

# Flying Scale Models

[www.flyingscalemodels.com](http://www.flyingscalemodels.com)

**SOPWITH SWALLOW**

PART 2: 1:6 SCALE 57.5" WINGSPAN FOR ELECTRIC POWER

**FULL SIZE FREE PLAN WORTH £24.95**



**MASTER MODELS**

## SHORT SUNDERLAND

FOR ELECTRIC POWER

## MARTINSYDE F.4 BUZZARD

1:6 SCALE, 62.5" (1600MM) SPAN FULL CONSTRUCTION FEATURE

**REVIEW**

## MAXFORD AIRCHO DH 2

WWI PUSHER FOR ELECTRIC

**REVIEW**

## PERFECT FOR R/C SCALE! JR XG11 EXAMINATION

MANY GREAT FEATURES FOR SCALE MODELS



## SOPWITH PUP

1:18 SCALE, 17.7" (448MM) WINGSPAN BUILD IT FOR INDOOR OR OUTDOOR ELECTRIC - **PULL OUT FULL SIZE PLANS**





# Parrot

## BEBOP DRONE

### SKYCONTROLLER



#### Own the sky with Parrot ultimate Full HD drone camera

- Lightweight and robust design built with safety in mind
- 14 megapixel "Fisheye" camera stabilised on 3-axis
- First-Person-View piloting
- Live video streaming
- Control the angle of the camera from the piloting application
- Extended range with Parrot Skycontroller add-on



FreeFlight 3 is available for free



From £499 - More details on [www.parrot.com](http://www.parrot.com)

Parrot SA - RCS PARIS 394 149 496.



THE ISSUE AHEAD...

# FORMATION...

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



6



12



40



## ON THE COVER

David Baker built his 86" wingspan Short Sunderland as a weekend workhorse for regular rise-off-water flying, rather than a special-events-only hangar queen. It tips the scales at just 7 lbs. Four Turnigy 1400 kv, 180 Watt brushless motors provide the lift-off, driven from two 2650mAh three-cell power packs. Read all about it in Alex Whittaker's review starting on page 40 in this issue.

## JUNE 2015 NO.187

### 4 CONTACT

Just for starters

### FULL SIZE FREE PLAN FEATURE

#### 6 SOPWITH SWALLOW

PART 2: Continuing construction of the 1/6th scale model designed by Peter Rake, built and described by Charles Sherman

#### 12 MARTINSYDE F.4 BUZZARD

Dr. Mike Hawkins F.R.Ae.S. presents his 1/6th scale 62.5" (1660mm) wingspan model of the best WW1 fighter type that the Royal Air Force never had!

#### 18 BUZZARD TYPE HISTORY

Story of an outstanding WW1 fighter overtaken by the course of history

#### 22 RADIO REVIEW: JR X11

Ian Titchell takes a detailed look at JR's 11 channel radio, with scale modellers in mind

#### 30 THE QUIET ZONE

Peter Rake presents another miniature indoor/outdoor model with full size pull-out plans. This time, it's a Sopwith Pup and he combines this with a wealth of technique tips for keeping the weight down and R/C system options

#### 40 MASTER MODELS SHORT SUNDERLAND

Alex Whittaker admires David Baker's 1/16th scale 86" (2,184mm) off-water flier built for electric power

#### 46 KIT REVIEW: MAXFORD USA AIRCO DH2

Something really different in WW1 ARTFs - an electric powered pusher

#### 54 FOCKE WULF Fw 190D ANATOMY

Fine-line drawings in 1:40 scale by Arthur Bentley (Part 2)

#### 58 SCALE SOARING

Chris Williams expounds the value of CAD plan-drawing technique while finishing yet another version of the Scribe Bergfalke and harps back to last August's White Sheet

#### 62 SCALE FROM SCRATCH: PART 4

Designing and drawing WW2 fighter wings,...strength-v-weight, the Ken Sheppard way



**Editor:** Tony Dowdeswell  
**Publisher:** Alan Harman  
**Design:** Peter Hutchinson  
**Website:** ADH Webteam  
**Advertising Manager:** Gareth Liddiatt  
**Admin Manager:** Hannah McLaurie  
**Office Manager:** Paula Gray

**FLYING SCALE MODELS** is published monthly by ADH Publishing, Doolittle Mill, Doolittle Lane, Totternhoe, Beds, LU6 1QX. Reproduction in part or whole of any text, photograph or illustration without written permission from the publisher is strictly prohibited. While due care is taken to ensure the contents of Flying Scale Models is accurate, the publishers and printers cannot accept liability for errors and omissions. Advertisements are accepted for publication in FLYING SCALE MODELS only upon ADH Publishing's standard terms of acceptance of advertising, copies of which are available from the advertising sales department of FLYING SCALE MODELS.

#### EDITORIAL ADVERTISEMENT

**& CIRCULATION:** Doolittle Mill, Doolittle Lane, Totternhoe, Beds, LU6 1QX.  
Tel. 01525 222573 Fax. 01525 222574.  
Email: [enquiries@adhpublishing.com](mailto:enquiries@adhpublishing.com)

#### CIRCULATION TRADE ENQUIRIES:

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

**NEWSTRADE:** Select Publisher Services, 3 East Avenue, Bournemouth, BH3 7BW.  
01202 586848  
Email: [tim@selectps.com](mailto:tim@selectps.com)

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

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

**(c) Copyright Flying Scale Models 2015 ADH Publishing.**

The paper used on this title is from sustainable forestry

# CONTACT

## FLYING SCALE MODELS SCALE TROPHY 2015

On 21 June North Berks MFC is the place to be...

Since *R/C Model Flyer* magazine is no longer with us, the popular R/C Model Flyer Scale Trophy competition/fly-in this year has been renamed 'The Flying Scale Models' trophy, sponsored by this magazine.



There will be trophies in three categories to be won. The **FSM Scratch-built Trophy** will be for the best scratch-built scale model flown on the day - scratch-built that is from original design, plan or balsa built-up-kit; the **FSM ARTF Makeover Trophy** for the best ARTF makeover (i.e. customized to inject a degree of individuality - for example a revised colour scheme); and also an **FSM Clubman Trophy**. So everyone will be in with a chance!

As per the previously established precedent, judging will be laid back and the atmosphere very relaxing with the emphasis of appreciation of everyone's models - just bring a scale R/C model and fly! If you would like to bring a turbine powered model, please check with the Club President, Ed Darter on 07973532228, before traveling, to check if gas turbine models are permitted due to farmer restrictions.

There will be onsite facilities and a super BBQ will operate over the lunch hour. Competition rules are simple - there aren't any! You'll be made very welcome. Any queries, or for directions, ring Ed!

Last year, to commemorate the start of WW1, the Scratch-built Trophy was awarded to the best WW1 present flown on the day and, as it was also 70 years since the Normandy D-Day landings, the ARTF Makeover Trophy went to the best re-worked ARTF model of a type that took part in D-Day (well, it had to have invasion stripes!). This year, however, there are no themes, so any scale model is in the running, providing it flies on the day. Judges will be looking for scale-like flying, as well as an accurately detailed finish!

If you haven't been before, why not come along - you'll be guaranteed a friendly welcome - and a great day of scale flying!

The North Berks flying site is north of Wantage, Oxon, off of the A338, just above East Hanney - the access road to the site will be signposted. See you there?





# GET YOUR HANDS ON ULTRA **POWER**



## CHARGE ...your passion



*OptiFUEL™ is one of the fastest growing brands in Europe with competition winning Nitro fuel products for the RC Model sector, now OptiFUEL™ is delighted to add a new brand OptiPOWER™ which will be the flagship brand for the new range of RC Chargers and LIPO cells.*



> **ORDER NOW** FROM YOUR LOCAL RETAILER  
FIND YOUR SPEC @ [www.optipower.co.uk](http://www.optipower.co.uk)

**OptiPOWER™**  
...your passion



# Sopwith Swallow

PART 2: Continuing the construction article for the 1/6th scale model designed by Peter Rake and built and described by Charles Sherman

.....  
Having promised myself to draw up this model, things kept interrupting the progress of actually getting the plans drawn - usually in the form of other plans in need of drawing. I'd drawn up plans, in various scales, for the Sopwith Monoplane number 1 (Scooter), but never for the Military Monoplane number 2. A little urging from others, Charles included, prompted the model you see here. That's it from me, I'll simply hand you over to Charles for all the details. *PETER RAKE*  
.....



Climbing gently away for another flight, the Swallow shows off her simple, but attractive lines.



## MORE WING STUFF

The wires for the aileron servos were inserted next. The wires will run to the fuselage from the wing inside the rear centre section struts. Mark off the position where the struts will be attached to the wing and drill a hole for the aileron wire through the plywood plates.

A pylon structure is mounted in the centre of the wing from which eight support wires run to attachment points on top of the wing. The 16 gauge wire I'm able to obtain won't bend past 90 degrees without cracking, so after a couple of failed attempts, I decided to deviate from the plan and join up the four legs of the pylon from individual pieces of wire, rather than the two triangular sections shown in the plan.

*(16 swg wire shouldn't be a problem to bend into the shapes shown, but if yours is, follow the method Charles describes. It's another of those materials that can be a bit variable in quality. PR)*

I created a simple jig by drilling holes where each leg will be located in the wing and marked off the point where they should all connect. I cut the four pieces and bent them to the correct angle. I then soldered the front pair together, followed by the back pair. I next slipped a small metal ring over the top and secured it with some strands of thin wire, then soldered that onto both sections. The ring ties everything together and is also what the rigging wire will be connected to.

Next, I drilled holes into the ply sections at the position where the rigging structure is intended to be lashed and glued to, inserted the legs of the pylon and glued into place.

The photos show the wing with just two of the three layers of 1/8" balsa used to form the back of the wing centre section. I had left the third one out until the rigging structure was in place so the holes to which the structure was to be lashed to the wing, could be accessed. I glued the third layer down, then sheeted the centre and front sections and sanded it all down. The gaps were filled and sanded prior to covering the wing.

At this stage, I installed the aileron servos (R8 and mounting plates glued into place) and did the final sanding of the wing.

## ON TO THE FUSELAGE

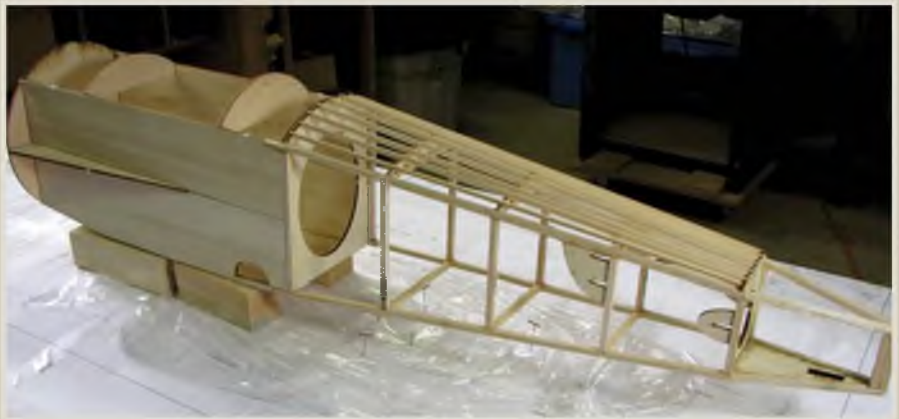
The fuselage is built in two sections. I started by building the sides of the rear section over the plan, one on top of the other to make sure things were even. I then cut the cross pieces for the top and bottom, making sure they were the same length and used the top view of the plan to line things up.



The simple jig Charles used while setting up his rigging pylon. See text for reason why.



The pylon bound in place onto the ply dihedral braces.



The basic fuselage structure is pretty straightforward, although I'd have been tempted to fit the centre section struts before the stringers - so I didn't risk breaking any.



Can you spot the 'deliberate' mistake? Yes, those c/s struts are in the wrong positions. At least it shows how they're bound in place.



I'd actually intended those exit plates to be flush with the outside and the tubes trimmed off flush. This way, only the tube will come into contact with the covering.



Starting with an undersize cockpit opening, and the sheet behind it slit helps set it up around the change of angle involved.



I connected one side at a time to the bottom cross pieces making sure the side was joined at 90 degrees. Once happy with that, I connected the top cross pieces and then inserted F10. The longerons were cracked behind F10, then pulled in and glued to the ply plate to hold the tailskid (TS). *(When you do this, make sure you score the inside and fill the score with glue before you pull the sides together. Cracking the outside of the longerons leads to a gap, and weak spots. PR)*

The front section is pretty straightforward. Each side combines two sections of 1/8" thick balsa and F1 and F6 are used to join the front and back. A section marked as D is added to the forward inner side of each side section and then the two ply pieces used for securing the undercarriage in order to help keep the section squared up are glued into place. Assembling this section over the plan, and repeated



checks, assist with keeping everything completely square. All the items referred to are clearly marked on the plan.

With the two basic fuselage sections assembled it's time to join the front and rear assemblies. This task is made simple as the forward section of the fuselage is designed to receive the tail section. However, since straight fuselages fly better than ones that resemble a banana, do all the assembly working over the plan and take care to ensure that it is not only straight, but square too.

Now, with a full basic fuselage structure it is time to think about fitting the centre section struts before adding anything else. Since it's important that the wing is at the correct incidence angle, it is well worth making up a simple jig to assist in binding and gluing the strut wires to precisely the correct height above the sheet fuselage sides. This jig should take the form of two pieces of balsa that follow the shape between wing underside and sheet fuselage side, attached to a piece of ply that represents the lower surface of the wing. Make the ply complete with saddle clamps at the correct locations for the strut ends and marked for the side supports. Glue the side supports to the ply plate and you have your jig.

Bind the centre section strut wires to formers F2 and F4, but don't glue the bindings yet. Spot glue the jig



accurately onto the sheet fuselage sides and use the saddle clamps (or your P-clips) to pull the strut ends into the correct positions. Now firmly glue the strut wires and bindings to the formers. Don't worry if the rear strut is

All set for another outing the Swallow puts a lesser known Sopwith type into the air.







**It really is a pretty simple model to build, as shown in the obligatory naked model photo.**

still able to rotate, it won't once the wing is fitted, because the front strut will prevent that. Don't throw away that jig you made, because it can be used as a guide to drilling the wing so the P-clip positions are correct.

To complete the fuselage, fit the remaining top formers (F3, F5, F6/F6A, F7, F8 and F9), along with side formers F1A and SK. Once these are dry, the 1/16" balsa sheeting and stringers may be fitted. Note how the side sheeting is cut away at the front rigging point position. This is a feature on the full-size aircraft too. Fit the split pin (cotter pin) rigging points, bending over the ends inside the fuselage and gluing well with epoxy. Finally, glue in place the control cable exit parts, add the nylon tube cable guides and sand the fuselage ready for covering.

### THE COWLING

There are a lot of pieces in the cowl. Five balsa rings of four sections each and two ply rings made up of two sections each. There is a good reason for doing it this way, but do make sure you assemble each of the balsa rings over the plan because I can't guarantee that all four parts of each are identical.

The reason these rings are built up in this fashion is to do with the option of laser cut parts being made available by the publisher. Nice as single rings might be, for some reason (largely to do with humidity changes and stresses in the wood being relieved) they never seem to remain circular by the time they get to the prospective builder. To avoid this, the sectional approach is used. The added benefit of this being that it is now possible to arrange the grain in each ring so that you have the minimum of cross grain to shape and sand. Anything that makes it easier to perform this task has to be a good thing.

Begin assembling the cowl by making up the balsa rings and gluing the rings together. Further alternating the grain direction will not only add to the ease of shaping, it also makes for a stronger cowl front. Throughout this step, please avoid CA glues. They are notoriously difficult to sand easily and are likely to result in ridges on your finished cowling. PVA woodworking glue is fine, but Aliphatic (yellow) glue is better still because it sands so well.

Next month, in the concluding part of this construction article, we'll finish the cowl, look at covering and finishing the model and the all important flying notes. ■

CUT PARTS  
SET FOR THE

# SOPWITH SWALLOW

Get straight down to construction without delay! This month's full size free plan feature is supported by a laser-cut set of ready-to-use balsa and plywood components. This provides all the parts that, otherwise, you would need to trace out onto the wood before cutting out.

**IT DOES NOT INCLUDE STRIP AND SHEET MATERIAL OR SHAPED WIRE PARTS**

**Price £95.00**

plus carriage: £11.50 (UK); Europe £26.00

### Order set CUT/FSM505

Shipping Note: For shipping to destinations outside the UK and Europe, you will be charged our standard flat-rate price of £49. This covers most destinations and secures your order with us. However, we will contact you accordingly with an accurate total shipping charge prior to dispatch and either issue a refund or a PayPal money request for the balance.

Visit our secure website:

**[www.flyingscalemodels.com](http://www.flyingscalemodels.com)**

to order yours



Order direct from:- ADH Publishing, Doolittle Mill, Doolittle Lane, Totterhoe, Bedfordshire, LU6 1QX, UK. Tel: 01525 222573/  
enquiries@adhpublishing.com.



www.flyingsca



NEVER MISS AN ISSUE  
**SUBSCRIBE TODAY!**

www.adhpublishing.com

£42

Get your copy delivered to your doorstep before it reaches the newsagents by subscribing



www.adhpublishing.com



01525 222573



enquiries@adhpublishing.com



**JOIN THE ELECTRONIC REVOLUTION**

Enjoy FSM on your iPhone, iPad, Android phone or tablet PC.

Visit the App Store or Google Play and search for "Flying Scale Models" or visit PocketMags.com to purchase single issues and subscriptions to read on your device or PC.



Available on the iPhone  
**App Store**



**Google play**



lemodels.com

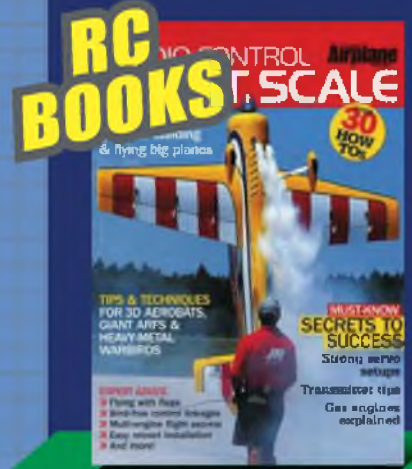
Follow us on Facebook  
facebook.com/pages/Flying-  
Scale-Models/495012097186048

Follow us on Twitter  
@ScaleModelFlyer



- MASTER MODELS
  - TYPE HISTORY
  - IN DETAIL
  - SCALE DRAWINGS
  - FREE PLANS
- CONSTRUCTION
  - TECHNIQUE
  - SHOW REPORTS
  - FLYING COLOURS
  - HOW TO'S
- GLIDERS
  - ELECTRIC
  - SCALE INDOOR
  - SCALE REVIEWS
  - SCRATCH BUILD

ALSO  
AVAILABLE  
FROM ADH  
PUBLISHING...



[www.adhpublishing.com/shop](http://www.adhpublishing.com/shop)



SUBSCRIBE FOR ONLY **£44**



SUBSCRIBE FOR ONLY **£55**

SEE THE ADH  
WEBSITE FOR MORE...





# Martinsyde BUZZARD

Dr. Mike Hawkins F.R.  
62.5" (1660mm) wingspan model  
that t





# BURZARD

Ae.S. presents his 1/6th scale of the best WW1 fighter type the Royal Air Force never had!



The Mike's first attempt, back in 1956 - 1/6th scale for control line, with Frog 500 power.

I first made a model of the Buzzard for control line in 1956. It was built to 1/12th scale and powered by a Frog 500 with its round topped plug. As I remember, it flew quite nicely, on the Race Course with the Worcester Model Club. One photo has survived.

### Ah yes, those were the days

I liked the shape then, I like it now, so this model, for radio, is built to 1/6th scale giving a span of 65.5 ins. (166 cms.) weighing in at 10.5 lbs. (4.8 kg.)

Construction is conventional built-up balsa and plywood

### Wings

The upper and lower wings are each made in one piece using balsa for leading and trailing edges and hardwood 1/4 in. square for spars.

Spruce is the best wood for this and was used on the original control line aircraft, but like crab in a seafood restaurant, is no longer easily available - and for the same reason I cut my spars from some strip wood I bought at a Do-it-Yourself shop.

The original aircraft had very close rib spacing that was not needed on the model, so I halved the number of ribs. Rib tapes are ironed on, over all rib stations and the fact that half of these have no rib underneath does not show.

Strut and wire fittings screw into 3/16" ply base plates between the ribs, after covering. The strut fittings can be made up from brass or dural, but aluminium is probably too soft. The strut body is 3/16" carbon fibre tube with a loop expoxied into each end. An unrolled paper clip is soft enough to enable the loop to be rolled by hand, on a slightly larger bolt, to give clearance.

Add a balsa fairing to shape to the strut and cover with *Solarplex*.

If you fly off tarmac, it is a good idea to add a plug-in wire hoop under each

lower wing tip to avoid scratches. Rub a damp bar of soap on the spar surfaces between the ribs so that the covering does not adhere in a dimple.

### Fuselage

The flat-sided fuselage uses light 1/8" plywood for the forward sides and 1/4" square hardwood for the rear open structure. Inside, doublers increase the strength for strut and undercarriage attachment.

The original aircraft had a gap behind the radiator to let cooling air out. The model's radiator, made up from 1/8" ply, has to be supported by F1 at the top and 1/4" square stringers at the bottom. F2 is angled slightly forward to give 2° downthrust and 3° right thrust. Engine mounts are screwed to F2 so that the prop driver is on the aircraft centre line.

The tank, at least 10 oz. for the *Laser 750*, can be slid into place through the lower wing-fixing hole. I suggest a duct tape loop around the tank to ease extraction and when fitting, pass three kebab skewers in from the front, through the hole in F2 and push them into the fuel tubes to lead them through the hole.

The panel over the top of the cowling is from aluminium sheet, screwed in place. This allows access to the battery box and was most useful when an engine change was necessary.

The horizontal tail is mounted at +3° incidence.

The cockpit has not been made full depth but nobody seemed to notice.

### Radio

2.4 GHz radio is recommended. I used *Hitec* with an *Optima 6* receiver running on 6 volts, 1000mAh NiMH batteries.

Aileron servos are mounted on the lower wing with access panels from underneath. HS 225s are fine. You need to make up a Y-lead to connect the





1



servos to the receiver in the fuselage - and do use heavy gauge electrical wire.

The aileron push rods on top of the top wing are dummies. Standard servos can be used for rudder/elevator/throttle. Heavy duty servos are not needed on these small control surfaces.

Polythene lead tubes of 1/8" i/d are used for the closed loop cables to rudder and

elevator. These are epoxied to the platform on F 6 and to sheeting at the tail outlet. The elevator cables are doubled, one for each side. 60 lb. test nylon covered fishing trace wire is fine for the cables.

#### Covering

Iron-on *Solartex* was used in 'RFC Green' on top surfaces and 'Antique' for the

undersides. Rib tapes were torn, 3/8 in wide from *Solartex* and ironed on giving the appearance of a full complement of ribs. (He cheats - so what?)

Stitching on the rear fuselage is simulated by pinning down a 3/8" strip of *Solartex*, shiny side up, sticking pins in it and winding thread round them. Stick the thread down with *CoverGrip* or *Balsaloc* and then iron the

4





complete stitching and its cover strip onto the fuselage.

### Rigging wires

90 lb. test Fishing trace was used with a loop at one end and a screwed clevis at the other to clip onto the rigging plates.

Crimps are from short lengths of 1/8" alumn. tube.

### Colour scheme

After all my German Albatroses (Albatri?), I felt it was time that I built a British aeroplane so I used the suitably coloured *Solartex* for PC 10 with roundels painted on using acrylic water based paint. A final sprayed coat of clear polyurethane varnish, thinned with cellulose type thinners and a spoonful of matting agent (French chalk) made it fuelproof and not too glossy. Do not use too much matting agent or the varnish will blush.

Alternatives could be the silver as applied to aircraft sold to Finland after WW1 with blue swastikas on a white background or Spanish Republican Navy, also silver with

red, white and purple roundels. These aircraft had the nose radiator removed and a rounded panel fitted. The radiator was repositioned between the undercarriage legs.

### Assembly

The model, tipped on its nose and sideways just fits in my Mitsui. van fully assembled. Although undignified, this saves a lot of time and bother at the flying field.

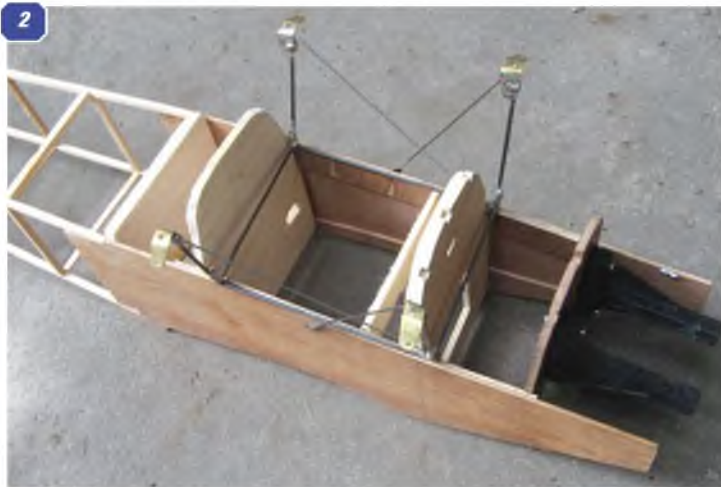
### Flying

Before installing the engine, I got out my 22 year old 1/4 scale Jungmeister V1 which is 66 in. span and about 2 lbs heavier than the Buzzard. With its Enya 90 FS, it flew and aerobatted very nicely thank you.

I then fitted an *RCV 91* to the Buzzard. This gave 9,100 rpm on a Master 14 x 6 prop, similar to the *Enya*. It was not enough power and although the model flew, take off was prolonged and it felt as if close to the stall in flight.

I took the *RCV* out and replaced it with a *Laser 150* that I had on

**1: A Bussard dissected! Bare bones of all the uncovered airframe components. Note simplified rib spacing. 2: The basic fuselage 'box' with the wire cabane struts anchored to formers and with the brass wing attachment 'shoes' soldered on. 3 & 4: Two views of the completed uncovered fuselage, showing the sheets mental wrap-around upper cowl access panel, dummy radiator 'box' and stringered rear fuselage.**



# CUT PARTS SET FOR THE

## MARTINSYDE BUZZARD

Get straight down to construction without delay! This month's full size free plan feature is supported by a laser-cut set of ready-to-use balsa and plywood components. This provides all the parts that, otherwise, you would need to trace out onto the wood before cutting out.

**IT DOES NOT INCLUDE STRIP AND SHEET MATERIAL OR SHAPED WIRE PARTS**

**Price £90.00**

plus carriage: £11.50 (UK); Europe £26.00

### Order set CUT/FSM506

**Shipping Note:** For shipping to destinations outside UK and Europe, you will be charged our standard flat-rate price of £49.00.

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

Visit our secure website:

**[www.flyingscalemodels.com](http://www.flyingscalemodels.com)**

to order yours



Order direct from:- ADH Publishing, Doolittle Mill, Doolittle Lane, Totterhoe, Bedfordshire, LU6 1QX, UK. Tel: 01525 222573/ enquiries@adhpublishing.com.









**5:** The fuselage rear underside, showing the tailskid and the tailplane bracing struts. **6:** control system installation, showing rudder, elevator and throttle servos at the compartment rear, receiver soft mounted to the fuselage side. Note the metal bracket that holds the fuel tank in place. **7-9:** Engine bay showing the engine and tank installations.

the shelf. This delightful engine gave 8,100 on a 16 x 8 prop and the Buzzard took off like a scalded cat! This is clearly too much power for proper scale flying, but was most useful when my friend Kuhn Sukasom was taking flying photos as I could fly by slowly and then put on power to do a tight turn safely, close to the ground for the next run.

An O.S. 120FS should be fine for the Buzzard, but with more power, such as my Laser, open the throttle gently at take off and do not use full power until up and away, to avoid sudden swings.

Loops are fine, easing off the power at the top but remember that a true axial roll was first demonstrated by Gerhard Fiesler when he did a triple roll called the 'Schraube', in 1927. The Buzzard would not be expected to do one and with the incidence angles it carries, neither will it.

When the Royal Thai Air Force opened its newly surfaced field at Tun Sri Kan, near Don Muang in Bangkok in October 2013, for three or four minutes I fought a mock duel with a 1/4 scale Fokker D VII. So is history repeated? Captain Eric Brown RN has written

fascinating descriptions of the many varied aircraft he has tested in his unprecedented career. He ends each chapter with a short, sharp comment. He never had the chance to fly the Buzzard but I would like to suggest that his comment might have been:

"...an SE5 on steroids"  
Build one and see.

**Mike Hawkins**  
mikeh@samarf.co.th



**10: SIMULATED STITCHING LINES:** These are 3/8" strips of Solartex, sticky side up and pinned to balsa with a clear plastic sheet underneath (Solartex backing). The pins are in a zig zag pattern and a doubled thread is then wound round, onto the next one, round and so on. They are then given a brushed coat of Clearcoat, CoverGrip or similar heat sensitive fabric glue. When removed from the backing, laid on the fuselage and ironed on you get the effect of stitching covered by a strip of covering.



# Martinsyde F.4 BUZZARD

## PROMISE UNFULFILLED

MIKE HAWKINS TRACES THE STORY OF AN OUTSTANDING WW.1 FIGHTER OVERTAKEN BY THE COURSE OF HISTORY



View from rear showing the very 'pointy' rear fuselage top deck.



Throttle and ignition control, left cockpit side.

**D**uring the First World War 1914 to 1918, aviation, driven by the military requirement, advanced at a remarkable pace.

At the start of the War, aircraft were barely able to keep themselves in the air and return safely to the ground. Four years later, specialised types for bombing, fighting, observation and ground attack were in service with each of the major warring Air Forces. Aircraft engines increased in power and reliability from 70-80 horse power to 300 or more, making possible a wide range of aircraft designs tailored to their intended tasks

A new prototype could be

built in a matter of weeks, although getting it into squadron service at the Front might take a year or so. Contrast this with the current F-35 Joint Strike Fighter, which has already been twenty years in development and still has serious problems of operation.

Contrast also, the one or two thousand pounds cost for a 1918 fighter with the multi-billion dollar cost of a modern combat aircraft. The next air war is unlikely to be like the last one and probably drones will often replace manned aircraft. I find it hard to get excited about them - so we look back.

Royal Flying Corps pilots 'at the Front' during the early stages of WW1 rightly demanded better aircraft

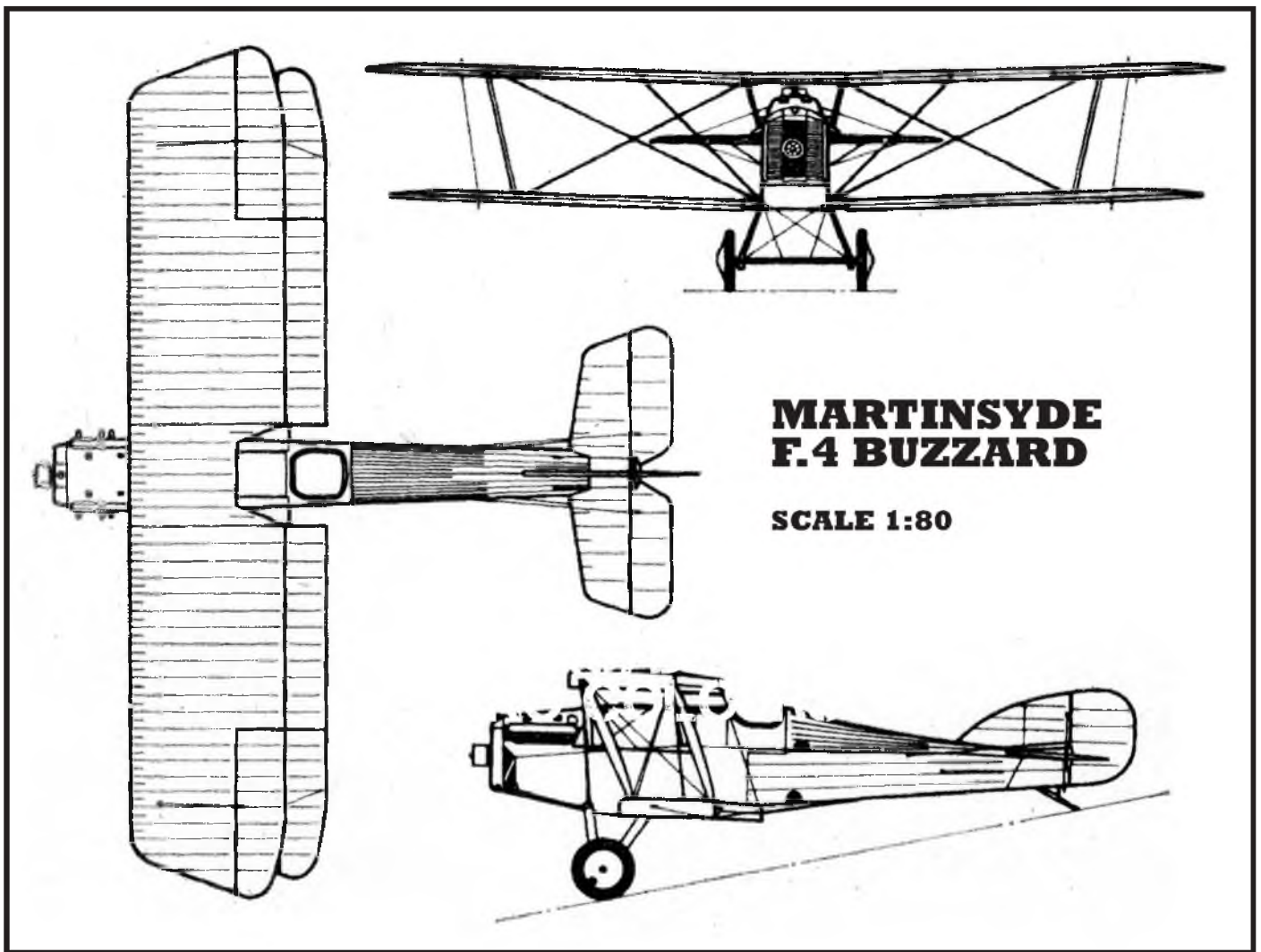
than the enemy was bringing against them. First, in 1915, the Fokker E.I and E.III 'Fokker Scourge' and then in 1917, the newly introduced Albatros D.III wrought 'Bloody April', when RFC squadrons suffered grievous casualties. Later, the Sopwith Camel and the SE 5 redressed the balance, although the pendulum started to swing back in favour of Germany when the Fokker D.VII appeared.

### Martinsyde who?

Long since out of business (1922), H.P.Martin and George Handasyde formed their company (Martin & Handasyde) and built their first aircraft in 1908-9. There followed a progression of mostly monoplane types of their own design and in 1912







## MARTINSYDE F.4 BUZZARD

SCALE 1:80

the organization was restyled as Martinsyde Ltd.

The early period of WW1 quickly defined the expanding need for combat aircraft and Martinsyde's pre-war experience in the design and construction of aircraft made it well placed to undertake a progression of sub-contracted orders on behalf of other established aircraft manufacturers, including the S.E.5.

Prior experience of aircraft design also made the organization capable of developing their own combat aircraft, the first of which was the G.100, built originally as a long range single-seat fighter and escort machine, but on the basis of its size and weight was reclassified as a day bomber and named 'Elephant'.

Deliveries to the RFC commenced in mid-1916 with a production run that totalled 270. The G.100 and follow-on G.102 (with more powerful engine) Elephants were used in France and the

Middle East.

The G.100 was not particularly successful as a fighter. It lacked agility in comparison to fighters of the times, not least due to the long double bay wings applied to provide the load carrying capability needed to handle the fuel load required for long distance tasks. But the Elephant performed a useful service in long-range bombing, carrying up to a 260 lb (120 kg) bomb load. It successfully performed this role from the summer of 1916 through to late 1917 and was also used for long-range photoreconnaissance, where stability and endurance were required (the type was capable of a five and a half hour flight).

Based on the successes and the shortcomings of the G.100, Martinsyde went back to the drawing board to create a better, more effective fighter, based on the G.100 and using some of its basic components, but with shorter span

single-bay wings and more powerful engine. This was designated Martinsyde RG and first flew in mid-1917 powered by a Rolls Royce Falcon III that delivered 275 h.p.

In trials at the RFC's test field at Martlesham Heath near Woodbridge, Suffolk the RG was clocked at 130 mph at 10,000 ft. It also demonstrated excellent rate of climb and a service ceiling of no less than 25,000 ft. It was found to have light control forces, good manoeuvrability and gentle landing characteristics. Among pilots who flew it there was enthusiasm for its performance, although the pilot's view from the cockpit came in for some criticism.

Suitably revised, with the pilot's position raised to improve the view from the cockpit, together with a string of other changes, the aircraft re-emerged as the F.3 (F.1 and F.2 both being two-seater developments of the 'Elephant') and



Right side of cockpit showing the hand pump that maintains fuel feed pressure.



Top view of the engine cowl forward of the cockpit.



Cockpit instrument panel, showing the control column spade grip. Note mounting bar for guns.



Engine radiator and propeller boss.



reached Martlesham Heath for re-evaluation in early November 1917. Trials reports were again very complimentary ("...streets ahead of anything..." said one report) but nevertheless, further revisions were required, which dragged on into the following year.

### Engine supply problems

In mid-to-late 1918 there was no sign that the War would end soon and both sides were preparing new improved aircraft types to equip their squadrons.

Greater power is key to improved performance and in UK, much hope centred on the ABC Dragonfly radial engine that was light in weight and promised to deliver over 300 h.p. A number of new fighters such as the Westland Wagtail and the Nieuport Nighthawk were in development to use it.

The Dragonfly engine was ordered into mass production, but was then found to suffer from incurable overheating and vibration, giving it a useful life of about six hours in the air - hardly acceptable for pilots flying over enemy lines with a prevailing westerly wind blowing them deeper into German held territory.

### A 'Plan B' for engines

So what alternatives were there for the newly formed Royal Air Force that came into being as an independent force on April 1st 1918?

Sopwith had developed the Snipe, based on their successful Camel, but with for the Bentley 200 h.p. Rotary engine - the very end of the line for the rotary-engined fighter.

Meanwhile the Martinsyde F.3 fitted with the Rolls Royce Falcon 280 h.p. engine showed great promise and with some changes to the gun installation and of the pilot's seating position to improve the view, it received excellent appraisals by service test pilots who flew it.

Here then was an answer to the next RAF fighter requirement, but - and there is always a 'but - , the excellent Rolls

Royce Falcon engine was in extremely short supply with most of its production allocated to the Bristol F2B 'Brisfit' already in service, and for which supply to front-line squadrons in France could not be compromised.

However, a shipment of 300 h.p. Hispano-Suiza engines were available and one of these, fitted to the F.3 airframe, became the Martinsyde F.4 Buzzard. It was by no means an innovative design, the wing section being the usual Royal Aircraft Factory thin and flat topped design, in sharp comparison, to the thick winged Fokker D.VII that had a top speed of about 110 mph

But the Buzzard managed nearly 140.

### Further tests and delays

Having created a truly outstanding fighter (for its time), Martinsyde were somewhat hamstrung for production due to outstanding SE5a sub-contract work, occupying factory space. Nevertheless, they had been able to supply a trickle of the F.3 type already on the order book and these found their way to No.60 Home Defense Squadron and eventually, were the only examples of the F.3/F.4 line to see front line service during WW1.

With the Hispano-Suiza engine firmly earmarked for the Buzzard, and with an order for 1,500 examples confirmed by the recently former *Ministry of Munitions*, tests and detail revisions dragged on throughout the late summer and early autumn of 1918.

Deliveries to the RAF had just started when the Armistice between the Allies and Germany was signed. Martinsyde was instructed to only complete those aircraft that were part built, while all other orders were cancelled.

The Buzzard was not adopted as a fighter by the post war RAF, the cheaper and already in-service Sopwith Snipe being preferred despite its lower performance. The November 11th Armistice rendered surplus-to-requirements the vast numbers of aircraft on the order books of aircraft manufactur-



**Ski type main undercarriage for winter operations on restored Finland museum F.4 Buzzard aircraft.**



**Engine cowl, showing exhaust and radiator.**



**Fuselage detail, showing stitching line to fabric covering. Note also mounting stirrup.**



**Bare fuselage of Finland Air Museum's F.4 during restoration.**



**Further view of the forward fuselage of the same aircraft.**







Martinsyde F.4A Buzzard in Spanish Civil War republican forces. The black anchor on the rudder indicates service with naval forces. The engine cowl is much more tailored and streamline than the blunt shape of the original.



Both sides in the Spanish Civil War operated the Martinsyde F.4A Buzzard, this one, in Royalist colours, carries a much revised radiator hung under the fuselage centre line.

Photos of the restored Buzzard that appear in these pages depict the aircraft at the Air Museum of Finland. With thanks: Keski-Suomen

ers and their sub-contractors throughout the UK and with it went the prospect of re-equipping the Royal Air Force with a new fighter type that was head and shoulders above anything else in prospect.

Martinsyde continued development of the Buzzard, buying back many of the surplus aircraft from the RAF, and producing single-seat racers, two-seat tourers and even floatplanes. After the bankruptcy of Martinsyde in 1924, these aircraft were obtained by the Aircraft Disposal Company, which continued to develop and sell F.4 variants for several years.

### In foreign skies

Whilst Buzzards saw no real British military service post WW1, small numbers of those produced by Martinsyde were sold



Spanish Air Force F.4 Buzzard in a sorry state after main undercarriage collapse.

overseas to foreign military customers in penny numbers to Belgium, Bolivia and Canada. Finland took 15 and operated the type right up until 1939.

The Republic of Ireland had four F.4s plus a different variant (Mk.II) purchased in November 1921, reputedly to allow Republican leader Michael Collins to quickly escape back to Ireland in the event of a breakdown in the negotiations for the Anglo-Irish Treaty (an interesting story in itself if true!).

Latvia took a total of eight; Portugal had four, whilst the largest number (reportedly 100) were supplied to the newly formed Soviet Union.

Twenty single seat fighters and two two-seater variants went to Spain, and eventually were used on both sides in the Spanish Civil War, and single examples also went to Japan and Poland.



The sole remaining example of the Martinsyde F.4 Buzzard is held on display in the Aviation Museum of Finland, at Tikkakoski, Jyväskylä - a fine example of the aviation restorer's art.

## SPECIFICATION

**Wingspan:** 32 ft. 9 ins.

**Length:** 25 ft. 6 ins.

**Weight (empty):** 1,811 lbs.

**Speed:** 138 mph. at 10,000 ft.

**Time to height:** 7 min. 55 sec. to 10,000 ft.

**Armament:** Two Vickers .303 machine guns.



### Sole survivor

Today, a single Martinsyde F.4 Buzzard survives in superbly restored condition at the Aviation Museum of Finland at Tikkakoski, Jyväskylä.





# JR'S XG11

IAN TITCHELL TAKES A DETAILED LOOK AT JR'S 11 CHANNEL RADIO WITH SCALE MODELLERS IN MIND.



XG 11 is one of the best mid-range radios on market. It uses JR's DMSS 2.4 GHz radio protocol and my tame electronic expert assures me that this is one of the most robust 2.4 GHz systems available. This is important as the 2.4 GHz spectrum is getting crowded.

At the moment, my key model flying interest is related to jet models, but I am also very interested in scale models. Typically, jets and complex scale models such as fighters and twins generally demand several key features, namely security of radio link, transmitter ergonomics and finally, programming flexibility.

When you have invested a lot of time, effort and money into a model then it pays to use the best radio you can. Clearly for flying sports model on four or five channels most radios will

cope admirably, but as your models get more involved then the radio becomes more important. As I said I brought the XG11 radio for my high-end models which should indicate how highly I rate it.

The XG 11 has been on the market for several years, but recently it has been upgraded to use JR's XBus link. This is an exciting development and I will be looking at XBus options in detail in Part 2 of this review, which will follow next month. For now, I want to focus on the main features of XG 11 radio. Clearly the purpose of

**T**he past few years have seen an explosion of mid and high-end radios offering a range of features that were almost unimaginable a decade or so ago. There have been new entrants to the market and one or two established brands have seen a decline in popularity. I have reviewed a large number of radios over the past decade for including most of the direct rivals to JR's XG11. This is an 11 channel telemetry-capable radio, which now features XBus capability. I was so impressed with this radio that I actually brought one for my own models after handling the review sample.

JR has long been regarded as one of the premium brands, but it is fair to say their recent history in the UK hasn't been an entirely happy one and they lost market share early in the 2.4 GHz era. In my opinion JR's



The switches on the left hand side  
Note three switch label options are  
provided to suit your aircraft type

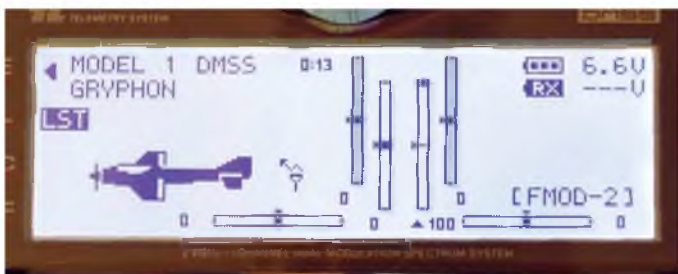




The switch arrangement is neat and logical. Note the rounded edges of the case which contribute to a comfortable feel.



**ABOVE LEFT:** There are two sliders on the rear of the radio. **ABOVE RIGHT:** The battery case houses a two cell LiFe battery of 1400 mah capacity. It also encloses the SD card. The SD card allows virtually unlimited model storage plus facilitates updating the software of the radio as JR release new features.



This is the home screen. There is a backlight facility and in this shot it's on.

review is to take a quick overview of the radio and I want to pick out some features which I think are of interest to scale modellers.

### JR's XG11 transmitter

Okay so let's look at what you get in the box. Basically there are several receiver options that alter the pricing slightly. The transmitter with an 11-channel receiver is around £650. As well as the transmitter and receiver, there is also a charger for the 2s LiFe battery in the transmitter, a comprehensive manual and a throttle ratchet adapter.

As soon as you remove the transmitter from the box you will be struck by its appearance. It comes in a titanium black finish and looks a bit like a cyberman's head! You might find the styling takes a while to get used to, but it's clean and uncluttered

and it is extremely comfortable to hold. I particularly like the curved sides, which mean that there are no edges digging into your hands. It is possible to buy a modular version of the radio, but for me the integrated version with DMSS was the way to go.

So let's look at the layout of the XG 11. There are two control sticks and associated trims. The sticks are very smooth in operation, but I found that even with the sticks extended to their maximum length they were only just long enough for finger and thumb flying. This isn't a problem for those who fly thumbs only. To enhance the feel of the radio, I brought some silicon switch covers and, while I was at it, a clear screen cover to protect the main screen.

On the top of the transmitter there are eight toggle

## TABLE 1

### BASIC FEATURES

- 30-model internal memory
- Telemetry with receiver voltage sensor built in, optional telemetry sensors available
- SD card slot for data sharing, storage and updates (SD card required)
- Li-Fe 6.4V, 1400mAh 2S transmitter battery pack
- Integrated charging circuit
- 9V AC/DC adapter supplied with automatic shutdown
- Easily adapts to stick modes 1 to 4
- 5-point mixing curves with midpoint adjustment
- 3-axis gyro remote sensitivity adjustment
- Balance function for multiple servo setups
- Dual trim options
- Touch Select System for switch selection
- 11-channel failsafe
- Three independent programmable timers

### SYSTEM LIST

- MODEL SELECT (MODEL SELECT)
- MODEL COPY & ERASE (MODEL COPY/ERASE)
- Model Type Select (TYPE SELECT)
- Model Name (MODEL NAME)
- Flight Mode Name (FLIGHT MODE NAME)
- Trim System (TRIM SYSTEM)
- Stick Position Switch (STICK POSITION SW)
- Trim input Switch (TRIM INPUT SWITCH)
- Stick Alert (STICK ALERT)
- Warning (WARNING)
- Transmitter Setting (TX SETTING)
- Trainer (TRAINER)
- Bind and Range Check (BIND&RANGE)

### FUNCTION LIST

- DUAL-RATE & EXPONENTIAL (D/R&EXP)
- Travel adjust (TRAVEL ADJUST)
- Limit Adjust (LIMIT ADJUST)
- Sub Trim (SUB TRIM)
- Reverse Switch (REVERSE SW)
- Servo Speed (SERVO SPEED)
- Throttle Curve (THRO CURVE)
- Pitch Curve (PITCH CURVE)
- Tail Curve (TAIL CURVE)
- Throttle hold (THRO HOLD)
- Gyro Sensitivity (GYRO SENS)
- Governor (GOVERNOR)
- Swash Mixing (SWASH MIX)
- Throttle trim (THRO TRIM)
- Throttle Mixing (MIX > THRO)
- Flight Mode Delay (FLIGHT MODE DELAY)
- FLAP SYSTEM (FLAP SYSTEM)
- SNAP ROLL (SNAP ROLL)
- Differential (DIFFERENTIAL)
- Aileron to Rudder Mixing (AILE > RUDD MIX)
- Aileron to Flap Mixing (AILE > FLAP MIX)
- Elevator to Flap Mixing (ELEV > FLAP MIX)
- Rudder to Aileron /Elevator Mixing (RUDD > AILE/ELEV MIX)
- Balance (BALANCE)
- Flap Rate (FLAP RATE)
- Motor System (MOTOR SYSTEM)
- Camber system (CAMBER SYSTEM)
- Brake system (BRAKE SYSTEM)
- Flaperon Mixing (FLAPERON MIX)
- Elevator to Camber Mixing (ELEV > CAMB MIX)
- Rudder to Spoiler Mixing (RUDD > SPOI MIX)
- Program Mixing (PROGRAM MIX 1-6)
- TIMER (TIMER)
- MIXING MONITOR (MIX MONITOR)
- SERVO MONITOR (MONITOR)



# 28X

## RETURN of the LEGENDARY "X"

### HERE'S JUST A FEW AMAZING FEATURES OF THE 28X

- Android™ powered 4.3" WQVGA-TFT Full Color Touch Screen
- Dual Processors for unmatched interfacing and RF reliability
- CNC Machined All Aluminum Gimbals for the Ultimate "feel the difference" experience
- Ultra High 65,536 Stick Resolution (16x higher than any previous system)
- Heavy Duty Cast Aluminum chassis for support and rigidity
- 28 available Channels/ 15 Flight Modes
- USB Host Controller for seamless data interfacing / USB Device Port for easy PC connection
- SD Card (Not supplied) for unlimited model, picture, sound, and telemetry log storage
- Customisable Vibration and Tone Notifications
- Audio Controller for voice, music, and telemetry notifications



### METAL INNER FRAME & FULL METAL STICK UNIT PROVIDE EXCELLENT ROBUSTNESS & PRECISION

Heavy Duty Cast Aluminum chassis for support and rigidity.

**Full metal gimbals:** A new full metal gimbal has been designed for this RC radio, mounted onto a Aluminium die-cast inner frame (ADC12). This luxurious mechanism provides extremely solid and precise feeling at all position.

**Stick dial:** A stick dial has been added onto both sticks. Two additional channels can be assigned to them.

**Ultra resolution:** The stick resolution is 65,536-frames which promises the best control ever. (16 times higher than the XG11)



Adjustable Metal Gimbal

#### Optional Stick Parts:



Short or Normal Length Stick Shaft (One Pair)



Short or Normal Length Stick Head (One Pair)



Stick Angle Adjuster Bar Sets

### MANY OF THE ADVANCED SPECIFICATIONS BECOME A DECISIVE ADVANTAGE

#### OS SOFTWARE THAT HAS UNLIMITED POTENTIAL

New Interface with Android OS and a TFT Colour Touch Screen.

A variety of useful apps are available within the 28x along with the normal features such as travel adjust, dual rate & expo ect.



#### FULL-COLOUR LCD TOUCH PANEL DISPLAY

**Colour LCD:** A new 4.3" (480 x 272) WQVGA-TFT resistant touch screen. The interface is multi-language.

**USB host controller:** The Radio 28X has an integrated USB host port. USB devices can be connected to this port for seamless data interface.



#### DUAL CPU

The 28X is very reliable with the dual CPU system. One is for control the transmitter and the other one is for user interface provided by the Android OS. All the critical functions will not be affected if Android OS failed.



#### SWITCH MODULE

**Switch module replaceable:** Both shoulder switch blocks are removable so the pilot can customise the layout for there own needs.

**Interchangeable switches:** All the switches can be interchanged for 2-position switch, 3-position switch, momentary switch, button and rotary type of the pilots choosing.



#### SD CARD

SD card can be used to transfer model data, pictures, sounds, and telemetry log. It can also be used for firmware updates. The flight log data can be used on the Flight Log Viewer (will be available at the JR site.)

JR Propo products are available from all good MacGregor Stockists



MacGregor Industries  
World Class Products • Excellent Service

The Global Brand  
**JR PROPO**

Find Us On:





## XG14



### XG14 14-Channel 2.4GHz DMSS XBus Compatible Transmitter

- 14 Full Linear Channels.
- Next generation DMSS dedicated Serial Communication System XBus.
- XBus setting done wirelessly from the transmitter.
- Premium Grade Gimbals as used in the DSX12.
- Uses XG11's advanced programming in the XG8's ergonomic body.
- SD card slot for data sharing, storage and updates (SD card required) : compatible with data files from XG11, XG8, DSX11, 11XZERO.

## XG14E



### XG14E 14-Channel 2.4GHz DMSS XBus Compatible Tray Transmitter

- JR's first tray-type transmitter in the XG series.
- 14 Full Linear Channels.
- Next generation DMSS dedicated Serial Communication System XBus.
- XBus setting done wirelessly from the transmitter.
- Premium Grade Gimbals as used in the DSX12.
- Uses XG11's advanced programming
- SD card slot for data sharing, storage and updates (SD card required) : compatible with data files from XG11, XG8, DSX11, 11XZERO.

## XG11



### XG11 11-Channel 2.4GHz DMSS XBus Compatible Transmitter

- Compatible with JR Propo XBus Serial Data System.
- Titanium Black colour plating offers a robust, durable finish.
- Ergonomic modern case design offers the best grip, comfort and balance.
- Built-in telemetry function provides in-flight information.
- Updated programming software satisfies the needs of expert Helicopter, Aeroplane and Glider Pilots.

## XG11MV



### XG11MV 11-Channel Modular Transmitter

- Modular version of the JR XG11
- 2.4GHz DMSS, 2.4GHz DSM2, 35MHz and 40MHz FM Modules Can be Fitted
- X-Bus Compatible
- Premium Grade Gimbals
- 4096 Resolution

## XG8



### XG8 8-Channel 2.4GHz DMSS XBus Compatible Transmitter

- Compatible with JR Propo XBus Serial Data System.
- 30 model internal memory.
- SD card slot for model data sharing, expanded storage and software updates (SD card not supplied).
- 1400 mAh Li-Fe transmitter battery pack, Transmitter weighs just 770g.
- Integrated charging circuit, 9V AC/DC adapter supplied with automatic shut down when battery is fully charged.
- Back lit screen & Touch Select System for switch selection.

## XG6



### XG6 6-Channel 2.4GHz DMSS XBus Compatible Transmitter

- Compatible with JR Propo XBus Serial Data System.
- JR's DMSS system offers high-speed performance
- Easy to view graphic LCD display & easy dial input.
- Easy handling with an ultra lightweight and ergonomic case.
- Same telemetry features as the XG8, & multiple points system is employed in each mixing curve.
- AA batteries type power saving technology tx.
- 20 model memory for Helicopter, Airplane and Glider functions.
- Micro SD Card Slot (Card not included).

**JR**  
*feel the difference!*



**DMSS 2.4GHz**  
DUAL MODULATION SPREAD SPECTRUM







To programme the radio you need to enter the various sub menus using the switches and roller around the screen. This is the first page of the function screen and you scroll through it to find the function you want to set up.

switches plus two digital switches. Initially these switches aren't labelled, but there are three sets of stickers available to label the switches, depending on your preferred set-up namely fixed wing, glider or helicopter. At the back of the case are two slider controls. There are enough switches etc. to cope with most options without having too many to keep track of things. You can assign the switches to suit your own preferences.

Once equipped with longer sticks I found the radio well balanced and it felt comfortable to hold. The switches are very easy to reach and the radio feels very smooth in operation and solid. It is light, whilst still being heavy enough to impart a feeling of quality. All-in-all the radio feels very comfortable

but for me that's not enough. If the radio isn't flexible enough and reliable, then it's not going to score well. I have already said that the DMSS radio link is one of the best on the market. The radio has enough flexibility in switch layout and programming function to exceed most people's needs by quite a margin.

One of my personal preferences is to have triple rate switches and here the XG 11 scores really well as its possible to have three position switches for triple rates. If you use a second switch you can have up to eight sets of rates - more than enough for my needs! To operate these, there are six three position switches, one two-position switch and one two-position momentary switch and obviously, since

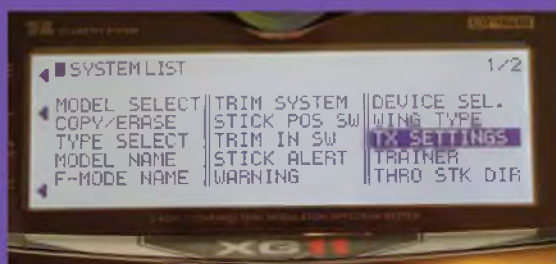
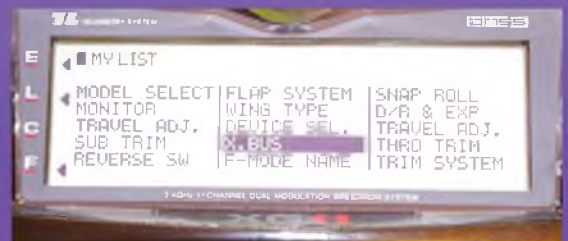


The XG11 comes with a number of receiver options. I went for the 11 channel receiver.

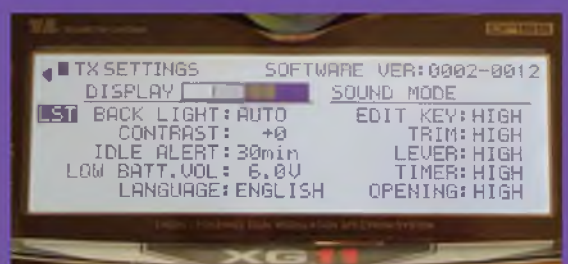


**ABOVE LEFT:** This is the second page of the function list screen NB I have highlighted the mix function to show how they appear when you scroll to the function you want. We will see the mix function in another picture.

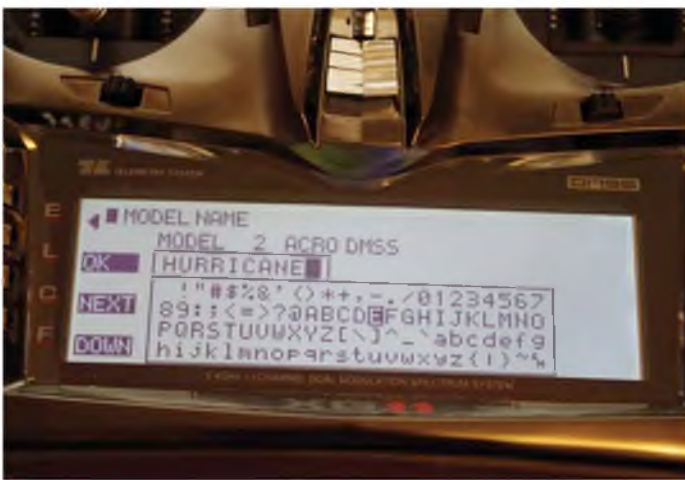
**ABOVE RIGHT:** The XG11 has a programmable "my list" page which allows you to select the functions you use most frequently and set up a short cut to find them in one place.



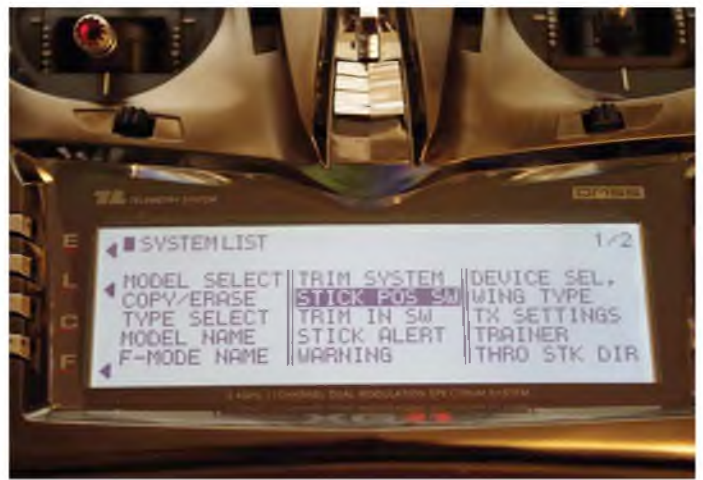
**ABOVE LEFT:** The system list is another two page offering and is more about configuring the transmitter and selecting the model. **ABOVE RIGHT:** From the TX setting you can find the current version of software installed in the radio. In this case its 0002-0012. JR's revision history shows that their software is remarkably bug free and the recent updates have added features to the radio so it make sense to update to enjoy the latest features.







The model name screen. You can assign names up to 9 characters long.



The system list allows you to define stick position switches. This is a handy feature for setting up things like a throttle stick controlled timer.



Although I haven't featured it strongly in the text here, the XG11 has a range of telemetry options. I don't like reading things off the screen when flying so only use things where I need to know when things aren't right using an alarm to alert me to the issue.



I am a fan of using switches and preset values for flap operation. If you do this and add in flight mode specific trim function you can set the model up really nicely in each mode.

they are freely assignable, you can use them as you want. One thing to mention is that it's also possible to set up stick position switches as well so you can, for example set up a timer to work off the throttle stick.

The main on-off switch is well placed and unlikely to be moved accidentally when flying. The screen for programming the radio is large and there are four buttons on the left hand side and a roller input on opposite side for programming entry.

### Programming the radio

There are basically two programming menus that you need to be aware of namely the System List and Function List. **Table 1** shows the main options available. If you have previously used a JR radio, the menu options will be familiar and they aren't really that different to Spektrum and Futaba so you shouldn't have too much trouble if you swap over to this radio!

As you can see, there is a pretty extensive array of functions and there's no way we can cover all of them. Instead I thought it would be worth taking a quick look at how easy the radio is to program. There's no doubt that it would take a long time to become fully familiar with every function, but I found most of the programming was pretty straightforward.

The first thing to get your head around is how to enter the programming and once you have tried it, it is very simple to navigate your way around the system.

### Program input keys

There are four standard button keys for input, plus an additional a jog-dial type roller. Almost everything can be done using this roller. The roller is operated by rotating it left or right, and pressing it. To confirm things are happening there is an electronic beep confirming a valid input. The button keys on the left side of the transmitter operate when a triangular arrow is displayed on the LCD screen. When the name of the key (abbreviated) is displayed on the LCD, the key will function as displayed. The CLR (clear) key has a primary function of resetting a value back to default. It can occasionally function as something else in which case it will have the function displayed instead of the normal arrow symbol.

One neat trick the radio has, is that to simplify adjusting models and switching between them it's possible to define a 'MY LIST' screen. Pressing the ENTER key while on the normal screen will select the 'My List' display. Nothing will be displayed on the 'My List' screen until it has been customized. I normally set up a list which includes model select, Dual rates travel adjust, device select, flap system reverse

switch and a few other items that represent the sort of things I am normally likely to want to do when adjusting or flying a model. This simple option can save time especially when you aren't sure where to find the sub menu you want. A few minutes setting up the 'My List', will save scrolling through the system and Function List to find things.

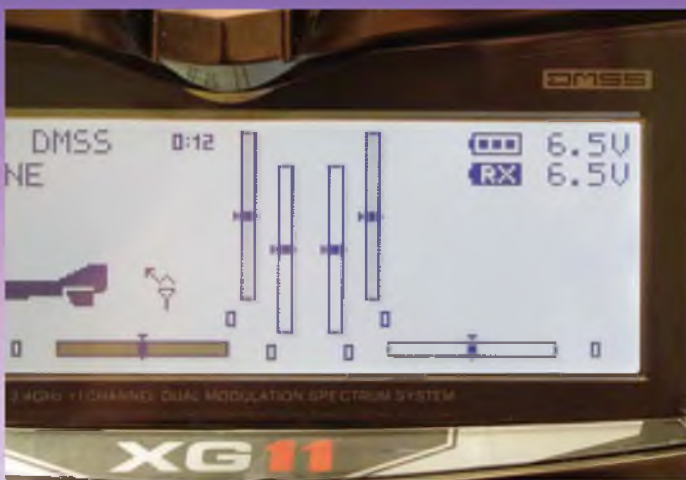
### Binding

Linking, aka binding, is done with a bind-plug and entering the bind mode on the transmitter. I should point out that you need to set up the Failsafe via a second menu. Although I don't want to get involved in discussing telemetry in detail, I think JR deserve full marks for installing flight pack battery voltage as a default into their receivers. This means that you don't have to buy an expensive add-on item to monitor the state of your flight pack.

### Program features

I obviously don't have much room left to discuss these in detail. What I can say is that I set up a wide range of models onto the radio and found it was very easy to produce a system that worked well in each case. Suffice to say that there are very few models that you won't be able to cater for using the radio with normal servos. There are six free program mixes





JR provide the receiver battery telemetry by default from their receiver so you don't need to buy additional sensor for this crucial item.



Device select allows you to select which switch or button operates some functions.



The mix monitor function. I really like this as it allows you to see at a glance what mixes you have on a model. This is really useful when you have a complex model and can't quite remember how you set it up!



The final screen shot shows the bind screen after the receiver has been bound. Note you have to programme the failsafe on the radio after you set the bind.

available and these allow you to cater for the few odd setups that the system designer chose not to incorporate.

One thing to mention is that the radio only lists four wing types and at first sight this would seem less than other radios. However, JR use a function called 'Mate', which allows you to assign two servos to the aileron, elevator, flap and motor channels as required. This allows you to set up loads more wing types very easily. The reason for JR's *apparently* low wing type count is simply that JR chose to define things differently.

To give you some idea of the radio's flexibility, I set up lots of models on it and the only time I had to employ the Free Program mixes was when I set up a scale Dassault Mirage delta with split elevons. As an aside, I tried setting this model up on another mid-to-high-end 18-channel radio and found that it also needed program mixing to get the same wing set-up.

One final point is that JR's XG 11 has an

ace up it sleeve in the form of the XBus system. We will take a detailed look at this next time, as it's a new concept to most modellers. In a nutshell, it will enable you to control up to four servos on each channel meaning that you have the potential to fine tune and operate up to 44 servos from one transmitter. For me this means that I can set up virtually any model I can foresee owning without the expense of going for the really expensive top end radio like the new JR28X or its rivals.

### Pilots view

I am pleased to say that I found the JRXG11 radio scores very highly both on ease of setting-up and comfort in use. Those features are great, but for me the main selling point is that JR's radio programming is very rigorously tested before it's released. This means that you are unlikely to find any software bugs in complex models.

I went through all the firmware revisions

and could find only one fix and that was related to switch names. That's after two years of updates, the majority of items being added features as JR develop their XBus system. The downside of the JR program is that it's slightly less flexible than some of the other systems, but I am more than happy to trade that off for a bug-free system. When I mention that the XBus system enables me to set up complex models and simplify their wiring, then the decision to buy the radio was an easy one to make.

Would I recommend the radio? The answer is an emphatic and resounding YES!

### UK DISTRIBUTOR

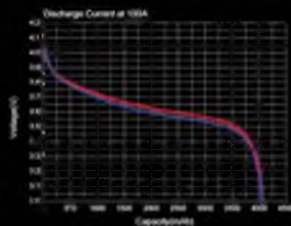
MacGregor Industries Limited  
Cordwallis Street  
Maidenhead  
Berkshire,  
SL6 7GF,  
<http://macgregor.co.uk/>  
Phone 01628 760 430

**PART 2:** Next month I will take a look at using the XG11 with JR's XBus system. I will explain what XBus is, how it is set up and the advantages it offers. The good thing is that can potentially simplify setting up your model and lower the cost of achieving a suitable set up at the same time. If you don't want to use XBus then the XG11 is still a superb radio but when you factor in the XBus capability then it offers some really exciting possibilities.



# UNFAIR ADVANTAGE

**A-SPEC G2**  
COMP GRADE LITHIUM TECHNOLOGY



Turnigy nano-tech A-SPEC G2 lithium polymer batteries are built to the absolute highest of standards to provide competition level performance. The A-SPEC G2 packs have the most stable consistent formula yet giving you peak performance without sacrificing reliability.

Simply put, you won't find a better performing pack on the market ensuring plenty of PUNCH for those high performance applications. If you are a performance junkie that is addicted to power, A-SPEC G2's are for you.

You won't be disappointed.

**TURNIGY**  
power systems

**GOLD**

**65C**

Available at [hobbyking.com](http://hobbyking.com)







**H**ere we go again, another thrilling instalment of what laughingly passes as an electric flight column. Once again I need to be fairly brief with my introduction, so I won't bother with one at all and go straight into the meat of the article under discussion. Yes, I am aware you'll miss out on the usual waffle, but we can make up for that at a later date.

#### CATCHING UP

As you may remember, last month I featured a plan for an indoor/outdoor model equipped with *Parkzone* style equipment. I also promised (threatened) more of the same for this month. The miracle is that that's actually what you're going to get. Now how often does that happen in this column?

As intimated last time, we have another plan for you. Sadly, a slight case of bad back syndrome (up to my eyes in pain-killers, but still barely able to move) means it's another unbuilt model. However, since it's a Sopwith Pup, and I've built several of those, that shouldn't be a problem. Because it hasn't been built yet this won't take the form of instructions and it is a very simple build anyway. What I thought I'd do is pass on some hints and tips for building this general style of model.

Anyone who has struggled through any of the rubber power scale kits that

**PETER RAKE PRESENTS ANOTHER MINIATURE INDOOR/OUTDOOR MODEL WITH FULL SIZE PULL-OUT PLANS. THIS TIME, IT'S A SOPWITH PUP AND HE COMBINES THIS WITH A WHEALTH OF TECHNIQUE TIPS FOR KEEPING THE WEIGHT DOWN AND R/C SYSTEM OPTIONS**



Not actually a scale model but it shows off how effective printed tissue is as a finish on these models.





**Note the way the pushrods are very much over-length at the rear of the author's White Monoplane.**



**How the wire pushrod end is attached to the carbon rod using heat-shrink tube and CA adhesive.**

abound should have no trouble with §actually building the model. As much as possible I've tried to keep much of it §§self-aligning. As such, the little locating pegs set the incidence on the lower wing, while the interplane struts set the dihedral. As long as you can cut the strut and undercarriage parts accurately (I'm pretty sure that the publisher will make this easier with the provision, at a reasonable cost, of laser cut parts) there's no worry about accurately bending wire components. In fact, if I recall correctly, the only wire parts on the model are the axle (absolutely no bends required) and the pushrod ends. Assemble the wood parts correctly and the covered components will almost assemble themselves. Okay, maybe not, but you get the general idea.

### EQUIPPING THE BEAST

As I said, and as the plans show, the

equipment salvaged from virtually any of the *Parkzone* RTF models is just fine for models of this type. Just don't try to fly it using a *Vapor* motor unit because this unit don't develop anything like enough puff. You'll need at least a geared 7mm motor, with an 8.5 mm item being better still.

Whilst a *Vapor* receiver, or an *AR6400* are ideal, there are other options. For example, if you don't mind a couple of extra grams of weight, four channel, fixed pitch *Nine Eagles* and *V911* helicopters make ideal donors. The *V911* unit even features rotary output servos instead of linear jobs.

Now, should you be considering going lighter, both in construction and equipment weight, you could do a lot worse than a *Plantraco* or *DT* receiver and magnetic actuators instead of servos. If you can build the whole model light enough, that *Vapor* motor unit we discarded might

just come into its own.

That said, you'll do an awful lot better than I could if you can get the model down to that sort of weight, but there are always some aeromodellers capable of building to amazingly low weight. In the past I've found around 20 grams to be about the limit for the *Vapor* motor unit, and even then it will depend to a large extent on the style of model. High drag, scale biplanes (or triplanes if it's last months plan you're thinking of) are definitely pushing the boundaries of what the motor will handle. Unless you are confident that you can build REALLY light it's a much safer proposition to stick with what's shown on the plan.

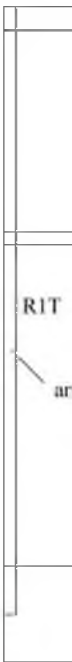
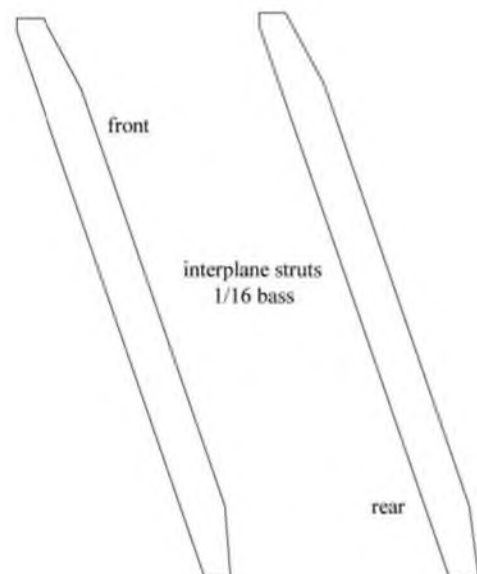
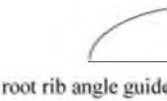
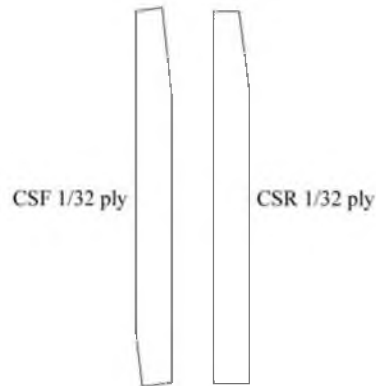
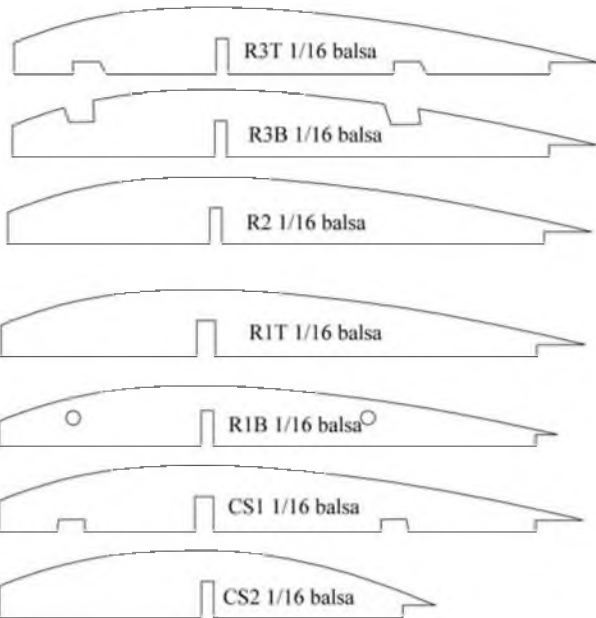
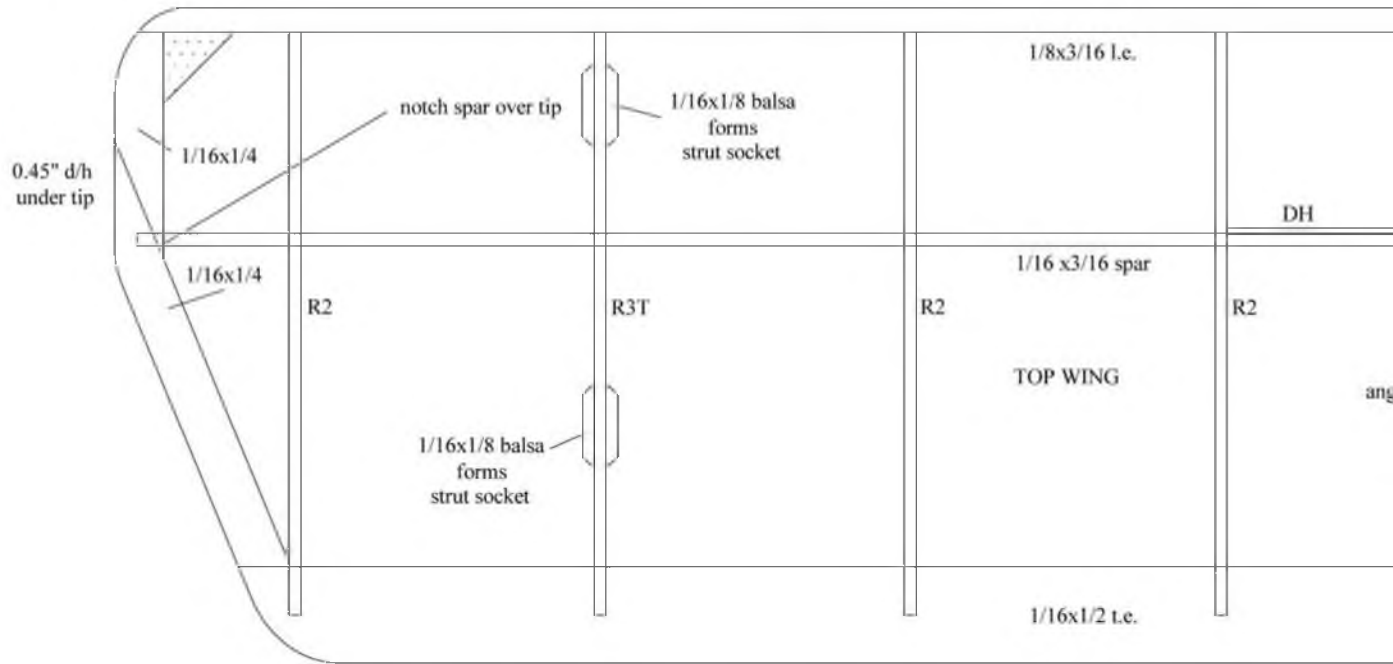
### LINKAGES

Obviously, considering the sort of weight levels we're talking about here, heavy-weight (or even lightweight) 'snakes' are



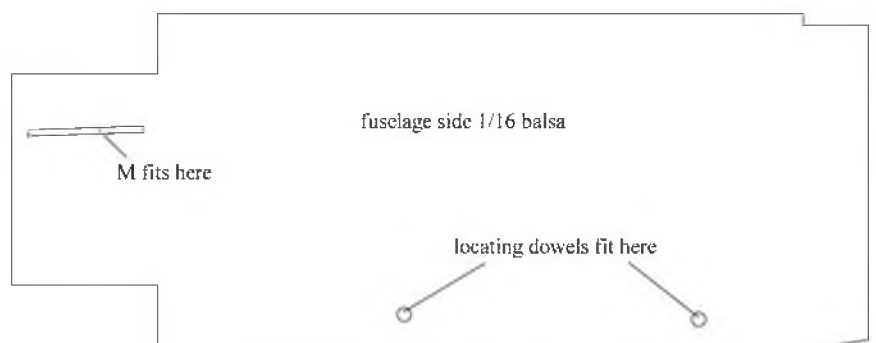
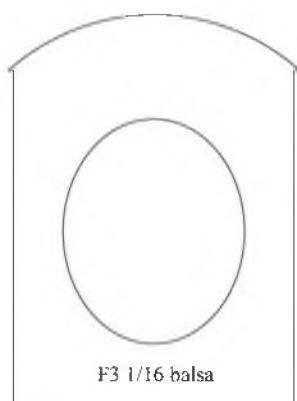
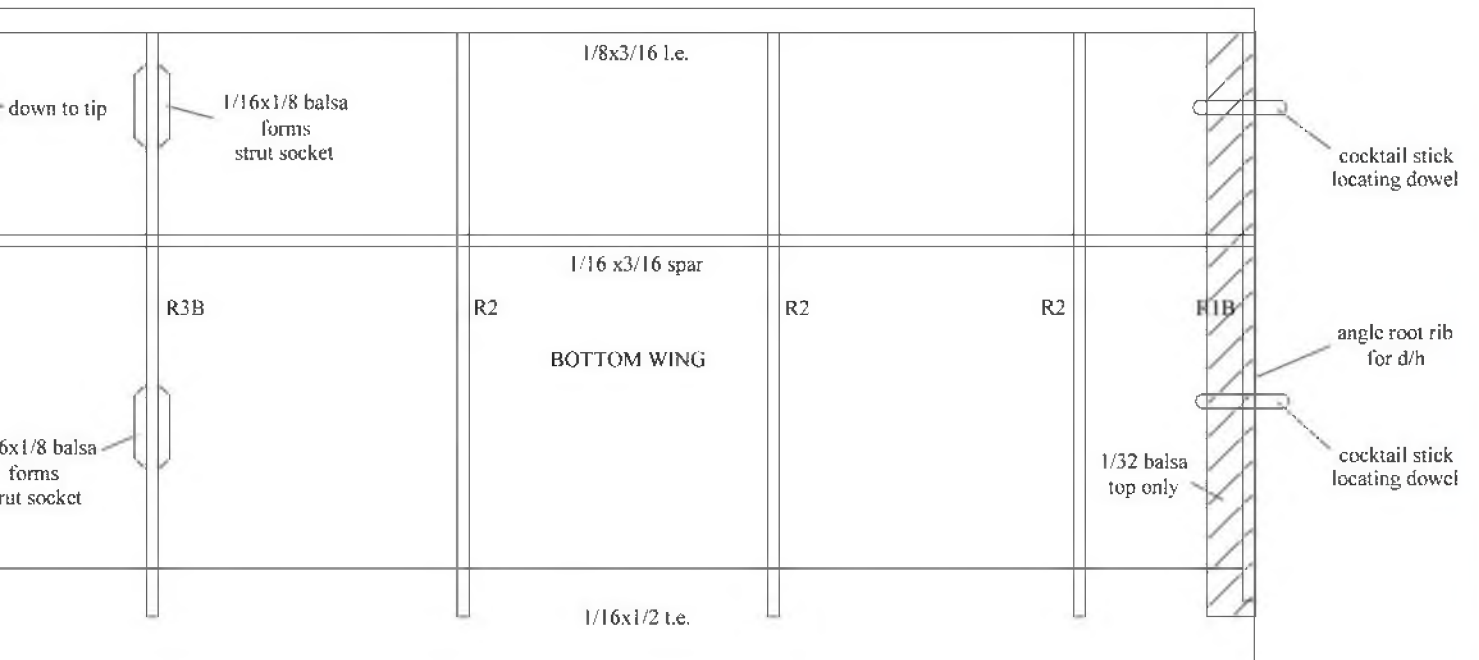
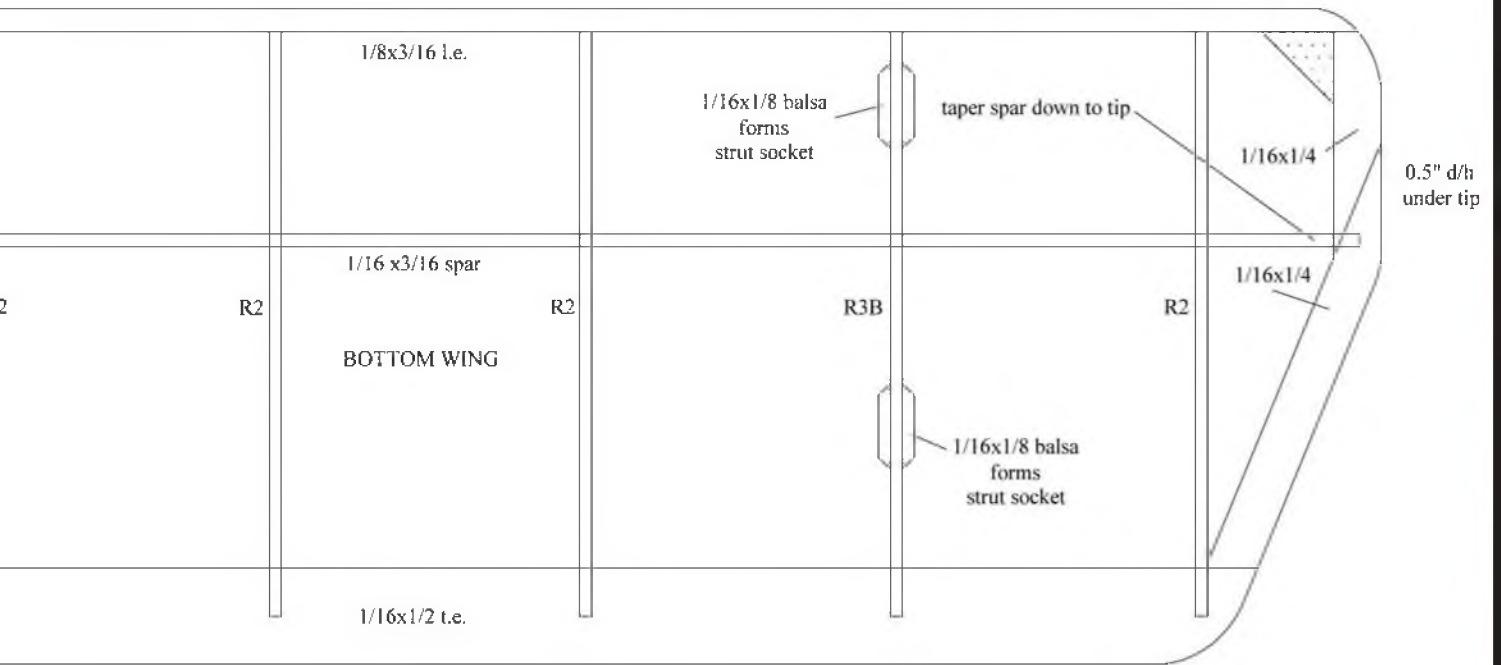
**The little Eastbourne Monoplane demonstrates how the pushrod aligns with the exit plate if you get the receiver position correct.**





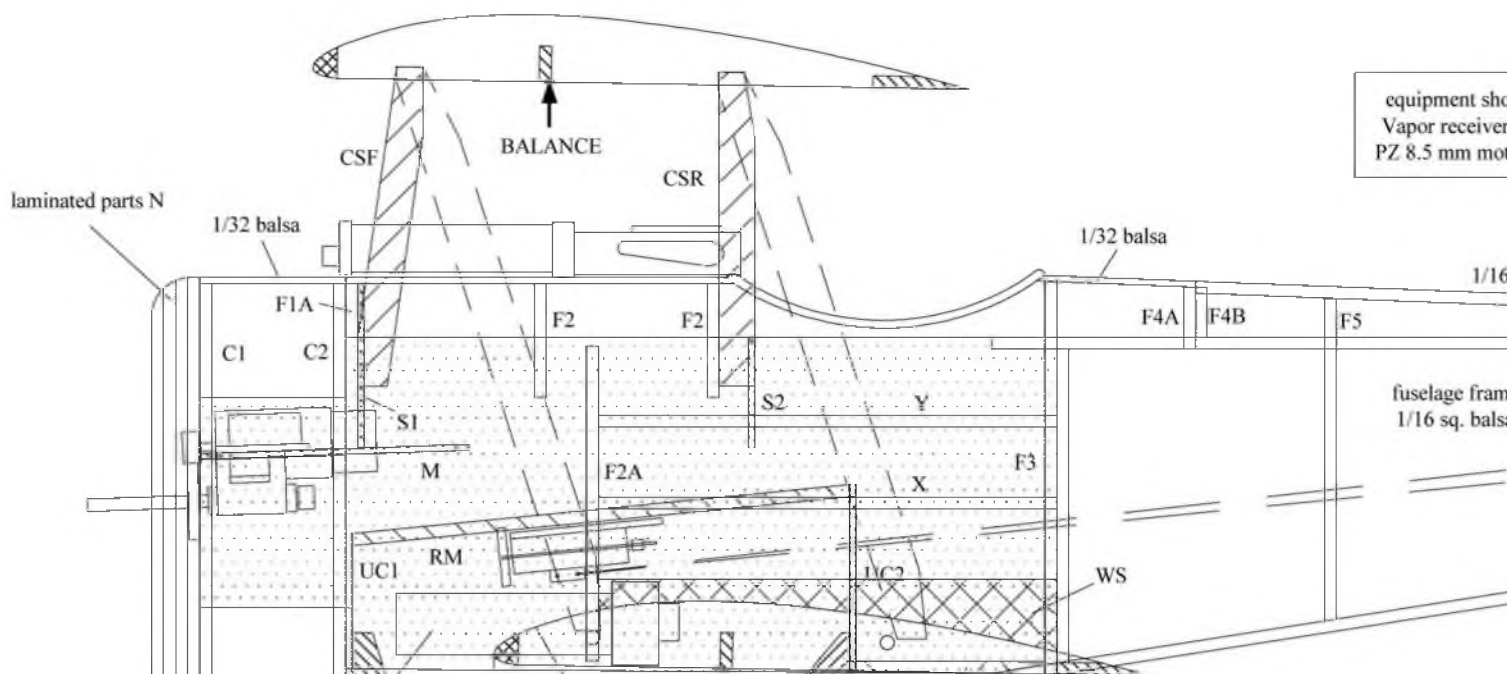
Peter Rake's  
**Sopwith Pup**  
 Copyright P. Rake 2015







equipment shown  
Vapor receiver  
PZ 8.5 mm motor

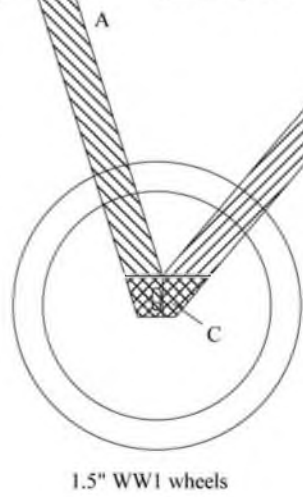


trim side sheet & F2A to clear wing root glue wing to fus. side

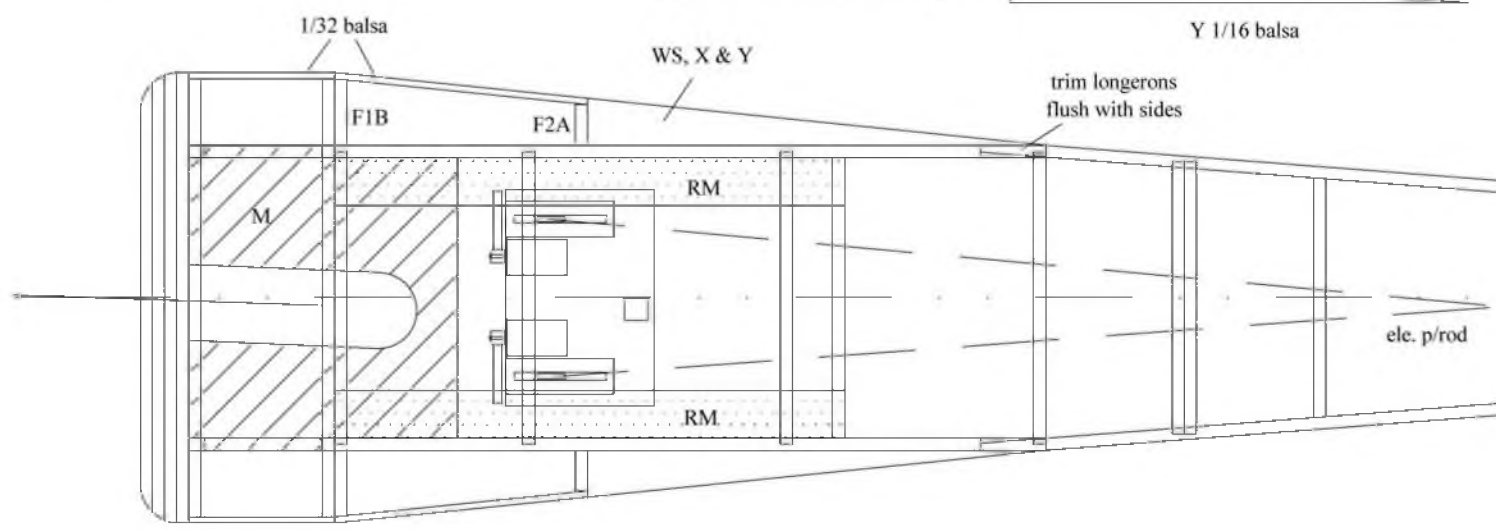
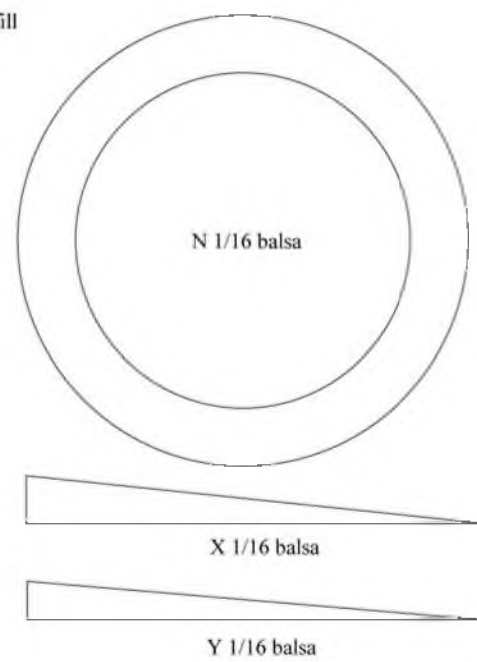
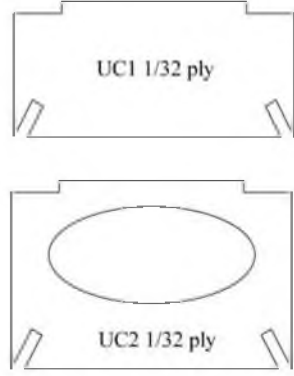
battery attach to side with small magnet (s)

- horn 1/32 ply
- C 1/32 ply

skid 1/32 ply



u/c frame shown full size assemble over drawing & glue into UC1/UC2





own is  
brick  
or unit

sq. stringers

F6

ele. p/rod

rudder p/rod

laminated outline  
3 off 1/32x1/16 balsa

tail from 1/16 balsa  
size or shape shown

F7

F8

T1

TP

EX1

EX2 (op. side)

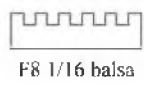
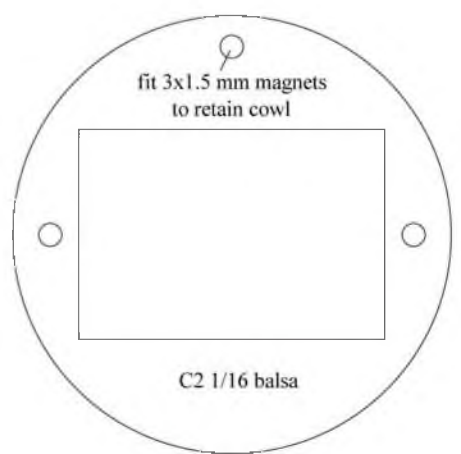
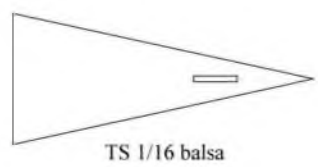
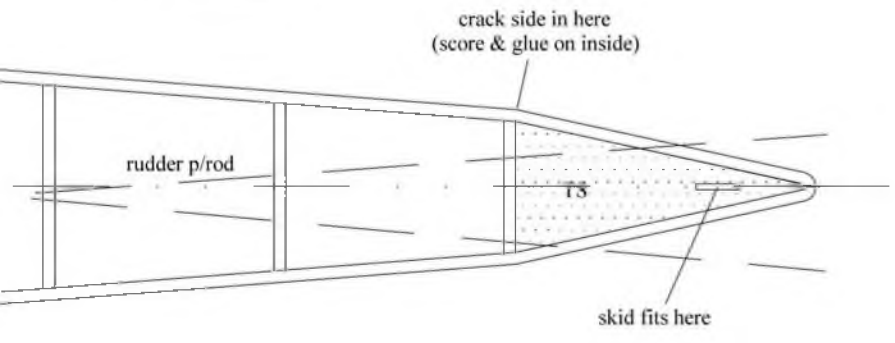
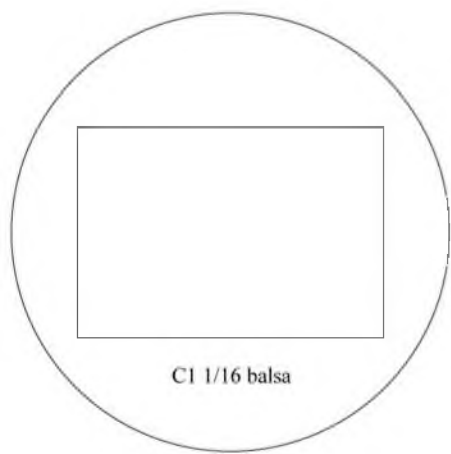
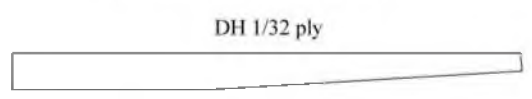
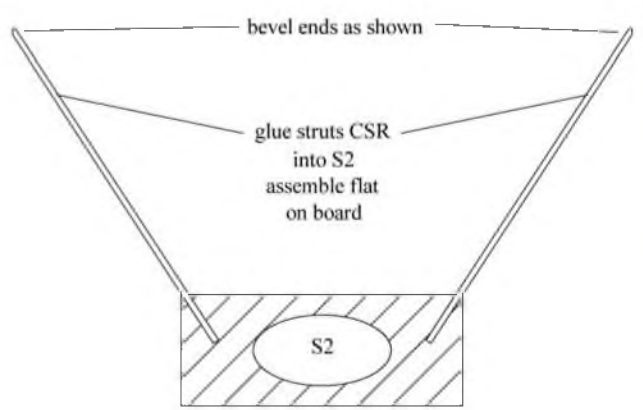
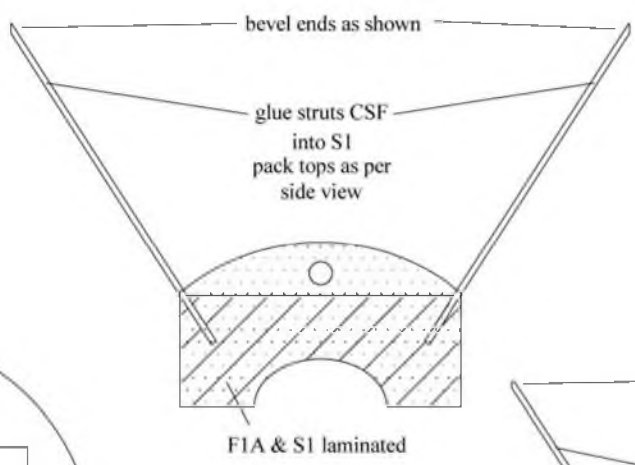
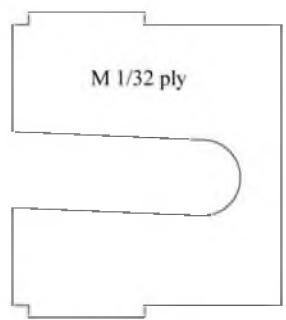
horn

1/32 ply skid

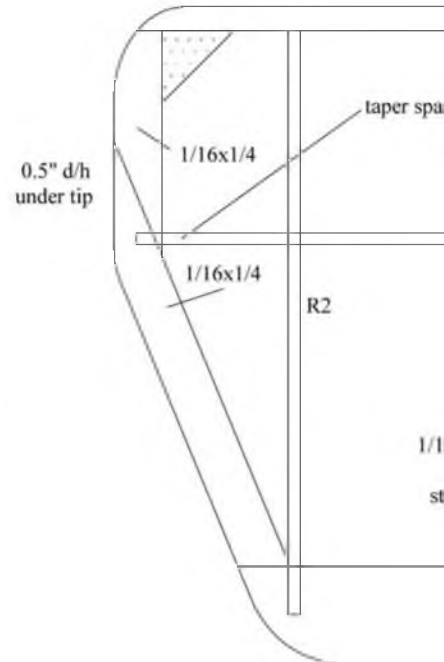
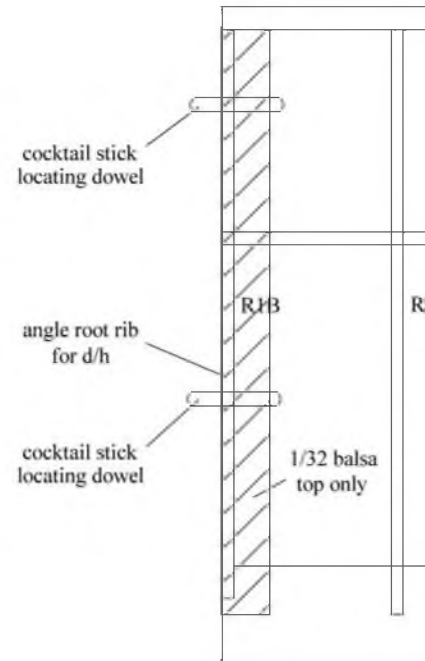
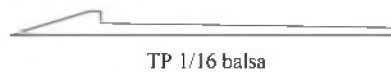
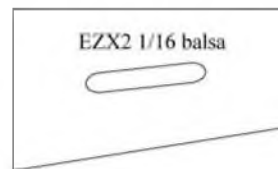
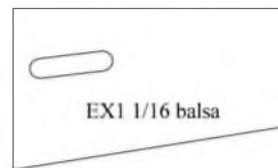
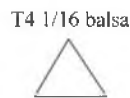
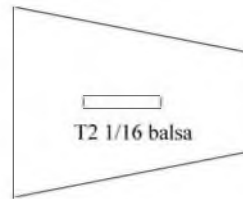
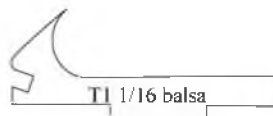
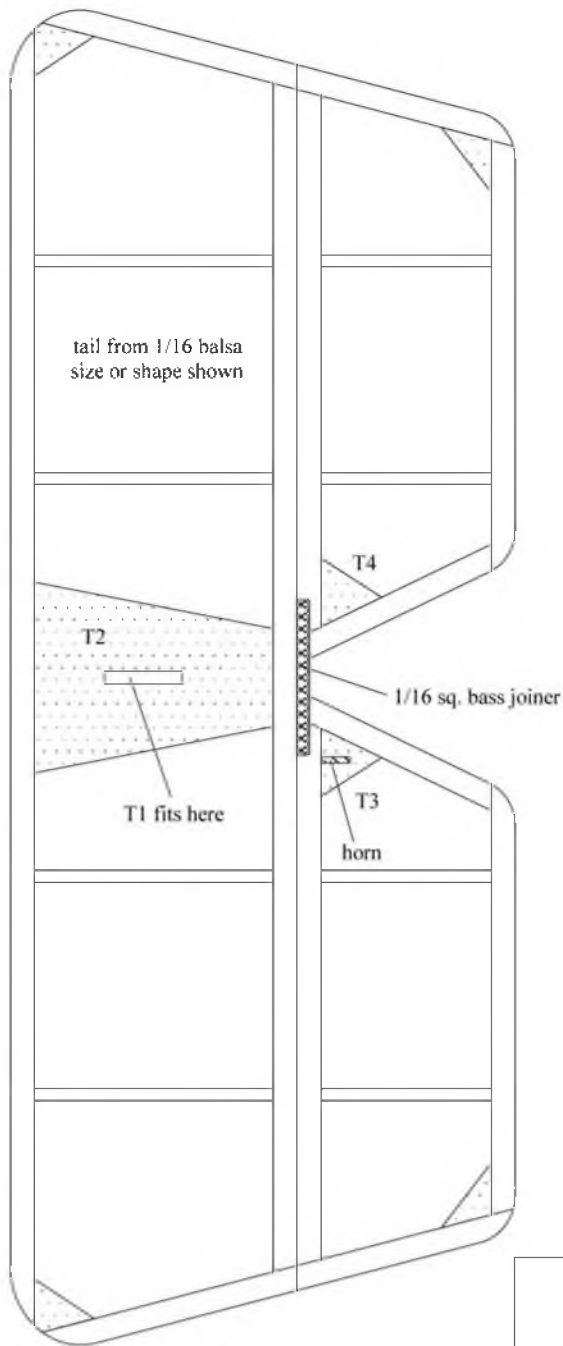
TS between sides

# Peter Rake's Sopwith Pup

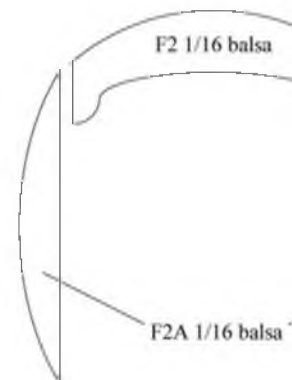
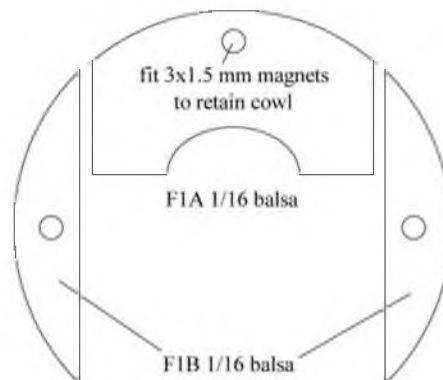
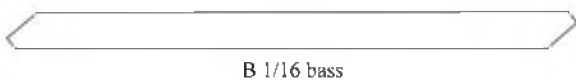
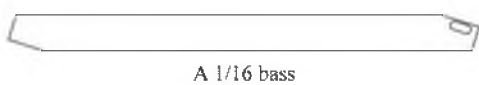
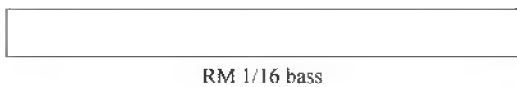
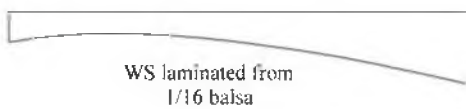
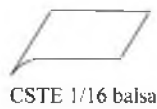
Copyright P. Rake 2015



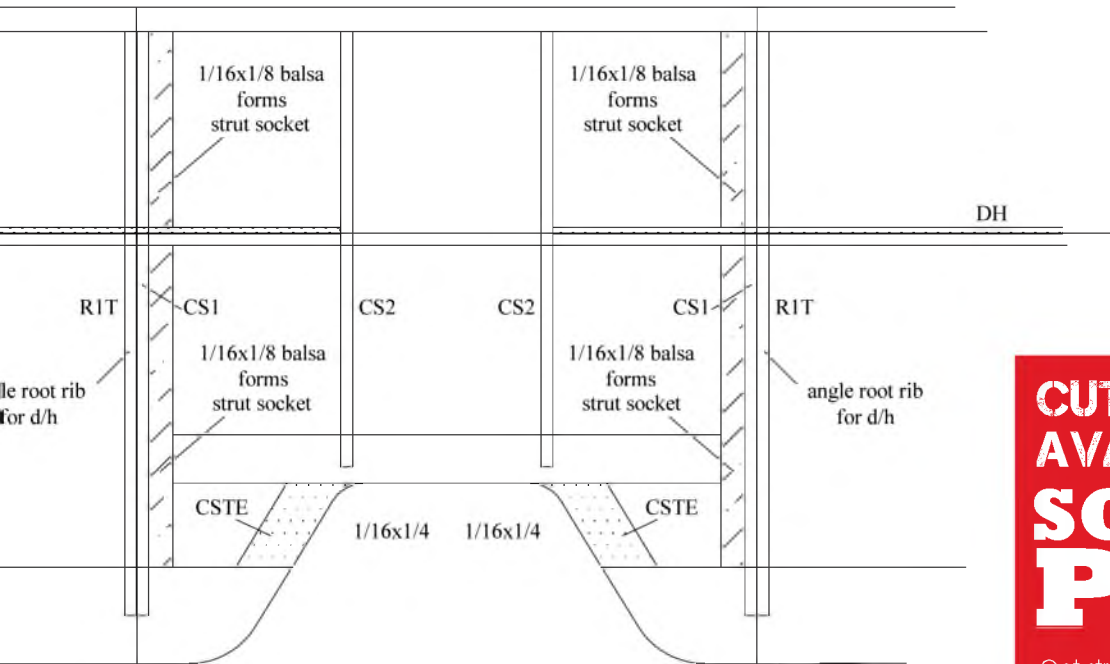




Peter Rake's  
**Sopwith Pup**  
 Copyright P. Rake 2015







**CUT PARTS SET  
AVAILABLE!  
SOPWITH  
PUP**

Get straight down to construction without delay!

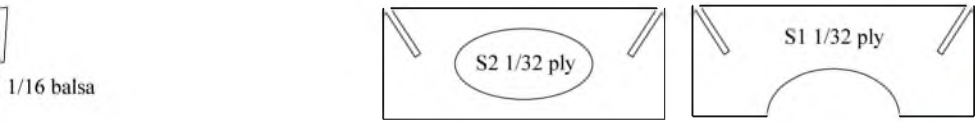
**Price £15.00** plus carriage

**Order set CUT/FSM507**

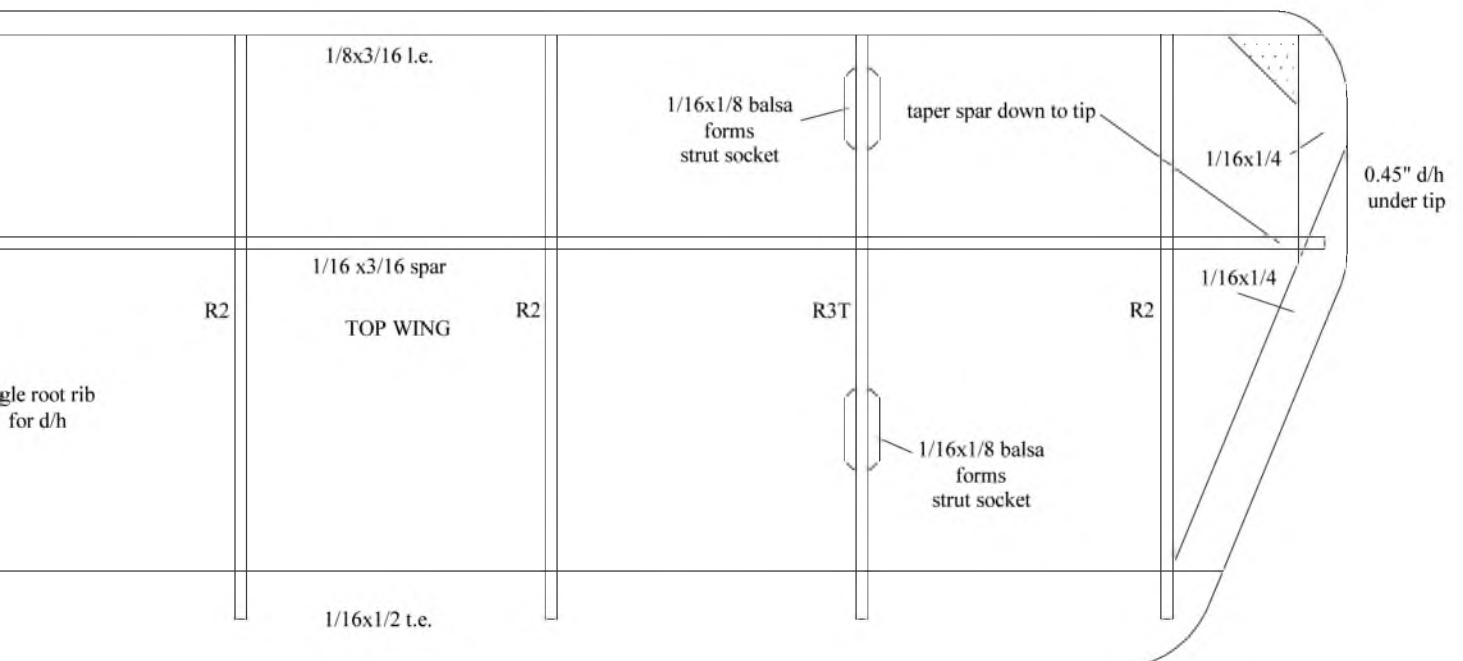
Visit our secure website:

[www.flyingscalemodels.com](http://www.flyingscalemodels.com)

to order yours



1/16 balsa







As you can see, helicopter boards can be extremely useful in fixed wing models too.



No small WW1 style wheels? Card cones and a little imagination, along with a toy cycle or two will provide lots of them.

out of the question. Add in the relatively puny torque generated by the 'brick' servos or actuators and it becomes clear that something both lightweight and with VERY free-operating control surfaces is required. So, no binding anywhere in the system is allowed if you aren't to stall the servos or actuators.

If you study the pull-out full size plans, you'll see that precise routes have been worked out for thin 1-1.5 mm carbon pushrods. So, it's quite important that, if using the same equipment, you position the receiver brick precisely as indicated on the drawings. Then, the pushrods will have a free, straight, bind-free run from servos to control horns. Honestly, those pushrod runs aren't just drawn in at random they do actually work out just right.

When installing the pushrods, do it while the receiver is still outside the fuselage so you have easy access for fitting the wire (0.020") z-bends into the servo arms. Fit the wire ends to both pushrods using heat-shrink tube and a spot of CA, but only fit them to the servo end at the moment. Also important, for the moment, is that you leave the pushrods well over length, with one longer than the other.

Now, with both pushrods attached to the receiver brick, slide them into the model through the (as yet) uncovered fuselage bottom. Since one is longer (quite a bit longer) than the other, it's a relatively painless task to align it with the exit guide without the risk of piercing the covering with the shorter rod. Then, you can slip the shorter one in place, position the receiver as indicated and glue it to the rails with a few small spots of R/C Modeller's Glue. I do stress SMALL spots of glue, taking great care not to get any

near the servo gears. It doesn't take much to foul those tiny gear teeth and that invariably leads to stalled servos and burnt out circuit boards.

Slip the control horn end wires/heat-shrink (pre-shrunk so you don't need to heat anywhere near the model or the carbon rod) and fit the control horns to the pushrod ends. Slide along the carbon rod until in the correct location (roughly) and glue the horn into the control surface. Not only does this avoid difficulty getting the wire into the already glued-in-place horn, it also means you can still do some final adjusting of the wire position to centre the control surfaces before adding a spot of CA to the carbon/heat-shrink/wire joint. The excess carbon rod can be trimmed off once everything is finally set up. Those little nail clippers are extremely good for this because they get into tight corners and cut the carbon fairly cleanly.

## HINGES

Of course, it's all well and good having free operating pushrods, but no help at all if your control surface hinges are stiff. Because of the thin surfaces we are dealing with here, whatever you use to form slots for the hinges will, equally, need to be to be very thin. To have sufficiently free movement, it also needs to be flexible, but not so flexible that you can't insert it into the hinge slots.

Thin nylon fishing line glued into pin holes works well, but can be a bit difficult to see while you're working with it (old eyes and all that, and yes, I should have gone to a certain well known Opticians; (this was written in the Luton Airport Arrivals lounge!)).

Two items I find much easier to work with are floppy disc (remember those) material

and the transparencies sold for overhead projectors. Both these technologies may be old hat, but the materials still make very good hinges for small models. Sand both sides to remove the floppy disc film and roughen them, cut into strips about 3/32" by 3/8" and a single floppy disc will provide enough hinges for several models of this type. No bad thing since I have several more of these lined up for you.

The beauty of these little models is that they're inexpensive to build, equip and cover and, additionally, they are fun to build and can be flown either indoors (in a reasonable sized venue) or outdoors on a calm day (or evening) at virtually any small park or playing field. Being small and electric powered, they are highly unlikely to draw attention or cause you any problems with the neighbours. Oh yes, and because they take up so little space to store, you can have lots of them. That much I can help with.

Just picture the scene, it's a gloriously calm summer evening, but you don't have time to charge up your big models and go to the flying field. However, there's a little park just around the corner and it doesn't take long to charge those little batteries.

Half an hour later you're happily cruising your little Sopwith Pup around within easy walking distance of your house. Plus, you have extra batteries on charge using the chargers that came with your deceased RTF models. Sheer modelling heaven and so much more satisfying than charging around the sky with an expensive lump of foam.

Should you wish to contact me, you'll find me at the usual place - PETERAKE@aol.com



# The British Model Flying Association

Protecting and promoting UK model flying for over 90 years.

£25 Million liability cover for all lawful recognised model flying activity as standard.

Join at [www.bmfa.org/join](http://www.bmfa.org/join)

## 2015 Fees

Senior £32, Junior £17,

Family Partner £21, Family Junior £13

Join via the website, over the phone or send payment with this advert

\*Membership year runs to 31st Dec 2015



Mr/Mrs/Miss..... D.O.B. ....  
Address.....  
Postcode ..... Tel: .....  
E-mail ..... Make Cheques payable to BMFA



BMFA, Chacksfield House  
31 St Andrews Road, Leicester,  
LE2 8RE

T: 0116 2440028

E: [admin@bmfa.org](mailto:admin@bmfa.org)

[www.bmfa.org](http://www.bmfa.org)



## VISIT THE ROTORWORLD WEBSITE

ALL THE LATEST R/C HELI ONLINE NEWS & MUCH MORE IS JUST A CLICK AWAY!



**ORDER ONLINE**

MANAGE YOUR SUBSCRIPTION, ORDER ISSUES, BINDERS, BOOKS, SUNGLASSES...

- LATEST NEWS
- REVIEWS
- FEATURES
- GALLERY
- VIDEOS
- EVENTS
- LINKS
- AND MORE...



MAKE SURE YOU VISIT US AND BOOKMARK  
[WWW.ROTORWORLD.CO.UK](http://WWW.ROTORWORLD.CO.UK)



## NEW Expanded Range!

### Hawker Hunter Set

True scale set includes landing light, navigation lights and two red strobes.

£114.50 + P&P



- NEW 40mm Landing Lights
- World renowned lighting systems
- Used by national scale champions and show pilots
- 20W Intelligent Lighting Controller
- 1.25W+ LED, 10W Strobe modules



### Warbird Set

Everything you need to make your warbird shine! Navigation and landing lights plus our FlightLights v5 controller.

£93.20 + P&P



For details and ordering goto  
[www.braincube-aero.com](http://www.braincube-aero.com)



**A**llow me a brief digression. Many moons ago when I was a nipper (and The Beatles were in the charts), my Auntie Renee bought me the iconic *Airfix* kit for Christmas. It was intimidatingly large and wondrously white. It was the first model I had ever built with an engine 'nacelle'. It was also the first time that I had come across that particular aviation word. I had no idea how to pronounce it!

Discovering the Sunderland was a seminal exercise for the nascent

modeller. Indeed, for many UK scale modellers, our first experience of the Short Sunderland was that beloved classic plastic kit.

### Short Brothers

In the 1930s, Britain had an overseas Empire on which the sun never set. Long haul air travel was seen as a vital means of linking the far-flung outposts of the Imperium, but those distant, undeveloped places lacked the airfields and landing grounds



# SHORT SUNDERLAND





# LAND

Admire David Baker's exciting scale model, and you will believe a boat can fly - says Alex Whittaker





**1:** The forward hull shape looks convincing. Simple but not over-simplified. Note Stand-Off-Scale home-moulded front gun turret, with simple trim glazing bars. **2:** Canopy treatment is completely appropriate for such a sport-scale model, and that porthole is actually a sticker. **3:** One of the batteries, well forward in the bay under the cockpit canopy. **4:** David turned up the engine nacelle wooden plugs on his small lathe. Vortex-VacForms did the rest. Note nifty exhausts. **5:** Climbing out nicely from lift-off. Note angle of brace floats, and the step of the hull. **6:** Front view of float shows contours and bracing.

Parked on the hard at the top of the slipway. The four motors are inexpensive Turnigy 1400kV items.

and the cost of creating such facilities was prohibitive for the likely level of usage.

However, where-ever there was a decent size stretch of water, either inland lake or coastal water, the flying boat was clearly a cost-effective answer and so, for 20 years from the early 1930s onward the big multi engine flying boat became the answer for counties needing a long range commercial and military reach beyond their own shores in support of their national interests.

In Great Britain, this was epitomized by the line of 'Empire' Class four engine flying boats developed by Short Brothers as their S.33 from 1933 and operated by Imperial Airways and its successor, British Overseas Airways Corporation (B.O.A.C.).

Thus, Shorts were well placed when the British Air Ministry issued their Specification R.2/33 for a long-range maritime reconnaissance flying boat with heavy defensive armament, for maritime reconnaissance and





Sunderland on a long distance patrol over Carr Mill Dam. Model has flatted-down Oracover film covering



ocean patrol tasks using the experience of the 'Empire Class' boats to produce the Sunderland.

First flown in 1937, the aircraft provided the ability to stay airborne for long ocean patrols, plus demanding search and rescue missions. In service with the RAF, RCAF, RNZAF and RAAF, throughout WW2 and on into the mid-1950s the Sunderland soon developed a reputation for toughness, with an exceptional ability to absorb enemy damage, and still return safely to port. Her defensive armament was comparatively light, but there was a lot of it.

She proved amazingly capable of defending herself. German fighters soon learned that she was not easy prey. In 1942, one RAAF Sunderland fought off no less than eight Junkers Ju88s, downing one, sending another limping home, and fighting off the rest. One rueful German nickname for the Sunderland was 'Fliegendes Stackschwein, or 'Flying Porcupine'. Though their primary workload included reconnaissance and

rescue, at which they excelled, Sunderlands were able to inflict lethal damage on enemy surface shipping. Sunderlands also had a good record against German U-Boats. Their long range capability enabled them to sweep vast areas of the Western Approaches, the North Sea, and the Mediterranean. A total of 777 Sunderlands were built. They remained in service from 1938 to the 1960s. In 1967 the RNZAF retired their last example. The civilian passenger developments of the Sunderland, known as the Sandringham and the Seaford, marked the close of the Golden Age of Imperial Flying Boats.

### The Model

David Baker is a resourceful chap. Like many of us, he built the famed *Airfix* Sunderland construction kit as a boy and the memory stuck. He is also a keen waterplane flyer and Chairman of the Wet Wings Model Flying Club in Lancashire. A few seasons ago, David had a novel idea that turned scale

modelling on its head. He decided to recreate an exact flying scale model of the original *Airfix* kit! This really was art imitating art, but scaled up, and fitted with modern radio. If you ever built the *Airfix* kit in the past, and now examine the photos, you will immediately note the amazing likeness. So what we have here is a highly practical, sports-scale flying model that captures the 'original' in an uncanny way. It really is a novel idea: an exact scale model of a famous plastic scale kit.

### Plan and documentation

The model and structure are all to David's own design, but closely based on the 1/72nd scale *Airfix* plastic kit three-view drawing. Desiring a faithful model of the original kit, David even copied the kit decals!

### Construction

The model is of traditional all-built-up balsa structure, plus a little plywood. The fuselage is made of 3/32" balsa built-up formers, and



**7:** Rear of the hull is faithfully modelled. Lower hull is skinned in fibreglass and resin for strength and water resistance. **8:** David has kept the detailing simple and "sports-scale". Interesting but practical, based directly on the famous *Airfix* kit. **9:** Home designed vinyl roundels. Simple, effective, and durable in the water environment.



1/16" sheeting. The exception is the underside of the hull, which is 3/32" balsa sheeting. The wing uses three-piece 3/32" balsa ribs, with 1/16" sheet Leading and Trailing, and an open centre to the Leading Edge, with 1/16" cap strips. The main spar is 1/16" hard balsa, with 1/8" square spruce top and bottom, on one side only, while the nacelles are built up and planked balsa structures. The Tail plane comprises 1/16" balsa ribs, with 1/32" balsa sheeting, top only. Spars are thin-walled aluminium tubes, the main spar being a 250-size helicopter boom

### Covering

Two prime considerations for any flying boat are flotation, and the repulsion of water. The covering regime chosen by David is therefore unusual and instructive. The finished model is covered throughout with gloss white Hobbyking Oracover, while the underside of the hull was covered in lightweight glass-cloth and resin.

### Painting

The white Oracover film covering was flatted back to dull with an authentic Scotch Bright scouring pad. Copy pads will not achieve the desired effect. The camouflage scheme was then aerosol spray-painted on this prepared matt substrate with Spectre spray paints.

### Legending and decals

David showed further ingenuity with his approach to the Sunderland's decals, legending, and graphic detailing. He began by scanning the decal sheet from the Airfix kit on his home printer/scanner and then emailed these scans to *Callie Graphics*, with



**10: Distinctively tall tail treatment on the Sunderland. 11: A bigger Airfix? Designer/builder David Baker demonstrates the size of his creation - a scale model for everyday flying.**



the appropriate enlargement factor from 1/72nd scale to 1/16th scale.

David reports that *Callie's* turned his order around in under two weeks, which he describes as brilliant service. David reports that the service was not expensive. *Callie's Graphics* did the windows too, which are not just simple black circles, but are shaded lighter around the rim - a subtle sports-scale idea, but it makes a difference

### Engine cowls, turrets and canopies

David hand-carved the turret and canopy plugs freehand in jellutong wood and

turned up the radial cowl plug in wood on the small lathe in his shed. He then commissioned Steve at *Vortex-VacForms* for the vacuum forming and reports the service from Steve at *Vortex* was excellent. Incidentally, I have also bought off-the-shelf *Vortex* vacuum-formed canopies and cowls in the past. They were excellent, and very reasonably priced.

[www.vortex-vacforms.co.uk](http://www.vortex-vacforms.co.uk).

### Powertrain

This is an electric multi-motor model, which confers certain advantages in terms of





water handling. For example, having (switchable) steering by motor power differential is a clear bonus. In other words, the model can be steered on water using the motors, and then that differential control can be switch out for flight mode.

When it comes to inexpensive electric power, David knows his stuff selecting unexotic, inexpensive items for the powertrain. For example, the Sunderland uses four Turnigy 1400kv 180 Watt brushless motors driving four 8"x 3.5" three-blade counter-rotating props. The flight battery comprises two 2650mAh three-cell packs. David reports that a charge rate of 25-50c gives around ten minutes flight time.

### Speed controllers

The motor power is controlled via four Turnigy 30amp programmable ESCs. A separate three-cell lipo powers the radio via a battery eliminator circuit (BEC)

### Pilot's notes

David really wanted this model to look like a large Airfix kit and to that end his Sunderland is a highly practical, stand-off scale, every-day flying model, not a rivet-counter's delight. As to the flying experience, here are

David's own words:

"It's all about the flying! I wanted it light so it sits on the water, not in it. Its water handling is superb and the differential throttle steering makes taxi runs a precise affair. (I turn off the differential steering for flight).

I chose 1/16th scale so that it would fit into my Volkswagen Passat estate car. Also, it is the same scale as the old Aerokits 34" radio-control Crash Tender which I own. I originally designed and built the Sunderland with scale incidence angles of +7 degrees wing incidence and +4 degrees tail. (The same as I used when I designed and built Andy Johnson's 17ft Whitley bomber).

However, with the Sunderland I created a model that, due to its ultra lightweight, would not land! The huge wing just went into ground effect when you tried to flare for landing, and it refused to land. Brutal surgery ensued. I set about the model with a razor saw, reducing wing incidence to +3 degrees and tail to +0.5 and it has transformed the way it flies. Long 'Splash-and-Goes' are now its usual flight pattern.

I don't treat this model as anything special; I fly it most weekends at the lake, sometimes in less than perfect weather. The electrics aren't anything special either; it's all fairly low

budget with motors costing around £7 each and ESCs around £10 each. It flies on my old Spektrum DX7, with cheapie seven channel Orange receivers, complete with satellites.

It did take an early bath once, when a wire pulled out from one of the BECs. I lost half the radio control and two motors! It flicked and dived into the lake like a cormorant. Being so light, it just bobbed back up less its front turret, with the minimum of damage".

## MODEL SPECIFICATION

### Short Sunderland Mk III

**Scale:** 1/16

**Span:** 86"

**Weight:** 7lbs (includes lipos ready to fly)

**Motors(s):** 4x Turnigy 1400kv 180 Watt brushless

**Prop(s):** 4x 8 x 3.5 3-blade counter-rotating

**ESCs:** 4x Turnigy 30amp programmable

**Flight Pack:** 2x 2650ma 3cell 25-50c gives around ten minutes flight time  
Separate three-cell lipo powering radio via Battery Eliminator Circuit (BEC)

Rising cleanly and effortlessly onto the hull-step, maintaining a scale-like angle.







# Maxford

The Maxford USA A

**T**he Airco DH.2 was a single-seat biplane 'pusher' aircraft, which operated as a fighter during WW1. It was the second pusher design by Geoffrey de Havilland for Airco, based on his earlier DH.1 two-seater. The DH.2 was the first effectively armed British single-seat fighter and enabled Royal Flying Corps (RFC)

pilots to counter the Fokker E.1-E.III 'Fokker Scourge' that had given the Germans the advantage in the air in late 1915. Until the British developed a synchronisation gear to match the German system, pushers such as the DH2 and the FE2b carried the burden of fighting and escort duties.

Early air combat over the Western Front indicated the need for a single seat





# and Airco DH 2

ARTF kit for electric power of this early WW1 fighter. Review by John Phillips

fighter with forward firing armament. As no means of firing forward through the propeller of a tractor aeroplane was available to the British, Geoffrey de Havilland designed the DH.2 as a smaller, single seat development of the earlier two-seat DH.1 pusher design. The DH.2 first flew in July 1915, armed with a single 0.303" (7.7 mm) Lewis gun which was

originally able to be positioned on one of three flexible mountings in the cockpit, with the pilot transferring the gun between mountings in flight at the same time as flying the aircraft. Once pilots learned that the best method of achieving a kill was to aim the aircraft rather than the gun, the machine gun was fixed in the forward-facing

centre mount.

The DH.2 had sensitive controls and, at a time when service training for pilots in the RFC was very poor, it initially had a high accident rate, gaining the nickname 'The Spinning Incinerator', but as familiarity with the type increased, it was recognised as very manoeuvrable and relatively easy to fly. The rear mounted rotary engine made







**The optional Lewis gun, instrument panel and windshield available from Maxford for the DH2.**



**Spare ammunition drums and carries are another optional extra.**

the DH.2 easy to stall, but also made it highly maneuverable.

The majority of DH.2s were fitted with the 100hp (75kW) Gnome Monosoupape rotary engine, but later models received the 110hp (82kW) Le Rhône 9J.

In total, 453 DH.2s were produced by Airco and none survived the end of the war, but currently a number of the DH.2 replicas are flying worldwide.

### The model

The Maxford USA range of kits seem great value for money and feature some unusual, infrequently-modelled aircraft, as well as some rather more well-known types. I was drawn to the DH.2 as it is one of those aircraft that has long interested me, but I have always doubted my ability to build one from scratch, due to its structural complexity. But a study of the Maxford ARTF on the MacGregor Industries website at

[www.macgregor.co.uk](http://www.macgregor.co.uk) convinced me that the Maxford kit was indeed impressive looking, a convenient size (1.6m span) and electric powered. For me it ticked all the boxes and the price was attractive too, so it was a done deal.

The modest sized box, duly opened, revealed all the assemblies separately packed and taped in place to prevent damage during transit and on close inspection, having removed the items from their confinement, confirmed that the build standard looked very good, as was the factory-applied olive drab shiny heatshrink film covering, the vac-formed front fuselage decking and the vac-formed dummy rotary engine, the latter from black plastic.

The two 'fuselage' side frames that carry the tail unit comprised carbon tubes top and bottom, separated by what looks to be glass fibre struts retained by aluminium

strip wrap-around brackets top and bottom, bolted on and each carrying a small fishing swivel - to be used when rigging the model (more on that later). These swivels were also fitted to the red/white painted interplane struts and the black painted inner bay struts.

The wing panels are joined by a carbon tube and a short dowel fitted in the root rib ensures incidence alignment (more of that later, too!). Slots in the wing surfaces are ready to receive the pre-formed struts and it would be wise, before starting the assembly to check the fit of the corresponding struts in these slots - the review kit needed quite a few of the slots to be slightly opened up to allow the strut to fit - don't be tempted to simply 'push home' the struts if they are tight as, after all, the wing structure is quite flimsy, as befits an aircraft structure of that era.

The rear of the laser-cut ply fuselage nacelle has a rectangular opening that runs through the fuselage to the front and a corresponding ply motor box is a sliding fit in the

fuselage, allowing the forward-af movement of the motor box to accommodate the different motor sizes that might be selected, etc. The dummy 'rotary' engine is mounted on a ply box that fits around the motor and fits to the rear of the sliding motor box.

The instructions say that the motor box can either be glued in permanently when the correct position has been determined, or screwed in place using supplied wooden blocks, which allow the motor and box to be removed should the need arise.



**Always fit a pilot! But preferable at the right scale! The optional bust from Maxford is 1/5 scale, not 1/6 unfortunately.**



The model features ailerons on the bottom wing only and an individual micro servo is needed in each of the outer lower wing panels. Elevator and rudder control is provided by another two micro servos, mounted at the rear of the side frames in a triangular joiner plate top and bottom. This gives a very short, positive linkage to elevator and rudder, but necessitates several servo lead extensions running along the side frame tubes and into the fuselage, via the inner wing panels.

The wire undercarriage (made from quite a substantial gauge of piano wire) locates in grooves in the fuselage nacelle bottom and is retained by plastic strap plates and self-tappers. The lightweight, foam tyred wheels are retained, not by the generic grub-screw collets, but by nylon locknuts, as the ends of the axle are threaded - no lost wheels in flight, on the Maxford DH.2, then!

The DH.2 also features a sprung tailskid that bolts onto the bottom of the rudder - the spring seems a trifle strong, it has to be said, but it certainly looks OK from a distance.

All the fittings supplied looked well up to the task and are very comprehensive, with plenty of spare swivels and screws.

Four RAF roundels are supplied and are made of very thin vinyl - they go on very easily and fit the double curvatures of the film covering well.

### Additional accessories

It is well to mention here the other Maxford accessories that can be

purchased to 'finish off' the DH.2 - namely, a detailed windshield, instrument panel and Lewis gun (sold together), a pair of ammunition drum carriers (with spare drums) and a pilot, although the latter is not available in the right scale!

The model is 1/6th scale, but Maxford pilots are only available in 1/5th or 1/8th scales. These are not absolutely necessary, but certainly add a lot to the model. I was able to find a suitable 1/6th pilot in my spares box and made up an instrument panel and gun, but it has to be said the Maxford ones are far superior, if somewhat costly.

### The build

The Maxford instruction manual is very good, with clear and precise written build-steps, each accompanied with a clear, B/W photo, so no complaints there, then. For the powertrain, I opted to follow MacGregor's advice and fit one of their Electrospeed Outrunner motors - a 900KV, 710W 3548/05 (the instructions actually call for a 400W motor) and a 30A esc, matched to a 12" x 7" APC prop.

The instructions do say that additional noseweight will be needed to balance the model (more on that later), so I opted to use a larger capacity lipo than I would normally expect to use in a model of this size, so that the extra weight was at least useful in added flight duration.

Theoretically also, the larger power motor/prop combination would mean a lower throttle setting, further increasing duration - we'll see!

I did however, have reservations about the strength of the fuselage nacelle nose. With the combined battery weight and the probability of additional noseweight, the moulded plastic skin of the nose cone and the thin laser cut structure under it looks rather vulnerable, should the model noseover during landing for example. I was correct to have these reservations, but more of this later.

The build, following the excellent instructions, went together very well with no problems being encountered. The extension leads from the elevator and rudder servos were attached to the boom tubes and struts as advised - with black electricians tape placed every few inches, keeping the lead tight so that it lay along the airframe tidily.

Getting the leads from the wing root into the fuselage nacelle proved a little fiddly. The way I devised was to use a length of piano wire with a hook shaped at one end, pushing the wire through the wing rib hole from the other side, right through the fuselage and opposite inner wing panel section, engaging the lead in the hook and carefully withdrawing the piano wire, pulling the lead with it. Then, using the piano wire with the nacelle hatch removed from the fuselage, the servo lead connector could be hooked and pulled into the fuselage, ready to be connected to the receiver.

The real surprise came when I fitted the outer wing panels onto the carbon tube wing joiners and slid them fully home. There was quite a mismatch between the



Gluing and screwing the rear frames to the lower wing inner panels.



Fitting the inner struts to the fuselage and inner wing panels, before fitting the top wing centre section.



The rudder and elevator servos in place on the top and bottom rear plates. Note the sprung tailskid bolted to the rudder.



Routing the tail servo leads along the booms and into the wing - a neat solution.



The sturdy uc assembly bolts onto the bottom of the fuselage.





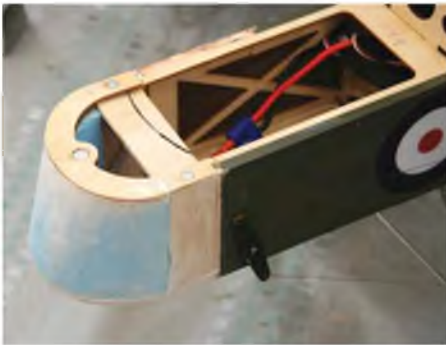
One of the outer top wing panel mismatch with the centre section at the leading edge.



View of the top wing outer panel incidence mismatch from the rear, showing difference in root TE heights.



Checking the incidence of each wing panel and centre section - at least the mismatch was even on port and starboard sides, top wing only.



The replacement foam nose being shaped and fitted. You can argue that the profile isn't quite right, but it's eminently practical.



The blue foam replacement nose is hollowed out to allow the lipo to be placed as far forward as possible - the wide ply crosspiece is the support for the additional noseweight needed.



The finished replacement nose, ready for painting to match the overall olive drab finish.

top wing outer wing panel root rib and the inner wing panel root rib - both left and right wing panel leading edges were higher than the inner panels and the trailing edges were both lower than the inner panels! Effectively this means that the outer panels top wing were at a higher incidence than the centre section of the wing! The lower wing panels were a much better match, inner to outer. Time to check what the actual incidences were!

The DH2 was stood on a flat surface and the tailskid raised and supported so that the tailplane was level (using a spirit level placed across the chord of the tailplane). The incidence of each panel was the measured using my Robart Model Incidence Meter - simple to use and accurate to within 1/2 degree, so it is claimed (I have no reason to doubt it!). Fitting the incidence meter to each panel in turn, came up with some interesting results!

Wing incidences with tail at zero degrees:

	Top wing:	Bottom Wing:
Centre section:	+3°	+3°
Port outer:	+3-1/2	+3°
Starboard outer:	+3-1/2	+3°

Little can be done to correct these variances on the top wing outer panels, but at least they are even, port and starboard. Whether the mismatches will effect in air handling noticeably will be seen when we get to fly the DH2! The problem would be if the incidences of the port and starboard outer wing panels were different!

### Rigging

With the airframe more or less complete, it was time to rig the DH2. As already mentioned, Bowden cable is supplied to use as rigging wire and my first thought

was that it was too big a gauge - for stiffness and for weight, but this is a review, so I went ahead and used it to the best of my ability as per the instructions, engaging the cable in the swivels attached to the struts and booms, as advised.

The diagrams in the instructions need to be studied a bit before attempting the rigging, but believe me the entire rigging can be achieved with just four lengths of cable! Admittedly, the length of each needs to be long and this causes a problem as the wire, as supplied, is wound round in quite a small radius and when this is released, the cable can become a mass of spirals, which can, if not careful, become entangled and cause tight snags in the cable.

Bear in mind that, initially, the whole length of each length of cable has to be threaded through each swivel, one at a time, and tightened, before moving on to the next bay. I found that the springs supplied to tension each length of wire were not strong enough to keep a decent tension on the cables to keep the rigging taut - and the various snags in the wire were difficult to straighten out exactly and invariably occurred in the middle of a rigging 'run'! I did it the best I could, but was not impressed with my efforts all. The model looked untidy and not like the website build-photos at all! I took a photo of the finished result, shown hereabouts, before deciding to remove it all, do away with the swivels (the line of the rigging looked weird in places, due to the swivels being too long and being fitted too low on the struts) and start again with something more suitable.

I finally opted for brown coloured nylon fishing line, which probably was a bit too thin, but was much lighter (all the weight of the rigging is virtually behind the CG position), easier to keep taught - you can knot each run at each strut and, by drilling

small holes through each strut top and bottom near to the wing surfaces, the attachment points look a little more realistic (from a distance) than the swivel method. The breaking strain of the fishing line can be kept low, too, so that in case of a 'heavy arrival', the rigging should snap, hopefully saving the airframe, rather than passing on the impact forces - this is purely conjecture, mind you, as 'arrivals' should, of course, always be avoided (once again, a fortuitous decision, more later!)

The final deviation from 'basic kit' finish was to give the whole model a light spray with a matt fuel proofer - not for protection, but to achieve a more realistic finish!

### Setup

As the instructions warned, the DH2 needed noseweight to balance at the correct CG position (2" back from the top wing LE), despite removing the relatively heavy Bowden cable rigging - and so the required lead weight was fixed in the nose of the fuselage nacelle, epoxied to a ply crosspiece over the front of the battery which was placed as far forward as possible. I was reminded of the thinness of the nosecone plastic when the nose received a knock with the battery in place - the plastic came into contact with the rigid battery - and cracked. The knock was not that hard, but enough to damage the thin wall of the nose - the implications, in the case of a noseover were becoming very clear!

The recommended control throws are given in both deflection angles and imperial measurements and so these were set up, in my case, I was using my DX8 Tx and so was able to apply three-position throws, using the recommended throw as the middle position, so that I had higher and lower rates available during flight



testing. I first thought of setting up aileron differential to combat adverse yaw, as it has been my experience with these WW1 biplanes, especially with just one pair of ailerons, that adverse yaw is usually the rule, rather than the exception, but as this is a review, I set up using the recommended 'same up as same down' throws, using a Y-lead.

So with the flight battery fully charged, the CG and control directions and throws double-checked, it was time to fly over the trenches...

## Flying

Perfect flying days in early February are few and far between, especially with sunshine to help the photography and so I waited and waited to no avail, deciding in the end that the next no-wind day would see the maiden flight. Thus, on a dull but windless day in early March, I took the DH2 to the strip, determined to get it into the air and do some decent flight-testing.

With everything checked out, the throws set to the instruction recommendations and a fully charged battery pack in place, I carried her out to the centre of the strip and checked the direction of the 'ever-so-slight' breeze, before lining the DH2 up and walking back to the pilot line.

I was expecting the build up to flying speed to be a way less than full throttle due to the power of the motor/prop combo fitted and sure enough, I needed only half throttle to get her rolling forward, accelerating, tail lifting after about 10 metres and then she lifted off, climbing at a relatively shallow angle, keeping her nose into the breeze until I had a good

height underneath her.

A turn to the right needed a dab of rudder to get her round, confirming the presence of adverse yaw, but not excessively so. A few clicks of 'up' elevator and right aileron had her flying straight and level - and, at half throttle, flying slowly like a WW1 biplane should. A few circuits to check her out and then into an eight - she turns far easier to the left than to the right (prop torque?), needing hardly no left rudder to get her started to the left, but a bit of right rudder to get her to go the other way!

Having become comfortable with the straight and level handling, it was time to try out the stall before throwing in some aerobatics. The wing-drop when it came was quite sudden, but easily recovered when authority over the control surfaces had built up again. The roll rate, as you might expect with just two ailerons, is moderate on the recommended throws, but switch up to higher rates and the rolls on aileron-only are fine - snap rolls with combined aileron/rudder are very quick, but hardly scale!

Loops can be nice and large on low power after a nice entry dive, or small and tight if you bang on the 'go faster' juice - again, hardly scale, though. Inverted flight needed just a tad of down elevator held in and she was very stable, with no attempt to roll out of it. I wouldn't say she was flying on rails, she needs concentration all the time and even more so in a stronger breeze, I would think, but the flight was very enjoyable.

Landing approach was straightforward, but I rued the fact that we share the strip with sheep! On a very nice roll-out after

what I thought was a textbook landing, one of the main wheels ran into a pile of sheep droppings and over she went onto her back, luckily not hitting the nose on the ground - and the only damage incurred was that the pilot literally lost his head!

Before the second flight, whilst the battery was recharging, I decided to adjust the aileron differential, by removing the Y lead and using two channels for the ailerons, retaining the 'up' throws to be 1" up as advised, but reducing the 'down' throw to 5/8". A quick check of the nose moulding showed that it hadn't escaped unscathed on that first landing after all, the crack was definitely worse, needing a piece of sticky tape to hold it together.

The second flight was every bit as pleasing as the first - more so, in fact as the turns were even to both the right and to the left, although I preferred to keep the rate switch on 'high', rather than the recommended throw - but that's a personal preference only.

I was enjoying myself so much I didn't notice that I hadn't initiated the flight timer and hadn't asked my watcher to time the flight, so it was a bit of a surprise when the ESC cut out to warn me that the power was low - flying slowly, it's harder to notice a drop off in power - and of course the DH2 was in the worst part of the circuit



A view of the DH2 with the supplied Bowden cable 'rigging' fitted - I tried my best, but it didn't look as tidy as the Maxford prototype views on the website!





for getting back to the strip!

The long and short of it was that in nursing her round for a suitable approach, I ran out of elevator authority and she banged down a bit hard on the main wheels - the tail came up and this time the nose was not so lucky - I guess it's fair to say that it just exploded! One wing tip touched, the interplane struts pulled out and the nylon 'rigging' snapped (what would have been the damage if I had used the Bowden cable rigging, I wonder?).

The damage was luckily easy to repair, replacing the shattered plastic nose with one carved - and hollowed out to facilitate front of the battery - from blue foam, epoxying the errant wing panel and struts and replacing the snapped rigging 'wire'.

### Verdict

The Maxford USA DH2 has the potential for flying well and, without doubt, looks super in the air. Addressing the adverse yaw by introducing aileron differential is heartily recommended - flying on higher rates than recommended certainly adds a thrill factor, but for 'scale-like' flying, the recommended throws are fine. The only

real problem I've got with it is the vulnerability of the nose structure - it is not strong enough for a 4S pack and additional noseweight placed so far forward.

Unless you can guarantee that each and every landing you make is going to be perfect, the risk of a noseover - and definite substantial damage - is ever present. I would recommend that as noseweight IS going to be needed anyway, I would fit thin ply doublers on the inside of the sides of the laser cut fuselage nacelle sides, running the length of the battery bay - and filling the nose area with expanding foam glue to toughen up the very thin plastic.

The price and complexity of the model, plus its flying performance makes it very good value for money - but only if you 'beef up' that nose, although it has to be said, a replacement 'nose' is very easy to fabricate, from foam of a vac-formed moulding using a thicker gauge plastic sheet. ■

**NOTE: The weather has presented little opportunity to get decent flying shots of the DH2 so far, so we have used pictures of the prototype DH2 from Maxford USA.**

### SPECIFICATIONS

**Manufacturer:** Maxford USA

**UK Distributor:** MacGregor Industries

**Span:** 50"

**Weight:** 4lb. 10oz.

**Power:** 400W outrunner minimum recommended

**ESC:** 6 0A brushless recommended

**Battery:** 3S - 4S 3300 - 5000mAh lipo recommended

**Servos:** 4 micro size required

**Functions:** 4-channel radio minimum required

**Price:** £159.95

#### Optional items

**JR Propo ES375 micro servo (x4):**  
£18.95 each

**Electrospeed power pack (motor & esc):** £57.95

**1/5 Pilot bust:** £13.95

**Windshield and Lewis gun:** £34.95

**Spare ammunition drums:** £18.95

#### Extension leads needed:

2 x 150mm, 2 x 300mm,  
3 x 450mm, 1 x 600mm





# Radio Control DroneZone

**Only  
£4.99**  
(in the UK)



## Radio Control Drone Zone

Into quadcopters, hexacopters, octacopters, UAVs or drones? Fancy having a go at FPV racing? Want to master aerial photography or filming? Need help building or setting up your multi-rotor? Confused about which model to buy? Worried about staying on the right side of the law? Then you need a copy of the latest Drone Zone special issue from the publishers of RC Rotorworld, the UK's best-selling model helicopter magazine.

Drones have hit the headlines recently as their popularity increases and people find a wide variety of uses for them. A key driver in the drone explosion is just how easy they are to fly. Thanks to the inherent extra stability offered by multi-rotor designs and the developments in electronic stabilisation systems, drones can be flown by almost anyone.

This special issue of Drone Zone offers expert buying advice, reviews of the latest machines and accessories, tips on where and how to fly safely, in-depth features on aerial photography and video, build tips and technical articles, as well as general features on subjects such as GPS, FPV and electronic systems. Features include:

- New product reviews
- Buyer's guide to the latest models
- Technology features on FPV and aerial photography
- Building your own drone from scratch or kit
- Drone dictionary with a full list of words, acronyms and terminology
- Plus, experts tips on drone dos and don'ts, safety advice, staying within the law, setting up and how to fly

With all this focused content and more, Drone Zone is a must buy special for all UAV, drone, quad and multi-rotor enthusiasts! Don't miss out, order your copy online now

**NOW SHIPPING**



**PLACE YOUR ORDER NOW ON TEL: 01525 222573 FAX: 01525 222574**

## DRONE ZONE

Name.....  
Address.....  
.....  
.....  
Post/zip code.....  
Country.....  
Telephone Number.....

Please debit my credit/debit card for £.....  
 Visa  Mastercard  Maestro  other.....  
 Card No.....  
 Expiry date..... Start date.....  
 Security Number (last 3 digits on signature strip).....  
 Issue No (if applicable).....

**UK: £4.99 inc p&g**  
**Europe: £5.99 inc p&g**  
**World-Wide airmail: £6.99 inc p&g**  
 Cheques payable to: ADH Publishing Ltd.

Signature.....  
Date.....

**Please mail this form to:**  
 ADH Publishing, Doolittle Mill, Doolittle Lane, Totterhoe, Bedfordshire, LU6 1QX, United Kingdom  
**Tel:** +44(0)1525 222573 **Fax:** +44(0)1525 222574 **Online:** [www.adhbooks.com](http://www.adhbooks.com)  
 (Photocopies of this form are acceptable)

**www.adhbooks.com www.adhbooks.com www.adhbooks.com**



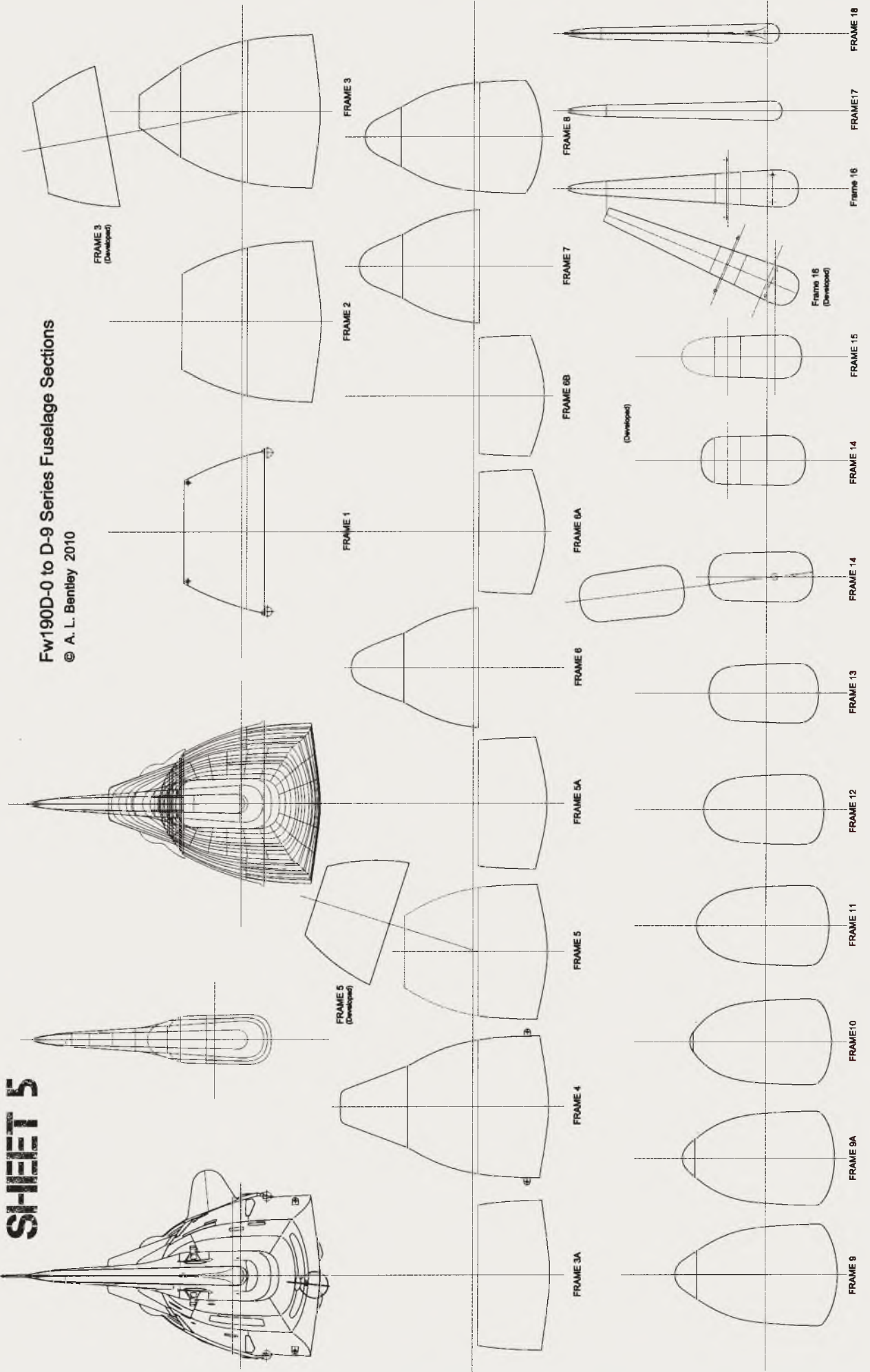




# SUPER-DETAILED 1:40TH SCALE DRAWINGS BY ARTHUR L. BENTLEY

MORE FW 190D DRAWING SHEETS OVERLEAF AND NEXT MONTH

## SHEET 5

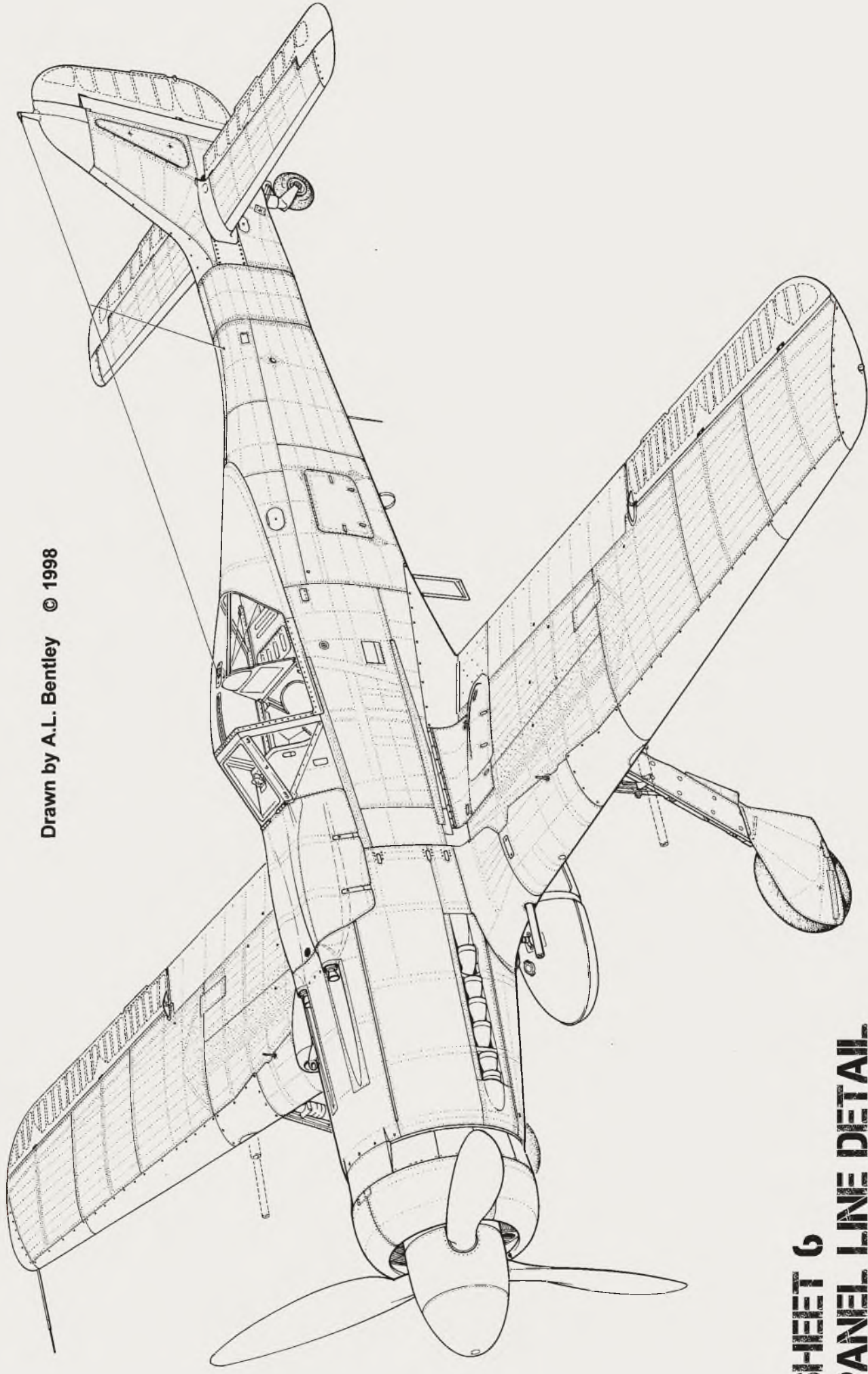


Fw190D-0 to D-9 Series Fuselage Sections  
© A. L. Bentley 2010



# FOCKE WULF FW 190D-9 ANATOMY

---



Drawn by A.L. Bentley © 1998

**SHEET 6**  
**PANEL LINE DETAIL**

---



**NEW FROM ADH PUBLISHING**

# The Modeller's Guide

Superdetailing, Painting and Weathering

Aircraft of WWII, with airfield accessories, ordnance and diorama

## The Modeller's Guide



SCALE MODELLING:  
A LOVE STORY READY  
TO ASSEMBLE

TOOLS AND MATERIALS

TECHNIQUES

BUILDING THE AIRCRAFT

- SPITFIRE MK. IXC
- P-47D THUNDERBOLT
- JU-87D 'STUKA'

MAKING A DIORAMA



**Aleksandar Počuč**

Modeller's guide to superdetailing, painting and weathering aircraft of WWII' book is intended for both beginners and advanced modellers as it covers wide variety of modelling tasks ranging from basic detailing, scratch-building, painting, weathering, machining custom parts using resin as well as scratch-building part from brass and aluminium and of course, diorama making. Basics about tools, paints and modelling materials have been covered as well. The book revolves around three subjects, P-47D Razorback, Spitfire Mk.IXc and Junkers Ju-87D Stuka, all in 32nd scale. Step by step concept will provide a good reference and ideas to all WWII aircraft modellers regardless of their experience.

**ORDER NOW:**



[www.adhpublishing.com](http://www.adhpublishing.com)



01525 222573



[enquiries@adhpublishing.com](mailto:enquiries@adhpublishing.com)

FOR ONLY

**£18.95**

PLUS P&P



ADH PUBLISHING, Doolittle Mill, Doolittle Lane, Iotternhoe, Bedfordshire, LU6 1QX, United Kingdom.  
TEL: +44(0)1525 222573. FAX: +44(0)1525 222574. ONLINE: [www.adhbooks.com](http://www.adhbooks.com)



On Silent Wings by Chris Williams

# SCALE SOARING

**A**fter the completion of the two-seater Minimoda, once again it became time to cast around for a new project. Having built so many sailplanes over the years, the list of appealing subjects is getting ever smaller, but

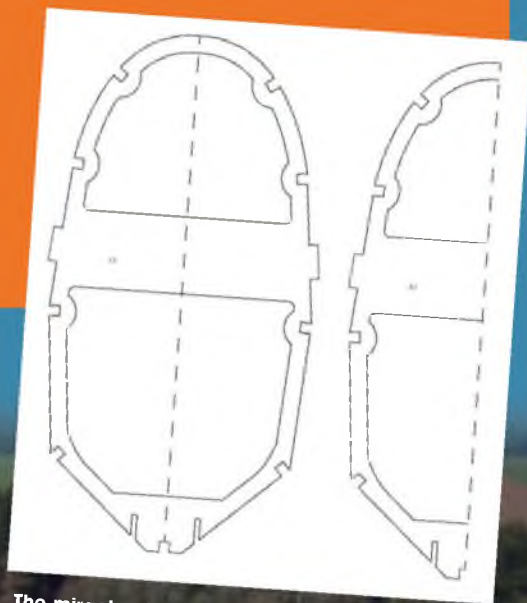
there are still a couple waiting patiently on the Bucket List.

One of these was the Bergfalke IV, a 1960s-era glider that was the last in the German Schelbe firm's line of successful Bergfalkes. I have had occasion over time to build no less than four of the Mk.1 version, three at 1/4 scale and one at one-fifth, such is the practicality of the full-size design. A two-seater, constructed with a steel

tube-framed fuselage and wooden wings, the Mk.IV represents nearly the last of traditional construction methods, as by this time glass machines were becoming dominant. Open structure fuselages, compared to ply-sheathed ones, allow for a significantly lighter airframe overall, thus it is that when light conditions hold sway on the slope, a Bergfalke is always the first to be thrust into the void, and it was with this in mind that the design of the Mk.IV commenced.

Drawing in CAD offers many advantages over traditional methods (indeed, pencil and paper seem like Stone Age artifacts these days) and a brief description might be appropriate for those that haven't tried it.

First up, the all important three-view is conjured up as a background. Then, a new layer is applied. Layers can be likened to sheets of digital tracing paper, only in this instance you can have as many layers as you like with all the various parts of your drawing visible or not as you choose.



The miracle of CAD: One former half transformed into fully symmetrical whole former.

Bergfalke IV and 1 for comparison.







**The Bergfalke fuselage in the custom jig.**

On the new layer, we start by drawing around the outline of the fuselage, using the various tools at our disposal, filling in such details as wing and tail positions, and the formers. At the same time the top view of the fuselage is traced, only this time, just one half of it.

Now, the three-view is rendered invisible, leaving our new traced drawing. This is then copied and pasted on to a new document. A little arithmetic is now required to obtain the scaling factor to enlarge this drawing to the size we require for the model. Once the percentage figure is arrived at, the outline of our new project can be achieved in just a few seconds. Now a half-drawing of the top view is copied, pasted and reflected within seconds, to get the other half of the fuselage, and the two halves are then digitally stitched together. This is by far the easiest way to draw symmetrical shapes, ensuring that the two halves are identical.

The fuselage formers, and indeed the wings and tailplane halves are similarly drawn, with as much work as possible being done on the one half before copying, reflecting and joining. In this way, given a working area of five square metres, it's possible to digitally construct the complete airframe in top view and check for any inaccuracies.

This is all a far cry from the last model I designed the old-fashioned way. When I



**Completed airframe, ready for covering.**

started work on the 1:3.5 scale HW-4 Flamingo, I used a new erasable biro I had bought from the local office supplies shop. When the drawing was finished and ready for publication, I became concerned that the paper had become somewhat creased, so I reversed it and applied the trusty domestic iron. You can imagine my horror when I turned the plan back over and found that all the inked lines had completely vanished! Now take a comparative look...

To have copied the Flamingo plan would have meant driving to the nearest large town and finding a print shop that could cope with the large size. To send it anywhere would have meant rolling it up into a cardboard tube and putting it in the hands of the Postal Service. The quality of the scanned drawing would have been even worse than my humble efforts were to start with.

A complete digital plan can be copied and pasted in seconds. It can be sent anywhere around the world in minutes. The quality of the drawing is as near perfect as you can get, and even if it should be accidentally erased, as a careful person, you will have backups stashed in various locations. Needless to say, pencils and erasers are now difficult to find in our house.

Thus it was that the Bergfalke IV drawing came into virtual being, the parts being



**Pilots from Tailored Pilots, fill the cabin nicely.**

printed out as I went along on a cheapo domestic/office A3 printer. The fuselage was built on my custom aluminium jig, designed to hold the formers at their appropriate stations with the help of the built-in ruler, although the plan will call for a simpler wooden base upon which the former supports will be glued. The steel tubes of the full-size have been replaced with 6mm sq hardwood, and the fibreglass semi-shell at the front with 1.5mm ply planking. The wings are of traditional construction, with the new twist of using 6mm spruce spars full length, with an additional spar dropped in part-way after construction, to obviate the tedious task of making up full-length tapered spars.

A search of the ever-useful Internet threw up a full size version that had been retro-fitted with winglets, a temptation I simply could not resist, as woodies with winglets are a pretty rare phenomenon.

So it was that the model was eventually completed and taken up to White Sheet Hill in Wiltshire for its maiden flight. Spanning just over four metres and weighing in a relatively light 13lbs, the Bergfalke looks to be an ideal candidate for self-launching into a light wind, it was shame, therefore that it was blowing a hoolie on this occasion!

Nothing daunted, I persuaded my pal Motley to give her the heave-ho and the fun and games commenced. It was



**Molley (Geoff Crew) with the maiden launch (Barry-Cole pic).**





**Author with the 1/4 scale Bergfalke IV.**

Immediately obvious that the glider was over-sensitive in pitch, and if I could have found a ship to fly alongside, a pretty good imitation of a dolphin could have taken place. The usual culprit for such behaviour would usually be a rearward C.G., but in this case moving the elevator pushrod clevis in a couple of holes seemed to do the trick. (I suspect that moving from a 4.8 to 6 volt on-board power pack also helped to create an impression of over-sensitivity). Further tests and tweaking revealed a model with exemplary flying characteristics, so it is

with some enthusiasm that I can now complete the plan.

**WHITE SHEET SCALE FLY-IN FLASHBACK; 3rd AUGUST 2014**

At the time of writing, the first of the scheduled Scale Fly-In's for the White Sheet Club has come and gone. The score? White Sheet 0, weather 10. You have to look back to August of last year to find the last time the weather was in a cooperative mood, and I realised to my surprise that I haven't covered the event in this column, either. Given the miserable



**Success...! Another project conclusion (Barry Cole pic).**

weather history of this do over the past few years, and judging by the stunned expressions of my fellow revellers, nobody could believe that at last Fortune has favoured us.

So, as a consequence, the newly repaired track at the top of the hill was soon packed with cars and the happy clink and clatter of sailplane rigging could be heard as far away as the market town of Frome. As attractive a glider as you will ever see, even in a moth of Sundays, is Dave Stokes' 1:3.5 scale Type 13 Petrel. This has been finished in the varnished ply

**White Sheet Fly-IN event director Steve Fraquet launches Geoff Crew's mighty ARF K8.**







### Happy scene at the White Sheet Scale Fly In.

exterior as it was when it left the factory in 1939. (My version of the self-same machine is finished in the red and translucent finish that it sports today after its last restoration).

This was to be the model's first venture onto the slope, and Dave couldn't have had a better day for the job. Fittingly present for occasion was Roy Proctor, White Sheet Elder, who by happenstance was once in a Petrel syndicate, and remembers the full-size being bungeed of a hill in nearby Dorset in the 1950s.

The Petrel had many flights during the day, and it was pleasure to watch indeed.

Always on the lookout for new models, Pat Teakle soon came on to the radar with his new 1/4 scale SZD Pirat. Once again, this was to be a maiden flight, and Pat performed his usual pre-maiden ritual of hefting the model over his head and running into the wind to 'make sure she wants to fly'. That the new model had the Right Stuff, was evident when the first flight commenced without any issues, and very pretty she looked, too.

Perhaps because of the excellent conditions, there was little for a reporter to comment upon: gliders were launched, gliders, flew, gliders landed, all without

incident. It wasn't until I asked Event Director Steve Fraquet to loop his ASW 20 that things livened up a bit. By this time, in true White Sheet tradition, the wind had strengthened up and occasional gusts of turbulence were coming through to make our lives more interesting. The first loop took place without incident. 'Too high' I commented. The second also was without mishap. 'Too high' I commented. 'Right' muttered the worthy lad, 'try this one, then'. At this point the wings went from an ordinary dihedral to what you might describe as a super-dihedral. I know I should be ashamed of what I said next, but a true reporter knows no shame. 'Perfect' I said.

Steve staggered off to perform a less than perfect landing, but the model was otherwise undamaged. It has been well proven over the course of time, that a single 14mm wing joiner blade is prone to bend when subjected to unseemly loads, so let that serve as warning to those with such a set up, and also remember to stay

away from intrusive reporters at all times.

As previously reported, Motley's giant Phoenix K8 had been re-fitted with it's originally supplied wings, which had been drastically modified with the inclusion of some actual wing spars. This was flown several times on the day, and proved to be quite a practical slope model, which could

launched single-handed without too much trouble. Due to its size, it is incredibly realistic in

#### Dave Stokes' Slingsby Petrel at the White Sheet event.

flight, and as a further test of the modifications, this time she endured a triple loop (followed by a Double Toe Loop, an Axel and a Lutz)

Mind you, I wouldn't fancy trying to launch this model in a very light wind!

It was lucky, then, that this, the last of scheduled scale events at White Sheet for 2014, should have been so successful. Kudos and respect to the event director, Steve Fraquet, may he do the same this year...

[c\\_williams30@sky.com](mailto:c_williams30@sky.com)



Steve Fraquet's ASW 20 explores the outer edges of the envelope.



Pat Teakle displays his 1/4 scale SZD Pirat.



# SCALE FROM SCRATCH

WANT TO TAKE A STEP BEYOND KITS AND ARTFS? KEN SHEPPARD CONTINUES HIS SERIES TO ENCOURAGE OWN-DESIGN SCALE MODELS

## PART 4: Designing and drawing WW2 fighter wings...strength v weight, the Ken Sheppard way

**A**lways the core consideration for all model airframe designs, the continuous battle to keep it strong enough without being too heavy is there at every step of the design process. Given that the wing, above all other airframe major sub-assemblies, takes the greatest loads, tension, compression and torsion, let's continue our look at our fledgling design of the Dornier Do 335 (photo of completed model shown hereabouts), start to make decisions about the wing structure - and then

commit them to drawing the plan.

Remember, we are not aiming to produce a fully engineered drawing, just one that will allow us to build a model. A lot of the detail will be filled in as we develop the model build, but before we start to cut wood, the basic structure must be formalised and 'stress checked' (informally) to ensure that it will be man enough for the job.

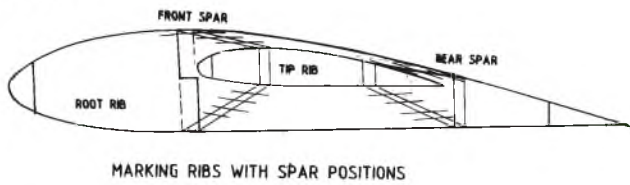
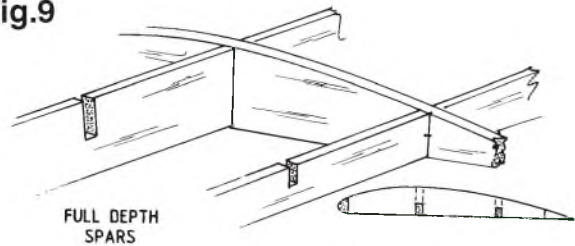
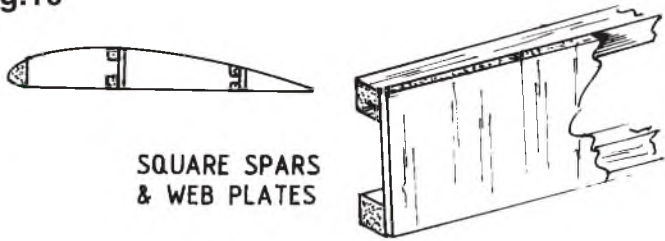
Last month, in Part 3, we looked at rib spacing (keeping the spacing even, to make rib development easier) and drawing the individual rib profiles. Now we

have to consider spar placement and sizes, undercarriage mounting and retraction geometry, aileron operation (I advise ignoring flaps if this is your first foray into own-design scale), skinning and building method - always considering the strength/weight factor. These elements are all, to some degree, inter-related, and as decisions are made regarding one or other of the elements, those decisions will impact on the others, meaning compromise (and maybe cheating), so the design process involves keeping all these elements in mind - a bit like juggling

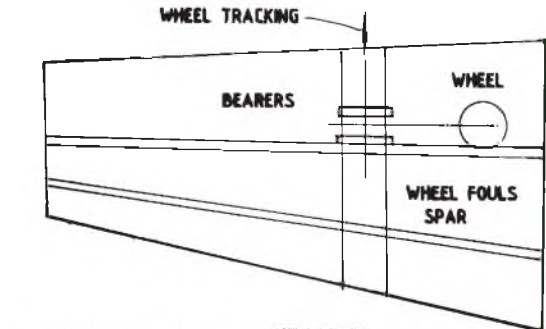
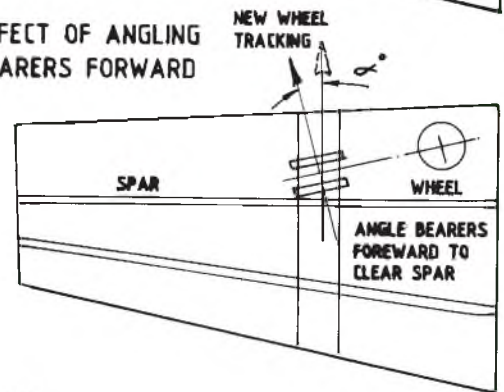


THE ULTIMATE BUZZ! AN OWN-DESIGN SCALE MODEL OF AN UNUSUAL PROTOTYPE. ALL THINGS ARE POSSIBLE WHEN YOU DESIGN YOUR OWN, IN THIS CASE, THE AUTHOR'S L2D POWERED STEARMAN HAMMOND Y1-S, AFFECTIONATELY KNOWN AS THE 'YELLOW PERIL'!



**Fig.8****Fig.9****Fig.10**

**1:** The Dornier Do335 referred to in this article has a 4-stroke engine up front, electric outrunner motor in the rear. A very practical set-up.

**EFFECT OF ANGLING BEARERS FORWARD****Fig.11**

lots of balls - until all elements are satisfied.

Let's start by making a few generalisations regarding the wing, then apply these specifically to the Do335 layout and section outline that we've already established.

For a fighter wing of the size that we are planning (.60 size) a single mainspar positioned at the max rib depth chord, coupled with a secondary full span spar on the aileron hinge line will be sufficient. Marking them on our rib drawing (detailed last month - **Fig.7**) at root and tip allows us to mark the spar positions on each rib section - see **Fig.8**.

For optimum compression/tension strength, a full depth main and secondary spar, straight-grained spanwise is possibly the first choice, cut from quarter-grain or medium hard balsa, 3/16" or 1/4" thick, and half-slotted to locate the wing ribs, for example (see **fig.9**). Alternatively, separate square section top and bottom spars set into the ribs, joined by vertical-grain balsa webbing pieces between the ribs is perfectly feasible, providing wood selection of the spars is correct and the square cross section of the spars is adequate (see **fig.10**).

At the secondary spar, a sub-spar (e.g. 1/4" sheet) can be fitted on the rear face of the secondary spar, to accept the aileron hinges - to facilitate this and keep the aileron hinge line in the right place, we have to move the position of the secondary spar forward by 1/4" from our

initially considered position (our first bit of juggling!).

### Undercarriage mounting

The main undercarriage position may similarly affect the mainspar position, so consider that next. With most taildragger fighters, the CG position means that the undercarriage leg pivot will be in front of the mainspar, so that the wheel is in the thickest part of the wing section when retracted. A trick here is to angle the undercarriage mounting bearers forwards at the inboard end towards leading edge, so that the leg pivot is close to the spar, but the wheel moves forward into the space between the spar and leading edge as it retracts (**fig.11**). This has an added benefit, in that to maintain the straight line tracking of the wheel when the undercarriage is down, as the leg comes up - the front edge of the wheel will be higher than the rear edge, so that the wheel more closely follows the up-curved lower surface of the semi-symmetrical wing (**fig.12**).

This is hard to imagine three dimensionally - so make a cardboard cut out of a leg and wheel and mimic the retract action in your hand. Rotate the wrist to move the bearers forward at the inboard end and you will see that the 'wheel' is toed out. Bend the cardboard so that the wheel points straight ahead again and lift your wrist to retract the leg along the new line of the bearers and the

front of the 'wheel' will be angled up, like the curve of the lower wing surface towards the leading edge - see what I mean?

This is looking at the undercarriage installation in plan view, it may mean that we have to move the main spar back a bit to get the wheel to fit, or use a smaller diameter wheel, perhaps. Before we decide, however, what we now have to do is look at the wing from the front view and angle the undercarriage mountings so that when the legs are down, they are at 90° to the ground.

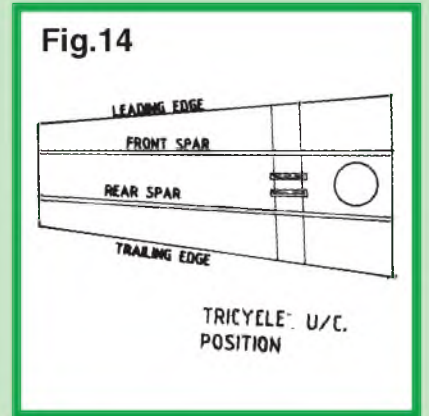
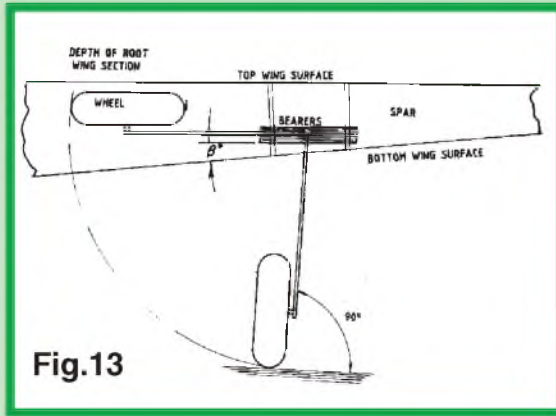
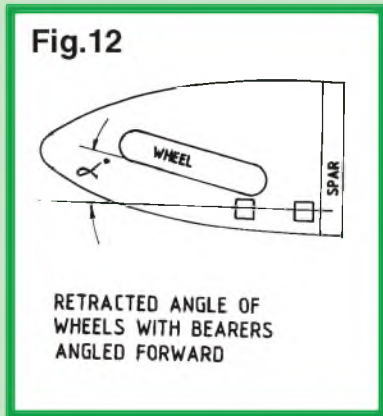
As the lower surface of the wing tapers up towards the tip due to the design requirement dihedral, the bearers can't be parallel to the bottom wing surface (most retract rotate through 90°) - see **Fig.13**. It's best to hold the intended unit over the drawing to check this. Carefully mark the angle of the retract mounting flanges on the drawing, then retract the unit through its full retraction angle and reposition the unit in the same place on the drawing, using the marks you made in the down position - does the wheel fit within the wing profile outline?

A third option we have is to change the rake of the leg (forward angle of the leg when down) by angling the bearers fore and aft (i.e. having the front bearer higher than the rear bearer). A forward raked undercarriage may not be true scale, but it will certainly help ground handling, especially the tendency for WW2 fighters





**2:** A fixed undercarriage on a fighter just doesn't look right - it's gotta be retracts... **3:** ... unless the full-size has a fixed U/C, like the Ju87 Stuka!



to nose over - another factor to be considered.

Now that we have looked at the full three-dimensional implications of the retract position, the compromise options that will have to be made here, to find a practical solution, is to change the wheel diameter or thickness, move the spar position, change the angle of the undercarriage mountings, or perhaps even the wing section will have to be thickened at the root, or a combination of any of these (a lot more juggling). All these are practical at this stage, but it has to be resolved and a decision taken, before moving on to the next stage.

### SPRUCING UP

OK, let's be specific and look at the Dornier Do335. Immediately, we see that

it's different to what has been discussed so far, because it has a tricycle undercarriage position is BEHIND the wing main spar (see **fig.14**). This should simplify matters, as the lower wing surface of the wing is flatter aft of the spar (deepest rib depth) and the room between spars should be greater than between the main spar and leading edge. However, the wing section is thinner aft of the spar, so the same considerations have to be taken into account before making the final decision regarding spar placement.

Regarding the spar size, I've already suggested that for a full depth, slotted rib spar, 1/4" thick firm, but light, balsa is fine. If opting for the separate top and bottom square spar, then again, on a model of this size, 3/8" square will be sufficient,

augmented by web plates from 1/16" balsa, grain vertical, between the ribs, glued to the spars. If opting to use spruce spars, you could sensibly reduce the cross sections to 3/16" deep by 3/8" wide, maintaining the same sort of strength - this could be useful if the taper of the wing from root to tip means that the tip rib depth is on the small side and would suit thinner section spars.

Another solution would be to use tapered spars, but as most fighters have wings of fairly low aspect ratio, this probably won't be necessary and so I'll leave you to read all about them - and how to do it - in Gordon Whitehead's book!

### MARKING OUT RIBS

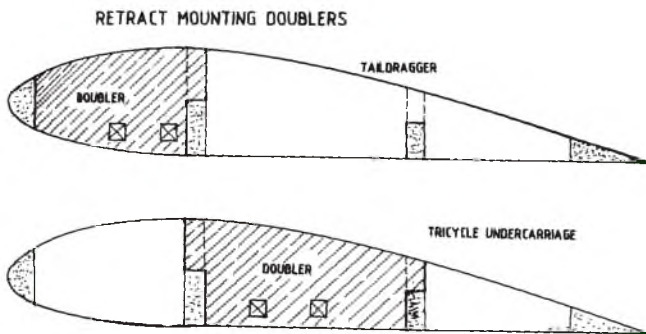
OK, so let's reprise where we are. We



**4:** They don't have to operate in a scale way! This retract should be twist and lift (Corsair), but who can tell that they're not when they're up? Keep it simple! **5:** Scale retracts are available - they're expensive, but are really the business! (this is a Unitract unit designed specifically for a larger F4U Corsair).



Fig.15



have a wing plan outline; we've placed all the ribs from root to tip to give even spacing of not more than 3"; we've drawn in a rear spar position along the aileron hinge line and allowed for a sub spar to carry the aileron hinges; we've considered the retract undercarriage mounting positions and modified the front spar position, angled the bearers and even thickened up the root section to accommodate the retracted wheels - if and where necessary; we've checked again and we're happy that we know the size and where to put the spars at the root and at the tip and we've drawn this revised spar position on our wing plan view and our rib sections.

For the ribs that carry the undercarriage bearers, a ply doubler will need to be fitted to each of the ribs between the leading edge and the front spar (for tail draggers) or between the front and rear spars (for a trike U/C). The ply doublers should be notched into the spar the same as the ribs, to transfer the landing loads into the basic wing structure (see Fig.15).

On these ribs we need to mark out the bearer slot/holes that will allow the bearers to be firmly fitted at the angles already determined earlier.

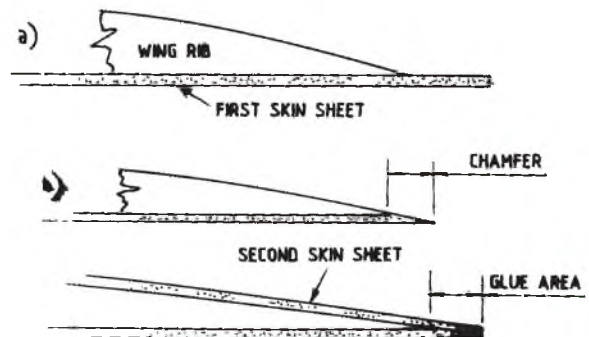
### LEADING EDGE

My preferred method for the leading edge is to fit a parallel section strip all the way out to the tip and shape it top and bottom to match the rib profiles, using a razor plane, blade or by sanding. The skins, when you do the wing panel sheeting, extend over this shaped leading edge (giving a good glue area) then the final nose section is sanded to shape at the end of the build. Again, considering the size of the model and the wing section that we are using, a 1/2" thick balsa strip cut from sheet (roughly tapered top and bottom to minimise the final sanding) is about right.

As the strip is the same thickness, it is easy to draw a vertical line on each rib drawing 1/2" back from the nose to give the cut line (see Fig. 8). All that needs to be done now is to allow for the thickness of the skins/ capping - say 1/16" sheet, and reduce the

Fig.16

### TRAILING EDGE FORMATION



profile of the individual ribs by 1/16" all round the periphery (except the LE cut line).

### TRAILING EDGE

Again, my preferred method for an all-sheeted wing is to form the trailing edges from the skins themselves, so the ribs are cut with pointed ends and left like this (needing some care to be taken during initial assembly, so as not to break the ends off) until the sheeting is applied. Jumping ahead to this, the first 1/16" thick skin is applied oversize at the trailing edge and then trimmed along the final trailing edge line, so that the edge on the rib side of the skin, when chamfered along the panel span, blends with the point of each rib (Fig.16). The top skin when fitted extends all the way to the trailing edge, giving plenty of glue area and a finished edge thickness of 1/16".

Regarding ailerons, I build the aileron structure into the basic assembly, and then cut them away for final shaping after sheeting - but more on that next time... ■



6: For a .40 size fighter, flaps aren't really helpful and add complication and weight - on a bigger model, operating flaps add an extra dimension to the 'realism' factor. 7: A typical .40 size fighter wing structure, before building in the servos, linkages and retract mountings, etc. Note the tabs on the ribs to hold them at the right angle. (Actually an EP Savoia Marchetti SM79 Trimotor wing). 8: Bottom sheeting added and linkages in place, prior to top skins being fitted (SM79).

### NEXT MONTH...

Ailerons, servos, linkages and wing attachment methods...



# Classifieds



## MANTUA MODELS UK LTD

Tel: 01753 856321 Fax: 01753 857444

179 Dedworth Road, Windsor, Berkshire, SL4 4JN

Open Mon-Sat 9.00 - 6.00pm

MANTUA AND AVIOMODELLI AIRCRAFT AND ACCESSORIES

Trade enquiries welcome for  
our full range of aircraft

MASTERCARD/VISA

## STEVE WEBB MODELS & HOBBIES

Tel: 01928 735225

Fax: 01928 735410

80 Church Street, Frodsham,  
Cheshire, WA6 6QU

Mon-Sat 9.30am - 5.30pm **Closed Wednesdays**

MASTERCARD & VISA ACCEPTED

email: [stevewebb@steve-web.demon.co.uk](mailto:stevewebb@steve-web.demon.co.uk)

**ADH**  
PUBLICATIONS

**Squadron Signal**  
PUBLICATIONS

**adhbooks.com**

## D.B. SPORT & SCALE

Quality traditional builders kits.  
Spitfire, Auster, Hurricane, SE5  
Sopwith Pup, Piper Cub and more  
also Plan packs & accessories

[www.dbsportandscale.com](http://www.dbsportandscale.com)

Tel: 01792 897501

Major Credit cards accepted.

[WWW.FLYINGSCALEMODELS.COM](http://WWW.FLYINGSCALEMODELS.COM)

## The RC Hotel Corfu Greece

English speaking instructors. No more travelling for an  
hours tuition every weekend. Everything is at your doorstep.

## FLYING SCHOOL

Learn to fly fixed wing and helicopter while on a holiday.  
Tuition from English speaking instructors. No more travelling for  
an hours tuition every weekend. Everything is at your doorstep.

Visit our web site for more information. [www.rchotel.com](http://www.rchotel.com)

Tel 00302661099322 Mob 00306982420044

Email [spiro@rchotel.com](mailto:spiro@rchotel.com) or [rchotel@kar.torhnet.gr](mailto:rchotel@kar.torhnet.gr)

The RC Hotel, PO Box 1567, Pulades, 49083, Corfu, Greece

## ADVERTISE HERE

THIS SPACE COULD BE WORKING FOR YOU. TO ADVERTISE IN THIS SPACE  
PLEASE CONTACT GARETH ON: 01525 222573

## Vintage Limited Edition Prints



visit: [www.aeromodeller.com](http://www.aeromodeller.com) for the full range



Vintage **AeroModeller** A3 Cover Artwork - *Limited Edition Prints*



**DURAFLY®**



# JUNIOR

Plug and Fly

Modern

History



**EPO**

The Durafly Junior perfectly captures the essence of vintage flight and design.

A classic design is timeless, but that doesn't mean they can't be improved upon using modern techniques.



#### Specifications

Wingspan : 1100 mm / 43.3 in.	Battery : 11.1V 1300 mAh Li-poly
Length : 765 mm / 30.1 in.	ESC : 20A Brushless
Weight : 695 g / 24.5 oz	Motor : DST-1100
Propeller : 8x6(Two blade propeller)	Servo : 9g x 4
Recommended radio system : 4CH	



Available at [hobbyking.com](http://hobbyking.com)



# AVIOS



## 1200mm Hawker Sea Fury FB11 EPO Warbird

Avios brings you a exemplary example of the legendary Hawker Sea Fury, the last propeller driven airplane to serve in the Royal Navy. A brilliant no-glue design arrives with all electronics pre-installed, all you require as a battery and radio system to complete. The outline is that of the FB11 version, which served well into the 1950s and was used during the Korean War. Modelled in the livery of Commander Peter "Hoagy" Carmichael, the only British pilot to in a piston engine aircraft to down a jet driven airplane during that conflict. The all EPO molded foam replica features functional flaps, retracts with gear doors, LED lights, scale 5-blade propeller, wing mounted rockets, and remotely activated drop tanks. The Avios brand is focused on premium quality design features, with no detail being spared. The Avios 1200mm Hawker Sea Fury is no exception.



**ESC**  
60amp Brushless  
Speed Control



**Motor**  
Brushless Motor 3648  
Out runner KV600



**Length - 1100mm**



**Wingspan - 1200mm**



**Weight - 2100g**

