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# Contents

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**FRONT COVER**

Fly off land or water with this 1:53 scale Thurston Teal flying boat, designed by Laddie Mikulasko for a 700 W (1120 KV) brushless motor or a .45 IC engine and four-function R/C. Water handling is excellent and when power is applied the model comes up on the step in less than 20 to 30 feet. The model is an excellent flier and with its thick wing it handles more like a trainer. Turn to page 36 to read the first part of Laddie's build report

## REGULARS




## REVIEWS



## FEATURES







# Pre-flight


**Kevin Crozier**
**Editor** | Radio Control Model World
Contact me either by post:
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Traplet Publications Ltd
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Malvern WR13 6NN. UK
or email: rcmw@traplet.com


Welcome to the November issue of RC Model World.

Despite the ongoing trend to instant gratification in aeromodelling, which has manifested itself most recently in the bewildering array of moulded foam, 100% ready to fly model aircraft (not that there's anything wrong with those – I'll fly anything with wings or rotor blades!), it's pleasing to see that traditional all wooden kits are starting to make a strong comeback.

Indeed most of the most recent models that we have received for review have been of this type, starting with the Cambrian Model Company's 'Elan 100' glider that was featured in the last issue. This month we are pleased to bring you a full build report on another polyhedral all-built up glider, this time electric powered, in the form of aeronaut's lovely little Luxx sailplane. And soon we will be following that up with another somewhat larger glider from the aeronaut stable, their magnificent Bergfalke. Just in is a neatly CNC cut Fokker DVII from the Super Flying Model range, distributed by Ripmax, and a true classic all-wood sailplane from DynaFlite (no prizes for guessing which one!) is also on the building board.

The only problem with traditionally built models is that they take a bit more time to assemble than an ARTF, which is fine for most modellers as they can take a few months (years in some cases!) to glue all the parts together, but our review models need to be built a bit quicker than that. So please bear with us as our review team complete the various wooden wonders that have been allocated to them.

Okay, so you now know the name of one of this month's review models (the Luxx), but our other test kit relies on those most modern of building materials – EPP foam and carbon strip! The Shake from Hacker Model Production is the perfect practice plane for indoor aerobatics and Mark Wilcockson has given it a thorough shake-down, having flown it through all the current F3P based schedules.

Staying on the topic of indoor aerobatics, those of you who like to make your own 3D models for use in the local sports hall will enjoy assembling an Arrow Pylon Racer from our free pull-out plan this month. Pedigree wise they do not come much better than this design, which has been penned by none other than top international F3P pilot Donatas Pauzuolis. Back to more traditional builds, our feature plan this month is the Thurston Teal, a 1780 mm wingspan scale amphibian by renowned model designer Laddie Mikulasko, which flies great either from land or water.

Highlights from our other features include an interesting article on Simulated Contra-Rotating Propellers by David James, who describes how he made a dummy second propeller for his scale Fleet Air Arm aeroplanes. We also have an interesting article on the make up of the oils used for the petrol/oil mixtures that power 'gas' powered planes, courtesy of chemistry guru John Bristow of Deluxe Materials fame.

Add on a few 'Flight Line' reports from the second round of the Traplet Scale meeting on the Wirral, the Lleyn fly-in for power scale soarers and Frank Tiano's 'Top Gun' scale invitational in sunny Florida, and I hope that you'll agree that we've lined up a very good read for you.

So, until next time...

Happy flying!

Kevin


RC MODEL WORLD

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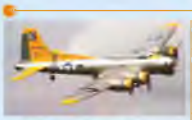

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# Take Off R/C News and Views

**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**

## Traplet Plans Range Expands

Just in is some exciting news from the Traplet Plans & Parts Service:

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## Pipedream Elevator

Mike White, designer of the Pipedream flying wing that was the subject of our free pull-out plan in the September issue, writes:

*"Dear Kevin*

*I have had a call from one chap who is building the Pipedream, up here in Ramsey, who tells me that the build of the elevators is confusing. Luckily he has not started on the wings but it seems that there is confusion between the foam and built up versions, for which I offer my apologies. The side view of the elevators (under the wing) on the plan is correct but the description of how to do it IS confusing.*

*To clear things up...*

*The build of the elevators for both foam and built up wings is essentially the same. They are built flat on the plan in the correct orientation, with the exception of the 1/64 ply item. Each elevator is now changed to the opposite wing and the 1/64 ply is glued to the now bottom surface. This will provide the required reflex."*

Thanks, Mike, for clearing that up for anyone building a Pipedream.

In a separate email, when we asked Mike for an alternative source for EPP foam to allow readers to build clones of his Zortayak from June's free plan, he came up with recommendations for both Sussex Model Centre and Robotbirds. The EPP stocks for both retailers can be found at the following pages of their websites:

**www.sussex-model-centre.co.uk/shopexd.asp?id=39820**

**www.robotbirds.co.uk/default/building-materials/foam-epp-and-geldipac.html**

# BMFA Scale Nationals

Following a review by the Commandant of RAF College Cranwell, who, acting on advice received from the Lincolnshire Event Safety Partnership, decided to decline permission for the BMFA to use Barkston Heath for the 2016 Power Nationals, most of the individual disciplines normally represented at 'The Nats' had to organise their own National Championships on alternative dates and at different venues.

Next month we will be catching up on the action at the F3A Aerobatic Nationals, courtesy of Keith Jackson, but in the meantime here are the results of the R/C Scale events. This took the form of a two day event at RAF Honington, tagged onto the end of the RAF Model Aircraft Association (RAFMAA) Championship flying week on 30/31st July. Our thanks go to Chris Allen, Contest Director, for this information and pictures.

The BMFA say that they are hopeful of seeing a return to RAF Barkston Heath in the future.

### The winners of Flying Only

| Pos | Name | Model | BMFA | Flight 1 | Flight 2 | Flight 3 | Total | Norm% |
|---|---|---|---|---|---|---|---|---|
| 1 | MIKE SOLLITT | RYAN-STA | 42682 | 1626.5 | 1531 | 1630 | 3256.5 | 100.00 |
| 2 | IAN PALLISTER | PIPER J3 | 86453 | 1575.5 | 1592.5 | 1601.5 | 3194 | 98.25 |
| 3 | JOHN THOMAS | CLIPPED WING CUB | 35245 | 1390.5 | 1278.5 | 1395 | 2785.5 | 85.58 |
| 4 | ALEX KENNEDY | TAYLOR CRAFT RC12 | 167787 | 1354.5 | 1260.5 | 1338 | 2692.5 | 83.10 |

### The winners of Stand–Off Scale

| Pos | Name | Model | BMFA | Flight 1 | Flight 2 | Flight 3 | Static | Total | Norm% |
|---|---|---|---|---|---|---|---|---|---|
| 1 | JIM REEVES | BRISTOL MC1 | 80379 | 1550 | 1559.5 | 1577 | 1832.0 | 4968.5 | 96.75 |
| 2 | JIM McCALL | SPACEWALKER | 184108 | 1578.5 | 1573 | 1429.5 | 1604.0 | 4755.5 | 96.84 |
| 3 | MARTIN FARDELL | RYAN BROUGHAM | 68822 | 1417.5 | 1297.5 | 1058.5 | 1496 | 4211.0 | 86.96 |

### The winners of F4C

| Pos | Name | Model | BMFA | Flight 1 | Flight 2 | Flight 3 | Avg of best two scores | Static | Total | Norm % |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DAVE WOMERSLEY | DH CHIPMUNK | 32449 | 1706.0 | 1700.0 | 1761.5 | 1733.75 | 1884.0 | 3617.75 | 97.78 |
| 2 | DAVE KNOTT | HURRICANE MK1 | 47166 | 1759.5 | 1771.5 | 1801.5 | 1786.50 | 1811.8 | 3613.00 | 100.00 |
| 3 | MICK HENDERSON | AIRCO DH9A | 128762 | 1710.0 | 1665.0 | 1612.0 | 1687.50 | 1869.8 | 3557.30 | 94.92 |
| 4 | STEVE JACKSON | AVRO 504K | 36868 | 1681.5 | 843.5 | 1632.0 | 1656.75 | 1749.0 | 3405.75 | 93.34 |
| 5 | DAVE TOYER | TIGER MOTH | 75095 | 1575.5 | 1569.5 | 1466.5 | 1572.50 | 1727.0 | 3299.50 | 87.45 |
| 6 | MICK REEVES | SOPWITH STRUTTER | 15674 | 1501.0 | 1474.0 | 1481.5 | 1491.25 | 1742.2 | 3233.45 | 83.32 |
| 7 | RICHARD CRAPP | WESTLAND WESSEX | 52698 | 1562.0 | 1534.0 | 1531.5 | 1548.00 | 1625.0 | 3173.00 | 86.71 |
| 8 | TERRY MANLEY | BLACKBURN SPRAT | 11235 | 610.5 | 0 | 0 | 305.25 | 1547.0 | 1852.25 | 33.89 |

# Transatlantic Slip Up

Regular correspondent and contributor, George Stringwell writes to correct an inadvertent error in our recent Spirit Flight article:

*"Dear Kevin*

*I really enjoyed Mark Wilkins account of the building and flying of the Ryan NYP replica in the September issue. However, I fear that Mark's understandable enthusiasm for Lindbergh's remarkable achievement led to him making a historically incorrect statement, viz: "....the Spirit of St. Louis was his ride for what he hoped would be the first transatlantic flight in all of history."*

*Whilst Lindbergh's flight was the first SOLO transatlantic flight, and the first between the North American mainland and continental Europe, it certainly wasn't the first non-stop Atlantic crossing. If we discount the lighter than air flight of the airship R34 in 1919 and the multi-stage Curtiss seaplane flight in the same year, we are left with the first direct non-stop heavier than air crossing by Captain John Alcock (pilot) and Arthur Whitton Brown (navigator) in a Vickers Vimy on the 14-15 June, 1919 between Newfoundland and Ireland, almost eight years before Lindbergh's flight.*

*This is not to detract from or belittle Lindbergh's achievement, but I feel that due credit needs to be given to Alcock and Brown for an equally remarkable achievement without the benefit of the technical development and improvements which took place in aeroplane and engine design in the years between their flight and that of the Spirit of St. Louis."*

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# Shake

**Mark Wilcockson assembles Hacker Model Production's latest EPP indoor model and puts it through all of the F3P schedules**



It's all supplied in one of Hacker's trademark slim red boxes


Shake caught in a rare moment of upright flight

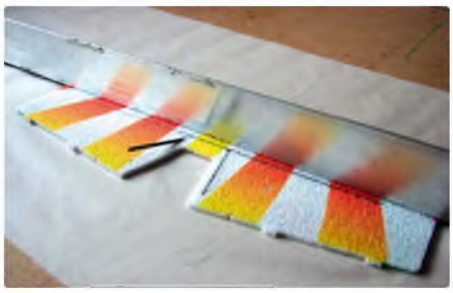

A quick look at all the parts before the build commences

Indoor precision aerobatics, officially known as the F3P class of competitions, has an active league in the UK, with a growing number of younger and highly skilled pilots joining each year. The league is split into four competition classes, with F3P C being the entry class and the manoeuvres getting progressively harder through B, B+ and A. F3P A is the international class, with World Championships being held every two years.

I have competed in the league for the past three years, progressively moving through the classes. The 2015/2016 season saw me taking the decision to move from the B class to A, skipping B+. It's quite a big step up (hence why B+ was introduced) and rather than risk damaging my competition plane, where one crash could see the airframe written off, I used an EPP practice plane, which was more robust and saw me making the transition successfully.

Hacker Model Production's introduction of an F3P plane, the Shake, made from 4 mm EPP is an ideal opportunity for anyone wanting to try competition flying without the expense and risk of buying a highly fragile Depron airframe. And whilst reviewing the model I will give some building tips and set up ideas, before testing it on the schedules.

Make sure the control surfaces are flexible by folding them over and weighing them down for about an hour



Carbon reinforcement is key in EPP models

A dropper bottle was used to accurately control the amount of glue used


Make sure it is flat by weighing down the main components


Adding the underside of the fuselage, using some aluminium angle (from B&Q) to make sure it is square

Aluminium angle on both sides of the fuselage keeps things straight whilst the carbon rod reinforcement is added


Every drop of excess glue counts so remove any surplus with toilet paper

Weight is the enemy of a F3P pilot. Hacker specify a ready to fly weight of 140 g+ and I will try to build within this. One option for saving weight (7 g) is a lighter motor than has been supplied for the review, with Hacker suggesting a Master Force 2809YT-17 for a lighter set up, and I would recommend this route. Whilst most competition planes are made of Depron or carbon, and weigh between 100 and 42 grams for the C and B schedules, this weight disadvantage should not be too critical.

For anyone who has built a 'Shock Flyer' type model before the build of the Shake will be familiar. On opening the box the quality of the kit is apparent, with quality cut EPP parts that we have come to expect. A bundle of carbon, all cut to size, and a small bag of smaller parts completes the kit.

For the review Hacker supplied a Master Force 2812CA-27 motor and Master Force 6 amp speed controller, which will spin an 8 x 4.3 inch propeller.

Hacker specify 5 or 6 gram servos for the control services and I used Dualsky 4.8 g servos for the elevator and rudder, with a more powerful 8 g Graupner C131 servo for moving those huge ailerons.

## Construction

Precision aerobatics require a well built and straight aircraft, so make sure your building board is straight and true before starting. I use an aluminium angle from B&Q for making sure parts are square and have several pieces of differing lengths to get into awkward places.

The build starts with reinforcing the elevator with three pieces of carbon strip into pre cut slots. Note here that the manual incorrectly lists the longer strip as part 30; it should be 31 but is easy to spot when you line the parts up. The carbon is introduced into the slot and if necessary ease it slightly to make sure it's fully embedded before it's secured with cyano and kicker. The cyano does not have to be foam safe.

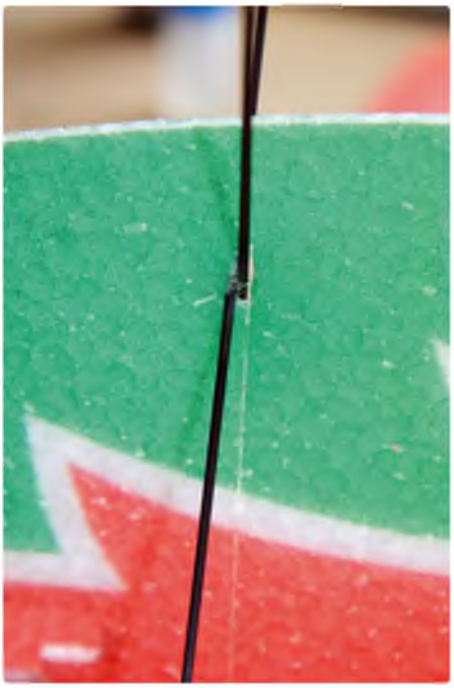
In F3P it's all about the weight and whilst it's not going to be critical in this build you may as well use best practice when gluing for when you progress to lighter models. It's amazing how much weight glue can add to a finished model. So to more accurately control the amount of cyano being used I use some small dropper bottles with metal nozzles, available from that famous auction site.

When gluing in the carbon use the nozzle to put a dab of cyano on both sides of the carbon about every 1.5 cm apart, rather than put a bead all the way along. Then, to ensure any surplus glue is removed, I use the edge of a piece of toilet roll to soak up any excess glue. It may seem extreme but it works.

After the tail is reinforced it is attached to the fuselage, followed by the wings. It only takes a few minutes using cyano and the parts fit together well, and are straight. Further carbon reinforcement is added across the wing. Make sure this is well embedded in the slot as later it will be crossed with some carbon rod when the fuselage is reinforced in the next step.


Testing the electrics before installation

Wing reinforcement is typical of indoor planes



The undercarriage is reinforced with Kevlar thread


The servos are installed before the top fuselage is added. Vertical carbon strip is about to be glued in to align the two vertical fuselage halves


First glue to the lower surface then use the strips to make sure the top is vertical

More checking before the glue is added

As with most indoor planes the lower fuselage is added next and using my aluminium angle it's easy to make sure it is square down its full length. Dabs of cyano secure it in place, working on one side at a time with the angle on the opposite side. With both pieces of angle in place the main wing struts are added in the form of 1 mm carbon rods between the bottom of the fuselage and the main deck. These fit nicely into the pre cut slots.

Final reinforcing is done using 0.8 mm carbon rods, which zig-zag down the fuselage. Take care here as the measurement given in the instruction booklet came out short for most of these lengths, up to 5 mm in some cases. So measure for yourself before cutting.

Finally, before turning over, the undercarriage rods are added. Where they cross in the lower fuselage, I tied them together with Kevlar thread as this is quite often a point of failure. However, if you don't have Kevlar some ordinary thread will do the job nicely.

Now it's onto the top. This is always harder as it's difficult to support the fuselage due to the carbon reinforcements and the undercarriage. However, it's still straightforward. The servos are glued into place after adding the extra long servo arms, as shown in the manual. It's easier to add the pushrod connectors before the servos are fastened in place.

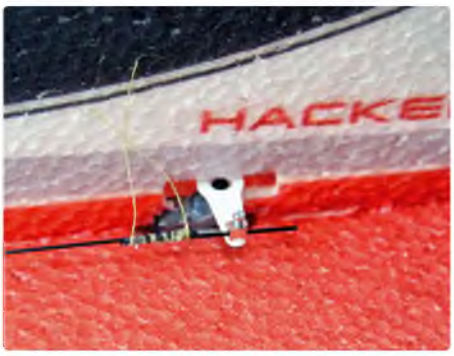
Add the top fuselage, making sure it is square. Two carbon strips fit into slots pre-cut in both the bottom and top, passing through the deck to aid this process, and they can be seen in photo 46 of the manual. Finally, the rudder section is attached to complete the main construction part of the build.

Now it's time to connect up those control surfaces. The control horns are glued into the pre-cut slots before attaching the carbon pushrods. The method of gluing metal Z-bends to the carbon rods and reinforcing the joints with heat shrink is well recognised and provides a secure fix, as long as you remember to sand the end of the rod first to give the cyano something to key into.

When fitting the elevator pushrod it was disappointing to find that the supplied length was about 5 cm short. Not having any spare carbon rod of the right size I had to join a piece of offcut using Kevlar thread and cyano; not ideal but effective.

The final stage is to add the motor and appendages in the form of the canaliser, side force generators and airbrakes. Shake now looks like an F3P model.

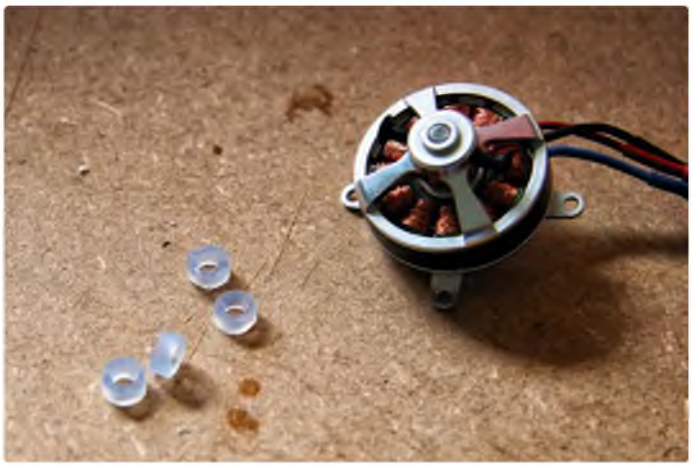
Pushrods partially assembled



The elevator pushrod was a little short and needed a fix

Keep the control surfaces straight whilst fitting the pushrods

The pushrods are supported down the length of the fuselage



Grommets made out of fuel tubing were used to aid thrust line adjustment. The grommets can be seen clearly in the final assembly

## Set Up

To allow any thrust line changes that may be required during flight testing I added 3mm pieces of fuel tubing between the motor and the mount on the plane. This allows fine adjustments to be made using the mounting screws.

Whilst the manual has surface throw recommendations, I usually set the throws at the maximum possible and then apply 80% or 90% expo. This makes them soft enough for test flying whilst making sure you have plenty of movement to call upon if needed. They can always be turned down later, as required.

To aid braking I set up switch so that when I am ready to take off the propeller is spinning slowly when the throttle is fully pulled back. In downlines the slow rotation acts as an additional braking surface. Give it a try – it really works! Although you do need to experiment to find the ideal rotation speed.

Finally, all that's left to do is set the Centre of Gravity by adjusting the battery placement. I set this in accordance with the manual at 235 mm from the motor mount. Ready to fly the Shake, complete with a 240 mAh battery, weighed 137 g.

## Test Flights

It was surprisingly hard to get access to a good hall for flying during the summer. Our usual sports hall was fully booked by footballers and cricketers. Eventually we settled on a small gym that we had used before in the knowledge that it was a bit tight for flying the F3P schedules.

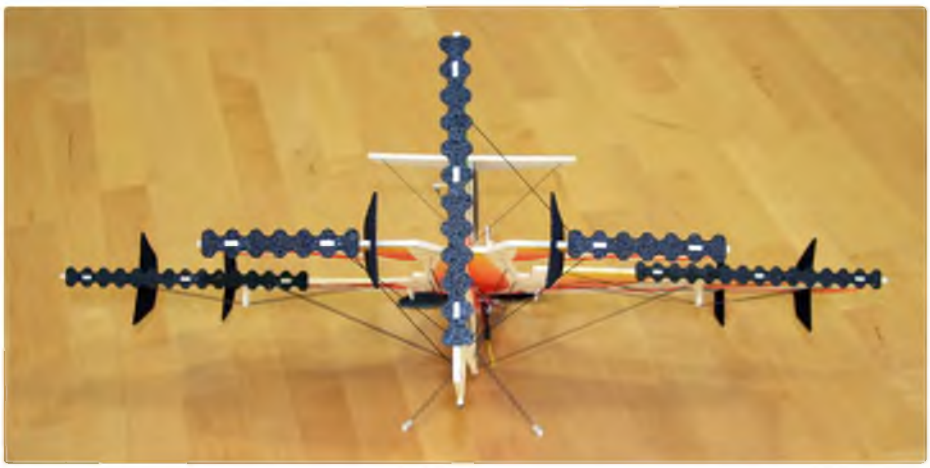
Adding a 240 mAh 2S battery I was soon ready to go. A blip of throttle and the Shake was instantly airborne. A quick pull on the elevator saw an instant pull into the vertical and an unintended prop hang. Never mind, so whilst in the prop hang I thought I would test it out... Without any adjustment of the motor's thrust lines it was almost perfect in holding station. Full aileron and a blip of throttle saw a smooth 'torque roll'. Flying the Shake was really positive so far.

A few circuits to settle into the model saw no trim being required and a half loop into inverted flight proved that the recommended C of G was spot on, with only the slightest amount of down elevator required to hold horizontal flight. Knife-edge flight was really easy with, again, only the smallest amount of rudder required.

It was time to test the schedules, seeing as this plane is designed for F3P. Both the C schedule and B schedule could be easily flown despite the size of the gym.


It's a great colour scheme


Plenty of airbrakes and side force generators make it a good aeroplane for indoor flying



A shot from the rear shows clearly all the EPP brakes


Author in a final pre-flight photo

Reaching for the roof!

So onto the F3P A schedule, which is the International class. But here I got caught out...

After flying the first manoeuvre of a double immelmann with two rolls just fine, on the second manoeuvre, a figure M with two quarter rolls on the first vertical downline, I misjudged the speed and was late on the throttle for the push into a half loop at the bottom. This resulted in insufficient speed and an upside down landing.

No damage was done so I handed the transmitter to my brother Paul, who is a much more accomplished and experienced pilot, having been part of the GB team in the 2015 World Championships. After a few circuits to get used to the plane, he promptly flew two A schedules. His advice? Keep the speed up and the Shake can fly all the manoeuvres quite pleasingly.

I also wanted to test the Shake outside and surprisingly one of those 'blue moon' moments occurred just two days later when a Saturday morning coincided with blue skies, winds less than 5 mph and no family activities planned! So off to my flying field and with a larger 350 mAh battery added the Shake had its first outside flight.

Without the constraints of the hall I was able to fly a couple of A schedules before the battery was flat. Penetration into a wind of about 3 mph was slow but manageable, not surprising given all the airbrakes and the low power of the motor.

A new battery and it was time for a bit of fun flying snaps, spins and hovering low and slow around the patch. This resulted in a really enjoyable flying session with the Shake.

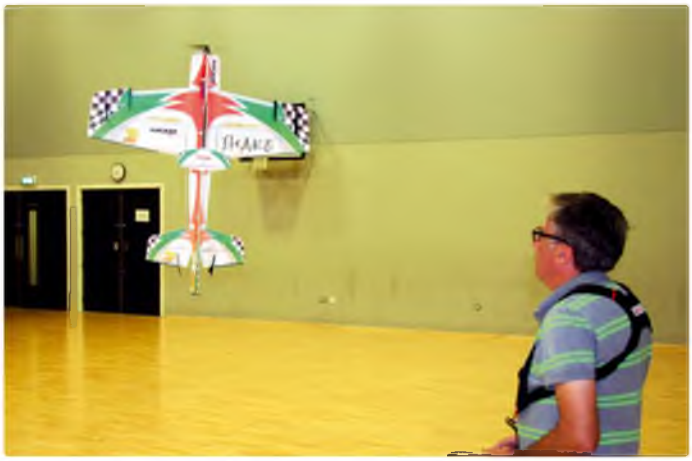
## Conclusion

The Shake is easy to build, just watch out for the few errors in the manual. It's capable of flying all the F3P schedules but it's not going to fly them as smoothly or be as competitive as a Depron or carbon machine weighing at least half its weight.

Where it would excel, however, is as a practice plane for someone wanting to start competitive indoor flying in F3P C. Such a pilot could fly a Shake and build confidence that the manoeuvres could be flown in a confined space before moving onto a more fragile machine.

Indoor acrobatics (F3P) is a great way to improve your flying skills and the Shake is a cost effective and low risk way of giving it a go. So look at the GBRCAA website for competition and schedule details and come along. It's a really friendly competition scene.

***RCMW***



Shake will prop hang all day – or at least until the battery runs out!


The Shake being taken through the A schedule


Knife-edge circle. See how little the rudder is deflected

RC MODEL WORLD

## MODEL INFORMATION

| | |
|---|---|
| **NAME:** | Shake |
| **MANUFACTURER:** | Hacker Model Production |
| **WEBSITE:** | www.zoomport.eu (search for Shake) |
| **PRICE:** | 67.76 Euros |
| **MODEL TYPE:** | Indoor ARF (F3P) |
| **CONSTRUCTION:** | Pre-cut and decorated EPP |
| **PARTS SUPPLIED:** | Airframe and accessories |
| **PARTS REQUIRED:** | Servos, receiver, motor, ESC and 2S LiPo |

## R/C FUNCTIONS

| | |
|---|---|
| **1:** | Throttle |
| **2:** | Ailerons |
| **3:** | Elevator |
| **4:** | Rudder |

## MODEL SPECIFICATIONS

| | |
|---|---|
| **WINGSPAN:** | 840 mm |
| **LENGTH:** | 920 mm |
| **FLYING WEIGHT:** | 135 g upwards |
| **F3P MOTOR:** | M Force 2809YT-17 |
| **TEST MOTOR:** | M Force 2812CA-27 |
| **LIPO:** | 2S 240 mAh |
| **ESC:** | 6 A |

## Dislikes

Mismatch between the carbon rod lengths quoted in the manual and the carbon rod supplied

## Likes

Easy to build • Capable of flying all F3P schedules • Can be flown outside in calm conditions

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| PP-RACK-3542 | 35mm | 43.5mm | 66.8mm | 84.8mm | £6.60 |
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The Black Horse Westland Wyvern is shown here undergoing tests with the Gannet CR prop. The prop looks better than the original but it is still too short and of the wrong profile

# Simulated Contra-Rotating Propellers

**David James describes how he makes a dummy second propeller for his contra-rotating prop driven scale aeroplanes**

If there is one thing that can spoil the appearance of an otherwise beautifully crafted scale model, it is the propeller/spinner assembly. This is why most scale competitions allow a non-functional scale prop to be substituted for the flight version whilst scale fidelity is being judged. In many cases this isn't a big issue because the working prop/spinner is barely visible in flight and, hence, virtually indistinguishable from the true scale version. In other cases, however, where three, four, or even five bladed props were used on the full size aircraft, the discrepancy with the scale model in flight becomes more obvious. Where the prototype used a contra-rotating (CR) propeller the illusion of scale flight is virtually destroyed unless a way is found to replicate it on the model.

In some cases there is an additional incentive for reproducing the CR prop because it should give a much more authentic sound than the characteristic rasp, rattle and roar of a reciprocating engine, or the rather inadequate whisper of an electric motor with a single propeller, such as I have been using for the Westland Wyvern and Fairey Gannet featured in this article.

When I started to look around for inspiration I found little in my web searches for CR props that could safely handle over 5 kW of power, unless a large budget was available to adapt one of the very expensive (but genuine) contra-rotating props that are currently being developed for F3A and IMAC competition models.

I wasn't up to fabricating one of these so I started to design a simulated CR prop specifically for the Black Horse Westland Wyvern that I had been flying. By 'simulated' I mean something that looks like a CR prop but has only one set of driven blades, the other set simply free-wheeling 'in the breeze'. Throughout this article all references to CR props should be taken to mean simulated CR props.

## Wyvern CR Prop, Marks 1-4

A fundamental feature of any CR prop/spinner design is the need to extend the existing motor shaft. An extension shaft with

The epoxy glass Wyvern spinner on the balancer before being cut into three sections for the CR prop. Balancing problems with the long spinner proved to be the Achilles heel of this design, although one successful flight was achieved before abandoning it

a flanged coupling was designed but proved difficult to manufacture sufficiently accurately to avoid significant run-out at the tip, giving rise to unacceptable levels of vibration. The flanged coupling was exchanged for a threaded coupling but this performed no better.

I thought the shaft extension problem could be avoided by substituting a specially fabricated long shaft to replace the standard one fitted to the Turnigy ROTOMAX 50 cc brushless out-runner motor fitted to the Wyvern and Gannet. Unfortunately, it proved impossible to remove the standard shaft without causing some damage to the motor bearings, which eventually led, once again, to vibration. The problem was made more severe by the close spacing of the two motor bearings relative to the large CR prop/spinner overhang.

Dave Wigley overcame the difficulty with his Top Gun (USA) winning Wyvern by using coaxial shafts with additional bearings positioned well ahead of the (petrol) motor bearings. I wished to avoid this complication and persevered with the long shaft design (Figs. 1 and 2). It was eventually made to work (Mk.4) but demanded very careful machining.

Having solved the shaft extension problem, attention turned to the very long (9 inch) spinner, which I fabricated from epoxy-glass. It looked much better than the totally non-scale version supplied with the Wyvern kit but it proved extremely difficult to balance accurately using the crude static balancing gear I had at my disposal. With proper dynamic balancing equipment, such as used for small gas turbine rotors, the outcome might have been different.

There is no point in dwelling on the Wyvern experience for too long because the CR prop was never a complete success, despite the many hours of work that Tony Walker, Kevin Trott and I put into it. The design was not sufficiently robust and all nine components comprising the rotating assembly needed to always be assembled with particular attention to the registration marks inscribed when they were balanced. As a result, the CR prop never inspired confidence and seemed to be operating close to its limits.

This slightly disappointing outcome was entirely due to my input to the designs and is no reflection on the excellent fabrication skills of Kevin and Tony. Nevertheless, we managed one, slightly nervous flight with this design before it was put to one side.

Despite these reservations valuable lessons were learned from the Wyvern, which were incorporated into the next CR prop destined for the Fairey Gannet. We had found the polycarbonate discs to be tough, easy to machine and tap, and far superior to the ply and Perspex discs we had tried initially. We had also found that high quality ball bearings were needed for the free-wheeling propeller, rather than the self-lubricating sleeve bearings used for the early Marks.

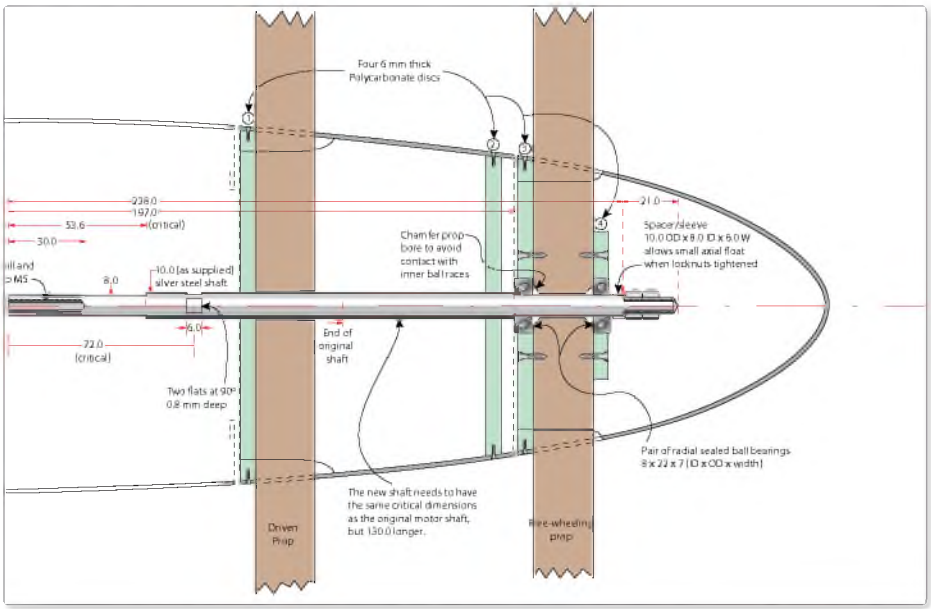


Fig. 1 - Wyvern simulated CR prop design Mk.6. The 9 inch long spinner and large overhang of the long shaft extension are evident in this assembly drawing

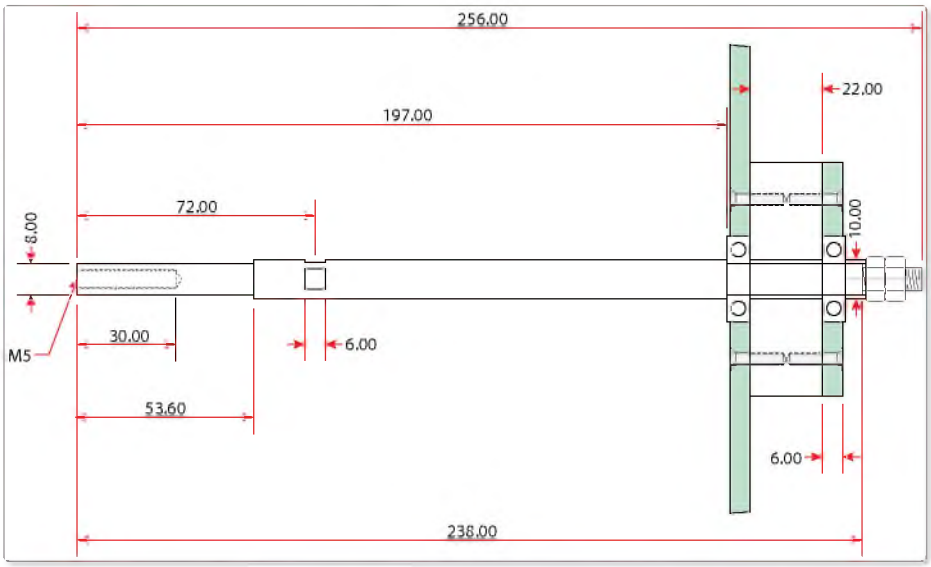


Fig. 2 - Manufacturing drawing for the Wyvern extension shaft (courtesy of Kevin Trott). This shaft replaces the standard shaft fitted to the Turnigy ROTOMAX 50 cc electric motor


The Black Horse Westland Wyvern (26 pounds, 88 inch span) flies superbly but lacks scale fidelity. I swapped a slightly longer commercial spinner for the one supplied with the kit but it is still far too short. The retracting tail-wheel is another improvement, as are the drop-able wing tanks

The long CR spinner is closer to scale and the two-blade props look fine in flight but definitely lack something on the ground. I designed the scale oleo legs and Kingfisher Aviation did a first class manufacturing job on them. The BH factory paint scheme is all wrong (see previous photo for the 'correct' colours)

## Gannet CR Prop, Marks 1-6

The biggest advantage offered by the Gannet is its relatively short spinner, which is only 6 inches long compared with the 9 inch long Wyvern spinner. Furthermore, a suitably shaped, sized and balanced spinner was available commercially. We were off to a good start but it still took five re-designs before Mk.6 proved successful!

Tony Higgins joined me for this stage of the adventure. His extensive experience with model engineering, particularly control-line speed, and excellent workshop facilities, proved great assets. Our first decision was to revert to a shaft extension but with a spigot, sleeve, and threaded coupling. We hoped that the much shorter overhang of the Gannet spinner and, hence, the length of the extension shaft, would make the task easier but we still ended up with unacceptable shaft run-out. So the depth of the spigot/sleeve was increased and fitted with a brazed-on flange sandwiched between the motor prop driver and spinner back-plate.

The next few Marks involved design changes to improve the front spinner retention system, and the bearing system.

The front spinner is rigidly coupled to the motor shaft and turns with the rear (driven) prop.

Changes were needed to simplify assembly/disassembly of the CR prop so that it would allow experimentation with a range of propellers of different thickness.

We needed to revise the free-wheeling (front) prop bearing system because standard commercial ball races could not provide a low enough run-out. PTFE loaded plain bearings were also unsatisfactory. The ball races we eventually used were expensive instrumentation flanged units to ABEC 5 level (American Bearing Engineers Committee) and the same as fitted to gyros in full size aircraft.

Suitable left and right-handed three-blade propellers had been sourced by this time, but the surfaces near to the hubs, where the three blades had been pegged and glued, needed to be faced-off and reinforced otherwise the free-wheeling assembly wobbled alarmingly due to the swash-plate effect. Work on the propeller(s) was all done on a fixture in a vertical mill to eliminate eccentricity, run-out and swash-plating. The polycarbonate discs were trepanned from 6 mm sheet.

We were up to Mk.4 before we were able to do any serious testing with the CR prop fitted to the motor. To our great disappointment the shaft run-out was still too large due to misalignment between the flange and shaft at the brazed joint. On the plus side, the commercial spinner, now sliced into three sections, proved much easier to balance and ran surprisingly smoothly despite the shaft run-out. This was attributed to aerodynamic damping produced by the whirling blades but we erred on the side of caution and limited maximum rpm for the bench tests to around half speed.

Mk.5 involved little in the way of design changes other than to the flanged shaft extension so that it could be put out to a local machine shop to be turned from a solid bar. The finished product was of excellent quality, with a very close sliding fit on the motor shaft. The Gannet was fitted with the CR prop and run up to 3.6 kW (5500 rpm). To our relief the vibration levels were acceptable but some slight run-out was still visible at the tip of the spinner retaining bolt.

Fortunately, this had nothing to do with the new flanged shaft extension and resulted from the method used to retain the front spinner. The long spinner bolt is made from a length of M5 studding screwed firmly into the shaft extension. By tightening a special nut that sits in the nose of the spinner the tension in the spinner bolt is transferred to the spinner and then to the periphery of the

**Painted and assembled spinner. The opposing pitch of the rear (driven) prop and the front (free-wheeling) prop can be clearly seen. The front spinner rotates with the driven prop**

**Showing the three elements of the CR prop. The left and right hand props are both 20 x 12 wooden units made by Fiala**

**This is the free-wheeling prop, sandwiched between two 6 mm polycarbonate discs which have been drilled and tapped to accept M2.5 machine screws that secure the discs to the centre element of the CR spinner**

**Another view of the assembled spinner. A special nut sits inside the tip of the spinner to fix it to the shaft extension. This was another critical part of the design (see text for details)**

polycarbonate disc that acts as the front spinner back-plate. The load then transfers via the bore of this disc to the inner race of the freewheeling propeller front bearing. If the nut is not tightened enough, the front spinner will not be locked to the shaft extension and will slip. If the nut is too tight, the polycarbonate disc begins to "dish" in an asymmetric manner and causes the spinner bolt studding to bend very slightly.

The final Mk.6 design (Figs. 3 & 4) overcame the front spinner retention problem by an aluminium 'top hat' that acts as a sleeve between the polycarbonate disc and the shaft extension. It is held against the inner race of the front bearing by a pair of lock nuts on the studding and is keyed to the disc by a peg that locates in a keyway through the bore of the disc. This arrangement means that there is no 'dishing load' on the polycarbonate disc, whilst ensuring that it, and the spinner, cannot slip (rotate) on the shaft. Hopefully, the drawing will explain how this was achieved far more successfully than my words.

We also replaced the mild steel studding with a length of silver steel into which Tony carefully cut an M5 thread. This proved stronger and straighter than the original studding obtained off-the-shelf at the local hardware store.

The Gannet and CR prop were re-united and testing resumed with real success at last! Maximum power was 4.6 kW at 6600 rpm (driven prop) using a pair of three-bladed Fiala 20 x 12 wooden props driven by the Turnigy ROTOMAX 50 cc motor controlled by a Turnigy dLux 160 A HV ESC. The batteries were a pair of Zippy Flightmax 5.8 Ah, 6-cell LiPos connected in parallel to give about 42 volts at 110 amps.

Most pleasing was the lack of vibration, coupled with a sound that made the hairs on the back of my neck stand on end! The pull was quite impressive too, so we connected a digital balance to the tail of the aircraft and measured a thrust of about 29 pounds. We then removed the free-wheeling prop and repeated the measurements with the single three-blade (driven) prop, which indicated, much to our surprise and delight, a slight reduction in thrust to about 28 pounds at the same 4.6 kW power setting, but slightly higher (6850) rpm on the driven prop.

When we came back to earth we realised that the thrust measurements were subject to considerable uncertainty. Nevertheless, there could be no doubt that the CR prop showed no reduction in performance, something we had feared when starting out on this tortuous journey.

It is frustrating that we have not yet found a reliable way to measure the rpm of the free-wheeling prop. Until then it is only possible to speculate on the effect of the front free-wheeling prop on the performance of the driven prop. I will come back to that later.

***RCMW***

**Continued next issue.**

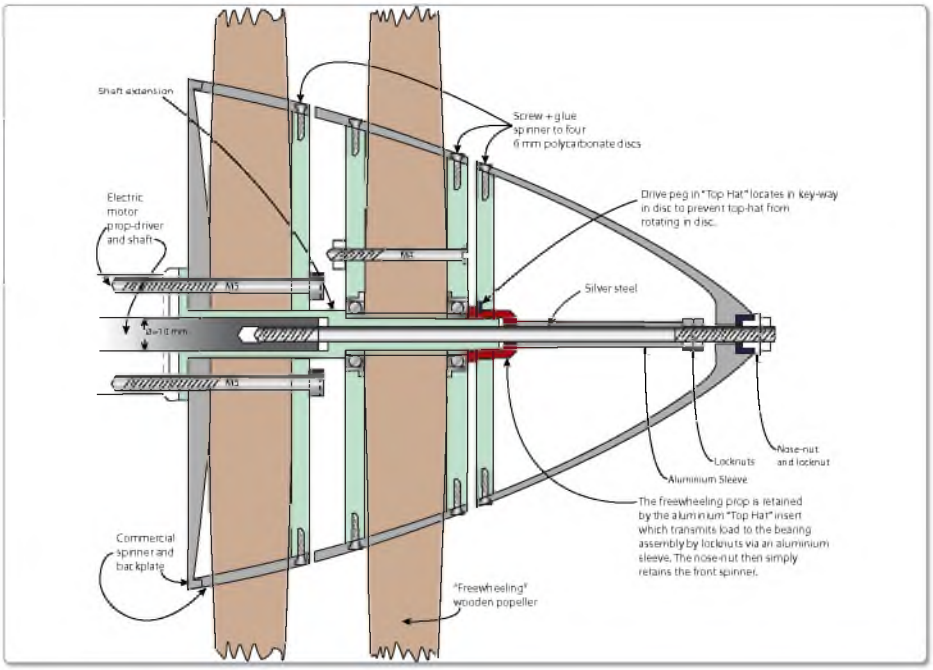


**Fig. 3 - Final (Mk.6) assembly drawing for the Gannet CR prop design. The shorter commercial spinner proved much easier to balance accurately than the long home-made Wyvern spinner**

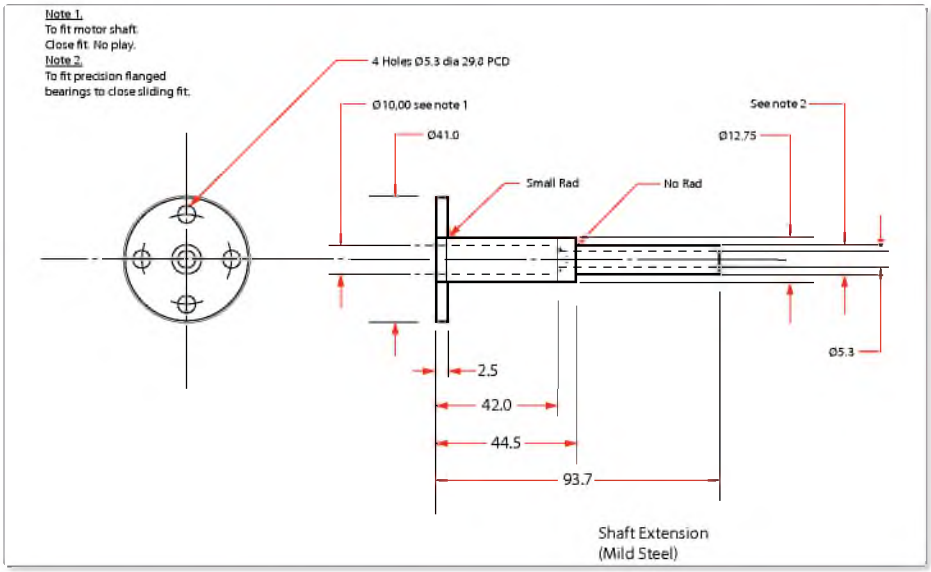


**Fig. 4 - The flanged shaft extension is the most critical component in the assembly. Get this right and you are in with a chance!**


**The simulated CR prop definitely improves the Fairey Gannet's appearance**


**In the next issue, join us as David flight tests the Gannet with its simulated contra-rotating propeller**

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# Aeronaut Luxx

**Frank Skilbeck assembles a quick build, all-wood construction electric powered glider that features a wealth of computer aided and computer cut components**


Attractive box artwork


The box is packed out with foam sheet to prevent the laser cut ply and accessories from moving around too much. The foam is not just packing material; it is meant to serve as a building board for the Depron templates (in the foreground), which should be taped down onto the foam. As the Luxx is a beginners' model this eliminates the need for a separate building board, which people might not have at this stage of their modelling career

Now I like the instant gratification of an ARTF model as much as the next flyer. But I always have something on my building board too, as there's nothing more satisfying than flying a model you've built. When I started it was the only way to get in the air, but that satisfaction never goes away.

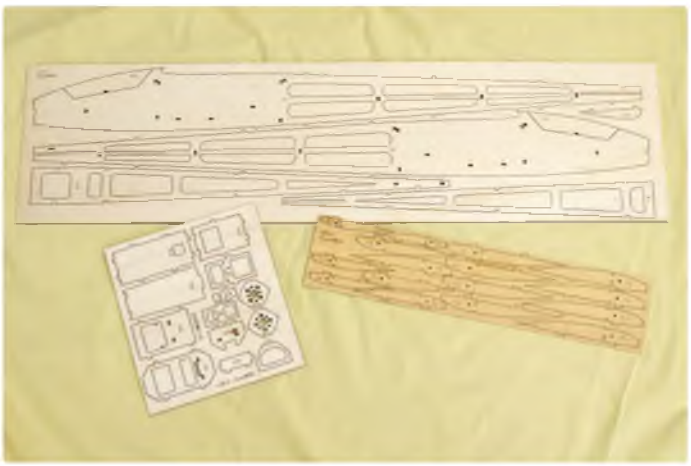
It looks like I'm not alone, as we are seeing a resurgence in building models. And for those wanting to dip a toe into the enjoyment of building your own model, the aero-naut Luxx rudder-elevator electric glider we are reviewing here would make an ideal starting point.

This kit is complete with all parts laser cut from ply and balsa, leaving the builder to provide the glue, covering, power train and, of course, the radio system. And being a fairly simple model it's an ideal introduction to the pleasures of 'build your own'.

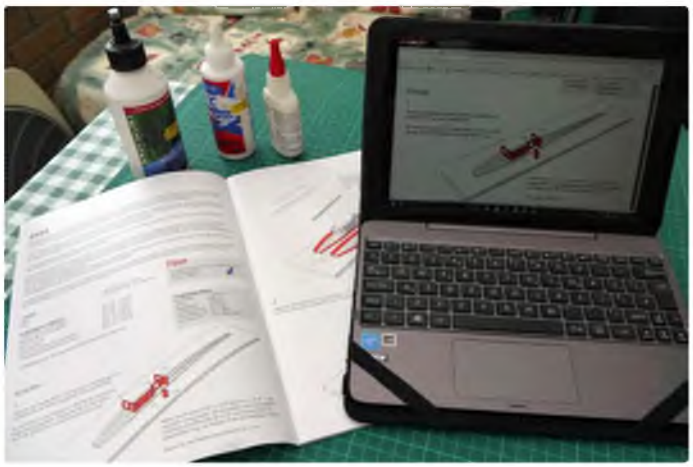
## There's Some Thought Gone Into This!

The Luxx is a simple1300 mm wingspan rudder elevator model with a polyhedral wing. It has a flat centre section and raised, tapered wingtips, and a square section ply fuselage. The kit is supplied in a colourful box with lots of information on the model, all in German, but still very eye-catching! Upon opening the kit the first surprise is that two thirds of the box is taken up with some foam packing, with just a few sheets of laser cut ply and balsa pieces. The foam is intended to be used as a one-off building board. The second surprise is that there are no plans, but there is a detailed instruction manual, again in German, but with a very good English version available as a PDF download from the web.

The fuselage construction requires no plans as it is all built from interlocking ply parts. And, cleverly, the wing is built on some supplied Depron foam templates, which have

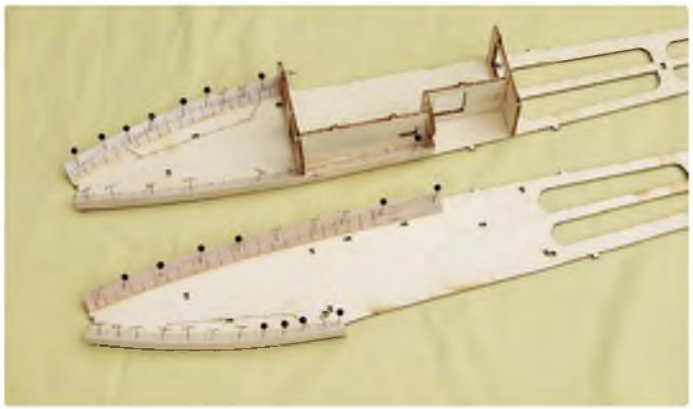


Laser cutting is very good and all parts are clearly identified



The printed instruction manual is in German, with an English version available as a PDF download

Main formers, servo and receiver tray mate up to fuselage sides, ensuring the sides are square



The only parts that require anything other than a light sanding are the triangular sections, which have to be notched to fit the curvature of the fuselage

Clever design ensures that the fuselage sides are fully aligned, with no possibility of building a banana fuselage

The kit comes with two optional motor mounts. Check which one suits your motor before gluing it in position

slots to space out the wing ribs, ensuring an accurate build.

So using the pictures in the German instruction manual and with the English version on my tablet so I could read the text, I set to work on the fuselage. The parts are held in the sheets by slivers of wood that haven't been fully cut through by the laser cutting procedure and while you can just push the pieces out it pays to run a modelling knife along the cuts to stop the wood from splintering.

The parts themselves are very good quality and fit together like a jigsaw. All the parts are clearly numbered and the step-by-step instructions leave no ambiguity as to how it all fits together. The fuselage sides are ply, with lightening holes aft of the wing and suitable holes for the tabs on the formers. Integrating the receiver and servo tray into the construction ensures that when the two sides are brought together they are accurately aligned and square. The only real work is to notch some triangular sections forward of the wing so it can be bent to the profile of the nose. The canopy at this point is still part of the fuselage sides. The two sides are then brought together around the motor mount.

aero-naut have thoughtfully included two pre-drilled motor mounts to fit your motor. I had an AXI 2217/16 motor good for 18 amps, so it was well capable of delivering the 100 watts recommended on a 3S battery. This motor is 28 mm diameter and lined up perfectly with the mounting holes in one of the supplied motor mounts, so this was glued into position. The canopy sections are then cut free, the formers aft of the wing are fitted and the fuselage sides are held in place with rubber bands while the glue dries.

The bottom sections, again all pre-cut, are glued in position. I used PVA for all joints and, as recommended, sanded off the burnt residue from the laser cutting process to ensure a stronger joint. The rudder and elevator control snakes are then fitted; the formers all have holes for the snakes to ensure they are well supported at regular intervals. The canopy sides are then glued to their formers and once dry the canopy is put back in place while the ply upper decking is glued in place. The canopy is cut free with a razor saw once the glue has dried.

A circular ply plate is provided to glue onto the motor mount so the front of the fuselage can be shaped to fit the propeller spinner. I went with a Graupner 9" x 5" folding propeller, which has a 39 mm spinner that closely matches the ply plate. E-Calc showed that this prop, combined with a 1200 mAh 3S battery, should draw around 12 amps and generate 130 watts, giving plenty of power.

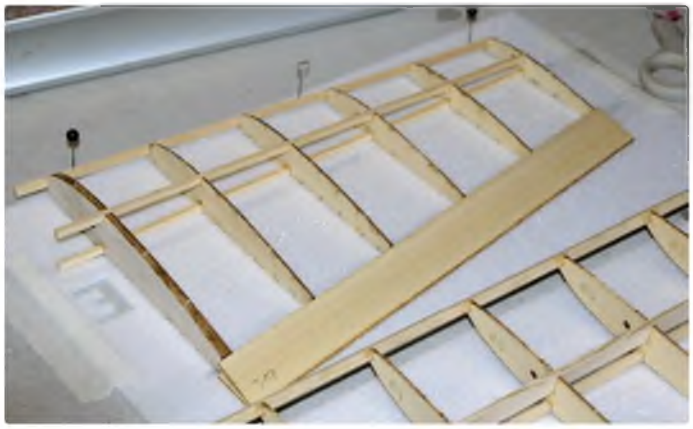
Assembled fuselage being held together with rubber bands while the glue dries. PVA glue was used for all joints

Once the upper ply sheeting on the nose has dried the canopy can be cut free. The rest of the canopy frame is fitted and the nose shaped to fit the spinner

Completed fuselage ready for covering

Tailplane surfaces are simple sheet affairs with anti-warp tips

Wing panels are assembled over Depron foam templates, which align the ribs. A small set square was used to ensure the ribs were set at 90 degrees



Tapered tip sections are built over their own foam templates

The tail feathers are simple sheets cut to shape, with the wood grain running at 90 degrees at the tips to prevent warping. All very simple.

The fuselage, canopy and tail feathers can then be covered. I used heat shrink film, which provides a light finish. The tail feathers are then slotted into the fuselage and held in place with tape or heat shrink film. The rudder and elevator are hinged with tape and ply horns provide the connections to the wire pushrods, which attach to the servo arms with screw keepers; all very straightforward and perfect for a model of this type.

Note the servo cables have to be threaded through a former and the receiver support plate. And while this is possible with the covered model it's easier to fit the servos and route the cables before covering the fuselage, and this is what I did.

## Wings

The wings are of conventional construction. But rather than being built over a plan sheets of Depron foam are provided. These have cut outs into which tabs on the wing ribs fit, so after putting some tape on the foam under the main spar and lower trailing edge to stop the parts from adhering to the foam, the wing ribs are glued in position, with the slots in the foam holding them in position.

The wing is constructed in three sections; the central parallel section and the tapered wingtips. The outer ribs on the centre section and inner ribs on the outer sections are cut from trailing edge strip to provide the dihedral for the wingtips – a neat idea. The leading edge is a simple square section, which glues into a V slot at the leading edge of the wing ribs so only some light sanding is required to round off the leading edge.

At the same time the top spar and upper trailing edge can be fitted. To prevent any inbuilt wing warps it's important to ensure the building board underneath the foam template is flat. As a precaution I placed some light weights at intervals along the wing to ensure that it stayed straight while the glue set.

The centre two ribs are of a reduced section, so this can be filled in with the provided pre-cut balsa sheet to support the wing retention rubber bands. The remaining ribs are profiled so no cap strips are required, speeding up the build and keeping the weight down. Once the glue has dried the wing tabs can be removed and the ribs given a light sanding before filling in the lower side of the centre two ribs with balsa sheet where it sits on the fuselage.

The outer tapered wing sections are then simply glued in place. Although the angled

End section dihedral is provided by wing ribs cut from triangular section. A larger set square was used to check the dihedral so both port and starboard wings are the same

Completed model ready for covering

My model was covered with heat shrink film, using a two colour scheme with a translucent covering to show off the wing handy work. Decals are simple and easy to apply, being of the sticky back type

My chosen AXI 28 mm diameter motor is a tight fit. The motor wires are secured to the fuselage side to ensure that they don't rub on the motor can. The ESC and flight battery sit side-by-side

section wing ribs should mean that both end sections are fitted at the same angle it is worth checking and sanding one side so it matches the other, if required. The wing was then covered in heat shrink film and I used a two colour scheme, with translucent film behind the main spars to show off the internal construction.

As recommended in the instructions, I made a small hole in the underside of the wing in the central sheeted section. This is to allow the air to move in and out of the wing as it is heated up or cooled down, preventing it from distorting the film finish. Thoughtfully all the ribs have a small hole in them to facilitate this.

Once the wings were complete all that was left to do was to fit the ESC and receiver, and to check the balance. Although a tight fit it's possible to fit a 20 A ESC and 1200 mAh 3S LiPo side by side on the battery tray under the canopy. I also had some 1300 mAh 3S LiPos but these were marginally too big to fit. There is plenty of room under the wing in front of the servos for the receiver and being a rudder/elevator model the transmitter set up is very straightforward.

Set up like this the Luxx balanced without the need to add any weight and the finished model, complete with battery, weighs 675 g, slightly above the 650 g quoted in the instructions. A check on the motor and propeller combination showed it was pulling 11.5 amps at full throttle, very close to the E-Calc calculation, which equates to just under 90 watts per pound.

## Watch That Warp

The first calm day for the maiden came when it was dull and overcast. But as I'd waited for a few days, we grabbed the camera and headed for the field. The test flight was non-eventful, the chosen motor and propeller set providing ample power. Full throttle caused the Luxx to zoom up but 50-60% throttle gave a good, controlled climb. The rudder and elevator controls were smooth and the Luxx turned well. It's not as responsive as an aileron equipment model but is ideal for relaxed flying on a calm day.

Power off and the glide was fast and flat, taking a long time to come down. Luxx will thermal well but you have to be careful not to go too high due to its diminutive size, relatively speaking, for a thermal soarer.

A few days later the wind had dropped down and the sun had come out. This time I found it difficult to get the Luxx to turn to the right and it was flying with full right trim. Investigation revealed that the wing had twisted. On reflection this was my fault as I had stored the Luxx by a window, where half the wing was exposed to the sun. This had caused the film to shrink, inducing a slight twist. I corrected this by twisting the wing straight, re-shrinking the film with a heat gun and then leaving the wing weighed down on a flat surface overnight. With this done the docile flight characteristics returned.

## Summary

If you are looking for an entry into model building and a relaxed flyer then the Luxx is an ideal model. The kit is very comprehensive and the quality of the laser cutting and fit of all the parts is exemplary. The manual is very detailed and the downloaded English version is an excellent translation.

With the power set up I've installed it is a bit overpowered. But the throttle stick works both ways and even though the Luxx doesn't have any provision for cooling air flow over the motor, ESC and battery, the modest power and using the climb and glide mode of flying gave no suggestion of anything overheating.

A flight of 12 minutes of climbing and gliding uses less than 50% of the 1200 mAh battery capacity. This would be an excellent model to keep in the car for a bit of relaxed flying, as long as you can ensure the wings don't get twisted if the sun shines through the windows!

***RCMW***

A simple push off at half power is all that is needed to have the Luxx climbing away. Climb outs don't need the 130 watts available on the review model and performance would still be sprightly on the recommended 100 watts

Power off the Luxx has a very flat glide

Bored with gliding? Luxx will roll with ease, if required

Overhead shot showing off the wing structure through the translucent covering

Luxx comes into land after several bouts of 'climbing and gliding'

Our intrepid author, suitably attired for a day of summer thermal soaring, holds the Luxx before launching her again into the blue, with clouds bubbling up nicely in the distance

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## MODEL INFORMATION

| | |
|---|---|
| **NAME:** | Luxx |
| **MANUFACTURER:** | Aeronaut |
| **WEBSITE:** | www.aero-naut.de |
| **RETAIL PRICE:** | 59 Euros (please contact UK dealers for GBP price) |
| **MODEL TYPE:** | Electric Powered Glider |
| **MOTOR USED:** | AXI 2217/16, 1050 KV |
| **BATTERY:** | 800-1000 mAh 3S (1200 mAh 3S used) |
| **CONSTRUCTION:** | Film covered balsa and ply |
| **PARTS SUPPLIED:** | Wood to build airframe and hardware |
| **PARTS REQUIRED:** | Motor set, LiPo and radio gear |

## R/C FUNCTIONS

| | |
|---|---|
| **1:** | Elevator |
| **2:** | Rudder |
| **3:** | Throttle |

## MODEL SPECIFICATIONS

| | |
|---|---|
| **WINGSPAN:** | 1300 mm (52.2 in) |
| **WING AREA:** | 2100 sq cm (2.26 sq ft) |
| **LENGTH:** | 920 mm (36.2 in) |
| **TARGET WEIGHT:** | 650 g (23 oz) |
| **REVIEW WEIGHT:** | 675 g (24 oz) |

## Dislikes

English instructions available as download only

## Likes

Well thought out design • Excellent parts fit
Good flying performance • Handy size
Good instructions

## Where To Buy?

We asked aero-naut for information about where UK readers can purchase the Luxx and other aero-naut products:

*"We have some dealers in the UK that will sell this kit, like Gliders, Puffin Models, electricwingman.com, Jotika Ltd and others. Please refer to our website www.aero-naut.com, where all our dealers can be found under the 'worldwide' section of the webpage.*

*The sales price is 59 Euros but we do not know how much dealers will sell it for in GBP. We will inform our dealer network about the review so they can make sure to promote this model on their websites."*

# Thurston Teal

**Fly off land or water with this 1780 mm span, 1:53 scale amphibious flying boat, rescaled by Laddie Mikulasko for a 38 mm diameter 700 W (1120 KV) brushless motor or a .45 IC engine, and four-function R/C**

Laddie proudly displays his new amphibious aeroplane

RC MODEL WORLD

## At A Glance

| | |
|---|---|
| **SPAN:** | 1780 mm (70 in) |
| **LENGTH:** | 1295 mm (51 in) |
| **WEIGHT:** | 6 lb 8 oz – 7 lb (2.9 – 3.1 kg) |
| **RADIO CONTROL:** | 4-5 functions (Ele, Ail, Thr, Rudd, optional Flaps) |
| **MOTOR:** | MVVS 4.6/1120 KV (38 mm dia. 700 Watt) brushless |
| **ESC:** | 60 amp |
| **PROP:** | 11" x 6" |
| **BATTERY:** | 3S (11.1 V) 5000 mAh LiPo |
| **CONSTRUCTION:** | Balsa, plywood, some hardwood |

## Introduction

For many years I have been a seaplane fanatic and I have always been on the lookout for a good looking or unusual design. About twenty years ago I came across a magazine article describing a prototype seaplane called the Teal, designed by Mr. David B. Thurston. I really liked the design so I decided to build a 86" wingspan scale model of it for a .90 OS four-stroke engine.

Recently, while surfing the Internet, I found a few sites with the information on the full size Thurston Teal designs. One of the sites is called Steinar's Hangar and on this site you can read about Mr. Thurston's career in the aircraft industry, and the number of seaplane designs he created.

One of his designs that I really like was an updated version of the original Teal. There were 38 Teals built and many of them are still


flying in different countries, so I decided to build this new version of the Teal. Using the three views and the photos, I drew a new set of plans for an electric powered model with a 70" wingspan. To be able to fly off the water or land, I designed the landing gear so it can be rotated manually to an up position when flown off the water.

After the model was built the first series of tests were done on the water. When taxying, with both floats touching the water, the water handling is excellent. When power was applied the model was on the step in less than 20 to 30 feet. The model is an excellent flyer. With its thick wing the model handles more like a trainer. Mr. Thurston set up the engine thrust line and the stabiliser angle in such way that there was not much change in the pitch angle at different power settings.

The next test flights were made from land. The steering on the ground is excellent as well and the take-off is a non-event. The model tracks straight and when it reaches enough speed it lifts off on its own. The Teal will loop and roll but it looks much better when flown in a scale-like manner. As I mentioned earlier, I designed this model to be electric powered, but any .45 glow can be used as well. The slight challenge is in deciding where to locate the fuel tank; one option is to have the fuel tank inside the fuselage just behind the former (F9). For this installation you will need a fuel pump. The second option is to make your own fuel tank that will have the shape of the rear section of the nacelle. This fuel tank can be made from either thin steel or brass sheets.

On this model I omitted installing the flaps. They are not required for flying but to be true to the scale you can add them. The flaps are full span between the fuselage and the ailerons and are of the same width as the ailerons. The drawing shows the outline of the flaps in heavy dotted lines.

The model is easy to build. I numbered all the parts (see plan) and will refer to them by these numbers. Try to build the model in the sequence as described below. The model is built using balsa, plywood and some hardwood. You will need two 36" long by 1/4" diameter carbon fibre tubes as well.

To aid the build Traplet are developing a laser cut wood pack, which is available to order – see Plan Details.

## The Wing

Cut out all the ribs. Cover the plans with a clear plastic. Make two main spar extensions from 1/4" plywood. Ensure you cut out the strip (28) accurately. Use epoxy to glue the 1/4" diameter carbon fibre tubes (26) to the top and bottom of this strip. Make sure that the width is the same over the entire piece. Once the epoxy cures sand it and try to slide this extension into the slot in the rib (W1) so that it goes through the slot without much play.

Pin the main spar (1) and the rear spar (3) to the building board. Position and pin all the ribs to the spars in the locations as shown on the drawing. Place the angle guide against the rib (W1) so that this rib is tilted slightly to take care of the dihedral of the wing. Insert and glue the top main spar (2) and rear top spar (4) to the ribs. Cut out the leading edge spar (10) and sand the edges on an angle so that they will follow the contour of the ribs. Glue the leading edge spar (10) to all the ribs. Between the ribs, glue in the balsa

Sandwich the 1/4" plywood spar with 6 mm carbon fibre spar tubes

Fit 1/16" balsa webbing with grain vertical

Sheet with 3/32" balsa

Ailerons can be conventionally hinged at the top or a Fowler type. Both methods are shown on the plan

Tip float fixing points

shear webbing (13) in locations as shown on the drawing.

Now take the main spar extension you built at the beginning and slide it into the openings of the ribs (W1) and (W2) all the way to the (W3) rib. Smear a slow setting epoxy onto the main spar extension and to the top and bottom of the main spars. Slide in filler pieces (5) between the bottom main spar (1) and the main spar extension to fill the gap. Do the same between the top main spar (2) and the main spar extension.

While the epoxy is still wet, glue on the plywood shear webbings (14) between ribs (W2) and (W3) and the shear webbing (16) and (17) between ribs (W1) and (W2). Insert and glue in the rear carbon fibre tube (27) to the ribs (W1), (W2) and (W3). Glue on the top trailing edge sheeting (9) to all the ribs. Glue the top leading edge sheeting (8) to all the ribs, to the main spar and to the leading edge (10). Flip the wing on its back and glue on the bottom trailing edge sheeting (7) to all the ribs.

At this time pull in the extension cable for the aileron servo. If you are going to have flaps then pull in the extension cable for the flap servo as well. Glue the bottom leading sheeting (6) to the ribs and to the main spar, and leading edge spar.

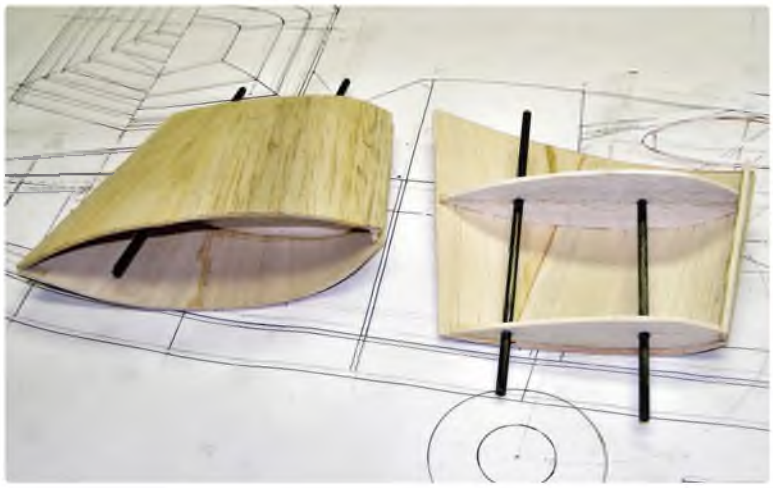
At this time separate the aileron from the wing by cutting the ribs (W5) between the top and the bottom rear spars. Glue the hinge support spar (21) to the top and to the bottom rear spars. Glue the leading edge (22) to the aileron. The bottom of the aileron is completely sheeted. Inside the aileron, glue the plywood plate to support the control horn. Between ribs (W3) next to the aileron, glue in the plywood pieces (14) and (15) to hold the hardwood blocks for the tip float supports. Glue in the hardwood block (18) between the rib (W3) and plywood support (14). Glue the second hardwood block between the rib (W3) and the plywood support (15). Glue all the cap strips (20) over the ribs. Glue the bottom sheeting (24) over the ribs (W1) and (W2) between the leading and the trailing edge sheeting and then glue the top sheeting (25) over the ribs (W1) and (W2 as well. Glue the wingtip sheet (11) and the triangular support (12) to the tip rib (W5). Now the wing can be sanded.

Next make the box into which the main spar extensions will plug into. Cut out the two identical plywood plates (31) and the top spacer (29), and the bottom spacer (30). Glue the bottom spacer (30) to the rear plate (31). Take the top spacer piece (29) and clamp it to the back plate (31). Now take one half of the wing and slide the main spar extension between the top and bottom spacers. There should be just enough of a gap between the main spar extension and the slot so that it is free to move in and out. Check the gap on other side as well.

With a pencil, mark the location of the top spacer. Smear the glue onto the spacer (29) and glue it to the rear plate (31). Let the glue cure. Once the glue cures, slide both main spar extensions into the space between the top and bottom supports to see if it will slide easily in and out. Glue on the front plate (31) to enclose the box. Again, after the glue is dry, slide the extensions in and out to check the fit.

Put the wing panels aside for now.

Align basic float to mark the fixing points



Steam or wet the 1/8" balsa sheet sides to aid curvature

Stabiliser before the final 1/16" balsa sheet, block balsa tips and elevator are added

Basic fin assembly shows the carbon rod for stiffness and the elevator snake

## Tip Floats

Cut out a set of formers (32) and (33). Draw the centre line on each of them. Mark the location of the holes on the former (32). Place this former on top of the former (33) so it sits on the centre line. Pin the top former to the bottom one. Place the flat 3/4" piece of wood under the formers. This piece of wood will be the template for drilling the holes in the hardwood blocks (18), (19) in the wing where the tip floats will be located. Now drill 1/4" holes right into the block of the wood under these formers.

Put the wood template aside for now. Drill holes in the other two formers using the first set as a template. Now, take the wing and place it on the building board upside down. Draw the centre line over the hardwood blocks (18) and (19). Place the wood template onto the centre line and drill the 1/4" holes into the hardwood blocks (18) and (19). The template will make sure that the holes are apart at the right distance from each other and square with the bottom of the wing.

Take the carbon fibre tube and cut to the proper lengths. On the carbon fibre tubes, mark the location for each former. Insert the front and back tubes into the hardwood blocks. Slide the formers (32) and (33) onto the tubes. Place the two 1/8" thick shims under the former (32) to create space between the float and the wing while building the float.

Position the formers on the carbon fibre rods on the marked location and glue them to the rods. Glue the leading edge (34) to the formers. Glue the float sides (35) to the formers and to the leading edge. Glue the bottom sheeting (36) to the bottom of the float. Pull out the float from the wing. Sand the float. Glue the plywood sheet (36) to the bottom of the float.

The float is now done. It will be held to the wing by the friction created between the carbon fibre tubes and the hardwood blocks in the wing.

## Stabiliser And Elevator

Cut out the rubs (S1) and (S2). Pin the stabiliser's hinge spar (42) to the building board and glue the ribs to it. Take the leading edge spar (41) and sand the edges on an angle to follow the contour of the ribs. Glue this leading edge to the ribs. Notice that the ribs (S1) are glued on a slight angle. Before gluing the top and bottom stabiliser sheeting, place 1/2" shims under the leading edge. Glue the balsa skin (40) to the ribs and to the spars. Flip the stabiliser on its back and glue the balsa skin (40) to this side. Glue the pre-shaped tip (44) to the stabiliser.

Cut out square holes in the bottom of the stabiliser, between both (S1) ribs. One hole is for inserting the main spar (80) of the fin into the stabiliser. The second hole is for the hinge spar (81). Build the elevator by gluing the ribs to the hinge spar (43). Then glue both the top and bottom sheeting (40) to the hinge spar and the ribs. Do not forget to glue the plywood plate (45) to the sheeting so that the elevator horn can be attached to it. Glue on the balsa tips (44).

## Fin And Rudder

Cut out the ribs (FN1) to (FN5). Cut the square 1/4" holes in each rib. Use 1/4" plywood as a guide to cut out the hinge spar (81). In this spar cut three slots for the rudder hinges. The elongated hole at the top is

Rudder before final 3/32" balsa sheet is added


for allowing the clevis for the elevator to go through. At the bottom of this spar drill five sets of 1/16" holes for attaching the 1/16" brass tube (61). With a needle and thread attach and then glue the brass tube to the hinge spar. This tube is for holding the tail wheel wire.

Mark the location of all the ribs onto the main spar (80) and the hinge spar (81). Slide the ribs onto the main spar and glue them to the main spar. Make sure that you keep all of them square with the spar. Glue the hinge spar to the ribs. Glue the leading edge spar (82) to the ribs. Glue the fin's sheeting (84) to one side only. Pull in the flexible control rod for the elevator control into the fin and glue it to the rib (FN3) and (FN4) and to the leading edge spar (82). Enclose the fin by gluing on the sheeting (84) to the other side. Glue on the leading edge cap strip (83).

Cut out the rudder's sheeting (85) for both sides. Glue the ribs to the rudder's hinge spar (86). Glue the rudder's sheeting to the ribs and to the hinge spar. Glue in the plywood plate to support the control horn on the inside of the right sheeting and glue the rudder sheeting to the other side. Cap the ends of the rudder at the top and bottom. At the bottom of the rudder, glue on the plywood cap (88). This plywood is needed to support the cotter pin for the tail wheel steering mechanism. Put the fin and the rudder aside for now.

## Next Issue

In the December issue of RC Model World, Laddie builds the fuselage of the Thurston Teal before completing the model, ready for its test flights.

***RCMW***

**CONTACTS**

**LADDIE MIKULASKO:**
lmikulasko@cogeco.ca

Be sure to read the next issue, as Laddie finishes his Thurston Teal in this bright Swedish scheme

# PLAN DETAILS

| | |
|---|---|
| **BUILD CATEGORY:** | Intermediate |
| **PLAN NUMBER:** | MW3779 |
| **PLAN PRICE:** | £19.99 ($33.99) |
| **WOOD PACK NUMBER:** | WP3779 |
| ***LASER WOOD PACK:** | £72.99 ($108.99 |

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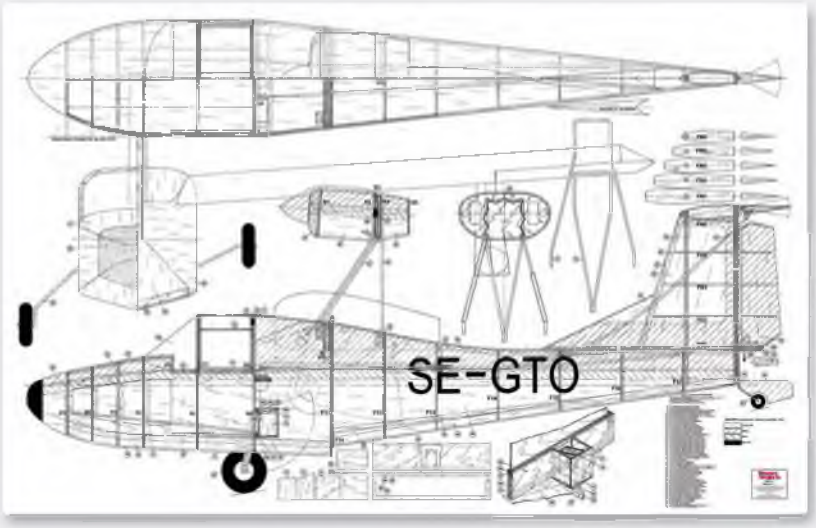

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# Traplet Open Scale Round Two

**A windswept Peter Maw reports from the second round of the 'War Of The Roses' scale competition, hosted by the Wirral Radio Control Flying Society**

Select a date, add the words 'Traplet Open Scale competition' to the date and the effect seems to be to create freak weather! This year we had 30 mph wind gusts and a gale blowing for the whole day on the first Sunday in August. But at least it was warm on the Wirral peninsula.

The second round of the 2016 War of the Roses had been rapidly transferred to the Wirral Radio Control Flying Society after the Bickershaw Club lost their field in May. The Wirral club committee and members generously donated their field for the day and prepared the flying area for a competition, which was very much appreciated by the competitors and organisers.

As a result of the strong wind, aerobatic models such as Sukhois and Extras were the most popular choice of airframe, although we were all treated to a couple of exhilarating flights from Mark McKee flying his impressive Black Horse two metre span Spitfire. And to prove that not all scale models are delicate objects that need wrapping in cotton wool, Bill Mansell flew a Piper Arrow, built from an Aviomodelli kit in 2004. Now fitted with an RCV 91CD four-stroke this 82" span, 15 lb plane handled the poor flying conditions really well. Bill was in second place in the competition all the way, until the last flight of the day when he was pipped at the post by Mark McKee who took second place and an RCMW subscription with the final flight of the competition.

Keith Fear from the Skelmersdale club bought two models in the hope that the weather forecast was wrong. As soon as he got to the field he knew that his lovely Moth Minor tandem trainer was not going to be the right model for the day so his Extra made an appearance instead.

## Standards

When Phillip Kent designed the Open Scale competition more than a decade ago it was to promote competition flying for people who did not have the time or inclination to build their own models. In the noughties there were ARTF planes, but Ready To Fly and Plug 'n' Play didn't really exist unless you had mega-bucks. All these sort of planes would not have been allowed in most competitions until the Open Scale format was designed.

As well as opening up scale flying competitions to more people by removing the need for the pilot to build the plane, Phil wanted to give people an insight into the judging of scale competitions and encourage more people to become judges.

Having done enough photography during Round 1, and having chatted to pilots during the lunch break, it was time to find out more about the judging. In previous years I have flown in the competition. Competitors stand behind the judges and so they can listen to what they are saying, which can be very discouraging! To get a better perspective I sat with the judges to listen in to their discussions and then I spent time with Geoff Brown, fresh from judging at the Nationals this year, and one of the judges at the event.

Geoff is an experienced scale modeller who has represented the UK in scale competitions and he won a bronze medal in the European Scale Championships in Poland. In his very first competition he came last, but by talking to and watching other competitors he worked his way up to win the scale Clubman class at the Nats with a Gloster Gladiator built from


Mark McKee from the Wirral club flew this lovely looking Black Horse Spitfire into second place. The 16 kg model is powered by an OS 33 petrol engine and it gave a sparkling performance – enough to send the pilot AWOL!


Just getting the machine back on the ground safely was an achievement this weekend. Jim Brown came over from Yorkshire to experience Lancashire hospitality – and wind! His Pilot Edge is powered by a DA60 with a lovely quiet Zimmerman stainless steel exhaust


Alan Glover's winning Sukhoi flew smoothly and Alan paid attention to what the judges want. His prize was a Denis Bryant SE5 plan and kit from Traplet

Pilots are allowed to stand behind the plane for take-off providing they have a helper to guide them back to the flight box


Keith Fear from Skelmersdale flew this Extra in preference to his lightly loaded Moth Minor

an enlarged Brian Taylor plan. He is now a fully qualified full size pilot as well.

At the event there were three experienced scale judges available so I was able to talk to one of them as each flight was taking place, as well as talking to Geoff at the end of the competition.

The Wirral club had marked out the judges area, as well as the take-off and landing area, and had helpfully put a flag on the far side of the runway opposite the judges to mark the centre of the flight line, as per the diagram. Pilots were told that they had to take-off and land within the marked area.

Even if the competitors knew nothing about judging standards, they were aware that they would lose marks if the wheels were still on the ground at the end of the take-off strip or didn't touch the ground on landing within the landing area. This was not as simple as it seems as the flags at each end of the strip were often pointing in opposite directions to each other.

We did not talk much about the obvious; loops have to be round and they have to maintain heading, and it would be good if a figure eight was shaped like a horizontal 8 in the sky. Mostly the chatter was about discussing why Geoff and his co-judges gave manoeuvres specific marks.

## They Aren't Dragons And Ogres

First of all I wanted to establish the ground rules that the judges would be working to and what they were expecting. The Wirral club site is surrounded by trees and the very strong gusty wind was blowing in every direction under the sun at various times. Turbulence, as the air rolled over the trees, caused several planes to be either pushed into the ground by downdraughts or lifted unceremoniously onto a wingtip. Several flyers called landing and started their final leg into wind, only to find that they were landing downwind as they approached the strip – disconcerting to say the least.

Billy Bennett's Goldberg Extra. Now 21 years old the plane is powered by an OS91FS

Although small this SBach has a 6S battery for sparkling performance in rough weather

If you can't see what the plane is doing in this picture, what chance have the judges got of marking it?

The judges said they could live with planes not performing perfect circles etc., but the basic principles of competition positioning must be kept.

## What Do They Want?

The competition is flown over at least two rounds and consists of 10 manoeuvres and there is also a mark for realism in flight – more about this later. Each manoeuvre has a maximum of 10 points. In olden days and in World Championships each manoeuvre had what was called a 'K' factor, assigning a level of difficulty to it. So a triple inverted flat spin (is that diving or flying?) might have a 'K' factor of 10, which means the score for the manoeuvre would be 10 times whatever the judge scored. The flat spin would get 50 points if the judge gave the contestant 5 points, but a manoeuvre with a 'K' factor of 2 could only get a maximum of 20 points if it was perfect.

This is discouraging, so Phillip Kent abolished the 'K' factor for his open scale system. Competitors should assume they have 10 points for each manoeuvre before they start and they lose points for errors. The rules for competitions are available on the BMFA website and are easy to follow.

## The Judge's View

The obvious question to Geoff at the end of the competition was, "What are the faults that competitors don't think about?" Some of the answers are really simple but I, like many people, don't think about them when I am flying:

1. Call 'Start' before the take-off run starts.

2. Only call 'Now' to indicate the start of the manoeuvre when the wings are level and the plane is flying straight down the flight line. Otherwise you lose a point before even getting in to the pattern.

3. Don't make the judge work hard to see the plane, so start manoeuvres over the take-off/landing strip and start all procedures directly in front of the judges. Allowances will be made for wind direction and speed.

4. If the plane is just a tiny speck in the distance don't expect high marks. In Round Two of the competition every flyer flew too far away from the judges. This was undoubtedly because of flying in a nasty crosswind coming from behind the pilots with lots of turbulence as a result of the wind flowing over the trees. So everyone got marks that reflected the problem but the judges made allowances for the really difficult conditions.

5. If the judge has to look straight up because the plane is directly over his head at the start of a manoeuvre don't expect to get any points for it.

6. Don't turn towards the judges in any procedure. One flyer on the Wirral did a superb stall turn but turned in toward the judges and scored a terrible 2 instead of the tremendous 10 he deserved for producing an excellent vertical climb and accurate 180 degree turn with the downward leg being exactly the same length as the upward leg.

7. In scale competitions pilots are given the option of selecting the pattern they want to fly. There are four compulsory manoeuvres and six that the pilot selects.

According to the BMFA rules they should demonstrate an appropriate range of capabilities of the subject aircraft and may be selected from a list. The selection of manoeuvres may also include up to two non-listed manoeuvres or flight functions, which the competitor feels are appropriate. 10 marks per flight are given for realism and given that there were only 10 marks between second and fourth place (to put it another way – prize winner or non-prize winner) selecting the right schedule for the plane and the weather is vital.

Geoff gave the example of demonstrating flaps in a gale with a high-speed aerobatic plane being a poor choice of manoeuvre. The pilot has to fly an accurate circle starting and finishing in front of the judges at relatively low speed and at a height suitable for deploying flaps. That is virtually impossible in a strong wind and is also inappropriate for highly stressed, fast flying airframes.

## Specific Manoeuvre Problems

Throughout the competition there were a number of flying errors repeated by many of the competitors, but which were not related to the weather or caused by incompetent flying. The problem was a lack of understanding of what was expected by the judges.

The rules state that each manoeuvre is to be marked out of 10 points by the judges, who will consider the following in their allocation of marks:

A) Accuracy of position of the manoeuvre.

B) Accuracy of execution of the manoeuvre in relation to the full sized aircraft's performance capability.

C) 'Start' & 'Finished' to be called by the pilot in the appropriate position.

D) Realism of Flight, to include: Speed of the model, smoothness of flight, size of manoeuvres.


**Left top & below:** Bill's 15 lb Piper Arrow is powered by an RCV 91CD. The plane is over 10 years old

Bill Mansell fuelling up his Piper Arrow. Is he being green stopping the fuel dripping on the grass or will he be returning the fuel to the can because fuel is so expensive...?



Keith Fear wisely kept this nice Moth Minor on the ground to fly another day. He is in the process of refurbishing the model for other competitions

## Helpful Judges Tips

All procedures should start with the plane flying down the centre of the take-off/landing strip.

**Take-off:** Call 'Start' while the plane is stationary and lift off in front of the judges. There was only one manoeuvre in the whole competition which scored a maximum 10 points and that was the Round 2 take-off by eventual winner Alan Glover. The plane's wheels lifted off the ground directly in front of the judges and this was followed by a smooth ascent and flat 90 degree procedure turn. Once the manoeuvre is finished the pilot must call 'Finished' or 'Complete' so the judges know when to stop judging.

**Figure Eight:** Don't call 'Finish' before the final straight flight has flown to the full width of the figure. Make sure the crossover is directly in front of the judges.

**Descending Circle:** Start in front of the judges over the landing strip and turn away from them. Call start before the turn starts. Remember to finish at below 6 metres in front of the judges. Geoff Brown said that it should look as if the plane is descending at a constant rate inside a cylinder. When he flew in competitions he used rudder in the turn as this gave a down elevator effect once the turn was started and helped to keep the plane descending at the same rate throughout.

**Split-S/Reversal:** Call 'Start' in the right place and start the manoeuvre in the right place. Start should be called before the plane is directly in front of the judges. As it gets level with the judges it should be rolled inverted and fly upside down for a second or so before starting the half-loop descent, it should then fly out straight and level so the manoeuvre describes a stretched C shape.

**Landing:** The wheels should touch the ground directly in front of the judges if you want to get near full marks.

**Chandelle/Ascending Turn:** The ascent should be at the same rate all the way through the manoeuvre, which means that as soon as the turn starts extra power will need to be applied; don't start the turn on full power.

**Overshoot:** This is an aborted landing. Think of it as a landing approach, which is too high and has to be aborted because the plane will not land before the end of the runway. This means that the plane should be at least at head height as it passes the judges instead of landing just in front of them.

**Rectangular/Triangular Circuits And Flap/Undercarriage Demonstrations:** Despite sounding simple these are all very difficult manoeuvres to fly accurately. Watching the flights with the judges it was obvious that it was extremely difficult to accurately work out how long each leg needed to be on triangular and rectangular circuits. Height has to be constant and because these are supposedly 'simple' flight patterns any deviation from straight and level or accurate circles will cause the pilot to lose marks quickly. Pilots always find it difficult to work out the length of the base leg, which should be the same distance either side of the judges.

Alan Glover from the Skelmersdale club applied the principals the judges were looking for throughout the competition, and looking at his flight in Round 2 from the judges' point of view he won by a country mile. He had a second round score of 95 out of a possible 110 in dreadful weather conditions and as a result of Traplet's generous prize Alan has a winter project to build a Denis Bryant SE5.

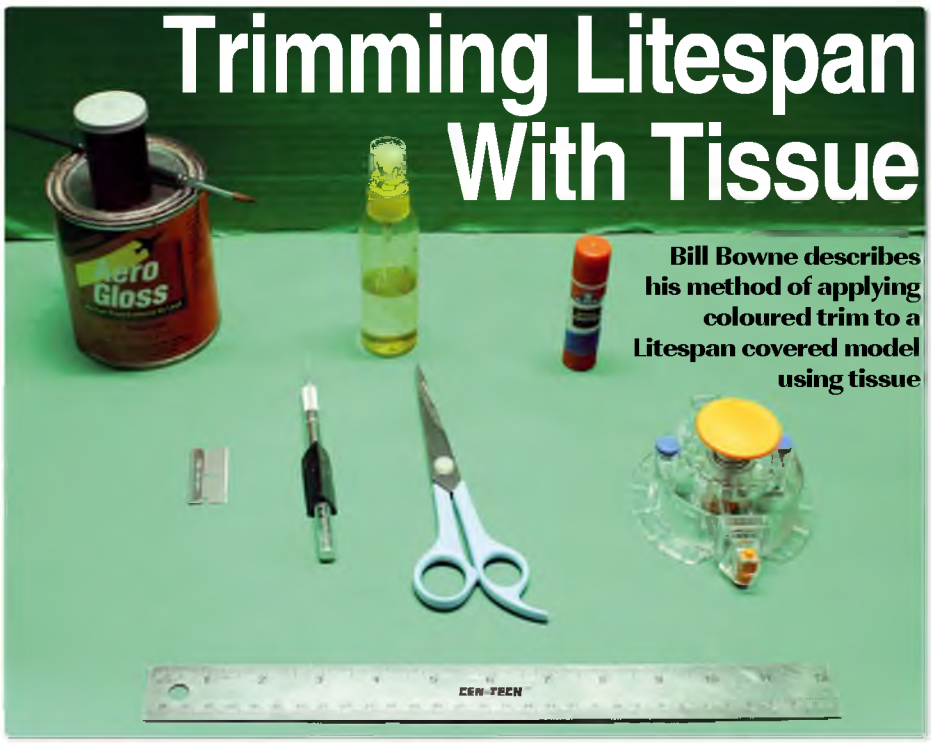
The Traplet competition is now attracting some regular competitors, most of whom would not normally dream of entering a competition. Coupled with the established Northern scale inter-club competition in Lancashire there is a real revival of competitive flying in the area. Hence the need for more judges!

Armed with this inside information from the judges we can all have a go and improve our flying standards. See you there next year.

***RCMW***

# Trimming Litespan With Tissue

**Bill Bowne describes his method of applying coloured trim to a Litespan covered model using tissue**




**Supplies needed (top left to right): clear dope (50/50 mix), rubbing alcohol spray, glue stick; (middle l to r), razor, hobby knife, scissors and circle cutter; (bottom) straight edge**

Litespan ('Coverlite' in the US) is a synthetic tissue paper for model covering. It's tougher than Silkspan, shrinks (a bit) when heated and is available in several colours.

Not as easy to apply as typical shrink films, Litespan doesn't shrink as much when heated, it doesn't go around curves as like Solarfilm or Ultracote, and it doesn't come with pre-applied glue. Instead, you have to apply glue to the surfaces to be covered. Balsaloc is the preferred adhesive and being water soluble it doesn't have the obnoxious odours of some other adhesives.

Litespan excels at emulating traditional tissue paper, with only a fraction of the work and with a much greater resistance to puncture. Litespan can be dyed (although it's a finicky task) or trimmed with other bits of Litespan. But applying the traditional tissue paper it resembles as pieces of coloured trim is easy and it looks great.

Silkspan works for trimming but gift store tissue (which does come in some interesting (!) patterns) also usually works well. But (big caveat here!), you should test gift store tissue before applying it as I've found some doesn't take well to be being doped. Happily, tissue is very inexpensive, so what doesn't work for trim can be used for (surprise!) packing gifts! Another benefit of tissue's low cost helps offset its fragility (especially when wet). Plan on making extra copies of all your trim bits, just in case.

Speaking of 'dope', I usually use old-fashioned Aerogloss dope (thinned 50/50) for most of my trimming work. But, some of the newer, water based substitutes work just as well (sometimes better, as we'll see shortly). Please remember that tissue is fragile, so if your 'dope' is relatively thin, brushing it on should work. But, if it's thicker, you'll need to either thin it or GENTLY rub it through the tissue.

We will walk through making a set of pre-WWII US 'star-and-meatball' insignias, to show most of the techniques. Give the method a try on your next old-timer – your friends will be sure you did it all with tissue and dope!

***RCMW***

## Water Based Dope?

Deluxe Materials make a water based dope in the UK called Eze Dope.

What I use here in the USA is Polycrylic (by Minwax). I use it straight from the can, but I know many folks thin it with water or rubbing alcohol. It isn't fuel proof but it won't attack plastics the way regular dope does. Some folks use Future floor wax (thinned with water) or water-based polyurethane (again, thinned), but I prefer Polycrylic as it's easier to clean up. Plus, Polycrylic is available in matt and semi-matt finishes, which work better on scale models. We don't want any glossy patches over the markings!

One very important caveat about water based dope substitutes is that only Eze Dope seems to shrink tissue. All the others will seal tissue, but don't seem to shrink it.

## Right Way Up

Please, when putting US stars on a model (I assume this also holds true for Russian, Chinese and other 'star' insignia), remember two points:

First, stars on a vertical surface (i.e., fin or fuselage side) point UP.

Second, wing stars always point either forwards or towards the wing LE. If in doubt, please check your documentation.

## Off White

Be aware that white tissue usually turns clear when doped. So, stick with white Litespan for white trim. On the other hand, we can take advantage of white tissue's turning transparent when wet. We'll have to use a water-based dope substitute, as dope WILL attack laser toner.

Tape an oversized bit of white tissue onto a sheet of bond paper, then run the assemblage through your laser printer. Trim the tissue to the edges of the design.

Prep the model's surface with a dab of water based dope substitute.

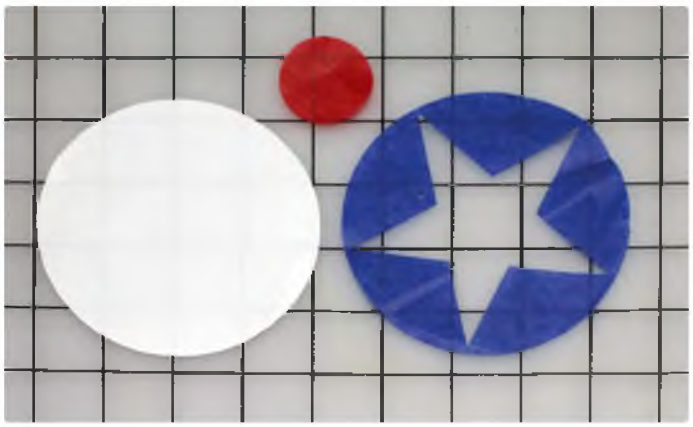
GENTLY set the tissue in place – it's VERY fragile and will easily tear when wet.

Dab more water-based 'dope' on over the tissue, saturating it.

**Tape the tissue down firmly and use bond paper for an overlay. The lines in the middle of the star's arms ensure that the circle cutter is centred precisely on the stars centre**

**Cut the blue disk to slightly overlap the white. Keep firm pressure on the cutter, lest the blade snags the tissue and rips it**

Using a straight edge, a SHARP knife and the bond paper pattern, cut out the star centre. Note that it doesn't quite reach the edges of the blue disc. Cut as you would drawing a star, that is straight from point to point



Once you've cut the blue discs, cut the red and white ones. Make some extra tissue bits in case some tear during installation

Paint the backs of the white Litespan discs with with Balsaloc. When dry, iron them in place

Dab a glue stick on the white disc, between each arm of the star

Carefully place the star over the white disc and gently press in place

Put another glue stick dab on the red 'meatball' and press that down

Give the whole insignia a light coat of thinned dope. Let dry!

A trick I learned from a long-gone hobby shop. A light spritz of rubbing alcohol shrinks the tissue and eliminates most of the wrinkles, evaporating quickly without warping the balsa. After the alcohol dries, apply another coat or two of thinned dope (if needed)

Main difference on the rudder is more use of the glue stick to apply (and wrap) the red and blue stripes over the white and yellow Litespan, before doping


Two copies of old club emblems laser printed on white tissue, with one 'doped' onto yellow and white Litespan (using water-based 'dope') shows how transparent doped white tissue becomes


My American modelling license number, laser printed on white tissue and applied with water based dope substitute. The white tissue virtually disappears when 'doped'. Don't use real dope though as it will melt the toner!

## CONTACTS

**SOLARFILM**
www.solarfilm.co.uk
Solarfilm's website features instructions and handy hints on using Solarfilm products (including Litespan)

# Arrow Pylon Racer

**Pull out this month's free plan to build this 660 mm span indoor aerobatic model, designed by Donatas Pauzuolis, Gold Medallist in the Aeromusical competition at the World Air Games in Dubai. Arrow suits inexpensive lightweight R/C equipment and flies using a 2S LiPo**


## Introduction

It's already the beginning of another indoor season and I hope that all of you are enjoying some fun flying indoors this autumn and winter.

High-level Pattern and Aeromusical planes require plenty of patience during the building stage. Also a decent flying level demands a solid practice plane, so it is natural that sometimes you need a model just for fun. I would like to present one of my personal favourite models, the 'Arrow Pylon Racer'. As the model name suggests it can be used for race competitions and it is easy to build; it does not require a lot of materials or high end equipment for assembly. On top of that it does not take a lot of space and can be flown very easily outdoors during calm weather.

## Building Materials And Tools

This model can be built from Depron or EPP foam. Naturally, EPP foam will make your plane more durable, which is great in case of small crashes. But have in mind that EPP is not a rigid material and during fast and sharp turns the model can have a lack of precision in control. My favourite material for such a small size plane is 3 mm thickness white Depron foam.

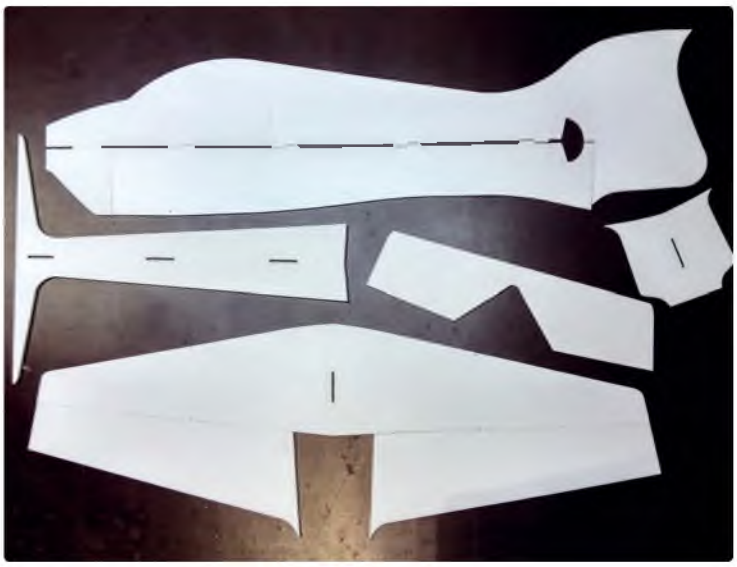
You will need a little less than one square metre to build the model. For structural reinforcement you will need some carbon rods and flat carbon strip. I have used

RC MODEL WORLD

### At A Glance

| | |
|---|---|
| **WINGSPAN:** | 66 cm (26 in) |
| **LENGTH:** | 71 cm (28 in) |
| **WEIGHT:** | 97 g (3.46 oz) without battery |
| **BATTERY:** | Gens Ace 2S 450 mAh LiPo, weight 24 g (<1 oz) |
| **RTF WEIGHT:** | 121 g (4.32 oz) |
| **SERVOS:** | Aileron – JR 188; Rudder and elevator – Spektrum A2020 |
| **MOTOR:** | AXI 2203/race outrunner brushless |
| **ESC:** | Castle Creations Talon 15 A |
| **PROP:** | GWS 7" x 6" |
| **CONSTRUCTION:** | 3 mm Depron, carbon rod and flat strip |
| **CENTRE OF GRAVITY:** | 160 mm from motor mount, 70 mm from wing L.E. |

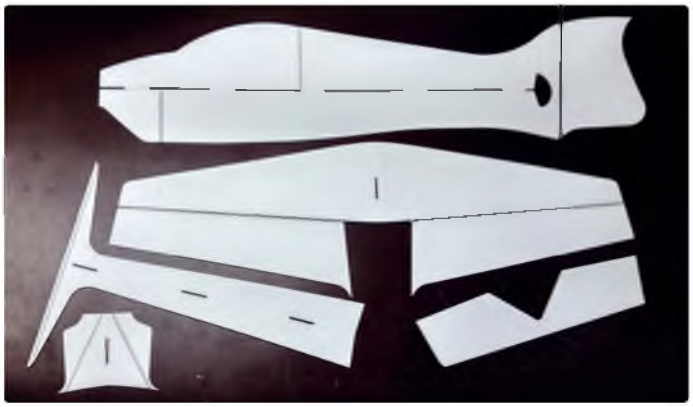
Arrow Pylon Racer is a small aeroplane so I was able to make all the parts from just two sheets



Aeroplane parts ready for further assembly

Motor mount reinforcement is made from 100 mm by 0.13 mm thick flat carbon strip

Elevator hinge line reinforcement is made from 250 mm by 0.13 mm flat carbon strip



All parts reinforced and ready for further assembly

Arrow's fuselage is reinforced with 0.13 mm flat carbon

approximately 155 cm of 3 mm thick and 70 cm of 0.13 mm thick flat carbon strip. Also 150 cm of 1 mm thick and 40 cm of 1.5 mm thick carbon rods were used.

You will also need Blenderm tape, foam friendly CA glue, CA kicker, fibreglass cloth and some paint (optional) for better visibility in the air. The main tool for this kind of model is a sharp hobby knife. You will also need a ruler, a file and some sanding paper.

To assist in the build Traplet are developing a pre-cut pack of Depron shaped parts, which should be available from the Traplet Plans service by the time you read this article (see Plans Details at the end).

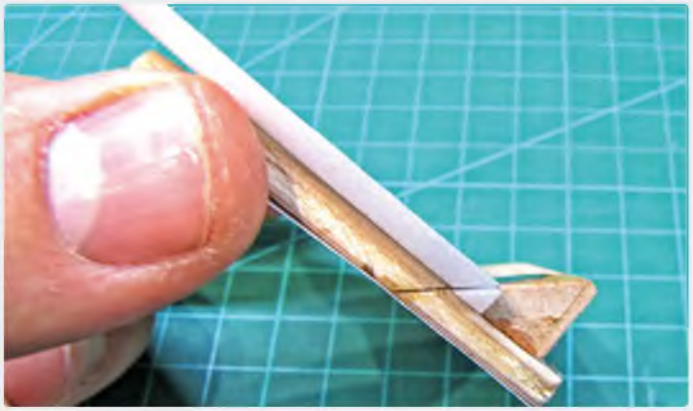
## Building Process

The model consists of 11 foam parts. The horizontal parts are: nose, wing, two ailerons, tail section and elevator. The vertical parts are: top and bottom sides of fuselage and rudder. Two 30 mm wide pieces will be used to reinforce the fuselage; they will form a box that will keep fuselage in place and they will also help to avoid distortions.

First you need to cut all the parts from the plan. If you have an option you can do it with a CNC milling or laser cutting machine, which would be the fastest and most precise way – or use a Traplet Depron pack! Otherwise you can do it old fashion way, cutting out the parts by hand. Place the drawing on a piece of foam and outline it. After outlining, carefully cut out each part.

Before assembly both the ailerons, elevator and 30 mm Depron lines must be prepared properly. The touching edge (the hinge line for the control surfaces) has to be sanded to a 45 degree angle. For better results a 45 degree bevelling tool should be used. If you want a long lasting model several high stress areas (the motor mount, landing gear, elevator, tail section and last, but not least, the wing from both sides) should be reinforced with flat 3 mm carbon. When you have glued the carbon to the wing it is time to attach the ailerons.

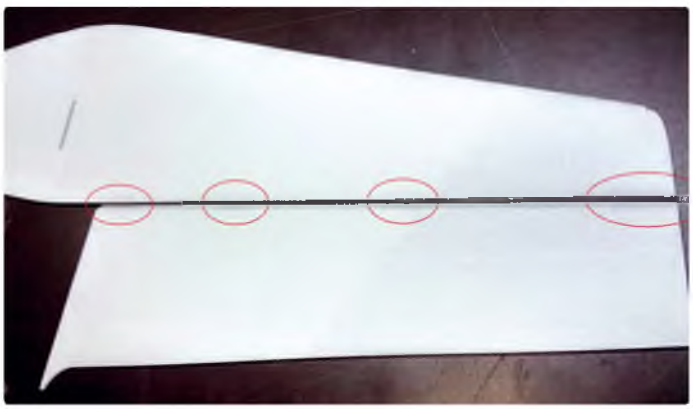




For this, or any other indoor aeroplane built from Depron, a bevelling tool is very useful and is easy to make. You will need the following: a sharp razor blade, 70 x 50 mm plywood plate and angled hardwood. Glue the wooden pieces together as shown. Slide the blade between the wooden parts; it must be placed at approximately a 45 degree angle to ensure that the Depron bevelling process goes smoothly

Home-made bevelling tools were used to prepare the aileron hinge lines



Ailerons mounted to the wing using Blenderm tape. On the top the tape is attached all the way from the root to tip. On the bottom, shown here, fit the tape in the middle and on the edges with 30 mm strips (circled)

The elevator hinge line is prepared using a bevelling tool

Put the ruler on the centre line as shown. Once the line is perfectly straight then glue the nose part to the wings and then the wings to the tail section

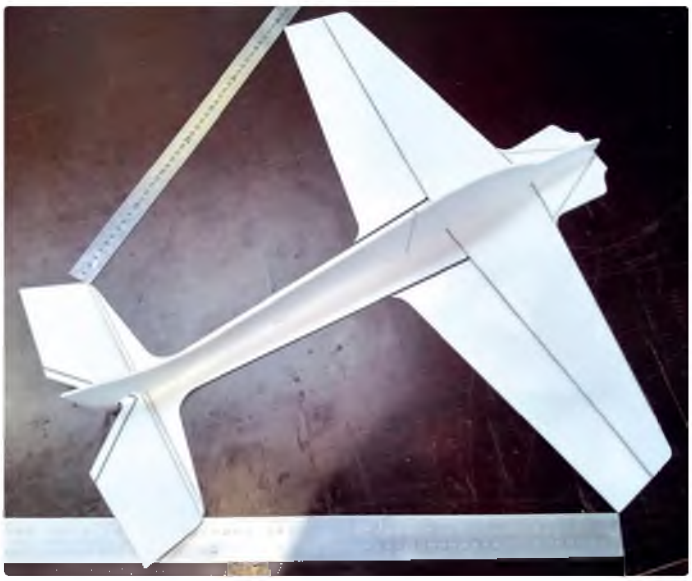
For this use Blenderm tape; to achieve good aileron deflection leave a 1 mm gap between the wing and aileron. Do the same steps for the elevator. Now join the three main horizontal parts together: the aeroplane's nose, wings (with already attached ailerons) and the tail section (with the already attached elevator). This step is the most important during the whole assembly of the Arrow.

You need to make sure that the plane is straight and the fuselage is not crooked. Use two rulers and measure the distance from the tip of the right aileron to the right elevator and from the tip of the left aileron to the left elevator. Make sure that these distances are identical. After you accomplish this step reinforce the fuselage with fibreglass cloth. The area right behind the wing, where the wing joins horizontal tail section, has proven to be the weakest point during a crash. Another area that faces constant stress is the landing gear fixing point.

For further assembly follow the step-by-step pictures and descriptions.

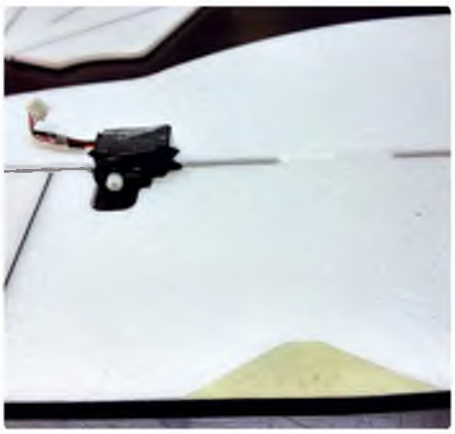
## Radio Set Up

This model doesn't require high end equipment so you can use pretty much any servo from 4 to 7 grams. Servos should have

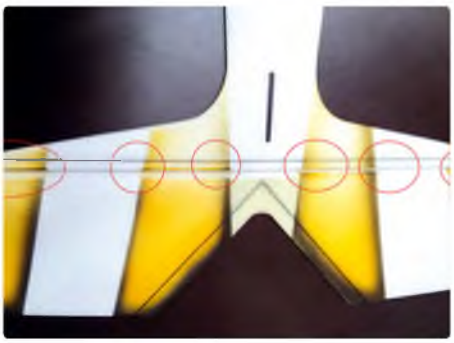


Make sure the distance from the right wingtip to the elevator is exactly the same as the distance from the left wingtip to the elevator

The aileron servo must be placed in the centre of the wing next to the leading edge. Cut the necessary holes in the vertical and horizontal aeroplane parts

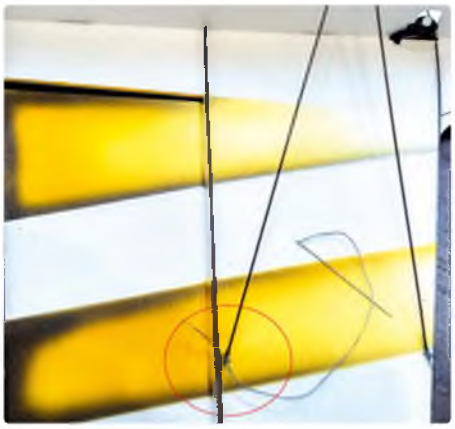


The area where the wing support will be joined with the fuselage must be reinforced using very thin plywood, fibreglass or carbon plate. 0.22 mm thickness fibreglass is shown here

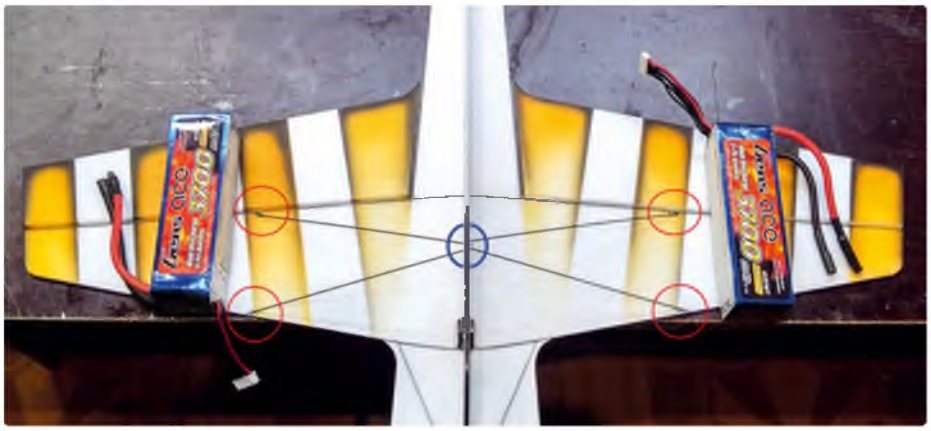


Additional reinforcement is added to the tail section. The central area is reinforced with a 0.22 mm thickness fibreglass plate, which will help to resist any twisting of the elevator and hold together the two flat carbon pieces that make the elevator stiff. The red circles show the small pieces of Blenderm tape that are attached to make sure the elevator always stays in place

Glue on the vertical underside part of the fuselage



Red circles – to strengthen the wings four carbon rods supports must be added (1 mm thickness and 180 mm in length). The joints next to the leading and trailing edges of the wing must be reinforced with knotted thread



Central blue circle – only when all four support points are reinforced should you move to the last step. Place the aeroplane on a flat surface and make sure that the wings are perfectly straight and level. To do this place some weights on the wings. Then glue all supports together to the fuselage; to do this apply a drop of glue and then make a knot in the thread

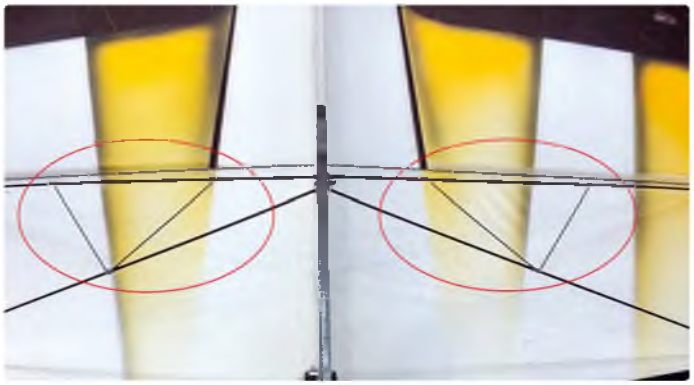
at least 0.8 kg of torque and a speed of at least 0.12 sec/60 degree. Have in mind that to keep pylon racing safe most organisers limit the battery voltage to 7.4 (2S LiPo) and the model RTF weight to 200 g. This means that a 2S motor will be more than enough to power this tiny aeroplane.

I would go with a 2000-2300 kW outrunner brushless 15-20 gram motor. My favourite option is the AXI 2203/race motor. Normally this motor is used to power almost twice the size Aeromusical model planes. The 2S LiPo battery's capacity should be 300-450 mAh.

Naturally, to gain speed different propellers should be used. Instead of the popular Aeromusical choice (a GWS 8" x 4.3") I am using a GWS 7" x 6". This prop is still great for 'agile' aerobatics and gives a lightning turn of speed in a straight line.

Depending on your battery and motor selection the speed controller should be somewhere from seven to fifteen amps and its weight should be from four to ten grams.

Last, but not least, is a light and reliable receiver. I have had great results with a Spektrum AR 6310 receiver that weighs just two grams. Another interesting option would be the Spektrum AR6335 receiver with its AS3X stabilisation system. **RCMW**

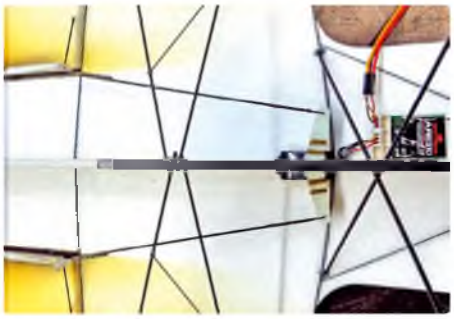


Attach 0.5 mm carbon rods to hold the wing supports together (circled)

Landing gear, made from 1.5 mm carbon rod (length 180 mm), is attached to the airframe

For the axles use 1.5 mm thick carbon rod. Mount light wheels as shown. Place the model on a flat surface and once everything is straight and level cut the axle and trim any sharp edges with a precision drill/grinder as shown

Aileron pushrods are assembled from 100 mm by 1 mm carbon rod. Pushrod ends are made using wire reinforced with CA glue and thread



Control horns are made from 0.5 mm thick fibreglass sheet. The slightly bent aileron pushrods are attached to the servo arm, also made from fibreglass sheet

Place the vertical top fuselage onto the already assembled model

Some additional reinforcement is added to the tail section. The bottom of the fuselage is reinforced with 0.7 mm carbon rod. Flat 0.13 mm carbon strip is added to join and reinforce the rudder tail post

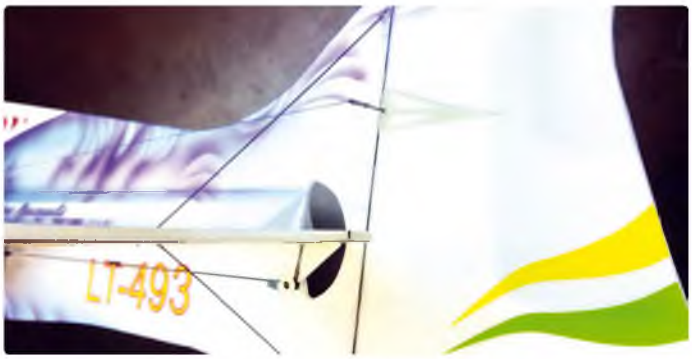
Adjustable motor mount placed on the fuselage, shown with an AXI 2203

One more crucial step to ensure a rigid and straight flying aeroplane is to add fuselage reinforcement. For such a small size aeroplane the easiest way to achieve this is by adding a torsion box. In order to glue the torsion box on straight you need to be sure that the elevator and wing surfaces are level so place the aeroplane on four cans as shown. Make sure that the cans are exactly the same height. Now you can glue on the torsion box

The rudder servo is mounted close to the Centre of Gravity. It is glued and reinforced with a triangular Depron support. Later it will be joined with a pull-pull connection

A battery box is built using Depron. Note its position close to the Centre of Gravity

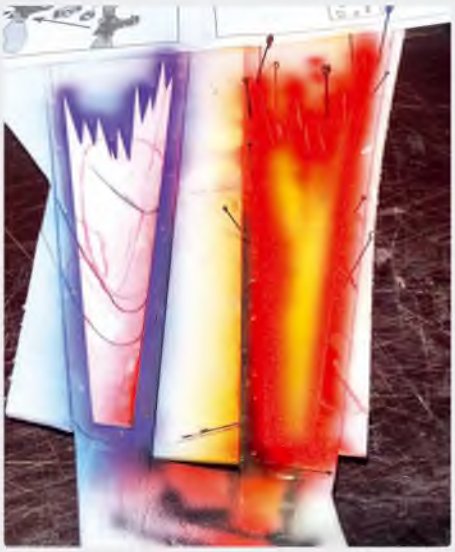
The elevator is controlled with pull-push system, with the servo mounted close to the nose. Make the pushrod from 1 mm by 520 mm carbon rod and support it at three points. For precise control a small ball link from a 250 size helicopter was used




The vertical fuselage is supported using 0.7 mm carbon rod. The rudder pull-pull area is reinforced with a fibreglass triangle. The pull-pull cables are made from braided fishing line

I believe that pylon racing models must have a rounded leading edge in order to create less drag in flight. So on the 3 mm leading edge I glue a piece of Depron and round it using sanding paper

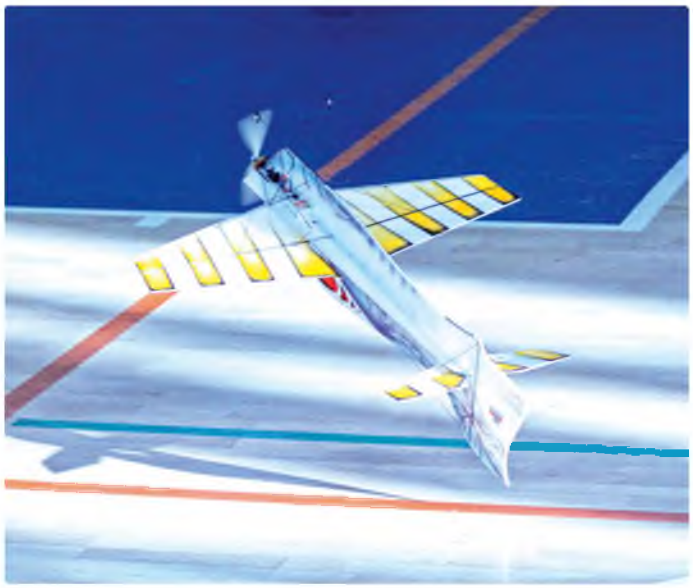
The same drawing was used by my friend to build a noticeably stronger and lighter version of the Arrow Pylon Racer from carbon rods and tubes



Arrow Pylon Racer during the various stages of paint spraying

Only a small amount of rudder is required in knife - edge flight

Arrow displays perfect balance in vertical manoeuvres



As the name suggests, Arrow Pylon Racer can be used for indoor pylon racing competitions. But it's also great for aerobatic fun flying

## CONTACTS

**DONATAS PAUZUOLIS**
www.pauzuolis-rc.com

# PLAN DETAILS

| | |
|---|---|
| **BUILD CATEGORY:** | Intermediate |
| **PLAN NUMBER:** | MW3802 |
| **PLAN PRICE:** | £11.99 ($20.99) |
| **DEPRON CUT PACK NUMBER:** | WP3802 |
| ***DEPRON CUT PACK:** | £17.99 ($22.99) |

Plans and parts are subject to Postage & Packing charges at standard rates.
*NOTE: All Depron Cut Packs are intricate shaped parts only. No strip material or sheet wood is included.
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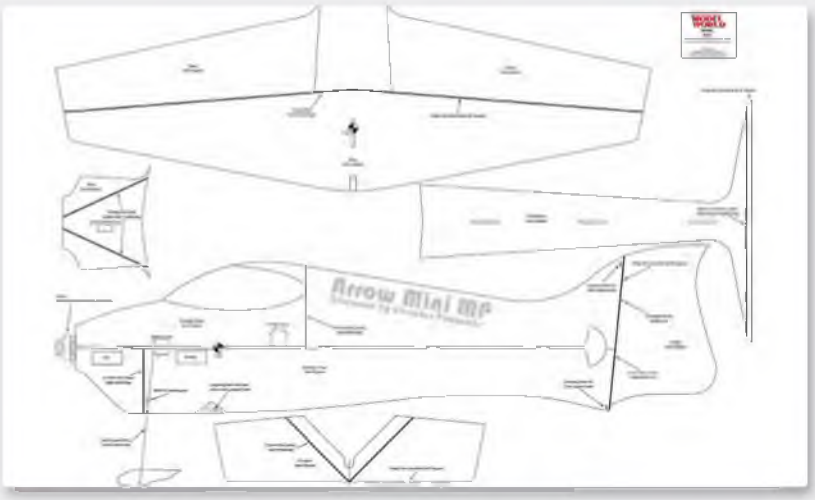
Email: orders@traplet.co.uk or order online at www.trapletshop.com



# Power Scale Soaring
## On The Lleyn Peninsula

**Phil Cooke provides a pictorial report from the annual Lleyn Power Scale Soaring Fly-In, when the PSSA join forces with the Lleyn MAC to fly their power scale gliders on the cliffs and slopes of the magnificent Welsh peninsula**

Chris Barlow provides the perfect launch for Peter Garsden's Israeli Air Force A-4 Skyhawk, winning the 'Best Flown Jet' prize for his flying throughout the day

The weekend of August 13/14th 2016 saw the Power Scale Soaring Association (PSSA) stage their annual PSS Fly-In with the Lleyn MAC, on the magnificent coastal slopes of the Lleyn Peninsula, North Wales. This was the fourth meeting held to date this year as the PSSA continue to actively celebrate their 30th Anniversary season since the group's foundation in 1986.

A less than ideal wind forecast still generated a well attended event, with a total of 18 pilots travelling with an array of models from all over the UK. Saturday proved the better of the two days; the typical wing loadings associated with this division of soaring require 15 mph winds as a minimum to get the models 'into the groove' and we were blessed with a warm, 20 mph Westerly from the outset. This saw us flying at Anne's Place, a picturesque stretch of coastal headland overlooking Hells Mouth Bay a few hundred feet below the launch point.

In perfect conditions, flying was achieved in a friendly, laid back manner throughout the day until gone 6 pm. The only timed structure to the proceedings was a group photo-call just after lunch and a short prize giving presentation late afternoon. Participating pilots voted for aircraft in three categories: 'Best Flown Prop', 'Best Flown Jet' and 'Model of the Event'. For winning 'Model of the Event' with his superb Vulcan, Andy Meade was awarded a BBMF print signed by all the crews and engineers and he also took home the 'Alan Hulme Memorial' trophy. Congratulations to the winners and thanks to all those who travelled and took part, and especially to the Lleyn MAC for hosting us.

For more information about PSS flying, the PSSA and their remaining events this year visit www.pssaonline.co.uk or contact Phil Cooke at: webmaster@pssaonline.co.uk

***RCMW***

Peter Garsden's A-4 Skyhawk in flight. Built from the Traplet wood pack and with a span of just 36" the model performed very well and looked totally convincing in flight. Refuelling probe is a 3D printed part – contact the PSSA if you'd like one

The Skyhawk is the subject of the PSSA's 2016 Mass Build running on September 11th, 2016

**And The Winners Are...**

| | | |
|---|---|---|
| Best Flown Prop | Tim Mackey | Supermarine Spitfire |
| Best Flown Jet | Peter Garsden | McDonnell Douglas A-4 Skyhawk |
| Model Of The Event | Andy Meade | Avro Vulcan |


Bob Jennings gets Andy Meade's large 72" span Avro Vulcan away in style. A perfect maiden flight ensued

Built up from the South Herts Model plans, the large Vulcan performed superbly from the coastal slopes. At 9 lb AUW it had great presence in the air

The Vulcan is even fitted with a Blue Steel stand-off bomb. With the ingenuity typical of PSS builders the fins on the weapon are designed to fold in upon landing to avoid damage to it or the model


BAe Hawk built by Matt Jones from the popular Andy Conway plans. The model is now operated and flown by Andy Meade. This one is fitted with a true scale wing

Harry Twist prepares to launch Chris Barlow's Avro Vulcan, built from the well proven plans of Ian Benson. Vulcans are a popular model on the slopes these days and at times there were five or six airborne at this event!

Bob Jennings checks on proceedings as Mark Kettle captures the flying action on 'Dragon Cam'! This homemade device (tailored for the geography of our event!) improves video control and panning in bright light conditions when the screen could not otherwise be viewed. Genius – and fun!

Alan Jones prepares his Me 163 glider prior to launch out over Hells Mouth Bay

Beautiful Hawker Hunter model by John Hey

Phil Cooke's Panavia MRCA Tornado prototype in flight, built from a modified plan by Andy Conway (photo by Andy Meade)


Not all models flown on the slope are balsa or foam creations! Harry Twist built this superb little Impala from Correx sheeting and it flies wonderfully well. It's certainly one of the cheapest routes to successful PSS flying if you fancied having a go!

Paul Jubb's impressive N.A P-51D Mustang, converted for PSS from the YT International power kit, gets a perfect launch from Bob Jennings (photo by Andy Meade)

Alan Jones' Aermacchi MB-339 built from the Dragon Models kit is launched by Phil Cooke


MB-339s do fly well from the slope. Kits are still available through Island Models. Alan Jones' example is on finals to land

Bob Jennings' Supermarine Spitfire Mk.24 on a fast beat up. The 43" span model is built from the Alan Hulme plans, which are still available through the PSSA

Tom Cooke's delightful Jet Provost in an early RAF trainer scheme. Built from the Traplet plan pack as part of the 2014 Mass Build this model still flies very well whenever it is aired

Small scale DH Vampire flown by Tim Mackey. An EDF ARTF kit converted to slope use, the ducted fan has been replaced by an amazing sound system with realistic jet noise and cannon fire. It kept us well amused on the slope!

EPP Shorts Tucano finished in a gorgeous RAF display scheme, built and flown by Bob Jennings. Model is captured on short finals after another aerobatic sortie!

Peter Garsden's Jet Provost. These little models have proven themselves a real hit with PSSA flyers who took part in the previous Mass Build

Bob Jennings prepares to launch the DH Mosquito built this season by Steve McLaren. Built from the Cloud Models power kit, it performed very well from the slope

The pitting area was always busy with models. A hive of activity supporting the relentless flying we enjoyed all day at Anne's Place

Tim Mackey (right) receives his prize after winning the 'Best Flown Prop Model' category with his Spitfire fitted with an awesome sound system (photo by Shona Meade)

The 'Best Flown Jet' prize was awarded to Peter Garsden (right) who flew his new A-4 Skyhawk with gusto throughout the day (photo by Shona Meade)

Andy Meade (right) is presented with the Alan Hulme Memorial Trophy following his win with the mighty Vulcan – voted 'Model of the Event' by the participating pilots (photo by Shona Meade)

Perfect conditions at a slope as picturesque as the one at Anne's Place will always lead to happy pilots! The PSSA take a breather from the flying for a group photo at lunchtime on Saturday (photo by Shona Meade)

The 'Sonata' is a great first 'built up' Rudder/Elevator glider for the beginner

# The Pleasures Of Simple Soaring

**In this high tech modelling world Loris Goring reminds us of the joy to be had from building a simple two channel glider**


This tailplane is being built dead flat on top of the plan

A slab sided fuselage is the easiest to build

I make no apologies for enjoying the simplest of radio control models – the R/E (rudder/elevator) glider. Does this mark me as a cheap and cheerful person? Well, yes, it does. Many of my gliders are cheap – and they make me very cheerful!

These days we enjoy a huge spectrum of types of flying models, from microfilm indoor jobs weighing next to nothing to huge scale models at half full size. While our hobby is continuously branching out into new areas, such as GPS guided UAVs, some of the simpler joys of model flying have almost been forgotten and are sadly unknown to young, unskilled newcomers.

Even in the R/C glider field things have moved on. Serious competitors think nothing of paying enormous prices for high tech, high performance composite ships, leaving many of us behind with attics full of old timers from the 1960s to the 1990s, built mostly of balsa wood. However, for sheer fun, and competitions where rules govern design specification, the old wooden gliders are no slouches at catching thermals.

Other than this, what then maintains our interest in our ancient gliders?

## Are Simple Models Completely Out Of Date?

I make no apologies for my own choice in going for the old timers. I know from experience that the first glider a youngster should have is a chuck glider, perhaps only 12 inches in wingspan. Parents will love them. With small children throwing and chasing a chuckie all day, they will be so tired that they will beg to go to bed at the proper time! Our busy modern world leaves little time for family bonding, but our hobby can provide just the spark that's needed, allowing grandparents and their families to have fun together.

Older children will pester you to move on to bigger and better things, so what better than a simple radio controlled Rudder/Elevator glider? Building a model aeroplane offers many useful educational elements: learning

Goldberg's 'Gentle Lady'

The 'Olympic 650' – a 2 m class sailplane


An absolute classic, Dynaflite's 'Bird of Time'

to read a plan, simple woodwork, radio/electrical knowledge and then flying skills – all valuable learning curves in themselves. They will also learn patience, rather than their usual demand for instant gratification, as is found with a Ready To Fly (RTF) model.

Parents know only too well the dangers when their children shut themselves in their room, texting and computing in an isolated world of their own. But are we doing enough within our own interest to counter this? The fact is that while 100% success is not guaranteed, making no effort will guarantee 100% failure. Like our fathers with model railways, we can help them to build a radio controlled glider to fulfil their own dreams.

## Building Characteristics To Look For

In earlier days, BARCS (British Association of Radio Controlled Soarers) published lists of classic gliders, many of them simply Rudder/Elevator controlled or Rudder/Elevator/Spoiler designs. If you enjoy hunting down plans, many were published in British and American R/C magazines and are still available.

Please visit the following link to see the simple glider plans offered by Traplet Publications: ***gb.tapletshop.com/sports-glider***

It may be better though to start with a modest kit, especially as these days they can come with the main parts like fuselage sides, bulkheads and wing ribs already CNC cut out of sheet wood. The same goes for a wide selection of the models in Traplet's sport glider range, which are available with laser cut wood packs.

The tail feathers (rudder, tailplane and elevator) should be built first as 'flat plate' parts, which describes them perfectly, except that the leading edges (L.E.) and tips are rounded and the trailing edge (T.E.) is tapered to aid airflow. The simplest tails are made of balsa sheet but some are built up and covered, making them lighter at the extremity of the fuselage.

The easiest beginners' construction for a fuselage is referred to as 'slab sided'. The fuselage cross section is rectangular, with the two sheet balsa sides being joined widthways with bulkheads and then sheeted top and bottom. The grain of the sheeting is often shown on the plan as going from side to side to add torsional strength. This offers the strongest and easiest method of construction for the beginner.

A single piece wing, or a two part wing with joiners, is preferably fitted to the fuselage with elastic bands, held in place by protruding dowels glued in across the fuselage. This type of wing mounting helps the wing to avoid damage during a bad landing. It is preferable for wings to have a simple aerofoil section like a 'Clark Y', which has a flat underside and is therefore easily built on a flat building board. Warps (twists) in any of the flying surfaces spells disaster.

The main wing spars take the full weight of the glider as it becomes airborne and vertical grain balsa webs on the main spar between the ribs adds to its strength. On larger 100" span gliders spruce sticks with balsa webs are sometimes reinforced with balsa sheeting from the spar to the leading edge (top and bottom), creating a 'D' section L.E.

This makes a very strong wing.

## My Personal Choice For The Novice

With a dearth of suitable kits my own recommendation is to start with a 2 m (6 ft) span glider that will keep costs low, be robust and will easily fit into a car. Two metre models can be used for high launches from a rubber bungee or winch, or slope soared from a suitable hill.

Balsa Cabin (01621 859711) still kit the delightful 2 m 'Sonata', which fulfils my suggested building criteria and the kit even comes with an option for electric powered flight. I have flown two of them for many years. At under £60 for the kit the Sonata is a great 'entry' model to build and despite only having an elevator on one half of the tailplane it flies superbly. Do ensure that the model's colour scheme shows up well against the sky as the Sonata is a good thermal hunter.

A serious problem we have in the UK is that glider kits of this type and quality are now scarce. However, a number of the most suitable gliders of this size are still kitted in the USA and I am told that orders for them have been recently swelling. Sadly, carriage, tax and the rate of exchange is not helping their imports, but to see what kits are available in the 72" to 100" wingspan size go online and tap in '72 to 100 inch rc sport gliders uk'.

Great Planes are still kitting a glider that has been a great favourite for many years, Goldberg's 'Gentle Lady' (wingspan 78.25"), and this is occasionally available in the UK at an excellent price of around £75 plus p&p. As for flying, the 'Gentle Lady' is still capable of winning club level competitions and she flies like many of the classics – relatively slowly so that novices have time to sort out the sticks on the transmitter.

## Moving On To Bigger Things

There are several 100" classic glider designs.

From the USA market look out for the Skybench Aerotech 'Oly 2' (wingspan 99") kit on www.skybench.com, or the smaller Olympic 650 (wingspan 72"). Shipping charges are now an eye watering US$57 for this $148.95 beauty, making it expensive. To save shipping costs many kits are now produced as just CNC cut parts and you buy your own sheet and sticks.

If you build an Oly 2 you will be on a sure and safe learning curve. Like my own designs, it has been developed to enhance performance over many years and it can be ballasted for the windier conditions we often have here in the UK.

## Bigger Birds

There will come a time, after acquiring some basic building and flying skills, that you will want a big bird!

However, right here in UK you can still find the absolute classic wooden glider – Dynaflite's 'Bird of Time'. This fine 116" wingspan kit is distributed by 'Hobbico in the UK' (0845 459 1966). It demands a more experienced building level, but will tempt many with its beautiful shape. She is a real floater that is easy to fly on a decent summers day.

Many of the R/E and R/E/S gliders have light wing loadings of around 5 to 7 oz/sq ft, so they fly best in light summer winds. And with thermals around they can challenge the pilot's concentration with the possibility of long flight times. Care is needed if launching them from a powerful bungee or winch, but it can be done with care. I tend to reinforce all main spars with carbon tows, attached with resin, before construction begins.

It is a fact that big birds fly a steadier course than small ones, but don't be too hasty to build big. My Aquila XL was acquired by sheer luck when I found a kit lurking on a hobby shop shelf. Attending club sales, shows and even specialist auction houses often unearths some bargain kits. The Aquila XL is my ultimate 12 foot 6 inch span R/E/S glider; yes, it really needs those spoilers to bring it down. But it is not the model to try and build on a dining table. It was kitted with a glass fuselage but it still took a whole winter of enjoyment to build and cover, so models of this size are not recommended for impatient folk.

Hunting down kits may not be your thing but as confidence in reading plans and balsa whittling grows the world's R/C magazine 'plans lists' are worth looking at. They contain many great classic R/E and R/E/S gliders that fit my criteria for a straightforward build. Again, it's well worth visiting ***gb.trapletshop.com/sports-glider*** to see what's on offer.

Finally, let me assure all beginners, and those of us that like a simple life, that R/E and R/E/S gliders can fulfil our ambitions in plenty. Hopefully, R/E and R/E/S gliders, whether built from kits or plans, will follow the trend in the USA where sales are increasing. I, for one, can highly recommend the endless enjoyment that these relatively low cost types of model glider can offer.

***RCMW***

A large handful. The (12.5 ft) 'Aquila XL' from the USA

My own R/E design, 'Mont-3' flies straight up the line

Anthony Bennett continues his adventures building models from sheets of foam

# Depron Diary

Duster high wing trainer, the first of my Diamond trio

Since my last article I have managed to finish off the Sea Hawk. Well I say finished, but as we all know a model is never really finished. We just decide to stop working on them any more.

I did have a few issues doing the markings as my artistic skills are not very good and my shaky hands make painting lines a bit difficult. I was discussing this with a good friend and he suggested I use an artist's ruling pen. The one I use clamps into a compass; you dip the end into the paint and you can then draw perfect coloured circles. Then all you have to do is fill in the paint between the lines. Simple.

So from now on I will be using this for all the roundels and lettering on my models. Thanks Andy. You can buy artists' ruling pens in most good stationers or art shops. They also come as an integral unit with specialist compass sets.

Artist's ruling pen

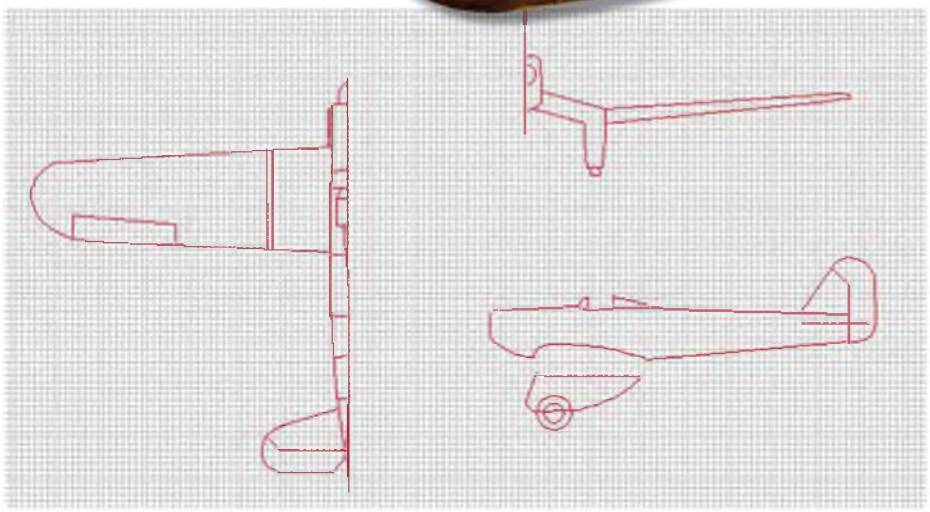

Finished Sea Hawk

## Diamond Idea

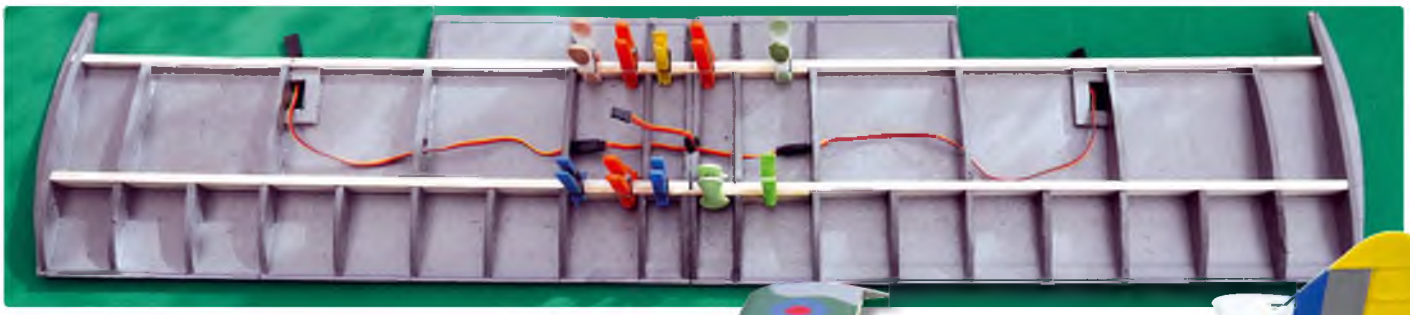
With the Sea Hawk finished my mind started to wander again and a new idea started to develop. So putting the Lightning on hold for a little while, I fired up the CAD program and started designing.

For my CAD work I use a really good value program called Total Cad 2D/3D. It only costs £8.00 from Maplins or Amazon and it does everything that I want, and is fairly simple to use - I like simple...

My idea was to design a basic wing out of Depron using the minimum of balsa and ply, and then design three different fuselages to fit the wing. So I came up with a 1 metre span wing using a Clark Y type aerofoil section. The main and rear spars are made from 6 mm balsa and the dihedral braces are 3 mm lite-ply. The wing skins are cut from single sheets of 3 mm Depron. Ribs are from 6 mm Depron and the whole lot is glued



One of my simple CAD drawings

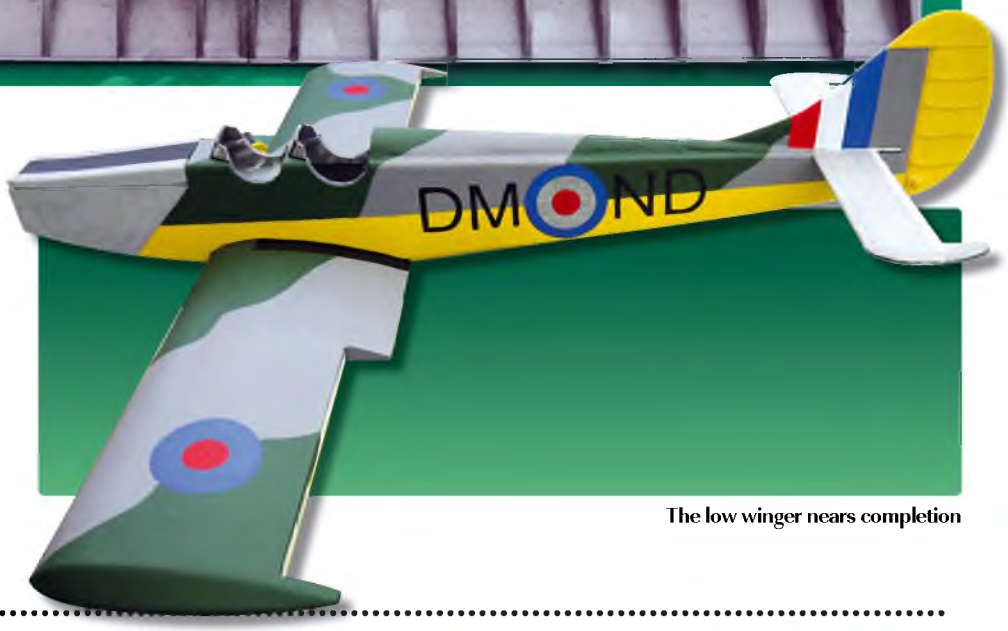


Diamond series wing construction.

together with UHU-por. I decided to call the series 'Diamond'. As usual they will be fitted with brushless electric motors and powered by 2200 mAh 3S LiPo batteries.

The first one I designed was a basic high wing trainer using 6 mm Depron for the fuselage and tail. I named this Diamond Duster – see heading picture. I used balsa for the doublers where the wing will sit and lite-ply for the motor mount, undercarriage mount and the wing support formers. The rest is all 6 mm and 3 mm Depron, as per all my designs.

The second fuselage is for a low wing, two seat trainer based on the Miles Magister. This is built in exactly the same way as the high wing trainer and will take the same motor/battery set up




The low winger nears completion

## Double Diamond

The last version is a biplane, again using the basic wing design but with two of them this time.

When building the wings for the Diamond trio I used a Clark Y type aerofoil section as it has an almost flat bottom. To get round the gentle curve at the lower front of the section I gently roll the leading edge of the Depron sheet sound the curved edge of the kitchen work top.

If you look at a sheet of Depron you will see that one side is shiny and the other side is flat. The shiny side is harder than the flat and also you will find that the sheet will flex and curve better one way than the other. So when curving Depron what you need to do is to have the shiny side on the inside of the curve and the sheet orientated so it flexes better in the direction of the curve you want to put in.

Here's how I curve 3 mm Depron to make up the underside of a Clark Y wing section. If you take your sheet and have got it the right way round it is a simple job to just gently warm the foam by rubbing your hand along the section you want to curve. Then work it round the curve of the worktop. For tighter curves I use broom handles, rolling pins (wait till the wife is out first!) or bottles, depending on how tight I need the curve to be.

The Depron will hold its shape once curved very well and the technique enables you to do some wonderful things with it. The foam can be kneaded between your fingers and thumbs to make compound curves and, thus, you can make quite complicated shapes out of single sheets instead of having to plank like you would with balsa wood.

The ribs are all cut from 6 mm Depron and glued in place with UHU-por glue. You will see that I have more ribs along the leading and trailing edges of the wing than anywhere else. This is to stop the edges of the wing from developing the 'starved horse' effect, which is where the foam curves inwards between the ribs, giving an undulating surface to the wing. I have found that if you place the leading and trailing edge ribs at 50 mm centres you can stop this from happening to some extent. You will not see many middle ribs as the spars and the outer skins give the wing its strength.

For fitting the aileron servos I just cut a hole in the Depron skin and line the inside with some 6 mm Depron for added strength. The servos can be glued home once the wing has been covered. Remember to run the servo wires before you finish sheeting the wing (a job I nearly always forget to do). I hope to have these three models finished by the next instalment and I should be able to show you some flying pictures. Plans will be available from Traplet.

Double Diamond is at about the same stage too!

Curving Depron around a roll top kitchen work surface

Depron can be massaged into quite intricate shapes

Silver foil on the Lightning wing is proving a bit tricky to keep in place in hot weather. Does anyone have any ideas about how to keep it attached to the model?

## Back To The Lightning

I have tried covering the underside of the wings and fuselage with aluminium tape to simulate the bare skin of the full size. I have found, after some experiments, that the tape will adhere better to the Depron if it has been sealed first, rather than just sticking it straight to the foam.

The big issues I have been having are with creases and the tape lifting if I leave the wings sitting in the conservatory on a hot day. I am not sure how I am going to get round this issue. If any readers can help me with this one, please email me – see the end of the article for my contacts. I love experimenting with new methods and ideas. It is what makes modelling so interesting and absorbing to do.

I still have to fit the wings to the Lightning and run the servo wires through them. Yes, I forgot to cut the holes in the ribs and run the wires before I skinned and painted the wings - oops! Then I can finish covering the top of the fuselage with 3 mm Depron and finish the covering and painting.

Then it will just be a case of carving a canopy from blue foam and she will be ready for the final fit out and testing.

## CONTACTS

If you would like to have one of your Depron models or foam building tips included in the next article, feel free to write to me at **arden48@gmail.com** enclosing a good quality picture or two.

## Trent Meteor Wing

I will be glad to get the Lightning done as it will free up my bench so I can get back to working on the Trent Meteor wing. This is my scale monster that I started a year go to see how far I can go with Depron, but I have not looked at it yet this year owing to too many other projects.

The Trent Meteor is a Mk1 that was converted to turbo props to test how these newly designed engines would perform in comparison to the original jets. So it is a Meteor with propellers. I need to sort out how I am going to fit the retracts into the wing centre section and get the undercarriage legs made up. I'm not going to be making scale legs as this is just an experimental build to see just how big you can go with an all Depron model.

Wing centre section of the monster Meteor

There have been some interesting and challenging moments during the construction of the fuselage and I am expecting a few more now that I am working on the wings.

The main issues have been with making sure it is all strong enough to with stand the stresses of flying and I have had to add far more balsa and ply than I would normally use in my smaller builds, just to make sure it will all stay together in the air. The fuselage was constructed using a 6 mm Depron cruciform centre with 6 mm formers and a 3 mm skin. On the fuselage I found that I had to add some 6 x 6 mm stringers down the full length of the structure to stop it twisting. I also found that I needed to add more balsa bracing to the fin to help it withstand the weight of the high mounted tailplane.

The other area of the fuselage that needed lots of wood is where the wing sits. I had to make up 6 mm lite-ply mounts for the wing to bolt onto; these had to be epoxied to the Depron structure in as many places as I could find in order to make them nice and secure. The wing fits on with 4 x 8 mm bolts and has a 6 mm ply tongue that locks into the nose section of the fuselage.

It also helps to hold on the removable nose of the aircraft as well. The nose is held on with 4 x 8 mm bolts and three aluminium tubes; I had to make it removable in order to get the thing into the car, it's that big! However, it will still be a light model for its size (10 foot wingspan) and it should hopefully fly in a very scale-like manner.

Next time I can talk about how I built the fuselages for the three Depron planes and we can have a little chat about my experiments with using foam for free flight models.

Well that's my coffee and biscuits gone and the workshop is calling me, so enjoy your building and flying. Bye for now. ***RCMW***

Meteor fuselage construction

The Trent Meteor is just a bit bigger than my usual Depron models!

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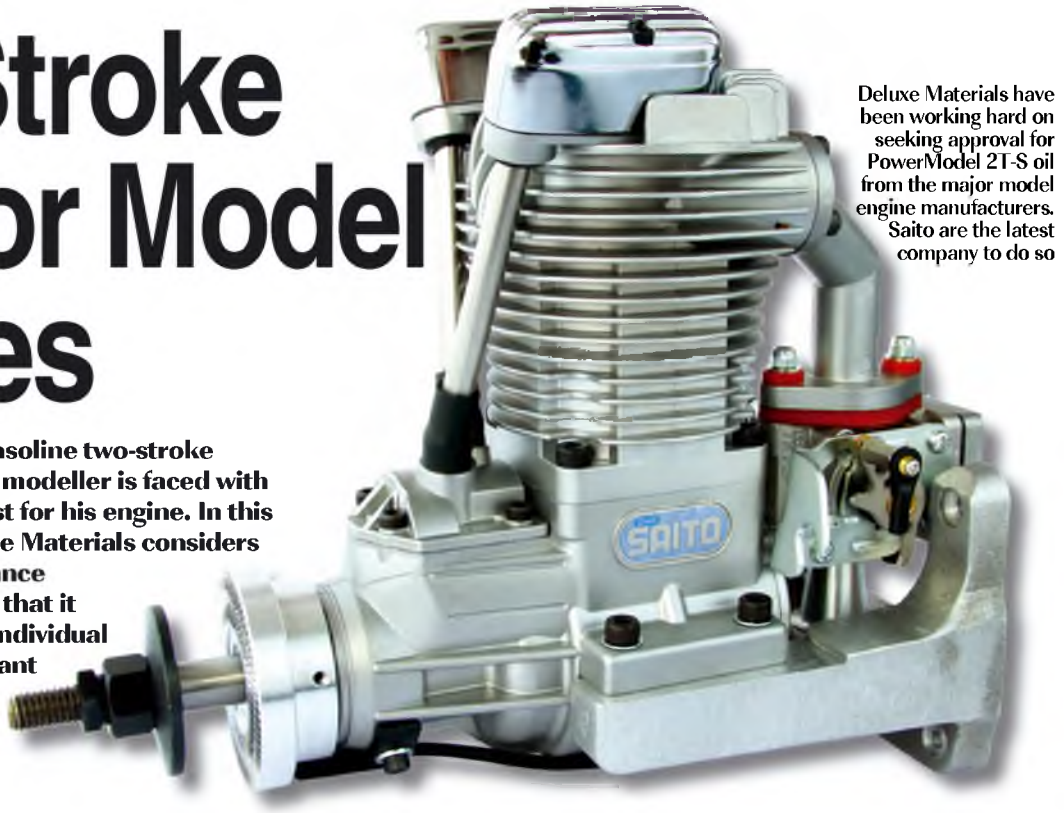
# Two-Stroke Oils For Model Engines




Deluxe Materials have been working hard on seeking approval for PowerModel 2T-S oil from the major model engine manufacturers. Saito are the latest company to do so

**With the increasing use of gasoline two-stroke mixtures as a model fuel the modeller is faced with a decision on which oil is best for his engine. In this article John Bristow of Deluxe Materials considers what makes a high performance two-stroke oil. John explains that it is the characteristics of the individual components that are important and not necessarily those of the finished oil**

## Designed To Beat The Combustion Process

In a two-stroke engine the lubricant is mixed with the fuel so it has to pass through the combustion chamber. This means it has to survive extreme combustion temperatures, 500-600C for methanol/alcohol fuel or 700-800C for gasoline. Inevitably some of the lubricant will evaporate and burn, but some remains to lubricate the moving parts.

A key requirement for two-stroke oils is, therefore, that they resist evaporation at high temperatures, which can rise to 300C on the piston. Low volatility of the oil is important, minimising evaporation off the piston and cylinder wall oil in order to maintain an oil film to protect the engine from wear or seizure.

That is why two-stroke engines require special lubricants with low evaporative and clean burning qualities. Figure 1 shows the composition of a typical two-stroke oil. The principle is to use a base oil with low evaporative quality fortified with a cocktail of additives. To this is added 10-15% of light distillate diluent to aid the mixing of the oil with the fuel. This diluent ensures that the fuel oil mixture is acceptable before starting

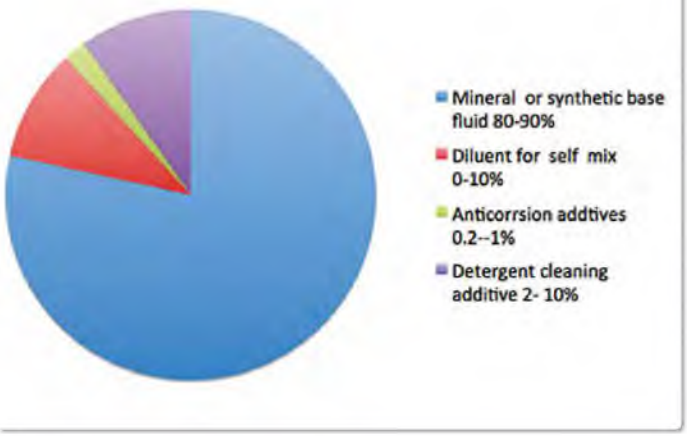



Fig 1: Composition of two-stroke oils

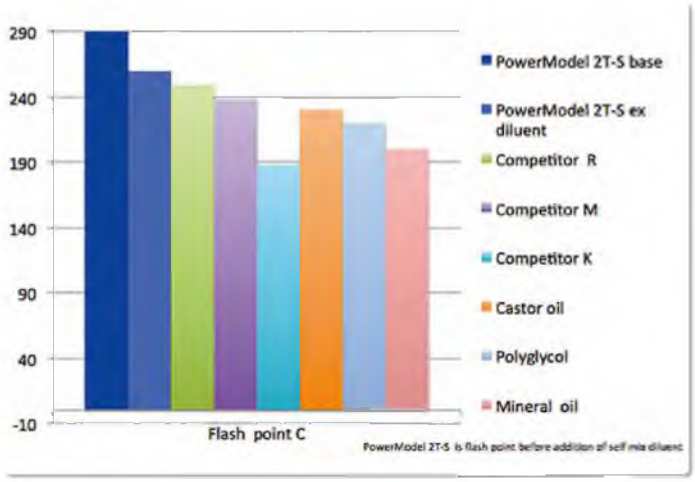



Fig 2: Flash points of two-stroke lubricants and base fluids

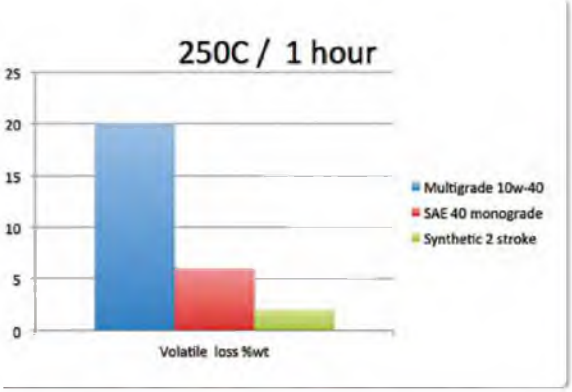



Fig 3: Volatility of four-stroke and two-stroke lubricants

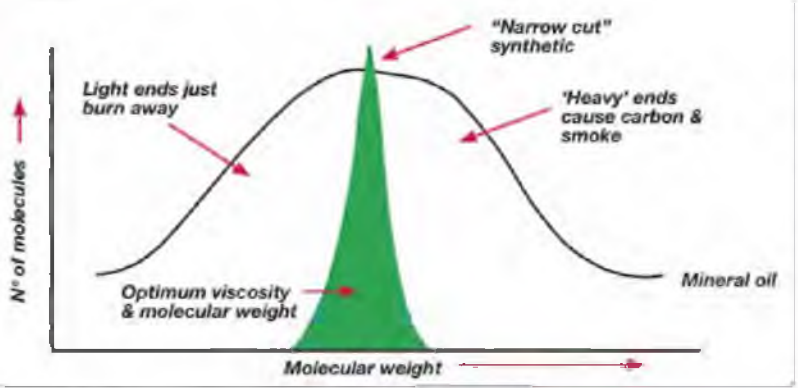



Fig 4: Synthetic versus Mineral lubricants

the engine. Too little oil could cause bearing damage or piston seizure. Too much oil will cause engine deposits (e.g. exhaust port carbon) and smoke. The diluent plays no direct part in the lubrication and simply burns with the fuel.

Flash point is sometimes used to compare two-stroke oils. (See Appendix 1 for flash point definition.) However, be careful that the comparison is like for like. For example, a data sheet may give a relatively low flash point for oil that contains a diluent (see Figure 1), whilst some basic two-stroke oils don't contain diluent.

But what is important is the effectiveness of the base oil and the flash point of the components before the diluent is added. The base oil must have low volatility and high flash point in order to remain to lubricate the engine. Figure 2 shows the flash point of some types of two-stroke oils, some for gasoline and some for methanol fuel.

As you can see the flash point of PowerModel 2T-S is the highest. Figure 3 gives some typical volatility data on lubricants using a standard industry Noack test, which measures evaporative loss at 250C over a 1 hour period. This shows that the volatility of multigrade oil is much higher than that of a straight SAE 40 monograde and this in turn is higher than that of the synthetic two-stroke base oil. PowerModel 2T-S uses a similar synthetic ester.

All types of synthetic fluids are almost pure materials and so make excellent base oils as they contain no 'light ends' that burn away to cause smoke or heavy ends to cause carbon and lacquer. See Figure 4.

With the increased use of gasoline as a modelling fuel and the resulting higher combustion temperatures of 700-800 C, the formulation of the oil becomes more critical. Good two-stroke engine oil will have ideally very low volatility and contain a potent cocktail of clean burning detergents and anti-corrosion additives. If chosen well, these are very effective, keeping carbon under control, especially on the hotter and top parts of the piston, including the ring grooves which, being close to the flame, can reach over 300C.

Special engine tests (designed by the Japanese Automotive Standards Organisation, JASO) have been developed and used to assess the various two-stroke performance criteria, e.g. film strength, piston cleanliness and smoke properties, but I will not go into these here. Suffice to say, lubricant film strength includes tests up to 300C. Test data has shown PowerModel 2T-S will out-perform other lubricants right up to these temperatures.

## Protection While The Engine Is Switched Off

The lubricant has an important role in protecting the engine from corrosion when it is switched off. Contaminants may include ingressed water, especially with methanol, or acid from burnt fuel (nitromethane produces nitric acid). These need to be removed by flushing or be neutralised using an after run oil treatment. Consider that the life of an engine depends on how well it has been prepared for storage and protected while switched off.

## Designed To Readily Mix With Fuels

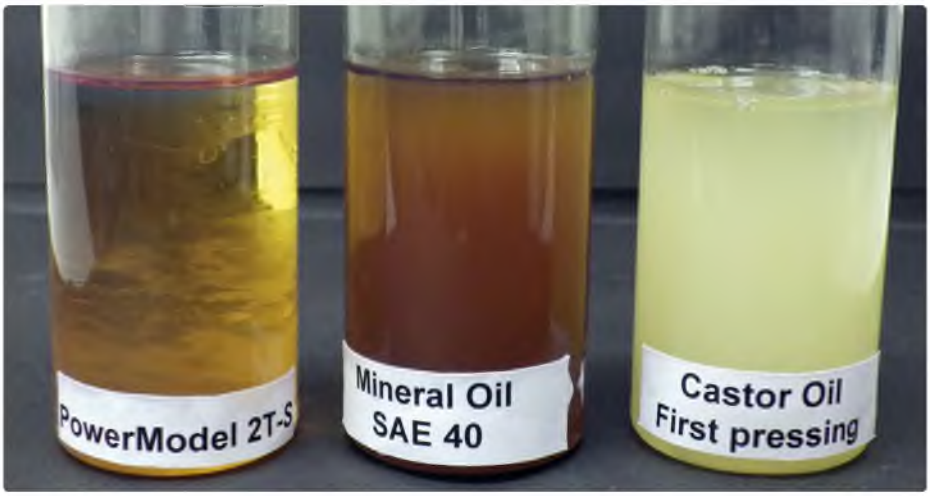
As stated earlier, the inclusion of the diluent to the oil formula ensures that it readily mixes with fuel and that a consistent fuel/oil mixture arrives at the engine.

The picture nearby shows the difference in miscibility of a diluted (left) and non-diluted two-stroke (right). Flash point of the diluent is an important safety issue if the lubricant is transported by air. Hence PowerModel 2T-S uses a relatively high flash point diluent making it non-flammable and therefore safe to transport.

Dyes are often added in the right proportion to identify ready mixed fuel. Synthetic lubricants, being purer will have greater long-term stability in fuel, whereas castor oil is the other extreme and often exhibits a cloudy appearance due to fatty acid crystals appearing and disappearing from time to time in both the oil and fuel mixtures, as can be seen in the picture nearby. Castor oil is therefore rarely used in road going two-stroke oils.

Mixabilty: Diluted v Non-diluted two-stroke oils

Dyes are often used to identify pre-mixed fuel




Appearance of oils – synthetic, mineral and castor

## Lubricating The Moving Parts

It is also most important to lubricate the bearings and seal the piston to achieve good compression, especially where the engine is very small and, for design or cost reasons, does not have compression rings. Typically lubricants with SAE 40 viscosity (Society of Automotive Engineers) work well here – see Figure 5. If the oil is too thin it will not seal the piston and if it is too thick it will create too much drag.

Castor oil is typically SAE 50 so has plenty of operating viscosity to seal pistons, possibly even too much. This is why we have optimised the viscosity of PowerModel 2T-S for maximum compression, lower friction losses and increased rpm. This is confirmed by user reports we have received.

**SAE Viscosity Chart (High Temp) 100° C (210°F)**

| SAE Viscosity | Kinematic (cSt) 100° C Min | Kinematic (cSt) 100° C Max |
|---|---|---|
| 20 | [illegible] | <9.3 |
| 30 | [illegible] | <12.5 |
| 40 | [illegible] | <16.3 |
| 50 | [illegible] | <21.9 |
| 60 | [illegible] | <26.1 |

Fig 5: SAE (Society of Automotive Engineers) viscosity system for classifying lubricants

## Synthetic Oils

I am a great believer in these for use with small gasoline engines.

Synthetic base fluids, as we have said earlier, have none of the impurities such as those in castor or mineral oils and at low temperatures exhibit far superior fluidity, as shown in a simple pour test – see picture.

There is a table following comparing some properties of a range of base oils used for two stroke lubricants.

Synthetic esters make excellent base oils for advanced gasoline two-stroke oils for many technical reasons including:

- Outstanding film strength (see Figure 6),
- High thermal stability (unlike castor oil)
- Low volatility
- Additive compatibility, i.e. they can also be fortified with powerful additives that protect against corrosion and prevent high temperature deposits.

Polyglycols have good high and low temperature properties and, being available in a wide range of viscosities, are commonly used as a substitute for castor in alcohol/high nitromethane fuel two-stroke lubricants. They do have limited additive compatibility and fortifying them against corrosion and long-term deposit formation can be challenging for the formulator.

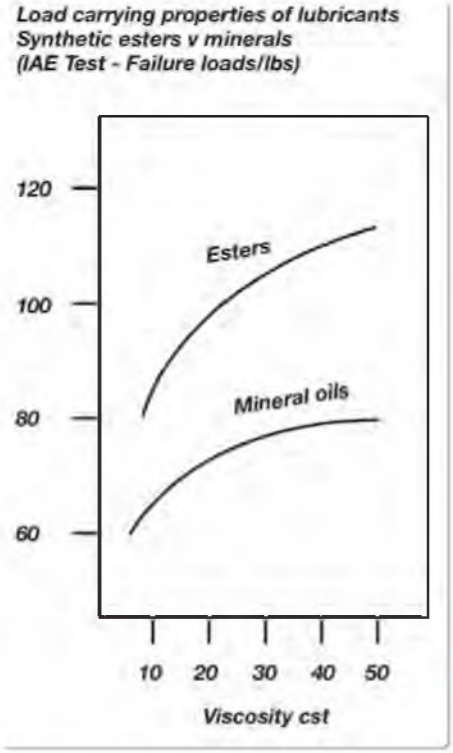
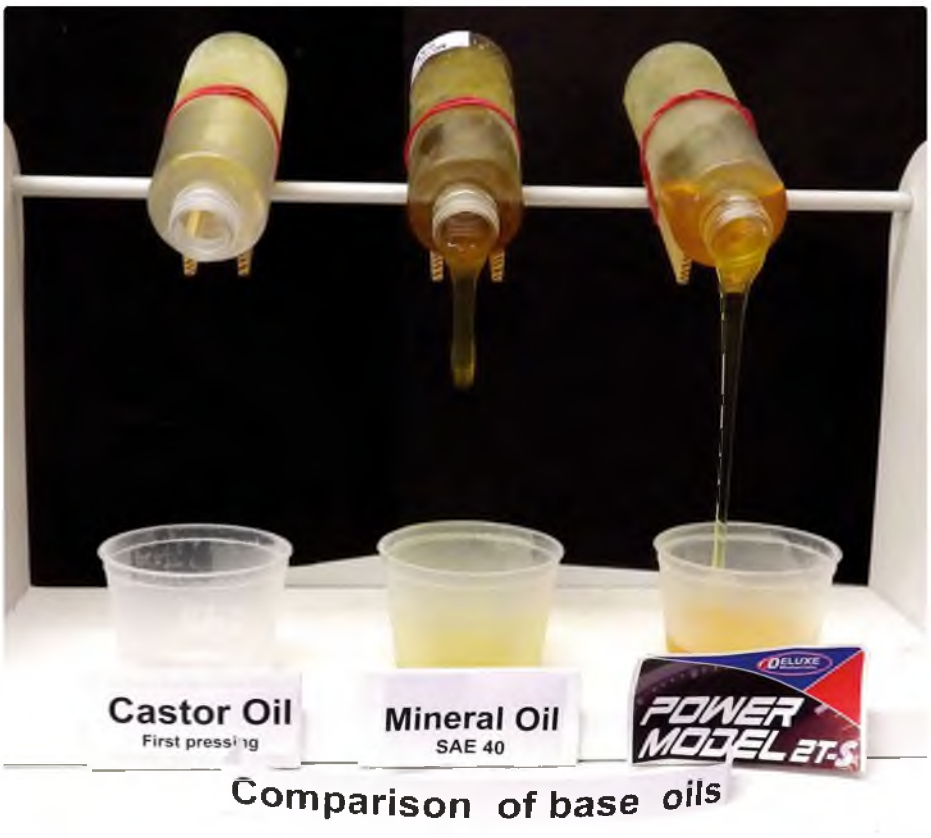



Fig 6: Film strength of synthetic esters compared with mineral oils show esters to be superior

## Conclusion

I hope you will have understood how two-stroke oil is formulated and why the properties of the individual components are more important than those of the finished oil. The use of gasoline fuel opens a whole new world of lubricant technology. Specially developed synthetic base fluids and additives are now available to formulators and marketers of modelling two-stroke oils. There is a range of advanced oils allowing the consumer to make the right choice for their engine. **RCMW**




Low temperature flow properties of lubricant base oils – castor, mineral and synthetic. Test temp is minus 10C

| | Mineral SAE 40 | Vegetable Castor oil | Synthetic Polyglycol | Synthetic Ester |
|---|---|---|---|---|
| **Thermal stability** | Average | Poor | Good | Very good |
| **Viscosity at 100C/cst** | 13 | 20 | 21 | 13 |
| **Flash point / C** | 220-240 | 220 | 220 | 260 |
| **Soluble in gasoline** | Yes | Variable | Yes | Yes |
| **Soluble in alcohol (methanol)** | No | Yes | Yes | No |
| **Typical volatility measured as volatile loss % at 250C (Noack test)** | 5 | 3 | 8 | 2-3 |
| **Additive compatibility** | Good | Poor | Limited | Good |
| **Film strength** | Good | Very good | Good | Very good |

## Appendix 1: Flash Points

There are two basic types of flash point measurement: Closed Cup and Open Cup.

The most common Closed Cup tester is Pensky-Martens where the liquid, e.g. oil sample, is heated and vapours above the liquid are trapped with a cup through which the ignition source is introduced (see Figure 7).

In Open Cup the oil sample is contained in an open cup (no lid); this is heated and at intervals a flame is brought over the surface. The most common test is the Cleveland open cup (COC).

Closed cup gives flash points 5-10C lower than Open cup.

If two-stroke oil is a mixture containing 5-10% of kerosene, the flash point measured is obviously that of the kerosene, the most volatile component.

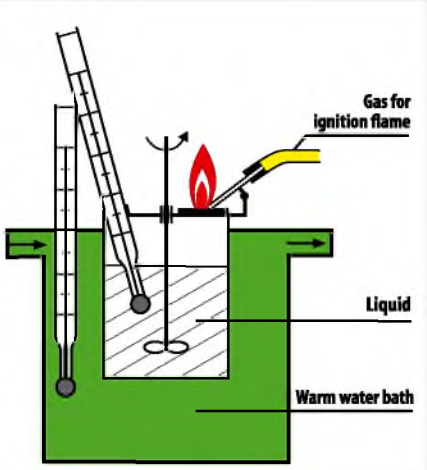
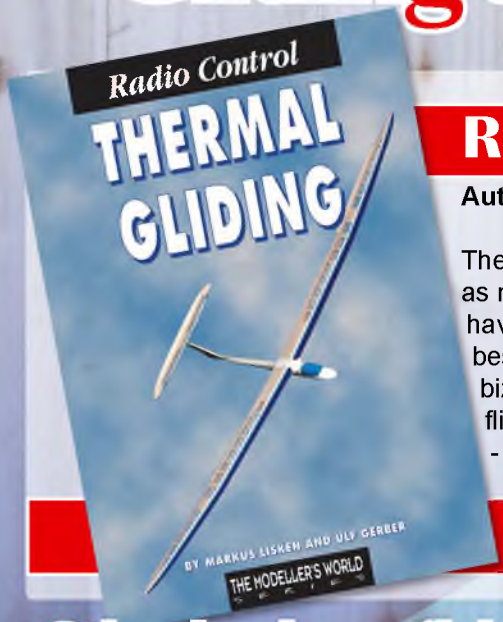



Fig 7: Flash point – Closed Cup test equipment

# Book Corner

## The Traplet Plans & Parts shop has a whole host of reference books to keep you in the sky!

# This month we focus on Gliding and Electric Flying




## Radio Control Thermal Gliding

**Author Markus Lisken & Ulf Gerber**

Thermals fuels both models and passions! No wonder, therefore, that there are as many different opinions as there are pilots. In this book personal opinions have been set aside in favour of measured results. This book shows you the best working updraughts and the additional of thermalling. Daring to unearth bizarre behaviors such as variometer flight or flying in Tropics. For extreme flights this books covers a whole series of models guaranteed to be unsuitable - you will be amazed as to what flies in thermals!

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# Top Gun 2016

**Barry Vaught reports from the annual invitational Top Gun event held in sunny Lakeland, Florida, USA**

Peter Goldsmith's Airworld F-104 Starfighter, winner of Top Gun 2016. The 11 ft long model is powered by a Kingtech 210 turbine and guided by Spektrum DX-18 radio

The Free Flight Mass Launch was an epic experience

David Platt won Flight Duration with his Asahi D4V1 'Judy'


Carl Layden's Avro Lancaster. Grand Concourse Champion


Rich Ultravitch's Extra 300. First place in Craftsmanship. Rich has some radical building skills

Top Gun improves every year and it has added new categories to increase the competition among manufacturers, builders and pilots. The Free Flight Scale competition was very popular this year and a very entertaining experience. Watching some of the pilots prepping their aeroplanes was rewarding and remindful of times gone by. The aeroplanes were stick built to a minimum wingspan of 36 inches for monoplanes and 24 inches for biplanes or triplanes.

Free Flight Mass Launch was quiet – until the sound of all the propellers exploded through the air! Dave Platt is still the King of Free Flight and he was 2016 Top Gun F/F Duration Champion. His Asahi D4V1 'Judy' did not want to land.

## Top Gun!

Peter Goldsmith is on a roll this year and he is Mr Top Gun 2016. His Airworld F-104 is very detailed, flies superbly and lands with a quarter to third power. The Airworld 1/4 scale kit weighs 47 lb 13 oz dry and is fitted with a Kingtech 210 turbine, Spektrum DX-18 radio and two 4000 mAh batteries – one for the 12-channel receiver and one for the uniLIGHT system.

## X Class

The new X Class is refreshing and requires that there is no builder of the model. The model must be an ARF model, either painted in the mould or covered by the manufacturer. The builder can add scale details but no coverings may be removed or replaced.

Top Gun's helicopter competition was expanded this year. They were located a good distance away from the aeroplanes for safety. Russel Matteini's Bell 222 was modelled after the Airwolf TV Show. Master Class first place was earned by Peter Wales and his Sea Sprite. Edward Banchez and his EC 145 earned first place in the Sport Class, while first in Team Scale went to Richard Gibson and Mark Huffman with their Bell 407.

## Safety First

The pilots always have to make the right decision for the safety of everyone involved when flying R/C aeroplanes. As an example, a Dauntless was making a pass during judging. A Cougar F9F jet was making another pass right behind the Dauntless and the distance between the two was rapidly disappearing. One of the pilots had to alter their course to avoid a collision. The Dauntless dived and the jet roared by. The dive was not one of the flight manoeuvres but it was the right decision. There were no point deductions and the Dauntless went on to win the Pro Prop Class at Top Gun 2016.

## Going Electric

Electric aeroplanes made a big impression this year. Mike Grady earned first in Team Scale with his MiG-15bis, with Dustin Buescher as the pilot. Mike's B-17G, flown by David Payne, finished fourth in the Unlimited Class, while Barry Raborn earned fourth place in the new X Class with his electric powered Willow. First place Masters Class went to Bob Violett and his F-80 Shooting Star. Frank Knoll finished third in Pro Am Prop with his Top Flight P-47 Razorback. Electric aeroplanes have come a long way and have earned a lot of respect from model aeroplane connoisseurs.

## Summing Up

Frank Tiano pays attention to detail, which makes Top Gun extraordinary. As an example of this the Top Gun strip was built so that the pilots would never have to look directly at the sun. The changes made at Top Gun in 2016 were impressive and I can't wait to see what the future brings.

Please contact ***franktiano.com*** for more information – and if you think you may be ready to compete with the very best! ***RCMW***

Curtis Switzer's Curtis B-2 Condor from the Tom Czenthe plans. 168 in wingspan, 45 lb, twin Saito 180 engines, Jeti radio

Rich Feroldi's Albatros D.V, 1:3 scale, Quadra 100 petrol engine, Futaba 12G radio. Rich earned second in the Masters Class

Air to air bomb run by Brian O'Meara's 1:3.3 scale P-47. 143 in wingspan, 116 lb, ZDZ 500 cc four-cylinder engine, Futaba 18MZ radio


Beautifully detailed Zero fighter built from enlarged Meister Scale plans by Toshiaki Nakayama. 1:4 scale, 119 in wingspan, 50 lb, Moki 150 engine, Spektrum DX-18 radio. Pilot, Dino DiGiorgio earned first place in the Unlimited Class

Jack Buckley's Tiger Moth DH 82A. 1:3 scale, Mick Reeves kit, 118 in wingspan, Desert Aircraft 150 cc engine, Futaba 14G radio. Jack earned fifth in the Expert Class


Barry Raborn's rare Japanese Willow, 1:5 scale. From the 3 Sea Bees kit, 80 in wingspan, Hacker motor, JR 12X radio. Barry earned fourth in the new X Class

Gerry Yarrish's Fokker Triplane built from the Balsa USA kit. 1:3 scale, 94 in wingspan, 40 lb, GT80 engine, DX-18 radio. Gerry also flew in the Free Flight Scale Class with a smaller version of this aeroplane

Second place in X Class was earned by Jason Bauer and his BVM F-16C. 1:10 scale, 96 inches long, Kingtech 140G turbine, Spektrum DX-18 radio

Franko DiMauro's T-33 from the Fei Bao kit. 1:4 scale, 100 in wingspan, Jet Rhino turbine, Spektrum DX-18 radio. Franco earned first place in Pro Jet Class

Mike Grady's MiG-15bis. BVM kit, 68 in wingspan, 22 lb, BVM electric ducted fan, Spektrum DX-18 radio. Pilot Dustin Buescher flew the MiG to first place in Team Class

Boli Muentes has moved up to third place in the Pro Jet Class with his F-16 Thunderbird. BVM kit, 1:6 scale, 96 in long, JetCat 140 turbine, 28X radio

First place in Pro Prop was earned by Dino DiGiorgio with his SBD Dauntless built from the Ziroli plans. 100 in span, GT 80 power, DX-18 radio

Third in Sportsman Class went to Jose Melendez and his G-91 Fiat, built from the C&C Models kit. 1:4.5 scale, Jet Central Cheetah turbine, DX-18 radio

Fourth place Expert went to Dave Wigley and his Hawker Tempest, built from Vailly Aviation plans. 96 in span, Quadra 75 cc engine, Spektrum DX-18


Dustin Buescher is on a roll this year and earned first place in the new X Class with his F-16. 129 inches long, Kingtech 210G turbine, Spektrum DX-18 radio

Gerson Louis Nissola's Tucano. 1:4 scale, CARF kit, 89 in wingspan, 40 lb, Jet Central TP, JR 12X radio. Team Brazil and their photographer Giovana Gastaldi are so much fun to chill with and we can't wait to see them again next year

Builder Mike Barbee and pilot Frank Knoll's RAF Wildcat earned second place in the Team Class. The scratch built RAF plane uses a 3W 240 cc twin and a Futaba 18MZ radio

Third place in Team went to builder Gary Allen and pilot Dorin Luck's Bucker Jungmann. 1:3 scale, 102 in wingspan, Desert Aircraft 85 cc engine, Futaba 14SG radio

Kristopher Gunter moved up to first place in Sportsman Class with his Fei Bao F-15 Eagle. 108 inches long, Kingtech K-210 turbine, Spektrum DX-18 radio

Aarahn Stewart's P-40 Warhawk from the 1:5 scale Top Flite kit. 86 in span, 27 lb, DLE 55 engine, Spektrum radio. Aarahn is also a powerful singer and he sang the US National Anthem to open the final day of Top Gun

Peter Goldsmith and his Skymaster T-33 took fifth place in the Pro Jet Class. 105 in span, 41 lb, Kingtech 210 turbine, Spektrum DX-18 radio. Notice the sky written G


Gene Lafond's self-designed Howard DGA 3 Pete is built to 50% scale! 122 in wingspan, 54 lb, DLE 85, DX8 radio. Seeing the Pete was a thrill and watching it fly was a blast!


Greg Foushi in front of the static judges with Sawbones. Thank you from everyone to all the judges for a great job


Team Sawbones, Greg Foushi and Bill Freeland with their Walt Garnes Hawker Sea Fury that earned them fifth place in the Unlimited Class. 1:5 scale, 93 in span, 45 lb, World Models kit. Moki 250 cc engine, Spektrum DX-18 QQ radio

Fourth place in Unlimited Class went to builder Mike Grady and pilot David Payne with a B-17 bomber. Their Wingspan Models kit is 1:9 scale, 138 in wingspan and uses four Hacker A60 motors


Second place in Unlimited Class was earned by Rod Snyder and Kobe Cantini with their BVM MiG-15. 1:6 scale, Kingtech 120 turbine, JR 12X radio

Helicopters were a new addition this year. Russel Matteini's Airwolf Bell 222 was a big hit


Mark Smith's Bell 206B Jet Ranger from the 1:4 scale Vario kit. 46 lb, Castle Creations Vertigo 395 electric motor. Mark earned second place in the Masters Class


First place in 2016 Top Gun Sportsman Class went to Kristopher Gunter and Sharon Gunter with their F-15 Eagle

Mr Top Gun 2016 Peter Goldsmith and his F-104 Starfighter


Pilot Dustin Buescher and builder Mike Grady with their first place Team Scale MiG-15bis

| Special Awards | Sponsored By | Winner/Aircraft |
|---|---|---|
| Masters High Static | ZAP GLUE | Rich Feroldi - Albatross D.V. |
| Expert High Static | FLY RC MAGAZINE | Peter Goldsmith - F-104 |
| Team High Static | RC SPORT FLYER | Mike Grady - MiG-15 |
| Unlimited High Static | MODEL AIRPLANE NEWS | Toshi Nakayama - Zero |
| X-Class High Static | FUTABA/HOBBICO | Jason Bauer - F-16C |
| Best Civilian Runner-Up | SPEKTRUM | Jack Buckley - Tiger Moth |
| Best Civilian Pilots Choice | RED BULL | Larry Folk - Piper Cub 'Top Cub' |
| Best Military Runner-Up | FALCON PROPS | Mike Grady - B-17 |
| Best Military Pilots Choice | HORIZON HOBBY | Toshi Nakayama - Zero |
| Best WW2 | RAY & ROBINS HOBBY | Brian O'Meara - P-47 |
| Best Biplane | EZ BALANCER | Gary Allen - Bucker Jungmann |
| Best WW 1 | FALCON PROPS | Walt Alexander - Fokker D.7 |
| Best Pre WW2 | WARBIRDS OVER THE ROCKIES | Curtis Switzer - B-2 |
| Best Jet | ELITE AEROSPORT | Jack Diaz - Fouga Magister |
| Best Pro-Am Pro | CORTEX - DEMON GYROS | Brian O'Meara - P-47 |
| Best Pro-Am Sport | JR RADIO | Jose Melendez - Fiat G-91 |
| Engineering Excellence | ROBART MFG. | David James - SPAD (1/2 scale) |
| Outstanding Craftsmanship | ZAP GLUE | Toshi Nakayama - Zero |
| Best Unlimited Showing | ROBART MFG. | Team Brazil, Gabriel Pellegrini - F-100 |
| Top Buns Award | FLY GIRLS | Aarahn Stewart |
| Best Jet Performance | KINGTECH TURBINES | Gustavo Campana - MiG-29 |
| Best WW2 Performance | MODEL AIRPLANE NEWS | Brian O'Meara - P-47 |
| Best Multi Performance | HORIZON HOBBY | Tim Cardin - Cessna T-50 Bobcat |
| Critic's Choice Runner-up | FTE | Gustavo Campana - MiG-29 |
| Critic's Choice | ZAP GLUE & MODEL AIRPLANE NEWS | Toshi Nakayama - Zero |

# DVD Corner

## The Traplet Plans & Parts shop has a whole host of reference DVD's to keep you in the sky!

# This month we focus on Gliding and Electric Flying


Glider Repair Lab 1
Prod. Code: RCADV026

Glider Repair Lab 2
Prod. Code: RCADV027

Glider Repair Lab 3
Prod. Code: RCADV028

## Glider Repair Lab - 1,2 & 3!

This first repair video will get you up to speed on the materials and basic technical methods that you'll need to know before learning the more advanced repair techniques taught in the Glider Repair Lab 2 & 3.
In the second Repair Lab, you'll learn some advanced methods for fixing the most challenging kinds of composite airframe damage suffered in high-energy crashes. The 3rd Repair Lab contains a detailed 2 hour program. Expert Paul Naton tackles some challenging repairs on a variety of glider wings, fuselages, and fins made from a variety of composite materials.

**Price £15.99 each**

## Other DVDs available on Thermal Gliding and Electric Flying

### Thermal Soaring Masterclass


This highly detailed new video will be valuable to anyone who thermal soars at any skill level. Even if you're an experienced pilot, the subjects taught will make you rethink your technique and how you think about the dynamic and unpredictable nature of thermal lift.

Product Code: RCADV031

**Price £18.99**

### Electric Sailplane Clinic 3


This double-DVD contains nearly three hours of fast-paced tutorials covering a variety of techniques and skills that will make you a better builder and help you understand the latest technologies and equipment now available for high performance electric gliders.

Product Code: RCADV032

**Price £X.XX**

### F3X Building Clinic


F3X Building Clinic is a detailed 150 minute instructional video that teaches you a variety of basic and advanced RC glider assembly skills and procedures needed to build modern sailplane kits for successful flights.

Product Code: RCADV030

**Price £15.99**

HSAD:RCMW_DVDS.NOV16

For full range of our reference DVDs visit www.trapletshop.com

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# Rockets Over Bohemia

**The Knauf Insulation Krupka Cup for Space Models took place in Krupka in the Czech Republic in late May. Our resident rocket expert Stuart Lodge reports on the explosive action**


ASP prototype by Michal Ozwald (CZE) boosts away impressively. A good scoring flight

Knauf Insulation has had a production facility in Krupka for a decade now and they are a major employer in the region. Sponsorship of local events, especially for young people, formed a major focus from the outset; 2016's Krupka Space Models World Cup was one of these and it promised to be a classic in brilliant conditions.

Nations represented were the Czech Republic, Slovakia, Switzerland, Slovenia, Latvia, Germany and the UK. This report focuses on the S7-Scale and S8E/P-RC Rocket Glider Spot Landing, with podiums for the other three classes later.

Your scribe represented the UK as FAI Jury President, in the company of Tomáš Indruch (CZE) and Gunar Putra (LAT).

## S7-Scale World Cup

There were 19 starters in this event. Judges, Zygmunt Janecki (POL), Jiří Kašpar and Bohuslav Kuda (both CZE), went into the static judging hall facing a wide array of prototypes, ranging from Arianes 44L and L-01 by Zdeněk Kolař and Milan Kučka (both CZE). In addition there was a super 1:40 scale Soyuz TMA (like the one that took the UK's Major Tim Peake to the International Space Station recently) by Russian national, Aleksandr Kozlov, who represents the Czech Republic these days. The judges also scored the Juniors' ASP models.

Slovakia's Vasil Pavljuk tabled a deceptively simple Sonda 1-2. There were a range of other models, including those by Czechs David Pastuszek, Tomas Podany, Lukas Pidrmann and Viktorie Trzilova, with their Nike Apache, Meteor and Viking 10 sounding rockets respectively. This gave plenty of scope for 'Originality' bonus points – except for the dozen-strong Juniors' ASP models – to be added to the static totals. But flight scores form a greater percentage of the whole, under the new scheme of things.

Sunday was flat calm with no wind and it promised well for the qualification flights with so much to play for. Brilliant comes close as a description, with virtually all entrants recording good flights. Zdeněk Kolař's Ariane 44L led the way from the early stages, delivering an impressive two stage boost, with plenty of Special Effects – including booster release, plus satellite launch at apogee. Vasil Pavljuk's Sonda 1-2, which always scores surprisingly well in the hall, seemed small by comparison to the others, but it delivered a realistic two staged flight, with good recovery.

The high spot was the Juniors' event, most flying ASP Sounding Rockets produced in RMK Krupka, with some brilliant basic skills on show throughout. A disappointment was that Kozlov's Soyuz TMA didn't come out to play on Sunday and so it couldn't feature on the podium, as it surely would have done.

**S7-Scale World Cup**

1. Zdeněk KOLAŘ CZE Ariane 44L
   565 + 170 = 735 pt
2. Milan KUČKA CZE Ariane L-01
   582 + 114 = 695 pt
3. Vasil PAVLJUK SVK Sonda 1-2
   516 + 112 = 628 pt

Impressive array of prototypes in S7-Scale. The winning Ariane 44LP by Zdenek Kolar (CZE) is far right and the super Soyuz TMA of Aleksandr Kozlov (CZE) is in the middle – pity it didn't turn up to fly on the Sunday! The simple red and white rockets are ASPs, forming the Juniors' entry at Krupka. Photo by Jiri Kaspar

Zdenek Kolar's Ariane 44L, Milan Kucka's Ariane L-01 and Vasil Pavljuk's Sonda 1-2 lined up in the hall with the opposition


Knauf Insulation have been in Krupka for ten years now and sponsor many events, including the Krupka World Cup

### S8E/P-RC Rocket Glider Spot World Cup

What's this all about? The gliders are boosted vertically using long burn, 40 Newton second (Ns) 'E' motors, to near 300 m (~1000') and at this stage are required to record a flight of 360 seconds/5 minutes. Simple so far... But the flight must terminate at 360 seconds as the glider nails a spot landing, with points deducted for being early or late and/or missing the target spot by more than one metre. The entrants flew in groups of five over the three opening rounds, with the top five scorers going head to head in a fly-off to smelt the metal.

Star players in the line-up included Swiss modellers Turi and Franz Hunziker, and Hans Stoll. Top Czechs, Pavel Brony, Zbyněk Krámek, Jan Čerepjuk, Petr Dubina and Milan Kučka, looked confident in the perfect conditions.

Franz Hunziker blew his chances with a dreadful opening flight, whilst compatriot Hans Stoll nailed a maximum score, following this up with a second 1000 points total in round two. Petr Dubina was nothing but consistent, whilst Slovaks Simon Bolfa and Michal Žitňan ebbed and flowed. Turi Hunziker held second spot for a long time in the opening three rounds.

The top five comprised Zbyněk Krámek, Jan Čerepjuk, Petr Dubina (all CZE), Turi Hunziker and Hans Stoll (both SUI). When the latter nailed the landing spot at 360 seconds precisely the fly-off degenerated, with Turi Hunziker descending to fourth place after a poor flight, leaving Petr Dubina and Zybnek Kramek the chance to fill second and third podium slots.

**S8E/P-RC Rocket Glider Spot World Cup**

**1.** Hans STOLL SUI
1000 1000 861 + 1000 = 3861 pt
**2.** Petr DUBINA CZE
997 1000 951 + 715 = 3663 pt
**3.** Zbyněk KRAMEK CZE
1000 820 985 + 986 = 3579 pt

Viktorie Trzilova (CZE) enjoyed a good meeting and featured on several Juniors' podiums

Behind every great man is a good woman! Fraenzi Stoll prepares the motors and igniters for winning husband Hans

Internazionale! Turi Hunziker is Swiss, his S8E/P glider is Ukrainian, the rocket motors are Polish and the Krupka Cup is Czech, while Knauf Insulation is German!

Franz Hunziker (SUI) boosts away a S8E/P-Rocket Glider at the start of what was to be a disappointing event for him

Hans Stoll (SUI) boosts away for his opening round maximum score

## Other Classes

The remaining World Cup classes are classic duration events flown using rockets which are 500 mm long, 40 mm in diameter for >50% of the length, boosted by 2.5Ns mini motors. The rockets are returned to earth under recovery systems packed into the body and include Streamers, Gyrocopters and... Gliders!

Yes, free flight Boost Gliders are a very popular category, with the designs varying from rigid 'chuckies' to fold-up designs that boost as a rocket, but become a glider at the top of the boost. The podiums of these three classes are shown below:

**S4A-Boost Glider World Cup**

1. Aleksandr KOZLOV CZE
   180 180 180 = 540 s
2. Zdeněk KOLAŘ CZE
   152 180 180 = 512 s
3. Michal ŽITNAN SVK
   180 148 154 = 482 s

**S6A-Streamer Duration World Cup**

1. Simon BOLFA CZE
   128 104 180 = 412 s
2. Michal ŽITNAN SVK
   180 147 76 = 403 s
3. Zdeněk KOLAŘ CZE
   180 64 133 = 377 s

**S9A-Gyrocopter Duration World Cup**

1. Vaclav KRUTA CZE
   169 180 180 = 529 s
2. Jonas BUECHL GER
   146 174 180 = 500 s
3. Michal OZWALD CZE
   144 180 150 = 474 s

## About Krupka

Krupka has a history dating from the 1300s and it is adjacent to Teplice, on the foothills of the Ore Mountains, near the former East German border.

Raketomodelářský Klub Krupka is an amazing place! Dating from 1972, when it was built by the local council, it's a dedicated building on two floors, comprising of workshops, juniors' facilities, sleeping accommodation, kitchens and a dining hall! Add to that a trophy collection from major Championships and World Cups that makes it the most successful sporting organisation in the Czech Republic. Your scribe was privileged with a three night stay.

Thanks are due to Bedřich and Věra Pavka, plus Pavel Brony, who managed my travels from/to Vaclav Havel Airport, with Věra doing a marvellous job as Contest Director too. Slovakia's Jan Maixner ran the range with his usual aplomb.

Worth mentioning was that the Knauf Insulation Krupka Cup also featured a national Juniors' event and also formed the Championships of the Czech Republic. It offered excellent flying, good sportsmanship and great socialising throughout.

***RCMW***

Yellow TSP rocket motors are Polish, brown Ultra motors are Serbian. The watches to time the flights come from somewhere else!

Front end close-up of Turi Hunziker's rocket glider. Four mini servos in a line, with the battery at the front. All pretty compact to improve boost prospects

Lots of action on the ground as the clock ticks down. Pavel Brony (CZE) completes his prep and checks his glasses as a team mate boosts away behind!

One of Krupka's juniors retrieves his S7-Scale ARCAS proptotype. Juniors were a major focus throughout

Main body of Zdenek Kolar's Ariane 44L returns safely following a super flight

Ariane 44L being wired up by Zdenek Kolar (CZE), prior to the winning boost. Cluster ignition is always very critical and it can easily end in tears – of joy, this time!

Winning S7-Scale boost by Zdenek Kolar's Ariane 44L. The rocket staged higher up, launched a satellite and returned safely for a good flight score

Mum watches on as Martin Strnad (CZE) pushes the button

Smallest Ariane L-01 on the planet! Jaromir Chalupa (CZE) wires up his compact cluster in a super S7-Scale mini model


Hans Stoll (SUI) takes the top podium spot in S8E/P-RC Rocket Glider. Czech Petr Dubina was second, with fellow Czech Zybnek Kranek third

S7-Scale podium, with Zdenek Kolar (CZE) proudly getting the Gold. Milan Kucka (CZE) and Vasil Pavljuk (SVK) were not that unhappy with second and third. A great event, sponsored by Knauf Insulation

The Banquet was pretty 'fluid', although the food – when it came – wasn't bad either! Your scribe chills out. Photo by Jiri Kaspar

# TRAPLET PLANS & PARTS SHOP

PLANS, PARTS, WOODPACKS AND SETS

# WORLD CLASS DESIGNERS

**Each month we will bring you a selection of the plans from our World Class Designers.**
**This month we feature**

# DENNIS BRYANT

***DHC-1 Chipmunk (68")***
Power Source - IC Propeller
Wingspan - 68" (1727 mm)

| | | |
|---|---|---|
| Plan | MW3444 | £27.50 |
| Woodpack | WP3444 | £71.99 |
| Canopy | CA3444CY | £20.50 |
| Cowl | CF3444CL | £22.50 |
| FULL SET | SET3444 | £128.24 |

***Westland Lysander (81")***
Power Source - .60 to .90 cu. in. 2-strokes; .90+ 4-strokes
Wingspan - 81" / 2057 mm

| | | |
|---|---|---|
| Plan | MW3448 | £32.50 |
| Woodpack | WP3448 | £103.99 |
| FULL SET | SET3448 | £122.84 |

***Hawker Fury 1 (60")***
Wingspan - 60" / 1542mm
Power Source - .60 cu. in. 2-stroke

| | | |
|---|---|---|
| Plan | MW3453 | £27.50 |
| Woodpack | WP3453 | £133.99 |
| FG Cowl | CF3453CL | £21.50 |
| Spinner Set | S3453SET | £22.99 |
| FULL SET | SET3453 | £185.38 |

***RAF.SE.5A (80")***
Wingspan - 80" / 2032 mm
Power Source - 1.80 cu. in. 4-stroke (20 cc)

| | | |
|---|---|---|
| Plan | MW3467 | £37.50 |
| Woodpack | WP3467 | £252.99 |
| FULL SET | SET3467 | £261.44 |

## Other models in the Dennis Bryant Elite Collection

| Model | Plan Reference | Plan Price |
|---|---|---|
| Miles M.14 Magister (68") * | MW3446 | £27.50 |
| Supermarine Spitfire Mk.22 (61") * | MW3452 | £27.50 |
| DH82A Tiger Moth (66") * | MW3460 | £27.50 |
| Fieseler Fi-156 Storch (93") * | MW3466 | £32.50 |
| Rollason Turbulent (63") * | MW3440 | £28.50 |
| Supermarine Spitfire Mk.22 (61") * | MW3452 | £27.50 |
| Fieseler Fi-156 Storch (93") * | MW3466 | £32.50 |

| Model | Plan Reference | Plan Price |
|---|---|---|
| Miles M.5 Sparrowhawk (63") * | MW3459 | £27.50 |
| Aeronca C-3 (81") * | MW3458 | £27.50 |
| Bristol Bulldog (63") * | MW3455 | £27.50 |
| Fieseler Fi-156 Storch (70") * | MW3447 | £27.50 |
| Comper C.L.A.7 Swift (63") * | MW3445 | £32.50 |
| Messerschmitt MW163B Komet (61") * | MW3454 | £27.50 |
| Hawker Typhoon * | MW3451 | £27.50 |

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Designer - Chris Williams

| | | |
|---|---|---|
| Plan | MW2669 | £23.50 |
| Woodpack | WP2669 | £121.99 |
| FULL SET | SET2669 | 117.85 |

***Minimoa (167")***
Wingspan - 167" / 4240 mm

Designer - Vic Steel

| | | |
|---|---|---|
| Plan | MW3465 | £32.50 |
| Woodpack | WP3465 | £95.99 |
| FULL SET | SET3465 | £115.64 |

***Göppingen Gö-1 Wolf***
Wingspan - 138" / 3.500 m

Designer - Laddie Mikulasko

| | | |
|---|---|---|
| Plan | MW3570 | £21.50 |
| Woodpack | WP3570 | £981.99 |
| FULL SET | SET3570 | £108.44 |

***BKB-1 Sailplane***
Wingspan - 120" / 3048 mm

Designer - Tony Slocombe

| | | |
|---|---|---|
| Plan | MW2320 | £22.50 |
| Woodpack | WP2320 | £100.99 |
| FULL SET | SET2320 | £111.14 |

***Slingsby T-45 Swallow***
Wingspan - 129" / 3280 mm

***Piper Vagabond***
Wingspan - 90" / 2285 mm

Designer - Colin Wood

| | | |
|---|---|---|
| Plan | MW2025 | £20.50 |
| Woodpack | WP2025 | £113.99 |
| FULL SET | SET2025 | £121.04 |

***Messerschmitt Me163 Komet (49.75")***
Wingspan - 49.75" / 1265 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3347 | £17.50 |
| Woodpack | WP3347 | £51.99 |
| Canopy | CA3347 | £7.50 |
| Cowl | CF3347 | £13.50 |
| FULL SET | SET3347 | £121.04 |

***DH 87B Hornet Moth***
Wingspan - 38.25"" / 975 mm

Designer - Ian Easton

| | | |
|---|---|---|
| Plan | MW3555 | £14.50 |
| Woodpack | WP3555 | £62.99 |
| FULL SET | SET3555 | £68.38 |

***A-4 Skyhawk***
Wingspan - 36 In (915 mm)

Designer - Phil Cooke and Matt Jones

| | | |
|---|---|---|
| Plan | MW3775 | £17.50 |
| Woodpack | WP3775 | £50.99 |
| Canopy | CA3775CY | £6.99 |
| FULL SET | SET3775 | £67.93 |

***DH83 Fox Moth***
Wingspan - 76" (1930 mm)

Designer - Robin Fowler

| | | |
|---|---|---|
| Plan | MW3643 | £22.50 |
| Woodpack | WP3643 | £90.99 |
| FULL SET | SET3643 | £100.78 |

***Mayfly-6E***
Wingspan - 76" (1930 mm)

Designer - Robin Fowler

| | | |
|---|---|---|
| Plan | MW3789 | £11.99 |
| Woodpack | WP3789 | £26.25 |
| FULL SET | SET3789 | £42.29 |

***Red-Raw***
Wingspan - 63"

Designer - Mike Freeman

| | | |
|---|---|---|
| Plan | MW3412 | £18.50 |
| Woodpack | WP3412 | £49.99 |
| FULL SET | SET3412 | £60.28 |

***Minimoa (167")***
Wingspan - 167" / 4240 mm

Designer - Peter Miller

| | | |
|---|---|---|
| Plan | MW3571 | £18.50 |
| Woodpack | WP3571 | £102.99 |
| FULL SET | SET3571 | £109.34 |

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Please note a wood pack consists of the ribs and formers for the model.
You will need to source additional strip wood and balsa from your local modelling material supplier to complete the model.
All prices are correct at time of going to press but may be subject to change without further notification.
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TRAPLET PUBLICATIONS

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***North American AT-6 Texan/ Harvard (68.5")***
Wingspan - 68.5" / 1740 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3352 | £20.50 |
| Woodpack | WP3352 | £73.99 |
| Canopy | CA3352CY | £12.50 |
| Cowl | CF3352CL | £23.50 |
| Flanged Prop nut | CD3352SP | £7.00 |
| FULL SET | SET3352 | £109.34 |

***Grumman F6F-5 Hellcat (64.25")***
Wingspan - 64.25" / 1632 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3350 | £22.50 |
| Woodpack | WP3350 | £108.99 |
| Canopy | CA3350CY | £7.50 |
| Cowl | CF3350CL | £34.50 |
| Domed Prop nut | CD3350SP | £12.50 |
| FULL SET | SET3350 | £167.39 |

***Chance-Vought F4U-1 Corsair (61.5")***
Wingspan - 61.5" / 1562 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3349 | £22.50 |
| Woodpack | WP3349 | £58.99 |
| Canopy | CA3349CY | £7.50 |
| Cowl | CF3349CL | £23.50 |
| Domed Prop nut | CD3349SP | £12.50 |
| FULL SET | SET3349 | £110.69 |

***Messerschmitt Bf109F (61")***
Wingspan - 61: / 1550 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3348 | £22.50 |
| Woodpack | WP3348 | £78.99 |
| Canopy | CA3348CY | £12.50 |
| Cowl | CF3348CL | £29.50 |
| Aluminium Spinner Set | CS3348SET | £22.99 |
| FULL SET | SET3348 | £148.03 |

***Gloster Gladiator (56")***
Wingspan - 56" / 1422 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3344 | £22.50 |
| Woodpack | WP3344 | £95.99 |
| Canopy | CA3344CY | £7.50 |
| Cowl | CF3344CL | £24.50 |
| Aluminium Spinner Set | CS3344SET | £22.99 |
| FULL SET | SET3344 | £156.13 |

***Supermarine Spitfire Mk.XIV & XIX (69")***
Wingspan - 56" / 1422 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3342 | £23.50 |
| Woodpack | WP3342 | £118.99 |
| Canopy | CA3342CY-A | £7.50 |
| Cowl | CF3342CL | £24.50 |
| FULL SET | SET3342 | £211.93 |

***Razor 90***
Wingspan - 50" (1270mm)

Designer - Shane Harding

| | | |
|---|---|---|
| Plan | MW3636 | £18.50 |
| Woodpack | WP3636 | £80.99 |
| Canopy | CA3636CY | £9.50 |
| Razor 90 ABS Air Intake | CS3636INT | £17.50 |
| FULL SET | SET3636 | £113.84 |

***Lockheed Super Constellation***
Wingspan - 88" (2235mm)

Designer - Philip Noel

| | | |
|---|---|---|
| Plan | MW3663 | £31.50 |
| Woodpack | WP3663 | £161.99 |
| ABS Cowl | CA3663CL | £23.50 |
| FULL SET | SET3636 | £195.29 |

***DH Mosquito***
Wingspan - 50" (1270 mm)

Designer - Philip Noel

| | | |
|---|---|---|
| Plan | MW3661 | £22.50 |
| Woodpack | WP3661 | £107.99 |
| ABS Cowl | CA3661CL-SET | £7.50 |
| Cowl | CA3661CL-SET | £7.50 |
| FULL SET | SET3661 | £130.94 |

***Vought-Sikorsky OS2U Kingfisher (58")***
Wingspan - 58" / 1473 mm

Designer - Brian Taylor

| | | |
|---|---|---|
| Plan | MW3343 | £22.50 |
| Woodpack | WP3343 | £78.99 |
| Canopy | CA3343CY-A | £21.50 |
| Cowl | CF3343CL-SET | £7.50 |
| FULL SET | SET3343 | £130.94 |

***Piper Comanche 260***
Wingspan - 73" / 1855 mm

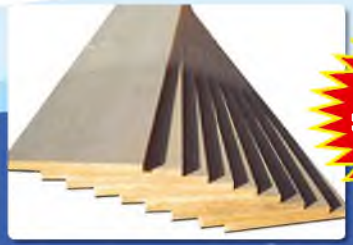
Designer - Keith Humber

| | | |
|---|---|---|
| Plan | MW2022 | £22.50 |
| Woodpack | WP2022 | £91.99 |
| FULL SET | SET2022 | £92.69 |

***DH Vampire FB5***
Wingspan - 73" / 1855 mm

Designer - Keith Humber

| | | |
|---|---|---|
| Plan | MW3095 | £13.50 |
| Woodpack | WP3095 | £28.99 |
| FULL SET | SET3095 | £38.24 |



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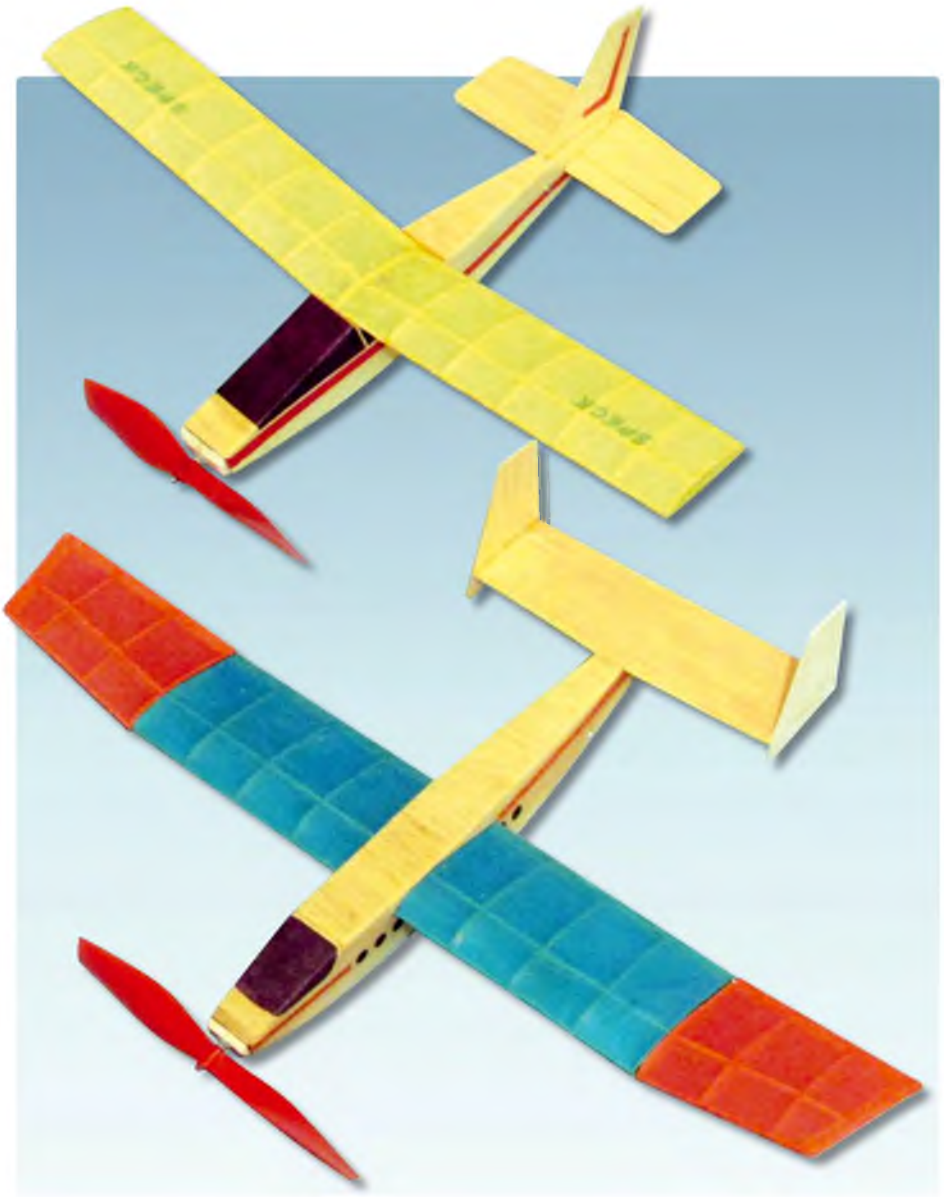
# The Sport Channel

**This month Gray is the recipient of some much appreciated gifts**



Two unexpected and very special acquisitions. This summer your author was given the prototypes of the Aerographics Speck and Agro rubber models from the early 1980s by designer Richard Preston

## This Month's Wise Words

Ever since I mentioned that I was in the process of setting up a model workshop in my new home hardly a day goes by that I'm not asked how it's progressing, which is very gratifying.

Back in August, I again met up at my club's annual event with Richard Preston from Chippenham, Wilts. As readers may recall, Richard was the original proprietor of the Aerographics range of fine free flight sport and scale models. At our show, Richard presented me with something that he thought might feel at home in my new model room. I could hardly have believed that the little gifts he'd brought would already have huge sentimental value.

The two models that Richard had gave me were the prototypes for his 'Speck' and 'Agro' from the early 1980's. During those distant, glorious summers my club began organising trips to model events and along with a dear and now sadly long-departed club pal, I happened across Richard at Old Warden. Richard had stacks of tiny kit boxes and rolls of plans in his car boot and was continually winding and launching demo models of two designs. The aptly named 'Speck' climbed nearly vertically and shot off downwind. The slightly more sedate 'Agro', a quasi-military looking twin-fin design, cruised around for ages looking so cute. Of course, my pal and I snapped up kits and plans, and the Speck and Agro remained firm favourites and we flew them at so many events. Subsequently, we always looked out for new Aerographics releases and Richard's published plans in the model press. My own Speck lasted for over twenty years.

I always associate those two models with some of my happiest times in our hobby and to now own the very first examples of each is a real pleasure. Next season both will fly again.

"Gift giving is a true art..." (Vera Nazarian)

## How Did I Think Of That?

This has to be one of the best of our occasional hints for a long time as it ticks all the boxes for usefulness and practicality, and I didn't have to think of it! I'm indebted to Paul Henshaw; member of my club's founding family and son of the late Gary, for this product which surely has endless applications for aeromodellers.

Heavy duty wipes, as sold to the building trade, are just perfect for the workshop and flying field. Although these pleasantly scented sheets look much like normal household wipes, they can clean up all kinds of unpleasant things that other products wouldn't touch. I can confirm that they'll cut through glue and paint, and even silicone and have a powerful degreasing action. For those of the IC persuasion, builder's wipes will make short work of glow or diesel exhaust residue. I guarantee, if you get a tub of these you'll quickly think of dozens of modelling applications. If/when you do, please pass them on!

Heavy duty wipes are available under a variety of brand names from builders' merchants and large DIY chain stores.


You may not know it yet but you need some of these! Heavy duty wipes, sold for the building trade, will prove invaluable in the workshop or at the flying field. We've tried them and they work!

## Meet Chief Lanzo

As we've seen lately, SC readers share my fondness for the Keil Kraft 'Chief' A2 of the early 1950s. It was my first successful R/C model in 1970 and it's still favoured around the world as a sport thermal, slope or electric glider.

We heard from Chris Freeman in South Africa, who always seems to have interestingly different projects underway. He got in touch this time to report on a Chief that metamorphosed into a strangely attractive hybrid! Chris explains:

*"I know that you like the Chief and thought you might like to see what we did with it. A few years ago, my friend asked my son Byron to build him a Chief and managed to borrow an original kit.*

*We enlarged the plans to a 2 metre wingspan and photocopied all the original printed wood pieces. My friend laser cut all the shaped pieces and my son built this for Colin. Flight performance was very good with a Park 480 electric motor and a 2200 mAh LiPo.*

*Byron loved the shape of the Chief fuselage and thought it would be nice to add the wings for the 1942 Lanzo Record Holder that I had built! Last year Byron finally got to build his Chief and as you can see it looks like a good match. This also has a Park 480 motor and it makes a very nice relaxing glider to fly.*

*I also built a new Old Timer for our main Vintage day; bit of a rush job and it was done in just two weeks, and all parts were hand cut. It is a 1937 Stick with a Turnigy Donkey as power and a 2200 LiPo. A very nice and gentle flying aircraft but not one to thermal with as it might just get lost with all that wing and not that much control authority!"*

Congrats, Chris and Byron on a superb pair of Chiefs. The incorporation of the Lanzo wing is a creative master stroke and the resulting model looks 'right'. Are any readers working on 'remixes' of other famous designs?

Nice montage of electrified Vintage subjects by Chris Freeman and son Byron. Green KK Chief is Chris's enlarged two metre version, while the red one is Byron's hybrid with the wing of a 1942 Lanzo Record Holder! Also in there is Chris' speed-built 1937 Stick

## Swanning About

I still maintain that we could teach the tabloids a thing or two about cutting edge headlines...

Nice to see that since our item on George Stringwell's electric recreation of the 'Swannee', the 1960s single channel low wing mini 'pattern ship', word has been getting around and the design is now on several 'to build' lists. At the time of writing I've just e-mailed out another copy of the plan. (Just mail me at the address below if you'd like one).

Long time contributor, David Lovegrove, discovered the Swannee a while before and just had to try it. David writes:

*"I noted the piece about George Stringwell's new Swannee, which I think is a delicious little model. I first encountered the Swannee up at the Pontefract Vintage Meeting back in June and immediately promised myself that I'd have one flying, a.s.a.p.*

*I've finished it and although maybe not as glamorous as George's (he must spend ages on the finishing!), I think it looks okay. It repays a little bit of effort, doesn't it? I can't be doing with fully-furnished canopies though - life's too short!"*

Having seen David's model at a couple of events, I can honestly say that he's done an immaculate job and his colour scheme is just so authentically 'sixties' that it looks the part in every way.

Better still, just 'down the road' at the Shilton SAM35 Vintage Fly In event in the Cotswolds in September, David very kindly trusted me to have a fly with the Swannee (the first I'd ever seen built or flying!) and it was real joy. Well behaved, a good speed range and as lively as you want when required. Like the majority of current Swannees, David's model flies on rudder, elevator and throttle. During its flights several modellers pondered on how we ever flew such models back in the day, on simple rubber escapement control on rudder only. But as one wise former button-pusher observed,

*"We simply made the best use we could of the available technology."*


Everyone's favourite single channel low-winger of the mid 1960's, John Bowmer's 'Swannee' is gaining more fans. Latest we've seen (and flown!) is this example by David Lovegrove, which just exudes 60s charisma!

### Accumulating Acquisitions

Not long after I became the owner of the Speck and Agro, a couple more completely unexpected gifts arrived, again prompted by my new workshop and from another respected model designer.

Ron Baddorf of Richmond, VA in the USA has longstanding connections with the UK and was an eager supporter of the Small Model Association in its early days. Ron wondered if I might like a couple of kits to help kick off my building schedule in my new home? When I opened Ron's package I was confronted by a sight that proved jaw-dropping.

What Ron had sent was a pair of rubber scale kits from the legendary US Comet stick-and-tissue range. The largest rubber scale model I've ever built was about 24" span but right here were an Aeronca Chief and a Taylorcraft from Comet's Giant Scale line, both 54" span...

Their construction is classic traditional F/F and the quality and grading of wood in both kits is remarkably good. Although friends and clubmates suggest converting them to lightweight R/C electrics, I intend to build them for rubber power more or less as standard, as it'll be a real 'first' for me.

Having been endlessly impressed by videos of the Flying Aces Club Nats online, I've often thought about giving this class a try. I'll keep you updated on their progress and if any SC readers have flown large rubber scale models, I'd be glad to hear of your experiences. Ron, I can't thank you enough.


Another greatly appreciated gift, this time from our old friend Ron Baddorf in the USA. Comet Kits Aeronca Chief and Taylorcraft are giant scale rubber power free flight models and that's exactly how they're going to be built. A first for your author

### Off Piste

The 1930's science/tech magazine cover that we featured recently showing a flying surfboard rig brought in some suitably amused comments. Although it was undoubtedly a theoretical forerunner of modern kite-surfing and parascending, the consensus seems to be that it would have had 'problems'.

One reader mentioned that during a holiday this summer he'd had several attempts at riding on what he described as 'a giant inflatable airfoiled mattress', towed behind a speedboat and intended to fly in surface effect. But, it had a wild pitch oscillation and kept dunking its hapless passengers in the Med. Our correspondent didn't fancy trying to explain to the operator that it had a Centre of Pressure problem!

Now, look at our pic this month of a mag cover from the early 1950s. Although this small personal wing for skiers, to extend their time in the air when hopping down a mountainside, may look far-fetched its basic principle is sound and is in use today!

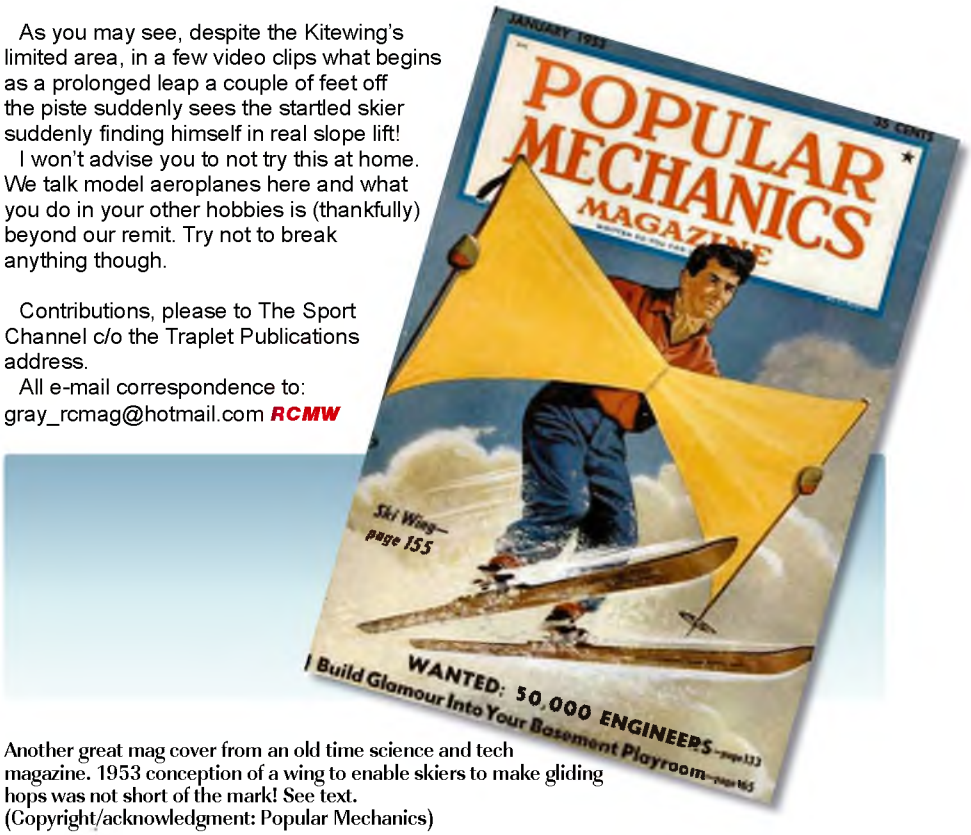
Take a look on YouTube and search for the 'Kitewing'. This small, built-up, fully airfoiled micro hang glider is not much bigger than a large model wing but skiers and practitioners of other outdoor and extreme sports now use Kitewings to add an extra dimension to their activities.

As you may see, despite the Kitewing's limited area, in a few video clips what begins as a prolonged leap a couple of feet off the piste suddenly sees the startled skier suddenly finding himself in real slope lift!

I won't advise you to not try this at home. We talk model aeroplanes here and what you do in your other hobbies is (thankfully) beyond our remit. Try not to break anything though.

Contributions, please to The Sport Channel c/o the Traplet Publications address.

All e-mail correspondence to: gray_rcmag@hotmail.com **RCMW**




Another great mag cover from an old time science and tech magazine. 1953 conception of a wing to enable skiers to make gliding hops was not short of the mark! See text.
(Copyright/acknowledgment: Popular Mechanics)

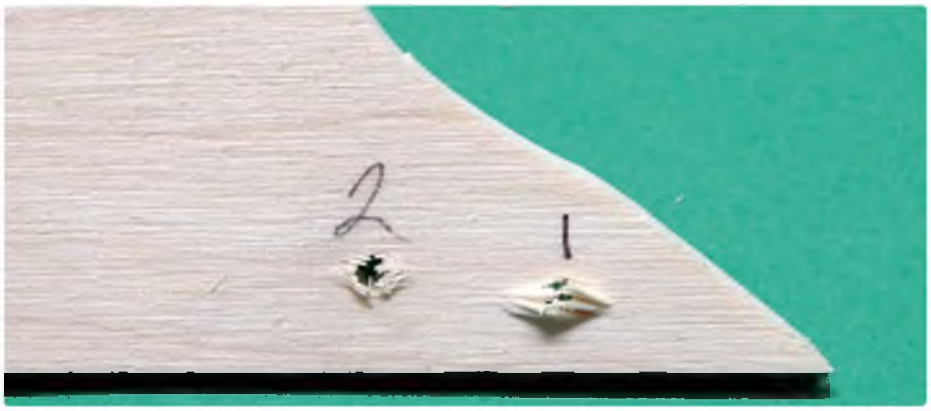
# Clean Drilling

**Bill Bowne offers a quick tip to reduce splinters when drilling through wooden model parts**

Drilling holes through balsa, ply and lite ply can be a pain, especially when the drill bit tip splinters the outgoing hole edge.

To lessen the chance of splintering we use a scrap of pine or other harder wood as a backstop. As a nice side benefit the scrap wood reduces the likelihood we'll drill through the top of our workbench too!

When the backstop scrap is worn out, just toss it into the kindling bin for your next camp-fire! ***RCMW***




**Top Right:** When drilling through ply, balsa or any other wood that can splinter, use a backstop wood scrap to lessen the chance of splintering (and to protect your work surface)

**Bottom Right:** Two 3/32" holes, both drilled through a piece of 1/8" poplar (lite) ply. Hole 2 was drilled using a scrap of hardwood as a backstop, but hole 1 was drilled without it and is clearly more splintered than hole 2

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# Diary Dates

## EVENT CALENDAR

A FREE service, advertise your club's event, show, fly-in, bring and fly, swapmeet, sale or whatever. Simply send in the details to: 'Diary Dates', RC Model World, Traplet Publications Ltd., Traplet House, Willow End Park, Blackmore Park Road, Malvern, WR13 6NN, UK. Or Email to RCMW@traplet.co.uk Traplet Publications Ltd. are unable to take responsibility for event cancellations. Check before you go.

## INDOOR

**5th Nov, 3rd Dec '16**
**Fun Flying at Potters Bar**, at Furzefield Sports Centre, Mutton Lane, Potters Bar, Herts. EN6 3BW. From 6 pm until 10 pm, flyers £9, spectators £2. Small rubber free flight and small electric models, wingspan will be limited to 20". All enquiries to Mike Quille, Tel: 020 8500 3549, Email: mp.quille@live.co.uk

**12th Nov, 10th Dec**
**North London MFC Indoor R/C Meetings**, at Furzefield Sports Centre, Potters Bar, Herts. EN6 3BW (Junction 24/M25), 6 pm – 10 pm. All up weight limit for fixed wing 225 g, 36 inch span, Helicopters 400 g. BMFA insurance required. Admission: flyers £9, spectators £2.50. For more information contact Peter Elliott on 01707 336982

## GENERAL

**8th Nov '16**
**Southend Radio Flying Club Table Top Sale**, The Ecko Club, Thornford Gardens, Southend on Sea, Essex SS2 6PU. From 20.00 to 22.00. Table set up from 19.30. Entry £2, Tables £4 (includes entry). Please book tables in advance. Refreshments available from the bar. For more info contact Les 07729 421939, or Den 01702 295988.

**20th Nov '16**
**Southern Counties Swap Meet**, at Mountbatten School, Romsey, Hampshire SO51 5SY. Admission only £4, under 16s free. Tables £8 including one admission. Sellers from 8.30 am, buyers 9 am to noon. More details at hmfa.bmfa.org/ To pre-book tables only call Mike Stokes on 07702 742647

**4th Dec '16**
**Loughborough Model Flying Club 19th Annual Swapmeet**, at Rawlins Acedemy, Loughborough Road, Quorn, Nr. Loughborough, Leics LE12 8DZ (directions on www.lmfc.net). Sellers set up 9 am, open to public 10 am, Hot & cold refreshments available. Tables £4, admission £3. Early table pre-booking is essential to avoid disappointment. For more details contact Richard on 07400 921929

**8th Jan '17**
**Croydon Airport Military & Aviation Collectors Fair**, at the Hallmark Hotel, Purley Way, Croydon Surrey CR9 4LT (see the link for directions: www.hallmarkhotels.co.uk/our_hotels/croydon/location/). Aviation collectables, book dealers, model collectors, uniforms, medals, toys, kits etc. Doors open at 10:30 am, £3.50 entry, children under 10 free. Free car parking. Traders contact Aviation Antiques on 07973 885754, stalls plots to be pre-booked. Croydon Airport Control Tower is open for visits. For more details contact Dave Sutton, Email: davidsutton16@aol.com Mobile: 07973 885754

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**Enya** 35RC glow engine with silencer £20. Also several Davies Charlton 049 glow engines £10 each. Frog MK2 diesel 149, from 1960 in original box with all papers. Call 07909 766687. Suffolk.

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**Vintage** Modellers: Aeremodeller annual 1959 and Control Line manual by R. G. Moulton (1961). Both in good condition, £10 the pair, including postage. Call 01772 684244. Lancs.

**1/4** scale Tiger Moth 80" wingspan, built but never flowm, Enya 90 cc 4-stroke, £150. Dakota 60" wingspan, everything in it, £45, never flown, no ba, no RX. Call 01268 288094. Essex.

**Magazines:** Fly Scale, Model Flyer, R.C. Flyer, Silent Flight, R.C. Model World, Quiet Flight Aeromodeller, Aviation Model International, Radio Modeller, RCM&E. 800 plus in total, £20. Call Alfred 01782 624415. Staffordshire.

**Enya** 19 RC glow engine NIB £30, also Wasp 049 glow engine NIB £20. D.C Bantam £10. Good Enya 40 with silencer £20, new Merco 35 RC £15. Call 07909 766687. Suffolk

**R/C** Model World magazines. I've got every one from the first edition to December 2015. Collect only, £50. Call Bill, 01282 421029. Lancashire.

**Multiplex** "Bonito" electric hotliner kit 1.93 metre. Multiplex quality, formed foam veneer wing, epoxyglass fuselage, balsa, ply parts, hardware. Collection only. £100. Phone John on 01395 264331, kit is untouched. East Devon.

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**Super** Tigre S3000 30c.c. 2-stroke glow motor for sale, new-in-box with silencer & instructions. £120 + postage. Wood props. To suit above:- Pair 'Smart' 20 x 10; 'Smart' 22 x 8; 'Menz' 22 x 8, all £10 each. Phone Peter on 07810 000567. Herts.

**OS** 2-stroke motors for sale, all new-in-box with silencers & instructions:- Max 61SF, £75; Max 40FP, £55; Max 35FP, £50; Max 20FP, £45; Max 15FP, £40; Max 10FP, £35 & postage. Call Peter 07810 000567. Herts.

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**Seagull** Super Decathlon, built ASP 91FS new. Just fit RX battery and pilot ready to go, buyer collects. Call 07879 020281, Norfolk £240. Plus other model kits, send S.A.E please.

**Thunder** Tiger ready II ARTF plus Aviomodelli float kit designed to fit this model. Both new kits. £120 for both or £60 each plus P+P or collect. Call 07879 020281. Norfolk.

**Zlin** 526 Acrobat 86" span, old but ready to fly, new servos fitted air retracts Webra 01-2st, £260. Call 07879 020281, Norfolk. Plus numerous other kits, send S.A.E please.

**OS** FRS-300 Sirus radial engine as new, unrun, boxed complete with Keleo exhaust collector ring and lots of accessories. Prefer buyer to collect £1800. 07879 020281. Norfolk.

**OS** FF 320 Pegasus engine as new, boxed, unrun, mint complete with accessories £1600. Prefer buyer to collect, heavy box. 07879 020281. Norfolk. Pus numerous model kits call for list, send S.A.E. please.

## WANTED

Wanted plans parts, abandoned project DH Mosquito, 1/7 th scale (92"). Call John 07951 412936. Cambs. Also plans parts etc. BAE Hawk, 1/7 th scale.

**Wanted** front housing for OS MAX 45FSR ABC engine. Call John on 0776 6762896. Oxon.

**Wanted**, silencer (muffler) for Super Tigre 3000. Call Graham on 01372 275968. Surrey.

**Plan** of A2 glider Daedalus by Otto Rosser, also pram Dinghy SHTS 1 & 2. All expenses paid. Call Colin 01271 830865. Devon

**Any** aviation collectables wanted. Made/unmade plastic kits, R/C kits, models, books, diecast models etc. Write 27-A The Grove, Biggin Hill, Kent, TN16 3TA or call 07973 885754.

**Thunder** Tiger 120 PRO 2 stroke side exhaust. Call Williams 020 8445 9567. London.

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MODEL WORLD

# Next Issue

**DON'T MISS OUR DECEMBER 2016 ISSUE!**

## World Scale Championships

Neil Tidey reports from the 2016 World Scale Championships held in Ploesti, Romania. Unfortunately Romania did not prove to be a popular venue and some European teams did not attend. For the first time in over 40 years of the Championship, Great Britain did not field a team for the F4c event, even though team trials had been held. Although not well supported there were entries from 10 countries, including many famous scale modellers. In F4h, Richard Crapp and Dave Toyer were joined by Mick Reeves and Steve Kessell as Team Manager for the GB Team. Although the entries were down the major competitors came, making the event a true competition.

## World Champion Talk

Daniel Boulanger from France, flying his Caudron, won the F4h event. The model is 1/4 scale and it is powered by a Laser 150. In his interview with Daniel, Dave Goodenough reveals how, when he first met the new World Champion, he wasn't that impressed with his flying. Dave recalls: *"I first met Daniel Boulanger a few years ago when he was flying at our club's two day scale extravaganza. His model, the Caudron Luciole, was flown admirably, though I originally thought it was done without the usual French 'verve'. How very wrong I was! Not only was the model built to a remarkable standard, it was also presented in flight exactly as the type would have been flown. It had been designed to be used as a training aircraft and that's how Daniel flies the model, emulating the steady flying patterns of newbie flyboys."*

## DECEMBER 2016 ISSUE ON SALE THURSDAY 17TH NOVEMBER

## Great War Combat

Image courtesy of Tracey Cosier

Once a year, at an undisclosed location in Victoria, Australia, a group of dedicated and determined individuals get together to 'recreate' the iconic aerial battles of the Great War. They are never certain just how many Allied or German aircraft will turn up. But one thing is certain – nobody goes down without a fight! Each aircraft tows a short length of paper streamer and opponents attempt to remove it, or sections of it, from the aircraft. There are few rules to these battles, and almost none applying to the aircraft. The only requirements are that the aircraft shall be powered by a .25 cu in glow motor and be representative of a WWI type – either German or one of the Allies. Electrics are not permitted due to the very real possibility of LiPo damage and possibly a fire – this is Australia we're talking about, with lots of dry grass around!

**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*

***The December issue will be on sale Thursday, November 17th, 2016. Order your copy TODAY from your newsagent or model shop. Alternatively check out the Subscription Offers in this issue and be among the first to take advantage of our FREE classified advertisement service***

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| Wingspan: | 1500mm (59") |
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| Weight: | 2900-3080g (6.4-6.8lbs) |
| Servos: | 4-5 Quartz QZ507 (Recommended) |
| Radio: | 4-5 Channel (Required) |
| Motor: | Quantum II 55 Brushless (Recommended) |
| ESC: | Quantum 80A Brushless (Recommended) |
| LiPo: | 5S1P 4500mAh 30C (Required) |
| I/C Engine: | .40 - .55 2-Stroke (Required) |
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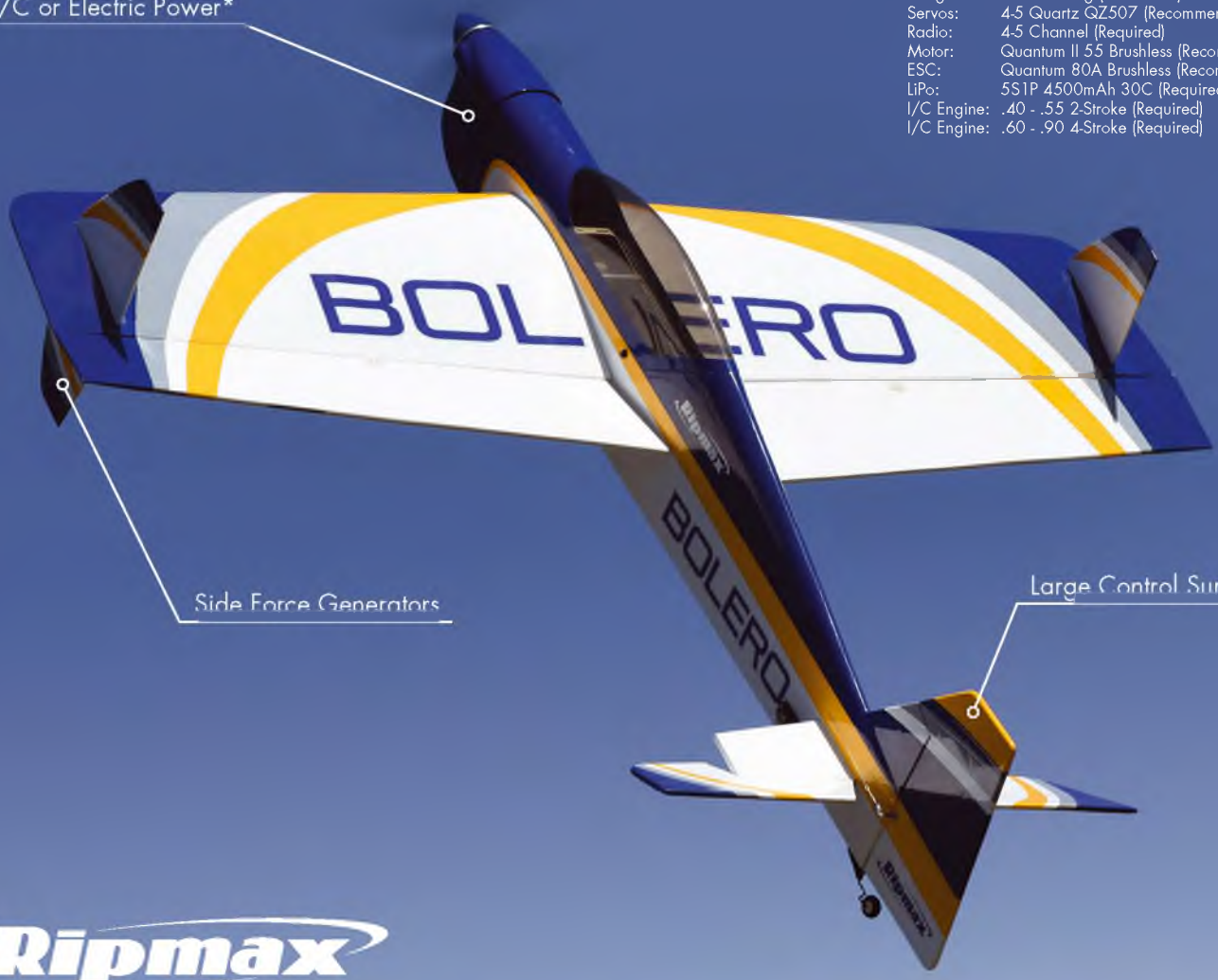


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