex Imrie Collection)



3 (Photo: Alex Imrie Collection)



4 (Photo: Alex Imrie Collection)

quality control and adherence to the designer's original construction specifications quickly cured these ills. Re-designated Fokker D.VIII, the aircraft re-entered service. Jagdstaffel 11 were the first to re-equip, followed by Jagdstafeln 1, 6, 10, 19, 23, 36 and the Marine-Feld-Jagdstaffeln 1, 2 and 3.

However, due to the serious delays caused by the initial production deficiencies, the Fokker D.VIII saw only three weeks of combat service before the November 11th 1918 armistice, during which the aircraft proved to be an effective fighting machine, providing the pilot with good all-round vision by the standard of the period. It was not as manoeuvrable as the Fokker Dr.1, but more so than the D.VII and those who flew it in combat regarded it as an excellent fighter.

Had the War continued into 1919, more powerful variants using the 145 hp Beers UR III rotary engine and 200 hp Goebel Goes Imia were planned and had these entered service, these could well have given the newly formed Royal Air Force's squadrons equipped with the S.E.5a and Sopwith Snipe a hard time indeed.

As also occurred in 1945, there was a post WW1 round up of German aircraft by the Allies, including some of the 85 examples of the Fokker D.VIII operational with German Air Service units. Some of these were shared among the Allies for evaluation including US Air Service.

But not before Anthony Fokker had spirited 20 examples away to his native Holland, from where he sold some to the Netherlands Air Service. Others were sold to Poland, to equip the 7th Aviation Squadron and used during 1919, in that

1: VzFlgmr. Georth of Marine Jagdstaffel III with Fokker E.V 144/18. Cowl and wheels are yellow, '3' annotation probably white. 2: Off.Stv Altemeir of Jasta 24. He had worked for Krupp and used the Krupp motif as his personal fuselage marking. 3: This Fokker D.VIII is one of the Jasta 6 machines, that seem to have had their fair share of photographers' attention. 4: Fokker sold D.VIIIs to Poland after WW1. This machine was the personal mount of Lt.Stefan Stec, seen at Lwow in 1919. 5: Fokker E.Vs of Jasta 6 lined up at Bernes on August 8th 1918.



5 (Photo: Harry Woodman Collection)



(Photo: Harry Woodman Collection)



(Photo: Alex Imrie Collection)



(Photo: Alex Imrie Collection)



(Photo: Harry Woodman Collection)

country's conflict with Ukraine. Others went to Italy as 'spoils of war', while Japan was also a recipient

In 1921 Lieutenant Leigh Wade of the US Air Service produced the following evaluation of the D.VIII after testing at McCook Field: -

'The aeroplane has a tendency to turn to the right in taxiing, takes off quickly, climbs very rapidly and is very manoeuvrable.

It is easy to fly and the controls are sensitive. It is tail heavy, but so light on the controls that it is not tiresome to fly. The visi-

bility is good.

The machine's guns are so placed that in the event of a crash, the pilot would undoubtedly be injured by being thrown against it.

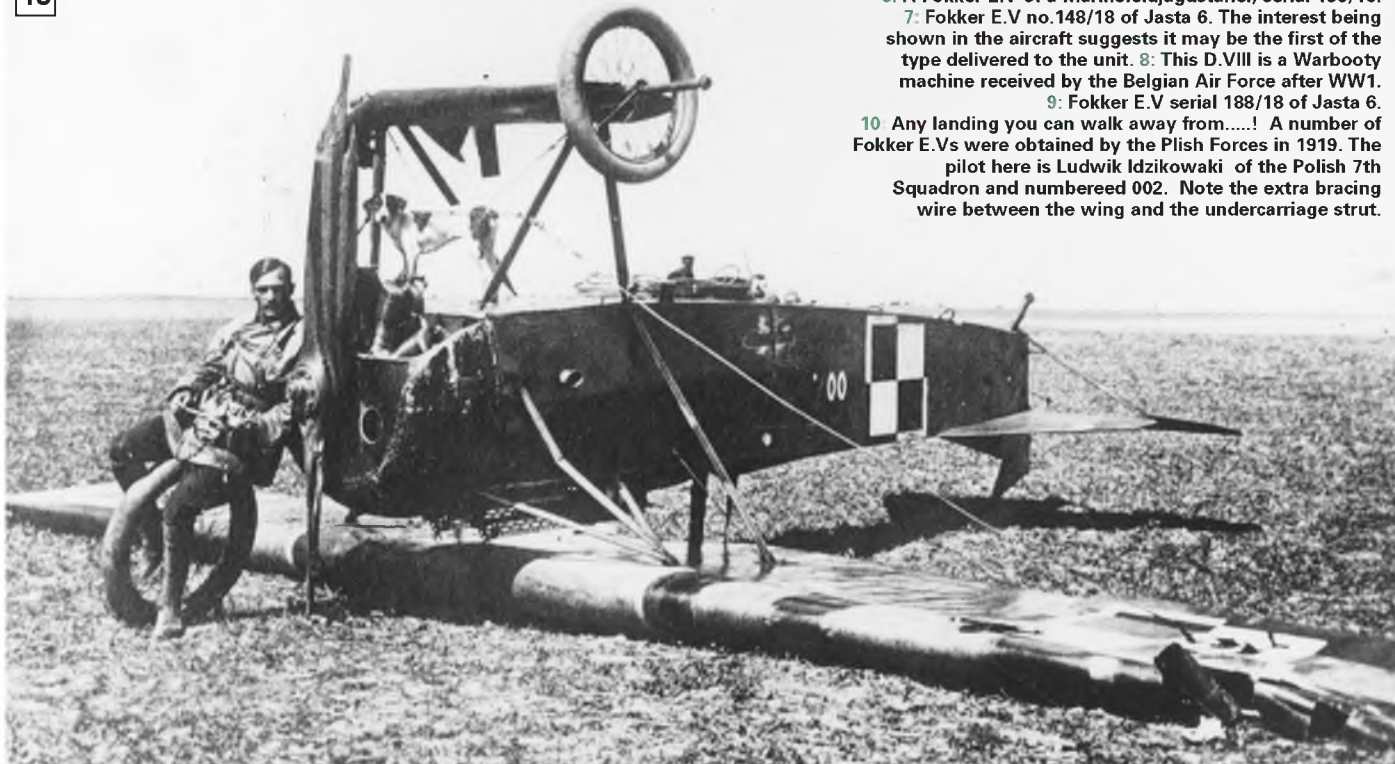
The aeroplane lands very slowly with a slight tendency to drop the right wing and to turn to the right on the ground.

The controls for the engine are very inconveniently located, in as much as the throttle for the gas in the left side of the fuselage and the throttle for the air is on the left side of the control stick.'

It might be said that the Fokker E.V (in its original format) was the aircraft that set back the development of the monoplane fighter by a decade and a half. If those fully avoidable problems had not occurred, then success with the D.VIII, then the biplane fighter configuration might not have 'ruled the roost' until the mid 1930s!

Such then was the Fokker D.VIII, a fighter aircraft of great promise, that just ran out of time ... rather like that other great German fighter, a generation later - the Messerschmitt Me262!

10 (Photo: Harry Woodman Collection)



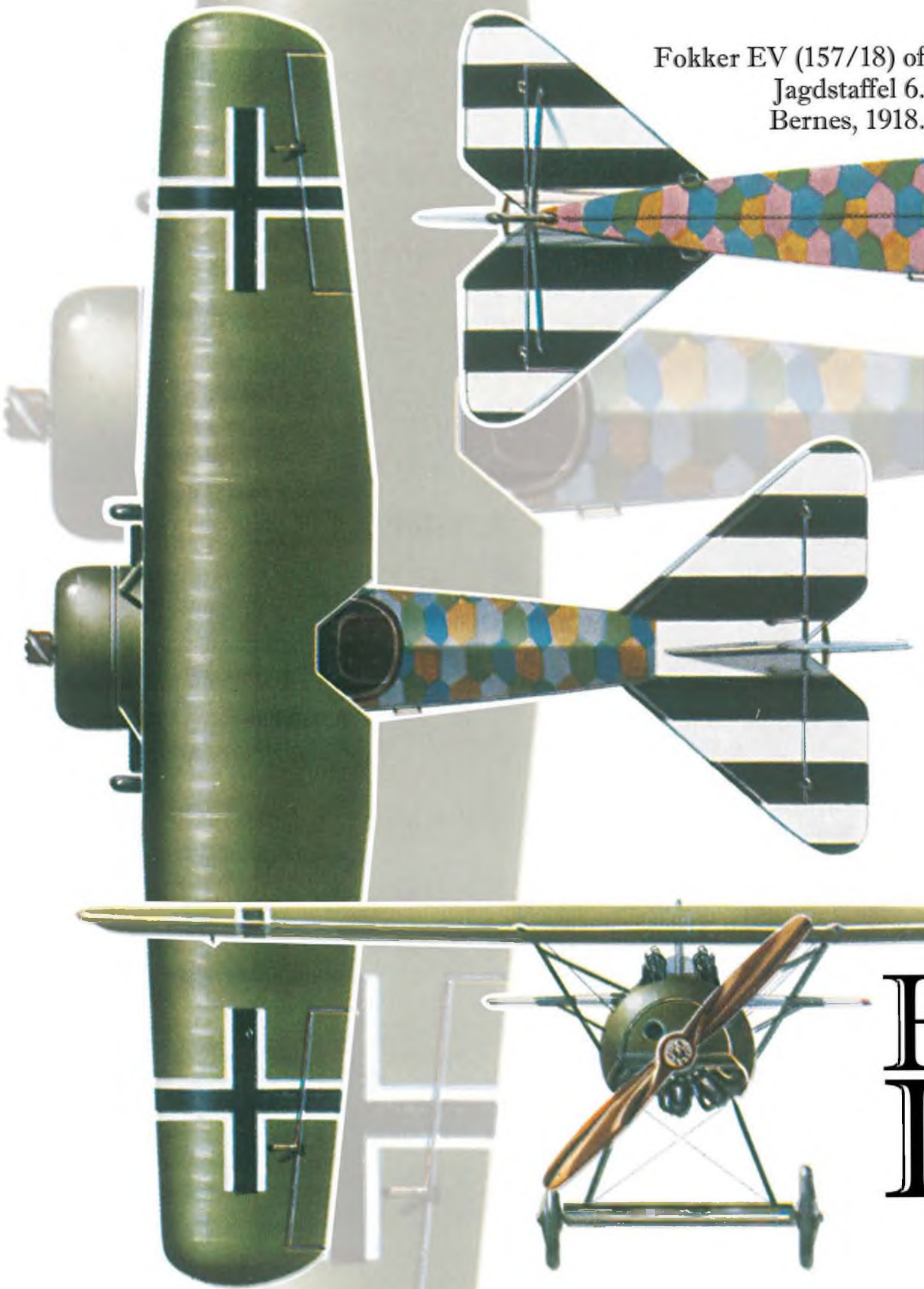
6: A Fokker E.V of a Marinefeldjagdstaffel, serial 138/18.

7: Fokker E.V no.148/18 of Jasta 6. The interest being shown in the aircraft suggests it may be the first of the type delivered to the unit. **8:** This D.VIII is a Warbooty machine received by the Belgian Air Force after WW1.

9: Fokker E.V serial 188/18 of Jasta 6.

10 Any landing you can walk away from.....! A number of Fokker E.Vs were obtained by the Polish Forces in 1919. The pilot here is Ludwik Idzikowaki of the Polish 7th Squadron and numbered 002. Note the extra bracing wire between the wing and the undercarriage strut.

Fokker EV (157/18) of
Jagdstaffel 6.
Bernes, 1918.



F
H



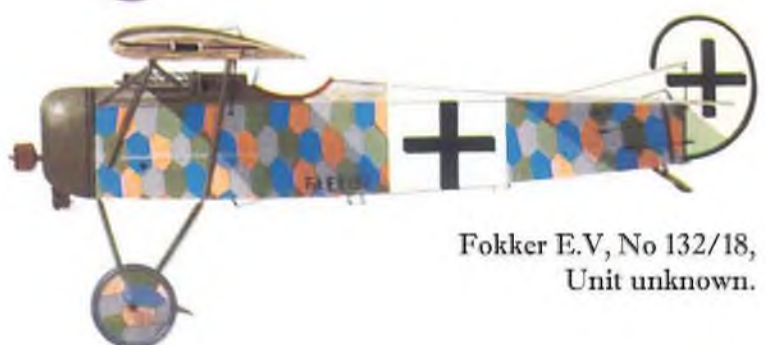
Fokker E.V, Jasta 6, Busigny-Escaufort,
France, August 1918.



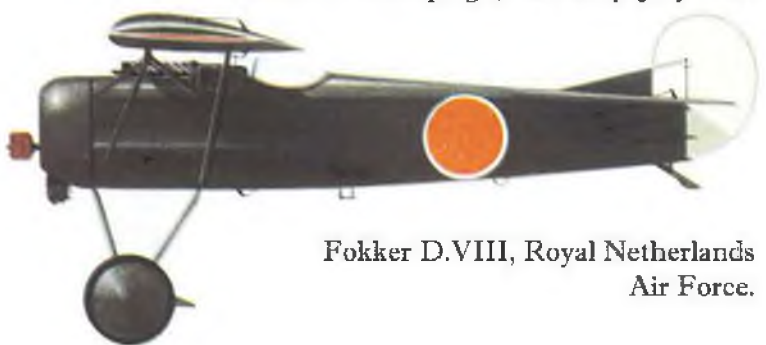
Fokker E.V, Jasta 6, Busigny-Escaufort,
France, August 1918.



Fokker E.V, No 132/18,
Unit unknown.

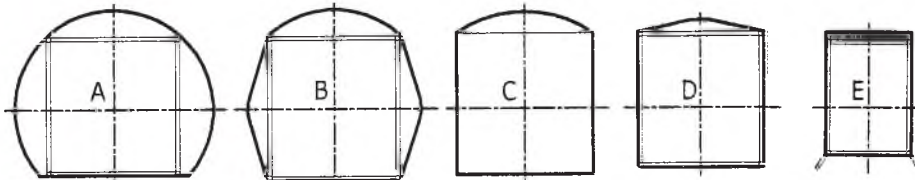


Fokker E.V, No. 7 (Kosciuszko) Squadron,
Polish Air Force, Lwow, 1919. Flown by
Lt. S. Stec, the Squadron Commander during
the Ukranian Campaign, February-July 1919.

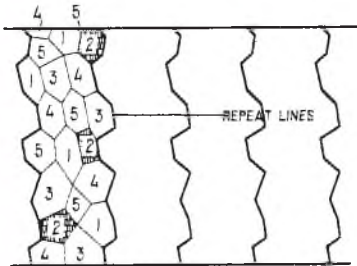


Fokker D.VIII, Royal Netherlands
Air Force.

Fokker D.VIII Flying Colours



FUSELAGE SECTIONS



5-COLOUR DAY FABRIC

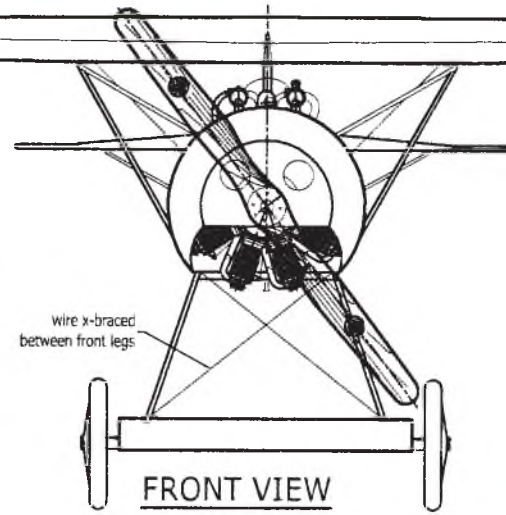
UPPER FABRIC

- 1 = DULL GREEN = 27-F4
- 2 = GOLDEN BROWN = 7-E4/E5
- 3 = DARK BLUE = 21-F6
- 4 = DARK VIOLET = 17-F6
- 5 = DARK GREEN = 25-F5

LOWER FABRIC

- 1 = GREYISH MAGENTA = 13-E6
- 2 = LIGHT BROWN = 6-E5
- 3 = DULL BLUE = 21-E4
- 4 = DULL VIOLET = 16-E4
- 5 = TURQUOISE GREY = 24-E3

UPPER & LOWER FABRIC IS SAME PATTERN
 DARK UPPER FABRIC ON TOP OF WINGS, TAILPLANE, AXLE WING & SIDES OF FUSELAGE
 LIGHT LOWER FABRIC ON BOTTOM OF WINGS & TAILPLANE, AXLE WING & BOTTOM OF FUSELAGE
 RUDDER & FIN PAINTED FLAT WHITE



FRONT VIEW



scale

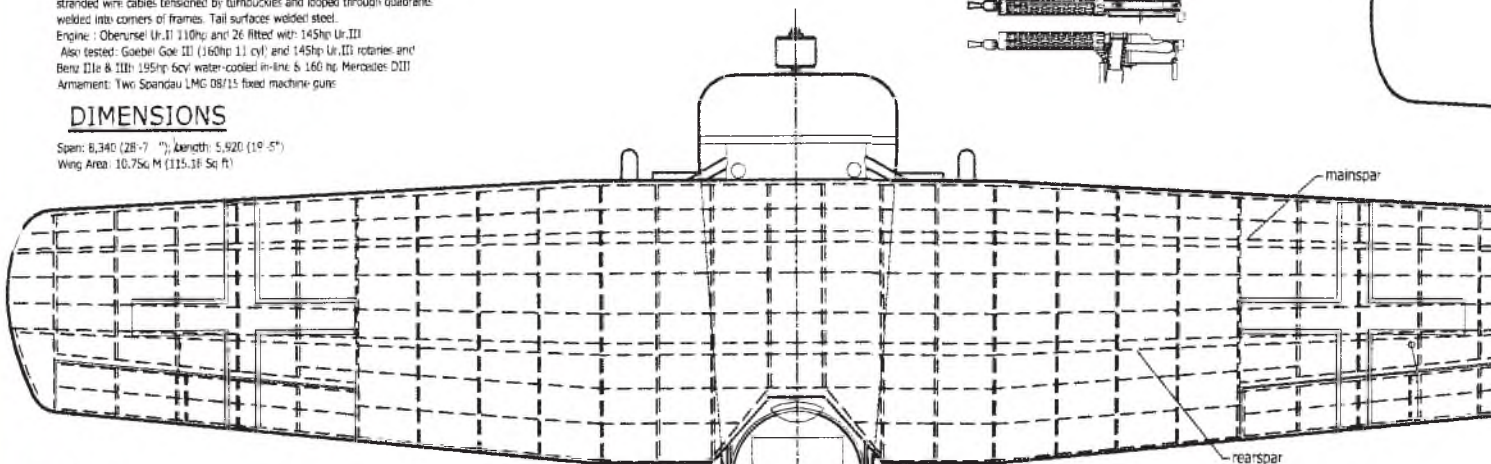
DESCRIPTION

Originally E.V (Eindokker 5), redesignated D.VIII by the Idflieg and ordered before the end of the D-Type competition. Operational 24th Oct '18.
 Construction: Wooder wings; Fuselage welded steel, bays braced with stranded wire cables tensioned by turnbuckles and looped through quadrants welded into corners of frames. Tail surfaces welded steel.
 Engine: Oberursel Ur.II 110hp and 26 fitted with 145hp Ur.III
 Also tested: Goebel Goe.III (160hp 11 cyl) and 145hp Ur.III rotaries and Benz IIIe & IIIb 195hp 6cy water-cooled in-line 5 160 hp Mercedes DIII
 Armament: Two Spandau LMG 08/15 fixed machine-guns

DIMENSIONS

Span: 8,340 (28-7 7/8); Length: 5,920 (19-5 1/2)
 Wing Area: 10,750 M (115.18 Sq ft)

Spandau LMG 08/15
 fixed machine gun



PLAN VIEW

COLOURS

Fuselage fabric covering lozenge camouflage.
 Wing, Axle-wing, Cowl & Struts dark green.
 Rudder & aft part of Fin white.
 Crosses black with white edges.

Oberursel Ur II
 (Le-Rhone J-9 Series)



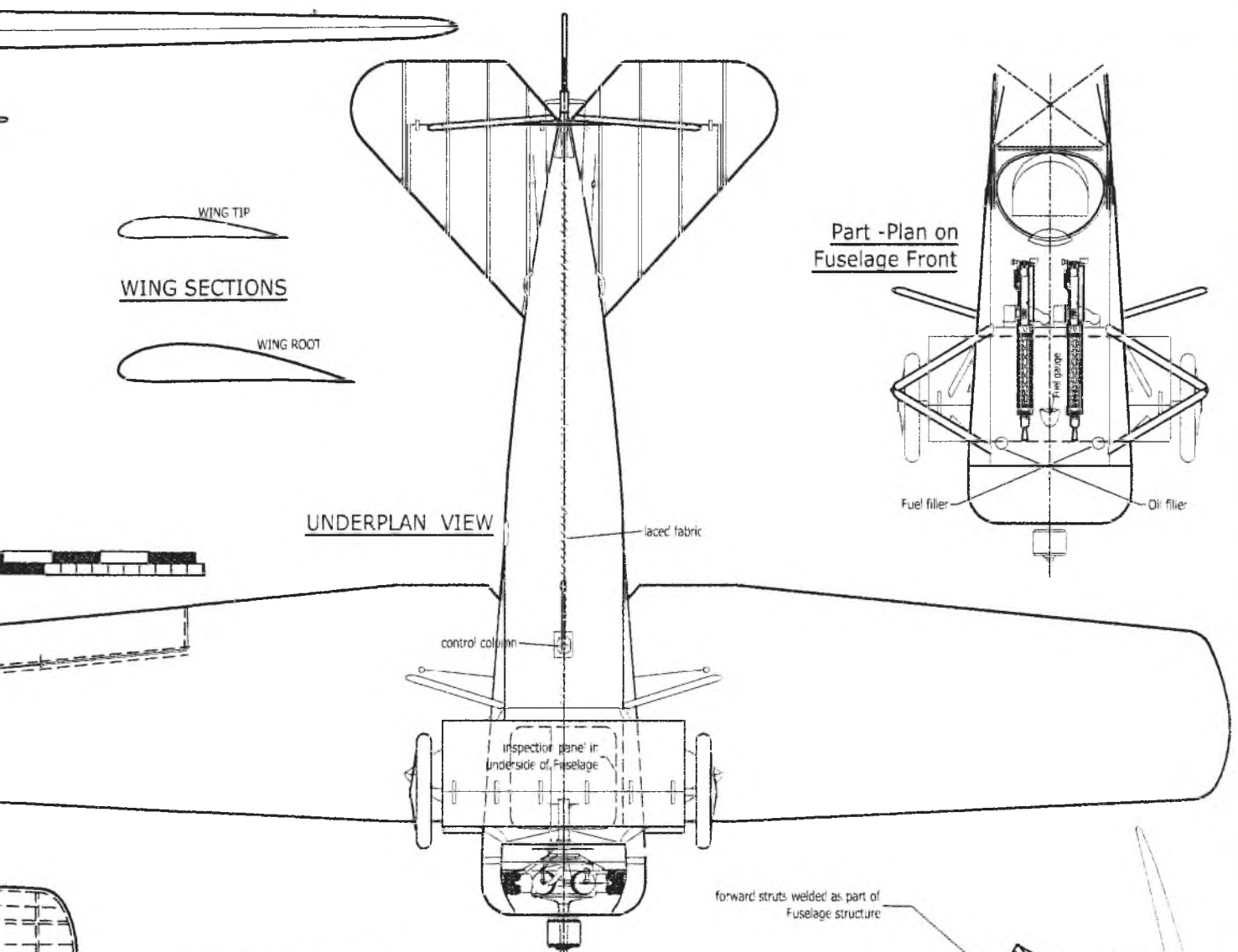
Propeller



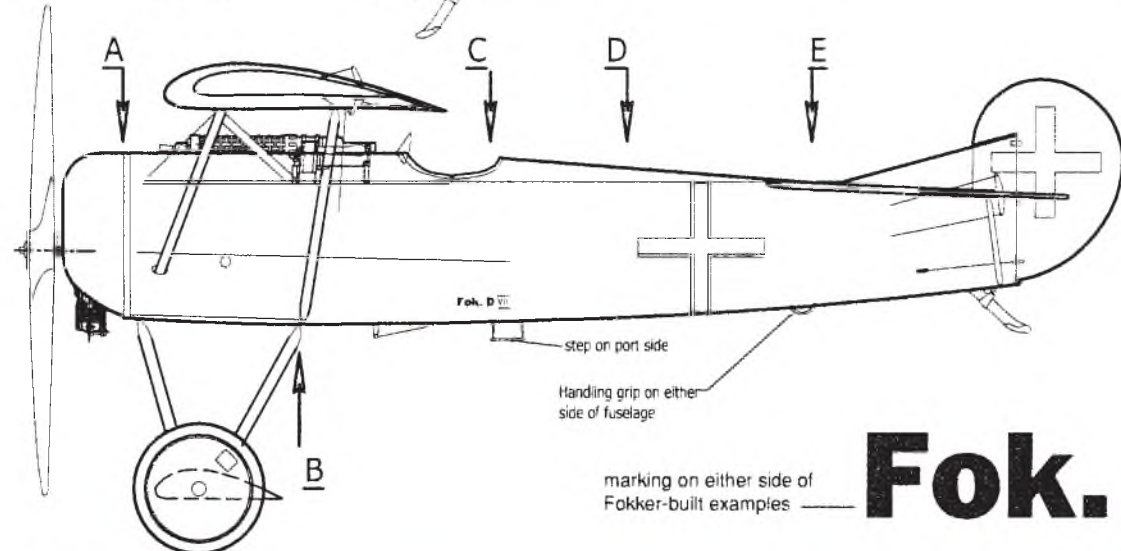
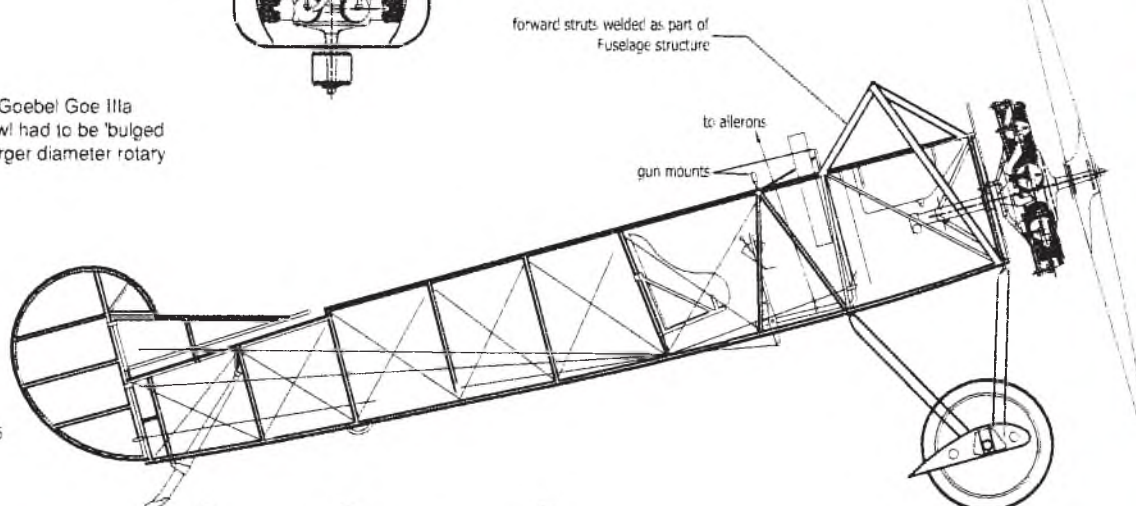
LOGO at 5 x general Scale



**FOKKER
 D.VIII/E.V
 SCALE 1:40**



with the 200hp Goebel Goe IIIa installed the cowl had to be 'bulged' to accept the larger diameter rotary



marking on either side of Fokker-built examples

Fok. D VIII

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Sole remaining example of this 1930s racing and aerobatic biplane restored to pristine condition.

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The distinctive back-staggered 1930s biplane with retracting undercarriage.

BELL P-39Q AIRACOBRA (130 images) CD22

Superbly restored example of this much maligned WW2 fighter aircraft, that was used with great success by Russian forces in the ground attack role and with saw much action in the south Pacific, from where this restored example was recovered.

BLERIOT MONOPLANE (74 images) CD23

The Shuttleworth Museum's machine, the oldest original example still flying. Much close-up detail showing all the exposed rigging, structure and the 'bedstead' main undercarriage, plus Anzani engine.

BOEING PT-13/17 STEARMAN (54 images) CD24

Subject aircraft is a current British civil register example used for airshow displays.

BRISTOL BULLDOG (60 images) CD25

This collection depicts the example assembled from two donor airframes and restored to superb standard by Skysport Engineering. It can now be seen at the Royal Air Force museum, Hendon.

BRISTOL F2B 'BRISFIT' (28 images) CD26

Full close-up detail, including photos of engine cowls, for both Rolls Royce Falcon and Hispano-Suiza engines.

NEW... BRISTOL M.1c (100 images) CD27

Early WW1 fighter monoplane. Example depicted is the faithfully authentic replica built by the Northern Aero Works and operated by the Shuttleworth Trust museum.

BUCKER BESTMAN (43 images) CD28

Authentic example as exhibited at the Fantasy of Flight museum in WW2 Luftwaffe colour scheme.

BUCKER JUNGMEISTER (79 images) CD29

Radial engine version. Example from Fantasy of Flight museum.

CHANCEVOUGHT F4U-1D CORSAIR

(132 images) CD30
The famous 'bent wing bird' and super detail.

NEW... CHILTON DW1 (90 images) CD31

Original upright engined version of this diminutive British low wing sports/racer.

CHRISLEA SUPER ACE (123 images) CD32

Late 1940s civil light aircraft with distinctive twin fins and nosewheel type undercarriage. A fully restored example.

CHRISTEN EAGLE (90 images) CD33

The spectacular, stylish aerobatic biplane revealed in close-up. Example shown is the two seat version.

COMPER SWIFT (91 images) CD35

1930s racing aircraft. Example depicted is the radial engined example at Shuttleworth Museum.

CURTISS HAWK 75 (130 images) CD36

The 'export' version of the Curtiss P-36 that saw service in during WW2 with Finland and during the 'Battle of France' in May/June 1940. Example shown is a combat veteran.

CURTISS JN-4 'JENNY' (130 images) CD37

An authentic, restored example in full detail.

NEW... CURTIS P-40B TOMAHAWK

(130 images) CD38
Rare, full restored example of the early version of the Curtiss fighter aircraft that was at Pearl Harbour on Dec. 7th 1941 and survived the attack!

CURTISS P-40N (100 images) CD39

One of the later versions of the famous Curtiss Warhawk, the WW2 fighter aircraft that saw service in just about every combat theatre of operations.

De HAVILLAND DH84 DRAGON (40 images) CD42

Forerunner of the more famous DH 89 Dragon Rapide, this collection depicts a superbly restored example.

De HAVILLAND DH89 DRAGON RAPIDE (100 images) CD43

Graceful twin engine biplane airliner that saw service from pre-WW2 through to the mid 1950s. Several are still flying and three are shown in this picture collection.

NEW... De HAVILLAND DH 53 (60 images) CD40

1920s lightweight low wing sports aircraft designed to a low-power specification. Machine illustrated is the sole remaining example.

NEW... De HAVILLAND DH 60 (140 images) CD41

The aircraft that set the British 'club' flying movement on the road to success during the 1930s.

DH TIGER MOTH (110 images) CD44

Much close-up detail of civil register example, plus further detail of the IWM Duxford's example in Royal Navy trainer colours, showing the blind flying hood.

DHC CHIPMUNK (70 images) CD45

A bumper bundle of images that provides a vast array of detail pictures, plus photos of examples in both RAF trainer and civil colours.

ERCO ERCOUCPE 415 & AVALON ERCOUCPE (115 images) CD46

The elegant twin finned light/sport aircraft. Both original Type 415 and later Avalon resurrection examples.

FAIRCHILD RANGER (60 images) CD47

Elegant US high wing light aircraft in full detail. Two examples shown.

FAESELER STORCH (90 images) CD49

Arguably the first military STOL aircraft, this stork-like looking aircraft has long been a modellers' favourite. Two examples are represented, the machine at the Fantasy of Flight Museum, Florida and the RAF Museum Cosford's example.

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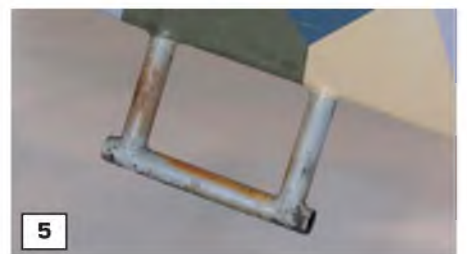
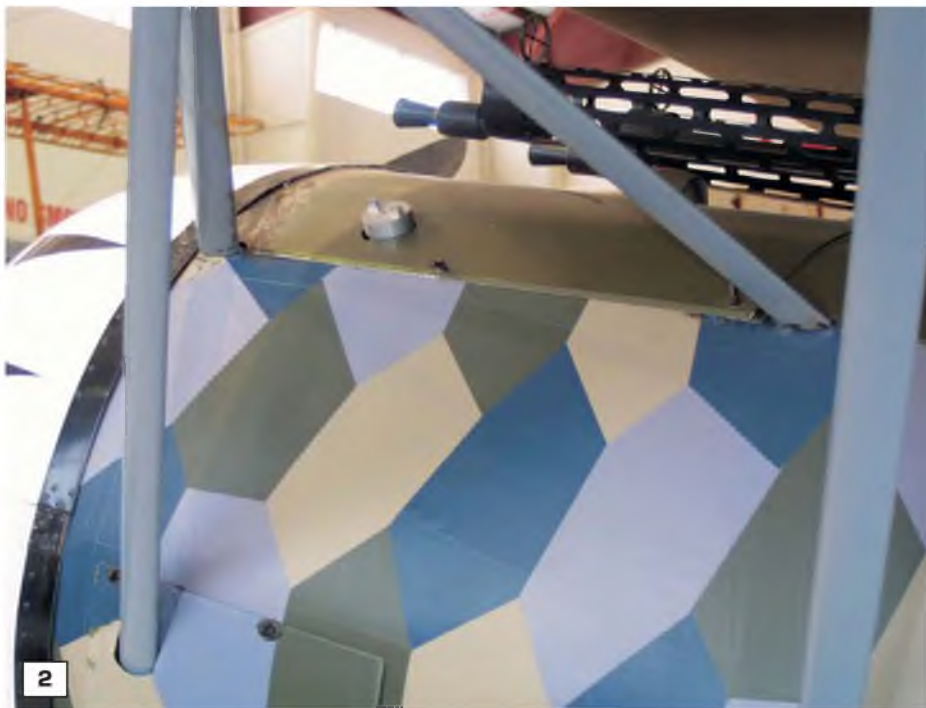
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Fokker D.VIII

A close-up study of the Fokker E.V at the Fantasy of Flight museum in Florida. It is a replica, but an accurate one.

1



1: View looking forward along the fuselage, showing the general arrangement of wing struts. 2: View of the forward fuselage looking forward toward the cowl, showing the wing struts and the fuel tank cap. 3: View of the left forward fuselage side, showing access panel, wing struts and undercarriage anchor points. 4: View of the fuselage rear, underneath the tailplane, showing the control wire runs to the rudder and elevator control horns. Note the leather facings where the control wires exit the fuselage. The wire at the top goes through the tailplane to the top surface elevator horn. 5: Detail of the foot stirrup on the left fuselage side below the cockpit.



6: Cockpit rim, showing leather coaming and binding. 7: Pilot's seat and safety straps. 8: Inside the cockpit looking forward toward the instrument panel. 9: Close-up of the lower cowl showing the cylinders of the rotary engine. 10 & 11: Two views showing the cockpit windscreen and the twin Spandau machine guns. 12: The engine cowl and the access panels behind the rear cowl line.

12





13



15



14



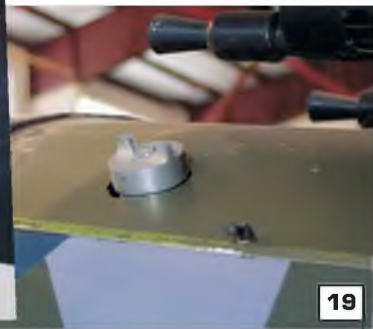
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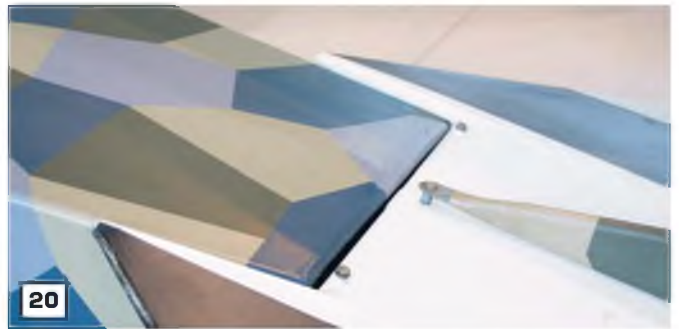
17



18



19



20

13: The anchor points on the lower fuselage for the rear undercarriage member and a wing strut. 14: View, right side of fuselage, just behind the engine cowl, showing wing strut, where it enters the fuselage. 15: View of the right side of the rear fuselage, showing the control cable runs. 16: Lifting handle at the bottom of the rear fuselage side. 17: Rudder control horn and adjustable clevis link to the control wire. 18: The rudder post, showing the rudder hinges, together with the elevator joiner and centre hinge. 19: Detail of the upper fuselage behind the engine cowl, showing the fuel tank cap.



21



22

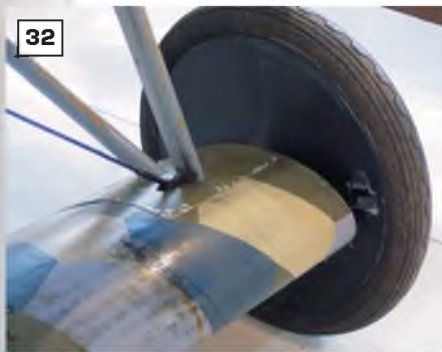
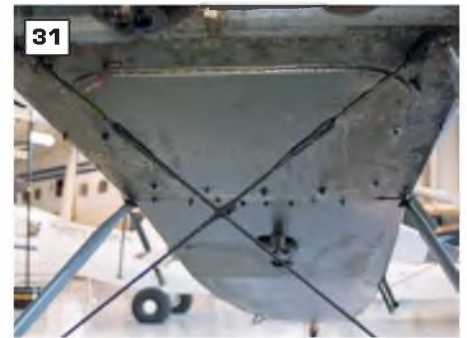


23

20: Rear fuselage upper decking, showing the tailplane leading edge and fin anchor point. 21: Upper surface of the aileron, showing the control horn. 22: Top surface elevator horn. Note the leather re-inforcement where the control wire enters the tailplane fabric. 23: Tailplane and elevator, showing the elevator aerodynamic balance.



24: Lower surface of the aileron showing the control horn. 25: Close-up of the aileron control horn, control link and aileron hinge. 26, 27 & 28: Three views of the anchor point on the wing undersurface of the front wing strut. 29: Detail of the anchor point on the wing undersurface for the rear wing strut. 30: View of the undercarriage legs where they enter the undercarriage fairing viewed from the outside, looking forward. 31: View looking rearwards along the fuselage underside, from just behind the engine cowl, showing the main undercarriage cross-brace wires and fuselage access panel. 32: A look at the same components, looks rearwards toward the inside face of the wheel. Note the anchor point for the undercarriage cross-brace wire. 33: The main wheel - not known how authentic the tyre is. 34: General view of the main undercarriage, showing the struts and the cross brace wires. 35 & 36: Three views of the tail skid, which has been modified with the addition of a metal shoe that gives a degree of ground steering



34

35

36

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R/C SCALE ELECTRICS *by Peter Rake*

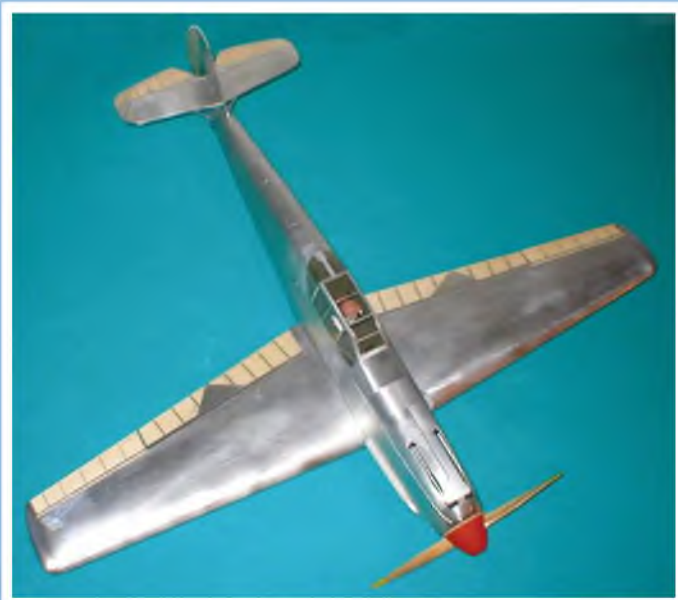


Right, off we go again with another episode in the never-ending saga that calls itself *The Quiet Zone*. Sounds a bit like a horror story, doesn't it? Well, don't worry, despite the fact that it does sometimes read a bit like a horror story too, this time it should not. You may not escape a certain amount of waffle (it wouldn't be the same column without the waffle) but this time I promise there will be no indoor models, no helicopters and definitely no designs by yours truly. There'll be plenty of space for those another time. So, now that you know what won't be appearing, no doubt you'd like to know what you can expect to find here this time around.

As regular readers will be aware, occasionally I like to feature the models of a particular builder or designer and that is precisely what I have in mind for this month's column. As you may also have noticed, I have a personal preference for models of early aircraft and WW1 types. As such, more modern aircraft don't appear here that often. No, it's no use blaming me for that, I can only write about items you tell me about and, if you'd like to see more modern, faster flying models featured here, you know just how to go about getting them - send me some photos and details!!!!

Anyway, as I was saying before I was so rudely interrupted (by myself!), if more recent types and faster flying models are what do it for you, this could be right up your alley. Being somewhat younger than I, and presumably having somewhat better reflexes and flying skills, our featured designer/builder is much more of a 'speed-merchant' than I am. Mark Rittinger is to more modern types what I appear to be to the 'early birds': quite a prolific designer. Unlike me, however, his models are





As you can see, panel shaped pieces of aluminium tape form the basis for the finish.



It takes a lot of surface preparation and careful application to get the aluminium tape to go onto the model as well as this.

largely US modelling press oriented. Not too surprising, since that's where he lives.

Okay, as normal with this sort of item, I'll pass you over to Mark for a bit of an introduction. I always feel it's nice to know the modelling history of a builder or designer, it gives us a bit of insight into what has influenced the path they've taken. Once that's done, I'll attempt to do justice to the models of which Mark has been kind enough to supply photos.

The man himself

“ I was born and raised in the Detroit area, the son of a machinist, and my earliest memories of modelling are watching my dad build Carl Goldberg Falcon models in the garage. He always had a little bench where he showed me how to build rubber powered free-flight kits; Comet, Guillows, etc. From there, I went on to 1/2 A, Cox powered CL, models like the Goldberg Whizard and

Scientific models. Weekends were spent with the family and friends at the flying field, back in the 1970's.

My dad competed at the Toledo Expo several times, and actually won Second Place in 1979 or 1980 with an electric powered (re-wound slot car motor) 36" span Avia S199, and a First Place in 1980 with a twin TeeDee .049 Westland Whirlwind, complete with hand machined "prop-stops".

Dad passed away in the autumn of 1980, and at the age of 12 I spent a lot of time in the basement shop designing and building. It kept me out of trouble, and my mom knew where I was. One of dad's buddies got me flying RC with 2-meter gliders like the House Of Balsa 2 x 6 and the Goldberg Gentle Lady. I designed a few, including my Manta, and the Pharoah. My first electric model was a scaled up, 50" span Peck-Polymers 'Prairie Bird'. I had little money, and some spare R/C buggy

parts, so I used a Tamiya can 550 motor, an epoxied-on wood glow prop, an on/off switch, and a seven-cell buggy pack. It actually flew, made a few circles of the field on rudder and elevator, but that was about it. (Ah, those early days of electric flight, I remember them well. Thank goodness they're over. PR)

At age 17 I enlisted in the US Army and a posting to West Germany in the Field Artillery didn't afford one much modelling time. Upon release from the service after the Gulf War, I got back into modelling with dad's friend Jack Rosenthal. This was about 1992 or so, and

MARK'S BF 109 SWOOPS BY SHOWING HOW SUBTLE THE WEATHERING CAN BE USING THE METHOD DESCRIBED.



Mark has every right to look very pleased with himself. The weathering shows up very nicely in this shot and is not in the least overdone.

electric power was just starting to take off, no pun intended.

I was immediately attracted to the clean, quiet challenge of making things work. I got back into RC, once again got proficient at flying on some old glow models, then set about purely electric powered designs.

One of my first was the 'Python', a speed 400 sized sorta-Reno racer P-51, which was in fact a scaled down, simplified 1/4 Midget racer. It is now a free plan download on RC Groups.

From there, a speed 400 Messerschmitt Me 262, Westland Whirlwind, Kawasaki Ki 61, DH Mosquito, B 25 Mitchell, Martin B-26, North American A-26 Invader, DHC Caribou and many more followed. I also was challenged by those who said that a scale warbird just wouldn't work for electric. So I came up with a cheap set-up that put out great power, and

JUST TO WHET YOUR APPETITE, THIS HURRICANE WILL FEATURE NEXT MONTH.



designed the P-51, P-40, Ki.61, Dauntless, Bf109, Fw190, Spitfire, Hurricane and others with 42" span and geared R/C truck motors on Ni-Cads. They flew great, went together easy, yet were not very far off from scale outlines. They flew nice at 45 ounces with those set-ups, and fly spectacularly now with brushless motors and light LiPos. I even tried a 'Precious Metal', the Contra-rotating 30" P-51 with two Speed 400s running handmade gearboxes, and it flew!

Along the way, I've also created a few original sport models, like the still-amazing 'Sportwin' that shocked many with great performance on meagre speed 400s and the 'Quadzilla' four-motor pattern type ship. Most recently came the 'Super Sportwin', a larger, more powerful version of the S400 'Sportwin' using retracts and much higher power.

My latest projects have gone up in size, and the Bell P-63 Kingcobras are really fun ships. The first, since I really like a challenge, was the extremely clipped wing Tucker Race number 28 with retracts. This model has scale clip, and while it LOOKS scary, is actually a decent flying bird. The second P-63 was the Whiteside Race 87, done as a hand-launcher, with mild scale clip of the rounded tips. Much more fun to fly! The latest project I've been working on is a scale Reno Racer, the Osprey GP-5. This little wood homebuilt, powered by a small-block Chevrolet, was so fast that they changed the rules to make it ineligible to compete.

So, you can see I like a challenge, and I like something out of the ordinary. While keeping magazine readers happy with easy to build, popular scale

and sport models, I stretch my own designing and flying skills by doing more unusual, challenging designs. Perhaps a Napier-Heston racer is next, or an odd Blohm und Voss ship?"

So, there you have it. You now know how Mark got to where he is now and what motivates him to design the type of models he builds and flies. With the introduction out of the way, I'll now attempt to describe the individual models Mark was kind enough to send photos of. Since they are relevant to the overall story of Mark's modelling history, I'll include a couple of his sport models, along with the scale jobs. If nothing else they will serve to demonstrate what sort of set-up works in similar style models, thereby giving an indication of what scale models of similar proportions will require.

Interesting

Before moving on to detailing the individual models, How Mark has finished a couple of them is worth looking at in its' own right. Whilst most of them use film and paint finishes, with other techniques applied where appropriate, two in particular stand out as being different and possibly of interest to other builders of similar models.

The models in question are the rather nice looking Messerschmitt Bf 109 and Focke-Wulf Fw 190. Hard working aircraft in real life, they never look quite right in a pristine, factory fresh finish. However, it's only too easy to overdo the 'weathering' and end up with something very toy-like in appearance. Mark has managed to tread the fine line between realism and overkill in a rather innovative manner. I do stress, however, that this is a finishing technique that has to be handled carefully to prevent a fairly rapid build-up of excess weight - so be aware of the risks if applying the finish to your own model. An Fw190 that flies like a WW2 fighter is great, but one that has to fly at the speed of a modern jet is not so clever.

I rather like both these types and, if (a very



Catching 'em young. A very youthful Mark poses with his dad's Goldberg Falcon.

A subject admirably suited to a bare aluminium tape finish. More about the Marauder next month.



big IF) I were ever to build a WW2 model, it would probably be either of these prototypes. Therefore I felt going into detail about how Mark finished his models was a worthwhile exercise. I doubt that I'll ever need the information, but at least I now know just where to find it.

Basic construction of both models is very similar; an all-balsa fuselage and foam wings. As you'll see, the same method could be used on fully sheeted wings, but isn't applicable to models that don't have a solid surface upon which to apply the finish.

With the structure completed, and thoroughly sanded smooth, the entire model is glassed. Presumably, in order to save weight, this means an all over coating with skinning resin, but no actual glass cloth. (Yes, hard as it may be to believe, I do actually know about such types of finish.

In my misguided youth I did build models that weren't of WW1 and pioneering types. Goodness knows what I was thinking, but there you have it, I've owned up.) As you can imagine, this too has to be gently sanded completely smooth. At risk of preaching to the converted, always remember that with a painted finish it will only ever be as good as the preparation you are prepared to put into it. Even tiny lumps and bumps will become glaringly obvious as the finishing progresses. In my own experience, I find that nothing coarser than 400 grade wet or dry paper, used wet, gets you close to where you need to be and using finer grades, again used wet, results in a very smooth finish. The only proviso, of course, is to take great care not to actually sand right through the resin. You'll soon know if you have because the water (using the abrasive wet) will raise the grain of the wood - and put you back to square one again.

So, anyway, where were we before I started to wander? Oh yes, we had a glassed and carefully sanded model and were about to begin applying the finish Mark used. The next stage is to cover the entire model with thin aluminium tape. Mark mentions Harbor Freight HVAC tape by name, but I'm sure anything similar would work just as well. He doesn't specify precisely how he goes about this, but I'm assuming, from looking at the photos, that applying it in roughly panel shaped sections would give the most realistic finish because any paint removed from the edges is automatically where it would appear on the full-size aircraft. Also, I notice that control surfaces that were fabric covered don't receive the tape treatment except to emphasise where the 'ribs' would be.

Now, faced with a dazzlingly shiny model, he applies the colour scheme using Tamiya spray cans. And then attacks the only partially dry paint with what he describes as 'scrubbie pads' and high tack masking tape. I suppose that means something like Scotchbrite scourers - those green fuzzy things sold virtually everywhere. By not treating the aluminium before applying the paint, and not letting the paint dry completely before applying the 'weathering', he says it is relatively easy to obtain a realistic, well-used look.

Obviously, although we are specifically talking about WW2 aircraft here, the process is equally applicable to other types likely to have worn or chipped paintwork over metal panels. The nose area of WW1 types being a case in point, but it also applies to any hard working prototype. Equally so, if you omit the painting stage, it could just as well be used on bare metal finish types. All you'd have to do is polish individual panels to varying degrees to provide a most realistic impression of a metal skinned aircraft.

One proviso I would point out with this type of finish is that you will definitely need to be a



Okay, not a scale model Quadzilla, when we look at it more closely, will still reveal suitable set-ups for similar looking scale types.



Mark's latest model, and another I don't have room for this time, is an Osprey racer. Sleek isn't it?

bit careful where you route the receiver aerial. Since metal foil does an absolutely stunning job of blocking radio signals, you'll need to make entirely sure that you don't put in all this work only to lose control of your model the moment it leaves your hand. If for no other reason than that it would crumple all your carefully applied aluminium tape.

Moving on

Okay, so now we know how Mark finished these particular models, I suppose that would be a good place to begin getting down to more specific details about them. As usual, I can see I'm getting close to running out of space but there you go; you can't have everything. With the finishing technique fully described above, it won't matter if I stick to basics with the rest.

My favourite plane

Okay, so maybe you didn't need to know that, but I do really like the Messerschmitt Bf109 in most of its' various forms. In this instance, it appears to be an 'E', the type used in the Battle of Britain, but in finished here in desert colours. The spinner, which as much as anything leads me to believe it's an 'E', is glassed foam (1 ounce cloth), with a 3/32" ply back-plate.

As mentioned, the structure is a mix of an all balsa/ply fuselage and foam wings. It spans 42" and tips the scales at a respectable

32 ounces. Power is provided by a 42-40-900 motor, running on a 3s, 2600 mAh LiPo pack. Controls are aileron, elevator and throttle. Getting her airborne is achieved with a good, strong heave - its' hand-launched and has no u/c.

Second favourite?

Probably it is, there aren't too many WW2 types that appeal to me, but the Fw190 is well up there on my list. If I had to choose between the 109 and 190, it would be a very close thing. Even I'm not sure which way it would go.

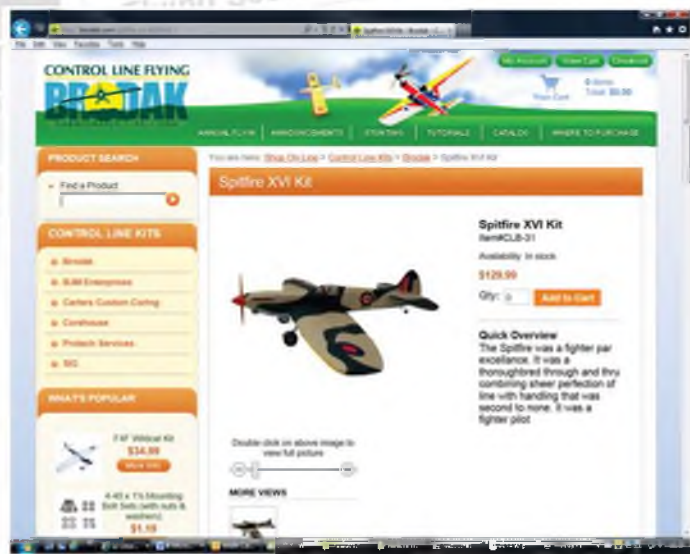
Of very similar size to the 109 (42" span), and very similar construction, the 190 has room in the nose for a 4.4:1 geared Multiplex motor. Another 3s, 2600 mAh pack providing the urge. Mark doesn't mention the controls, but I would suppose they are as per those of the 109 - aileron, elevator and throttle. This time, the all up weight is 35 ounces. Not at all bad for such a bulky, pugnacious looking model. There's just something about the look of a 190 that absolutely screams FIGHTER and Mark has captured that extremely well in his model.

There, I've done it again, run out of space yet again. Not to worry, that allows us plenty to look forward to next time.

If you have any contribution to make to the column, have a question, or just feel like a chat, you'll find me at PETERRAKE@aol.com ■

Techno Scale

Mike Evatt enters cyberspace for more TechnoScale Topics



ABOVE LEFT: Brodak's Spitfire XVI Kit for control-line.

ABOVE RIGHT: A PT-17 Stearman designed by Nick Zirola from the National Balsa Wood Co.

<http://brodak.com> is the URL for Brodak's on-line control-line emporium. If you are the least bit hooked on C/L you must drop in! Whether you are an experienced control-line builder and flyer, or whether you are just starting out, Brodak Manufacturing & Distributing is the "one-stop shopping" option for all of your needs. Their stock is simply staggering! 186 C/L Kits and 368 Engines are listed in their catalogue. Their Spitfire XVI kit shown in the screen-shot has a wing span of 54 in. and is designed for a 0.40 IC engine.

National Balsa Wood Co. at

<http://www.nationalbalsa.com> sell balsa wood, basswood, plywood, cherry, walnut, maple and mahogany and have been serving the needs of model makers, manufacturers and architects for over 20 years. Their state of the art facilities combined with their volume buying power directly from the plantations, allows them to pass on incredible savings. They maintain a secure online store where you will find not only timber supplies but also scale kits such as the PT-17 Stearman shown in the screen-shot. This 77 inch span wonder was designed by Nick Zirola for a 35-42 cc powerplant.

There are some delightful indoor R/C scale

models about these days which can provide hours of pleasure for a modest outlay. Log-on to <http://www.rcmodelcentre.co.uk> and take a look at the Nine Eagles YAK 54 RTF. This gem is a full-on aerobatic model that can be flown indoors or out. With an average flying weight of around 35g, outside flying needs to be in calm conditions. This model is intended for experienced aerobatic flyers only. The controls are powerful, although two levels of response can be selected within the transmitter. Absolutely no additional purchase is required to get flying. Even the four AA dry cells for the transmitter are included. What's more, the box it



ABOVE LEFT: The delightful Nine Eagles YAK 54 RTF. ABOVE CENTRE: A Focke-Wulf FW-190 from the German company LRP. ABOVE RIGHT: Wheelspin Models claim to be Europe's largest Model and Hobby Superstore!



TOP LEFT: Little Soaring Fleet is based in Poland and also sell excellent scale pilots. **TOP RIGHT:** Frisch Modellbau's version of the Polish PZL 104 Wilga 35 in 1/4 scale. **ABOVE LEFT:** Cine-Scale for "haute couture" scale model helicopters. **ABOVE RIGHT:** Don't miss the information on the Turbine Airframe for the VARIO Chinook body.

comes in can double as transport case as it has been cleverly designed to do just that!

The German company LRP, run by Jürgen E. Lautenbach, is probably better known for its model car racing products and expertise, however it is into R/C aeroplanes including two scale aircraft. Both are for electric power and come in either ARTF and RTF forms. The pair are a Cessna 182 and the Focke-Wulf FW-190 (shown in the screen shot). The Focke-Wulf model is made from durable EPO foam and is very strong. The paintwork is true to the original from the 40's and as unique as the authentic flight silhouette. Due to the powerful 3S brushless drive set, every flight manoeuvre will be successful. Check it out at <http://www.lrp.cc>

Wheelspin Models at <http://www.wheel-spinmodels.co.uk> claim to be Europe's largest model and hobby superstore! What started as a simple backstreet model shop has now evolved into a huge retail and mail order superstore with a worldwide customer base. Their retail store alone measures over 7,000 square feet! What took my

fancy here was the 'Advanced Scale Models' Pitts Special. This new version comes in a terrific new colour scheme. Designed for 1.20 size four strokes, it spans almost 1600mm (62.5").

Little Soaring Fleet is based in Poland and has a web address of <http://mysite.verizon.net/vze2gbfc> If you are tired of seeing ASH, ASW, DG, Ka6 gliders on your flying field this site is for you. If you are familiar with Foka, Swift, Fox or Wilga and would like to know more about other less known Polish gliders and soaring related planes then look no further. They also do a nice line in pilots as shown in the screen-shot.

Frisch Modellbau at <http://www.frisch.flugmodellbau.de> has been serving aeromodellers for more than 25 years and offers superb quality. Their version of the Polish PZL 104 Wilga 35 in 1/4 scale has over many years it has proved itself as an excellent towing aeroplane. The flying characteristics exceed those of the original in regard to climbing performance and ranges of application. Thanks to the large dimen-

sioned flaps, every drag-up and performance speed can be reached.

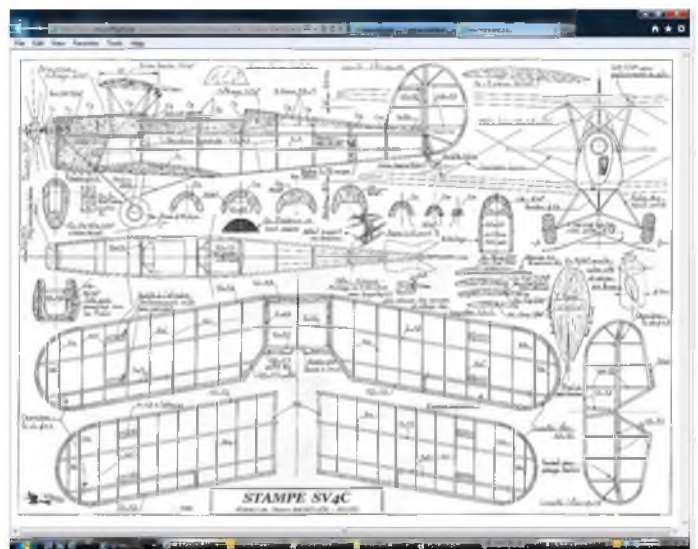
Cine-Scale maintain a web presence at <http://www.cine-scale.com> If you are looking for "haute couture" scale helicopters: from your dream to reality, then this is the shop for it. Cine-Scale Helicopters designs and builds functional radio controlled scale model helicopters. Their workshop's specialty is to complete their models to an unmatched level of finish, and to handle tailor made projects for their clients. Each model is unique, and built exactly in accordance to your requirements. They are even using 3D printing techniques to make details and accessories to an accuracy of 1/100 of mm!

The folk behind the website at <http://www.rcturbinehelicopters.com> are specialists in **turbine powered R/C helicopters...** with a background in specialist engineering, aerodynamics, and also manufacture of aerospace composites. They have a range of heli-turbine packages including their Heli-turbine system and their recent development of a Turbo-Prop system. Their photo and article gallery has much to offer the scale enthusiast. Don't miss the information on the Turbine Airframe for the VARIO Chinook body.

The **Midlands Large Model Flying Group** is made up of a small band of like-minded modelers who come from all walks of life but all share the same passion for larger than average radio controlled model aeroplanes. They enjoy six days a week access to their very large and well groomed flying field. With good overall open aspects, their flying site has played host to some of the largest and most spectacular radio controlled models ever to be seen anywhere in the UK. It is well worth visiting their website at <http://the-midlands-large-model-flying-group.webeden.co.uk> for the interesting web articles and excellent photo galleries alone.

If you are looking for a plan for your latest indoor F/F Scale model then you must visit **Microflight** at <http://www.microflight.be> This Belgium website has a plethora of plans to suit all tastes and abilities. I particularly like the Stampe SV4C, in Peanut Scale, designed by Thierry Bachelier shown in the screen-shot.

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



ABOVE LEFT: The Midlands Large Model Flying Group is passionate about large R/C scale. **ABOVE RIGHT:** The Stampe SV4C, in Peanut Scale, designed by Thierry Bachelier.

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