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MARCH 2015

# RC **MODEL WORLD**

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**19**

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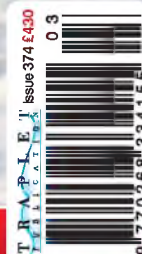
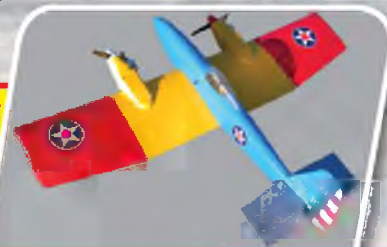
# **FLYING ON ICE**

**R/C PILOTS BRAVE THE SNOW AT RR HUCKNALL**

**PLAN  
FEATURE!**

**GRUMPY SKYLARK**

**BUILD THIS .15 SIZE SPORTS TWIN**



**The R/C Modeller's Magazine**



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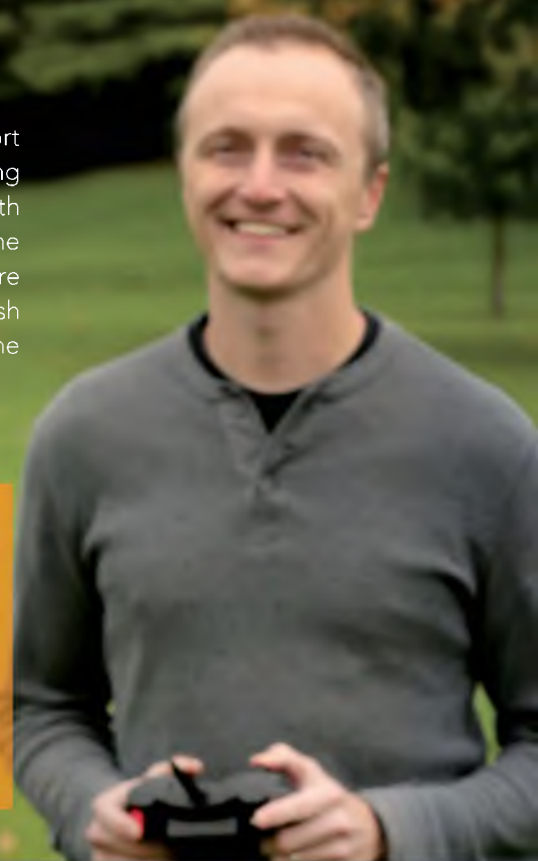


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# NEW HIGH QUALITY RC MODELS FROM DYNAM

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*The SMOOVE from Dynam is the first in a new range of exciting new factory assembled ARTFs.*

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*It is completely built, requiring minimum assembly. The SMOOVE is a great plane very well made and very enjoyable.*

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MARCH 2015 • ISSUE #374



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# PRE-FLIGHT

**W**elcome to the March issue of RC Model World. I don't know about you but I'm having a bit of frustrating time of it lately, model-flying wise. I'm not getting much done! As storm follows storm even the brief respites between them remain uncomfortably windy. In such weather I would normally choose to go slope soaring instead of power flying but the lulls are often South Westerlies, which are in the wrong direction to blow the cobwebs away with some gliding from the Malvern Hills just behind the Traplet offices.

And to add insult to injury the ground is becoming increasingly sodden, so whenever I have managed to venture out I have ended up paddling around in mud, glorious mud! Even electric models become caked in the stuff – or worse if sheep are in the field! I've no problem in wiping a glow model down but it galls to have to spray clean an EP affair.

Fortunately I have another hobby to turn to in such conditions and that's photography. Dark and dank conditions can produce stunning images but as with my model equipment I hate getting my photo kit wet. So I tend to wait for dry conditions before venturing out. Trouble is, upon arriving at a scenic location I often find that the wind isn't so bad after all and I could have gone flying anyway! You just can't win...

It's not only my hobby flying that's suffering, but review flying too. We have several models waiting for flight-testing but we need calm and sunny conditions to coincide to allow us to get good in-flight shots. One such model is the Balsa USA Student Trainer, and I have to applaud regular reviewer Neville Hill for his patience whilst waiting for the right conditions in which to fly this cabin monoplane.

In fact Neville has been waiting so long that he has already finished his next review assignment, which has joined the back of the queue! However, the Student Trainer is unusual in being a building trainer and not just a flying trainer, so Neville has quite a lot to say about its construction, which you can read about starting on page 22. The flying report will follow next month – weather willing!

Our other reviews this month include the colourful F2G Super Corsair from Roc-Hobby – a racing warbird that goes as fast as it looks! We also delve inside the programming of Hitec's new Flash 7 radio set, and there's also a step-by-step guide to cutting RAF style roundels using the pen-style Gyro-Cut and Easy Roundel Kit from Crafty Products.

Headlining the features list is our annual report from the Nuremberg Toy Fair, which remains the place to see all the latest commercial developments heading for the R/C model market. Neil Hutchinson files a mid-winter photo report from the Christmas Fly-in at Rolls-Royce Hucknall and Franco Bugada introduces a magnificent model of the five-engine Heinkel 111-Z 'Zwilling'.

Our plan features this month are in the form of Sunfish, a pretty little floatplane from Bill Bowne, which is this month's free pullout plan. And Peter Miller adds his Grumpy Skylark twin for .12 – .15 glow motors to the ever-expanding library of Traplet feature plans.

Quite a lot, then, to keep you busy if, like me, you are missing out on your regular fix of real model - flying!

Happy flying – when you can!

*Kerin*



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## RC MODEL WORLD

### Editor

Kevin Crozier [rcmw@traplet.com](mailto:rcmw@traplet.com)

### Contributors

Brian Cooper, Neville Hill, Chris Williams, Peter Miller, Bill Bowne, Micki Bowne, John Stennard, Chris Bowler, Neil Hutchinson, Andrew James, Dave Bishop, Donatas Pauzuolis, Franco Bugada, Richard Morris, Gray

### Managing Director

Tony Stephenson

### Operations Director

Tom Stephenson

### Design and Production Manager

Nick Powell

### Design Team

Nick Powell

### Advertising Sales

Tel: 01684 588548

### Marketing Executive

Lara Hunter Tel: 01684 588521

email: [lara.hunter@traplet.com](mailto:lara.hunter@traplet.com)

### Advertising Copy Controller

Cindi Griffiths Tel: 01684 588517

email: [adc@traplet.com](mailto:adc@traplet.com)

### Trade Sales Executive

Angela Price Tel: 01684 588568

email: [angela.price@traplet.com](mailto:angela.price@traplet.com)

### Printer

Warners plc

### Newsstand Distribution

Seymour Distribution Ltd. (020 7429 4000)

### US Distribution

Traplet Distribution USA Ltd

816 N. Country Fair Drive, Suite 5

Champaign, Illinois 61821, USA

Tel: (001) 217-954-0372

Fax: (001) 217-954-0472

usa@traplet.com

### Australian Distribution

Traplet Publications & Hobbies

P.O. Box 501, Engadine,

NSW 2233, Australia.

Tel: (02) 9520 0933

Fax: (02) 9520 0032

email: [sales@traplet.com.au](mailto:sales@traplet.com.au)

### South African Distribution

Traplet Publications South Africa, PO Box

1067, Qudtshoorn, 6620, South Africa

Telephone: (044) 272 5978

Email: [southafrica@traplet.com](mailto:southafrica@traplet.com)

### Published by

Traplet Publications Limited,

Traplet House,

Willow End Park, Blackmore Park Road,

Malvern, WR13 6NN. UK

Tel: 01684 588599 Fax: 01684 578558

email: [customerservice@traplet.com](mailto:customerservice@traplet.com)

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1 Year subscription prices:

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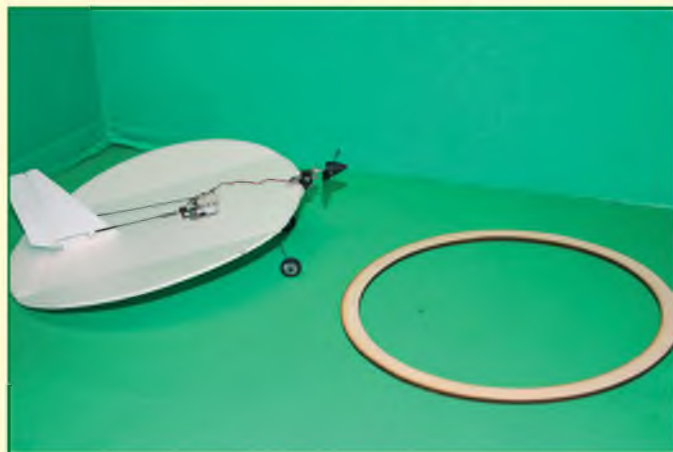
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### GO NUTS WITH EASY ROUNDDEL!



In this issue Bill Bowne reviews the Gyro-Cut and Easy Roundel Kit supplied by Crafty Products and available from [www.trapletshop.com](http://www.trapletshop.com)

As Bill demonstrates in his review the Easy Roundel Kit is usually used for cutting out circles of covering film to make RAF style roundels. But Bill has found another use for the kit:

*"Hi Kevin*

*I've found another use for the Easy Roundel rings – I cut out a Nutball from 3 mm foam using the 9" outer ring.*

*Since I have the carcasses of an Ember and two Vapors, I figured it made sense to make something to use them. I found the Nutball plans online, so I scaled them down and used the roundel ring to cut a 9" disk. With the Ember landing gear, motor, radio and modified pushrods the model came out at 16 grams. It flies okay but I'm going to try 2 mm foam and some Vapor hardware on the next one.*

*It's nice to be able to build a model in less than 24 hours, using Foam-Tac (by Beacon Adhesives) and a hot glue gun. Plus, repairs are easy with the hot glue gun, and necessary, considering how many times the wind has blown the Nutball into the lilac bushes!"*

Bill's review of the Gyro-Cut and Easy Roundel Kit starts on page 40.

## FREE FLIGHT CONVERSIONS

In last month's 'Take Off' we published pictures of three Skygipsy inspired models that were built by Dave Warren. Dave has sent in pictures of more of his free flight conversions:

*"Hello Kevin*

*Further to our emails regarding the Skygipsy, I thought you might like to see a couple of other free flight conversions.*

*First is a Keil Kraft Senator rubber powered model converted to R/C and using gear from an old Pico Stick. Well patched, I have lent/donated it to a mate who is learning to fly with it, for which purpose it is entirely suitable. He was out with it this morning in the field adjacent to here. This is the original size 30" span or there about Senator, but with a bigger wing using my trademark spruce spars and Depron ribs construction. It is 42" span, 6.5" chord, with sewn hinges on the elevator and rudder.*

*Also, a Vic Smeed Profile Madcap with a foam fuselage. The wings are balsa, built before I developed a sensitivity to balsa dust. The span is per the original at 44" and 7" chord. The motor is a GWS EM350. It is very stable and slow flying if required. Sewn elevator and rudder also.*

*The 'Auster', so called, is a twice size enlargement, much modified, of Phil Smith's rubber scale design for Veron, again powered by GWS.*

*All are 3-channel."*





# TRAPLET OPEN SCALE

## – IT'S HAPPENING AGAIN!

Following the successful re-introduction of the Traplet Open Scale competitions during 2014 in Yorkshire and Lancashire, we are proud to be sponsoring two more events in 2015.

The rules are simple. Five compulsory non-aerobatic manoeuvres are to be performed, with five further options from a choice of 18. Which means that non-aerobatic models can compete on equal terms with aerobatic models.

A generous range of prizes, including magazine subscriptions, plans vouchers, modelling tools and a complete wood pack and plan for the overall winner are up for grabs, making it well worth the effort of getting out of bed.

The only requirement is that the plane is a recognisable version of a full size fixed-wing aircraft; it can be scratch built, it may have cost just 99p from an auction or classified ad site or it may be even be worth several thousand pounds as a super-slick ready to fly model. There is no builder of the model rule so ARTF's and ready-made models can be used. The winner will be the person who flies in the most authentic fashion.

Pilots of models weighing over 7 kg need a 'B' certificate to fly at either event.

The venues are Pontefract and District Aeromodellers site (WF8 4QD) on Sunday May 17 and the Bickershaw MFC site (WN2 5TD) on Sunday August 9. Both events start at 10 am.

Flying schedules and further information for both events can be obtained by contacting Peter Maw by email at: [secretary@bickershawmfc.co.uk](mailto:secretary@bickershawmfc.co.uk)



*Dave Womersley won the first round of the 2014 Traplet Open Scale events with his Mini Cab. The plan and a laser cut wood pack for Dave's 1:4 scale model are available from [www.trapletshop.com](http://www.trapletshop.com), plan number MW2001. Picture by Bruce Corfe*



## MINIDRONE CHARGER



In the December issue of RC Model World we reviewed a pair of Parrot Minidrones, the Rolling Spider and Jumping Sumo. Both models worked a treat but we were frustrated by having to charge the drones' 550 mAh Lithium Polymer battery packs using the USB cable supplied. This could mean a long wait before being able to fly or drive either of the two Minidrones. Long USB charging times are now a thing of the past, with the two Minidrones at least, as Parrot have just released a tailor - made wall charger with which to charge the hard cased battery packs. Even better, each charger comes with a new battery, so you can be charging one pack whilst using the other. The Parrot Minidrone 'Charger + Battery Set' has an SRP of £22.99. For more details click the Parrot Rolling Spider & Jumping Sumo link at the Flying Toys website: [www.flyingtoys.com](http://www.flyingtoys.com)

**If you have any news or special interest announcements to make, or even a recently completed RCMW plan design, then why not drop RCMW a line or email [RCMW@traplet.com](mailto:RCMW@traplet.com)**





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The E-flite NIGHT VisionAire aerobat includes intense LED lights that give the internal structure a brilliant glow. The included Spektrum AR636 receiver has been specially tuned with an AS3X system featuring a Precision mode and a 3-D mode for an exceptional high-speed and 3-D aerobatic experience. Required: full-range 4+ channel programmable aircraft Tx with Spektrum 2.4 GHz DSM2/DSMX technology, and a 2200 mAh 11.1 V 3S 30C LiPo. £239.99 RRP



## HANGAR 9 ASW 20

Hangar 9's ASW 20 4.7 m ARF is a model tribute to the single-seat sailplane, its dramatic wingspan puts it above the 1/3-scale category; however its light weight allows options not typically found in a giant-scale glider. The sleek fuselage is moulded fibreglass right up to the vertical fin, carbon fibre rods support the foam-core wing panels, while balsa sheeting and carbon fibre spar caps help assure the Selig aerofoil is accurate and rigid. £829.99



## YUNEEC Q500 TYPHOON



With the Q500 it's never been easier to capture amazing photographs and video footage. The Q500 arrives factory-assembled and ready-to-fly right out of the box including the incredible ST10 transmitter and Personal Ground Station, a factory-installed receiver and flight controller, 5400 mAh 3S 11.1 V LiPo, DC balancing charger and AC adapter. The 3-axis CGO2-GB records full HD 1080p video and takes 12 megapixel still photos, and the built-in digital video downlink delivers streaming video.

For more info visit: [www.horizonhobby.co.uk](http://www.horizonhobby.co.uk)

## PARROT BEBOP DRONE



Parrot has launched its new Bebop drone in the UK, as well as a new WiFi extender, the Parrot Skycontroller. Featuring a full HD 14-megapixel fish-eye camera stabilised on a 3-axis framework, the Parrot Bebop drone captures stunning video onto its on-board 8 GB memory. The Parrot Skycontroller extends the range of the Parrot Bebop drone to up to 2 km, with intuitive controls and even the opportunity to plug-in FPV glasses for more immersive flying. £429.99 RRP, or £769.99 RRP for the Bebop Drone and Skycontroller  
[www.flyingtoys.com](http://www.flyingtoys.com)

## PHOENIX MODEL PRODUCTS SIERRA SPORT

The Sierra is a 3/4 channel intermediate, cross tail sport aerobatic slope soarer of all wood construction. Construction consists of a fully sheeted



built-up wing with a strong balsa ply fuselage. The 63" span Sierra has a good turn of speed, a good light lift capability and an aerobatic performance only limited by the flying conditions and pilot imagination/ability. £72.95

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

## JR 450 HELI BAG



New from JR comes this handy heli bag for 450-size helicopters. The bag has plenty of room for the Forza 450/450EX and a transmitter, a wide zipped opening allows for contents to be inserted and removed easily, two removable inner pockets and cushions and the shoulder strap is also included.

[www.macgregor.co.uk](http://www.macgregor.co.uk)



# Our pick of the latest R/C kits and accessories

## HITEC X4 MICRO CHARGER

This affordable micro charger features a built-in AC/DC power supply and four independent charge ports, each with the



four most common battery connectors. The individual LED displays show current, capacity and charge status, keeping you informed. Backed by Hitec, the X4 Micro may be compact, but it is big on performance! £39.99 SRP [www.jperkinsdistribution.co.uk](http://www.jperkinsdistribution.co.uk)

## DREMEL 8200-20



Dremel has improved its 8200 cordless multitool with enhanced runtime and less downtime (faster charging) allowing the user to perform heavier duty applications. The tool now contains a compact and powerful 2.0 Ah 10.8 V Li-ion battery, a high power 36 mm electric motor, variable speed control up to 30,000 rpm, motor brake, three LED battery gauge, and a soft grip. £145.

[Dremel-Direct.co.uk](http://Dremel-Direct.co.uk), [Tool-Shop.com](http://Tool-Shop.com) and DIY shops

## THUNDER POWER PRO LITE+ POWER SERIES



The Pro Lite+ Power Series brings an all-new generation chemistry that re-invents the 25C line and comes equipped with JST-XH balance connectors. The Pro Lite+ Power Series LiPos are the smallest by volume, providing higher energy density, more stable cell chemistry, and higher sustained voltage than previous versions. Pictured is the 1350 mAh. [www.thunderpowerrc.com](http://www.thunderpowerrc.com)

## HOTWING EVO 1200

Made from EPP the 1200 mm wingspan HotWing is suitable for beginners as well as experts. The model is very flexible and has exciting flying qualities. Even a brushless motor can be used as a drive unit. The HotWing comes with its wing ready covered, carbon pushrods and struts. Needed to complete: 2-channel R/C set with 2 micro servos and V-mix, brushless electric motor, 18 A speed controller, 7" x 6" prop, 3-cell 1300-1500 mAh LiPo, thin CA glue, and activator spray.



## SUPER ZOOM RACE



This popular aerobatic model comes in a new version with attractive colour variations and a larger area of aileron, larger side flat fuselage and Side Force Generators (SFG). The main parts of the model are made from expanded polypropylene (EPP), which provides excellent resistance during crashes. The model is equipped with a carbon landing gear. Required to complete: 4-channel R/C set, 4 micro servos, electric motor, 850 – 1300 mAh 3S LiPo, 28 mm spinner, prop, CA glue with activator.

For more information visit [www.zoomport.eu](http://www.zoomport.eu)



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Brian Cooper puts Roc-Hobby's mega fast Reno racer through its paces



# F2G SUPER CORSAIR

**D**uring World War II, engineers sought to increase the performance of the Vought F4U Corsair by installing a 4,360 cubic-inch (71.5 litres), 28-cylinder engine in place of the standard 2,800 cubic-inch, 18-cylinder engine. The Pratt & Whitney R-4360 radial engine generated nearly twice as much horsepower of the Pratt & Whitney R-2800 that equipped the standard Corsair, and Goodyear had to extensively modify the standard FG-1 airframe to take advantage of the considerable increase in take-off power provided by this larger engine. Thus it was

designated the XF2G-1 and became the most powerful reciprocating engine ever installed in a single engine aeroplane.

The rate of climb of the F2G was 7,000 feet per minute, twice the rate of climb of the standard Corsair and higher than the jet fighters of the time.

However, only fifteen F2Gs were built, and even less survive to this day. But one of the most famous survivors is NX5588N. It fell into neglect after the war but was lovingly restored in 1999 and makes regular appearances in the Reno Air Races. And this is the one modelled here.

## Model Overview

Roc-Hobby has modelled the F2G Super Corsair from foam and it is superbly engineered so that everything fits or clicks into place without any fuss or hassles. In fact it is something of a master-class in how an ARTF should be presented, which other kit manufacturers would do well to emulate.

The model has 'full house' controls and comes with flaps, plus electric twist-and-turn retracts. It even has lights.

Curiously, for an ARTF, it can be supplied in two choices of power levels. The first has a brushless 3536-KV 750 motor complete with a 35 Amp speed controller, and operates on a 3S LiPo. The second option is for more spirited flying and comes with a brushless 3648-KV 770 motor and a 70 Amp speed controller. This one requires a 4S LiPo. The manufacturers claim the 4S version will easily do 85 mph out of the box and can be tuned to reach speeds in excess of 100 mph. The 4S version is the one we have on review here and, having flown the model, I have no reason to doubt the claims.

## Simple Assembly

This kit is a Plug-and-Play version so there really isn't very much to do to get it ready for flying. But let's run through the simple tasks required to complete the model. We have to:

Fit the control horns and the linkages. The parts for these come in separate bags and are labelled so there is no confusion about



With its one-piece wing and just the tail to fit the F2G is rapidly assembled

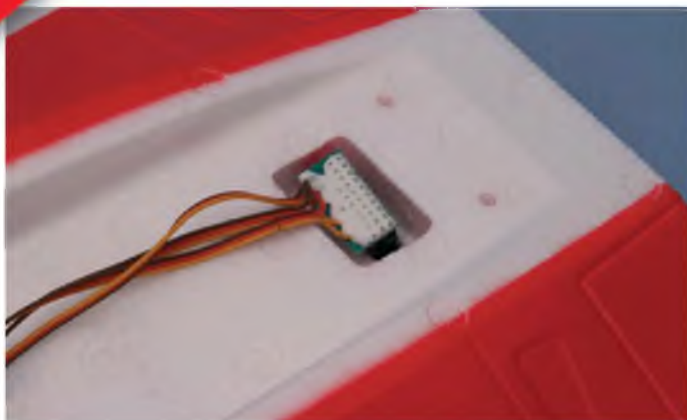




*Twist and turn retracts are a neat feature*



*The sturdy flap and aileron linkages use ball links*



*Wing wiring ends in this connector block. It would be nice to have the option of using separate aileron channels*



*Tailwheel is typical of several neat scale touches on this model*



*Tailplane is quickly attached with two screws*



which parts are needed for any particular application. The linkage connections are all sensible ball-and-socket types and they have no slop in them.

The tailplane has to be bolted on (two bolts) and then the twin linkages to the elevator servo need to be adjusted.

The twin linkages to the rudder servo need to be set up – one is for the rudder, the other for the steerable tailwheel.

We need to fit the propeller, which is secured with a large, chromed, domed prop nut. The prop itself is a very handsome affair with four blades, three of which are black and one is white. The motor has a substantial amount of right thrust built in – the manufacturers have obviously done their homework! The electric motor is hidden from view behind a dummy radial engine.

The wing fixes in place with four bolts and contains servos for the ailerons, flaps, retracts and lights. All of the wiring for the wings comes into a central 'block', which is basically a multiple 'Y' lead connector. This certainly makes it neater but it also denies us the choice to use two separate channels for the ailerons. More on this later...

That's the construction finished. We just need to add a LiPo battery and receiver. The LiPo lives under a hatch behind the motor. Two positions are shown in the instructions, depending on whether a 3S or 4S LiPo is used because the LiPo is used to adjust the C of G.

A Spektrum DSMX receiver was used and it fitted easily into the generous bay under the cockpit canopy. And yes, there is a pilot in the cockpit.

With everything complete the motor was given a test run and... woo-hoo, it certainly had loads of pull! Now we just needed to wait for a decent day to fly it.

### **A Long Wait**

And oh, how we waited. Ideally we like to take photos of review models when the sun is shining. But the weather gods sent us dark grey, heavily leaden skies and also spiteful winds, all of which conspired to keep us indoors. But the weather improved over the Christmas week. It was cold but the sky was blue, the sun shone and the wind had died down, so off we went to the field.

With all the ground checks completed there were no excuses left to keep the Corsair on the ground. So it was taxied out to its take-off point. The ground handling





*Four bladed prop is neatly replicated and retained using a chromed domed nut*



*Canopy pops off to reveal the radio*



*Double pushrods are used to operate the rudder/tailwheel and the elevators*



*It looks tight but the battery bay has sufficient room for the 4S pack used for the high power version*



*Completed F2G Corsair with the author's transmitter giving a sense of size*

was very good and it showed no tendency to want to tip over onto its nose.

The throttle was advanced and... wow! It was off down the runway and airborne like a scalded cat in about one second! The wheels were retracted and it began clawing its way to the heavens. This was superb. The power to weight ratio was simply exquisite.

The power was reduced to calm things down and to make sure everything was in trim, and to generally get the feel of the flight characteristics - and it felt very good. A few beeps of trim were applied just to get it flying hands off and then it was back down to low level for flying photos. The first couple of flights were for the benefit of the camera and to generally do any trimming adjustments. But after that we could let rip and really see how this impressive machine could fly.

At any power setting the Corsair felt 'solid' and was simply gorgeous to fly. All the controls felt nicely harmonised. The only minor criticism was with the ailerons which, being on a single channel and

connected via a 'Y' lead, did not have the facility to 'tune' them individually. The result was the rolls were just a bit barrelly, and the ailerons could benefit from a tweak of differential to get the model rolling perfectly. The servos could be wired to two separate channels but it would involve some minor surgery to dig out the multiple 'Y' lead block connector in the wing. This is a job which is on the 'to do' list.

Discarding the minor niggle with the ailerons, the handling in the air is brilliant. In flight, it feels like a much bigger model rather than a humble foamy. The power is astonishing and the model scorches vertically skywards without seeming to slow down at all. The built-in right thrust angle is just about perfect too as the climb, however steep, is precise and very straight.

This is a model that goes exactly where it is pointed, and it reacts positively to the slightest stick input. Another plus is that it can handle some fairly harsh wind conditions too. It does all the usual

aerobatics expected of a model of this type, and it does them well, but its real forte is to go fast. It looks superb when turning with the wings banked beyond the vertical - sometimes referred to as a high Radial 'G' turn - and there is no visible sign of the airframe bending under the strain. It just does it and completes the turn for another scorching 'beat-up' down the strip.

### **On Reduced Power**

The best action happens at high power settings but this aeroplane is also available in a lower power (3S LiPo) form. So, being curious, the power was reset to 75% maximum in another Flight Mode and off we went again. The model still performed excellently and the climb rate was adequate. It was lovely for some sedate, relaxed flying but the model had clearly lost some of its sparkle. It didn't take long to switch it back to 100% power.

The flaps work particularly well and have the ability to slow the model down and descend with the nose down but without



gaining flying speed. It is a feature that looks fabulous when starting a landing approach from high up and close in. Flaps down, wheels down, nose down and just fly it down to the ground. Superb.

In fact the flaps are so effective that if a flat approach is flown from far out the power needs to be maintained at about 40% to prevent the model from slowing down too much. Timing the touchdown in conjunction with juggling the power can result in some very slow landings and the wide chord at the wingtips definitely helps to reduce any nasty vices with stalling, etc.

It is truly refreshing to come across an electric ARTF model that has a decent delivery of power - and this one delivers in spades. Clearly, the 4S version it is not aimed at inexperienced flyers but the power can be tamed with adjustments on modern transmitters, and then can be increased as and when a pilot feels the need for a bit more grunt in the front.

It is a 'happy' aeroplane, which just loves being off the ground. It simply puts a big smile on your face. **RCMW**

## MODEL WORLD DETAILS

### MODEL INFORMATION

<b>NAME:</b>	F2G Super Corsair
<b>MANUFACTURER:</b>	Roc-Hobby
<b>DISTRIBUTOR:</b>	CML Distribution, www.cmldistribution.co.uk
<b>WEBSITE:</b>	
<b>PRICE:</b>	£184.99
<b>MODEL TYPE:</b>	Scale racing plane with flaps
<b>CONSTRUCTION:</b>	Moulded foam
<b>PARTS SUPPLIED:</b>	Airframe, 3648- KV770 brushless motor, 70 A ESC with 5 A SBEC, 9g digital servos w/metal gears, 4-blade 10.5" x 8" propeller, electric retracts
<b>PARTS REQUIRED:</b>	6-channel radio, 4S 14.8V 2200-2600 mAh 30C LiPo

### R/C FUNCTIONS

1: Ailerons	4: Throttle
2: Elevator	5: Flaps
3: Rudder	6: Retracts

### MODEL SPECIFICATIONS

<b>WINGSPAN:</b>	1100 mm (43.3")
<b>LENGTH:</b>	900 mm (35.4")
<b>FLYING WEIGHT:</b>	400 g

Standard Speed Specification is as above but with the following differences:

<b>FLAPS:</b>	None
<b>FLYING WEIGHT:</b>	1200 g
<b>MOTOR:</b>	Brushless 3536-KV750
<b>ESC:</b>	35 A with 5 A SBEC
<b>LIPO:</b>	3S 11.1 V 1800-2200 mAh 25C

### DISLIKES

Not being able to have the ailerons on separate channels

### LIKES

Everything else!



*Up and away in about a second, the Corsair clears the somewhat bumpy runway*



*This model goes exactly where it is pointed and it reacts positively to the slightest stick input. Its real forte is to go fast!*



*The F2G completes another high Radial 'G' turn and lines up for a 'beat-up' down the strip*



*Flaps work well, slowing the model and allowing it to descend nose down but without gaining flying speed. Looks fabulous on the landing approach!*



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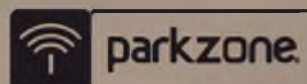


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**BNF (EFLU5380)**



405mm (15.9 in)  
Wingspan

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**RTF/BNF (EFLU2600/EFLU2680)**



410mm (16.2 in)  
Wingspan

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**RTF/BNF (PKZU2400/PKZU2480)**



*Neville Hill enjoys a healthy dose of real model building as he assembles a vintage style monoplane from Balsa USA*

# STUDENT TRAINER

**B**alsa USA's Student Trainer is a fully built up kit intended as an introduction for the novice builder. It is supplied in a much smaller box than a normal ARTF. The box art shows the aircraft finished in bright yellow covering and black trim. At 72" wingspan, with a fuselage length of 55" and a quoted weight range of 7 to 8¾ lb this is not a small aircraft.

It is supplied with die-cut balsa and ply sheets (unusual for today's kits, which are mostly laser cut), strip wood, three-part engine cowl mouldings, piano wire undercarriage, all linkages and pushrods and Perspex for the cabin windows. You also get two part full size plans and four (yes, four!) building instruction books.

It is left for you to supply the engine and engine mount, radio, wheels and covering of your choice, although Solartex is suggested as being suitable.

The engine range is given as a .40 to .46 2-stroke or .50 to .60 4-stroke. As I had a Saito 50 sitting in my engine cupboard, although on the bottom end of the suggested power band, I decided it would probably be fine.

On checking the parts count I found an oversupply of die cut balsa sheet #15 and an undersupply of #14. Both of these are for similar tail lamination parts. Luckily I was able to correct this by cutting some of the missing parts from the additional sheet and the remainder cut from my balsa stock.

## Assembly Instructions

The four assembly manuals were numbered 1 to 4 and covered every conceivable action needed to finish the aircraft inside and out, and then some! They are so detailed it took some hours to go through them. There are all sorts of



*Besides lots of lovely balsa wood there's a rolled plan, hardware, moulded parts and four highly detailed manuals*

hints and tips, and plenty of dos and don'ts, which a novice might find a bit daunting, but this is not to detract from the excellent instructions and photographs.

## Clear The Decks!

A good flat building board covered with a Sundela like fibreboard suitable for pinning into, and the tools detailed in the manuals, and we are ready to go.

Stick A to B... 'Oh, no!', I hear you cry. I'm only joking; I will only note items that concern me or if I feel the need to highlight certain areas or procedures.

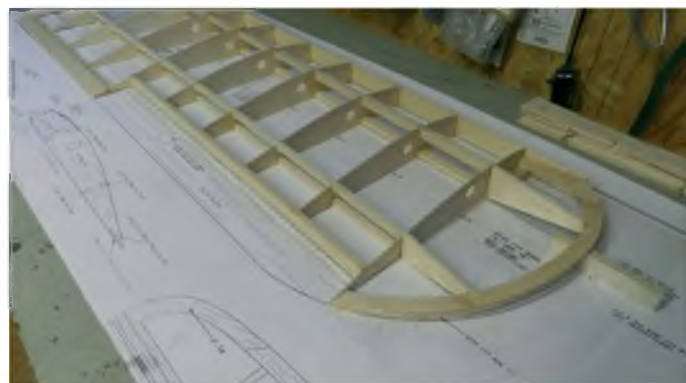


*Kit box maybe smaller than an ARTF but it's well packed with wood and other nice parts*





*Wing plan stretched out on the board. Note the wooden strips to spread the pinning areas. A plastic film is yet to be added to build the framework over*



*Starboard wing under construction*

Only break out of the die cut sheets the parts that you need for building. These are best marked with their number when pressed out, using a soft pencil so as not to indent the wood. To enable this there is a 'key to die-cut parts' in manual 1.

The die cutting was crisp and not at all like I remembered from my earlier days when there were generally lots of crushed edges. Some of the parts required help from the scalpel but most pushed out cleanly.

### **Wings (The Boring Bit)**

Built in two halves in the traditional way over the main spars, just follow the instructions closely and note that the main spar and some parts need to be packed up with 1/16 balsa strips. Ensure the inner central ribs are set to the dihedral angle. The tips are a lamination of various curved parts of balsa; make sure you follow the build sequence on this and prop them up at the required height.

All of the parts were of a good fit so once a dry build was completed I just wicked all of the joints with CA (cyano). Make sure

you do not miss any joints as this is easily done.

I made the positions and aperture for the aileron servos to suit ones that I had available, Futaba S3010's. I dropped them down into the wing by 1/4" as they would be less obtrusive.

I got a bit confused as to the size of the wingtip block used to prop the laminated tip up on the end rib. The plan said 1/2" square in two views and 3/8" square in another. This does not set the dihedral but only the position of the tips, so I decided that 1/2" would be fine.





Use a square to set the wing ribs at 90 degrees



Aileron trailing edge is clamped and glued in position



Form pushrod slots using a sharpened piece of brass tubing to ream out holes at each end. Then use a rule and sharp scalpel to cut out the infill of balsa

Sheeting of the centre section was not a problem but one small sheet was missing, which I made up from my box of bits.

When propping up the wing end whilst joining the wings ensure the centre line across the wing chord is parallel to the other wing, thus ensuring there is no twist. Epoxy the panels together, clamping as necessary.

The hinges supplied in the kit are in two parts, being pinned in the middle like a door hinge, and so require a thick slot. I normally hinge using Mylar cut from strip, which requires only a single scalpel cut. The supplied hinges went into their locations at an angle of about 30° and multiple cuts were required so they were not easy to fit.

### Tail Group (The Easy Bit)

I usually like building the tail as it all goes together so quickly and easily. The tail group in this case is made up of laminations of different die cut parts. But the problem was that one sheet was missing and there was an additional sheet of existing parts. Fortunately they were similar and I was able to cut some of the missing parts from the additional sheet, the rest being made up from my box of bits.

Sussex Model Centre, who supplied the kit, will be talking to their European supplier to check the inventory and ensure theirs are correct. A good result.

### Fuselage (The Better Bit)

A decision has to be made. Should we go for a tricycle undercarriage or a tail dragger. This took about two seconds and the decision was made – a tail dragger it was.

Just in case I might in the future wish to change to a tricycle undercarriage I built in the hardwood blocks for both options.

Various ply parts have to be laminated prior to the main build. As these items needed a good bond this was completed using white glue, with CA used on the balsa laminated parts.

The fuselage is mainly 1/4" square, but do cut the ends square to enable the glue to give a good bond. To ensure each side is exactly the same, build one side over the other with a plastic membrane between to prevent them sticking together. I normally use the clear backing from Solarfilm. You will remember to make opposite sides, won't you? (You only usually make this mistake once!)

When all set and sanded the fuselage box can be glued together. Be sure to keep it all square and straight. Add the pre-assembled motor mount assembly and all the triangular stock and bits and pieces to complete.

The instructions suggest that the glued on motor mount will detach in the case of a heavy arrival and save additional damage. Who knows? But it's a nice idea.

For the rudder and elevator pushrod exits at the rear end an easy way to cut them is to draw a pencil line at the exit position for the length of the slot. Then using a suitable size brass tube, sharpened on the end, twist the tube to make a hole at each end. Then join the holes with a scalpel and rule to make perfect slots.

The manuals showed the pushrods as Sullivan Gold-N-Rods and I assumed these were supplied in the kit. But what had been supplied was steel threaded pushrod ends, which would need to be bound and glued to 1/4" square balsa strip. I'm not keen on this idea, although I have used it many times in the past. So I decided to follow the manual and I purchased a set of Gold-N-Rods. These are fine but it is necessary to support them along the inner fuselage run. Just cut a suitable length of balsa with a couple of holes in, thread the rods through and stick this to the 1/4" uprights either side of the fuselage. Do this in two positions and you will get no sags in the runs or slop on the clevises. Of course, you have to remember to do this before you cover the fuselage - or have very small hands!

Since I was using a 4-stroke engine the control run for the throttle was not easy to position from the main servo mount. As there was an enormous space between the two front formers I decided to mount the servo in a purpose built mount in this space. This was excellent as I could position it directly in line with the engine throttle lever and the bonus was a very short control run. I simply added a hatch in the fuselage floor for access.

Next, trial fit the tail surfaces, having aligned the horizontal stabiliser. I pin this in position with two cocktail sticks, and glue these into the stab with CA, but not yet into the fuselage. This enables it to be repeatedly re-positioned without any further measuring.

Fit the radio gear and all control runs, and the engine with the front positioned at the correct distance from the bulkhead.

The engine cowling is made up of three parts. The bottom two are glued together using 1/64 strip ply and CA, with the top being screwed in position into plywood strips glued to the bottom. It sounds complicated but in practice is easy. Use car body filler on the joints and rub down with wet 'n' dry, then paint. It takes longer for the paint to dry than to assemble.

Don't forget that as this is an I/C model you need to fuel proof the engine bay, tank bay and cowling.

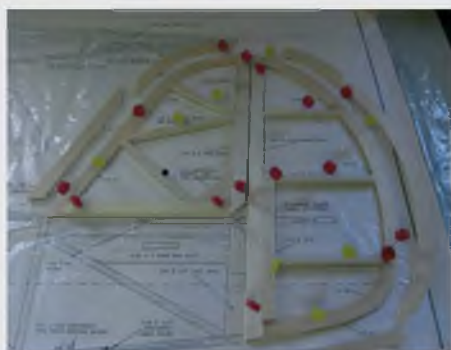
### Covering (Almost Complete)

Solartex was recommended and I agreed. I had some in stock and using mostly yellow, but with blue on the under wings and trim, we were soon on the way. The tail surfaces were first, leaving the bits for gluing uncovered, then the fuselage, followed by the wings. Remember to put in some pull throughs for the aileron leads prior to covering the wings.

Adding trim is difficult with Solartex due to the surface weave but I managed the fuselage trim with 'tex on 'tex. The wings were a different proposition and I decided to use Halfords' best car enamel, however masking was somewhat of a problem as I needed a curve in the centre section. But eventually I managed it.

I was aware that paint can 'leach' under masking if you are not careful on Solartex, so I tried just misting the first coat or two, followed by a heavier coat. On removing

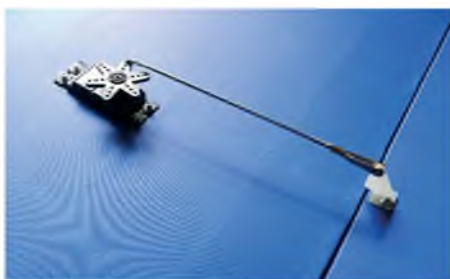




Beefy tail components are simple to build over the clear plan



Make sure to add a pull string when building each panel with which to pull the aileron servo leads through



Aileron linkages are short and direct, helping to ensure slop free controls



Cocktail sticks help locate the tail while it is being set up and glued in place



Chunky tail parts after rounding off the edges



The long motor box is designed to break off in an accident to try to prevent further damage to the rest of the fuselage

the mask, guess what? It had leached anyway and to my eyes it was a disaster. Well it was on and there was nothing I could do about it. Perhaps I will get it right next time! (You have to be right up close to spot it Neville, so please stop worrying! – KC)

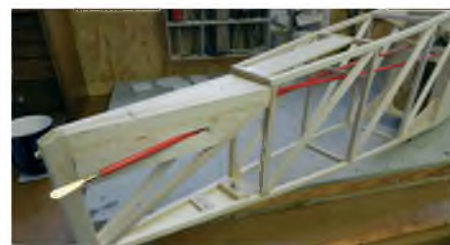
To get the side windows 'looking right' cut the covering about 1/4" inside the edges, then roll the excess covering over the balsa frame and iron it down on the inner edge. Then when you glue the Perspex windows to the inside it all looks very neat. I used Canopy Glue for this.

I cut the Perspex front window to the template on the plan but with two wing dowels poking out of the front I thought it was never going to fit correctly. Guess what? It was a perfect fit – surprise, surprise! I fixed this in position with three screws each side.

### Final Finishing (The Time Consuming Bit)

Refit all control horns, reposition pushrods, add keepers to the clevises and join up to the surfaces. Plug in all servos and battery and we are ready to set up the surfaces to the recommended throws. Finally check and set the Centre of Gravity. This showed the model to be nose heavy. Moving the battery back to the rear bulkhead improved it slightly but I eventually put 72 grams on the tail using 'sticky weights', which brought the C of G to 73 mm from the wing leading edge, just in front of the recommended 75 mm.

I know there is always some debate about 'static balance' but I always set the balance



If you use snakes for the tail pushrods it's worth building in horizontal supports across the rear fuselage



Cabin detail with the tail servos in position



There's plenty of room in the cavernous fuselage to mount the throttle servo so it has a less torturous run to a four stroke's carburettor. A new hatch was made to give easy access



## STUDENT TRAINER

across the wings by resting the tail wheel/skid on the bench and holding the spinner, with the engine not on compression. The wings should stay level. If they don't I add weight to the high side; this is usually only a few grams but I have found it makes a difference with loops etc.

### Building Conclusion

Would this kit be suitable for a novice builder? Yes, but I thought the instructions, while being very detailed and excellently presented, were in some places too complicated for a novice.

But overall I enjoyed building and covering this aircraft. My painting, as they say in a school report, 'could do better' but I was quite pleased with the overall finished result.

### Flying

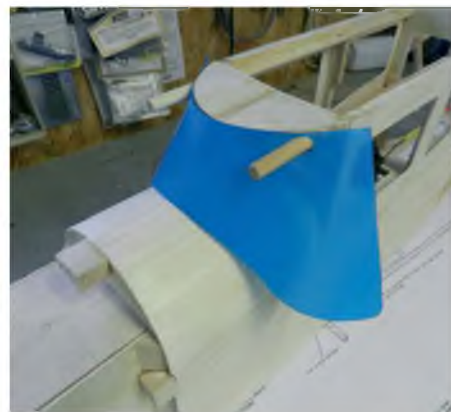
#### (What We Are Really Interested In)

Sorry folks! You'll have to wait for the next issue for this as I've handed the Student Trainer over to the Editor to take pictures and to perform the maiden flights.

**RCMW**



*Clamping support pieces to the lower engine cowling*



*Trust the template given for the front windscreen – it fits perfectly!*



*The wooden structure shows through as some late winter sun lights up the Student Trainer*



*A characteristic of Balsa USA's Student Trainer is its long nose*

## MODEL WORLD DETAILS

### MODEL INFORMATION

<b>NAME:</b>	Student Trainer
<b>MANUFACTURER:</b>	Balsa USA
<b>KIT SUPPLIED BY:</b>	Sussex Model Centre
<b>PRICE:</b>	£199.99
<b>MODEL TYPE:</b>	Wood Building Trainer
<b>ENGINE RECOMMENDED:</b>	.40-.46 cu in 2-stroke, .50-.60 4-stroke
<b>ENGINE USED:</b>	Saito 50 4-stroke
<b>RADIO REQUIRED:</b>	4 channel, 5 servos
<b>CONSTRUCTION:</b>	Built up balsa and ply

### R/C FUNCTIONS

1: Throttle	3: Elevator
2: Ailerons (2 servos)	4: Rudder

### MODEL SPECIFICATIONS

<b>WING SPAN:</b>	72 in (1829 mm)
<b>WING AREA:</b>	840 sq in (54 sq dm)
<b>FLYING WEIGHT:</b>	7 to 8.¾ lb (3.2 – 3.6 kg)
<b>FUSELAGE LENGTH:</b>	55 in (1397 mm)
<b>ENGINE SIZE:</b>	.40-.46 2-stroke, .50-.60 4-stroke

### DISLIKES

Die-cut sheet count incorrect • Addendum sheet needed to highlight change in control rods to avoid confusing novice builders

### LIKES

Wood is of good quality • Die cutting is very crisp  
• Informative, well presented manuals • Finished aircraft looks great • A good, satisfying build



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# SILENT SCALE

*Chris Williams introduces his latest scale glider and looks at beefing up the wings of a popular ARTF kit*



*Author launches his current Bergfalke MU13E*

## Workshop Antics

If, like me, you happen to be addicted to flying wooden scale models from the slope there is a somewhat narrow range of weather conditions that are ideal for that purpose. Although most of my designs are perfectly capable of flying in wind speeds of 20 mph plus, the maximum enjoyment takes place in wind speeds of around 10 mph or less, purely because of the perceived scale effect. In these gentler conditions a scale glider looks much more realistic in flight, with a smoother passage through the air devoid of those annoying bumps and twitches that are the signature of flying in strong winds.

The downside of this is that I often find myself perched on the edge of a hill in the face of a gentle breeze not knowing whether a launch is going to culminate in a flight or a landing out.

By a Darwinian process this has led to one glider being my number one choice for such a circumstance. Consider the necessary qualifications needed: having thrown the model off into the wide blue yonder, should there be insufficient lift you really don't want to have land out at the bottom of the hill, as this will of necessity cause undue deterioration of footwear and heart muscle.

So the model must be light enough and of sufficient efficiency that the initial impetus provided by the hand launch will allow it to turn parallel to the slope, sniff for any useful lift for a few seconds and, if none is forthcoming, still have enough retained energy to ease back on to the hill and land, ready for another attempt.



*Bergfalke in action*





**Comparative views of the two Bergfalkes**



**Custom-built aluminium jig contains the Bergfalke 4 fuselage**

A lot depends on how much time you spend in the gym, but in my case a quarter scale model is about as large as I can go and still have the muscle power to perform the foregoing task.

On top of that, such landings might also be somewhat inelegant, so the structure will have to be able to withstand sudden shock stresses that the full size would never countenance. Having designed quite a large number of wooden scale sailplanes over the years, I can say with some confidence that they were all put together on the basis that sudden shock stresses were going to be the norm rather than the exception!

without building the same model yet again? The answer was to move forward in time to the 1960s and consider the Bergfalke IV. Once again this is still a steel tube/wooden flying surfaces machine but now it has a fully moulded canopy and - what's this? - I've found a version retrofitted with winglets, very much a rarity on older gliders.

Nestling in my archives I happened to have a Scheibe 3-view drawing that would provide a suitable basis for the design. So without further ado the PC was fired up and the fun commenced. It is once again worth noting that a 3-view, even an official

construction, in this case it was assembled on my homemade aluminium jig. This is made up from two lengths of 'L' section aluminium, bolted together in such a way as to leave a gap in the centre along which the brackets to which the fuselage formers will be attached can slide along and be set to any desired station with the use of a butterfly nut and bolt.

This process is greatly aided by fixing a tape measure permanently to the jig bed. All the bits and bobs for the brackets and fixing are readily available at good old B&Q. The fuselage went together at a fair pace, with the fibreglass fairing at the front

**Geoff Crew with the re-furbished Phoenix K8**  
See overleaf.



The Scheibe MU13E Bergfalke is a two-seater glider, first built by the German Scheibe concern in the early 1950s. The fuselage is of steel tube construction, whilst the flying surfaces are of traditional wood and fabric construction. I built my first version of the Bergfalke some 25 years ago and, having discovered its light-air properties I've built a further four or five since, winning the odd competition or two along the way.

So, when it came to looking for a new project after the two-seat Minimoa my thoughts once again returned to the Bergfalke family. What could I build

one, signed by the designer himself, is not a definitive representation of the full size and is likely to be riddled with inconsistencies that will cause the model designer to scratch his head until it turns shiny. (This is possibly because 3-views as such were (and are) produced for sales and other purposes.)

What makes life a lot easier these days is the Internet, from which many and varied photographs of Bergfalke IV's can be gleaned. And, as everyone knows, a photograph is worth a thousand words.

As the fuselage structure is unsuitable for the traditional half-shell method of

being replicated with planks of 1.5 mm ply, which will later be filled and sanded to shape. The wings are of pretty standard construction, with 6 mm square spruce spars and balsa sheeting.

Contrary to modern practice all the servos are up near the centre of gravity, with the elevators connecting to a sliding square tube in the rear of the fuselage, the tube being energised by an old-fashioned wooden pushrod. The wings will be retained with two sets of three no. 63 rubber bands, folded twice, a system that has relieved the stresses of many a heavy landing over the years!





*Proof of the pudding: the K8 endures some multiple looping!*

When the airframe was rigged for the first time it became evident that the Mk.IV version was noticeably larger than the Mk.I and I began to wonder if the old muscles were going to be up to the job.

Whilst winglets tend to look eye-catching, especially on a woodie, it doesn't take an Einstein to work out that they are going to a considerable logistical problem between hangar and field. So it was decided to make them detachable and, to go one step further, also make up a pair of conventional tips for use when no one is looking. With the airframe more or less complete the next stage is to make up a mould, or rather a former, for that large canopy. But that's a whole other story.

### **The Restoration Of Big Kate**

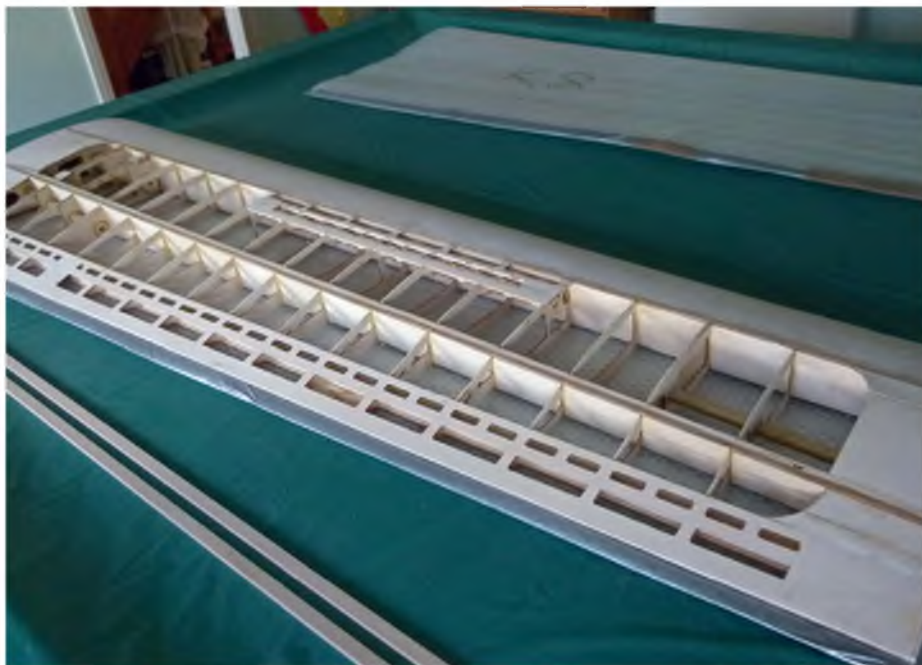
Last time around I featured a photograph of my pal Motley's K8, still flying, even with half of one wing missing. During the second half of 2014 wing failures on these large scale ARF's were becoming a bit of an issue, so when he decided to strip out the wings and see what was what, the results were interesting to say the least. These large beasts weigh in at around 30 lb, which is very light for a model of this size. And stripped of their covering it was possible to see just how the weight had been saved.

There is no spar as such, the nearest thing to it being some thin strips of Lite-Ply. A large aluminium tube runs through the 'D' box, starting at the root, but strangely, being not quite long enough to reach the tip where the outer wing panel joins. Predictably, this is where the wing let go. Due to the fact that it was becoming a known problem the manufacturers had modified the wings, and Motley's K8 came with these, and a set of the un-modified originals.

Having stripped the original wings, a retro modification became evident. With a bit of careful slotting, 12 x 6 mm spruce spars could be let into the rear of the 'D' box, top and bottom, with some similar beefing up of the rear spars too. He then fitted Lite-Ply webbing between the ribs and beefed up the ribs where the joiner tubes ended and where all the bending loads would be most concentrated.



*The damage to the K8's wing*



*The replacement wing, plus spruce spars*





Author with the new 1/4 scale Bergfalke 4



Bergfalke 4 is 10 lb AUW and ballasted for the correct C of G at this stage



Winglets and standard tips for the Bergfalke 4



Pat Teakle's Celestial Horseman in action at White Sheet

He reckoned to have spent around thirty hours on the job in total.

We took her to a nearby slope one day to see how well the modifications had worked. As probably the most serious strain you can put on such a glider is to loop it (I can't imagine anyone bunting a full size) she was put through a series of fairly tight loops during which the wings bent upwards to show the forces involved, but resolutely refused to let go.

Success, then, and it just goes to show that with a modicum of ingenuity and a little workshop time a very modestly priced model such as this, which flies very nicely indeed, can be rendered useable.

### Almost Scale

During the latter half of the 2014 season, Pat Teakle came along to White Sheet Hill with what appears to be a scale model, but which, in fact, is a vintage sports model design called the Celestial Horseman.

Not really in the purview of this column, then, but it's so pretty I felt obliged to include it..!

### It Must Be Quantum

The other day, I was watching a programme on the gogglebox in which the presenter endeavoured to explain quantum theory to me. It's not the first time this has been tried, but it steadfastly refuses to take. I experienced the usual bewilderment: how do they come up with these ideas? And where did they get the mushrooms..?

It seems that nothing is real, not even that final demand you might be holding in your hand. If you look right down to the sub-atomic level, it seems that things can be in two places at once, and even more bizarrely, things only exist if you happen to be looking at them at the time.

After a considerable period of time someone set up a lab experiment with lots of complicated scientific equipment and was able to prove that this is actually true. It seems like a lot of expense and effort when all they had to do was to consult me. I could have added another layer to their theory - the Time-Delay-Effect.

Consider this: you have had your glider towed up to 1500 feet. You've released and your once third scale model now looks to be 1/32 scale. You then put your left foot into something unpleasantly squishy and look down to see what has occurred. Instantaneously your glider winks out of existence, a fact that can easily be confirmed because when you look back skywards she's nowhere to be seen.

This is where the Time-Delay-Effect comes in to play. Although in theory the glider should have winked back into existence as soon as you looked back up, the Laws of Quantum are twanging away trying to catch up. So, whilst the glider is in a state of non-existence, the universe had expanded, which is why when you clap eyes on it again it's in a different and totally unexpected place in the sky.

I'm expecting a call from the people at NASA any day now to explain my theory, but really, it's just a load of Quantum...

**RCMW**



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Peter Miller introduces his plan for a Grumman inspired sport twin for .12 - .15 size glow engines



# GRUMPY SKYLARK

**O**ver the years I have designed a few twin-engined models. These have always been exciting to fly and really performed well. Recently I was asked to design another and as I have always liked the Grumman Skyrocket series of experimental and prototype aircraft I used the Skyrocket to inspire my ideas.

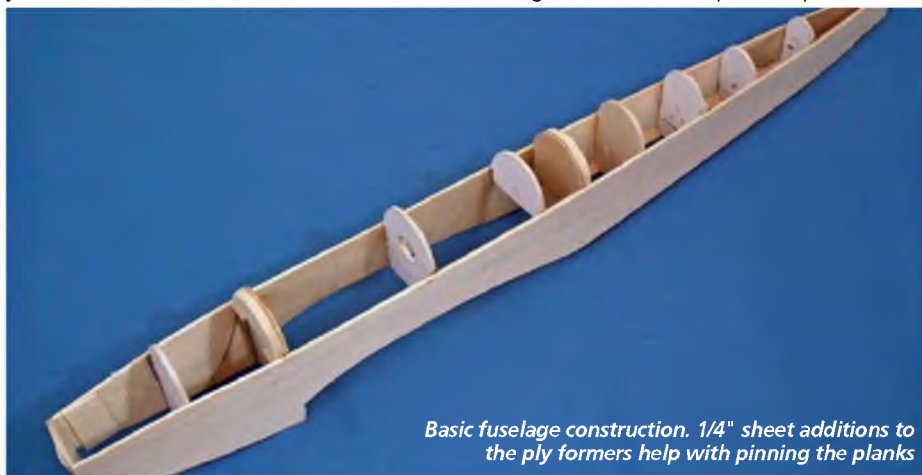
I chose to base the size on an area on a previous design but as I did not have two .15s spare I used a couple of SC 12s. But I kept the sizes the same as I knew that many people would opt for the larger engines. The result is a 49" span model with a sleek fuselage and plenty of wing area. An all up weight of 4 lb 2 oz gives a sensible wing loading.

Construction is very simple really, although some people may shudder at the thought of planking the top of the fuselage. Let me say that planking does take some care and a bit of extra time but it is a very satisfying technique. It is also an essential technique for the serious scale modeller.

## Flying The Skylark

Now this is the part we all read first and especially so when the model is an I/C powered twin. Twins have a bad reputation when one engine cuts but with some care they really present no great problems, as you will see.

The first take-off was smooth and straight with a steady climb out. It soon became apparent that for some reason this model needs a lot of control movement but going to high rates soon cured that problem for the first flight. For the second flight we brought the low rate up to the previous



Basic fuselage construction. 1/4" sheet additions to the ply formers help with pinning the planks





*This 49" span model has a sleek fuselage and plenty of wing area*



*Fuselage top being planked. It looks horrible in this state*



*Underside of nose is also planked and the rear is sheeted. Note that the nut plate has been fitted*



*A few minutes work with a razor plane and sandpaper transforms the planking*

high rate and set the high rate even higher.

It was also found that when on a single engine rudder was needed at times.

Fellow club member and friend, Stuart Pickett flies my models for the camera. I also let him make the first flight with the model as he is a better pilot than I am. He was soon happy to make low passes for the camera and once I had a good set of photos he was allowed to play with the model.

He was soon throwing her around and trying spins and loops, and inverted. The model performed them all well. Spin recovery was instant upon releasing the sticks.

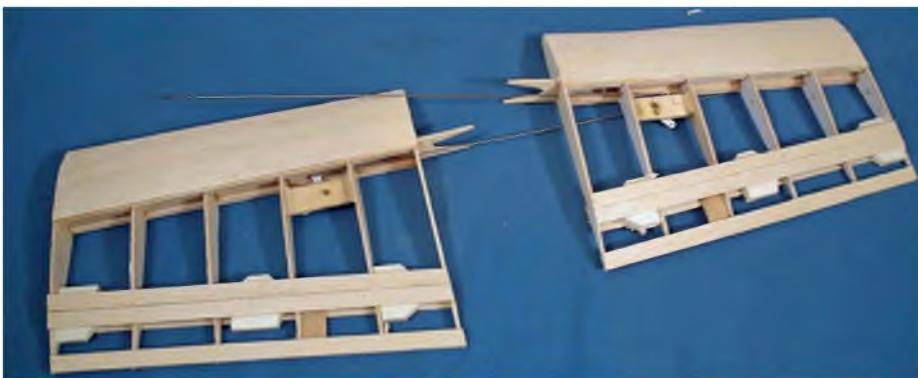
Eventually an engine stopped but we didn't know which one. It was soon found that the model could be turned both ways but that when turned into the dead engine there was a tendency for the inner wing to drop. However, it could be picked up with the aileron easily enough but some rudder was also needed.

The approach was easy on one engine and the landing was fast, straight and smooth.





Wing outer panels under construction and ready for top sheeting



The completed panels



The nacelles are needed to set the rib spacing on the centre panel of the wing. Top and bottom views shown here

I made the next flight and found that the model was great fun. While both engines were running it was just like any other aerobatic model. I flew outside loops from inverted, which is always a good test to see if the model has adequate power. I also flew an avalanche or two; that is a loop with a flick roll at the top. Four point rolls were reasonable, although the weight of the engines out on the wings made it difficult to be really accurate.

When one engine stopped I carried on experimenting and somehow ended up in an inverted flat spin. Now that is normally a fatal manoeuvre, but somehow the model came out of it and I ended up flying round



Starting to build the centre panel, with the nacelles used as spacers

the right way up. Don't ask me how I did it, or even if it was my reactions or just lucky stick wagging!

The general consensus of opinion is that this is a good fun model. And treated with care while on one engine it would be a great trainer before flying a scale twin. Power is adequate for normal aerobatics but a couple of .15s would lift it into a sublime machine with extra speed and climb.

Having said that, I was really amazed at how well it flew on a single .12. That is a mere 2 cc and yet it would maintain height and even climb gently on one engine. However, until one is used to flying on a single engine the wise course is to treat single engine flight as a 'get back to the runway' situation.

One of the most satisfying manoeuvres is a long shallow dive across the field, then pull up and roll. This would be even better with two .15s!

## Building

Construction is pretty simple really. However there are a few sequences that should be followed just to make sure that everything fits and that there are no warps. Just follow the instructions and you should have no problems.

Start off with the fuselage. Cut out all the parts and glue the ply doublers to the fuselage sides. Use medium hard wood for the sides.

I use impact adhesive for the doublers. Thixofix is really good for this; Evostick is nearly as good but not the water-based version. Add the triangular longerons along the bottom of the sides.

Build the fuselage over the plan, joining the sides at the rear and fitting the formers from 10 to 6. Note that formers 3 and 6 have 1/4" sheet laminations at the top. This to take the pins for planking because these two formers are made of plywood.

Once the assembly has dried pull in at the front and add the remaining formers. At this stage fit the snake outer tubes. Then fit the bottom sheet.

Now you can do the planking. You will have to chamfer each plank and also taper them towards the ends. Try to taper them so that you do not have to twist them too much.

Work on alternate sides and slowly work to the centre of the fuselage. Try to get as good a fit as possible. You can fill any gaps later with scraps of wood and filler but it is better to get as good a fit as possible.

Once the planking has been finished leave it to dry. It will look horrible, being all rough with bumps etc. Don't worry, as after ten minutes with a razor plane and sandpaper you will have a beautiful smooth compound curve that is a joy to see. Fill any minor gaps and sand again. With the planking done you will be proud of the result.

Fit the tailplane platform and tailskid mount. Then make up and fit the ply plate with the blind nuts for the wing bolts.

This completes the fuselage construction. Pretty simple wasn't it? Mind you, we make up for that in the next section.





The outer panels are glued on before the top sheeting is fitted to the centre panel



Completed wing ready for attaching the nacelles



Aileron bellcrank bay



Wing servo bay showing aileron connection. Use a swing keeper on the servo



Underside of the nacelle showing the throttle servo bay

### Wings And Nacelles

The sequence for building the wings will guarantee a warp free wing. It is simple and it works.

Build the wing outer panels first. Start off by pinning down the lower leading edge sheet, and the aileron spar and leading edge lower capstrips. Also the aileron trailing edge sheet.

Glue down the lower main spar and add all the ribs. Do not glue the ribs to the leading edge sheet yet. Add the aileron spar and aileron leading edge. Fit the aileron ribs.

Glue in the top spar and glue on the 1/8" sheet leading edge. Glue in the dihedral braces and add the root ribs. Leave it all to dry out.

Now raise the lower leading edge sheet and glue to the leading edge and ribs. I use aliphatic glue along the leading edge and Superphatic glue along the ribs. You can also glue on the spar webs and scrap blocks for the aileron hinges now.

Shape the leading edge, aileron spar and leading edge etc. to match the ribs. You can now glue on the top sheet and capstrips. Finally, add the 3/8" x 1/8" trailing edge.

You can now lift the wing from the building board and add the aileron bellcranks and their pushrods, but not the pushrods to the ailerons. Fit the rib capstrips and the sheeting under the bellcrank bay as show. You can also fit the wing tips and separate the ailerons from the tips.

Now build the basic engine nacelles. These are needed to set the rib spacing exactly where they go on the wing.

Build the wing in the same way as the tips but do not fit R-3s yet. Use the nacelles upside down to set the gap where they are located.

Note how R-1 has a slot in it, while R-1a does not. This slot forms the hole to the wing dowel. I like to epoxy a short length of 1/4" brass tube in the hole as this allows one to change the dowel easily on the field.

Fit the paper tubes for the throttle servo leads. This best done by rolling a strip of paper round a 1/4" dowel and inserting it through the holes and the releasing the paper, which will spring out to the full size. Then apply glue to hold it in place.

When you have reached the stage of adding the top you can join the tips to the wing centre panel. Pin the tips down with

5/8" dihedral under each tip. This is not too critical but make sure that the dihedral braces fit the spars properly.

Add R-3s at this stage. I do it this way because it guarantees a perfect fit between R-3 and R-4.

Glue in the 1/8" ply plate for the servo. The servo is mounted with servo mounting brackets.

When this joint has dried the top sheet can be added. The whole of the centre panel is sheeted. Add the trailing edge. I use the separate trailing edge because it is easier than chamfering the wing sheeting and you can use very hard trailing edge, which reduces any hangar rash.

Now the wing can be lifted from the board and the leading edge cap strips fitted. Also install the bearers for the throttle servos. Make sure that they are low enough so that the connection to the throttle cable is inside the nacelle. I didn't and had to make blisters in the hatches.

The lower rear sheeting can be added now and once dry the trailing edge can be fitted. Cut away the sheet where the nacelles fit. The wing is basically complete.

Just add the 1/16" ply plate underneath for the heads of the wing bolts.

### TOP TIP

Take two very short pieces of wing bolt and sharpen them in a pencil sharpener. Insert these into the blind nuts. Position the wing exactly where it should be and press down. The stubs will make dents in the wing to locate the boltholes exactly.

### Nacelles

These are very simple. The main sides are 1/8" balsa over 1/32" ply doublers and two formers. The undercarriage mount is made from 1/4" ply, with a plate across the bottom of the nacelle to which the torsion bar is clamped with saddles, and one up the side with a slot for the upright prong of the leg.

There is a hatch on the top for the tank. This is held down with small screws. I glued very short lengths of 1/4" dowel into the hatch to reinforce the screw locations.

The bottom is covered with 1/8" sheet. Add strips of 1/8" ply across the nacelle to take the screws for the 1/32" ply hatches over the throttle servos.

The engines should be mounted on long engine mounts, as supplied by SLEC or





Building the cowls around the engines



A cowl after final shaping



Tank hatch. Note the short dowel inserts to take fixing screws



Close up of throttle hatch and the ply strips for the fixing screws

Radio Active. Mount the engines right at the end of the mount. This helps get the C of G in the right place. It also allows room for the fuel pipes and the remote glow connector.

Glue the nose rings to the spinner backplates with 1/16" spacers. Then fit 3/8" sheet between N-1 and the nose ring. When the assembly is dry you can remove the engines and spinners, and carve and sand the cowl to shape.

Note that there is no side thrust or down thrust.

### Tail Surfaces

These are so simple that they hardly need any description. Use medium grade 1/4" sheet. I use CA hinges and SLEC Neater horns.

### Covering

My favourite covering is Solarfilm Supershrink Polyester. It gives a great finish with a less plasticky feel. It shrinks round double curvatures really well, is much less sensitive to over enthusiastic application of heat and it never sags in the sun. It is also lighter than most of its competitors.

Choose a bright colour scheme and make sure that the underside is very different to the top. I like big dark panels on the wings; these can be on the top or the bottom depending on your chosen scheme. I chose a pseudo pre war American colour scheme but the choice is yours.

I cover the tail surfaces before gluing them on, making sure, of course, that there is no film in the joints.

### Installation

I used some old Supertec Mini servos in the fuselage and for the ailerons. Any servo will fit though. I used two 9 gram metal geared servos for the throttles.

The aileron servo is connected to the bellcranks with the pushrods. Take a piece of 8 SWG brass tube and slide it over the ends of the pushrods. Insert the piece of wire that goes to the servo and with everything lined up flood the brass tube and wires with solder.

As mentioned the SC 12 engines are fitted right at the front of the long engine mounts.

The tanks are Radio Active 4 ounce tanks. These are a bit tight to get in and the hardwood strips for the tank hatch hold down had to be trimmed back in the middle.

You do not want to be trying to fit Ni-starters into the gap between the nacelle and fuselage, or the prop and wing. I fitted remote glow connectors to 1/16" ply plates and glued these to the top of the nacelles. It will pay to shorten the leads as the space in the nacelle is limited.

Control throws are surprisingly large:

Aileron - high rate 3/4", low rate 1/2"

Elevator - 1/2" (This setting seems ideal and no other rate is specified)

Rudder - high rate 1 1/2", low rate 1" (I like keeping it on high rate!)

Now go out and have fun being an adrenaline junkie.

Just a thought... Some people have taken my similar designs, added a couple of inches to each wing and fitted .25s. This fills me with horror but then some people like doing 200 mph on a motorbike. If you try this, invest in a box of Pampers! **RCMW**



Ready to go in the low winter sun



The general consensus is that this is a good fun model





*Power is adequate for normal aerobatics but a couple of .15s would make it a sublime machine with extra speed and climb*



*If treated with care while on one engine it would be a great trainer before flying a scale twin*



*With both engines running it is just like any other aerobatic model. But even on a single .12 it will maintain height and will even climb gently on one engine*



*For some reason this model needs a lot of control movement*

## RC MODEL WORLD DETAILS

### MODEL SPECIFICATIONS

<b>MODEL NAME:</b>	Grumpy Skylark
<b>WINGSPAN:</b>	49" (1266 mm)
<b>WING AREA:</b>	476 sq in (3070 sq cm)
<b>WING LOADING:</b>	18.76 oz/sq ft
<b>LENGTH:</b>	37" (940 mm)
<b>WEIGHT:</b>	62 oz (1860 g)
<b>RADIO FUNCTIONS:</b>	Throttle, Ailerons, Elevator, Rudder
<b>RECEIVER:</b>	Spektrum
<b>SERVOS:</b>	Supertec Mini
<b>BASIC CONSTRUCTION</b>	
<b>MATERIALS:</b>	Balsa, Ply, Spruce
<b>COVERING MATERIAL:</b>	Solarfilm Supershrink Polyester
<b>CENTRE OF GRAVITY:</b>	2.5" (62 mm) from Leading Edge
<b>CONTROL THROWS:</b>	
<b>AILERONS:</b>	High ¾", Low ½"
<b>ELEVATOR:</b>	High ½", Low ½"
<b>RUDDER:</b>	High 1 ½", Low 1"
<b>IC POWER</b>	
<b>ENGINE RANGE:</b>	.12 - .15 cu in (2 - 2.5 cc)
<b>ENGINE USED:</b>	SC 12
<b>PROP:</b>	Master 8" x 4"

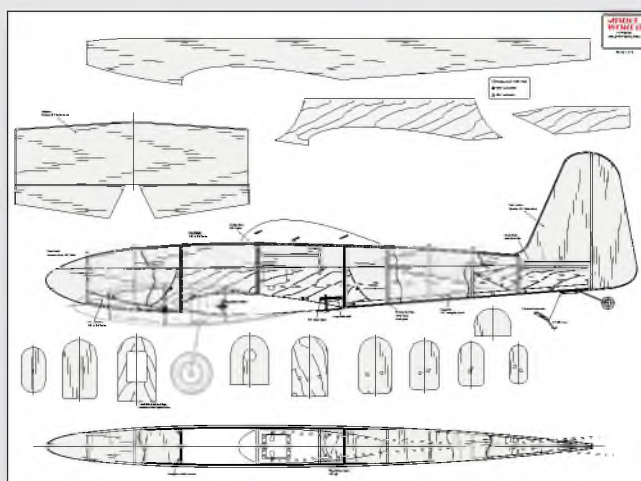
## PLAN DETAILS

<b>NAME:</b>	Grumpy Skylark
<b>BUILD CATEGORY:</b>	Intermediate
<b>PLAN NUMBER:</b>	MW3740
<b>PLAN PRICE:</b>	£15.99/US \$27.99

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Bill Bowne tries out a pair of decorative trim cutting aids from Crafty Products

The Gyro-Cut and the Easy Roundel Kit. The former is a nifty swivelling film cutter, whilst the latter consists of a series of concentric rings of laser-cut lite ply set within a lite ply bed and intended for use with the Gyro-Cut



# GYRO-CUT AND EASY ROUNDDEL KIT

**A**fter I submitted a jet fighter-ish design to this magazine (Valkyrie, Nov 2014, RCMW), Editor, Kevin dropped me an email. He'd noticed that I did the Valkyrie's US markings on my home computer and wondered if I'd like to try Crafty Products' new Gyro-Cut tool and the Easy Roundel system as a better way to do the job (albeit for UK insignia). Supposedly, those tools would make cutting insignia from shrink and sticky-backed film easy.

Making markings via clear mailing labels and a laser printer is easy, but there are several shortfalls: the colours aren't as vivid as paint or film, they don't last long in direct sunlight, the labels come in limited sizes, they aren't fuel proof, and you must provide a white film backdrop for any white coloured bits.

On the other hand, shrink and sticky-back film solves all of those problems. The only pain is in cutting out the shapes. Hobby knives will do the cutting, but they'll nick templates with the same

glee as they show slicing through film - and fingers! My personal preference is to use shrink-film instead of sticky-back film for trimming as it allows for larger 'bits' to be cut out and it's easier to avoid the dreaded film-stuck-to-itself trap. As we'll see, that meant I had to make some changes in how I assembled and applied the roundels, but that's about it.

Shortly after Kevin's promise of the cutter and roundel system for review, I was in my garage workshop, deep in the process of cutting out shrink film 'feathers' for a new model. I was doing it the familiar, old way, using a #11 hobby knife and lite (poplar) ply templates. My hand/eye coordination



Held just like a pen, Gyro-Cut is comfortable to use



is not fantastic (in other words, I'm a bit of a klutz!), so I was getting pretty frustrated with my hobby knife digging into the templates.

That's when I heard the postman driving by and was delighted when he handed me a package from the Traplet on-line shop: [www.trapletshop.com](http://www.trapletshop.com). I had the Gyro-Cut in use within minutes. (Yes, I did read the instructions and watch the video first – there's some very good information in them! Visit: RC Flying Traplet TV Gyro Cut on You Tube) Swapping my hobby knife for the Gyro-Cut for the next 'feather', I was delighted at how smoothly the cutter worked on the same templates I'd been using all along.

Two more nice things I noted whilst using the Gyro-Cut. First, it doesn't dig into my cutting mat the way my hobby knives did.

Second, it's true that it's almost impossible to cut your fingers with the Gyro-Cut. I normally cut myself at least once or twice when making long, straight cuts with a hobby knife. Usually that 'bumping' feeling is quickly followed by pain and mess. With the Gyro-Cut it was a 'bump'. Period. No pain, and no blood on the workbench. Yet that blade (I'm still using the original blade) has remained sharp.

### What's In The Packets?

The Gyro-Cut uses a swivelling blade in a shallow 'Z' shaped handle, making it surprisingly easy to hold. The advertising claims that the blade will easily pivot to follow the direction of motion, making it easy to do large, curved cuts in one, continuous motion. I confirmed that on the first day!

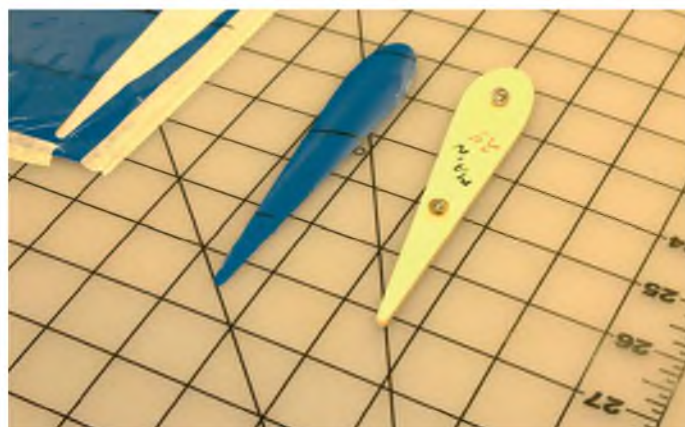
The Easy Roundel system uses a set of laser-cut rings and a lite-ply jig 'bed' (it does look a bit like a young child's puzzle) to make it easy to cut roundel insignias from shrink or sticky-back film. Depending on the ratio between the rings and the number of colours the system can produce properly proportioned roundels from 2" to 9" in diameter. Clear instructions are included with both products, as well as directions to some very nice web videos.

### Really Easy Roundels?

It was too late to use the Easy Roundel kit on the plane in progress, so I decided to make my next model, the Marlin (already mostly drawn up) into an early FAA aircraft. (For my fellow US residents, the FAA in this case stands for Fleet Air Arm, and is one of the good guys!) I could have just cut out



*Gyro-Cut neatly followed the 'feather' templates that I already had in use. It cut easily through the Ultracote covering film. Dark lines on the covering are from a water-soluble marker. The screws sticking up from the template help in holding it, plus their points provide grips to keep the template in place*



*Packs of replacement blades are available but they last a lot longer than standard craft/scalpel blades*



**Step 1:** In the centre is the jig, layered with crisscrossed masking tape, sticky side UP. The tape is held by the anchor ring (innermost ring is outer diameter of blue ring). Extra rings are taped in place for storage. On the left, front to back, are white ring spacers, the innermost blue ring spacer and the outermost blue ring spacer. On the right are red and white disks and the blue ring, previously cut with the jig rings. Note that the white disk is one 'ring' that is larger in diameter than the inside of the blue ring, to ensure no 'leakage of colour from the surface under the roundel when the film is shrunk down



**Step 2:** Place the blue ring inside the jig, adhesive side up



**Step 3:** Add the remaining spacers and then place the red disk in the centre. Note the rings are taped together to lessen confusion



## GYRO CUT

some roundels and had the review done, but it would've felt incomplete without seeing how the end result worked on a real model.

I covered the Marlin completely in white Ultracote/Profilm. After that I went off to the computer to watch the Easy Roundel videos (again). Then I re-read the instructions – and I'm glad I did! Two particular hints stand out:

The most important one is to cut on the INSIDE of a ring, not the outside. So don't use that centre disc; it's much easier to cut inside the next ring than it is to cut around that tiny disc!

Second, tack down the film before cutting. If you don't have spray adhesive, masking tape or a glue stick will work fine (I prefer the glue stick as the residue washes off with water).

I practiced cutting a few rings and discs from paper and scrap covering film before I got serious and started cutting 'for real'. It was actually quite easy, provided I remembered those hints about tacking down the material and only cutting inside the ring.

Since the Marlin's all white, I didn't cut a white ring. Instead, I substituted masking tape for the 'gap' and for tacking the bits in place during assembly. As the Marlin isn't a scale model I wanted to use the largest roundel I could fit, to make seeing the model easier. Happily, the kit had a 5" diameter roundel form that easily fitted my needs. Assembling and applying the shrink-film roundels runs a bit differently than the process shown on the video, but it's still quite easy (check out the photos for how to do it).

To try a roundel on a non-white background, I made one with a white disk, letting it overlap the blue ring to ensure no background colour would 'leak' between the outer edge of the white and the inner edge of the blue when the film shrinks. It required a slight change in the order of assembly but that was about it.

As a side note, I'm an American. I've long known what British roundels look like. I was an avid plastic modeller in my youth and built lots of Spitfires, Hurricanes and other RAF models and I can tell it from other countries' markings. But, until the Easy Roundel kit made me actually look at roundels, I didn't realise how many different types the RAF (and RAAF, RNZAF, etc.) used. There are lots of different ratios, with colour changes due to theatre of operation (i.e., no red in the WWII Pacific and no white on many camouflaged upper surfaces).



**Step 4:** CAREFULLY, remove the spacers so that only the outermost 'blue' ring spacer is left



**Step 5:** This is where the with-a-white-ring/without-a-white-ring methods briefly diverge. If we don't have a white disk, skip Step 6. If we have one, don't skip it!



**Step 6:** Place the white disk in the jig



**Step 7:** Remove the outer blue spacer, lift the whole assembly from the jig and gently pull the assembly from the anchor ring



**Step 8:** Set your iron at the lowest temp that'll activate the adhesive (around 2200 F/1040 C for Ultracote/Profilm) and iron the roundel onto the surface



**Step 9:** Carefully remove the tape by pulling it back over itself. Re-iron as needed then wipe down the roundel with denatured alcohol (if needed) to remove any visible tape residue



# Top Tip

One thing has to be kept in mind when making and applying any trim – dark colours will show through light ones so don't let a border be visible under the white. I can't say how many times I've seen US or UK markings applied over camouflage (or D-Day stripes), with the dark/light borders clearly visible through the insignia. Plan ahead!

# Conclusion

Rarely do I find modelling gadgets that really work as the manufacture claims they

will. The Gyro-Cut and the Easy Roundel system have both found their way onto that short list. Neither one is a 'does everything' tool, but both do what they're designed to do well.

One word of warning. If your spouse is a scrap-booker, don't let her see how well your Gyro-Cut works, otherwise you may find it's 'migrated' to her hobby area!

Now, as a suggestion, how about providing downloadable files of kiwis, kangaroos, maple leaves, etc. for some of the rest of the folks who use roundel insignias?

RCMW



Finished roundel, ironed in place. Red dots on either side are alignment marks. Sharpie pen marks won't smear or rub off when touched, but a rag dampened with alcohol (rubbing or denatured) will remove them



The finished Marlin. All the red diamonds were cut out with the Gyro-Cut (including the US licence numbers on the wing centre-section) without needing to change the blade. Imagine how many craft knife blades the same job would've taken! Unfortunately, whilst I had no problem cutting the wing roundels with the Easy Roundel system, the boom roundels were too small for said system... So there won't be any close-ups of those crooked rings!

Get the Roundel Kit and Gyro Cut FREE when you subscribe to RC Model World. See page 14 for full details and fantastic subscription offers.

# CONTACTS

UK Traplet Shop: <http://gb.trapletshop.com/>

US Traplet Shop: <http://us.trapletshop.com/>

Search for Gyro Cut and look out for combined deals!

# MODEL WORLD DETAILS

## PRODUCT INFORMATION

**NAME:** Easy Roundel Kit  
**MANUFACTURER:** Crafty Products  
**AVAILABLE FROM:** Traplet Publications  
**PRICE:** £19.99

## DISLIKES

Can only do limited sizes of roundels

## LIKES

Can make symmetrical, clean roundels in a matter of minutes



# MODEL WORLD DETAILS

## PRODUCT INFORMATION

**NAME:** Gyro-Cut  
**MANUFACTURER:** Crafty Products  
**AVAILABLE FROM:** Traplet Publications  
**PRICE:** £12.95

## DISLIKES

Nothing!  
Okay, maybe it could be coloured bright red so I can find it more easily on my cluttered workbench!

## LIKES

Follows templates easily without digging into them • Doesn't dig into self-healing mats, unlike hobby knives • Much safer than a hobby knife, especially when making long cuts against a straight edge • Easy to make long, curved cuts without lifting the blade, even around curves • Yet to wear out a single blade • Cuts shrink and sticky-back film equally well







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# TALKING TO YOU... THE SPEKTRUM WAY

Gadget aficionado John Stennard gets the gen from Spektrum's talking telemetry products

All four sensors were quickly fitted to the profile F-18 test model



The telemetry sensors and the TM 1100 module added very little weight so the flight performance of the F-18 was largely unaffected

In this feature I am only looking at the 'talking transmitter' (voice alerts) and 'talking telemetry' that I have been using on my Spektrum DX9. If you have a Spektrum system there are other 'non-talking' telemetry options but I am not covering these. I am also not filling the pages with masses of technical details that can be easily read on websites. Let's begin with a definition to launch my simplified take on Spektrum Talking Telemetry. I quote:

*'Telemetry is the highly automated communications process by which measurements are made and other data*

*collected at remote or inaccessible points and transmitted to receiving equipment for monitoring. The word is derived from Greek language, where 'tele' = remote, and 'metron' = measure.'*

So when I was having fun with an on-board ZLOG altimeter, which was accessed and read on landing, this was definitely not telemetry. 'Real' telemetry has now been around for a while and has become increasingly sophisticated. Although I owned a telemetry capable Spektrum DX8, I was not interested in a process whereby I had to look at the Tx or a device to see what was happening to my model.

However, when I purchased the DX8 it came with a TM 1000 module and this had sat patiently on the shelf waiting for a chance to be useful. One thing led to another and I eventually switched to a DX9 transmitter. This was a move to get a Tx with a bigger model memory to avoid having to carry two transmitters around. I soon found out the hard way that model data cannot be transferred between a DX8 and a DX9 Tx. I had to spend a lot of time binding and entering model data into the new Tx, then flight testing each model. So 'voice alerts' and telemetry were definitely not on my mind!

With all the models tested I had time to take a look at the 'voice alert' function of the DX9. I enjoyed experimenting with the young lady who can tell me if my flaps are hanging down. She can also tell me, in suitable commanding yet dulcet tones, the position of my U/C, what different rates I have set, etc. Set to the highest volume she is easy to hear and at my age it's reassuring to hear someone remind you what your function switches do.

The voice function is easy to set after entering the 'Custom Voice Event' menu.





Relative sizes of the two Spektrum telemetry modules. Both are lightweight



The airspeed monitor has to be positioned correctly on the model

On choosing 'Add New Sound Event' one can choose whichever switch you are using for rates, retracts, flaps, etc. and scroll through masses of voice commands until you find the appropriate one. You can do the same with the timer and choose the voice option rather than just a tone.

After working through all my models with functions where it helped to hear a command I discovered the TM 1000 module hiding amongst some receivers in my Spektrum cache. Now that I had a talking transmitter, and was enjoying having a companion on-board when flying, I decided to take a look at what I was missing by not using the TM 1000. Rummaging in the Spektrum cache again I found all the leads that had been supplied with the TM 1000, so I started reading up on what I could do with it.

What I am not doing here is supplying detailed information on the whole

Spektrum telemetry range but giving an overview and looking at how I've used both the TM 1000, the TM 1100 and some of the applications. The range of sensors at the time of writing includes Rx and flight pack voltage, temperature, brushless rpm, I/C engine rpm, airspeed, altitude, 3-axis G-Force in both 8G and 40G ranges, high current sensor and a variometer. The Spektrum website will show any additions.

### Basic Needs

Starting with the receiver, the telemetry modules can be used with any Spektrum or compatible Rx. But if you want to view flight log data after a flight then you have to use a Rx with a data port. In flight data from the telemetry module sensors is then sent via a data lead to the Rx and on to the Tx. Personally, I was really only interested in hearing performance information during the flight. A telemetry module is of course

required and both the TM 1000 and TM 1100 have common inputs for rpm, temp/voltage and data. However, if you want more telemetry applications the TM 1000 is required, with its X-BUS socket. Through this socket one can 'daisy chain' other sensors. This is not available on the smaller and lighter TM 1100.

Both are actually quite small physically and I've had no problems squeezing a TM 1000 into a small model. At 15.8 g (0.56 oz) it is pretty light and the actual sensors are also very lightweight. The smaller TM 1100 only weighs 5.4 g and is classed as 'fly-by range' and 300 - 400 ft is quoted.

On both modules the single temp/voltage input can be used for both sensors using a Y-lead. The lead supplied with both modules allow you to immediately try the temperature sensor without any additional purchases. You can also use a supplied lead to use the voltage sensor for the Rx battery pack or the flight pack. Naturally you will want more. Well I did, anyway!

### Telemetry Trials

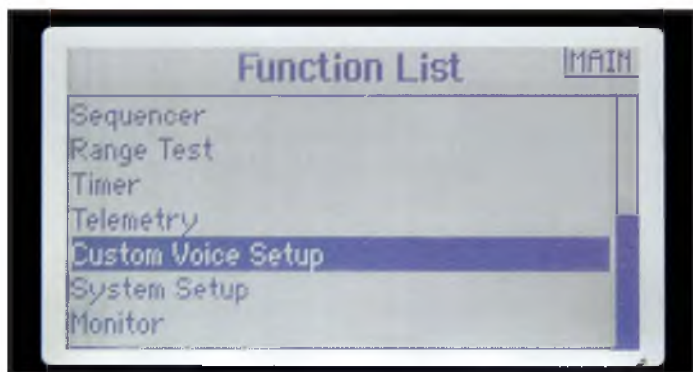
When you are ready to start playing with your telemetry this is where the fun starts. The module has to be bound alongside the Rx you are using and in theory this should be simple. Due to the fact that a tiny switch on the module has to be depressed during the binding process unless you have three hands it can take a while to get it all working. A plastic probe is provided to press the tiny binding button but I still found it frustratingly fiddly.

With the Rx and TM 1000 functioning as one, the Tx will tell you that you have telemetry. An easy first check that things are happening is to connect up the temperature sensor lead to the module and enter Telemetry in the Tx menu. This menu procedure is followed with all the applications. The Telemetry screen shows 12 option 'boxes'; numbers 1 to 10 initially show 'Empty'. Number 11 is specifically for Rx battery voltage and number 12 for a Flight Log. After entering any of the empty 'boxes' scrolling then lists the telemetry sensors, i.e. rpm, airspeed, etc. So if temperature is chosen for number 1 this is now the designated location for the temperature information to be received and displayed. After entering the temperature location the next screen gives you various choices to set alarms for minimum and maximum temperatures, the frequency with which you want to receive reports, ranging from 5 to 60 seconds, and the frequency of any warning reports.

A quick check that the system is working is to listen to the temperature report then grip the temperature sensor lead. The reports should now be giving you a regular update on the rising temperature. If the volume is too low this is a good time to increase it via the roller switch. Basically, while the screen information is obviously different depending on the function of the sensor the initial setting up follows the same pattern. The values can be changed from US to Metric.

I decided that I would equip an old model with telemetry and test out four applications. The TM 1000 was supplied

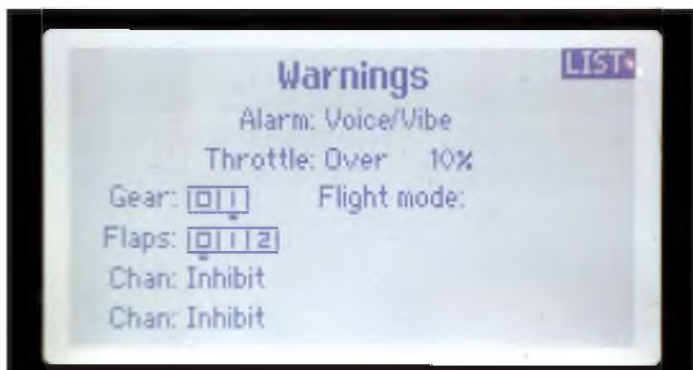




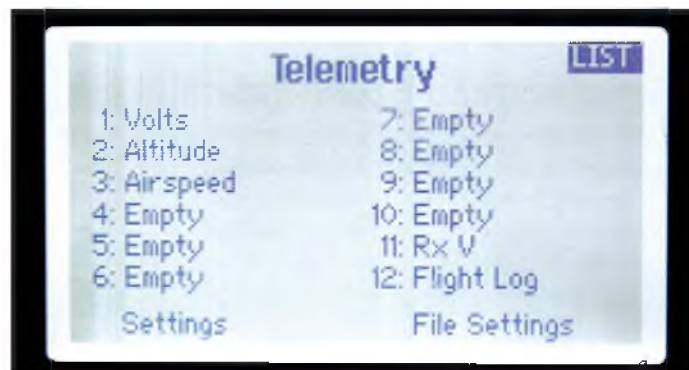
The Function List allows you to access the Custom Voice Events menu



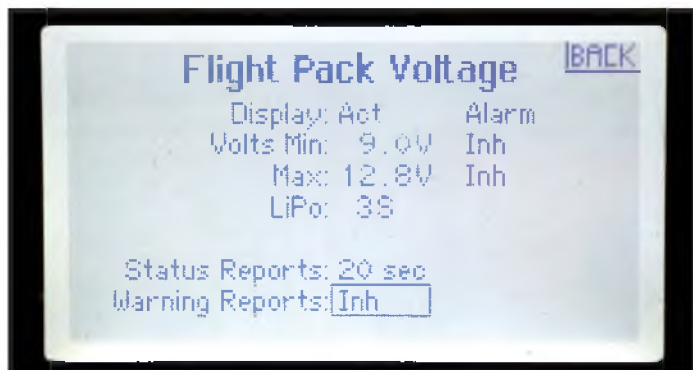
Alarms can be set for voice/vibe and combined settings



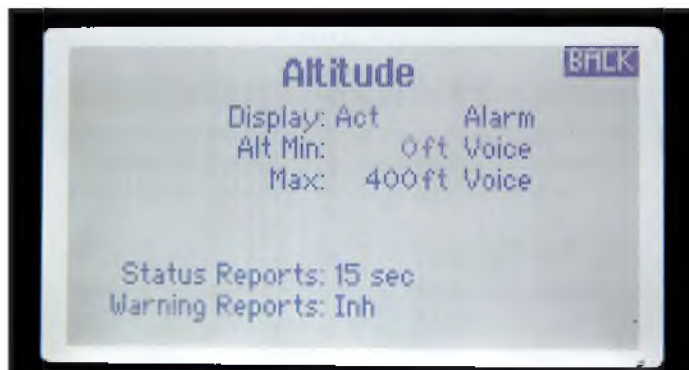
Switches can be chosen to operate functions and the actual spoken words are shown



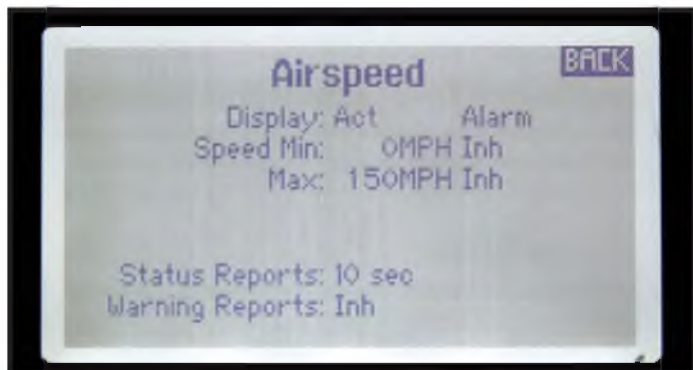
The telemetry menu allows for 10 different inputs. In use I allocated number three to my Airspeed sensor



Flight Pack Voltage is a particularly useful telemetry function and does not require a special module



The Altitude sensor is extremely sensitive. Even picking the model up will register the increase in height



The Airspeed sensor also is very effective and it's interesting to 'hear' the speed variations when piloting



The Temperature sensor wraps around the flight pack. Airflow around the pack obviously affects the read out. The Flight Pack Voltage lead is taken from the power lead

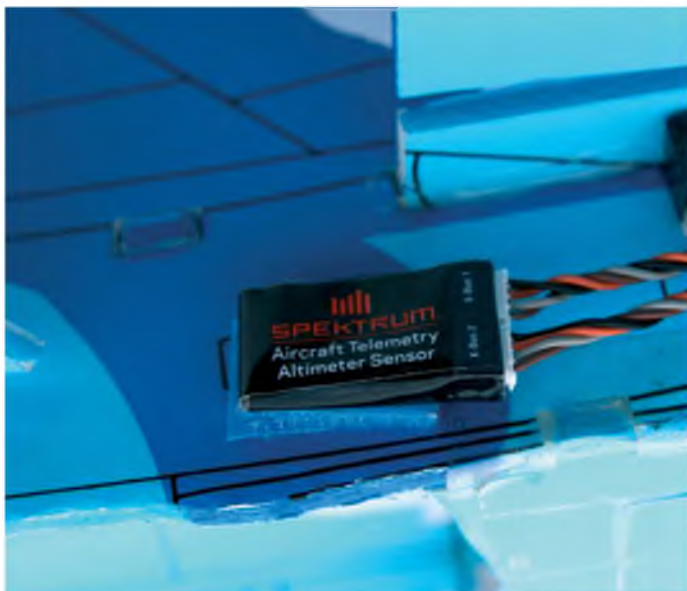
with the lead required for measuring temperature and other leads with connectors that could be used for voltage measuring, and I soldered the lead to the flight pack connector. My other interests were altitude and airspeed so I purchased these modules and decided to use all four applications on a well worn profile EDF F-18. The advantages were that it was very easy to install and access the TM 1000 and

it was equally easy to fit the telemetry sensors.

Setting up the individual sensors can be done before or after they are fitted into a model but it makes sense to test they are working correctly prior to fitting. All of mine worked perfectly. The altitude sensor is amazingly sensitive and will detect quite small changes in height. Airspeed is a different matter but I did find out later

that a reasonable wind will make it work; I guess blown air from a fan would do the same. The only module requiring care when fitting is the airspeed sensor, as this must be positioned out of any prop wash, but this is not an issue with an EDF aircraft. Although the profile, flat plate wing F-18 design is not a particularly efficient airframe it is an easy to fly and stable model, and so makes a good platform for testing the telemetry.





The Altitude sensor is very small and can be positioned anywhere in a model



Installation of the Airspeed sensor on the Screamer EDF Delta

### Air To Ground Reports

With everything registering the temperature lead was wrapped around the flight pack, the model was launched and I started to hear regular reports on the flight pack temperature and voltage, the height and the speed.

There are two options to hearing the reports. The internal speaker can be used or an earpiece. The volume of the internal speaker when set on maximum is quite loud and is very easily heard. Due to the fact that the flight pack LiPo was in the airstream the temperature report was not very significant; it was really just measuring the air temperature. I also quickly realised that I was receiving reports in metric units so after the first flight I changed to imperial. The altitude report was useful as it enables you to be aware of what the model looks like at different heights. I now have a better idea of how high I'm flying with my non-telemetry equipped models. The airspeed reports were also interesting and I spent some time flying different patterns to reach the maximum speed, a lowly 55 mph with this old model. The most useful and

practical reports were the regular updates on the flight pack voltage. These reports gave an interesting insight into the rate of voltage drop and were really helpful in monitoring the flight duration.

After numerous flights with the F-18 I decided to equip two other models with sensors using the telemetry equipment from the test model. As I needed another telemetry monitor I purchased the much smaller TM 1100. This was fitted in my Dynam A-10 to report on the flight pack voltage, while my small 50 mm fan size Screamer EDF delta received the airspeed sensor using the TM 1000. I had intended using the tiny lightweight TM 1100 in the Screamer but this does not have a port that can be used with the airspeed sensor. Using the flight pack voltage sensor is particularly useful with EDF models as hearing reports enables you to reach more accurate decisions regarding flight duration. I have thought my 50 mm fan Screamer delta, which uses a 4S 1000 LiPo, to be one of my fastest models. The airspeed sensor has confirmed this with speeds of around 100 mph.

### Yes? No? Or Maybe...

Are voice alerts and talking telemetry the best thing since sliced bread? Well, whatever your measuring point here, from me they get a resounding yes, yes, yes! Whether it's receiving basic information about flight time, position of the rates, etc., which of course does not need modules, or actual performance related information that does. I really do rate the talking system and it has considerably enhanced my piloting experience. OK, I always did like 'add ons' like flaps, retracts, cargo bays, tow points etc., but I really am enjoying hearing the flight information as it is happening.

If the Spektrum telemetry modules and sensors were less expensive I would be fitting them in all my models. But because of the binding procedure it's not very practical to move the modules between models.

So if you have a suitable Spektrum transmitter I'm sure you will enjoy the added experience of hearing what's going on in your model. If you are interested then take a look at the Spektrum Telemetry website for full technical details of all the sensors:

[www.spektrumrc.com/Air/Telemetry.aspx](http://www.spektrumrc.com/Air/Telemetry.aspx)

**RCMW**

Using the Airspeed sensor I now know the Screamer really can fly at 100 mph!







Chris' Edge back on its wheels

# OOPS! I DID IT AGAIN

*Chris Bowler shows how to repair the undercarriage mount of a typical ARTF kit*

It was a great flying day. The wind was light, weather fair, model set up and flying right. What's not to like?

During last year's good summer my Edge 540 had a fair bit of airtime and performed well, albeit slightly underpowered with a 91 four-stroke up front.

It is fair to say that over the years the proliferation of ARTF models, with many recent additions proving to be highly successful and practical aeroplanes, has introduced a lot of new model flyers to the hobby. But some may not have had previous modelling experience and they will never have built a 'proper' model for themselves. In no way is this a disparaging

view; I have and will again enjoy ARTF models. From my viewpoint they fill the ever present need to have a ready-made model just for fun flying, and there are many available at prices that can be hard to beat even if you build from the tree wood up!

## But...

Well there is always a 'but'! And one of the major ones that I have come across is the undercarriage mounting in a lot of ARTF models. The Edge shares the same type of fuselage mounting in common with dozens of other models of all sizes. It consists of a fuselage cross member simply

glued to formers and the fuselage sides. Perfectly adequate and in no way a hard criticism BUT only when all landings are high on perfect too!

My hand would be among the first up if a group was asked "Are all your landings perfect?" I'd have to shout a resounding "No!" Just ask my regular fellow flyers. On second thoughts, don't!

So it was that on the fourth flight of the day, without incident I might add, a landing was called. It was a bit quick, a bit long and the model ran off the tarmac, dropped over the edge into the tractor ruts and became legless in an instant.

Joy was not unconfined.





*Removing the damaged cross brace*



*Severe surgery to remove the remaining bits, taking care not to cause more damage*



*Laminating the new cross brace. Note the shaped bottom layer to fit the fuselage*



*First version ready for shaping and fitting with captive nuts in place*

## Inspection And Repair Choice

Initial examination showed that the entire mounting had been broken away from the model and had indeed broken the cross member in the middle. It looked quite a mess. This wasn't the first time it had happened, so the repair was going to be slightly more difficult than the previous one as I had already beefed it up a bit!

Back in the workshop all the bits were removed to see the extent of the airframe damage, which was not very much, though the main former had been broken. It was clear that a more substantial mount was needed and a new partial bulkhead would have to be made from scratch. All fairly simple and straightforward to do.

## Repair Sequence

First thing after inspection is to assess the integrity of the structure. Make sure it is not compromised anywhere else in the airframe. Shock damage can be transmitted a long way back and is well worth checking for. Also, pay attention to the engine bay as what appears to be a modest impact with Mother Earth can cause engine mount damage. Luckily in this case it didn't.

Once the damaged pieces have been removed prepare the fuselage sides ready to receive the new cross-brace, making sure that the gluing areas are sound.

I made a new over-wide cross brace from three laminations of ply, with the grain of the sandwiched centre piece running opposite to the outer two. This gives added strength and resists any twisting forces. The lower third of the sandwich was shaped to match the undamaged recesses in the fuselage bottom, with the other layers forming a step to aid adhesion. Always make numerous test fits to make sure everything is accurate.

I actually made two versions of the cross brace before deciding on the best solution. Trial and error method takes a bit longer but the end result was good. While these layers are clamped up and drying (I used the ever favourite white wood glue) attention may now be centred on the broken bulkhead.

## Ruthless

To gain access and make a new bulkhead requires some fairly heavy 'surgery'.

Don't be afraid to remove rather more than may appear to be needed. I used a hacksaw blade in a holder to cut the damaged area free and to make clean edges for the new piece. A quick rummage in the 'gash box' found ply of a similar thickness to the original and after measuring up a solid ply former was made and test fitted.

Why solid? Well it is a bit of a cheat, but if you drop in a solid piece it is then simply a case of marking out the former shape from the remnants of the original piece that was left in the fuselage. Cut out the centre and then fit into place. I should emphasise that this replacement piece is laminated to the remnants of the original, making a very strong repair. I didn't attempt to 'cut' it to fit where the breaks were. This piece may now be glued in. I had to hold it in place with ply wedges, as there was no access for clamps!





*The second version with all three laminations cut to fit the existing bulkhead. Note that it sits lower than the rear bulkhead to allow for the thickness of the undercarriage legs*



*Shaping the ends of cross brace to the fuselage section*



*Test fit of a trial one-piece cross brace that was discarded*



*The new bulkhead being glued in and held in place with ply wedges*

## Cross Piece

As the glue sets in the fuselage work continues on the cross brace. Mark and drill the holes for the undercarriage captive nuts, making sure they do not interfere with any of the fuselage structure and any new bracing pieces that may have been added.

Once the glue has set on the fuselage former check fit the cross brace and mark out the contour of the fuselage. It is then simply a case of using a belt sander to obtain the correct profile. Once satisfied with the fit glue the cross brace into place. That sounds fairly simple, but you will need a couple of long model sash type cramps to hold it all together. I left it overnight to set and the following day I painted the assembly before bolting on the original undercarriage legs that were undamaged in the 'incident.'

There you have it. All done.

With the model sitting on its new gear mount you will notice that the spats are still in place. Though battered they survived and I will confess to a bit of 'bodgeography' as they had split and are now held together with gaffer tape. Remember, this is my 'everyday' model. Cosmetic and competition ready it ain't! But it flies well.

## Acid Test

It was back to the flying field a couple of days later and, as always after a repair, everything was checked prior to flight. Especially the C of G as any repair can have an effect on balance. Luckily this one was spot on without adjustments.

It was successful and now with more careful approaches and landings (and not letting the Edge fall off the edge again!) there is hopefully lots more airtime to come! **RCMW**

## After!

Hopefully was about the measure of it. I had a few good days with the repaired model and was in a particularly exuberant mood one day. You are ahead of me aren't you?

Flying end to end, with stall turns at each end, a loop in the middle, four-point roll, loop and roll off the top. Great fun. Another lower four point roll to follow?

All was going great, until on the third hesitation brain fade set in and the wrong rudder input meant a big impact with the tarmac! A warning was called and I had no time to make face saving inputs but I did have time to see a spectacular display of exploding model. A worthy impression of confetti in a balsa ballet!

Most of us are familiar with the trudge to see what survives. In those immortal words, "Not a lot!"

The salvage didn't take long. After removing all the radio and accessories it went into two bin bags. And I said goodbye to a great model that I may yet replace with another of the same ilk.

I have had two Edges, one as described and the other a larger petrol powered version. Both flew exceptionally well, so I might be tempted... After a bit of self-indulgent R and R!



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F&OE





*The ice runway*



*Plenty of warm clothes were the order of the day. The flight line for the 3D flying slot*



*Neil Hutchinson reports from a winter whiteout at Hucknall*

# ROLLS ROYCE CHRISTMAS FLY-IN 2014

**F**or many years the Grantham and District Model Aircraft Society's Christmas Fly-in, organised by Richard Scarbrough, has been held at RAF Barkston Heath. The 2014 event would have to have a new venue because of the unavailability of Barkston. Richard made it known he was determined to keep the annual fly-in going and several kind offers came in. He decided to accept the offer of Brian Wilson, chairman of the Rolls Royce club, to use their site at Hucknall, Derbyshire. Thus the date was set for the 28th December.

The Sunday was chosen because it looked to be the best day weather wise. At that time there was no forecast for snow, but all that changed on the evening of Boxing Day when there was a large downfall of snow, which threatened the fly-in. The following day Richard went over to Hucknall and was very sceptical that the fly-in would take place. While he was there, he met local Rolls Royce club member Darren Langwade. Darren was in positive mood and between the two of them, using their cars to compact the snow, they made an ice runway.



*Ali Machinchy gets the huge Airworld Yak 11 ready for flight, with a little help from his friends*





*Topflite giant scale P-47 of Steve Rickett. The model uses a Kolm 50 cc four-stroke petrol engine*



*The fabulous third scale Yak 11 of Ali Machinchy. Powered by a Moki 400 cc petrol engine this model not only looks great, it sounds it too!*



*And now for something completely different! Ali Machinchy's 40% scale CARF SU31 with a colour scheme that looks more suited to an FW190! An Evolution 260, 7-cylinder radial proves ample power for this large model*

The weather on Sunday was superb, with a bright, clear blue sky and just the slightest breeze. It was still cold, but in the sunshine it was a pleasant winter's day. Darren did a little bit more work to extend the ice runway and everything looked set for an

excellent and enjoyable day's flying.

About 40 hardy souls turned up and we were treated to some very good and safe flying. Richard took the pilots briefing and shortly after 10 o'clock the flying started and continued throughout the day. The

assortment of models was amazing, from a little E-flite Gee Bee Racer with a 35.2 cm wingspan, right up to a third scale Yak 11, with a 238 cm wingspan!

The huge Yak 11 belonged to Ali Machinchy, who brought along several other models. One of which was a brand new Aero L29 Delfin jet trainer. The mighty Yak 11 is a huge model and needs a huge engine to go with it! A Moki 400 cc 5-cylinder petrol engine provided more than enough power for this very realistic model. Phil Noel at Pinnacle Aviation does most of Ali's model painting and weathering. When one looks at the standard of finish he puts into these models it is understandable why Ali and so many other people use Phil's services.

The L29 has still to make a visit to Phil; Ali put some stickers on the Delfin and flew it in its factory finish. I think when the L29 leaves Pinnacle Aviation it will look superb! It certainly is a lovely looking aircraft and in my view prettier than the later model L39 Albatros.

With all the snow around it was an ideal opportunity to fly float planes, of which there were several. Dennis Richardson turned up with two and Darren Langwade flew another. I think Darren's model probably holds the record for the longest landing roll out - I've never seen a model slide so far on its skis!

Dennis flew his old Catalina, built from a Ray Wood plan, and a newer Kyosho ARTF Macchi M33, a 1930s Schneider Trophy racer. Both models made easy work of landing on the softer, thicker layer of snow either side of the runway.

This was not the case for several models that ventured off the ice landing strip. The trip onto the white stuff usually resulted in the model coming to a quick stop with its nose in the snow. The only damage of the day was to the propeller on Richard Scarbrough's P-47, caused by a nose over.

We were also treated to some aero towing. Ian Redshaw brought along a huge Ka13 glider with a 5.6 m wingspan. The glider was built from the German Rosenthal kit. The model glider's colour scheme is a replica of a full size Ka13 based at RAF Cosford, which Ian flew. Steve Vodrey supplied the tug plane and the pilot was Steve Rickett. Steve did a superb job of towing the glider up to a good height before releasing it.

As I mentioned earlier there was a large variety of models, from the very small electric model to the very large radial engine scale model. The type of models varied greatly, too. The whole day was very sociable and fairly laid back. Even though the flying was continuous throughout the day there was plenty of time to fly whenever one felt like it.

There was also the added bonus of Lawrence with his hot food van, so there were plenty of bacon butties and hot tea and coffee to go round! I have to say this was one of the most enjoyable Christmas fly-ins I've been to and despite the difficult runway conditions everyone flew very well. This was a very good and safe model-flying event; well done to one and all for making it so. **RCMW**





Brand new Air-C-Race Aero L29 Delfin owned by Ali Machinchy. The model is still in its factory finish. A Kingtech 140 jet turbine is Ali's engine choice for this lovely model



Richard Scarbrough's Topflite ARTF P-47. A DLE 55 cc petrol engine is the power source for the 23 lb, 89" wingspan model



Hangar 9 Carden Extra 300, an 89" wingspan fully aerobatic model. This one was flown by Ali Machinchy's son, Zavi. I think Zavi will be flying some of dad's big models very soon!



One of several floatplanes. Dennis Richardson's 19-year-old Catalina. Dennis usually hand launches the model but was able to take-off in the conventional way on snow



Dennis Richardson's Kyosho Macchi M33 ARTF. Not a model that Dennis flies very often, but the snow inspired him to bring it to the fly-in. An old Laser 62 powers the M33



The ex Ivan Jordan Texan, now owned and flown by Ryan Edwards





Denis Richardson always turns up with a squadron of models and here's another, the Grumman Avenger. The model was built from a kit by the now defunct US company, Skyshark. A 72" wingspan model, it has a Laser 120 petrol engine for power



Tony Nijhuis design Vickers Wellington, built and flown by Geoff Graves. Twin Zenoah 26 cc petrol engines provide plenty of power for this large model. Geoff was doing some very low passes with it



An undercarriage failure on Chris Poyser's Zero meant a wheels up landing. Landing on the soft snow meant there was no damage to the airframe



Ian Redshaw's Ka13 glider being towed aloft by Steve Vodrey's tug plane, piloted by Steve Rickett



Ka13 coming into land. The large glider has a 5.6 m wingspan



Freewings EDF Stinger 90 of Shane Dunkley



Darren Langwade's floatplane had probably the longest landing roll out of the day – it seemed to slide forever on the ice!





An old faithful, the Hawker Sea Hurricane of Richard Dagleish. It was built from a Brian Taylor plan and based on Hurricane flown by the Shuttleworth Collection at Old Warden



With the right colour scheme for the snowy conditions, here's Dennis Richardson's lovely Ilyushin Il-2 Sturmovik



Big P-47 of Steve Foxon. The model was built from a Bud Nosen plan and has a wingspan of 103". A 3W 75 cc petrol engine powers the large Thunderbolt



A model from the good ole days of glow fuel – a Gangster 63! The model belongs to Simon Illsley. He uses a HP61 two-stroke in the Gangster, which flew very well



Paul Needham's President T240, built from the SLEC kit. A Zenoah Zg 38 cc powers the 2.4 m wingspan model



Paul Needham's T240 gets slightly off the ice runway and finds the 'arrestor' snow! No damage, other than to the pilot's pride



A lovely little model, the HobbyKing Lancaster of Paul Martin. The model has been revamped and now has the colour scheme of the BBMF's Thumper III. The Lancaster looked really good in flight



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# SUNFISH



In the '60s Don McGovern, a US flying boat enthusiast, edited the US magazine *Flying Models* and wrote a very entertaining water-flying column called 'All Wet'. I haunted the newsstands (no hobby shops within bicycling distance!) for every issue, which I quickly devoured. So I blame him for my addiction to flying boats. Mr. McGovern, amongst other models, designed the famed Navigator flying boat (kitted by Jetco) and the well-known Privateer series (some kitted by Berkley). After many years of lusting after other folks' flying boats, I finally decided to build my own, a small one, intended for flying from a nearby cove. So, armed with copies of plans from Don McGovern and Ken Willard (another prolific US designer), I drew up some basic design objectives for my first flying boat design:

1. Keep the hull simple, square and easy to build, using McGovern and Willard's designs for locating the step
2. Allow the bottom of the rudder to act as a water rudder
3. Make the wing floats variable in length so I could 'tune' them as needed
4. Cover the model with document



*Sunfish was inspired by the floatplane designs of Don McGovern and Ken Willard*



Have fun off water with Bill Bowne's easy build electric floatplane



laminating film (DLF), commonly known by the brand name Doculam. DLF shrinks crystal clear, so an unpainted model would show any leaks. (Note: I used several coats of clear water-based polyurethane on the foam floats and struts, followed by two coats of the same rattle can paint as used on the rest of the model).

5. No hatches. Yes, I know that having to remove the wing to change batteries is so 20th century, but I really didn't want to have to deal with waterproofing a hatch!

6. Rudder and elevator pushrod exits and horns would be above the tailplane, to reduce the chance of leakage

7. Fit an oversized ESC that wouldn't get as hot during use, as it was going to be sealed away

#### Drawing And Building

went pretty quickly and after a few weeks' work, Micki and I were off to the local swimming cove for the test flight. It went well, but was more of a splashing success than a smashing one. The first time I hit the power the downward leverage from the pylon-mounted motor made the Sunfish try to play submarine and crash dive! Holding full up and gently applying power helped,



*Sunfish on maiden flight day. Note the early short, blunt nose that made her want to crash-dive under power, the adjustable floats and her clear Document Laminating Film covering. The plan shows the longer, more successful nose. Unlike most human nose jobs, Sunfish's got longer, not shorter!*



*Only one float touches the water as the Sunfish taxis out. That's all that's needed! Having both floats in the water would require longer struts with lower-hanging floats that would be more likely to catch a wave and cause a water-loop*



## SUNFISH

but until the model gained a good deal of speed the spray around the nose was spectacular!

Once the Sunfish broke water it showed no bad habits. I was able to toss her around with ease and she handled very nicely when I did several splash-and-goes.

Then I taxied the Sunfish in for a pit stop... Uh, what are those dark splotches? Uh-oh, that's wet balsa... It LEAKS! Remember my thinking that the clear DLF would help me find leaks? Well, it sure did – and more than I expected. When I removed the wing there was a good 1/4" of water sloshing around in the hull!

One lesson learned after this session was that a covering gun with the heat off makes a good wet fuselage dryer!

### Take Two!

Fast forward a few weeks and it was time to take out the Sunfish again, fitted with a new, longer nose, a re-sealed wing/fuselage joint and a paint job.

Joy! Not only was there a lot less splashing but the Sunfish showed no desire to dive for the bottom. And, when I pulled the wing off, the inside was completely dry!

The Sunfish's hull is simple and rectangular, with an almost constant width forward of the wing TE. The float struts are just long enough and are plenty buoyant. There are no complex curves! The rudder-bottom water rudder and the oversized ESC both work well. Considering how much leakage I got from the original covering I'm glad I left out a battery hatch!

Finally, the Doculam did almost too well – when I saw how much water had leaked through seams, I was pretty discouraged. But, I marked the spots and recovered the plane as needed.

So, now that we're done with how the Sunfish came about, how about building one? We won't go into a stick-by-stick litany as it's really a very straightforward model. We are, though, going to go over what makes a seaplane different from a land plane.

### Seal it Up

First off, think LEAKAGE. Water WILL get everywhere. Make sure you seal the wing/fuselage joint and where the motor wires exit the fuselage with silicone sealant. That especially includes where the wing TE butts against F5, as that's where much of the water splashed onto the wing top will drain.

Since the silicone sealant that smells like vinegar can corrode electronics, remove all your electronics before using it. Wrap the wing in sandwich wrap, then apply a good bead of silicone seal to the wing/fuselage joint, work it into the gaps and bolt the wing back on. Let it cure overnight before you remove the wing.

Apply some Vaseline/petroleum jelly in the ends of the snake/pushrod tubes. A coat of clear dope inside the bottom of the fuselage isn't a bad idea, either. No, it won't waterproof it, but will delay water absorption. Finally, when covering get all those seams down firmly, with extra attention to the forward fuselage and rudder bottoms. A second coat of material



*Take-off run. The wing is almost level and the floats are out of the water. Sunfish is planing on her forward fuselage and accelerating towards take-off*



*She's off and away, climbing out for another flight*

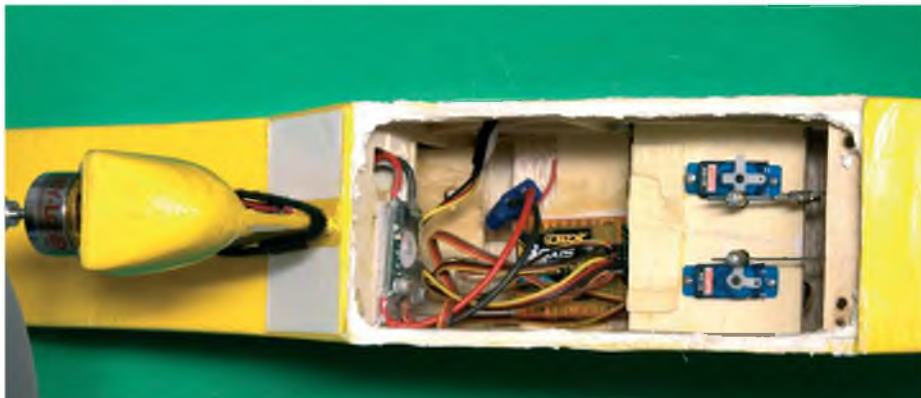


*After her nose job, resealing, and a coat of rattle can paint, Sunfish not only looks prettier, but she gets off the water with much less fuss.*



*Black on pylon is hermaphrodite Velcro strip holding motor wires in place. Covering is painted DLF, with sticky-back film and tape trim*





*It isn't as cluttered inside as it looks. Battery goes under the ESC (left side). Receiver/Gyro is about 3/8" off the bottom, Velcroed to a false floor, and servos are on the right. Note plentiful supply of silicone sealant on the wing saddle!*



*Splash-and-goes are great fun*



*Yes, those trees are pretty close! Sunfish is suitable for tight fields, such as this little swimming area*

on the fuselage bottom helps too.

The original Sunfish came out at just over 19 ounces with the painted DLF finish, three HS-55 servos, a combination gyro/receiver and a 3S1000 LiPo pack. With a wing area of 241 sq inches that produced a wing loading of 11.6 oz/ft sq.

With the C of G at 2.2" back from the LE (i.e. right under the spar centre) the Sunfish is stable. Since she does have a fairly large amount of drag she'll slow down and drop pretty quickly when the throttle is cut. She will do basic aerobatics but needs a heavy hand on the power stick to make it through them without losing altitude. Stalls are gentle and the model gives plenty of warning before nosing down, but she does require time and power to recover (probably thanks to the lack of much prop blast on the wing).

For control throws, I used:

Ailerons: +1/4", -1/8"

Elevator: + 1/4"

Rudder: + 3/8"

You'll note that the motor and the wires are exposed on the side of the pylon. I've had no problems with water getting into the motor (probably because I haven't dunked it – yet...) and I have the motor/ESC wiring connectors covered with both heat-shrink tubing and clear tape.



## Water Flying Tips

I'll finish with a few points that I've learned about water flying so far:

1. Taxiing crosswind really requires paying attention to aileron and rudder, using 'into-the-wind' aileron to keep that wing down. Use the wind to your advantage - it's a lot easier to let it blow your model ashore than it is to try to force it across the wind.

2. Don't try to force your model off the water. Feed in a lot of 'up' to get it on the step, then relax most of that up as the model accelerates. Let her gently fly off the water.

3. When landing keep some power on and do a long, flat approach. Let the model slow as you skim just over the water whilst feeding in up elevator. Once the model is down and is planing along, slowly reduce power and elevator - but don't release the elevator until the model is completely floating and not flying! **RCMW**

# MODEL WORLD DETAILS

## MODEL SPECIFICATIONS

**PLAN NAME:** Sunfish  
**WINGSPAN:** 31.25" (79.38 cm)  
**WING AREA:** 241 sq in (15.55 sq dm)  
**WING LOADING:** 11.6 oz/sq ft (35.32 g/sq dm)

**LENGTH:** 30.9" (785 mm)  
**WEIGHT:** 19.4 oz (549 g)  
**C OF G:** 1.92" (49 mm) from Leading Edge

**RADIO FUNCTIONS:** Throttle, Ailerons, Elevator, Rudder

**RECEIVER:** Orange RX3S  
**SERVOs:** Hitec HS-55

**BASIC CONSTRUCTION MATERIALS:** Balsa, Ply, Lite Ply and foam

**COVERING MATERIAL:**

Document Laminating Film and paint

**CONTROL THROWS:**

Ailerons: + 1/4", - 1/8"  
 Elevator: +/- 1/4"  
 Rudder: + 3/8"

## ELECTRIC POWER

**MOTOR:** Skatty 400XT, KV 1025

**PROP:** APC Slow-Flyer 8 X 3.8"

**ESC:** Castle Thunderbird 18 (18 Amp)

**BATTERY:** 1000 mAh 3S 25C



Land with power on from a long, flat approach. Once the model is planing slowly reduce power and elevator

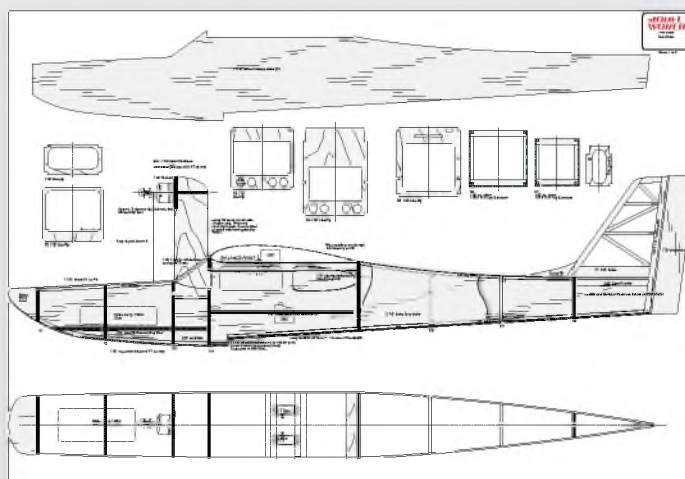
## PLAN DETAILS

**NAME:** Sunfish  
**BUILD CATEGORY:** Intermediate  
**PLAN NUMBER:** MW3729  
**PLAN PRICE:** £11.99/US \$20.99

Plans and parts (if available) are subject to Postage and Packing charges at standard rates.

Copies of plan number MW3729 are available from RC Model World (Plans Service), Traplet Publications Limited, Traplet House, Pendragon Close, Malvern, Worcestershire WR14 1GA, England, Telephone: + 44 (0) 1684 588599, Fax: + 44 (0) 1684 578558, Email: [orders@traplet.com](mailto:orders@traplet.com) or order online at [www.trapletshop.com](http://www.trapletshop.com)

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### Standard Equipment



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GPS Sensor x1



GPS LED x1



PCU Power Control Unit x1



4213 Brushless Motor x4



M480 Motor ESC x4



Undercarriage Control Servo x2



7.5 Inch Main Rotor x4 sets

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7.5 Inch Carbon Main Rotor x4 sets

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Andrew James checks out Hitec's freshly styled mid-range radio control system



# FLASH 7

**M**y first Hitec radio dates back to the early 1990s and it proved to be a very competent, if rather basic 6-channel set. I can clearly remember the styling though, it being heavily chromed and a bit 'plasticky', which did date the design somewhat.

In the intervening years Hitec have made a name for themselves for making affordable but high performance servos. But as well as servos they continue to make some great radio sets, the latest being the very smart looking Flash 7. There's no way this 7-channel 2.4 GHz set can be accused of being dated. It is very modern looking indeed, with a nicely rounded case and build quality that is the equal of current offerings from other top R/C manufacturers. There is still a bit of chrome in the form of the generously sized central stick bezel and switch plate. But this time it adds to, rather than detracts from, the appearance of the set.

It is interesting to note that both the Flash 7 transmitter and the Optima 7 receiver supplied for review are both made in the Philippines, rather than the more obvious oriental countries that you might expect. They obviously know how to screw together a decent radio over there!

## Flip Box

Presentation is bang up to date too, with the radio sitting inside a flip top outer box. Rather than the more common 'egg box' material inner carton the Flash 7 is

protected by a black plastic tray with a clear lid. A detailed 102-page manual sits in a depression moulded into this lid.

Removing the transmitter reveals space for four servos, not supplied with the Tx/Rx combo reviewed here. But what you do get is a heavy-duty switch harness and an Optima 7 slim line receiver, plus an Rx antenna holder and an 'SPC cable' – more on this later.



Flash 7 is supplied in a smart flip top box



The Tx sits on a plastic tray inside





*This combo comes with an Optima 7 Rx and a heavy-duty switch*



*Detailed manual tells you all you need to know*

### Ergonomics

The Flash 7 Tx fits nicely in the hands, especially for 'thumbs on top' flyers. The six top and shoulder switches are all easily operated by spare fingers, as are the two side mounted sliders; all the switches and sliders are assignable so the set is easy to configure so that switchable functions are in the same place as any other radios that you may own.

The rear case is deeply recessed to provide a good grip in both hands and if you fly this way you could safely do so without a neck strap. However, since the sides of the case are smooth and rounded it feels a bit less secure when adopting a 'finger and thumbs' grip on the sides of each stick, so I would recommend using a neckstrap if this is your preferred way to hold a transmitter.

Trims are all digital types and they are easy to reach in operation. The main sticks are firmly sprung, with a ratchet fitted to the throttle stick. Stick lengths and tension are fully adjustable to suit personal preference. Flash 7 is supplied as a Mode 2 set, but it can be quickly changed to Mode 1 by taking the rear case off, which gives access to the back of the stick units.

The On/Off switch sits between the main sticks, just above the neckstrap loop. The switch is deeply recessed to reduce the risk of it being inadvertently switched off whilst the set is in use.

At the bottom of the front panel is a large backlit LCD screen. The backlight stays on whilst you make programming adjustments but switches off a few seconds after you stop making inputs to help extend battery life. There is also a backlit Hitec badge at the top of the Tx, which stays on permanently, shining blue when the Tx is transmitting or green if it is on standby. However, with modern LED technology it is likely that this does not actually consume much energy.

Programming is via a large Jog Dial to the right of the LCD, in combination with a small Back Button just above. The Jog Dial is rotated to scroll through menus and then pressed to select the option required. Menu items are highlighted in black as you rotate through them, so it is easy to select and confirm the features you require.

Turning now to the rear of the transmitter, the battery bay is populated by a dry battery box for four AA cells. The default battery type is Alkaline (4.0 Volts) but a great feature of this radio is its ability to use other popular (rechargeable) battery chemistries too, including LiPo (7.0 Volts) or LiFe (6.0 Volts).

But since the radio comes with a 4 x AA battery box it makes sense to use some standard NiXX rechargeable cells.



*Central stick bezel is chromed but gives the Flash 7 a distinctive look. I like it!*



*Left hand stick array and slider*



*Ditto on the right. All switches are assignable*



*The display is clear to read, even when the backlight has switched off. Programming is via the Jog Dial and Back Button at the right of the screen*





The battery box is held securely using a hook and loop strap



Central socket array: PC Data interface at the top, Trainer socket in the middle and DCS port below for powering accessories like FPV goggles

Some R/C manufacturers frown on the use of such batteries with their latest sets but Hitec have realised that this is sure to be an obvious choice as many of us will have sets of rechargeable NiCad or NiMH cells for other modelling or household tasks. So it is great to see them being included as one of the battery options. I made full use of it by quickly installing four 2000 mAh capacity NiMH cells.

Whatever type of battery you choose to fit it will be securely held using the hook and loop strap fitted inside the battery bay. This simple idea will stop the battery pack from dropping out when you open the rear cover.

Having fitted a set of rechargeable cells you can charge them in-situ using the charging jack built into the right hand side of the case. Just above the battery bay are a further three sockets. The top one is marked DATA and it is used to connect the Tx to a PC via one of Hitec's HPP-22 Interface Modules. The HPP-22 (or the wireless HTC-NAVI Interface) can

be used to analyse telemetry data and to program your radio and the Optima series of receivers.

You can also use it to store model set up data on a PC and update the radio's software and firmware. The same port can also be used to connect a HTS-Voice Telemetry system, which fits on the handle of Hitec radios and provides voice announcements of telemetry data.

The middle socket is a 3.2 mm stereo jack for attaching a training lead. This links the Flash 7 to another Hitec Tx so that they can be used as a Master/Slave pair for student pilot training. This jack can also make use of the Flash 7's 'pass-through' function to control head tracking devices for First Person View (FPV) flying.

And at the bottom of the three sockets is found the DCS port. Also known as Battery Voltage Power Out, this can be used to power optional accessories such as FPV goggles.

### Notable Features

Unless you are an absolute beginner you will be familiar with the common features of a modern radio control system, so I will not bore you with a list of the Flash 7's capabilities. Save to say that it has all the usual functions that you would expect from a state of the art 2.4 GHz Tx. I will instead concentrate on highlighting some of the more notable features of this set.

### Audible Warnings

The first thing you notice when switching the Flash 7 on is likely to be either a Throttle High or Flight Condition warning. This tells you that either the throttle stick has been left above idle, or that a flight condition (aka flight mode) has been selected by a switch being knocked on whilst in storage.

It is good practice to get in the habit of having all your switches pointing the same way for off so that when you get the Tx out of its box or case you can quickly flick them all into that 'safe' position before flying. I prefer to have all my switches pushed back for off, pulling them forward to engage the functions that they control. Anyway, if either of these warnings sound simply pull the throttle stick back to its lowest position and/or flick the switches back to their 'off' positions.



*If the throttle is left open when the switch is switched on you the set really lets you know about it!*

### Optima Or Maxima?

The Flash 7 comes with an Optima 7 receiver. This is a general purpose, high quality receiver, equipped with full telemetry capabilities and it includes a Low Rx Battery Warning as a basic function.



The Flash 7 combo includes an Optima 7 Rx, heavy-duty switch harness, a clip to hold the BODA aerial and an SPC lead to connect an auxiliary receiver battery



If this goes off in flight, via an audio warning from the Tx, then it is time to land the model as fast as you can.

The Optima 7 features a single BODA aerial. This refers to the larger diameter piece at the end of the aerial and stands for Boosted Omni Directional Antenna. The main advantage of this feature is that the single aerial can be installed where it is most convenient, rather than having to accommodate two aerials at 90 degrees to each other, as is common with dual aerial systems.

There is also an SPC (Supplementary Power Connection) port to power the receiver separately from the servos. A battery pack of up to 35 V can be plugged in to this socket. But in normal use this port is blanked off with a jumper and the Rx gets its power either from a dedicated Rx battery (4.8 – 6 V) or directly from an ESC or BEC.

If telemetry is not important to you then consider the Optima 6, which is stripped of all telemetry functions. You may also wish to use Hitec's Maxima range of receivers. These also do away with telemetry. However, they should only be used with digital servos. To use one of these Rx's you will need to change the receiver type to Maxima under the Spectra sub menu of the System List.

### Scan Mode

Also found under the Spectra sub menu is Scan Mode. If you want to use your radio in a busy 2.4 GHz environment, say at an indoor meeting in a city centre location or at a very busy fly-in, then you can ask the Flash 7 to scan the 2.4 GHz frequency table and it will select the cleanest frequencies to use to fly your model.

This does, however, involve re-linking the receiver each time you use Scan Mode, which is – forgive the pun – a bit of a bind. So for use at the average countryside club flying field, with just a few other R/C transmitters to work around, the normal frequency hopping spread spectrum technology will easily maintain a firm link between the transmitter and receiver.

### Secure Link Technology

Those clever engineers at Hitec have another 2.4 GHz trick up their sleeve in the form of SLT (Secure Link Technology). This is a system being adopted by some model manufacturers, notably Hobbico, to produce Tx-Ready models. The idea is that the model is ready to fly straight from the box and just needs binding to a compatible transmitter.

It works in a similar way to Horizon's incredibly successful Bind-N-Fly series of models, so it is no surprise to see other manufacturers developing a similar system.

It will be interesting to see if J Perkins, Hitec's UK distributor, adopts the Tx-Ready system for their own ready to fly models, such as those in the Ares range?

### System List

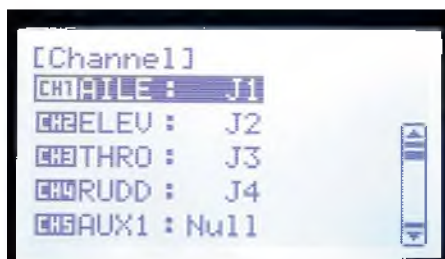
In common with most other modern radios the Flash 7 uses two primary menus to set up a model, System List and Function List.



To access System List be sure to hold the Jog Dial and Back Button until it appears



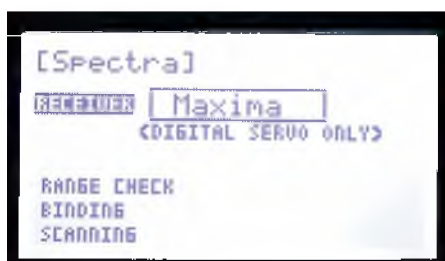
In this screen you can select Model Type and define what type of wing and tail it has too. All the common variations are catered for



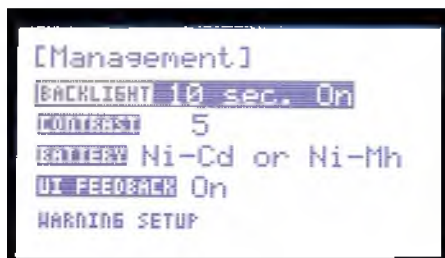
You can reassign the channels to operate control functions in an order that you prefer



The telemetry screen allows for the most popular sensors. The list is sure to grow!



Spectra is the submenu for changing the receiver type, seen here in Maxima mode



Management screen is where you can adjust screen settings and change the battery type

To access the System List the instructions tell you to press the Back Button and Jog Dial simultaneously but if you do this too quickly then it will not work. What you need to do is to press the two together and HOLD until the System List appears. This is a safety feature to prevent the list from being accessed accidentally.

The System menu is used to select a model memory and to give it a name. You can also copy, reset or delete a model. Flash 7 has 20 model memories.

You can then define the type of aircraft as either Acro (aeroplane), Glider or Helicopter, and choose the wing and tail types from a list of popular options. In Heli this changes to a list of popular swashplate types.

A new feature with the latest R/C sets is the ability to not only assign the switches and sliders on a radio, but to also allocate the channels to different functions. Hitec call this Channel Selection and it allows new users to emulate the channel allocations that they are more familiar with from using another brand of radio.

Trim Step and Trainer are next on the menu, but these are long established features so I will not dwell on them here, save to say that with the Trainer option you can opt to give the student either full or limited control.

Sensor is next on the menu and is used to set up any telemetry sensors that you have connected to an Optima receiver. All the popular data types are catered for, such as GPS, RPM, Temperature and Battery.

Next up is Spectra, which is used to select between Optima and Maxima Rx's, as well as binding and making range checks.

Mode allows you to set the transmitter up for stick modes 1 – 4.

Management is the sub-menu where you can change the backlight's duration and screen contrast. And this is also where you tell the Tx what type of battery you have fitted, in my case 'Ni-Cd or Ni-Mh'. It is also the place where you can switch any audible tones or warnings on or off, such as the beep when you press the jog dial, or the throttle stick high warning mentioned earlier.

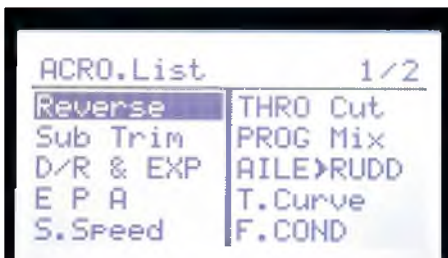
### Function List

This two-page list gives you a multitude of parameters to set up for each individual aircraft. It is accessed by pressing and holding the Jog Dial.

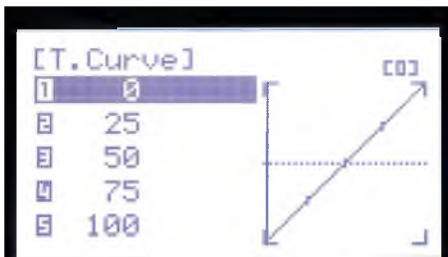
For aircraft or gliders it includes all the usual functions such as Servo Reverse, Sub Trim, Dual Rates and Exponential, EPA (End Point Adjustment, aka Travel Adjust) and three Programmable Mixes. And depending on the model type you have selected you get access to a wide selection of extra parameters, like Flight Conditions (Flight Modes) for aeroplanes (highly recommended to use!), Butterfly mixing (aka Crow braking) for gliders, and Pitch and Throttle Curves (5-points) for Helicopters. Curves are also provided for some aeroplane functions too.

It is difficult to expand on the Function List for fear of getting the radio reviewer's curse of finding that you've effectively rewritten the instruction manual. So I will

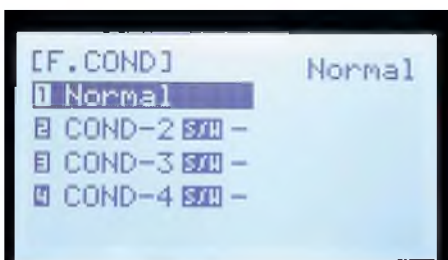




ACRO version of the Function List has all the usual aeroplane options that you would expect



An example of a graphical display. This is a five-point throttle curve



Flight Conditions are well worth using. You can call up different rates and expos at the flick of a switch



Lights off, showing the back lit screen and the RF indicator light under the Hitec badge

finish this review off with just a couple of functions that caught my eye.

### Throttle Lock

For many years helicopter pilot have been able to allocate a Throttle Hold switch. This is used to cut the throttle to a safe idle prior to an autorotation, or it can simply be used as a safety switch to prevent the motor/engine from spooling up the rotor blades whilst the model is being carried to or from the pits if the throttle stick is accidentally nudged forwards.

But wouldn't it be great to have this facility for a fixed wing model too? Well, with Throttle Lock now you can. By default this is activated by pressing and holding the Back Button, but it can be allocated to a spare switch if desired.

It works a treat but just a word of caution. Do make sure that the throttle is at the closed (or idle, if IC) position before pushing the Lock button as it will engage at other throttle settings too! I guess this caters for those pilots who like to have their throttles working the other way around, i.e. stick forwards at idle.

### Virtual Channels

Flash 7 allows the set up of two Virtual Channels as master channels when setting up a programmable mix. The instruction book details a good example of this, where ailerons have a secondary function as flaps

and the flap amount is controlled by one of the side-mounted sliders. You assign the slider to a virtual channel and then mix that channel to the aileron servos. Obviously you don't want the flap function to be active all the time, probably only on landing, so the programmable mix is set up to be activated by another switch so that the slider only works when the switch is on.

If you have ever come across a situation where the usual programming fails to provide a solution, this may be just the sort of trick that you need.

### Conclusions

Hitec's Flash 7 is a great radio and it would be a great choice for operating all club style models. There are also a great number of advanced features that would allow it to be used for even quite complex models too, such as moulded, multi control surface gliders and scale jets.

A set like this would be a good investment for a beginner too, as it will allow you to continue using it as your experience grows and you move onto more complex models.

And although it is not a unique feature to Hitec, I do like the assignable channel function as it makes this fine radio a real alternative for people who favour the different channel allocations used by other popular R/C brands.

RCMW



Flash 7 is a stylish, thoroughly modern radio set



A stand out feature of this attractive set is the servo slow feature that allows any of the seven servos to be slowed down to about 25 seconds from end to end

## MODEL WORLD DETAILS

### PRODUCT INFORMATION

NAME:	Flash 7
MANUFACTURER:	Hitec
DISTRIBUTOR:	J Perkins
WEBSITE:	www.jperkinsdistribution.co.uk
PRICE:	£169.99 SRP
PRODUCT TYPE:	7-channel R/C system with telemetry
PARTS SUPPLIED:	Optima 7 receiver, heavy-duty switch harness
PARTS REQUIRED:	Batteries

### PRODUCT SPECIFICATIONS

RADIO TYPE:	2.4 GHz using Adaptive Frequency Hopping Spread Spectrum
RESOLUTION:	4096
FRAME RATE:	7ms (with Maxima receiver)
MODEL MEMORIES:	20
MODEL NAMES:	9 Characters
MODEL TYPES:	Acro, Glider, Helicopter
TELEMETRY:	Yes

### DISLIKES

The need to press and HOLD the Back Button & Jog Dial to access the System List needs highlighting

### LIKES

Modern design • Comprehensive programming features • Tx-Ready (SLT) function • Throttle Lock function • Channels and switches can be reassigned



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*This year Nuremberg was dominated by 'drones'. This 'Spreading Wings S900' six-motor multicopter is near the top end of DJI's large range of camera carrying machines*

# NUREMBERG 2015 YEAR OF THE DRONE!

*We tour the Model Hobby halls at Europe's major Toy Fair to find out what's new and what's hot from the leading manufacturers and distributors of model flying products*

If you were new to model flying and were to visit the Nuremberg Toy Fair to see the latest products then you would come away with the clear impression that the future lies with electric multicopters. Fitted with four blades, six blades or eight blades and available in many different sizes, there's now a vast array of such machines to choose from. Most carry cameras and many now come fitted with gimbals that offer pan and tilt functions whilst filming from the air.

We also detected the rise of a new style of quadcopter, designed for FPV racing. Several stands exhibited small, compact quads fitted with bulbous FPV aerals. This could well be the 'next big thing' but after hearing tales of pilots racing through woodland care needs to be taken to fly legally and with a competent observer who can maintain line of sight with the model.

Those in search for more traditional model aircraft would have to look a little harder this year and at first we feared that we would not find much in the way of new, fixed wing models to show in this report. But after a thorough sweep of the hall we found plenty of new products to show to you – and one or two interesting multicopters too! **RCMW**



*Liz Lane and Roger Hamilton were on hand to demonstrate the ACCURC flight simulator. This fine example of British technology features aerodynamically accurate model behaviour and has a 'workbench' feature that allows you to experiment with different set ups and to change components such as servos, batteries and motors ([www accurc com/](http://www accurc com/))*



*This handy sized 2.8 metre span LO 100 scale glider was seen hanging from the aero-naut stand*



*This nice Bergfalke provided an eye-catching backdrop to the aero-naut Modellbau stand ([www.aero-naut.de/en/home](http://www.aero-naut.de/en/home))*



*New from aero-naut was this 3.6 metre span Schleicher Ka6e with a modified SB99 wing section*





Distinctive Inspire 'aerial platform' from DJI lifts its carbon fibre motor booms out of the way to give a clear 360-degree field of view when filming with its 4K video/12 mega-pixel stills camera. Features optional dual operator controls (one films while the other flies) and Vision Positioning technology to accurately hold position, as well as lowering the platform's legs automatically for landing



DJI's stand was packed full of interesting tech and drew large crowds. This was taken during a quieter time at the end of the first day of the Toy Fair ([www.dji.com/products](http://www.dji.com/products))



FMS foam models are distributed in the UK by CML. Here's their new 1.2 metre span SuperEZ sports aerobat



Also of 1.2 metre wingspan, this P-51D Mustang in 'Darlin' Ann' livery should be a popular model



Labelled by FMS as 'HOT', the stylish Explorer is fitted with an F3A style canalizer



Sleek twin fin Scorpion EDF jet is by ROC HOBBY, an FMS partner brand that is also distributed by CML ([www.cmldistribution.co.uk/](http://www.cmldistribution.co.uk/))



Graupner's stand was full of HotTrigger aeroplanes in various sizes and made from a multitude of materials, from sheet foam to a large built up ARTF



The Trigger 2400 caught our eye. Who could resist such a neat looking model, with its Extra styling?



Graupner are one of the companies developing small FPV quadcopters. Graupner products are distributed in the UK by Logic RC ([www.logicrc.com/](http://www.logicrc.com/))





Hacker Model Production's stand was chock full of ingenious models made from EPP foam ([www.hacker-model.com/](http://www.hacker-model.com/))



Hacker's 2-metre range of gliders come in a variety of sport and scale designs, including a Blanik and Fox. Electric powered versions are available too



Ondrej Hacker displays the 1.2 metre span Master Stick for 3S motor sets



The recently reviewed Vagabond extreme slope soarer is now available in red, green and blue 'Hexa' colours



You can now fly a Vagabond from a flat field with the new Vagabond XL. This aerobatic two metre electric soarer suits 150 watt plus motors and 3S 1300-1600 mAh LiPo packs



Walled off stands, with entry via a reception desk, are popular with many companies exhibiting at the Toy Fair, but it is unusual to encounter them within the model hobby hall. Horizon Hobby went this way for 2015, but once inside visitors could feast their eyes on this wall of new aeroplanes, dominated by the Hangar 9 ASW 20. The 4.7m ARF has a fibreglass fuselage and balsa sheeted foam core wings



Steve Hall from Horizon Hobby USA proudly displays the Toy Fair's 'Teenager & Family' Award, which was won by the Hobbyzone Sport Cub fitted with SAFE (Sensor Assisted Flight Envelope) technology ([www.bindnfly.com/products/](http://www.bindnfly.com/products/)) ([www.horizonhobby.co.uk/](http://www.horizonhobby.co.uk/))



Rare Bear from E-flite is a brightly coloured racing plane that is claimed to reach flight speeds above 100 mph straight from the box. A specially tuned AR636A receiver with built-in AS3X stabilisation allows you to experience stable high-speed flight but with easy handling. The 1200 KV brushless motor is energised by a 4S 3300 mAh LiPo (not supplied)



E-flite's FJ-2 Fury is a fun alternative to the more common F-86 Sabre. Fitted with a Spektrum AR636A receiver it features a specially tuned AS3X gyro stabilisation system to give the Fury a more locked-in feel in flight. Power is via a 70 mm EDF unit fitted with a .15-size 3700 KV brushless motor. Requires a 4S battery pack



The E-flite Viking Model 12 replicates the aerobatic biplane flown by Jacob Holländer with the Scandinavian Airshow. Power is from a brushless 280 outrunner and a 3S LiPo. Viking is another model that comes with AS3X technology to give great handling during the most aggressive of 3-D manoeuvres



With its upside down props the ultra micro Blade Nano QX 3D quadcopter can perform high-speed flips, hairpin turns and inverted flight. It is fitted with SAFE technology, giving Horizon the confidence to say that, '... there's almost no penalty for error if you practice aerobatics over plush carpet or soft grass'





Hobbico products were presented on their usual large and airy stand. Visit the following websites for more product details. ([www.greatplanes.com/index.html](http://www.greatplanes.com/index.html), [www.flyzonesplanes.com/](http://www.flyzonesplanes.com/), [www.top-flite.com/](http://www.top-flite.com/), <http://en.flitework.at/>)



Pretty 'Sequence 1.20' from Great Planes spans just over 1.8 metres and suits, as the name suggests, 1.20 cu in 2-stroke engines. Other power options are a 1.55 4-stroke or a 50-65-450 Rimfire brushless outrunner motor on a 22.2V 5000 mAh LiPo



Bright yellow Extra 300 SP spans 50 inches (1.27 m) and takes a 42-50-800KV Rimfire outrunner and a 11.1 V or 14.8 V 2200 mAh LiPo



Flitework is another aircraft brand from Hobbico. The 1.2 metre Shiny has internal lighting. This was one of several exhibits at Nuremberg capable of night flying



This neat P-51 Sport Fighter can be powered by a .46 - .55 cu in engine or a 42-50-800KV Rimfire outrunner motor and a 4S 3800 mAh LiPo. An ideal club scale model, it spans 52 inches (1.32 m)



Try your hand at vertical take-offs with Flyzone's Canadair CL-84 'Dynavert'. 950 mm wingspan



**Left:** Brand new from Flitework, this Mirage 2000B-OV EDF jet is just over 2 metres long and has a wingspan of 1.3 metres. The fan diameter is 120 mm and the model requires a 12S 5000 mAh LiPo pack



Also from Flyzone is this A6M2 Zero RTF. The 45 in (1145 mm) span foam fighter features bomb drop, flaps, retracts and navigation lights. Suits 3S 2200 mAh LiPo packs



**Left:** Top Flite is the company's scale brand. Here is their Giant P-47 Razorback ARF in olive green livery



**Right:** Back to Great Planes now for a look at the recently launched Citabria ARF. This 85 in (2160 mm) scale beauty is usually powered by a 30 - 35 cc petrol engine; however an electric option is also listed







This year J Perkins were concentrating on exhibiting the Firelands Group product lines. The Ares Sopwith Pup spans 352 mm and the small biplane should be popular with British customers



At 743 mm wingspan the Decathlon 350 will make a relaxing small field aeroplane. Ready For Receiver (RFR) option will allow it to be fitted with your own choice of radio



Spectre X is fitted with a video camera and is just 183 mm in diameter



These sleek Ethos quadcopters measure 555 mm in diameter and are available in HD and FPV variants



The full Ares line up, neatly displayed on the new Firelands stand ([www.jperkinsdistribution.co.uk](http://www.jperkinsdistribution.co.uk))



Ninja 400 MR is an appropriate name for this aggressive looking quadcopter from JR Propo. A custom tuned 6-axis gyro stabilisation flight control system gives the Ninja 3-D aerobatic performance. Requires a 3S 2200 mAh LiPo pack ([www.macgregor.co.uk/jrheli/jrh88357.htm](http://www.macgregor.co.uk/jrheli/jrh88357.htm)) ([www.jrpropo.co.jp/english](http://www.jrpropo.co.jp/english))



Good looking Bucker Jungmeister seen hanging from the Simprop stand. ARTF model has a wingspan of just over 1.6 metres ([www.simprop.de/](http://www.simprop.de/))



Zulu from Origin Hobby is a 1.5 metre flying wing for 4-channel radio with elevon mixing. It can be built as either a glider or an EP model when fitted with a 950 KV motor (<http://originhobby.com/>)



Left: Latest product from the chemist's lab at Deluxe Materials is Power Model 2T-S, a fully synthetic oil for mixing with gasoline to use in model 2-stroke petrol engines. It offers high temperature protection when running an engine at or near maximum rpm, especially in installations with restricted airflow, such as scale cowlings ([www.deluxematerials.co.uk/gb](http://www.deluxematerials.co.uk/gb))





If you liked the Multiplex Solius then you will love the new 2.4 metre Heron. Although it looks similar, this is an all-new airframe with carbon fibre/carbon tube technology used in the wings for high torsional rigidity. Believe us, it's difficult to bend! The Heron also features flaps, giving Crow Braking for steep approaches and short landings ([www.multiplex-rec.de/](http://www.multiplex-rec.de/)) ([www.jperkinsdistribution.co.uk](http://www.jperkinsdistribution.co.uk))



Another innovative company waving the flag for Britain was OptiPOWER. Famed for their high performance LiPo packs, they were exhibiting a new range of batteries aimed at the multirotor market. We were also treated to a demonstration of the BEC Guard and Ultra-Mega Guard, which protects the ESC/BEC from back EMF; a modern digital servo, if suddenly moved when switched off, can produce a damaging voltage spike. The BEC Guard (the long, thin gadget at the bottom edge of the demo rig) also smooths the BEC output and eliminates voltage fluctuations, thereby reducing 'brown outs' due to momentarily low BEC voltages. If you fit the optional semi-circular LED units you will certainly know if the system is activated as they are mega bright! ([www.optipower.co.uk/](http://www.optipower.co.uk/))



Phoenix Models had their own stand this year, where they displayed a small selection of fresh ARTF kits



MXS is a .46 - .55 size aerobat. The 1:5 scale model weighs in at close to 3000 grams, for a 1472 mm (58 in) wingspan



This bright red Stinson Reliant is to 1:7 scale and spans 1720 mm (67.7 in). It suits .91-size engines or equivalent electric power



Matt finish Gripen is a 1:7 EDF jet for 90 mm fan units and 8 - 12-cell battery packs





Over now to Pichler, who had several new models on display, including this Junkers JU 52, which was covered in printed film to replicate the corrugated finish covering of the full size trimotor. The 1630 mm span model is designed for 450 W motors and a 3S 4300 mAh battery pack  
(<http://www.pichler.de/pichlerwp/>)



In the literature for the 910 mm span Flash, Pichler ask if you've had your adrenaline shot for today? A pertinent question, as with a 650 W motor and 4S pack the Flash can reach speeds of over 130 mph

We regret that we didn't catch this helpful chap's name, seen here holding up the Diabolo XP. Branded 'Extron Modellbau' the XP spans 1540 mm and is designed to take one of Pichler's BOOST 80 brushless motor sets



It's that man again! This time he is holding a Rhonadler Ka 7, an ARTF glider of 2540 mm wingspan and all wood construction



Scooter is an attractive 1630 mm wingspan cabin monoplane designed for 650 W electric power



Time now for a quick look at some of the stars of the show – the multicopters. There were a multitude of professional looking stands like this one by AEE showing their versions of camera carrying aircraft  
(<http://www.aee-cameras.com/product/unmanned-aircraft-system/>)



Yuneec are one of the more established brands and they also make full size electric aircraft too! This eight motor aerial platform, used for law enforcement, demonstrates that multicopters are being designed for much more than hobby flying  
(<http://www.yuneec.com/>)



Walkera are perhaps best known for their affordable R/C helicopters, but this pair of camera rigs shows that they have a firm grip on this lucrative market too  
([www.walkera.com/en/](http://www.walkera.com/en/))





Ripmax always have an impressive stand at the Nuremberg Toy Fair, chock full of interesting new products. It was good to see a nice selection of aeroplanes (<http://www2.ripmax.net/>)



Acro Wot XL is the latest take on Chris Foss' best-selling sport aerobatic design. Developed for petrol engines of 25 – 35 cc, the XL can also be powered by large glow engines. The built-up structure is from CNC cut balsa and ply, with a painted fibreglass cowling. The Acro Wot XL wing separates into two halves for ease of transport. Wingspan: 2000 mm (78.7 in)



Another popular Chris Foss design gets the extra large treatment! This time it's the Wots Wot's turn. Using the same engine range as the Acro Wot XL, the Wots Wot XL is easy to assemble and disassemble; the moulded wing struts having a single attachment screw at each end and both wings separate into two halves. Wingspan: 1690 mm (66.5 in)



Ripmax have come up trumps with the new Black Horse range of WW2 fighters in traditional sizes. Our favourite, the Hurricane .46 really captures the original aircraft's character. Recommended engines are a .46 cu in 2-stroke, a .70 cu in 4-stroke or electric equivalent. Wingspan: 1520 mm (59.8 in)



When fitted with a .61 cu in 2-stroke or a .91 size 4-stroke this new Bf 109E should really sparkle. Electric set ups are also possible. Air retracts and a set of oleo struts are included, and flaps are fitted as standard. Wingspan: 1650 mm (65 in)



The Sea Fury FBII .46 neatly replicates the curves and the radial engine cowl of the full size aeroplane. The cowl will hide almost any glow engine that you may want to fit, or it can be fitted with a punchy electric set up. The undercarriage is fixed but retracts can be fitted if required. Wingspan: 1460 mm (57.5 in)



The complex curves and elliptical wing of the Black Horse Spitfire Mk IX .61 are neatly crafted in ply and balsa. Fit her with a .61 cu in 2-stroke, or maybe the new OS GGT-15 and she will really fill the sky. Air retracts and oleos are included. Wingspan: 1730 mm (68.1 in)



Fired by their success with the Xcalibur sport jet, Ripmax have developed a larger version to suit 80 – 160 Newton turbines. Xcalibur+ is quick to assemble and provides easy access to the turbine and on-board equipment through a removable canopy hatch. The fuselage and slide-on nose are moulded in epoxy/glass, with the remainder built-up from balsa and ply. Three liveries are available – RAF, Sport and Thunderbirds - with the latter shown here. Wingspan: 2338 mm (92 in)



Black Horse MiG 29 is built up from balsa and ply, and the structure wraps around two 90mm EDF fan units (not included) to provide copious amounts of thrust. The wing panels are removeable for transport. Retracts are not included, but the kit does come with scale oleo legs. Wingspan: 1420 mm (55 in). Battery Required: 2 x 6S 5500mAh 30C



A bird's eye view of the Black Horse Pilatus PC-9 33cc. Designed for petrol engines such as the OS GT-33, this kit contains a set of tricycle air retracts with functioning oleo legs so you can fly her from most flying fields. Effective flaps help too! From our high viewpoint you can just make out the highly detailed dual cockpits and the authentic looking pilot. Wingspan: 2000 mm (78.7 in)





With J Perkins being heavily involved on the Firelands stand this year Seagull Models had their own stand. At the rear was this impressive Westland Lysander of 118 inch wingspan. It suits 50 cc engines or electric equivalent.  
(<http://seagullmodels.com/>) ([www.jperkinsdistribution.co.uk](http://www.jperkinsdistribution.co.uk))



T-28 Trojan's always make popular models. Seagull's version spans 63 inches and suits .60 - .90 cu in size engines or electric equivalents



RV8's have been modelled several times but this one has an attractive colour scheme. The model spans nearly 80 inches and suits 1.20 size engines. Or fit a similar size electric motor set



This attractive biplane is a Steen Skybolt. The 15 cc class scale model spans 61 inches



In their brochure, Seagull have got the information on this large FW 190 mixed up with that for a similar size Spitfire, so please forgive us if we get it slightly wrong! However, the annotation says that the Focke Wulf has an 80 inch wingspan and suits 33 - 38 cc engines



This mean looking Skyraider is seen in 'Warbird Tiger' colours. At 63 inch wingspan the model suits .61 - .90 size engines



Our last model from the Seagull stand is this small 3-D sports aerobat. Named the Magic Star 3D, it comes in at just under 40 inches span and suits 480-size electric motors





As usual at the Toy Fair, Hacker Motors were hosting a display of the latest SebArt kits. The stylish Mythos pattern ship is now available in 30-size. Spanning 1280 mm (50.4 in), Mythos 30E is designed for the Hacker A30-10XL and a 3S 3000 mAh LiPo ([www.sebart.it/](http://www.sebart.it/))



SebArt's sleek Avant jet design has been around a while, but this smaller 1360 mm (53.54 in) wingspan version has been developed for a 90 mm EDF unit or a P20 gas turbine. Features built up balsa wings and tail, with a painted fibreglass fuselage



Next month we will be compiling a 'Gadgets & Gear' special to show you some of the latest transmitters, engines and R/C tech on show in Nuremberg. But for now we will leave you with a look at a stealth looking quadcopter, called the Explorer, that caught our eye. ([www.zero-drone.com/](http://www.zero-drone.com/))



Explorer from Zero-Tech is of modular construction. The Vision HD camera and 3-axis gimbal simply clip in to the airframe whenever you want to film video or shoot still images. The camera shoots at 1080p/30fps and 720p/60fps, or stills at up to 14 megapixels. We especially like the option to shoot DNG RAW files, which retain lots more detail than the usual JPEGs



Explorer is easy to take apart if you damage a critical part. The centrally mounted processing unit simply clips in to the middle of the drone, and other modules like the Explorer Vision camera or a GoPro mount clip on underneath. The GPS flight control system is fully integrated so there are no trailing leads or separate GPS modules to worry about. The legs are manually operated and can be retracted when flying without a camera, giving the Explorer a very slim profile



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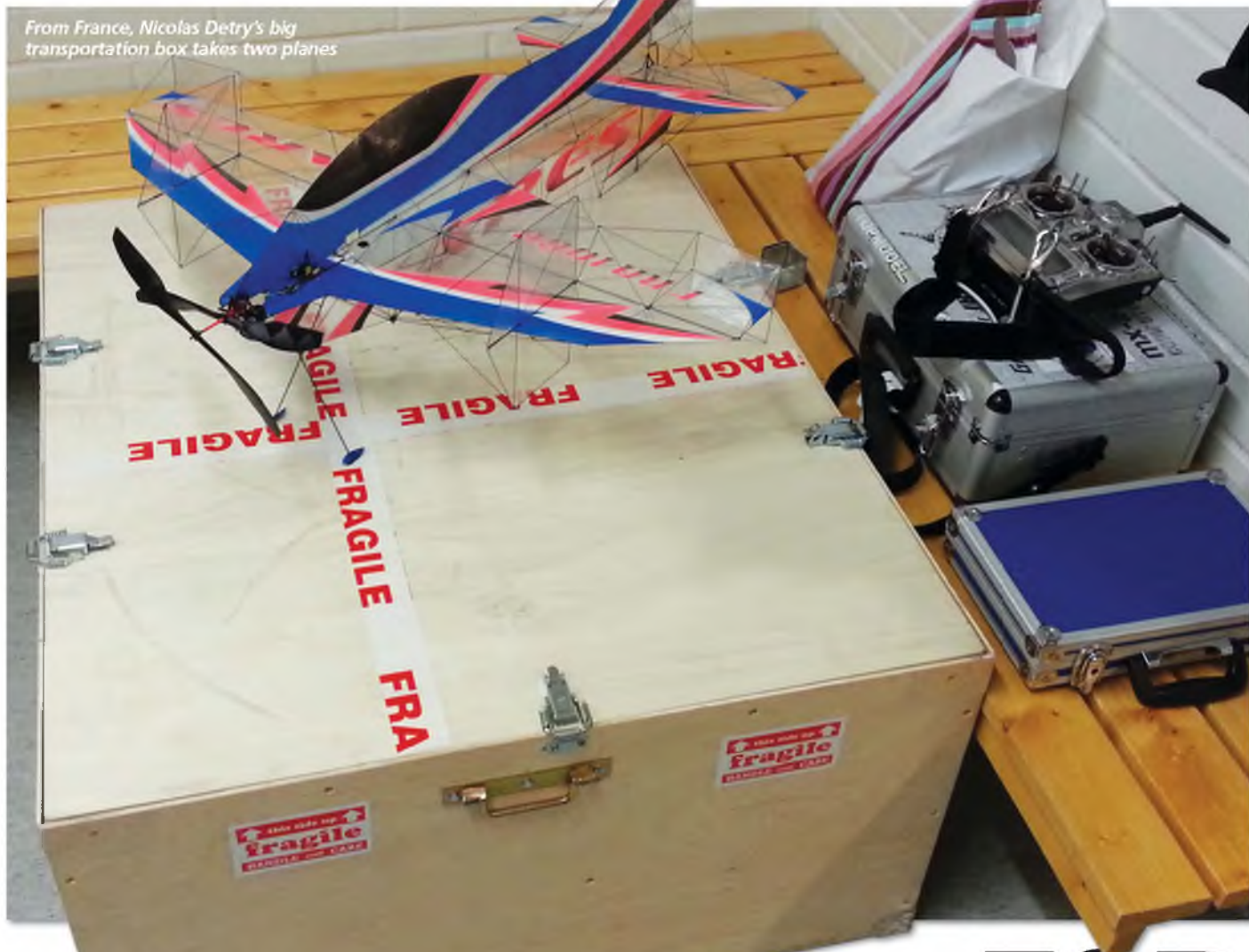
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**[www.prowing.de](http://www.prowing.de)**



From France, Nicolas Detry's big transportation box takes two planes



Donatas Pauzuolis describes  
how he makes sturdy boxes in which to  
transport his lightweight indoor aeroplanes

# F3P

# TRANSPORT BOX

In my previous 'how to' articles about F3P (indoor aerobatic models) I described how to build very light competition level aeroplanes. There is no question that such light (70 - 90 g) aeroplanes will fly extremely well. Unfortunately, such a low flying weight comes with a price. Heavily milled or Mylar covered aeroplanes will be really fragile.

In order to keep your highly valuable aeroplane in one piece and in great shape for longer you need to build a special transportation box. I am not only talking about a strong box that can withstand international flights and 'careful' baggage carriers, but also about a light box in which you can store your aeroplane at home and use it to transport your aeroplane to the practice or competition hall.

You may think that transportation issues are not that important but I can tell you from my own experience that a lot of

damage can be done to a plane during transportation. From a light aeroplane's view, which is covered with 3-micron film, even a light wind can have the effect of a hurricane!

## Light Transportation Box

Building a box for storage or travelling a short distance by car is not that difficult. Let's assume that you'll be the only one who will handle the box, so the box should be strong enough to withstand heavy wind, rain or possible light damage during transportation.

To avoid such problems you can make a light transportation box by using several different materials - regular Styrofoam, thin plywood, Plexiglas or Styrodur. Each of these materials has its own advantages and disadvantages:

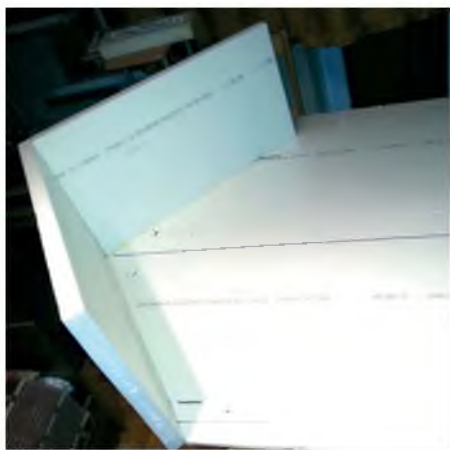
**Styrofoam** – this material has several

advantages. First of all it is very easy to purchase. Hardware stores offer various sizes and thicknesses of sheets. You can glue Styrofoam with various glues. It is very easy to work, and cutting and sanding is simple and does not require a lot of time. Last, but not least, it is cheap. Disadvantages are that it is flexible and not very strong. A box made from Styrofoam won't last very long.

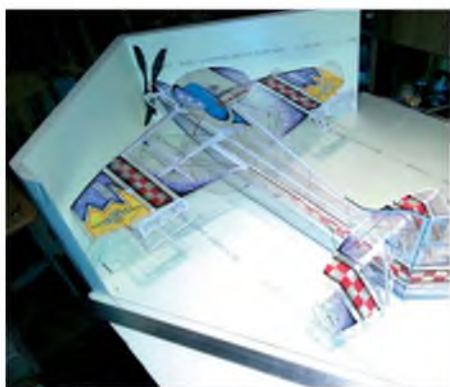
**Thin plywood** – plywood's advantages are that it is pretty easy to obtain, quite easy to work with and a properly built box will last noticeably longer compared to a Styrofoam box. And the price of thin plywood is still pretty reasonable. A disadvantage is that you need more tools to work with it, for example a saw, and stronger glues.

**Plexiglas** – if you use clear Plexiglas you will be able to see the plane all the time.





*Sheets of Styrodur usually come in quite small pieces (about 1 m x 0.6 m). You need to join/glue two pieces to make big top and bottom sheets*



*You need to build your box around your aeroplane.*



*The easiest way to make Styrodur box edges stronger is by using toothpicks*

A properly built box will last a long time. Disadvantages are that it is more difficult to purchase, the price is pretty high and it is difficult to work with.

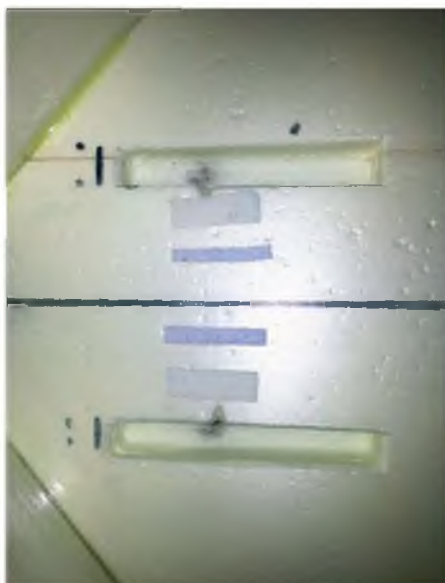
**Styrodur** – this is easy to work with. The box will last a long time if built properly, and it is not difficult to purchase. But the disadvantage is that it costs a little more compared to Styrofoam and thin plywood.

Knowing all the above advantages and disadvantages I recommend you choose Styrodur. (An insulation board made by BASF, also known as XPS or extruded polystyrene - KC)

Building a square or rectangular box is easy and fast. But have in mind that such boxes will use a lot of space in your house or car. Also, it won't be easy to get them through narrow spaces like doors. Due to this I would strongly recommend making a



*Make sure to leave 2 - 3 cm free space between the aeroplane parts and the box walls*



*Milled slots for the landing gear. This way the plane stays in one place and the height of the box becomes a little smaller*

box that replicates the shape of your plane and choose a box size that is only a little bigger than the model.

To build my transportation box from Styrodur I use 5-minute epoxy. This glue is suitable for gluing all the above mentioned box making materials. No matter which material you select you're going to need some basic tools: a sharp hobby knife, a Dremel with a milling tip, sandpaper, saw, reinforced duct tape and a glue mixing cup.

#### Top Tip

To use all the space inside a box build a special compartment between the aeroplane's wing and tail. This will reinforce your transportation box and it will also give extra space for equipment and accessories. For example a charger, batteries, glues, propellers, etc.



*Side walls nearly finished. Note how the rudder is angled to minimise the space needed for the plane*



*To make the box top place the assembled box on a big 1 m square piece of Styrodur and mark it with a Sharpie*



*Finished box top. To fix it on the box I use five pieces of Velcro tape, one on each corner*

#### Heavy Duty Transportation Box

When it comes to building a box that can withstand rough travelling by airlines it requires another level of preparation and a different approach to box building. During the last ten years of my participation in international events, I have taken my fragile aeroplanes from Vilnius, Lithuania to Belgium, France, Spain, the United Arab Emirates and the USA. Most of these trips were successful and I had no problems reaching my destinations with my aeroplanes in one piece. So now I will share my knowledge about international flights and how you should prepare for them before your trip.

Building a reliable box will take about two to ten days (depending on your building skills and the complexity of your box). So if you know you are going to fly to some contest, don't leave your box building to the last moment.





*Build extra compartments inside for flight batteries, a light charger and small accessories. They also act as box reinforcements. It is possible to put quite heavy objects on top of the box without it collapsing*



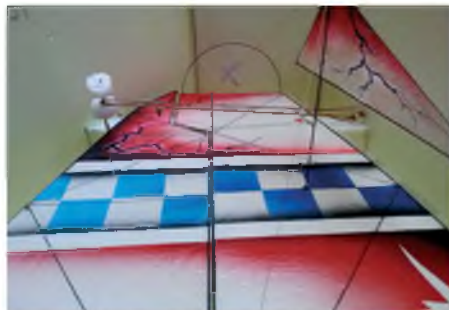
*Fix the model solidly but not too firmly. Always leave a small space for some movement of the aeroplane. This reduces stress on the plane when your box receives an impact. Here the landing gear is fixed with thin pieces of Velcro*



*Use the soft side of Velcro for wing supports.*

Before building the box you need to know the size limitations of oversized baggage for your airline. Each company has its own policy about this. From experience I can say that most airlines tend to have a problem when your baggage is noticeably different in shape and has bigger dimensions. So I always try not to exceed these dimensions: 1000 x 1000 x 500 millimetres. However, boxes with these dimensions will cause slightly different check-in procedures. I will cover this a little bit later.

I usually participate in pattern and aero musical classes in the same competition. So I usually need to transport two aeroplanes at once. This makes box building and packing noticeably more difficult because I need to arrange space for packing two planes and small accessories, and also leave enough room for box reinforcements. If you are carrying only one plane construction of



*The wing is fixed with a thin rubber band and has little chance to move*



*This aeroplane's tail is kept in place with the help of a single rubber strip*



*Finished boxes with aeroplanes inside*



*On the way back from IITOP in France this box withstood a 5,000 km trip with many personal items packed on top - including 25 litres of French wine!*

the box becomes quite similar to what I described in the first part of this article – the 'light transportation box'.

F3P pattern aeroplanes are usually bigger and have more aerodynamic devices compared to aero musical planes. So it is more logical to place pattern aeroplanes at the bottom of the box. If your pattern plane has a T-canalyzer it is best to place the plane inverted at the bottom of the box. This way the T-canalyzer won't interfere with the second plane.

When you are building a heavy-duty transportation box for travelling by air, soft and light materials will no longer work. You'll need solid and well-proven plywood. A box of the dimensions I already described will take two aeroplanes.

Another really important detail of your transportation box is weight. Obviously modern F3P aeroplanes have incredibly low weight, so pretty much all weight will



*Gernot Bruckmann and Alan Goljevcek travel together in one car to international events. As you can see, placing five planes vertically in thin Styrodur holders is not a problem. However this does not protect them from wind when carrying them in and out of the hall!*



*Bad weather at the 2013 German F3P Championships serves as a reminder that a transportation box is a necessity for light and fragile F3P planes*



*An example of a solidly built heavy-duty plywood box*

be from the box itself. Plywood has good qualities for this task, but you must be really careful and select the right thickness. For my boxes the top and bottom are usually made from 5 - 8 mm thick ply and the sides and reinforcements are from 4 - 6 mm thick plywood. So if you make a box with my suggested dimensions (1000 x 1000 x 500 millimetres) and use the materials that I mentioned above, very roughly your box weight will be between 10 to 20 kg. For most airlines this is an acceptable weight for main baggage and in most cases you won't be charged an additional fee.

Although 10 - 20 kg may seem not that much, some airports are really big and in some cases you will have to carry your box by yourself. Adding a couple of small wheels and a comfortable handle will make the task of moving a bulky box much easier.





*Soft mounting inside the transportation box is from foam and Styrodur*



*This plane is fixed by a Velcro strap over the motor*



*Wooden strips reinforce the inside corners of the box*

### Dealing With Airlines

In order to have a successful trip you need to do several things at home to arrive at the airport well prepared.

First, don't select cheap airlines. I know low price flights can look tempting but when you are travelling with such unique baggage eventually the flight will cost about the same as with a regular company. And on top of that it will likely cause you a big headache. In most cases cheap flight airlines use online check-in and this isn't an option for us. We need to deal with a real person and explain what we are carrying as baggage and why, and how to proceed with it.

Another very important piece of advice is that you need to know your flight company's rules and policies about oversize baggage. It is best to contact the airline in advance and ask them to send you an email with all information (size, weight and



*Make a small, comfortable handle from aluminium*



*A one-piece hinge is used to attach the lid on a heavy-duty box. Once the box is closed it becomes noticeably stronger. Another advantage of a hinged lid is that it will never accidentally fall inside the box and damage the aeroplane*



*Even with the best packing, fragile planes can be damaged after flying with airlines. So always be prepared to take a repair kit - a sharp knife, foam friendly CA, accelerator, a piece of Depron and some carbon*

fees) regarding oversized baggage. Be sure that you have that email printed with you when you arrive at the airport. This way you'll be sure that they won't cause you any additional problems or charge you any additional fees.

Another thing you need to keep in mind is how to transport your box from the airport that you have landed at to the competition site. It's perfect when you have somebody to help you with that, otherwise you'll have to rent a car. The wisest thing to do is rent a minivan and it would be wise to make a reservation for that kind of car in advance.

Your box is the same as any other item that goes through an airport. It must be scanned for security reasons. And your 1000 x 1000 x 500 mm box almost certainly won't fit through a regular scanning machine. Some airports have scanners for oversized baggage but in most cases you'll have to



*When preparing a box for travelling with an airline place highly visible warning stickers on the box to send a clear message that fragile items are inside. It is good idea to write it in several languages, first English and then the language at your destination*



*I always fix pattern planes on the bottom. Next, I build a stand for my aeromusical plane. I use most of the space and place spare parts and extra material around the planes*

deal with manual checking in of your box. If you have a solid wooden box security staff will ask you to open it. So be sure that you have some tools to open and close your baggage. I would recommend that you take a cheap screwdriver that you are happy to throw away because you won't be able to take it with you on the aeroplane.

Here's a trick that can sometimes help to move you through security a little bit faster and avoid opening the box. When building your transportation box you can install couple of small, clear Plexiglas windows. These will allow airport security to see what you are carrying inside the box without opening it.

After the security procedures are done your box will be taken manually to the aeroplane. Sometimes this procedure can take a lot of time, so it is wise to arrive at the airport about two and a half hours before your flight.





*A superb transport box made by Ruedi Gallati from Switzerland*



*The transparent Plexiglas sides of Rudi's box allow you to see the plane all of the time*



*From France, the big transportation boxes of Nicolas and Stephane Pietu can be used as pit tables*

When you are passing a box to the person who will carry it to the aeroplane you should explain what the box contains and ask them to transport it very gently. However, to give the same message to the airport staff that will unload the box is impossible. So probably the best way to do that is to use clear and visible markings on the box. A warning that the contents are extremely fragile should be written in the language of your destination country. Also, a smart thing to do is to put a big picture of your aeroplane on several areas of the box. Last, but not least, don't forget to put on some 'This Side Up!' stickers.

### **Conclusion**

Hopefully this advice will show that safe transportation of your model isn't that difficult. And with a little bit of preparation and some luck you can visit and enjoy flying at international F3P competitions and shows. Best of luck! **RCMW**



*Kimmo Kaukoranta of Finland rests his models on top of his very solid plywood box. Kimmo uses these boxes to safely transport his fragile planes by land, sea and air*



*Julien Hecht, Theo Catros and Fabien Turpaud built special models and special cases for the Finland and Lithuania F3P Championships. The models have removable wings, which allows their transportation cases to be very light and compact*



*I had a unique chance to work with Franco Dragone, the famous theatre director of shows like the Cirque du Soleil, in Abu Dhabi. Without a solid plywood transport box I could not have taken my planes safely to this exotic country*



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Franco Bugada relates the story of Angelo Montagna's multi-engined Heinkel He 111-Z



# LUFTWAFFE SIAMESE TWINS



A bit of restraint is needed after starting all five OS FX 46 engines

**T**he Heinkel 111 medium bomber/reconnaissance warbird was designed by Siegfried and Walther Gunther in 1934 for the company Ernst Heinkel Flugzeugwerke A.G. It was one of Germany's secret developments against the Treaty of Versailles. It was officially born as a civil transport machine, following the specifications of Deutsche Lufthansa, for a project asking for a rapid mail and passenger transport. But in fact the plane had been designed to have the capability of being transformed into a military bomber.

The first flight of He 111-V1, piloted by Capt. Gerhard Nietschke, took place in 1935 in Rostock-Marienehe. He 111-V2, 'D-ALIX' had a smoking compartment in place of the bomb bay and ten passenger seats close to the tail. The V3 was a military aircraft, but V4 was a civil version and it was exhibited in Berlin in 1936. It was the fastest civilian transport plane in the world. Germany emphasised the maximum speed of the He 111-C, declaring 400 km/h, but the reality was 360 km/h.

Versions B, D, E and F participated in the Spanish Civil War and gave the impression



The take off roll begins after holding back the model until all the engines are at maximum rpm



The majestic He 111-Z soars aloft for the first time





### *Not a sight you will see everyday!*

that the defensive armament was sufficient, except in daylight operations when some fighter escort was suggested. The aerodynamic front fuselage, with its transparent panels, gave some problems in sunshine or rain as the visibility was reduced. Pilots were often obliged to open their windows to look outside! Also, during the Spanish Civil War, version E with a stepped cockpit was used. It equipped the 'Legion Condor'.

Various engines were installed – the BMW VI, Jumo 205 diesel and BMW 132. The engines installed in quantity were the Junkers Jumo 211 because of difficulties in obtaining the Daimler Benz DB 601 normally employed on the Messerschmitt Bf 109 and 110 fighters. The most powerful and rapid version was the He 111-G, equipped with the Daimler Benz DB 601-B and reaching 410 km/h.

When the flaps were lowered the ailerons were also inclined, so increasing the flap

effect. In 1937 the He 111 was tested with rocket boosters under the wing and this revealed the possibility of drastically cutting the length of the runway at take off.

In September 1939 Germany based its bombing activities on close to 800 Heinkel He 111 aircraft. During wartime it was the primary bomber used by the Luftwaffe, despite its unsatisfactory speed, poor manoeuvrability and inadequate defensive armament. But it was a very strong tool, capable of flying with extensive damage. It was used during the Battle of Britain, the Battle of the Atlantic, and in the Mediterranean, Russia, Middle East and North Africa theatres.

Germany tried to substitute this plane with project 'Bomber B'. It was intended to be a new, better performing machine but events obliged the Luftwaffe to continue using the He 111. Production stopped in 1944, after more than 5,600 He 111's had been manufactured.

The Spanish company, CASA built the He 111 (CASA 2-111) under licence, starting from 1943. After the war, Ejército de el Aire used the same basic bomber for a number of years. It was declared obsolete in the '50s, but the last plane came off the production line in 1973. Some sources talk about a total quantity of more than 8,000 He 111's being built, starting from 1935.

### **Most Used Version**

The most used version is considered to be the He 111-H, fitted with the Jumo 211 engine of 1100 hp. Version H-1 appeared early in the war, followed by H-2, which was equipped with the improved Jumo 211 A-3 engine. In September 1939 Luftwaffe had 400 He 111 H-1/H-2.

The H-1's defensive armament proved its weakness, so the H-2 had extra machine guns on each side of the fuselage. Version H-3 had two Jumo 211-D 1 motors of 1200 hp and a 20 mm cannon in front; production of these began in 1939. The H-4 was able to carry 2000 kg of bombs inside, or two 1000 kg or four 500 kg bombs on two external racks.

A balloon cutter was installed on H-3 and H-4, but was finally abandoned due to airborne difficulties. It was called H-8 and H-8/R2. The H-5 is dated 1941; it was equipped with better defensive armament and could carry one 'Max' bomb of 2300 or 2500 kg or mines, heavy fire and flashlight bombs.

The H-6 was equipped with the Jumo 211 F-1 of 1350 hp, with a 20 mm cannon in front, one machine gun under the fuselage, and one at each side. Some H-6 also had tail armament. The Jumo 211 F-2 was also installed, increasing the maximum speed to 435 km/h at 6000 m and 365 km/h at sea level. The H-6 was also equipped with torpedoes for marine operations.

The H-7 was not built and the H-9 was destined for training. H-10 started its career in 1943 with minor variants in its defensive armament. H-11 had an external rack for 550 kg bombs and more powerful engines (1340 hp). 230 new machines of this type were built and some other existing planes were converted.



*As his confidence builds, Angelo makes a tight turn with the large He 111-Z*



*The throttle servos are governed so that they produce the same rpm*





*After a fast approach the model is slowed for landing*



*Angelo guides the Zwilling in for a nice six (!) pointer*

H-12 had equipment for launching 'semi-guided' bombs, while the H-14 had improved radio aids against ships, and H-16 had redesigned frontal glazing for improved visibility. H-18 was a night version with special combustion gas exhausts. H-20 had a dorsal turret with a 13 mm machine gun and others on the nose; the ventral position also received an increase in calibre. H-21 was a night bomber with flame dampers on its 1750 hp motors. H-23 was the final version with Jumo 213 A-1s installed.

One particular task of the He 111-H was the air launching of V-1 flying bombs. They were secured to a special rack placed between the fuselage and the starboard engine. Some sources reported that more than eight hundred V-1's were launched in this manner.

### The 'Zwilling'

Amongst the various special configurations was the Heinkel He 111-Z. Starting from an idea of General Udet, this plane was also known as the 'Zwilling', 'Gemini' or 'Siamese Twins'. The most used

nickname is 'Zwilling', using the German word. The wingspan was 35.4 m.

In 1942 an Allied reconnaissance aircraft took a picture of a strange plane at an airfield. It appeared to show two He 111 bombers bolted to each other. We can imagine the discussions and the brainstorming that went on in the Allied secret service offices!

Design of the Zwilling was dictated by the necessity of having a plane capable of towing giant transport gliders like the Messerschmitt 321 and the Junkers 322. These gliders were designed in 1940 but the Luftwaffe had no tugs for them. The tug was designed in 1941 when two He 111-H6's were joined together, with an intermediate rectangular wing, with an extra motor installed in the middle. The distance between the two fuselage centre lines was 12.8 m, with a wing area of 148 sq m. It only took three months to produce the first machine.

The last 'Z' machines had the legacy of the He 111-16 and were preferred by many aviators.

Power was from five Junkers Jumo 211

F-2/S-2 engines, with twelve inverted 'V' cylinders, liquid cooled for a total capacity of 6700 hp. The pilot was in the port fuselage, together with an engineer, radio navigator and a gunner. The co-pilot was in the right fuselage with reduced instrumentation, another gunner and another engineer. The crew sometimes increased to nine.

When the monster was tested it revealed good performance and the Luftwaffe decided to place an order for ten machines. Depending on the He 111 available at the moment of its assembly it was decided to convert the armament of these ten machines with some differences to each other, by installing machine guns of 7.7 mm or 13 mm calibre, and even a 20 mm cannon.

The aircraft showed some difficulties during take-off when towing the heaviest cargo gliders and it was decided to add some extra power. So the He 111-Z was equipped with two JATO 500 kg extra rockets installed under the fuselages or two 1500 rockets hung on the central wing.

In flight the aircraft was able to fly without the three central Jumos, a loss of 2,680 hp. Endurance was also increased by using four extra fuel tanks, hung under the fuselages. They were dropped when empty.

Maximum speed reached by He 111 Z-1 was 477 km/h, the maximum range around 1,900 km, and the service ceiling 4,900 m. The empty weight was 21,500 kg, and 28,600 kg when loaded.

Towing the Me 321 was by two 16 mm diameter cables, hooked onto the central wing close to the two fuselages. Speed was limited to 220 km/h. The He 111-Z was used also for towing two smaller gliders, like the Go. 242. In this case one independent cable was connected to each fuselage and the speed was 250 km/h. Towing of three small gliders was also tested with good results, but this practice was abandoned.

Two prototypes were built for testing, and production was limited to ten examples of the He 111 Z-1, which was destined for glider towing and cargo transport. The Z-2 bomber and the long-range reconnaissance Z-3 were not built.





*Easy does it! All's well that ends well, as the Heinkel was soon back on its wheels*

Initially destined for attacking Malta, it was then planned to use the 'Zwilling' to transfer troops and materials by glider to Stalingrad, and then on to Caucasus.

All twelve aircraft were destroyed; eight by battle events and four were dismantled.

### Angelo Montagna's Model

As usual with a scale model, Angelo's first problem was in finding a good 3-view drawing. Angelo also purchased a plastic kit, which revealed many details of the plane, much more than the drawing he was able to obtain. He started with some detailed drawings to arrange all the necessary engine and control installations. Panels were designed in to access any mechanisms where precise adjustments would be needed.

The decision was taken to manufacture the model in the traditional way using birch, poplar and balsa woods, and glued using vinyl adhesive. The fuselage stiffeners are mostly of pine, planked with 3 mm balsa.

Angelo settled on the OS FX 46 for the five engines, using Graupner 11 x 7 propellers. The retractable landing gear was based on adapted Eurokit products. The tail wheel is non retractable and is fixed.

The transparent nose was manufactured with a 3 mm plywood frame. Curves in the windshields were made after heating them up. All the 'glass' was glued in after painting the frame.

The wing is manufactured in three parts for ease of transport. Practically all the ribs are from plywood, covered with 2 mm balsa, followed by 27 gram/sq m glass fibre cloth. Four spars, of double 'T' section, run through the ribs, giving a very strong structure. The central part of the wing includes two retractable gear legs and the pneumatic system parts. Angelo used Hitec servos on all four undercarriage legs.

For the throttles, JR 507 servos are used, synchronised with throttle governors, and so eliminating the danger of unexpected yaw due to different engine speeds. Aviomodelli 300 cc fuel tanks are placed behind the bulkheads of each engine.

The outer wing panels house the ailerons, operated by Futaba 9202 servos, the two external landing gear legs and the outer engines. A pair of aluminium plates connect the central wing to the outer panels and to the fuselages, using eight bolts. The assembly needs to be strong and rigid to absorb vibrations from the engines.

Two R/C receivers have been installed, one for the port aileron, elevator, rudder and the two external motors. The other Rx works the starboard aileron, elevator, rudder and the three central motors via throttle governors. Two batteries of 1400 mAh capacity are installed.

The installation needed a large quantity of connections for piping and wiring, so a jig was made for arranging everything properly and safely.

Manufacture, including design and construction drawings, required something in the region of 800 – 1,000 hours. Angelo's model has a span of 3.25 m, a length of 1.52 m and weighs 14 kg.

### First Flight

The first flight was made at the Speziana airfield, close to Pavia in Italy. Before mounting them in the model the five engines were tested separately. In fact, Angelo has constructed the model in a way

that still makes this possible, which helps when making separate adjustments to each engine. The model was then completely assembled.

The first attempt to take-off saw some problems, as it was very difficult to increase the speed progressively. So it was decided to restrain the model and to take-off with the engines at their maximum rpm's. Using this procedure the big aeroplane became airborne very easily.

With the undercarriage retracted the model had a good five minutes of flight, during which Angelo performed all the normal flight patterns. His impressive aircraft made a majestic sight. The landing approach was at high speed for safety reasons, but then, at a lower speed and with the legs and wheels extended, the Zwilling safely touched the ground. You can imagine the congratulations and the pats on the back that Angelo received for his near perfect demonstration of this complicated model.

After a short time there was a meeting in Biella and Angelo received a trophy from the organisers and many compliments from the spectators, all of who enjoyed the next few flights of his Heinkel He 111-Z.

It is a very rare model aeroplane - maybe the only one in the world? **RCMW**



### Picture Credits:

Photos of aircraft – Giorgio Apostolo collection

Photos of model – Angelo Montagna



# VIRGINIA AVIATION MUSEUM

*Bill and Micki Bowne point out subjects for scale models as they continue their tour of lesser – known US aviation museums*



*An SR-71 guards the entrance to the Virginia Aviation Museum, situated on the grounds of the Richmond International Airport*

**E**ast of the Virginia state capital, Richmond, sits a little jewel of an institution, the Virginia Aviation Museum (VAM). With a strong emphasis on the state's aviation pioneers, the VAM contains a surprising number of rare and unusual aircraft. The last Vultee V1AD, a view of gleaming polished aluminium sleekness, a racy Curtis Speedwing, and one of the last two 1918-era Standard E-1 fighter trainers head the list.

The VAM's cheerful and friendly volunteers are happy to discuss aviation with visitors and enjoy showing off their wards. Micki was particularly delighted at the chance to step over the railings and get an up-close look at a Model T Ford. (Yes, there are also some antique cars on display. Remember, Henry Ford invented the automobile so no one would have to walk to the airport!)

The building is small so there isn't much room to walk around the aircraft. Several are hung from the ceiling; that would make viewing their upper surfaces difficult but an open-topped classroom/viewing balcony in the middle of the building provides an excellent vantage point for seeing most of the hanging aircraft better, plus it provides a fine overview of the main floor displays.

**RCMW**



*Yes it's a SPAD, but no, it isn't exactly French. Built in the UK by Mann Edgerton & Co. Ltd. this well-travelled aircraft is one of 19 SPAD VII's sent to San Diego (on the far side of the US, over 2,000 miles west of Virginia). It served as an advanced gunnery trainer for the US Army Air Corps until decommissioned in 1920*



*The Curtiss-Wright A14D Speedwing is the only one in existence. Designed to take advantage of the radically streamlined NACA engine cowling, this particular airframe was kept by the Curtiss-Wright company as a demonstrator and was flown by such famed aviators as Jimmy Doolittle*





The US may get credit for inventing the first practical aircraft (the Wright Flyer), but when WWI started we didn't have a single combat worthy military plane. This Standard E-1, one of 60 built, was an attempt to bring the US aircraft industry up to speed but it was still inferior to the Camel and SE5a. Visible below the E-1 in this shot from the observation platform are the silver Bellanca CH-400 and an orange-and-yellow 1929 Curtiss Robin private aircraft



Designed and built by the Pitcairn Company specifically as a mail carrier during the dangerous 1920s, the Mailwing PA-5 was a familiar sight at airfields around the US



The Fairchild Model 24 came in several versions, both with radial and in-line engines. This radial engined 1937 Model 24G not only has a graceful, eye-pleasing shape but also boasts a cheerfully vivid paint scheme!



Want to build a biplane but don't want to mess with all of those struts? Take a look at the Waco series of cabin bipes, such as this 1935 Waco YOC. This airframe was once owned by Richmond native, Walter M. Jeffries, designer of Star Trek's Starship Enterprise (think of those Jeffries tubes Scotty was always crawling in – yes, they're named after him!)



When Lindberg went shopping for a plane for the New York to Paris race this is the plane he really wanted. But since Bellanca wouldn't sell him a CH-400 Skyrocket unless he let them provide the pilot, he went to Ryan... and so was born the Ryan Spirit of St. Louis. The museum's Skyrocket was originally built as a CH-300 Pacemaker and was abandoned when it crashed on an Alaska glacier. Rescued in 1964 and converted to a CH-400, it wears the markings of the aircraft flown by Virginia native Admiral Chamberlin and his crew in the NY to Berlin race





Yes, there were other US Army (and Navy) basic trainers between the fabled Jennies and Stearmans! Consolidated built the Fleet, well known for its sturdy construction and nimble manoeuvrability. If you look carefully at the front cross-strut on the landing gear you can see an innovative way to have two struts cross without interference – one has a great big loop in it, whilst the other goes straight through the loop!



From the other side of the observation deck we can see a Taylor E-2 Cub, granddaddy of the Piper J-3 Cub (one of whose partially uncovered bones is visible below the E-2). Micki's already put me on notice that she expects an E-2 to be in her future fleet. Yes ma'am!



The museum's Bucker Jungmeister was formerly the property of Count Jose L. Aresti, creator of the Aresti system for scoring full-scale aerobatics. It now wears the colours of Beverly 'Bevo' Howard, famed aerobatics pilot from nearby South Carolina. (Howard's Jungmeister was restored after his fatal crash and is now on display at the Smithsonian Institution.)



The VAM's pride and joy: the sole remaining Vultee V1AD Special. Built as a luxury airliner in the mid-1930s, the aircraft were forced out of service with the airlines when the US Civil Aeronautics Administration (CAA, predecessor of the current Federal Aviation Administration – the US's FAA) required all airliners have at least two engines. Sadly, many of the aircraft were smuggled to Spain, converted into crude fighter/bombers and destroyed during that nation's Civil War

**CONTACTS:** Virginia Aviation Museum: [www.vam.smv.org/index.html](http://www.vam.smv.org/index.html)



# CUTTING FILM THE EASY WAY!

*The Editor puts the Antex Stencil Tool to work helping to assemble a ready covered ARTF kit*

**T**he Airbrush Company based in Lancing, West Sussex are regular contributors of new product information for our Shop Window column. As you would expect they specialise in airbrushes and accessories. Amongst the latest batch of products to be featured on their website (<https://airbrushes.com>) is this mains powered stencil burner, manufactured by soldering iron specialists, Antex.

This product caught my eye as I was mid-way through assembling an ARTF aerobatic model for a kit review. This required the removal of several areas of heatshrink film from the ready covered airframe. Now you can do this with a new scalpel blade and a light touch, but it is oh so easy to press a tad too hard and to end up scoring the wood underneath. This could prove to be a problem when removing the film covering a tailplane to fuselage joint as any scoring could lead to structural failure of the horizontal tail.

An alternative way to remove pre-applied film is to burn through it using a fine tipped soldering iron. This works well but you do end up with charred remnants of sticky film clogging up your soldering iron tip. And if you strive to keep your soldering bits clean and well tinned this can be more than a bit annoying!

Enter the Antex Stencil Tool, which at just £24.95 inc.VAT, provides a cost effective way of doing the same job but with a purpose made tool. Although originally designed for making stencils for cake decorating, artwork, home decorating etc. it is perfect for this task too.

After letting the cutter heat up you simply just draw the angled tip along the edges of any film to be removed. It is best to just let the tip do the work itself, without adding any excess pressure as it is quite sharp (although not nearly as sharp as a knife!) and it is possible to still score the wood if you are very heavy handed. Running the tip along a steel rule generates a nice clean cut through the film, which can then be lifted away from any areas to be glued. **RCMW**



*The Cut Master Stencil Tool is part of the Antex Craft range. You can buy one from [airbrushes.com](https://airbrushes.com)*

## CONTACT

### The Airbrush Company Ltd

79 Marlborough Road (East), Lancing Business Park, Lancing, West Sussex, BN15 8UF

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*It looks like a soldering iron but is just 18W so it needs to be given a few minutes to heat up*



*You can either hang it up with the body hook or use the safety rest supplied. Either way, do make sure that it is kept away from anything flammable while in use or cooling down*

*Drawing the tool lightly along a straight edge makes a neat job of removing film from the centre of a ready covered tailplane (seen here for clarity after removing the burnt through film)*



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**5 PRODUCTS**



Just to whet your appetites I've included a few models I've designed over the years, all using the proportions described in this article. We'll start with a design that was inspired by old-timer models. Miss Bikini is typical of a relaxing to fly model design and is great for those lazy summer afternoons



# AN ITCH TO SCRATCH

*In part two of his short series on own design models Bill Bowne looks at monoplane proportions*

Last month we looked at ARTF and kit bashing as an easy intro to designing and building your own model. This month we're going to start the process of creating a brand new, original monoplane design.

We're going to start with a sport model. Yes, scale ships are fun but we need to get the basics down pat before we start on a dream scale model. Just as we start learning to fly with a trainer model, we're going to start with a 'designing trainer'. I promise, though, that we WILL get to scale models in a bit!

First, we have to get a few definitions out of the way. I'm not trying to insult anyone's intelligence, but some folks don't know what these terms mean. RCMW is published in the UK, but it's read all over the world, by folks to whom some sort of English is their native tongue, and by those dedicated folks (bless 'em) to whom English is a second (or more) language. We all want to have a common understanding of what these terms mean, so let's take a moment to cover a few:

**Wingspan** – the distance from wingtip to wingtip. When the wingtips are curved (like a Spitfire) it's a good idea to slightly decrease the span used in calculations to allow for how much area is left out by the tips. So, I recommend that first time designers' use squared off wingtips to make design calculations easier.

**Wing Chord** – the distance from the wing's leading edge (front) to its trailing edge (rear). We will use Average Chords (the tip chord plus the root chord, with the sum divided by 2). When calculating the Average Chord, include the chord at the centre of the wing (even if it's inside the fuselage), not at the wing root as the centre chord. As in the Wingspan definition, I recommend that first time designers use squared off wingtips for easier design calculations.

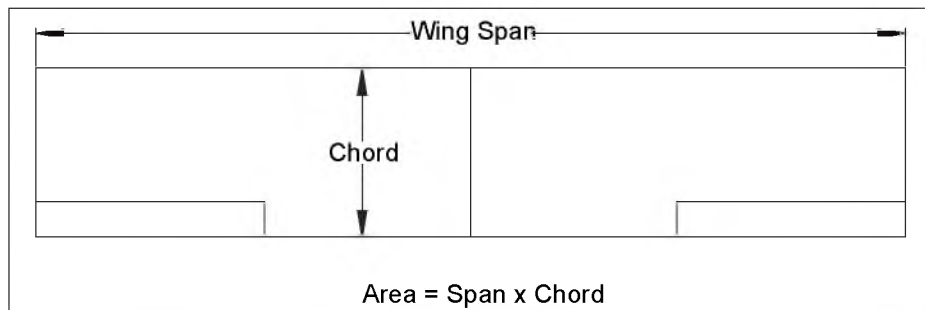
**Wing Area** – the area of the wing, including those parts covered by the fuselage, nacelles and so forth. The area, mathematically, is equal to the Average

Chord times the span. See why we want to start with a simple wing shape?

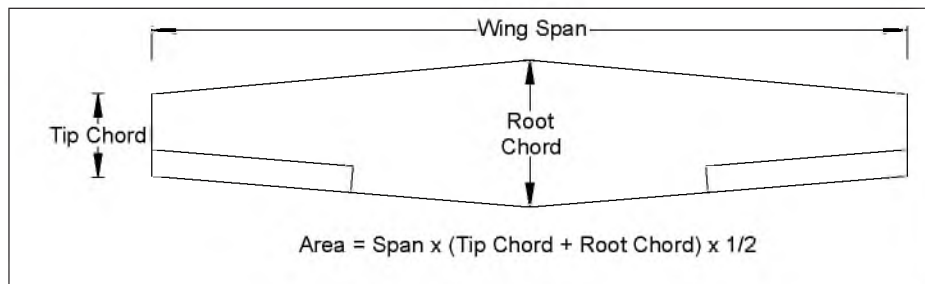
**Wing Loading** – the wing area of the plane divided by the weight. This can really vary between models. Wing loadings that are fine for quarter scale planes are prohibitively heavy for smaller models, for example. The lighter the wing loading, the slower the model can fly and the more manoeuvrable it can be. On the other hand, a lighter wing loading also increases the model's vulnerability to wind and turbulence.

**Aspect Ratio (AR)** – the relationship between the wingspan and the average wing chord. The higher the Aspect Ratio (i.e. the longer the wingspan is compared to the chord), the more efficient the wing usually is. That's why gliders have such long, thin wings. On the other hand, the longer the wing the slower the plane will roll. Long wings have a lot of inertia to overcome. Think of the wings as being like a figure skater's arms; the further out they

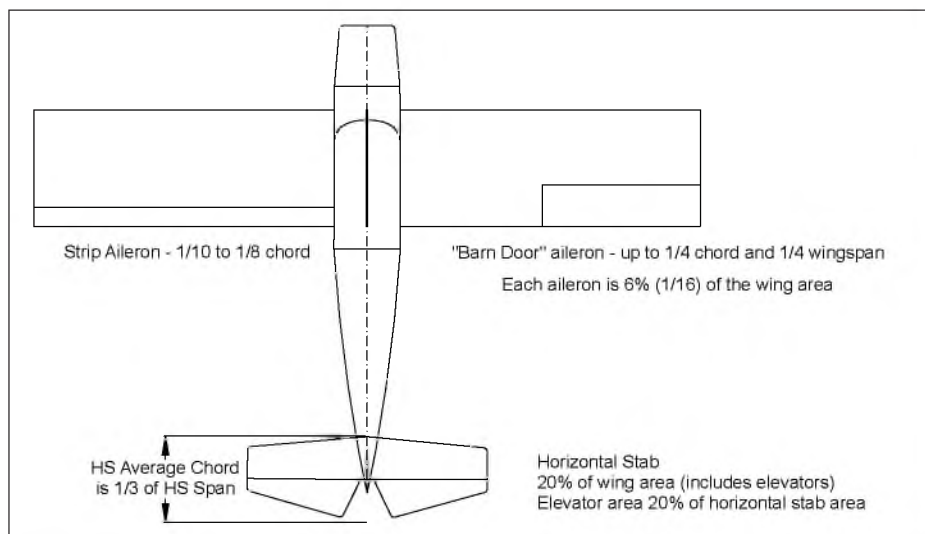




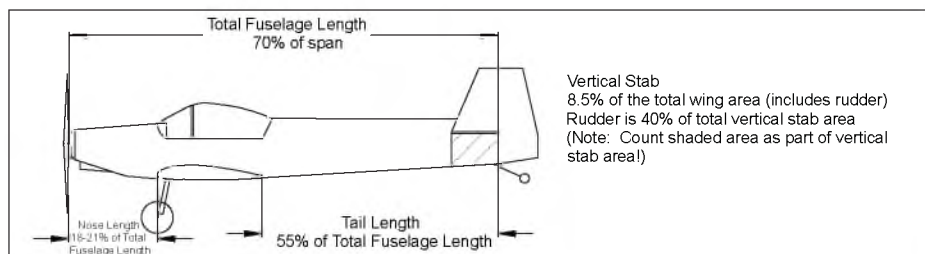
For a constant chord wing (also frequently called a Hershey bar wing due to its resemblance to the chocolate bar) the wing area equals the span times the chord



For a tapered wing things get a bit more complex. We have to take the average of the root and the tip chords, then multiply the result times the span. Note that we use the chord at the very centre of the wing, not where the wing meets the fuselage



Wing and tailplane proportions. When creating the ailerons don't forget that you lose the aileron area covered by the fuselage. Use it in calculations, then compensate by increasing the part outside the fuselage



We count the area under the horizontal stabiliser (tailplane) as being part of the vertical stabiliser (fin) area. As a side note, the axle of a taildragger belongs under the leading edge (use the average chord for tapered wings)

stretch, the slower the skater pirouettes. So, aerobatic planes have shorter wings and can roll faster. Very short Aspect Ratios, such as ones on circular airplanes like the famed F5U Flying Flapjack give models great manoeuvrability. But woe be the pilot if the engine dies, as the glide is essentially non-existent. For typical models, Aspect Ratios normally run from 5:1 to 6:1. We're going to compromise and go with 5.5:1 (in US Air Force technical schools, this is where

the instructor usually stomps his foot on the floor a few times).

**Centre of Gravity** – Most folks think this is only the line the plane balances on when held by the wingtips. WRONG! That's just balancing it on the pitch axis. The Centre of Gravity is a 3-dimensional balance point at the intersection of the roll, pitch and yaw axes. A plane will balance on that point, no matter what attitude it's in. Ideally, we

should balance each model at least on the pitch AND roll axes, not just the usual pitch axis.

Models that balance ahead of the C of G are normally more stable and hence less responsive, which may make them harder to fly comfortably. That isn't fun, but can be corrected by GRADUALLY moving the C of G aft. On the other hand, models that balance behind the C of G are more responsive because they're less stable, which can easily lead to an out of control situation, especially at lower airspeeds, as in landing... I don't recall where I first read it, but I've long remembered the saying that a nose-heavy model may fly poorly, but a tail-heavy one will only fly once. From personal experience I usually start with a C of G at 25% of the average chord. I'd rather start with a nose heavy model and then gradually move the C of G aft as I learn how the model flies. For the aerofoils I use that's usually at the thickest point in the wing, which is also where I normally put the spars. That makes it convenient to remember to balance at the spar.

Enough defining, what do we do with this stuff?

### In Proportion

Well, I use a set of rules to determine the basic proportions of every model I design. These rules were originally compiled by the late Chuck Cunningham. Mr. Cunningham was a columnist for R/C Modeler magazine in the USA for many years. He designed several successful models, including the well-known Lazy Ace.

What did Chuck do that was so great? Simply, he looked at what worked. Chuck compiled the proportions of many successful R/C models and averaged them out. He then created a series of nomograms from the averages and wrote a series of articles on using them. Those articles were published in RCM every couple of years for decades. I took the articles and converted the nomograms back into equations, which I now use in a spreadsheet. Yes, Chuck did change the numbers a bit from time to time, but he always kept them pretty close to what you see here.

Do you need to use a spreadsheet? No, but it is a faster way to calculate things and lets you quickly make a lot of 'What If?' comparisons.

What you really do need are the proportions. With them, all you need to do is set the wing area and do a little calculating. These proportions are based on the most common sport model Aspect Ratio (AR) of 5.5:1 (Gee, where'd we hear that?)

Here are the proportions for conventional monoplanes. Remember that these are for 'average' models. If you want to design a 3-D ship, you'll need to increase the sizes of the control surfaces relative to the flying and tail surfaces.

I apologise to those who routinely use the metric system, but the English (foot/pound) system is used in my home country. I'm afraid I'll make blunders if I try to swap back and forth, so I'm going to stick with the English system in this series.



### Common Proportions For Conventional Monoplanes

#### Average Wing Chord

Square root of (wing area divided by Aspect Ratio)  
 IMPORTANT – divide the area by the AR FIRST and then take the square root

#### Span

Aspect Ratio times Average Chord

#### Aileron Area (approx.)

6% of the total wing area PER AILERON

#### Total Fuselage Length

75% of the wingspan

#### Tail Length

38.5 % of the wingspan, from the wing TE to the rudder post

#### Nose Length

17 % of the wingspan, from the wing LE to the back of the propeller

#### Horizontal Stab Area

20% of the Wing Area (this includes the elevator)

#### Horizontal Stab Average Chord

Square root of (the horizontal stab area divided by 3) (Aspect Ratio of 3:1)

#### Horizontal Stab Span

3 times the Horizontal Stab Average Chord

#### Vertical Stab Area (with the Rudder)

8.5% of the wing area. IMPORTANT – This includes the area of the fuselage side that is under the Horizontal Stab!

#### Rudder Area

40% of the Vertical Stab Area

#### Elevator Area

20% of the Horizontal Stab area

**Editor's Note** – The Horizontal Stabiliser is also known as the Tailplane. The Vertical Stabiliser is also known as the tail Fin

### How Big A Wing?

As you can see, once you have the Area and the Aspect Ratio all else follows.

Okay, but how big a wing do you need? That's a good question. You need to look at how heavy the model will be and what kind of wing loading you can live with. Be realistic about how lightly you can build a model. A good way to get an approximation is by looking at kits and plans that you and others have built.

Let's assume you decide your plane will weigh 2.5 lb and that you'd like the wing loading to be 16 ounces per square foot:

Convert the weight to ounces. 2.5 lb times 16 ounces/pound makes 40 ounces

40 ounces divided by 16 ounces per square foot produces 2.5 square feet. At 144 sq inches per square foot, that's about 360 sq inches

With an Aspect Ratio of 5.5:1 the Average Chord is the square root of 360/5.5, which equals about 8.09 inches. The span is then 8.09 times 5.5 = 44.5 inches



Increasing the A/R to 6/1 to get greater efficiency and longer flights with a geared .05 motor and round cells resulted in the Hot Dawg. The mismatch between the Hershey bar wing and the rounded tail feathers always irked me but I just couldn't get myself to cut her wings open to change them!

Now use the proportions from the table to calculate the proportions you'll need. For our project, we get the numbers shown in the text box below:

The first thing you might notice is that the numbers for the fuselage don't quite add up. The sum of the wing and tail chords, plus the nose and tail lengths is actually about 32.99 inches, not 33.4. That's due to there being a lot of rounding in the percentages.

We can ignore this. These numbers are NOT hard rules that must be obeyed to the last decimal point! Remember, these proportions are all based on AVERAGES of

successful models, so there is leeway.

Another point concerns the weight of the motor or engine you're using. If you have a heavier power plant, shorten the nose slightly; for a lighter one, lengthen it. For the model we'll be working on next month we'll assume the motor is rather heavy, so we'll cut the nose back a bit. Of course, if you build heavy tails then you may prefer to cut back the tail, instead of the nose.

Okay, so now you know how big the areas must be, how far apart the tail and wing must be, and so forth. How do you convert these numbers into aeroplane drawings? Well that's going to be the topic for our next article, so see you then! **RCMW**

### MODEL WORLD

<b>WING AREA:</b>	360 square inches
<b>AVERAGE WING CHORD:</b>	8.09 inches
<b>SPAN:</b>	44.5 inches
<b>AILERON AREA:</b>	21.6 square inches
<b>TOTAL FUSELAGE LENGTH:</b>	33.4 inches
<b>TAIL LENGTH:</b>	12.5 inches
<b>NOSE LENGTH:</b>	7.5 inches

<b>TAILPLANE/HORIZONTAL STAB AREA (INCL. ELEVATOR):</b>	72 square inches
<b>ELEVATOR AREA:</b>	14.4 square inches
<b>TAILPLANE/HS AVERAGE CHORD:</b>	4.9 inches
<b>HORIZONTAL STAB SPAN:</b>	14.7 inches
<b>VERTICAL STAB AREA (WITH RUDDER):</b>	30.6 square inches
<b>RUDDER AREA:</b>	12.2 square inches



Reducing the A/R of the wing and adapting the rest of the proportions produced the Tango (Touch AN GO). Power on, she could land at a slow walk and was a real terror at spot-landing contests. But she had a very poor glide, so when the engine quit over tall corn her end came quickly!



These rules aren't just for electric models! They work just as well for glow and gas too, as in my Tommyhawk. The Tommyhawk, a stand-very-far-off-scale model was a hot pattern ship style model that I built circa 1986 using a .40 glow engine as the motivator



With a bit of adjustment to the nose length due to the motor location the Cunningham equations can easily be used to come up with a other types of models, such as the Sunfish flying boat, which is this month's free plan



The same formulae produced the Snippet. Using an OS 15 glow and a Futaba radio resulted in a very acrobatic fun-flyer



# Welcome to the Traplet Plans & Parts Service.

**Supporting modellers for over 30 years with 1000's of plans, a massive range accessories and laser cut woodpacks. With award winning designs from world class designers we are proud to bring you an amazing selection of Chris Williams. This month we look at an amazing selection of Scale Glider plans from Chris's collection.**



## **MINIMOA** Difficulty ★★★★★

Chris Williams shares his 1:3.5 scale design of one of the best known sailplanes and, using a Quabeck 3.5/12 wing section, produces a superb model for both builder and flyer alike. Aimed at the experienced builder, the Minimoa will be a very rewarding scale project.

### PLANE SPECIFICATIONS

WINGSPAN	191" / 4850MM
RADIO FUNCTIONS	4 FUNCTION

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### **WOODPACK WP2665**

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## **MINIMOA** Difficulty ★★★★★

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### PLANE SPECIFICATIONS

WINGSPAN	167" / 4240MM
RADIO FUNCTIONS	4 FUNCTION

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# Traplet Plans & Parts Service

## Amazing selection of Scale Glider Designs from Chris Williams

### SCHEIBE A-SPATZ



Difficulty ★★ ★

The Spatz series from Scheibe sprang to life in the early 1950w. The L-Spatz has been extensively modelled but the earlier 'A' and 'B' versions less so. Chris Williams designed this glider to fulfill a need to find something that would be handily sized and able to flown off the slope in light conditions.

#### Plane specifications

SCALE	1:3.5
WINGSPAN	3.8M
WING AREA	8.7SQ FT
WING LOADING	180Z/SQ FT
WEIGHT	4.5KG
RADIO FUNCTION	5

**PLAN MW3676**

**£20.99 / US \$34.99**

+ P&P/S&H

### SCHLEICHER ASK-11



Difficulty ★★ ★

The Schleicher ASK-11 is an unusual model to scale, but Chris Williams has managed this at 1:4 scale on the 2 well-detailed large CAD plans. Construction is all wood.

#### Plane specifications

WINGSPAN	3.21M/126"
WEIGHT	8-9LB
SCALE	1:4
FLIGHT BATTERY	2200 MAH
RADIO FUNCTION	5

**PLAN MW3657**

**£20.99 / US \$34.99**

+ P&P/S&H

### BJ-1 DUSTER



Difficulty ★★ ★

Designer Chris Williams has enlarged his 1:6 scale model to this 1:5 scale 102" span scale glider and included electric power for ease of flying from a flat field. Can also be aerotowed or flown from a slope.

#### Plane specifications

WINGSPAN	102"
RADIO FUNCTIONS	5
WEIGHT	4LB
SCALE	1:5
MOTOR E-POWER	2810 1100 KV BRUSHLESS

**PLAN MW3648**

**£14.99 / US \$25.99**

+ P&P/S&H

### RHONADLER 35



Difficulty ★★ ★

At 5m span this 1:3.5 scale model of a 1930 vintage sailplan has been designed by Chris Williams for 5 function and is constructed from all wood and highly detailed on the 4 large CAD down plan sheets with detailed building instructions. Model can be dismantled for transport..

#### Plane specifications

WINGSPAN	197"
WING SECTION	G0535 MOD ROOT, HQ35/12 TIP
WEIGHT	9KG APPROX
SCALE	1:3.5
RADIO FUNCTIONS	5

**PLAN MW3645**

**£35.99 / US \$59.99**

+ P&P/S&H

### SCHEIBE-LORAVAI TOPAZE



Difficulty ★★ ★

The latest design from top scale glider enthusiast, Chris Williams, this 1:3 scale sailplane uses half round ramin hardwood mouldings to replicate the tubular metal fuselage of the original glider.

#### Plane specifications

WINGSPAN	197"
RADIO FUNCTIONS	5
WEIGHT	20LBS
SCALE	1:3

**PLAN MW3580**

**£32.99 / US \$56.99**

+ P&P/S&H

### SCHEIBE-LORAVAI TOPAZE



Difficulty ★★ ★

The latest design from top scale glider enthusiast, Chris Williams, this 1:3.5 scale sailplane uses 6mm half round ramin hardwood mouldings to replicate the tubular metal fuselage of the original glider.

#### Plane specifications

WINGSPAN	169"
RADIO FUNCTIONS	5
WEIGHT	12LBS
SCALE	1:3.5

**PLAN MW3578**

**£21.99 / US \$35.99**

+ P&P/S&H

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## HW-4 FLAMINGO



Plane specifications	
WINGSPAN	196"
RADIO FUNCTION	4

Difficulty ★★ ★

Yet another superb scale replica from Chris Williams, the unusual 5 metre flamingo is both elegant and a fine flyer whether aero-towed or launched from the slope..

**PLAN MW3463**  
**£30.99 / US \$49.99**  
 + P&P/S&H  
**WOODPACK WP3463**  
**£139.99 / US \$237.99**  
 + P&P/S&H  
**ABS CANOPY CA3463CY**  
**£26.99 / US \$45.99**  
 + P&P/S&H

## SLINGSBY T-51 DART 17R



Plane specifications	
WINGSPAN	190"
WEIGHT	16LB 8OZ
LENGTH	85"
RADIO FUNCTION	5 - 6

Difficulty ★ ★

A magnificent 1964 World Champs competition glider designed by Chris Williams to a 1:3.5 scale. Constructed using all wood and traditional building techniques from the large two sheet plans with instrument detail. Individual slide on wing panels, retracting u/c and airbrakes are some main features.

**PLAN MW3178**  
**£21.99 / US \$35.99**  
 + P&P/S&H  
**CANOPY CA3178CY**  
**£20.99 / US \$35.99**  
 + P&P/S&H

## SLINGSBY T-50 SKYLARK 4



Plane specifications	
WINGSPAN	177"
RADIO FUNCTIONS	5
WEIGHT	13LB

Difficulty ★★ ★★ ★  
 For those who prefer a 1:4 scale glider this Chris Williams' design is the baby sister to the larger MW3105 at 1:3.5 scale. Construction is identical to the larger model with some reduced size wood parts, and flying is stable and graceful with good aerobatic capabilities.

**PLAN MW3106**  
**£28.99 / US \$46.99**  
 + P&P/S&H  
**CANOPY CA3106CY**  
**£20.99 / US \$35.99**  
 + P&P/S&H

## SCHEIBE BERGFALKE II/55



Plane specifications	
WINGSPAN	156"
LENGTH	73.5"
RADIO FUNCTIONS	4

Difficulty ★★ ★★ ★

This almost 1:4 scale vintage design by the accomplished Chris Williams has been redesigned from an original drawing to be lighter and more efficient. Its all wood construction is not for the faint hearted and results in a superb multi-function scale model.

**PLAN MW3084**  
**£21.99 / US \$35.99**  
 + P&P/S&H

## SLINGSBY T-31B



At 1:3 scale this three large sheet plan model is a superb replica by Chris Williams and with the HQ3-5/12 wing section, will provide the builder with ample flying rewards. The model requires 7 servos and multi-function R/C.

Plane specifications	
WINGSPAN	173"
RADIO FUNCTIONS	5
WEIGHT	22LBS
SCALE	1:3

Difficulty ★★ ★★ ★

**PLAN MW2957**  
**£00.00 / US \$00.00**  
 + P&P/S&H

## SLINGSBY T-21



Plane specifications	
WINGSPAN	185"
RADIO FUNCTIONS	4
WEIGHT	18LBS
SCALE	1:3.5

Difficulty ★★ ★★ ★

A balsa bashers delight, big and realistic in flight at 1:3.5 scale. Designed by Chris Williams, this is a good big first scale model.

**PLAN MW2707**  
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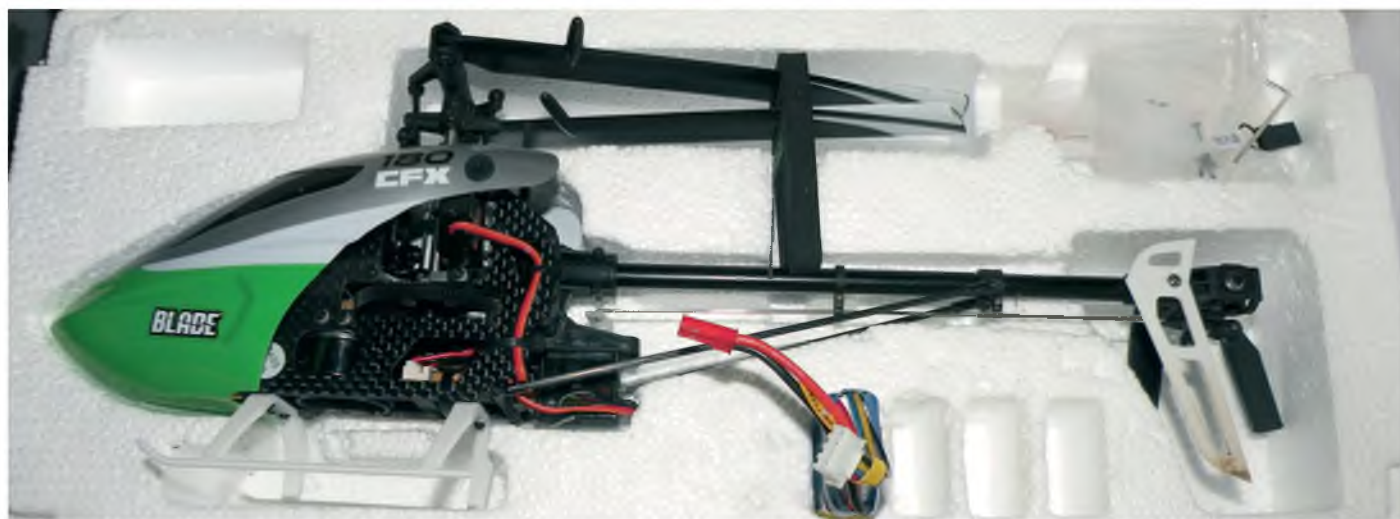


# ROTARY WINGS

*Richard Morris takes a close look at the Blade 180 CFX*



*Straight out of the box, the Blade 180CFX hovers for the camera*



*What you see is what you get – the model, battery and accessories, plus the all-important instructions*

**N**ow I believe it is fair to say that Blade helicopters have been one of the market leaders when it comes to miniature and indoor helicopters. They seem to have an uncanny knack of being able to introduce new machines at a remarkable rate and this has resulted in them having a comprehensive range of models. This range extends from simple fixed pitch models to state of the art miniature flybarless collective pitch machines, not to mention an array of contra-rotating models as well. With today's technology it is now quite difficult to distinguish in some cases between

indoor and outdoor models, with some of the small machines being more than capable of performing just as well outdoors. Where the Blade 180 CFX falls is probably open to debate, but there is one thing for sure and that is the fact it is, on paper at least, looking like it should have a stunning performance. So now is probably a good time to take a look at this new model.

#### **Nicely Presented**

The Blade 180 CFX is presented, as many Blade helicopters are, in a handy box with its own carrying handle and room

inside for a number of batteries and other accessories. As for the model itself, in my case the bind and fly basic version, upon opening the box there was the model, a plastic bag with the bind plug, an Allen key, a 3-cell 450 mAh LiPo battery and a small amount of Velcro. All that is required to get it flying is a suitable battery charger and a full range DSM2 or DSMX technology transmitter; this means a DX6i or higher.

Now let us turn our attention to the model. The main frames are carbon fibre, with both the motor and main shaft being supported with metal cross members. The metal frames that carry the main shaft also





double as the servo mounts for the cyclic servos. The metal main shaft is carried in two bearings, with the plastic main gear mounted on the main shaft beneath the lower metal cross member and driven directly from the pinion on the brushless motor, which is mounted in front of the main shaft. The battery plate is fitted on top of the main frame in front of the motor, which means the canopy has to be removed to change batteries.

To the rear of the main gear is an idler shaft, which carries a further pinion gear that is driven by the main gear and carries the drive to the tail torque tube through a pair of plastic bevel gears. This idler shaft is carried in the plastic tail boom case that fits between the main frames and into which is plugged the metal tail boom that carries the tail torque drive tube. This plastic case also carries the tail pitch servo. The tail gearbox is a simple open frame unit that carries two bevel gears and the all-plastic tail pitch change mechanism. The tail output shaft is carried on two bearings and terminates in the metal tail hub, which carries plastic tail blade grips, each supported on single bearings.

The swashplate is plastic, as are the main rotor head components such as blade grips and centre hub. The centre hub of the rotor head has integral control rod guides moulded in and supports the feathering spindle, on to which, the plastic blade grips are fitted, with each being carried by a single radial bearing and a thrust

race. There are carbon tail boom supports fitted between the main frames and tail boom. To the boom are fitted tail pitch control rod supports. The standard canopy is made from a Lexan type material, with a fibreglass version available as an optional extra.

### Avionics Fit

Moving on to the electronics, the brushless 5800 kV motor is controlled by a Castle Creations Talon 15 speed controller, which is programmable, although it comes ready to go in the 180 CFX. Moving on to the servos, cyclic control is taken care of by three Spektrum H2060 Nanolite digital rotary servos weighing in at just 4 grams and capable of producing 11.4 oz-in of torque at 6 volts, with a speed of 0.07 seconds for 60 degrees of movement and a Nanolite tail servo taking care of the tail. The receiver is the AR6335 6-channel, with AS3X flybarless technology and including advanced piro-compensation for unrivalled performance in a helicopter of this size. Again this unit also comes ready programmed.

Once the battery has been charged and your chosen transmitter programmed, as per the instruction manual, you are ready to fit the battery using the Velcro supplied, and bind the transmitter to your Blade 180 CFX. The binding procedure is standard, as it is for all models of this type, and once completed you should be ready to get flying.



*High performance cyclic servos are supplied as standard with the Blade 180CFX*



*The swashplate is controlled by the cyclic servos spaced at 120 degrees and mounted to the metal frame for direct control inputs*



*The plastic rotor head has integrated control rod supports and can be upgraded to metal, although they are more than adequate as standard*

### First Flights

For my first flight I chose to go outdoors. After the transmitter had been switched on, and with the model on an even surface, I connected the battery. You need to wait, without moving the model, once the power has been connected. This allows time for the receiver to initialise properly. Once this has happened you can fit the canopy and you are ready to fly.

After checking that the controls were operating in the correct orientation, I gently opened the throttle and in no time at all the rotor head was spinning. With small models such as the Blade 180 CFX you need to have the courage of your convictions and quickly lift the model straight into the hover. And that was exactly what I did. The Blade 180 CFX rose up and sat steady with very little input from me. Once it had settled I tried the cyclic controls, which were extremely responsive and exactly as one might expect from a model that claims to have 'Hardcore 3-D Performance'. I held the model in the hover and only moved it around a little for the first flight. Then, while the battery was charging for a second flight, I added a little exponential to the cyclic controls on the transmitter, just to calm things down a little.





The tail servo is mounted so as to give a direct but works



Tail gearbox and pitch mechanism is simple but works



Power comes from a 450 mAh battery and is sufficient for about three minutes of flying

With about 15% exponential added the model was much more to my liking, so I soon found myself flying around and at home enough to try a few loops and flips with the model in idle up. The little Blade 180 CFX certainly gets a move on and it would be all too easy to let this machine get too far away to see exactly what was happening.

Once back into the hover the model now felt much more settled, although the cyclic control is still quick, which is no doubt something to do with the high rotor speed. With the 450 mAh battery flight times are around three to three and a half minutes, so before the next flying session some additional batteries will be required.

### Conclusions

Blade seems to have done it again. Here is another small/micro helicopter with all the feel and performance of something much larger and more powerful! The Blade 180 CFX manages to hold its own outdoors, even in a light breeze and is small enough to be used in a sports hall or similar. Its strong construction should allow this model to survive quite well should it come into contact with terra-firma or anything else for that matter. This small helicopter is certainly not a toy and is probably their best small helicopter yet. **RCMW**



After the first flight some exponential was added to the cyclic controls



In the right hands the Blade 180CFX will do the book

### MODEL INFORMATION

**NAME:** Blade 180 CFX  
**DISTRIBUTOR:** Horizon Hobby UK  
**GUIDE PRICE UK:** £190 – £200

### MODEL SPECIFICATION

**MODEL TYPE:** Collective Pitch single rotor  
**CHANNELS:** 6  
**SWASHPLATE:** 120 degree CCPM  
**MAIN ROTOR DIAMETER:** 60 mm  
**MAIN BLADE LENGTH:** 154 mm

### MODEL WORLD DETAILS

**MAIN MOTOR:** Brushless outrunner 5800 kV  
**PINION SIZE:** 10 teeth  
**MAIN GEAR:** 104 teeth  
**TAIL DRIVE:** Torque tube  
**LENGTH:** 340 mm  
**WIDTH:** 60 mm  
**HEIGHT:** 130 mm  
**FLYING WEIGHT:** 190 g  
**BATTERY:** 450 mAh 3S LiPo  
**APPROX FLIGHT TIME:** 3 min



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## ELECTRIC AND INDOOR

**5th Mar, 2nd Apr, 7th May, 4th Jun '15**

### Waltham Chase Aeromodellers

Indoor R/C Small Models Meetings. Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. 7 pm to 9.30 pm. £4 for fliers and £1 for spectators. Fliers will be required to show proof of insurance. All models will be weighed before flight, and judged on their suitability for the venue on the evening. Alan Wallington, Tel: 01489 895157 or [www.wcaero.co.uk](http://www.wcaero.co.uk)

**7th Mar, 4th Apr, 2nd May, 6th Jun, 4th Jul, 3rd Oct, 7th Nov, 5th Dec '15**

### Indoor Fun Flying at Furze Field 2015.

Furze Field Sports Centre, Mutton Lane, Potters Bar, Herts EN6 3BW. 6 pm until 10 pm. Flyers £8, spectators £2. Contact Mike Quille, Tel: 020 8500 3549 or Email: [mp.quille@live.co.uk](mailto:mp.quille@live.co.uk)

**8th Mar '15**

**2015 BMFA** South Eastern Area 40th Crawley indoor meeting. K2 Leisure Centre, Pease Pottage, Crawley, West Sussex, RH11 9BQ. 11 am to 6 pm. Regret no R/C. Lots of comps and plenty of fun flying time. Please contact Competition Sec CADMAC: John Dart, Tel: 01293 420830, [johndart17@aol.com](mailto:johndart17@aol.com) or [cadmac.org.uk](http://cadmac.org.uk)

**14th Mar '15**

### Waltham Chase Aeromodellers

Indoor R/C event. Main Hall at Havant Leisure Centre, Civic Centre Road, Havant, Hants PO9 2AY. 7 pm to 10 pm. Free-flight models may not be flown at these meetings. £7 for fliers and £1 for spectators. Flyers will be required to show proof of insurance. Alan Wallington, Tel: 01489 895157 or [www.wcaero.co.uk](http://www.wcaero.co.uk)

**14th Mar, 11th Apr, 10th Oct, 14th Nov, 12th Dec '15**

**North London MFC** Indoor Radio Control Meetings 2014. Furze Field Sports Centre, Potters Bar, Hertfordshire EN6 3BW. Saturdays, 6 pm to 10 pm. All up weight for fixed wing 225 g, 36" span and helicopters 400 g. BMFA insurance required. Flyers £9, spectators £2.50. Contact Peter Elliot, Tel: 01707 336982

**14th Mar, 18th Apr, 30/31st May, 27/28th Jun, 25/26th Jul, 30th Aug, 26/27th Sept, 17/18th Oct '15**

**BMFA F3B** League Events (plus Speed Comp & Nationals). For more information and entries to Clive Needham, 0161 2843143, Email: [l.needham7@ntlworld.com](mailto:l.needham7@ntlworld.com)

**21st/22nd Mar, 25th/26th Apr, 30th/31st, 27th/28th, 26th/27th Sept**

**Waterplanes at Ullswater** (Windermere Model Waterplane Flyers), contacts: George Carpenter on 01524 782272 or [gcarpenter@btinternet.com](mailto:gcarpenter@btinternet.com), Colin Smith 01524 762282. Proof of insurance essential.

**28th Mar '15**

**Waltham Chase Aeromodellers Indoor R/C event.** Main Hall at Fleming Park Leisure Centre, Passfield Avenue, Eastleigh, Hants SO50 9NL. 7 pm to 10 pm, except December event, which is 2 pm to 5 pm., Free-flight models may not be flown at these meetings. £8 for fliers and £1 for spectators. Fliers will be required to show proof of insurance. Alan Wallington, Tel: 01489 895157 or [www.wcaero.co.uk](http://www.wcaero.co.uk)

**28th Mar '15**

**BMFA Scale** Indoor FF Trimming Meeting, The Bushfield Leisure Centre, Orton Centre, Peterborough, PE2 5RG, 10 am to 6 pm. Free flying, but priority given to Scale Indoor FF Nats entry trimming. Flyers £15, spectators welcome, contact: Andy Sephton ([andrewjsephton@gmail.com](mailto:andrewjsephton@gmail.com) or 07872 625279)

**19th Apr '15**

**BMFA Scale** Indoor FF Nats, Note New Venue – University of Wolverhampton Sports Centre, Gorway Road, Walsall, West Midlands WS1 3TA, 8 am to 6 pm. Open Rubber, Kit Scale, CO2/Electric, Peanut, Pistachio, Glider, Air Race, Mass Launch. Pre-entry only – contact organiser. Spectators welcome £6.00, under-18 yrs free entry. Contact: Andy Sephton ([andrewjsephton@gmail.com](mailto:andrewjsephton@gmail.com) 07872 625279)

## GENERAL

**1st Mar '15**

**Beverley and District Model Aircraft Club Spring Swapmeet**, at Tickton Village Hall, near Beverley HU17 9RZ, 9 am till 12 noon. Entry £1, Tables £5. Contact Brian Jenkins [2bee.jays@live.com](mailto:2bee.jays@live.com), 07970 959875 or [www.badmac.btck.co.uk](http://www.badmac.btck.co.uk)

**4th Mar '15**

**Phoenix MAC** NW Area Spring Swapmeet, at Deanwater Hotel, Wilmslow Road, Woodford, Cheshire SK7 1RU (on the A5012 Wilmslow to Poynton Road). Doors open 7.30 pm, Table Holders 7 pm (tables at £3 each). Comfortable seats and bar, meals available in restaurant. Contact Terry Mason 0161 439 3816 or 07950 052039, or email: [pmaccheshire@aol.com](mailto:pmaccheshire@aol.com), with name, telephone number and number of tables required.

**7th Mar '15**

**Brightlingsea MFC** Swapmeet. Alresford Village Hall, Ford Lane, Alresford, Essex, CO7 8BL. 9.30 – 11.30 am. Entrance £2, tables £3 (set up from 9 am). Contact Bob Goodenough for info and pre-booking tables (essential), Tel: 01206 303749 or [www.forjac.co.uk](http://www.forjac.co.uk)

**8th Mar '15**

**Retford Model Flying Club** Spring Swapmeet. At the Babworth Road Sports & Social Club. Babworth Road, Retford, Nottinghamshire DN22 7NJ. Table set up from 9.30 am (small table £4 book in advance, £5 on the day. Large table £6 or £7 on the day) includes 1 helper. Doors open

10 am – 1 pm, Admission £3. Hot sandwiches, tea and coffee available from 10 am. For further information and bookings contact, Chris: 07966 764803, Gerald: 07941 867130. Website: [www.rmfc.org.uk](http://www.rmfc.org.uk)

**20th Mar '15**

**DADMAC** Auction at Chivas Community Suite of Dumbarton Football Club, Castle Road, Dumbarton. Book-in items from 5.30 pm, Auction kicks off at 8 pm. Entry fee, but no commission on sales. Trade stands, exhibits, bar/bar snacks available. Auction forms available on website: [www.dadmac.org.uk](http://www.dadmac.org.uk) Contact: Maurice Irvine, 01475 689711

**22nd Mar '15**

**The Great Southern Model Auction** at Mountbatten School, Romsey, Hampshire, SO51 5SY. The doors open at 9 am, auction starts at 11 am. Entry £5, under 16s free. Refreshments available. Minimum lot £10. Pre-booking of auction lots is strongly recommended, contact Paul on 07500 175897. See [www.hmfa.hampshire.org.uk](http://www.hmfa.hampshire.org.uk) for more details

**22nd Mar '15**

**Horam Model Swapmeet**, at Horam Village Hall situated on A261 (Post Code TN21 0JE), 10 am till 4 pm. All proceeds to go to Kent, Surrey, Sussex Air Ambulance. Refreshments available. Tables £7 Admission £4, table bookings contact Robert Richardson 01825 762372, [rob.richardson@talktalk.net](mailto:rob.richardson@talktalk.net) or T.Inman 01892 652734

**3rd Apr '15**

**Watton Radio Model Club** Bring & Buy, at Hingham Social Club, Watton Road, Hingham NR9 4HB. Seller from 5.30 pm. £5 per table additional helpers £1. Doors open 6 pm entry £1. Bar open, refreshments available. Contact Martin Pawsey 01953 883892, [martin.pawsey@btinternet.com](mailto:martin.pawsey@btinternet.com)

**4th Apr '15**

**GBR/CAA F3A** League competition. Skelbrooke. All schedules. See [gbrcaa.org](http://gbrcaa.org) then for Competition News' for details and 'Forum Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Bob Rowland on 07969 456441 for details

**11th/12th Apr '15**

**PSSA Fly-In**, The Great Orme, Llandudno, meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members – proof of insurance required. Usual 'Fly for Fun' format. For more information contact Phil Cooke on 07772 224719 or email: [webmaster@pssaonline.co.uk](mailto:webmaster@pssaonline.co.uk)

**12th Apr '15**

**Ash Park MFC** Annual Model Auction at South Molton Community College, signposted from A361. Light refreshments are available, doors open for sellers at 9 am, public at 9.30 am, auction at 10.30 am. Entrance £1.50. Telephone John Newman 01237479575 or email [john.new@talktalk.net](mailto:john.new@talktalk.net)



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# THE SPORT CHANNEL

## This Month's Wise Words

It's not often we have to call upon him for a column header; just as well he doesn't get a percentage! Well, it doesn't seem all that long ago that I was in the difficult position of having to produce two editions of this column in the midst of a house move.

Back then, I sat here, surrounded by a mountain of boxes and bags, all waiting to be carefully unpacked and I pondered on the fact that at the time the majority of my possessions were aeromodelling-related. My gallant work-party of good friends who helped me move found it most amusing and perplexing.

How, they wondered, could one individual amass so many curious possessions, some that were obviously little used and where did they all come from anyway? I had to admit, I hadn't a clue.

As I write this edition of SC, I am faced with yet another move; in fact by the time you read this, I will be in my new residence, most likely about to embark on that long, wearying unpacking process once more.

All my modelling activities have temporarily ground to halt while I'm preparing to ship out, but as I've emptied my spare room and shed, I've uncovered projects that I promised myself I would finish when I first moved in here. I guess good intentions only get you so far sometimes!

To all readers waiting for communications by post, please be patient while I deal with the inevitable chaos of this move. Email should be relatively unaffected.

## Rapide Progress

Five years ago I ended up in Cheltenham General Hospital over the Xmas and New Year holidays, for two weeks, with a serious illness. It was a truly grim time, but thanks to the doctors and staff there I was at least able to walk when I left (something that wasn't fully assured when I was first admitted!).

For most of my stay I was not very mobile and spent my days reading the same small pile of model mags and paperbacks, and writing my notes for this column.

One day, I eavesdropped on a conversation a couple of beds down the ward from mine. Two fellow inmates were having a general chat, but I noticed one of them dropping in an occasional very intelligent and informed remark about aircraft. A little later, as I hobbled down the ward, I introduced myself to my near neighbour and mentioned that I'd overheard him talking about aviation.

He asked me what my interest was and when I mentioned aeromodelling he exclaimed, "I used to be a modeller back in the 1960s!" My companion turned out to be David Jessop from Bishop's Cleeve near Cheltenham. He'd been a very keen modeller in his youth and had tried most

"...MY MOVING FROM  
HENCE TO THERE  
MAY BE BLESSED..."  
(SOCRATES)



*Beautiful DH-89 Dragon Rapide built jointly from the Dumas kit by David Jessop and Roger Roberts of the Prestbury Park MFC in Cheltenham, Glos. SC claims some credit in David's return to the modelling fold!*

things. Work, travel and other hobbies had then taken precedence in later years.

Our long, regular chats over the following few days made my stay in the ward more bearable. David was eager to hear how the hobby had developed and sharing much of my own 'traditional' modeller's background, found the technical innovations of the intervening years astonishing.

I lent David a few of my magazines and promised to keep in touch once we'd been discharged. I left hospital first and began a correspondence, sending him frequent packages of mags and plans CD's. In subsequent months, it became obvious that David was contemplating a return to the hobby.

Sure enough, David joined a local club, the Prestbury Park MFC and learned to fly



on an assortment of ARTF's and foamies. Under the PPMFC's tuition, he made good progress and proved to be a 'natural'. I now meet up with David quite often at one of our winter indoor venues, where he flies heli's, quadcopters and 3D aerobatic models!

David is also enjoying his return to building models. His first R/C scale project is of one his favourite full size subjects, the De Havilland DH-89 Dragon Rapide. Made from the 42" span Dumas kit, the Rapide is a joint venture with fellow PPMFC member Roger Roberts who built the airframe.

David writes: "My DH-89 is finished apart from the rigging wires and links joining the ailerons on the top and bottom wings on each side. I did most of the covering and applied the decals with training and guidance from Chris Reid, also from PPMFC.

The models markings and finish are taken from HG 691 based at Duxford. You will find many pictures of this aeroplane if you Google 'hg691 images'. The model is powered by twin DC motors and a single DC speed controller, supplied by a 2-cell, 1450 mAh LiPo."

A magnificent job, David, I look forward to seeing the Rapide flying one day. It's really heartening to know that I may have played a small part in bringing you back to our hobby.

The long-established Dumas company have taken great strides in their kitting over recent years and offer an impressive range of built-up 'stick & tissue' style F/F and R/C models, featuring superlative laser-cutting throughout. I will unashamedly admit some bias here, as I have their WACO CG-4A troop glider kit awaiting construction and R/C conversion. A web search will find several Dumas outlets in the UK and a look at the company's own website will just make you want to start building. See if I'm right...

### Fleet Gallery (The Long-Distance Aeromodeller)

Our ongoing quest for photos of model fleets has revealed exceptional levels of variety, quantity and quality in our readers' output. We've just heard from Bryan Passey, who not only far exceeds our regular criteria for an 'all-rounder' aeromodeller, but pursues his interests under what can only be called challenging conditions.

Bryan mailed: "I've enclosed some photos of some of my efforts. They are control line scale (Mosquito), my pulse jet powered speed model, together with others including Rapier powered F/F models. There are others like the control line Halifax and at present I am building a West Wings Tempest V for freeflight rubber, a precursor for a control line Vickers Viscount, just to keep me busy over the winter.

Living as I do on the west coast of Scotland in a small town named Lochgilphead, there is only one other modeller and my local club, if you care to call it that, is a round trip of 170 miles and the nearest model shop 180 mile round trip!

Much of my flying is done at what was RAF Machrihanish on the Mull of Kintyre – another 110 mile round trip, so I tend to



**Above:** Just a small selection from the varied fleet of Bryan Passey (right) from Lochgilphead, Scotland. How about C/L scale – Mosquito and Halifax, R/C – one of the Southerner family, I think and F/F scale – Rapier powered DH 110. Bryan's a prolific builder and flying sessions involve a long haul (see text)

build more models than fly them, but when I do it's a case of a car full of models, free flight and control line!"

I think SC's readers will surely join me in admiring Bryan's dedication and the diversity of his models. He sent in far more images than we could run in one edition; we'll try and show you some more eventually.

Keep your fleet pics coming in (those winter builds should be nearing completion, no doubt). And if you build/fly/shop under difficult conditions, we'd love to hear your personal stories.







Another tiny sample of Bryan Passey's vast output. Twin Rapier SARO A/1 flying boat, F/F Keil Kraft Pirate, C/L scale Wyvern and pulse jet speed model! Brian also flies a couple of scale C/L pulse jets, which we must show you another time...



### Return of the Giant FROGs...

A small, coincidental link to the aforementioned stay in hospital came in as this edition was being written. The first model building project I began when I came out of hospital was a FROG 'Wren', a 25" span twin-finned freeflight towline glider, kitted in the early 1950s and a subject I'd long fancied building, having missed out on the FROG range the first time round.

My Wren turned out surprisingly well, considering that most of it was assembled on a wobbly building board propped up on my sickbed. It proved to be a nice little flyer and is still around today with very few repairs and patches.

The long defunct British FROG brand has enjoyed a long overdue rebirth in recent years thanks to the Internet and plan download sites such as Mike Stuart's outstanding House of FROG.

Repro kit manufacturers have also been helping to revive FROG favourites with modern production methods. Local pal

Simon Rogers mailed to say that he'd just finished a scaled-up, 36" span version of the Wren, from Derek Foxwell's well-respected 'Old School Model Aeroplane Factory'.

Simon reports that the kit was a pleasure to build, having completed it at the beginning of last winter. At the time of writing, the Wren hadn't been tow-launched, but a few test-glides showed that whereas the original FROG design was a nice enough sport model, this bigger brother had serious gliding potential and the last time I heard from him, Simon was talking about fitting a dethermaliser.

Whilst looking into other current sources for FROG designs, I chanced upon Brankit, a manufacturer who produces a range of Vintage/Nostalgia kits which feature some FROGs (including a 25" and a 30" span WREN) and subjects from other popular ranges in standard form, plus some enlargements and reductions. Have a look at these fine kit lines and tell them SC sent you.

### Game Not Quite Over?

Thanks to the gentleman who mailed in to respond to our item last time on the predicted demise of model flying within the next ten years. My correspondent wrote, "I do hope that the hobby won't be closed down just yet – the next two or three big builds I've got lined up will take at least a decade! Can you have a word, please?"

Contributions, please to The Sport Channel c/o the Traplet Publications address.

All Email correspondence to:  
gray\_rcmag@hotmail.com **RCMW**

### CONTACTS

#### Dumas kits:

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

#### Old School Model Aeroplane Factory (email):

[derekfoxwell@btinternet.com](mailto:derekfoxwell@btinternet.com)

#### Brankit:

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



Already showing promise and threatening O.O.S performance, Simon Rogers' 36" scale-up of the FROG 'Wren', from the Old School Model Aeroplane Factory kit



Couldn't resist including this one! Gloucestershire reader Graham Crawshaw was given this venerable Cambrian 'Pioneer', which he proceeded to renovate and get back in the air with electric power. Cute Bleriot-style 3-channel sport model was a great favourite in the 70s and early 80s. Did your club have some?



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# NEXT ISSUE

## Novice E



Here's one for Sid King fans, or simply those of you who want a simple, no frills sport model for some relaxing club flying. Long standing modellers may think that they have seen Sid's latest electric design before, and there's some truth in that. This truncated version is based on the Cotswold Kits 'NOVICE', which was Sid's first ever kit. Billed as 'The Plane With NO VICES' it went on to sell over four thousand kits

## Bebop Drone



It has been a while since we went to the press preview of the Bebop Drone in Florida, which is the latest quadcopter from those inventive folks at Parrot. And now we are fortunate to have been given a sample from the first shipment to test. This new drone comes with a novel Skycontroller to hold the smart device used to control the drone. It features R/C style joysticks, so it should be much more intuitive for R/C pilots to fly. We shall let you know...

**APRIL 2015 ISSUE ON SALE THURSDAY 19TH MARCH**

## Cutting A Spitfire Foam Wing



After Chris Freeman displayed his latest 1/6th scale Spitfire on a South African R/C website he was asked how the foam wing was made. Anyone who has hot cut their own foam wings will know that cutting out useable blanks of the Spitfire's tapered elliptical wing is no easy task. So sit back and find out how Chris did it!

**PLUS...**

More features, columns and reviews from across the complete spectrum of the R/C model-flying hobby

All contents are subject to change without notice

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