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MARCH 2017

RWD5

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Feature Plan

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NEXT GEN SUKHOI
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FRONT COVER

The RWD5 was built in Poland in the 1930s where it was used as a trainer and club aircraft. One aircraft was modified and flew across the Atlantic ocean to South America; it was the smallest aeroplane to cross the Atlantic. Peter Miller's .40 size model of this attractive aeroplane is easy to build, although the cowling is a little more complex. It features a one piece 66" cantilever wing. Turn to page 40 to read Peter's article on building the RWD5

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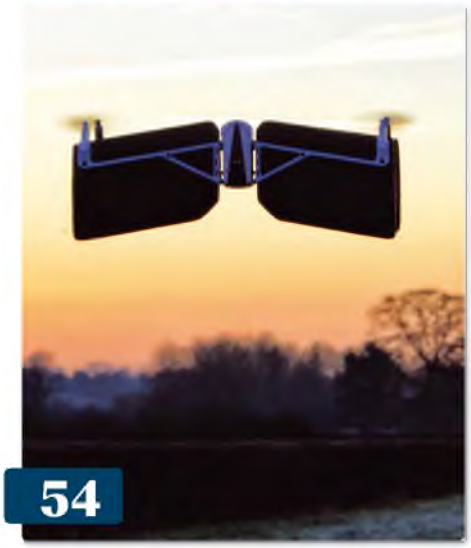

Pre-flight

Kevin Crozier
Editor | Radio Control Model World
Contact me either by post:
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Malvern WR13 6NN. UK
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Welcome to the March issue of RC Model World. Our regular readers will probably have noticed that this issue of RCMW is a bit slimmer than usual as it doesn't have a free plan stapled in the middle. In its place is a fabulous Pick Your Own Plan offer that enables you to get a discount worth at least the free plan's value off a plan listed in our new hand picked 'Pick Your Own Plan' feature – see centre spread! The choice is yours!

For as long as I can remember this magazine has incorporated a free pull out plan in its centre. Well, that's not strictly true because as a young modeller I can remember buying the early issues of RC Model World and they didn't feature a free plan. I used to devour all the available R/C magazines of the time and you had to buy the Aeromodeller for one of those, which I used to pull out and store safely in a folder, ready for when I wanted to cut out a set of parts and build my own free flight or control line creation from scratch. And there's the rub: I never did build a single one, as my modelling career veered off in the direction of the slab sided fuselages and foam wings that were popular in the R/C kits of the day.

But never mind, I still got a great thrill from opening up those free plans, studying the designs and making dreams to actually build one or two of the models. So I get it, I really do: there are lots of our readers who dearly love the free plans in each issue, and many of you progress much further than I did and actually get to build and fly some very nice models from those drawings.

So I was a bit taken aback when asked to a meeting to discuss reducing the frequency of the free plans to every other month. There was no way I was going to let that happen, was there? However, I was shocked to discover the sheer cost of the exercise and I had to confront the reality that when combined with the profusion of Depron and other modern materials now being used to construct a lot of the small model designs we are offered lately, we were putting out some very expensive drawings that showed nothing more than the outlines to slabs of sheet foam.

That's not to say that we don't get some lovely conventional models as free plan features, as the Mini Super Bistormer in the last issue shows. And some of those Depron based models are well received too, the recent E-Vulcan being a case in point; I have received several positive messages about that particular model aeroplane and promises to build a veritable squadron of foam V-bombers!

But to make best use of those expensive pull out plan sheets that Traplet's management team have promised to still make available, albeit on a bi-monthly basis, we will now be taking a much more critical look at the free plans we offer. So expect a lot more balsa in the spaces between the leading and trailing edges, and a little less foam. And when we do publish a foam plan feature, the drawing may be offered in an alternative way, such as a reduced scale drawing on a magazine page, ready for enlargement, before it enters the Traplet Plans Service for posterity.

Let's turn our attention now to the articles we have assembled for your enjoyment in this issue. As we've been discussing plan features let's start the ball rolling with this month's Feature Plan, which is for a little known but highly attractive 1930s Polish training aircraft, the RWD5. Designed by Peter Miller for his favourite type of power plant – a .40 four-stroke engine – this 66" span scale model is simple to build and has docile flying characteristics.

Our triple bill of scale building features continues; this month Peter Maw concludes his Dalotel build from the RCMW plan, Chris Bowler builds a mainplane for his Druine Turbulent and John Higgins progresses with his own-design electric Cri-Cri project.

We also bring you flight tests of three exciting models, starting with the second generation Sukhoi SU-29MM from E-flite, which is a fully aerobatic scale foamie that excels in both 3D and smooth manoeuvres. Parrot Swing is an agile X-wing machine that takes-off vertically and transitions into forward flight, while the Cambria Funfighter Zero is a new take on the popular funfighter format, being a simple to build, veneered foam wing warbird for bigger than normal .40 size engines – ideal for those old glows looking for a new home!

We wrap things up with some of our favourite regular columns; Scale Soaring for classic gliders, In The Loop for F3A aerobatics, The Sport Channel for club and retro topics and last, but not least, High Tension to build up our petrol engine knowledge base.

A great read, we hope you will agree. So until next time...

Happy flying!

Kevin

CHECK OUT PAGE 14 FOR OUR LATEST SUBSCRIPTION DEALS

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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

What Tony Did Next

Since his recent retirement from Traplet Publications, RC Model World's previous Editor, Tony van Geffen has been kept busy by helping with aircraft restoration at Sywell Aerodrome. We thought that our longer term readers would like to know what he has been up to.

Tony writes:

"Hi Kevin

Sywell is doing me good - see pictures attached. Can I say its better than working! I have restored three wings of the replica SE5A and helped a bit with the Tiggie. The Tiger Moth belongs to a customer and is coming to the end of a total restoration. It's an unusual example in that it is a long range version with a second fuel tank mounted forward of the front cockpit.

The SE5a is one of six built to 80% scale by Slingsby in 1968 for a film called 'Darling Lili' starring Julie Andrews and Rock Hudson. Matthew Boddington is in charge of the rebuild/restoration to full flying condition and it should be seen as part of the 'WW1 Display Team' in 2018, appearing at full size airshows around the country.

Matthew's father, Charles was the Flight Director during the original filming."

Aside from this, Tony helps out with other aircraft duties at Sywell, including repairs and maintenance. He also enjoys some occasional flying experience.

DX6e Compatibility

Roger Smith spotted an oversight in our recent review of Spektrum's DX6e radio:

"Dear Kevin,

I have just received my February issue of RC Model World and have just read the review of the Spektrum DX6e transmitter. The article suggests that it is both DSM2 and DSMX capable.

However, my understanding is that ALL Spektrum transmitters being sold within the European Union are DSMX ONLY as there is EU legislation forbidding the sale of DSM2 transmission equipment.

A friend of mine has a DX6e transmitter he bought last December. There is an addendum in the manual saying that the EU versions are DSMX only. I contacted Horizon Hobby UK this morning and they confirm that Spektrum DX6e transmitters sold in the UK comply with EU regulations and are therefore DSMX only.

I'm sure you'll want to check this out yourself, however I felt it necessary to point this out as a lot of people are being caught out when they try to bind new Spektrum transmitters to DSM2 receivers and finding they will not bind."

Many thanks for bringing this to our attention, Roger. We contacted Horizon and received a quick reply:

"Yes this is correct. Within the EU, DSM2 transmitters can no longer be distributed. This is different in the U.S."

It's old news really as the regulation changes date back to late 2014/early 2015, but apologies to all for forgetting it when checking the article. I should also point out that existing DSM2 equipment is still safe and legal to use, so if, like me, you have older Spektrum (and JR) gear then please don't think you have to consign it to the bin.

Baby Bolt

Plans for this neat 35 inch span P-47 , which was featured in RCM&E, February 2017, are now available from the Traplet Shop.

Baby Bolt is a re-work of Clive Smalley's one-piece warbird. The three sheet plan shows full construction details for this 1:14 scale 35" span R/C model of the famous Republic P-47 Thunderbolt . Designed for electric power, or unpowered for thrilling PSS flying, the model requires 2 or 3 channel R/C. A laser cut wood pack is available containing most of the shaped balsa and ply parts, such as fuselage formers and wing ribs. We can also supply an additional wood pack containing the sheet and strip wood needed for the model, as well as a moulded canopy and a cowl.

The original model was powered by a HET Typhoon-Micro 6/20 outrunner, turning a 7" x 4" prop, via a 20A ESC and 3S 2200mAh LiPo.

Plan - Product Code: RC2174. Price: £13.99
Wood Pack - Six sheets of accurately laser-cut parts in high quality balsa and ply. Product Code: WPRC2174. Price: £30.99
Additional Wood Pack - Containing the sheet and strip wood needed to complete the model. Product Code: AWPRC2174. Price: £33.99
Canopy - Product Code: CARC2174CY. Price: £7.99
Cowl - Product Code: CFRC2174CL. Price: £16.80
Set - includes the plan, laser-cut wood-pack, sheet and strip wood, a moulded canopy and cowl. Product Code: SETRC2174. Price: £92.99

MODEL SHOW NEWS

LMA, Haydock Park 2017

The Large Model Association have decided that they want to stop those winter blues and get the show season started a bit earlier in 2017 with their new show at Haydock Park Race Course (WA12 0HQ) on Sunday, March 19th.

At the end of every show season the LMA hold a static show at the British Motor Museum, Gaydon, where members and visitors look at the models that are being built and look forward to seeing them finished and flying in the new year. With this new show at Haydock Park the LMA thought it would be good for large model enthusiasts to see the finished models up close and to be able to chat to the builders before they are used in their first full season of flying.

As with any LMA show there will be a good trade presence so you can buy those final items for the coming flying season, or grab an early bargain to start the year. A bring and buy is also planned (£10.00 per table plus entrance fee) so take along the items that you no longer want and wish to sell on.

As with Gaydon there will be a chance to sit in on a various master-class tutorials from some of the best modellers around the UK. Talks will be held on how to use glass cloth, Jeti radios and jet turbines.

For latest news and entry information please visit:
www.largemodelassociation.com/events/

ProWing International 2017

Over in Germany, the ProWing International Trade Fair will take place at the airfield in Soest/Bad Sassendorf (40 km east of Dortmund) from April 28th - 30th, 2017.

After the huge success of previous ProWing events the trade fair will be even larger this year, with lots of international exhibitors and visitors expected to visit the show. More than 100 exhibitors are expected to present their products. You can view the exhibition list, updated daily, on the show website.

Besides model displays by specially invited R/C show pilots there will be a full scale display by a Pitts Special. Companies will also present their products live in an 'Action Area' beside the flight line. Here you can see working engines, turbines, mufflers, smoke systems etc.

On Friday night there will be a relaxing get together in the 'Air-Lounge' event tent, with live music on the Saturday night. Accommodation is available close to the airfield for visitors who want to stay the whole weekend. You also can use the camping area at the airfield, which has electricity and restrooms. Please register for this on the show website, where you can also see the latest event news and ticket information:
www.prowing.de

Weston Park Model Show 2017

The top Midlands model show returns on the 16th - 18th June, 2017.

As a new and exciting addition, to be run in conjunction with the main show, The Wrekin Model Flying Club will present a dedicated 'Quadcopter And FPV Drone Fair', where there will be displays, both static and flying, of the very latest drone equipment, from small micro-copters to large and powerful professional machines. Experts will be on hand to answer questions on all aspects of this growing sector in miniature aviation.

A large audience is anticipated to attend the three separate show arenas: the Main Show Line, the Helifest Park and the Quadcopter Fair.

Some exciting news for 2017 is that Sebastiano Silvestri from Italy will be flying at this year's Weston Park Show. Sebastiano is, of course, famous for his SebArt range of high quality ARTF aerobatic and jet kits. This is a display that is not to be missed! Also, the Elster Jet display team from Germany will be back again, flying amazing synchronised aerobatics.

Other highlights include night shows on Friday and Saturday, with illuminated model and full size aircraft flying (some with pyrotechnics!), model car racing and a model boat regatta, over 100 trade stalls, a family fun fair and rides, a rocket school for children to have a go at building and flying a model rocket, and a massive swap meet on all three days.

Camping is available on site so you can stay and enjoy the fantastic evening night shows, as well as live music entertainment on both Friday and Saturday night.

Weston Park is a show that's not to be missed – and this one could be the best yet!

For the latest show information please visit:
www.westonparkmodelairshow.co.uk
Or call Steve Bishop on 01952 587298.

31st Wings And Wheels Model Spectacular

Work has started in earnest on organising the 31st model show at the iconic North Weald Airfield in Essex on June 24th and 25th 2017.

As one of the longest running model shows in the UK, Wings and Wheels hosts all disciplines of R/C modelling, from indoor model planes and helicopters to the latest drones and jets. The large, open flying site, using one of the runways at North Weald, enables the largest of large model aircraft to fly - some as large as 87% scale!

Traders are already booking their favourite space and all traders will be booked on a first come first served basis. There will also be a new indoor exhibiting/trading space. Anyone interested in trading at the show should contact the organisers at: **admin@wingsnwheels.net**

The Bring & Buy section of the show has grown dramatically and attracts modellers from all over the country to either sell their excess kit or snap up a bargain.

Apart from amazing model aeroplanes you will see everything R/C at Wings & Wheels, including boats on the temporary boat pool and displayed in the static marquee, as well as hovercraft, tanks, trucks, drones, Daleks and lots more!

The camping and caravan area is now booking, as are advance ticket sales. Visit the show website **www.wingsnwheels.net** and go to 'Buy Tickets Now'. For further information regarding any aspect of the show please email the organisers at **admin@wingsnwheels.net** or call 01242 604126.

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Wingspan 2286mm

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- Fibreglass fuselage & booms
- Precision built wooden wings and tail
- Suitable for grass fields
- Multiple colour schemes available
- Disassembles for easy transport
- Large flaps for improved slow speed performance
- Built for speed!
- Wingspan 2286mm

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The Boomerang capable sport jet. give superb aerobatic low wing loading means speeds too. Deploy the Elan slows down dramatically off grass fields. The fuselage is fibreglass and the booms, wings and tailplanes are built from balsa/ply. The Elan fits a 60-100N turbine and access to the electronics and tank is easily through the large hatch in the top of the fuselage. The Elan is perfect for a newcomer to jets or a seasoned pilot looking for an 'all around' sports model.

Elan is an attractive and The large control surfaces performance yet the the Elan excels at low large flaps and the making it ideal for use

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P-51D Mustang 60cc ARF

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www.horizonhobby.co.uk

C-ME FLYING CAMERA

'Selfie' drones are the in-thing right now and Revell Control are hopping on board the hype train with the C-Me Flying Camera. The C-Me is no larger than the latest iPhone so it fits in your pocket and sports an 8MP HD camera. It is GPS enabled and features auto-land and auto-take-off modes, as well as a 'follow-me' function. C-Me is of course connected to social media, enabling you to share your photos straight away. The proposed release date is in May.

www.revell.de/en

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Get a taste of what the early days of aviation were like with this scale reproduction of the classic Waco biplane. The 550 mm wingspan E-flite UMX Waco BL blends classic style with state-of-the-art features to give you one of the most rewarding flying experiences at any size. It comes out of the box with scale touches, which include moulded surface details on the wing and fuselage, carbon-fibre flying wires, clear windscreens and more. All this detail is brought to life by a 180-size brushless power system and this, along with the model's light wing loading and AS3X technology, gives you a wide flight envelope to enjoy.

www.horizonhobby.co.uk

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www.aerobel.ch

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www.hacker-model.eu

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www.horizonhobby.co.uk

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HSAD RCMW_SUBS DPS MAR17

Sukhoi SU-29MM

Andrew James tries out the 'Gen 2' version of Horizon Hobby's 44-inch span aerobat, now sold under the E-flite brand

This model of the SU-29MM was designed by US aerobatic champion, Mike McConville

If you are a follower of Horizon Hobby products then this compact 44 inch wingspan model of the Sukhoi SU-29MM may look familiar. Indeed, it was first released as part of the company's ParkZone range in a vivid green colour scheme, complete with SAFE (Sensor Assisted Flight Envelope) and AS3X gyro stabilisation technologies embedded in the radio system.

This new 'Gen 2' (Generation 2) version adopts a more restrained blue and white livery and retains AS3X stabilisation, although the SAFE functions have largely been dropped. However, 'Panic Recovery' has been retained, but this is now an option when binding the factory fitted AR636A receiver to your DSM2 or DSMX transmitter. I used a Spektrum DX6 to fly this model.

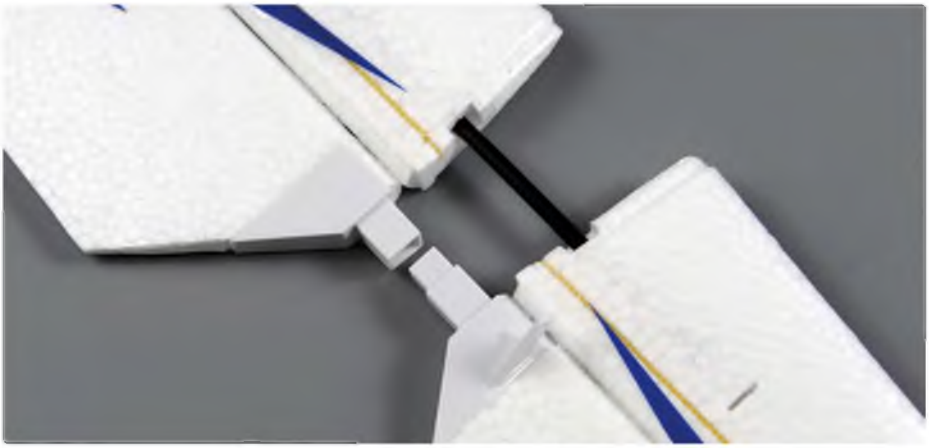
SAFE, in its various formats, is a great way of taming what would otherwise be quite advanced models and allowing them to be flown by relatively inexperienced pilots. But when fitted to an agile aerobatic model like this maybe it stymied sales a bit, with experienced pilots shying away from being seen flying something equipped with such an all encompassing safe flying system? Whatever the reason for the first generation's demise it's great to see this little model back on model shop shelves once again, now pared back to just the AS3X stabilisation system,

As usual from Horizon Hobby this kit, now part of the E-flite brand, comes in a smart and colourful box

Parts spread showing the largely completed airframe

The wire undercarriage is fixed in place with a plastic strap

Oops! Don't forget to fit the leg covers, which are secured by the undercarriage fixing screws



The elevators are connected by a large cross section plug-in joiner

Tailplane halves push into cuffs moulded on each side of the horizontal stabiliser mount

which is appreciated by pilots of all abilities. It does retain 'Panic Recovery' as an option but this is no bad thing as even the most experienced of pilots get things wrong from time to time and it is rather handy to be able to quickly put the aeroplane back into straight and level flight on those odd occasions when your brain fades!

Quick Build

After several years of producing Ready To Fly models to a high standard, Horizon Hobby have got the art of kit manufacture down to a fine art. It starts with the neatly decorated box artwork, which tells you all you need to know about the model, plus any extras you may require while you are in the model shop.

Pulling off the lid reveals the airframe parts, all neatly secured in a stout polystyrene tray and kept in place using strategically placed cross pieces.

A nearby picture shows the kit parts after being removed from the box and as you can see this is a largely ready built airframe. Putting it together is simply just a case of securing the undercarriage with a plastic strap, making sure to trap the ends of the leg fairings under the screws before driving them home. It's then a case of pushing one wing panel onto the wing tube, inserting the tube through the fuselage and pushing the wing root into its matching moulding on the side of the fuselage. The other wing is then slid into place before securing both panels with 3 x 22 mm screws.

Likewise, the two piece tailplane slides onto a joining tube before pushing each panel into cuffs either side of the plastic horizontal stabiliser mount. The elevators are connected with a chunky square joiner that mates together when the tail panels are pushed into place.

With the tailplane fitted I checked the tailplane/wing alignment from the rear and found that they were sightly out. This is quite normal with foam RTFs but was easily cured by my usual method of sliding some thin pieces of business card in-between the opposing cuffs and tailplane roots to pack up the horizontal stabiliser by a small amount.

Back to the instructions, a strip of self-adhesive tape, top and bottom, over the edges of each cuff provide secure retention of the tailplane. It may seem a bit lo-tech but it works, so why complicate things? However, I would advise checking the tape strips once in a while to make sure that they are fully attached.

A stout pushrod is then fitted between the rear mounted 13 gram digital micro servo (the same servos are used all-round) and the elevator. A swing keeper is used at the servo end, while a ball-link clevis is used at the control horn. This needs to be secured using a small bolt and nyloc nut. A similar set-up, factory fitted, is used to link up the rudder.

After connecting up the aileron leads to the factory fitted AR636 receiver the assembly of the SU-29MM is complete. It's an easy job that takes just a few minutes!

Radio Quick Start

The excellent instructions for this model actually begin by giving Quick Start Information for setting up the radio. The table starts by asking if you want to use the Panic Recovery feature, in which case the bind procedure is different to that usually used

As a Bind-N-Fly Basic model the SU-29MM comes with a factory fitted Spektrum AR636A and 13 g digital servos all-round...

...But you will need to supply a suitable LiPo. This 25C Sport pack from Overlander has proven to be ideal and can be purchased with an EC3 connector to match the one fitted to the 40 A ESC in the kit

Pushing the pack as far forward as it will go gives the recommended balance point but there's plenty of space to move it gradually rearwards if you prefer a more lively set-up. Note the ESC arming switch

Underside view of the completed model. Note the Vortex generators along the leading edge of the wings, which are said to give enhanced slow-speed and 3D performance

by Spektrum in that the model is powered up and the bind plug is removed before the transmitter is switched on and the bind button pressed. If the bind plug is left in place during binding the Panic Recovery feature is disabled. I chose to enable Panic Recovery, not least because I wanted to test it for this review. Besides, it's a good safety feature, so why not use it?

Next up is programming your radio. A comprehensive table is provided for popular Spektrum transmitters, which I followed to set up a new model memory in my DX6 in four easy steps. If you own a DXe transmitter there's a QR code that you can scan to get set-up pages for several Horizon aircraft, including the SU-29MM.

All that remains is to set the Dual Rates and Expo. I have learned that with AS3X aircraft it is best to trust the folks at Horizon and use their recommended settings, at least to start off with, so I programmed in the High and Low Rates suggested. At first glance the low settings seem quite conservative (45% and 25% on the ailerons and elevator, with 10% expo), while the high rates are set to maximum (100% rates all round, with 40% and 35% expo on the ailerons and elevator). I normally assign a three-position switch on the right hand shoulder of my transmitters as the Flight Mode switch, so I also set up an interim Flight Mode where the settings were somewhere in-between, just so I had somewhere else to go if the recommended set-ups were either too tame or too aggressive. As it turned out the recommended Low Rates are fine for general flying.

Finishing Touches

Almost there! It just needed a final check to make sure that the model balanced correctly with a 3S 2200 mAh LiPo. The battery bay, which is accessed by removing the large combined battery hatch/canopy is more than long enough if you like to experiment with gradually moving the balance point rearward. But to start with I placed one of my new Overlander 3S-2200 packs in the most forward position possible and found that this was perfect to balance the SU-29MM at the suggested Centre of Gravity, 82 mm back from the leading edge at the wing root.

The model could now be powered up to check the control directions and perform the all-important AS3X control tests. This model includes an ESC switch, which needs to be switched on after plugging in the LiPo. The ESC will then sound a series of tones and an LED will light up on the receiver to show that the radio has initialised. If Panic Recovery has been enabled the control surfaces will also cycle back and forth twice to show that the system has been switched on; if the panic feature is not used then the controls will cycle just once.

Obviously, as with any other model, care needs to be taken to ensure that the control surfaces are going in the right direction, but with AS3X you also need to make sure that the gyros are compensating in the correct direction too. In all but one instance I have found Horizon's AS3X set-ups to be spot on, but it's still worth using the graphic provided to check that the gyros are moving the controls in the correct direction.

The movements whilst the model is hand held can be slight so it's worth double checking just to be sure. You will also need

The Sukhoi is of lightweight construction and is moulded from durable Z-Foam

Taking-off for the first time

Looking good in the late evening sun

It's a great all-round aerobat

to blip the throttle above 25% to engage AS3X, so please keep out of the way of the prop whilst doing this. The propeller is factory fitted to this model but I removed it while setting up the radio and performing the control and AS3X checks, just to be on the safe side.

Let's Fly!

After flying several gyro stabilised aircraft I have learned that it's best to mechanically trim the pushrods so that the control surfaces are at neutral without resorting to tweaking either the main trims or sub trims. This model seemed well set-up, although the elevator did seem a little bit down, so I wound in a couple of turns of up so that it was at neutral.

After performing a range test the power on both the Tx and Rx were cycled to reset the Hold indicator fitted to the AR636A receiver. Although not mentioned in the SU-29 instructions this Rx has a light that flashes to show the number of times (if any) that the receiver has entered failsafe. Chances are that even if you find that the Hold indicator is flashing then the duration will have been too short to be noticed by the pilot. But if you do find that the Hold light flashes a lot and you also notice that the model enters failsafe in flight then you need to investigate further. In this instance, however, the receiver in the SU-29MM performed without any such indications.

The first take-off was straight and easy but the Sukhoi wanted to climb, even at mid-power settings. It's no good fighting a model like this, especially one equipped with AS3X, so I landed and dialled in some down elevator. The next climb out was much better; in fact I had overdone it a bit and I made a mental note to lengthen the pushrod by half a turn.

The model was flying accurately in all other respects and with that little touch of down she was a joy to fly inverted. Loops, rolls and other basic manoeuvres are a piece of cake with the Sukhoi at the Low Rate setting but when High Rates are selected she really is capable of turning herself inside out. The roll rate is phenomenal! I tried a series of 3D stunts and the SU-29 really flatters in this respect. My first attempt at a stall turn actually turned into quite a long prop hang as I became mesmerised by the model's uncanny ability to pin herself vertically in the sky without me having to do an awful lot on the sticks..!

A test of the Panic Recovery facility soon showed that the model could be recovered from any attitude by a quick press of the Panic button, after which it sprung instantly back into straight and level flight. It will even roll out from inverted! It's really tempting to throw the Sukhoi into all sorts of strange angles just to watch it right itself; it's great fun to do this but do warn your club-mates first as they will think that your radio has gone haywire!

All too soon the five minutes recommended as the Flight Timer setting came to an end and my DX6 began to beep. After a leisurely circuit the first flight was finished by what seemed to be quite a heavy landing. A quick check of the LiPo showed that it was down to about 25% capacity, so five minutes on the timer is just about right to allow for a

couple of 'go arounds', plus leaving a healthy reserve in the pack.

The next flight went just as well as the first one and all too soon that darned timer went off again. The Sukhoi was lined up for another nice landing but once again it ended a little bit on the heavy side. Hmm, let's try that again...

After a quick take-off and a short circuit the Sukhoi was nicely set up for landing. Just above the patch the power was cut and up elevator was gently eased in to start the flare – and she pancaked in again from just a couple of inches high...! This time I noticed that as I pulled up elevator to complete the flare, the elevator definitely dipped. It's obvious really: the AS3X system was trying to counteract the large dose of up elevator given to flare the model with a dose of down elevator, and with the model so close to the ground a hard landing was inevitable.

The instructions do say that the easiest way to land this model is to do a wheeled landing, where the aircraft touches down on its main wheels while the tail-wheel still in the air. I will certainly try to practice this at the end of flights with the Sukhoi in the future rather than trying to force it to make a three pointer. Wheeled landings may not look so nice but they will be better for the long term survival of both the undercarriage and its mounting block!

Sukhoi Success!

I really like this model. It's quick and easy to put together. And at 44 inches wingspan it's the perfect size for transporting in one-piece in my estate car, with room to spare for another couple of aeroplanes. Treat it to a couple of new 3S - 2200 LiPo's, such as the Overlander 25C Sport packs that I have used, and the SU-29MM will reward you will oodles of flight performance.

It's an excellent addition to the model hangar of intermediate to experienced club pilots.

RCMW

Ample rudder deflection during a knife-edge pass but the 13 g micro servos can deliver a lot more throw than that. Big throws at high rates are great for 3D stunts!

Lined up nicely for landing. It's best not to pull in large amounts of elevator in the flare or the AS3X system may compensate and push the model onto the ground

RC MODEL WORLD

MODEL INFORMATION

NAME:	Sukhoi SU-29MM
MANUFACTURER:	E-flite
DISTRIBUTOR:	Horizon Hobby UK
WEBSITE:	www.horizonhobby.co.uk (search efl8850)
PRICE:	£199.99
MODEL TYPE:	Aerobatic and 3D
CONSTRUCTION:	Moulded Z-Foam
PARTS SUPPLIED:	Airframe, brushless motor, ESC, 6-ch receiver, 4 micro servos
PARTS REQUIRED:	DSM2/DSMX transmitter, 3S 2200 mAh LiPo

R/C FUNCTIONS

1: Throttle
2: Aileron
3: Elevator
4: Rudder

MODEL SPECIFICATIONS

WINGSPAN:	1120 mm (44.0 in)
LENGTH:	1074 mm (42.3 in)
WING AREA:	26.0 sq dm (403 sq in)
FLYING WEIGHT:	1150 g (40.6 oz)
WING LOADING:	14.5 oz/sq ft
MOTOR:	15 size brushless outrunner, 1250 KV
ESC:	40 amp brushless
BATTERY:	2200 mAh 3S 11.1 V 25C LiPo (not supplied)
RECEIVER:	Spektrum AR636A 6-ch with DSMX
SERVOS:	4 x 13 g digital high-speed micro servos
PROPELLER:	12 x 4 in
SPINNER:	49 mm diameter

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Dalotel DM-165

Peter Maw adds the finishing touches to his latest building project using the Traplet plan and wood pack MW3541

It gets quite exciting when a model arrives at the stage of putting it all together. As a personal preference I like to use two locating dowels at the front of the wing rather than the single wing dowel shown on the plan. This actually makes the dihedral brace almost redundant, but I have never been brave enough to build a model without a dihedral brace to prove it.

Don't Panic!

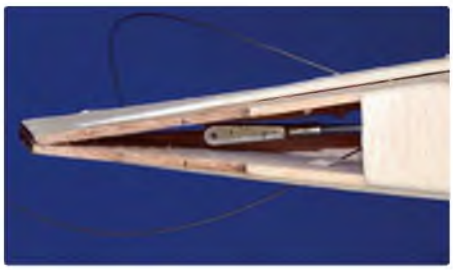
The tail is built and covered, the fuselage and wing are built... The next step is to put it together and see the fruits of your labour. Unfortunately the taste of bitter disappointment will be on your tongue.

There will be a massive gap between the fuselage wing seat shape and the actual wing shape. This is because the shape of the tapered wing at the point of exit from the fuselage is significantly different from the root. In today's world of CAD systems it would be possible to accurately draw the fuselage wing seat to reflect the actual size of the wing at the junction with the fuselage side, but in the world of model design before CAD that is probably a bridge too far.

This is why we build and fly scale models. The Dalotel looks great in the air!

Nice seating arrangement for the wing bolt plate

The wing has a very different shape at the exit point from the fuselage, but don't worry as it is easy to fill and is normal for a tapered wing design



The elevator pushrod has just enough space to work well and gives 35 mm movement each way

Fin and fin supports must be a wood to wood joint

Glue the fin supports in place using the fin to position them accurately. Shape the supports once they are dry and cover them before finally fitting the fin

Solid fin mounting with a large area for gluing

A set-square means the fin and stabiliser are accurately aligned

Which means there will be a gap as can be seen in the picture. The solution is old-fashioned whittling. In the picture I have filled the front gap with 6 mm balsa and the rest of the gap will be filled with strips of 1 mm and 2 mm balsa – that was proper modelling, wasn't it?

We are almost ready to start covering the aeroplane now but the tail will need gluing in place. To make life easy fit the fin support fillets to the tailplane before gluing the fin, then it is simple to sand them to shape and cover them without the fin getting in the way. Note that the film has to be cut away to allow a good glue joint between the tailplane and fin.

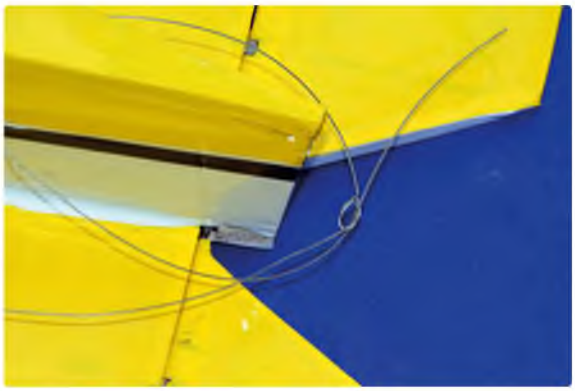
Covering

There is only one colour scheme for this aeroplane if you are going to make a proper scale model, but you have the choice of a French or English registration.

The simplest way to cover the model is with heat-shrink film, either Solarfilm or Oracover (Profilm). Solarfilm is thinner, lighter and less costly than Oracover. Oracover is more opaque and very good at coping with compound curves. Both films need to be tacked down with low heat around the edges. Providing there are no creases ironed into the film it will not matter what the surface looks like at this stage. Then go round the edges again with a higher heat setting. Finally, glide the iron at high temperature over the main area of the film. It will miraculously shrink and look beautiful.

Once the fuselage sides have been covered and the rudder push-pull cable bought out through the covering it is a good idea to loosely tie the left and right cable together. This means that they can't disappear inside the fuselage, never to be found again! You can use the inner tube of a snake cable to retrieve them but it is a pain in the posterior and a time consuming exercise.

The black anti-dazzle paint in front of the cockpit can be painted directly onto the heat shrink film. Obviously, painting onto a glossy film covering will not give a brilliant finish. The answer is to rub down the film with fine steel wool or very fine (1200 grade) wet and dry paper, used dry as it is less abrasive. All this will do is remove the gloss top surface from the film and give the paint a good surface to adhere to. Brushing an acrylic paint onto this prepared surface will produce a nice, smooth finish. If you use this technique for an IC model it will be necessary to use fuel proofer to fix the paint onto the film.



Loosely tie the push pull rudder cables together while covering the model. It is not easy to get a cable back through the fuselage openings once it has been covered

Oracover/ Profilm is brilliant at covering compound curves in one piece

Putting Things Off

We have almost come to the end of the build, with one notable exception – the cockpit canopy. Often an acetate canopy is provided with kits but the Dalotel has a simple shape, which means the expense of producing a moulded acetate canopy cannot be justified. It is made in two parts and can be created from one A4 sheet of acetate. The main section of the cockpit is quite long at 220 mm and will benefit from a central support, as shown in the picture. This looks reasonably scale as the real machine had a split sliding cockpit. The front part of the cockpit is created free-hand by bending the acetate to shape and drawing the shape with a Sharpie or similar pen. Always make the first attempt at the shape larger than you think it should be; it is so much easier to remove excess material than trying to add a bit more.

If your local model shop is into train set landscape modelling it will have sheets of acetate in various thicknesses, which have protective covering on both sides. This is wonderful as you can mark out shapes and paint onto the protective sheet without any trouble. When the canopy is painted all the paint will be on the inside of the canopy, which means cockpit glue will not show and the canopy will remain looking immaculate for the life of the model. When you paint the canopy run the brush from the masked area to the edge of the acetate to guarantee a sharp line without any leakage under the masked area.

Two cockpit formers are provided in the kit but life will be easier if a third former is made up to support the acetate cockpit

Covered acetate makes painting easy. Draw the front cockpit shape free-hand. Always over-estimate the size and trim back when trial fitting

Almost a professional job!

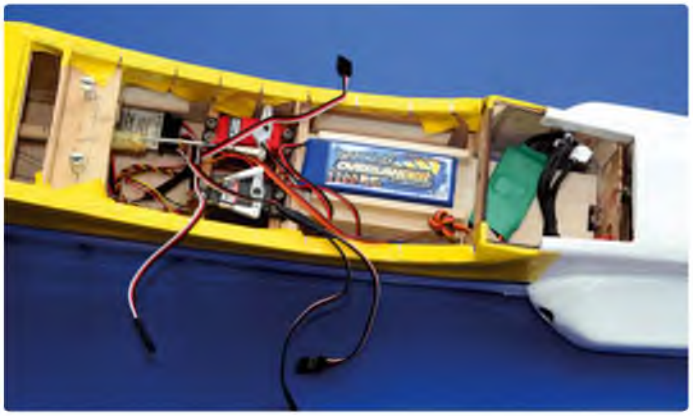
Graphics were created in CorelDraw and produced by a local shop display specialist – it was novel work for them!

Hey Ho, It's Off To The Field We Go

A beautiful autumn day, with no wind and plenty of sunshine. The shiny yellow and white Dalotel had been checked over, and over again – what could go wrong? The answer was a speed controller that decided not to work. Disgruntled, I sent the controller to 4-Max, who diagnosed a dry joint and returned the 60 amp ESC to me for no charge. What a nice company!

Proprietor George Worley also offered me a top tip. All modern electrical products such as LiPos and ESCs come with pre-tinned wires (solder already applied). However, because of environmental issues the solder used is lead-free. Everyone who has ever used lead-free solder knows it is very poor at everything. Solder made from tin alone, or tin with 5% silver doesn't flow well, it does not wet the joint and it is brittle when it's cold. Worst of all, according to George, it doesn't mix well with lead/tin solder. Which is unfortunate because that is all I use, so at some stage the soldered joint will fail. It just happened to be the day we were going to test fly the Dalotel and get the flying pictures, as well as being the most perfect flying day of the year. George's top tip is that you should cut off the tinned ends of wires and re-tin the wire with solder containing lead, then you will get a proper, strong joint when you solder the connectors in place.

It is impossible to buy lead solder from DIY sheds etc., as there are no legal mass-market uses of lead solder. It is perfectly legal to use lead/tin solder in hobby applications and it can be bought from independent shops. Try ModernRadio of Bolton (see contact details) who sell 5 metre and half-kilo rolls of lead/tin solder. You will also be able to find smaller packs of lead/tin solder on the 4-Max website.



Receiver, battery and control surface leads all fit easily into the fuselage

Make the battery box oversize so that the LiPo can be repositioned to get the C of G as you want

Checked over and ready for the maiden flight

To combat the wet, relatively long autumn grass lots of up elevator was needed to stop the plane from nosing over at the start of the take-off run

Safely away on the first flight but it needs a bit of trimming and aileron differential

Here We Go Again

Two weeks later a soggy Sunday morning turned into a brilliant Sunday afternoon and the Dalotel made another appearance at the flying field. Top jet pilot, plus generally brilliant flyer, Anthony Jones 'volunteered' to do the test flights while I did the photography.

"I've got to do the photography for the magazine!" is a brilliant excuse for not doing the test flight yourself. Just as well, as it turned out. One of the many things that is different with building your own model instead of buying a RTF is that you don't necessarily know how it will fly, which is all part of the excitement. You do know that the build quality will make sure the plane will take a few knocks though.

In an earlier article I mentioned that despite the instruction on the plan to build without side-thrust it was incorporated into the fuselage build. I was very glad that decision was made. Long-ish wet grass, small wheels and a slightly forward C of G meant that lots of elevator was needed for the test flight. Full up elevator was set at 35 mm and that made the plane a bit twitchy at full power. More of a problem was very little response to right aileron; Anthony ended up flying the plane with full right rudder and right aileron to keep it in a gentle right circuit and landed as soon as possible. Club members love a problem and several people chipped in with valuable advice but the pilot's opinion is most important in this situation.

Adjustments followed. 2:1 differential was put into the ailerons and more right aileron movement was dialled in, along with some right rudder offset to compensate for not enough side thrust. After Anthony was pushed out to the flight line to take the plane up again, off we went. This time he also had a wingman to adjust the trim (Multiplex transmitter trims are not in the most convenient place if you need to keep fingers on the sticks) and operate the retracts.

The Dalotel was much better this time round. Surprisingly, we all noticed a significant difference once the wheels were tucked into the wing; the speed increased and the plane was much smoother. (There was no way any of us were going to put the retracts up on the first flight!) So good in fact

that it was possible to run a couple of low passes for the camera. Half power gives a lovely speed to this aeroplane, which means plenty of power in reserve for the vertical manoeuvres.

Once the plane was trimmed out it flew well and certainly looked nice in the sky. With the wheels up and power on, the Dalotel looked brilliant racing across the field, especially when it was sunlit against black clouds. There were no aerobatics on this flight, just figures of eight and some circuits. It is certainly a slippery aeroplane and needs a long approach to bleed off speed, but looking at the shape as it comes toward you there isn't a lot of drag to slow it down. The full size has air brakes and you can see why.

After the rain that bucketed down on the Olympian parade in Manchester the next day we had a bright and sunny morning, so now it was my turn to fly. It fairly leaps off the ground but then the elevator comes off quickly and the plane just keeps heading skywards; that's the way I like it when I want a safe flight. It is very responsive to elevator, possibly because there is a lot of movement. I first flew proportional radio when I was 12 in 1966 and it was difficult enough then for the manufacturers to get four channels moving vaguely in step with the sticks. Things like expo weren't even dreamt of, which means I have never used it. But I might try, as it would definitely smooth out straight and level flight. (Works a treat! - KC)

Power is plentiful and all the manoeuvres you would expect this type of plane to do are easy to perform; vertical stuff is fine and it is obvious when the plane is approaching the stall.

For what initially looked like it was going to be a simple low-wing scale trainer, the Dalotel project has had numerous twists and turns and has been a fascinating model to build and fly. As always Traplet have created a top quality laser-cut wood pack to give you a good start and it will definitely improve your building and flying skills. What more could you ask for? ***RCMW***

After making suitable adjustments, Anthony Jones crosses everything before the second Dalotel flight

It's worth it in the end to get a fine scale model like this one. A proper build gives immense pleasure and job satisfaction too

CONTACTS

AXI MOTORS/BATTERIES/ESC:
www.electricwingman.com

PURPLE POWER BATTERIES/MOTORS/ SOLDER/ESC:
www.4-max.co.uk

BALSA AND OTHER WOOD SUPPLIES:
www.blackburnmodels.com

PROPER SOLDER:
modernradio.co.uk

MODEL SPECIFICATIONS

NAME:	DM-165 Dalotel
MANUFACTURER:	Traplet Publications
MODEL TYPE:	Low wing near scale monoplane
WING SPAN:	54"
WING AREA:	513 sq in (0.33 sq m)
WING LOADING:	24 oz/sq ft (7.2 kg/sq m)
ENGINE:	0.32 cu in two-stroke or equivalent electric motor (Axi 2826/12 used with 12 x 6 prop, 60 amp 4-Max ESC and 4S-3700 LiPo)
CONSTRUCTION:	Balsa and ply
WEIGHT:	5 lb 4 oz (2.38 kg), inc. 4S LiPo

R/C FUNCTIONS

1:	Throttle
2:	Rudder
3:	Elevator
4:	Aileron (two servos)
5:	Retracts

PLAN DETAILS

PLAN NAME:	DM-165 Dalotel
BUILD CATEGORY:	Intermediate
PLAN NUMBER:	MW3541
PLAN PRICE:	£17.55
***LASER WOOD PACK:**	WP3541
WOOD PACK PRICE:	£86.44
OR BUY AS A SET, WITH 10% OFF:	SET3541
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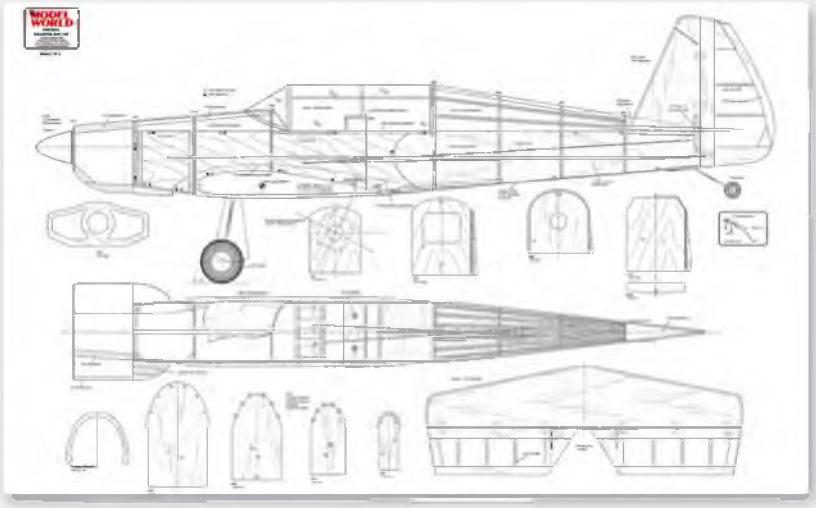

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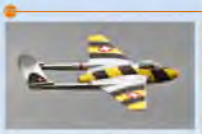

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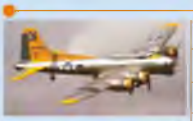

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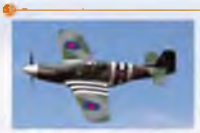

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Cri-Cri Capers

In the second part of his article on the construction of his own design scale model of the full size micro twin, John Higgins progresses to the completion of the airframe

A really solid centre section

Flaperon hinge from epoxy printed circuit board

Late autumn, as the leaves fall from the trees and the nights start drawing in, sees flying opportunities start to diminish. For the dedicated model builder, however, the dying of the light is the prelude to one of the most enjoyable seasons of the year... No, not Christmas, enjoyable though that season is, but the building season!

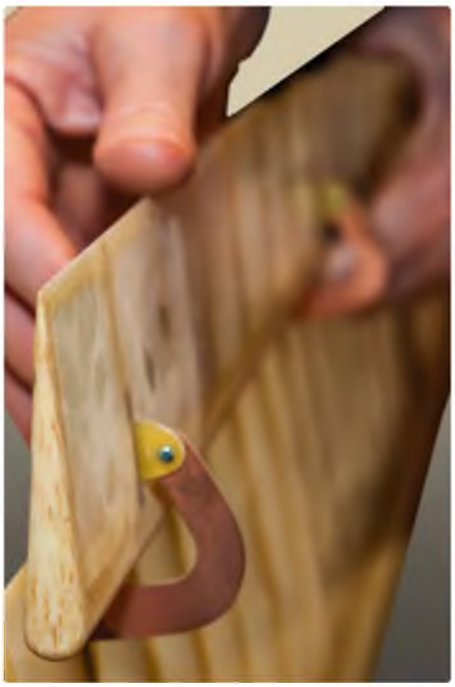
You may remember that I left the Cri-Cri with all of its main components already constructed and most of its major constructional problems resolved. Coming back to a project after a lay-off is a bit like half reading a book and then picking up the tale three months later – one has a fair idea as to the plot but you might be a little hazy on the details. Luckily, the Cri-Cri has a strong plot and the little details sprang back quickly into focus...

The wing joiner box (I'm using rectangular steel blades in brass tubes, as used in sailplanes) was constructed in short order and, after much alignment-checking and trial-fitting, was epoxied into place. The rear undercarriage mount was fitted and keyed into the joiner box assembly to form a really solid centre section. I must admit that I was rather pleased with the season's progress to date as the model sat on the bench showing off those sturdy carbon legs!

When I finished the tailplane all those months ago, I remember being impressed by the sharpness of its trailing edge, but when the Junkers-style flaperons were completed

The 'Junkers' style slotted flaperon

the trailing edge sharpness would have impressed a Samurai, being stiff and almost a metre long! Yes, very impressive; these things would be classified as an offensive weapon if carried in a public place! Working out the geometry for the flaperons and devising their hangers and pivots proved an interesting diversion. Strangely, once the flaperons were fitted I was amazed at how much bigger the wings looked.



The sharpness of the flaperons would impress a Samurai!

Light Programme Inspiration

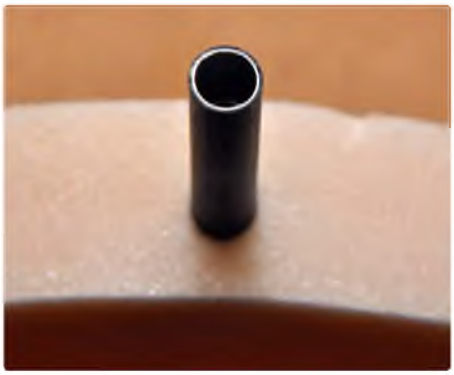
Model building has a natural progression that is more or less predetermined – process 'A' needs to be completed before process 'B'. This is fine if you are building a model from a kit, where all the parts are in the box, but if the parts have to be made to order you may find yourself stuck if you have to wait for the part to be manufactured. The solution is simple – do something else while you are waiting. Following my own advice, I fitted the elevator and rudder servos in the fuselage. The rudder is driven by a closed-loop but the all-flying tail uses a pushrod and bellcrank system.

Back in the days when dinosaurs roamed the earth modellers made pushrods out of balsa. They knew that the pushrod needed to be light so as to reduce the inertial loads on the weedy servos available at the time and to ensure accurate control responses (that lad Newton knew a thing or two!). Some adventurous types used hardwood dowels but soon found that a firm landing (crash?) would result in the heavy pushrod's inertia stripping the elevator servo gears.

Nowadays we have carbon rods and tubes that will provide the necessary rigidity but they are not as light as you might think. Time for a bit of lateral thinking. What other pastime might use light, rigid rods or tubes? Archery is the answer you are looking for! I've used arrow shafts as pushrods before and the latest ones are just what is needed. What would you say to a thin-walled alloy tube covered on the outside with a thin layer of uni-directional carbon? Feather light and rigid – ideal.

If you are in need of a pushrod get on the bus to Ambridge and, once there, ask any of the locals to point you in the right direction... (Radio 1 listeners might struggle with that one, John! - KC)

If you need a light, rigid pushrod...



Arrow shaft pushrod material in cross section

Project Spat

I thought that I might have a pair of spats in stock that would be just the job for the main undercarriage but, as luck would have it, they were the wrong shape and were too small for the wheels. I have made spats from wood before but the spats for the Cri-Cri are quite large and would use significant amounts of balsa block so I thought I'd do a bit of experimenting.

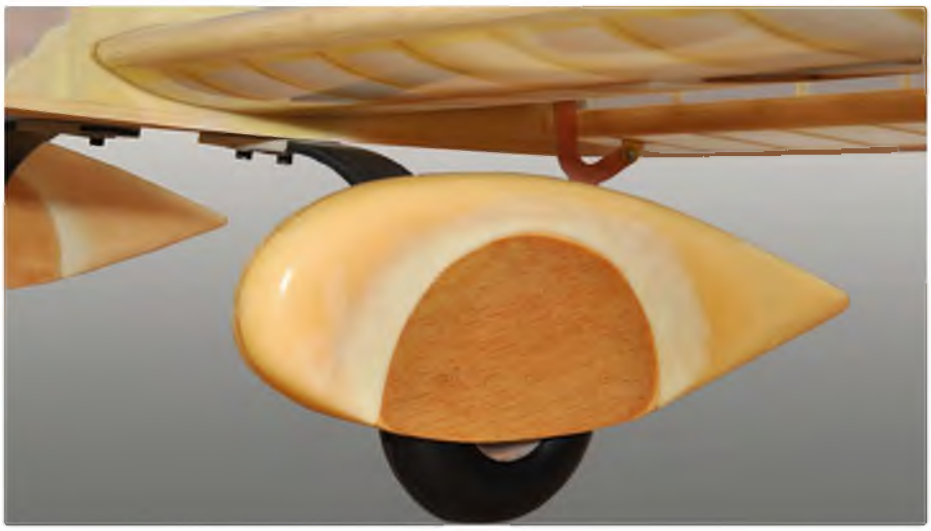
Project spat started with a side-view drawing. This was printed off and stuck to some cheap 2 mm lite-ply. Once cut out, this lite-ply core had lots of lightening holes added (removed?). A pink foam block of the correct thickness was hot-glued to the core, keeping the glue well away from the edges; hot glue is rubbery and does not sand well. The block was then cut to the core's profile on my trusty Dremel, using the ply core as a cutting guide.

Another foam block was then fixed to the other side of the core and cut to the core profile. The wheel well was lined with a strip of Pro-skin, hot-glued in place. The lining was then sanded flush with the foam blocks and ply covers used to enclose the wheel wells. The spats were carved and sanded to shape and a bit of filler was added here and there. Once covered in two layers of 4 oz glass cloth and epoxy resin, then hardened off in the airing cupboard and rubbed down, I had two lovely, case-hardened spats. At 90 grams each they were lighter than the ones I had originally earmarked too!

Top Tip

If the cloth is cut 'on the bias', at 45 degrees to the weave, it accommodates compound curves easily.

Spat construction method is evident here



Underside view of the spat and undercarriage

Bubble Canopy

The next big job and, if I'm honest, not one that I had been looking forward to, was the very large canopy that is an essential feature of the Cri-Cri design. The rear section is a single curvature piece that should be fairly straightforward, but the centre 'bubble' would have to be moulded – and that will demand that a plug will have to be made. Putting my best foot forward, grasping the nettle and mixing my metaphors, I made a start on the rear canopy frames; one for the rear section and one for the rear of the opening canopy.

Now, one of the aims of this project has been to explore new construction methods and materials. In keeping with this philosophy, I made the frames from Depron strips and carbon fibre. The two frames needed to be identical if the opening canopy was to be an exact fit to the rear section. With this in mind I made the hoop as a single item at double the width. Once cured the hoop was then sawn lengthways down the centre and the cut faces given the carbon treatment. Result: two identical, strong, rigid hoops that weighed next to nothing!

The canopy itself proved to be a nightmare. Profiled with lite-ply and faced front and back with the same material, the canopy 'block' was assembled from slabs of compression-resistant pink foam. Getting the basic, rough shape was easy; the material carved beautifully when attacked with my best

Checking a moulded canopy hoop for fit

twelve inch carving knife and it responded well when introduced to a coarse Perma-Grit tool. A couple of layers of glass/epoxy were applied, rubbed down and a final coat of finishing resin applied. I then spent the best part of a week rubbing down and filling! Try as I might I could not eradicate all the humps and hollows. Since perfection was obviously determined to evade me, I had to settle for what my meagre skills would allow. In trepidation I sprayed on a coat of acrylic primmer and rubbed the surface down to a glass-smooth surface.

In the past I've made small, moulded parts myself and I've watched others form small cockpit canopies, and the like from pop bottles, but the Cri-Cri canopy is in a different league. The canopy looked big on the drawing but, in 3D, sitting on the bench, it looked huge. Think of a twice-size rugby ball and you begin to get a fair idea of its bulk.

Moulding such a monster myself (although I did toy with the idea) was a bridge too far; this was a job best classified as 'industrial' rather than 'hobby'. My wife and I spent a happy day sourcing a suitable cardboard box and packing the plug so that it would survive the rigours of the Parcelforce experience. It was duly posted off to the vacuum formers. The wait to see how things had turned out was excruciating. Would the foam be crushed by the vacuum? Would the surface finish be good enough?

The news, when it came, was good and bad; the plug was just about strong enough to survive the moulding process but the primer that I had used could not take the heat. As a result the moulding was not good enough to use – it was full of blisters and melted-on patches of primer. I had the plug returned to me for modification and yet more rubbing down.

This was to be the last act of the 2014/15 building season. The Cri-Cri, with all its major parts, settled down in a quiet, secluded corner of the workshop to await the coming of late autumn. I, on the other hand, headed off to the flying field!

Canopy plug. The source of much sweat and grief

Disappointments don't come much bigger than this. The first attempt at canopy moulding

Building Season, Again!

When, once again, the building season arrived (it was now late autumn 2015) I was faced with the prospect of solving the issue of the dreaded canopy moulding that had been hanging over the project since the early part of the year. Now, modellers everywhere are a pretty determined lot and I'm no different. I was not going to be beaten by a lump of foam and fibreglass!

The poor old canopy plug did not know what hit it. I removed all the old primer and areas of cellulose filler, filled all the voids and treated the plug to a couple more layers of heavy duty glass cloth, applied with epoxy. This was roughed down and a good thick layer of car body filler was applied. This, in turn, was rubbed down and a final thin skim of filler was applied to fill all the scratches left by the rough sanding. The plug was now finished off by wet sanding, working down to 1200 grit.

A few words do not do justice to the amount of effort involved in all this rubbing down. By the conclusion of the process I had spent many hours on the job and had forearms like Popeye! And I had a beautifully strong and smooth canopy plug...

Christmas was now fast-approaching so I wasted no time in posting the plug off to Sarik Vacform. They were very busy in the pre-Christmas period but promised to get things back to me before Santa had loaded up his sleigh. The 'phone call telling me that all had turned out well and that the plug had produced two lovely canopies was the best of early Christmas presents. As promised, the plug and canopies arrived on my doorstep before the turkey was ready for the oven. (Thanks, Barry, you're a star!) Just as a point of interest, the plug has now covered roughly 680 miles in the hands of the Royal Mail!

Human psychology is never easy to understand, and it never ceases to amaze me how a dose of good news not only lifts the spirits but can put the spur to model construction. Since the major problem of the canopy was now solved, I was able to make real progress with the glazing, resolve a niggling problem with the nose-leg oleo and complete the remaining skinning of the fuselage. To all intents and purposes the construction was all but complete.

At this point I can almost see seasoned model builders everywhere shaking their sage-like heads and saying, "This lad does not appreciate just how long all the little extra bits take". I have to say that they are absolutely right! The snowdrops were up and blooming by the time all (or most) of the little extra bits were finished and, to celebrate my successful completion of one more orbit of the sun (my birthday is in February), I deemed it right to do a trial rig of all the various model parts.

The best of early Christmas presents

Making real progress with the glazing

Finally! An Aeroplane

As model builders everywhere know, this is the first moment of truth – the second being the first flight. Will all the bits fit? Will all the angles and alignments be as they should be? Is the model likely to be tail heavy? Trial rigs are best done indoors, on a day when one's beloved is not around! (I once did a trial rig of a 4 metre glider in the bedroom and then, after admiring it, found that I couldn't get the wings to release: in this state the model could not be persuaded to leave the bedroom…)

With the living room furniture pushed well back, I was able to admire the fruits of my labours. All the angles and alignments were spot on and even the C of G looked as if it was going to be in the correct place. My only point of concern was the weight, which, in this unpainted state, was around 13 pounds. A bit of guesstimating and calculator bashing, allayed my fears; the wing-loading would still fall within acceptable limits and the twin motors would have more than enough power.

RCMW

TO BE CONTINUED

Aerospace quality materials form the nose leg

The nose leg mount/pivot uses a modified fibre-filled IC engine mount

MODEL WORLD

CRI-CRI SPECIFICATION

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MOTORS:	580 KV
POWER:	2 x 1.4 kW
POWER LOADING:	133 watts/lb

Above & below: A Cri-Cri starts to emerge

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Scale Soaring

Chris Williams reports from the White Sheet Club Scale Fly-In that took place on the 4th September 2016

Pate Teakle with his Mucha IS-2 and Skylark

Last Up...

This was to the fourth and last of the club's scale do's for 2016, and, as with all the previous events, the preceding forecasts were not encouraging. This time around the wind was forecast to be due West, which would put it directly between White Sheet's two main slopes. Nothing ventured, nothing gained, so as the club's Scale secretary I declared the event on by posting on the SSUK forum the preceding day and went to bed with my fingers crossed!

Not surprisingly those of a faint heart were put off by the forecast and it was the usual suspects that gathered on the Sunday morning, with a smattering of new faces. Initial flights showed that the usual spot on the main SW face was just a little too bumpy so we moved the whole thing, lock, stock and transmitters, over to the left side of the bowl, where we settled down for the day.

Long-time scale event stalwart Pat Teakle had brought along his own-design IS-2 Mucha, built to quarter scale and looking rather lovely in its cream and see-through livery. The full size was designed in 1947 in Poland and first flew in 1949, beginning a long line of Mucha variants, many of which still survive to this day. Pat enjoyed many long flights with this delightful glider during the day, surpassed only by the flights he obtained with his equally delightful Skylark 2.

A day at the 'Sheet' when a scale event is being hosted would not be complete without the presence of Chris Wynn and his 1/4 scale Backstrom Plank. This flying wing has given us many an entertaining moment over the years, as its owner has the doubtful gift of being able to throw her off the hill at the precise moment when the conditions are at their worst. Few can forget the occasion a few years ago when he launched the Plank

Barry Cole (Smallpiece) gets the Mucha into the air

Scene at the White Sheet Club's September scale fly-in

into a light breeze, only to be assailed by a mini-hurricane during which the canopy came off and the pilot ejected!

This time, too, the Plank endured the bumpiest conditions of the day and only Chris's high level of piloting skill got her safely down in one piece. Simon Newman was a new face returnee, having tasted the pleasures of slope based scale gliding at the previous event and had come back, eager for more. He had a fine old time with his Topmodel Ventus, with plenty of spirited aerobatic flying, and probably had the most flight-time of all of us during the day.

For some time now Motley and I have been considering schemes to separate Smallpiece from his Duster. I'm not talking about the yellow house-based cleaning implement, so beloved of our better halves, but his E-assist glider. Time and time again, should there be any slight doubt about the conditions on the day, he would always revert to the default position of flying the Duster, which will fly in just about anything. We have considered elaborate kidnap schemes, fake burglaries, and simple sleight of hand, but we needn't have bothered because during the course of the day Smallpiece lapsed momentarily into Wrong-Model-Syndrome, the consequence of which was that the poor little Duster had its fuselage comprehensively re-designed. 'You could put the Minimoa together', we gently suggested? He looked at his car in the far distance and calculated the amount of walking involved. 'Nah', he said, and handed out some Mars bars. Well, who could argue with that?

Talking of Minimoas, Bob Aston had travelled over from Thame in Oxfordshire, bringing with him a 1:3.5 scale Minimoa built from my old plan by someone unknown, but now sadly deceased. I gave the model the

once over, very impressed with how light it was, but wondering all the same if the wind wasn't a little too strong for such a light wing loading. In the event I needn't have worried, as the Minimoa sailed majestically around. The only slight problem was the catching of a wingtip in the long grass as she landed, resulting in a flip over, but with no resulting damage.

Jack Sidebotham had been threatening to bring his 1/4 scale Slingsby T21 along to the event for its maiden flight during the preceding weeks and he didn't disappoint. It seemed a shame to have to break it to him gently that, what with all the drag from the struts and that big, wide open cockpit, this was not an auspicious day for a maiden flight. He accepted this with good grace and I'm sure we will see if fly before too long.

Mention must be made of The Mendip club's Bob Cooke, who had been labouring for two or three years to modify one of the giant Phoenix Model K8s in order to render it airworthy. It was fitted with flaps, in order to replicate a rare full size version, but the heroic thing was that he launched it himself. All the more annoying, then, that I missed it!

Although the wind was in between the two slopes there was the added bonus that with some careful flying it was possible to transit from one to the other and thus fly two slopes from the one place! It costs only £10 to join the White Sheet club... How's that for value-for-money!

That's it for the 2016 season and we have had some great days during the four of the scheduled events. Could it possibly happen again next year...?

Smallpiece propels the Plank into action

Your author enjoys the conditions with his Flamingo at the scale fly-in

Simon Newman's Topmodel Ventus in action

Bob Aston's 1:3.5 scale Minimoa made light of the sometimes bumpy conditions

Jack Sidebotham's 1/4 scale Slingsby T21 remained on the ground

Zugvogel IIIa Maidens At Last!

The last time around saw the Zug airframe almost complete and ready for the covering stage. For 50s and 60's gliders I have these days developed a cunning plan, whereby the flying surfaces are covered with film, thus saving a fair amount of weight and, more importantly, a heck of a lot more in the spraying of paint, a process that is filled with hassle and torment. (Each time the garage has to be cleared and every nook and cranny in the house filled with airframes – not an aid to marital harmony!)

So, as the chosen full size subject was in an all-yellow livery, I ordered up some yellow film and braced myself for the painting-of-the-fuselage ordeal. A quick check showed that my existing yellow paint was a reasonable match, so the Solartex-covered fuselage was primed and painted yellow. With a sigh of relief the garage was once more refilled with airframes and I then put the Zugvogel together for its first post-painting rig.

Disaster! The colour match that I had thought to be reasonable was instead a ghastly mis-match, a sure candidate for making Williams a laughing stock amongst his peers. (Note to self: quick checks to be a thing of the past) I stewed for a fortnight or so, and then resigned myself to the inevitable: the fuselage was going to have to be sprayed again.

This time, in order to avoid further embarrassment, I sent a sample of the yellow film off to a paint supplier up north, with a request to scan it with a spectrometer and send me the resultant colour. This they duly did, and at a price that compared very favourably indeed to that of local factors. (I also sent a sample of white film: you can't be too prepared!) I'm happy to say the resultant match was excellent, any slight disparity being down to the fact that yellow has almost no opacity, or covering power at all.

So, with batteries charged and the Zug fully mission-ready, the three of us (myself, Smallpiece and Motley) gathered up at White Sheet hill one morning, only to find the whole place covered in a thick mist. Once we had run out of coffee and biscuits, I decided that at the very least a quick test-glide on the flat was in order, the visibility being 200 yards or so. Motley gave her the honours with a mighty heave-ho and she floated off in an encouraging manner.

Here, the advantage of E-assist paid off. Emboldened by her behaviour so far, I opened the taps and climbed to about fifty feet or so, all the time flying a tight three-sixty so as not to lose sight of her. This brief adventure culminated in a nice smooth landing, and I pronounced myself well pleased with her performance.

Author with the recently completed Zugvogel IIIa

A brief burst of motor makes for an easier launch

It was only a few days later that once more we found ourselves on the same hill, surrounded by the same fog, only this time with a side order of rain. Luckily, this time the forecast for clearing skies turned out to be true and the opportunity for some proper test flying took place. The Zugvogel flies well and is a pretty machine, too. My thanks to Smallpiece for the piccies.

I had managed to make a small cover to hide the prop shaft when the moustache is removed. (Serendipitously, there is a similar cover on the full size.) Thus fitted, it's impossible to guess that the model has a motor fitted, a fact which I hope shows up in the photographs.

Success, then, and an even more crowded garage. Now the search for the next subject begins...

Heard At The Workshop Door

I had just come to the end of a session of wing rib cutting when I noticed it was rolling around to coffee time. I called out to the missus, 'It's time for a shrink'.

So that's what a Freudian Slip is... ***RCMW***

CONTACTS

c_williams30@sky.com

The Zugvogel in glider mode with the prop removed

In action at the White Sheet NW slope

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RWD5

A 66" span scale model of the RWD5 Polish trainer from the 1930s, designed by Peter Miller. Construction is similar to many vintage models, so the RWD5 is simple to build and has docile flying characteristics. Ideal power is a .40 four-stroke engine

At A Glance

WINGSPAN:	66" (1676 mm)
WING AREA:	676 sq in (4361 sq cm)
WING LOADING:	18 oz/sq ft (57.72 g/sq dm)
LENGTH:	47" (1192 mm)
WEIGHT:	86 oz (2438 g)
RADIO FUNCTIONS:	Throttle, Ailerons, Elevator, Rudder
SERVOS:	Hitec HS-311
BASIC CONSTRUCTION MATERIALS:	Balsa, Ply, Spruce
COVERING MATERIAL:	Solarfim Supershrink Polyester.
CENTRE OF GRAVITY: 3	.3/4" (94 mm) from Leading Edge
CONTROL THROWS:	Ailerons - High 5/8" (13 mm), low 1/2" (9 mm) Elevator - High, up 1" (25 mm), down 1/2" (12 mm) Low, up 3/4" (19 mm), down 3/8" (10 mm) Rudder - High 1½" (38 mm), low 3/4" (19 mm)
ENGINE RANGE:	40 cu in four-stroke (7 cc)
ENGINE USED:	O.S. FS 40
PROPELLER:	Master 11" x 6"

Left: The designer with his RWD5

Choosing a new model to design can be difficult sometimes. One can know roughly what sort of model one wants to build but finding the right one can involve hours and even days of looking at pictures and three view drawings.

I knew what I wanted. A scale model that was about as easy to build as a KK Super 60 and of a similar construction but with no wing struts. After a very long search I looked in a forgotten folder and there I found the perfect subject – the RWD5. This is a high wing, two seat cabin aircraft with no dihedral and no struts. It has a four cylinder inverted Gypsy or Cirrus engine. Perfect!

The RWD5 was built in Poland in the 1930s and was used as a trainer and club aircraft. One aircraft was modified and flew across the Atlantic ocean to South America; it was the smallest aircraft to cross the Atlantic.

None of the RWD5s survived the war but in the 1990s a perfect replica was built, which is called the RWD5R and registered as SP-LOT. There are loads of photos of RWD5s and a useful website with some good photos of the 5R. I will mention that there are a few pictures of SP-LOT without the spats for those who prefer not to fit them. Plastic kits are quite common on eBay but are not very detailed.

The model is very easy to build, although the cowling is a little more complex as it uses metal side panels (very simple to make!) and piano hinges (easily available!). The one piece 66" cantilever wing is also very easy to build. You could use aluminium tube to make it into a three piece wing for transporting the model, but I don't recommend it. Colour schemes are very easy to do and all of them seem to be very similar.

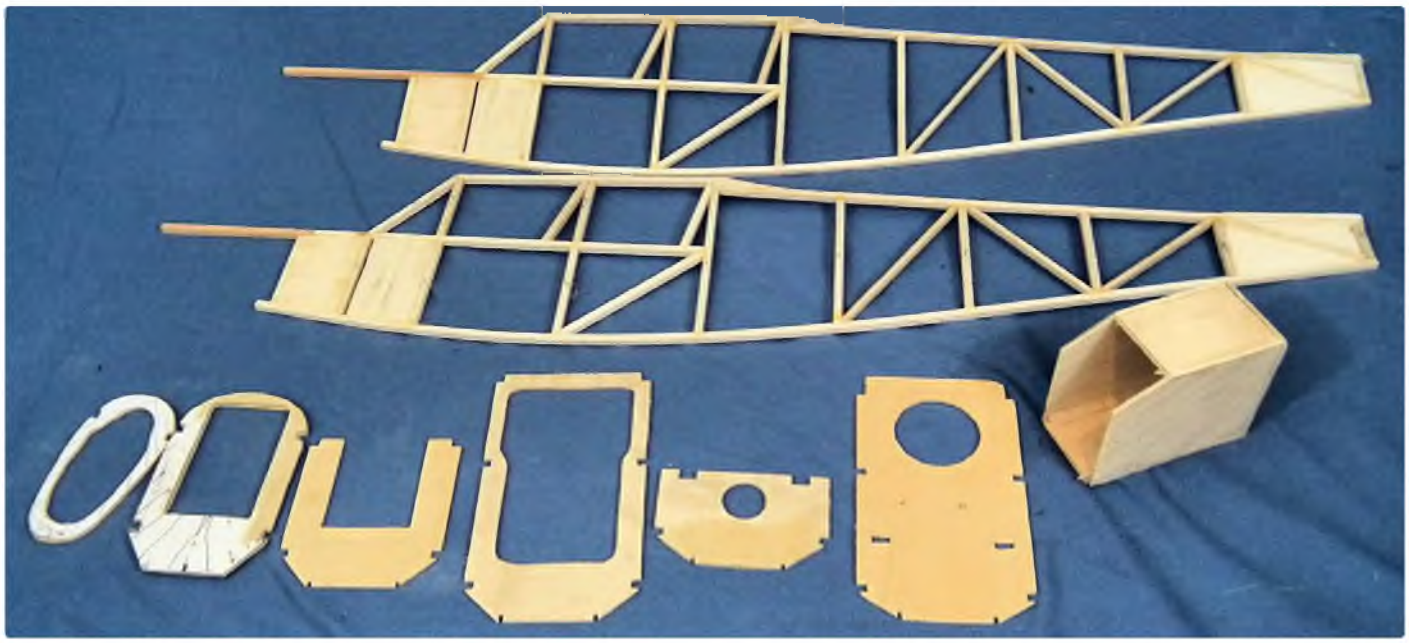
Flying

I know that most people will turn straight to this section of any plan article, so let's put it here before we start on the construction.

The model has low wing loading and a lot of wing area with a strong lifting aerofoil section. It is powered by an O.S. FS 40 Surpass. I will say now that any more power and you will have difficulty landing under power.

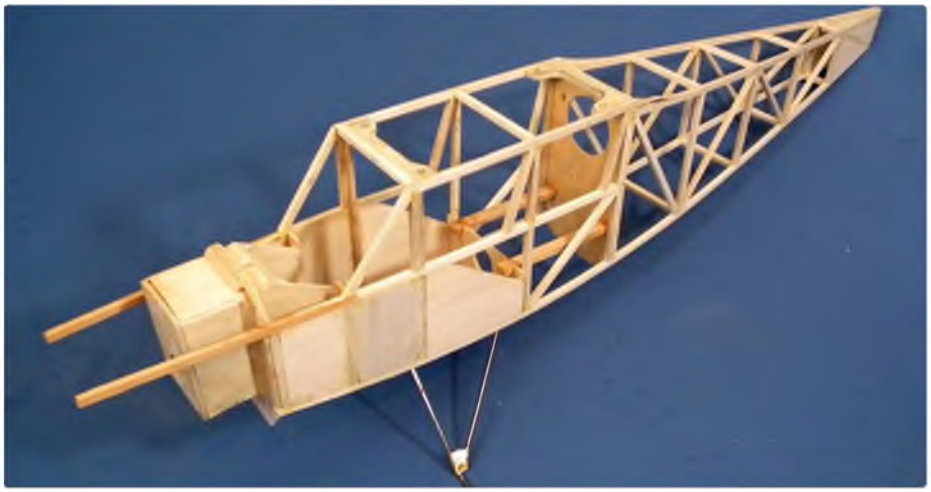
By some miracle we got a perfect Sunday a mere week after completing the model and the field had been freshly mown. The first take-off was a non-event, she simply rolled forward and took off smoothly – very Super 60ish. I found that my original setting for the aileron throws were a bit out; too much on high rates and too little on low rates, but still perfectly controllable. The model flies round in a very stable manner. She will loop and roll, although these are not scale manoeuvres.

After a few minutes I handed over to Stuart Picket, who flies my models while I take the pictures. Very soon he was ready to make the low passes for the camera. Once this was over Stuart was allowed to play with the model and his usual form of playing is to try his best to make it bite. Spins, stalls, anything



The fuselage sides and a mass of formers ready to assemble. The tank box/engine mount has been used to get the formers accurate

Inside of the tank box showing triangular stock and blind nuts



Basic fuselage assembled, with extended ¼" spruce strips to take the cowling hinges

that will show up any bad habits. Guess what? No bad habits, no nasty surprises.

The landing did present a slight problem. It wouldn't! The throttle had to be brought back as far as possible on the trim and eventually the engine stopped and it made a perfect, smooth landing.

On the next flight I flew her round and did the odd loop and roll. I did not try inverted but with enough down she would do it. I had adjusted the idle but it still took me four approaches to get her in for a perfect greaser. I will say that the landings were down a gentle slope so with the wind in the opposite direction things would be easier.

So here we have a really nice relaxing model that looks great in the air. It has no vices and flies like dream.

Let's Get Building

Start off by building the two sides from 1/4" square balsa. You will have to join in the 1/4" square spruce to the front of the centre longerons using a scarf joint at least 1" long. This is where you will screw on the piano hinges for the cowl side panels.

Note: You will need an engine mount with a round base. (See picture, page 44.) The SLEC SL006F-R is the one that I used. This is necessary to fit the tank box under the turtle deck.

The sides are built over the plan. Build one side and allow to dry, put sticky tape over each joint and then build the second side over the first. Cut out the formers and laminate F-3 and F-3a. Build the engine mount box as shown. Join the sides with formers 5 and 7, making sure that the assembly is square. When dry add former 6. Pull in the rear of the fuselage and add cross braces. This will hold it square while the front is being built.

Fit the 1/2" sheet tailplane platform. This takes the dowels that hold the fin securely. Pull the front in and fit former 3/3a and former 4. When this assembly has dried fit the engine mount box. Don't forget all the triangular stock; this really does add a lot of strength. Fit the 1/4" sheet side inserts between F-5 and F-6.

Bend up the undercarriage parts and bind and solder the front legs to F-5. Then fit the ply plate between F-5 and F-6 with the relevant supporting blocks. When dry bind and solder the rear legs in place. The servo tray supports can also be glued in at this stage.

The rear U/C legs can be joined to the front legs with 1/32" brass, which is folded round as shown. This is a far better method that binding with wire. Carefully cut out and fit the 1/4" ply plates for the wing bolt blind nuts. The blind nuts are fitted later when the holes have been drilled in the wing.

Fit the snake outer tube with their supports into the fuselage. Then you can add the stringers. Using 1/16" sheet cover the bottom of the fuselage back to F-6. Fit F-1a, F-2 and F-3b. Add the 1/4" spine and when dry cover the top of the cowl with rolled 1/32" sheet.

Add the 1/8" square window frames and window sill. Shape these together with the main side stringer which goes to nothing at F-3. Add the lite-ply plates for the dummy shock strut mounts and the switch mount. Sandpaper these to match the line that the covering will take later.

The most complicated part of the fuselage is the cowling. When I built it originally with the engine in place I couldn't get the engine out! The modified cowl works perfectly.

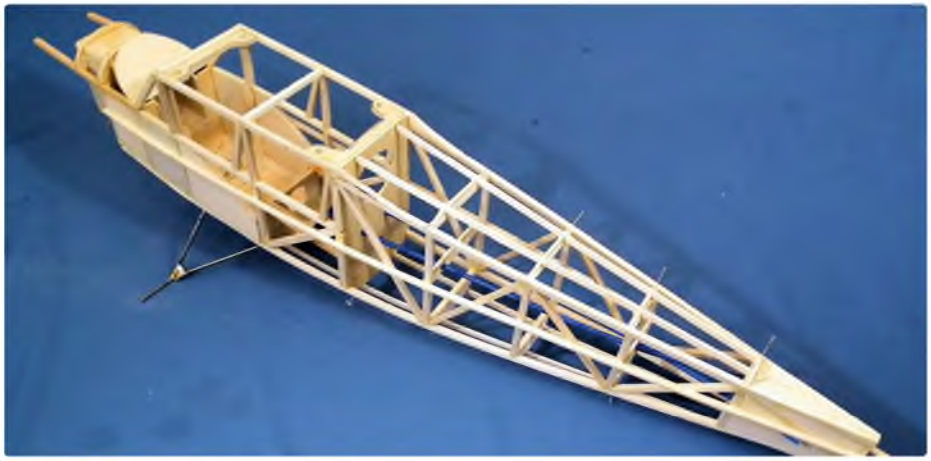
Laminate the three layers of 1/2" sheet and F-1. Also laminate the layers of 1/2" sheet for the bottom of the cowl. Carve these roughly to shape, fit a hardwood block or piece of ply to the rear of the lower block to take the rear retaining screw. Also, glue a hardwood block to the front face of F-3 to accept the screw.

Drill two holes in F-1 as shown and matching holes in F-1a. Screw the nose

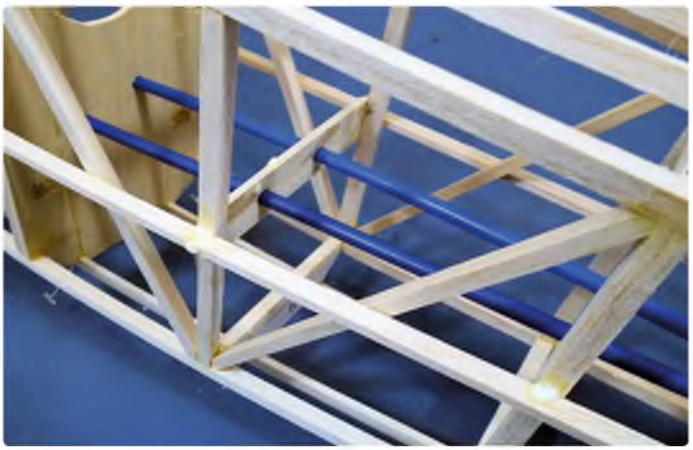
Detail at the front showing the scarf joint for the spruce strip

Looking down into the fuselage showing the undercarriage mounting plate and servo rails

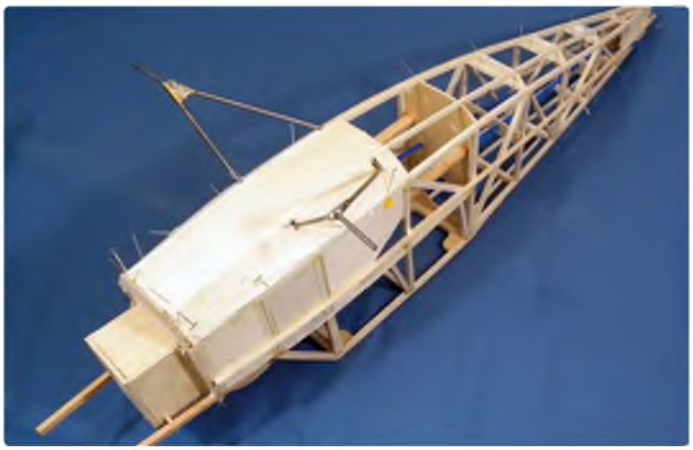
Underside showing U/C mounting in detail



The stringers being added. One more on the sides is still to be fixed



Supports for the snakes



Bottom of the fuselage is sheeted with 1/16" balsa

portion of the cowl to F-1a. Glue the lower cowl to the bottom of the nose block and screw to its block, then leave to dry. When dry, carve and sand to final shape. Note that to nose laminations are shaped to leave a slight recess on F-1 so that the aluminium side panels fit flush.

Glue strips of 1/4" square spruce along the bottom block to take the screws that hold the side panel down. The side panels and their hinges are fitted after covering but I will describe that operation now.

Take the Hobby's piano hinges and cut them to length. Note that the panel is not supported behind F-3. Drill the holes out to 1.6 mm. Add extra holes at each end of the hinge. Drill matching holes in the side panels. The side panels are bent to fit F-1 and then curved out to allow the cooling air to escape from the cowl. Screw the hinges to the 1/4" square spruce at the top of the cowl.

With the engine installed make a cut out to clear the silencer and make holes for the needle valve. The latter is trimmed to length so it can be adjusted but does not need to be removed to open the cowl. The other cowl panel has a hole for the remote glow connector and for the fuel filler tube. These can be located elsewhere but this is the simplest place to put them.

The panels are now screwed to the hinge with 1.6 mm screws 6 mm long and nuts. The screws can be trimmed back afterwards. The side panels are held down with small wood screws into the spruce on the edges of the bottom block.

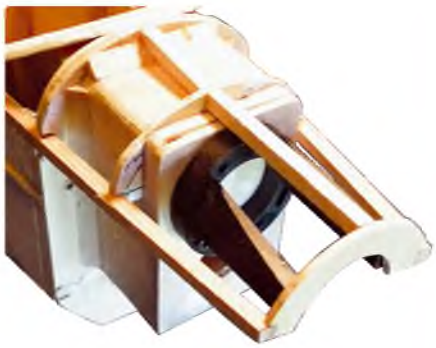
It is also a good idea to make a suitable hole through the bottom block to allow a long plug wrench to reach the glow plug. You really do not want to have to take the cowl off on the field for such a normal job.

The spats are a job that I really hate. If you choose to model SP-LOT you can leave them off or fit them – your choice. They do make the model look much nicer. The spats are laminated as shown on the plan. A piece of lite-ply is glued to the 1/16" ply lamination, as shown.

Make up the brass sheet brackets. These hold the spats on and also provide the attachments for the dummy shock struts. Solder them firmly to the axles but use a heat sink to prevent the joint between the front and rear U/C legs from melting. A big pair of pliers clamped to that joint will do the job.

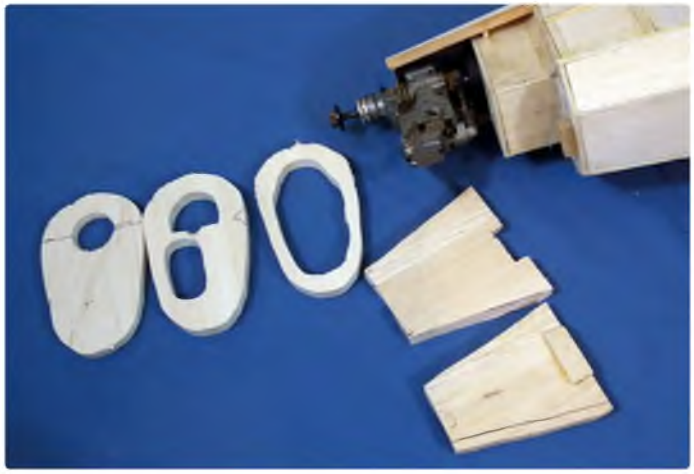
Carefully drill through the spat, making sure that when the wheel is on its axle it is not binding. Then make a slot up to the hole on the inside of the spat. Line everything up and mark the holes through the holes on the bracket, then drill the spat out to take 3 mm blind nuts (also known as spire nuts). Wheels can now be held to the axle by binding with wire and soldering. The spats are held on with two very short 3 mm screws. The dummy shock struts are made as shown and screwed to the bracket and the top bracket with 2.5 mm screws and nuts.

This completes the fuselage construction.



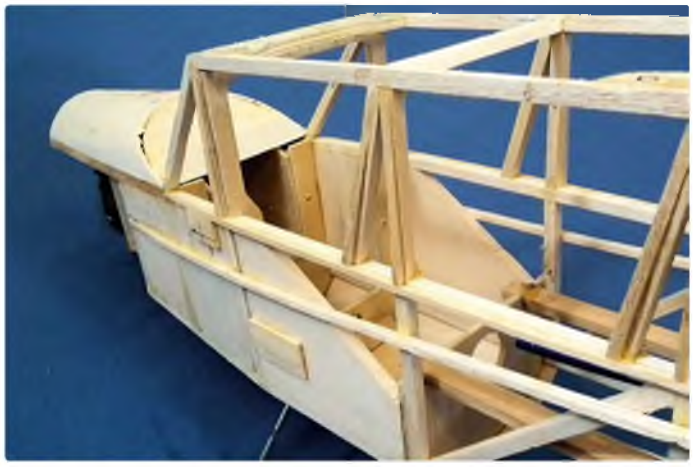
The SLEC engine mount, temporarily fitted. Note that it has been shortened a little. The cowl is now ready for the rolled top sheet

Top sheet fitted and engine temporarily installed



Balsa parts for the cowl roughed out

Lower part of the cowl glued together. This is screwed to the upper part



Left: Window frames added and the stringer trimmed to shape

The Wing

I like this one piece wing but it can be a problem if you have a small car (mine is small but I don't have a passenger!) and in a small workshop. You could buy a 1/2" aluminium tube with phenolic outer tube from SLEC and plug the outer panels on. This works very well. Just run the tube down between the main spars. I have recently built a similar model, a Peyret Mauboussin Type 11, with this system and it worked well.

The wing is pretty simple to build. The outer panels are built completely and are then joined to the centre section during its construction. This ensures a warp free wing. Start off by laying down the lower leading edge sheet, the aileron spar and aileron leading edge capstrips. Glue down the bottom main spar and then, using ribs to position the rear spar, this needs to be packed up with scrap 1/16" sheet between the root and aileron cap strip. Glue on all the ribs. Do not glue to the leading edge sheet at this stage. The ribs will need to be packed up close to the trailing edge location. Add the infill over the rear spar in the aileron area with 1/4" sheet. Add the aileron leading edge. Make and fit the trailing edge.

Chamfer the bottom of the 1/8" sheet leading edge to match the angle of the ribs and glue it in place. When the glue has dried raise the leading edge sheet and glue it to the leading edge. I use scrap trailing edge stock to hold it in place. Use aliphatic resin along the leading edge and Superphatic glue along each wing rib.

Fit all the aileron ribs and add the assorted hinge blocks, gussets and the ply plates for the horn mounting. Shape the top of the leading edge and the aileron leading edge and aileron spar to match the ribs. Add all the spar webs. Add the top leading edge sheet using aliphatic resin. I use lots of clamps to hold it to the spar and map pins to hold it to the leading edge. At the same time you can fit the capstrips over the aileron spar and aileron leading edge.

The wing panel can now be lifted from the building board and we can start on the centre section. As before, lay down the leading edge sheet and also the lower centre section sheet. Build the centre section in the same sequence as the outer panels. Leave the end ribs loose at the stage.

Fit the hardwood blocks for the front wing bolts. These should be drilled and counter-bored before fitting in the wing because it is all too easy to find that the hole has gone off centre. Add the infill just in front of the trailing edge as this prevents crushing when the rear bolts are tightened down.

Now you can join the outer panels to the centre section using the 1/4" square spruce dihedral braces. The tips of the outer panels are propped up 7/16" and this gives very slight dihedral on the under surface of the wing. The outer ribs can now be glued in place and up against the outer panel root ribs.

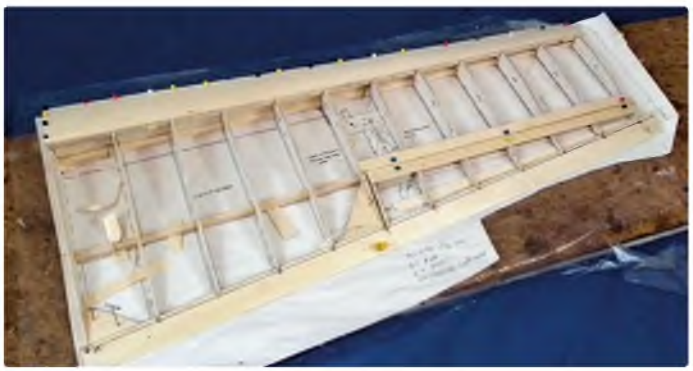
U/C leg joint and showing the bracket that holds the spat on and takes the bottom of the dummy shock strut. This must be soldered on securely

Spats ready to be drilled for the blind nuts. Note the slot on the inside and the hole on the outer face

Right side of cowl showing fuel filler and remote glow connector

The hinged cowl side panels can be opened without removing anything

The wing is very easy to build. This is stage one



The wing ready to be lifted from the building board. The sequence described guarantees no warps

The centre section with the outer panels joined on. This shows the hardwood blocks for the front wing bolts

Doing it this way you get a perfect match between the two panels.

Once the glue has dried you can continue sheeting the top of the centre section. The ply plate for the rear wing bolts can be included in this. On mine it is on top of the 1/16" sheet but it is neater if done level with the rest of the sheet. You can now lift the completed wing from the board and carry on completing the sheeting and all the capstrips. The tips are carved from block or laminated 1/2" sheet.

Trim away the sheet round the servo bay and insert the ply plate for the servo mounting. I use plastic servo mounting brackets. Mark the location of the wing bolts and drill the rear locations carefully, open the holes for the front wing bolts.

Now comes a bit which needs care. Locate the wing in its correct location and hold it there with clamps and pins, etc. Very carefully mark through the holes onto the 1/4" ply plate in the top of the cabin. Make sure that these marks are in the middle of the ply because you are going to have to pull blind nuts into the holes.

When you are satisfied, drill the holes at 5.5 mm and the check that the wing is lined up and the four 5 mm nylon bolts go through smoothly. The front bolts need to be 50 mm long (Modelfixings can supply these). Once you are happy with the whole set up drill out the holes in the ply to take the blind nuts. A 6 mm drill is the right size for this.

Now you can pull the blind nuts (also called Tee nuts in the Modelfixings lists) into place. I found that the easiest way was to get a 5 mm bolt and nut and washer. Run the nut up the bolt and put the washer on, locate the blind nut and screw the bolt into it. Now, using a spanner, 'unscrew' the nut, which will pull the blind nut into the wood. You can put a tiny drop of CA glue under the head of the blind nut to make it a little more secure but don't let it get into the thread whatever you do. With the wing complete it can be used to shape the laminations of 1/16" sheet that fits under the leading edge to take the top of the windscreen.

Now all that is left to do on the wing is to connect up the pushrods and the servo.

Tail Surfaces

The tail is nice and simple. I did take the trouble to duplicate the rib structure of the elevators and rudder. I think this saved about 5 grams! Compare with the solid tailplane and fin. The tailplane and fin are made from 1/4" sheet. The fin has two slots cut for the support dowels. I cut them under 1/4" wide and used a drill to open them out. This reduces the amount of filler needed and is stronger.

You could make the elevators and rudder from solid sheet. I made them with a 1/16" sheet core and 3/32" ribs and outline each side. This is more scale but doesn't really show up on the finished model.

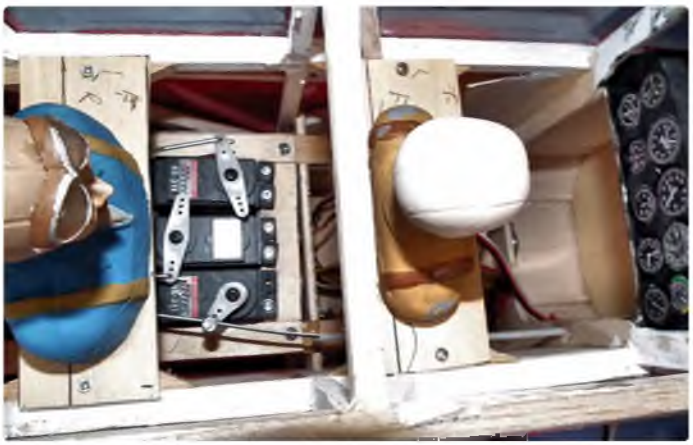
Aileron servo bay. Mount the servo with Radio Active servo mounting brackets

Completed wing, ready for covering

Wingtip carved from block, or two layers of 1/2" sheet plus a little scrap wood

Aileron bellcrank bay. The aileron pushrod can be fitted after covering

Simple tail components. Or you could just make the elevators and rudder from soft 1/4" sheet



The pilots sit on ply bases screwed to small hardwood blocks. Note the simple instrument panel. Remove the pilots and the radio is accessible

Covering

There are a large number of photos of RWD5s on the internet. Most have the standard colour scheme, which is quite nice and easy to do. I chose SP-LOP as I had stocks of red film and it was slightly simpler than SP-LOT, which is the one currently flying.

I use Solarfilm Supershrink Polyester as I find that it works perfectly and is more resistant to higher temperatures. The silver is Solarfilm as I believe that the Supershrink is a bit shinier than doped fabric. Needless to say, cover the model before gluing on the tail surfaces and leave the wood uncovered where it will be glued one.

I got my lettering done by an eBay seller, fastsign.co.uk. Not quite the right style but very good, quick and very cheap.

I did make a slight mistake. I should have had silver lettering for the lower half of the fuselage registration. It was quite simple to cut the registrations in half and apply the red top half and then match up the silver bottom half. The metal panels on the side of the cowl are painted with Humbrol enamel, which is a pretty close match.

Installation

For once there is a vast amount of room to install the radio, etc. You can get both hands into the cabin if they are not too big. Start off by installing the fuel tank; I used a Kavan 6 ounce tank. This is buried a long way into the tank box so I suggest making up a handle by adding sticky tape to the sides of the tank and forming a grip at the rear. If you ever need to take the tank out you will thank me. I use a clunk weight on the tube to the engine and also one on the filler line. This makes de-fuelling so much easier.

The main receiver is stuck down to the ply plate that forms the cabin floor with Velcro. The satellite receiver is stuck to F-7 by the same method. I mounted the battery, again with Velcro, on the right side off the cabin wall. I only used an 800 mAh Eneloop, which is adequate as the model is not going to be thrown around the sky all the time.

Servos are mounted on a ply plate, which is screwed to the two rails between F-6 and F-7. It is easier to screw the servo to the ply plate out of the model, then you only have four screws down in the fuselage to hold the plate in. Connect up the controls with the snakes.

The throttle run works well. I fitted a ball connector to the throttle arm and throttle cable. This brought the connection out far enough to clear the tank box and engine mount.

Fit the tail wheel. Add the dummy shock struts by bolting them to the brackets and assembly is complete.

The pilots are just 1/6th scale pilots glued to ply plates. I glued small pieces of hardwood inside the window sills and screwed the plates down; this allows for easy access to the radio. The instrument panel is

very easy – just a 3/4" wide balsa block with some instrument faces glued on.

I stuck together about three layers of Solartrim and cut thin arrows out of this. I stuck one each side of the wing close to the fuselage on the C of G location. I can then place my fingers on the marks and lift the model to check the C of G. I was pleased and surprised to find that the completed model balanced about 1/16" in front of the marked location. I left it there!

After the test flights control throws were set at:

Ailerons:	High 5/8", low 1/2"
Elevator:	High - up 1", down 1/2"
	Low - up 3/4", down 3/8"
Rudder:	High 1½", low 3/4"

So here is a nice, easy to build scale model that is relaxing to fly, looks good in the air and has lots of character. What more does one want for those summer evenings?

RCMW

Admiring the 66" span scale model of the RWD5 Polish trainer from the 1930s

I chose to model SP-LOP as it was slightly simpler than SP-LOT, which is the one currently flying

On the first flight the throttle had to be brought back as far as possible on the trim and eventually the engine stopped and the RWD5 made a perfect, smooth landing

Ready for the first take-off. Stuart Pickett, who flies my models for the camera, holds the RWD5 while yours truly gets ready

RWD5 flies in a very stable manner. She will loop and roll, although these are not scale manoeuvres

This model exhibits no bad habits and holds no nasty surprises

Here we have a nice relaxing model that looks great in the air and flies like dream

CONTACTS

Piano hinge - Hobby's
hobby.uk.com (search piano hinge)

Small screws, 5 mm nylon wing bolts (inc. 50 mm long), blind nuts etc.
Modelfixings.co.uk

Lettering - Tim at **www.modelmarkings.com**
Also **fastsignuk** on eBay

Some good photos of the RWD5 replica can be found at: **www.samolotypolskie.pl**
And photos of a lot of other RWD5s can be found on Google

PLAN DETAILS

PLAN NAME:	RWD5
PLAN NUMBER:	MW3812
PLAN PRICE:	£18.99
LASER WOOD PACK:	WP3812
WOOD PACK PRICE:	£38.99

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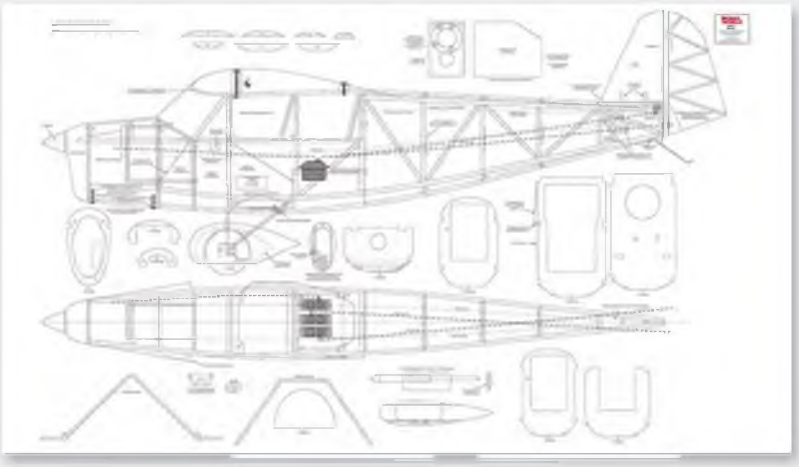

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Get a great deal on your next Traplet plan building project with our new bi-monthly reader offer

Welcome to our new 'Pick Your Own Plan' feature, a very special new offer based on selected plans from the Traplet Plans Service, which we will be running when there is no pull-out plan in the magazine.

While we hope our choice of free plan in every other issue is appreciated by a wide selection of our readers there are understandably going to be times when the drawing we feature may not pique your interest. So why not pick your own?

Pick Your Own Plan - Please quote offer code **398PYOP** when placing your order

How It Works

For each 'PYOP' feature the Editor will hand pick four plans from the Traplet Plans Service (which now includes plans from the MyHobbyStore range, including plans originally published in magazines such as RCM&E and Radio Modeller). Three of the plans will come from the established categories on the Traplet Shop website, such as Scale Plans, Electric Sports Plans, Powered Sport Plans etc. And the fourth will be a 'lucky dip' taken from a random fourth category.

The offer of 50% off is based on the full RRP as shown on trapletshop.com and to make it even more appealing we are going to start the ball rolling by allowing you to combine more than one offer featured in any one 'PYOP' feature. So if all four aeroplanes featured appeal to you as potential building projects then you could save up to a whopping £48.00! That's right – almost £50 in potential savings, which you could then spend on a laser cut wood pack or cowl and canopy for one of your chosen models!

Are you ready to clear your building board? OK, here we go...

"A rewarding project for those with good building experience"

From our Scale Glider Plans category: Minimoa (191")

Chris Williams shares his 1:3.5 scale design of one of the best known sailplanes and, using a Quabeck 3.5/12 wing section, produces a superb model for both the model builder and flyer alike. Aimed at the more experienced builder, the Minimoa is sure to be a very rewarding scale project.

Wingspan: 191 in (4850 mm)
Scale: 1:3.5
Radio Functions: 4

Matching items include:
Laser Cut Wood Pack (WP2665)
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"A highly detailed plan for anyone seeking an immersive scale build"

From our Scale Plans category: Airspeed Courier

Designed by David Vaughan, this classic and historic aircraft is a scale enthusiasts dream. Of all built-up construction, the plan was featured in the November 1989 issue of RCMW and is practically a lesson in scale modelling in itself. David's original model was powered by an O.S. 60 FS.

Wingspan: 93" (2360 mm)
Radio Functions: 4-5
Engine: .60 cu in two-stroke
Weight: 10 lb

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"Vintage style, with lots of balsa to bash!"

From our Sports Plans category: Centaur

A 78" span vintage style sportster for four function R/C and .70 size four-stroke engines, designed by Peter Allanson. If you like traditional building and vintage style aeroplanes then this near two metre cabin model will fit the bill. The two large sheet plans are well detailed and a laser cut wood pack is also available to aid construction.

Wingspan: 78 in (1980 mm)
Engine: .70 cu in four-stroke
Radio Functions: 4
Length: 57½ in (1450 mm)
Weight: 7 lb 10 oz
Wing Area: 853 sq in
Wing Loading: 20.7 oz/sq ft

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"Simple to build. A David Boddington classic!"

From our RCM&E Aircraft Plans category: Mannock

With the addition of the MyHobbyStore plans range, which includes plans published in publications like RCM&E and Radio Modeller, the Traplet Plans Service is now able to offer one of the world's largest collections of English language model plans. When given the opportunity to dip into this vast resource, I went straight for the work of an old colleague and model making maestro, David Boddington.

This WW1 style biplane, designed by DB, has been built by hundreds of R/C modellers over the years. Of very simple, basic construction, Mannock can be modified to be of either British or German appearance. Versions have flown with skis and floats, and have also been converted for bombing, photography and glider towing, as well as being used for formation displays at model shows. A biplane for all seasons!

Wingspan: 60 in (1524 mm)
Engine Size: 0.60 cu in
Radio Functions: 4

Product Code: RM280 **RRP:** £17.50 + p&p
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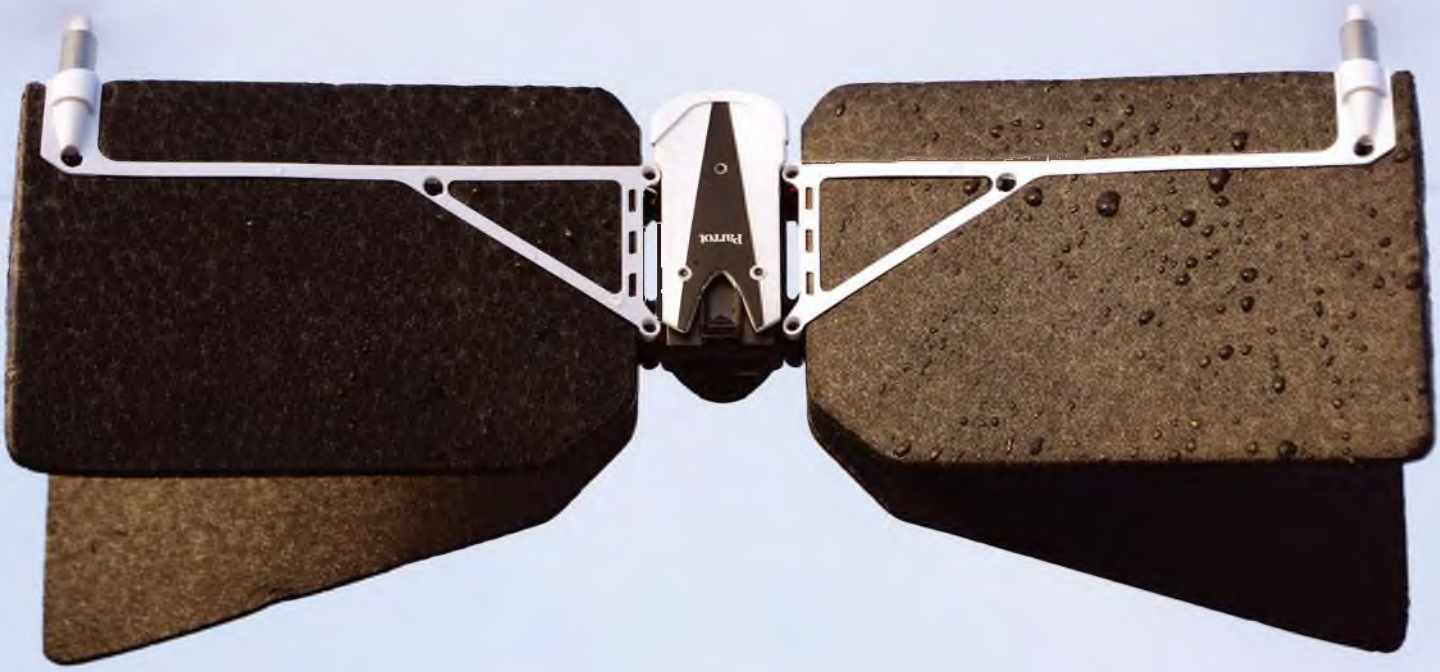


Swing

With Parrot's latest Minidrone you can enjoy the best of both worlds when flying in either drone or plane modes. Kevin Crozier puts one to the test

The Parrot Swing is great fun in either quad or plane modes

As a passionate R/C model pilot who will fly anything with either wings or rotor blades the Parrot Swing is heaven sent, allowing guys like me to have fun flying a model in both quadcopter and fixed wing modes. As Parrot's publicity blurb says, Swing offers 'the stability of a quadcopter and the power of a plane!'

It also has a vague likeness to space fighters from a certain series of popular Sci-Fi films that I'm a big fan of, which only adds to its appeal.

And, as a final tick of many boxes, it's the latest in Parrot's line-up of Minidrones, a few of which I have already flown or driven, so it shares the same small hard cased 550 mAh LiPo battery pack. Hence, I was not just restricted to using the single LiPo pack supplied in the box and could extend my flying sessions by using the battery packs that I had accumulated from other Minidrones. I would encourage anyone interested in a Swing to buy an extra pack or two as just one flight per flying session is sure not to be enough when flying this fun-filled device.

While you are dipping into your pocket you may also want to invest in a Minidrone Charger, which also comes with an extra battery pack. The Swing is normally charged by plugging it into a USB port but whilst doing so it is a bit vulnerable, especially if attached to a computer, where an inadvertent swipe could give it a knock. This small USB charger allows you to put the Swing safely back in its box while you charge a few LiPo packs, one at a time.

Swing and Flypad are packed in separate boxes, both protected by egg-box inner trays

Box Contents

Open the flip top carry box and inside you will find two additional boxes, one containing the Swing and the other a Parrot Flypad, which is a games console style controller. Both are protected by egg-box style moulded inner trays. Here's the full list of contents:

1	Minidrone Swing
1	USB cable
4	Spare propellers
1	Parrot Flypad
1	Smartphone mount
1	Quickstart guide

Priced at £119.99 the Swing may seem a bit flimsy at first sight but its lightweight construction and foam wing panels are essential to its excellent VTOL performance.

Box contents

Flypad

While checking the price of the Swing, I was also pleased to see that the high quality Flypad controller is available separately. It retails at £39.99 and would make an excellent alternative to controlling existing Minidrones, like the Rolling Spider, which are usually flown using the FreeFlight Mini app on a smartphone. You need to have Bluetooth switched on to use this app.

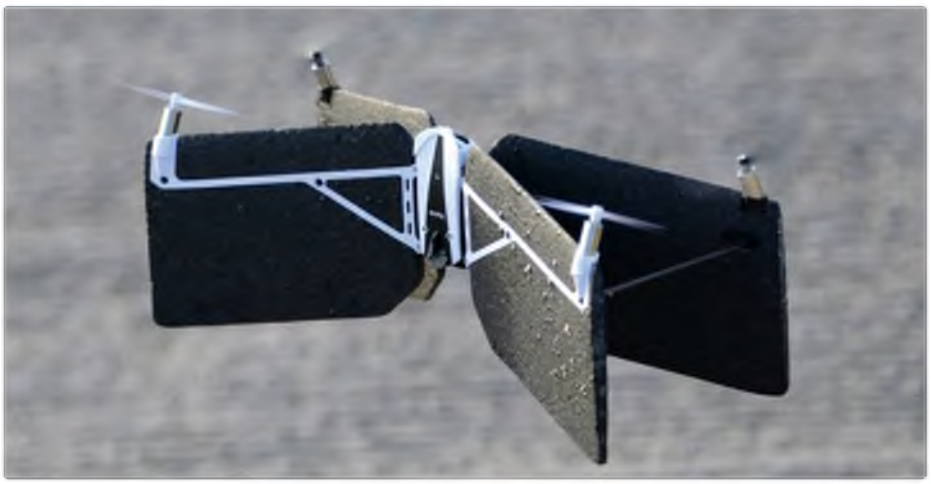
Incidentally, the Swing can be controlled via this same app too, which could prove to be a boon if you go flying and discover that you've forgotten to charge up your Flypad.

The Flypad has traditional twin stick controls and is supplied in Mode 2 as standard, with throttle and yaw on the left stick and pitch and roll on the right stick. The power switch is mounted in the centre of the controller, at the top.

There are four buttons on the front face marked 1 & 2 and A & B. These allow the Swing to perform pre-programmed flight patterns. Straight out of the box they allowed the model to make simple turns but after checking for firmware updates and downloading the latest version the same buttons now allow the Swing to loop, roll and do vertical U-turns – much more entertaining!

Not supplied, but I would highly recommend purchasing the optional Parrot Minidrone Charger, which comes with an additional hard cased LiPo pack

Between these four buttons is the central Take Off/Landing button. Swing has to be taken off and landed in quadcopter mode but this button helps to automate the process. When pressed it signals the model to take-off, after which it will stabilise at one metre above the ground. Pressing it again will cause the Swing to automatically revert to quadcopter mode, after which it will descend and then switch off its motors. If you find that the drone is not lined up with your chosen landing spot then you can use the Flypad's controls to gently nudge it back into the correct position prior to touchdown.



Swing always takes-off and lands in quad mode

Beginnings of transition to plane mode. Note that the model is actually inverted, caused by pressing the L2 back button switch. Pressing R2 will make it fly the 'right way up'!

The EPO foam wing panels may seem fragile but have proved to be quite robust. Note the black underside to the body and wing struts

Changing Gear

On the back shoulders of the Flypad are more push button switches, two on each side. The largest ones are used to 'Change Gear' – quite literally – when flying in aeroplane mode. Pressing either the left or right switch once will cause the Swing to, err.., swing forward (hence the name, I guess) into slow, nose-high forward flight. Pressing it again allows the nose to drop more and the speed to build up, while a final press brings the model almost horizontal, at which stage it will reach its top speed – not blisteringly fast but still quite nippy.

Just a word of caution: what I would call the 'normal' way round for this model is with the white upper bodyshell and white wing spars pointing towards you when it takes-off. Pressing the large R2 'Change Gear' switch will tilt the Swing away from you into forward flight and the controls act as you would expect. But this model can be taken off and flown equally well 'inverted', i.e. with the black underside facing the pilot. In this case pressing the large L2 'Change Gear' switch will cause the controls to be reversed, which is a bit disconcerting to anyone with traditional R/C model flying experience.

This may seem a bit strange but Parrot are obviously trying to make the Swing appeal to a much wider audience than just existing model pilots, some of whom may find it much easier to fly their model 'back to front'. The only problem with this approach is that if they decide to move on to a more traditional model then they may find that they need to 'un-learn' these inverted flight processes, which could well be second nature to them by that stage. Personally, I would recommend that any novice flyers learn to fly their Swing with the white body panel facing them and pressing R2 to engage forward flight.

Of the two smaller buttons on either shoulder, pressing L1 will cause the Swing to automatically perform a U-turn, while R1 can be used to take a photo. I'm not sure that this has much use though as the Swing spends much of its time with its nose in the air, so most pictures taken from the rear mounted camera will be of the ground. With a bit of practice though I guess you should be able to sweep it around yourself and your mates at high alpha to take some selfies (or dronies!) from unusual angles.

FreeFlight Mini

I have already mentioned Parrot's FreeFlight Mini app, which you can 'Get' for both iOS and Android devices. It connects to the model via Bluetooth and allows you to pilot the Swing (and other Minidrones) using virtual joysticks in Joypad mode, which is the default setting, or by tilting your smart device using Accelerometer mode. To make the switch from quad mode to plane mode you just need to make a single swipe of your finger across the screen.

From the home screen of the app you can also access your settings for piloting the model, photos, and the 'Parrot Cloud'. You can also use it customise the drone's flight parameters, such as maximum altitude and speed. However, the default settings for both of these parameters seems pretty good straight out of the box.

But for me the most useful feature of the app is that it shows real time battery information from the Swing. I use this after a flying session to judge the state of each LiPo pack and to estimate how much charge I need to put back in to store them at around 50 to 70%. I tend not to use the app while I am flying as I prefer using the 'proper' R/C controls offered by the Flypad (plus it has more range), so how do I know when the flight battery is about to run out without using the app? In most instances I find that the quoted flight times (7 minutes in quad mode and 8½ minutes in plane mode) are more than adequate to allow me to have a good five or six minutes of fun without getting anywhere near exhausting the battery, so more often than not I land before the pack is low on capacity. But I did let it fly for a bit longer on one flight and found that the Flypad starts to vibrate, giving a clear warning that it was time to land.

Conclusions

This is another great drone product from Parrot. It's simple to set up and flies great in both quad and plane modes. The provision of the Flypad controller, with its R/C style sticks, makes it much more attractive for experienced model pilots, as does the plane mode.

I've only flown the Swing outdoors in calm conditions and it has handled gentle breezes with ease. However, it should be even more fun indoors, especially when flying straight towards a wall and then using the U-turn function to perform an abrupt about turn. The ability to loop and roll, while automated, also add a welcome extra dimension when flying this little Minidrone.

All in all this is a great little drone/aeroplane and is highly recommended. ***RCMW***

The Flypad offers experienced R/C pilots a more natural way of flying a Minidrone than the FreeFlight Mini phone app. However, it flies just fine using a phone or tablet too

Swing looks mean in low light conditions thanks to the LED 'eyes'

Last flight of the day in chilly but calm conditions

MODEL INFORMATION

NAME:	Swing
MANUFACTURER:	Parrot SA
WEBSITE:	www.parrot.com/uk/minidrones/parrot-Swing#parrot-swing
PRICE:	£119.99

PARROT SWING

INERTIAL MEASUREMENT UNIT:	Evaluates speed, tilt and obstacle contact (using 3-axis accelerometer and 3-axis gyroscope)
VERTICAL STABILISATION:	Ultrasound sensor, which measures below 13 ft/4 m altitude in quad mode and a pressure sensor
HORIZONTAL STABILISATION:	Camera sensor
BATTERY:	550 mAh LiPo (30 min. charging time with a 2.1 A charger)
CONSTRUCTION:	Polypropylene structure with EPO wings
SPEED MEASUREMENT:	60 FPS vertical camera (in quad mode)
CAMERA:	60 FPS vertical camera, 300,000 pixels
MAX ALTITUDE:	80 ft (25 m)
BLUETOOTH CONNECTION:	V4.0 BLE
RANGE:	200 ft (60 m) with Flypad, 65 ft (20 m) with smartphone
WEIGHT:	2.57 oz (73 g)
DIMENSIONS:	L 325 x W 126 x D 121 mm
OS COMPATIBILITY: i	OS 7 and up, Android 4.4 and up
SOFTWARE DEV KIT:	OS Linux (SDK available on Parrot.com)

PARROT FLYPAD

BATTERY:	200 mAh LiPo (6 hour life, 2 hour charging time)
RANGE:	200 ft (60 m)
BLUETOOTH CONNECTION:	V4.0 BLE
WEIGHT:	10.40 oz (295 g)
DIMENSIONS:	L 160 x W 78 x D 9.8 mm

Mitsubishi A6M Zero

Almost everyone likes a Funfighter. So it's great to know that Cambria's famous Funfighter kits are in safe hands and still in production – and the range continues to grow! Neville Hill builds the latest addition to this much loved line-up of easy to build warbirds, a .40-size Zero

This Zero kit is manufactured by Cambria Funfighters, who make a range of semi-scale fighters from the Second World War period, with the accent on FUN! Each model follows the classic lines of its full size counterpart and they are intended have a very wide speed range. Cambria's stock funfighters are designed for Reno 300 pylon racing and are claimed to reach speeds in excess of 140 mph!

The Zero follows the same design and benefits from the low speed handling, but is also fast and furious to fly.

A6M History

This long-range fighter aircraft, operated by the Imperial Japanese Navy Air Service, was considered the most capable carrier based fighter aircraft when introduced early in World War II. With excellent manoeuvrability and long range, it gained a legendary reputation as a dog fighter, although this was at the expense of an armoured cockpit and self-sealing fuel tank which made the pilot very vulnerable.

By 1942 a combination of new tactics and better equipment enabled Allied pilots to engage the Zero on more equal terms. By 1943 inherent design weaknesses and the lack of a more powerful engine meant the Zero became less effective against the newer enemy fighters. It was outdated by 1944 but in the latter years of the war it continued to be used in Kamikaze operations.

More Zeros were built than any other Japanese aircraft, and it remained in production until 1945 with nearly 11,000 of all variants being built.

Manuals

The model is supplied in a plain cardboard box, with labels detailing Cambria Funfighters and the contents of the kit. There are no printed instructions but a DVD is supplied, which contained printable build instructions and many photographs. I found these difficult to view as my computer was not able to play them as a slide show and I therefore had to keep returning to the disc. I'm on Windows 10 so I was not sure if it was me or the disc? *(If you save the files to your computer you should be able to do this - KC)*

This build would not be for a beginner and I had to puzzle over a few areas which were not immediately evident from the instructions. There was, however, a very clear full size drawing to be used in conjunction with the instructions.

Neville presents the Zero for the camera. A handy size model for club flying

Classic Brit kit! The plain box contains a treasure trove of well cut balsa and ply, foam wings, a nice plan and a hardware bag. Instructions are on the CD

Kit Contents

The contents include a very clear, well wrapped canopy and a bag of bits including an engine mount, fuel tank, Mylar for hinges, wing bandage, pushrod ends, full size drawing and bolts. Also supplied were a list of parts and a drawing illustrating them. Quite a full complement.

This is obviously a proper builder's kit with lots of balsa and wooden bits. It's a pity that there are not too many of them around these days. The balsa and ply sheet had been laser cut, which was excellent, and the correct grade for the job.

A pair of foam veneered wings are supplied. If you have been around the modelling scene for some years you will have seen these before, but if not they are hot wire cut from a block of foam. Veneer is then stuck on, usually with an impact adhesive, and leading and trailing edges are then added. This makes for a very strong wing, if a bit heavier than a balsa built up wing.

When used for pylon racing (Cambria Funfighters are keen supporters of the Reno 300 class) foam wings provide torsional stiffness and the quartered obechi used for the skins provides a very straight grain.

I have not seen a pair of foam veneered wings since I made my first Wot 4 many years back, so this was a bit of a surprise. But don't do as I did and throw the scrap bits away as you will need them to position the wings for gluing up later.

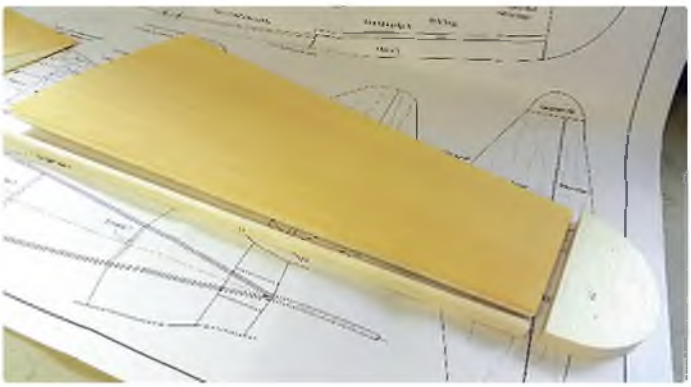
No pilot was supplied so I needed to find a suitable one as I think this always finishes the model off.

The Build

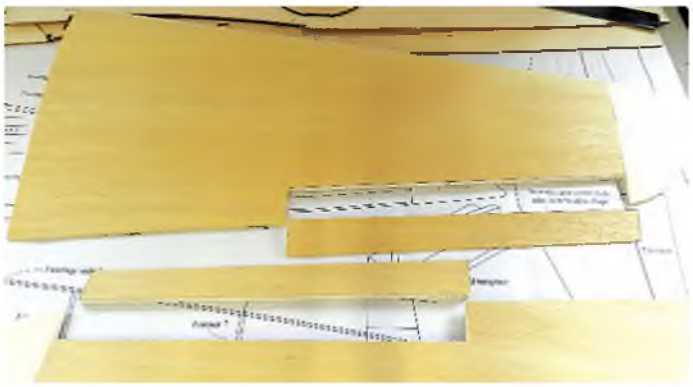
You need to read the instructions and understand them fully as there are some parts that need to be started/finished before others.

Since I was using PVA white glue, and the setting time is not quick, I bitted and bobbed around the build where I could to save time, although you could tack parts in place with cyano while the PVA sets.

Remember these? It's nice to work on a set of veneered foam wings again



The leading edge strips and wingtips need to be glued on prior to shaping

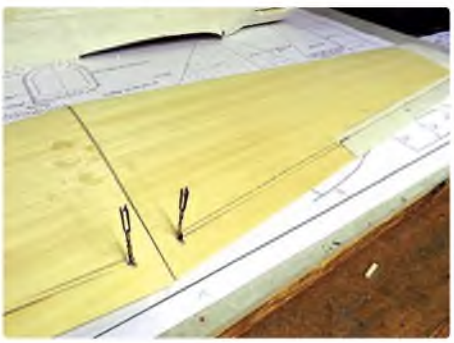


Ailerons are marked out and cut away from the training edges

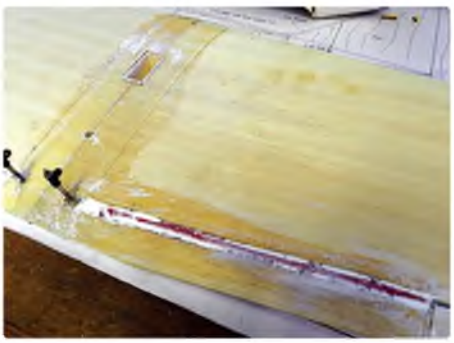
Wings

Following the instructions, the leading edge and wingtips were added using white glue. Wing bands and masking tape were used to hold these in place. When set the ends were cut to length ready for joining. Cut out the ailerons to the supplied template (very thoughtful) and make sure you use a new blade in your hobby knife to give a good clean cut as it is easy to tear the foam. I joined the wing halves together using epoxy as recommended and set the dihedral to 25 mm on both sides. I then added capping strips to the cut edges of the aileron LE and wing TE using white glue.

The only problem that I had with the wings was the aileron pushrods. Cambria Funfighters suggest that after cutting a channel in the wings to take the rods, the rods are covered with Vaseline and bedded into the slot with 30-minute epoxy. But the first time I did this there was no way the pushrods were going to move – they were set solid! I soon found out that getting a piano wire pushrod out of set epoxy in a foam wing is not for the faint-hearted...



A channel is made either side for the torque rods. The well greased rods are glued in with epoxy and the veneer strips are put back on top. A neat job...



...but the review model's rods were stuck! Cutting them out and fitting torque rod tubes made from split snake outers saved the day. Not so neat now though!

Eventually they were cut free but I was not going to try that again, so on with the thinking cap. I could not slip tubing over the rod as there was a bend on each end, so after slitting down some snake tubing, I found I could slip it over the bend. The channels had to be opened out to allow the snake tube to fit, after which I roughed up the outer face of the tube and set this in epoxy. This worked fine.

Cambria Funfighters must have used the epoxy method in the past but if you leave the slightest non-greased area the pushrod is going to stick. So be very careful.

(The instructions now recommend the use of Molybdenum grease and plenty of it! Cambria Funfighters also say that when set the epoxy does require a hard push to break the rod free but this works fine on the whole range, except the Spitfire due to its wing shape - KC)

Hinging and adding the ailerons is next, and they are then shaped to the wing profile. I was surprised that the Mylar hinges had to be cut so narrow but time will tell if they stand up to use. I inset the servo into the wing vertically, building a 1/8" balsa box to house it, glued in with epoxy.

When all was fully cured, I shaped and sanded all surfaces. I then added the wing bandage to the centre joint.

Fuselage

First up, sort out the fuselage sides and doublers. Glue them up and make sure you make opposite sides. Weigh them down on a flat surface so they do not bow, adding plastic sheeting between so they do not stick together, and let this cure overnight. While the fuselage sides were setting, I glued up the front cowling.

(Top Tip: When building over the plan, cover it with old Solarfilm backing so that nothing sticks to it. It can then be reused if necessary.)

Next job was to add triangular section throughout and build up back to former 4, positioning all as instructed and ensuring that the fuselage is built symmetrically about the centre-line. Make sure the wing bolt plate is set at the correct angle to engage the wing at a right angle.

I used 30 minute epoxy for fixing all the formers and wing bolt support plates as the front end will probably take quite a bit of stress with my flying. When cured add the former to the back end and trim the rear to meet at the centre-line. Continue to build over the centre-line and ensure that the fuselage is straight and true.

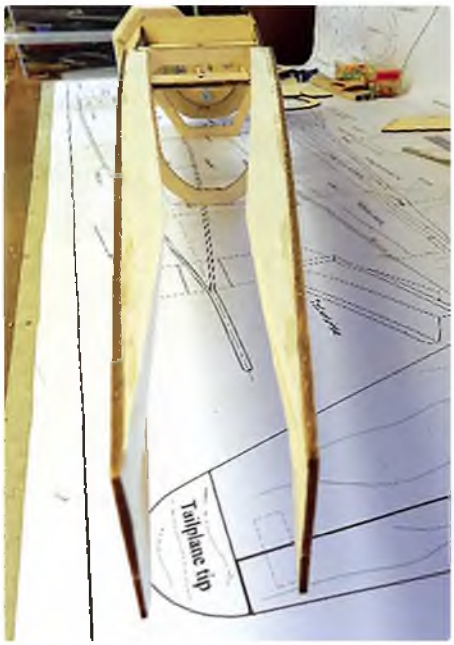
Probably the most time consuming part of the fuselage build is planking the rear top deck – not my favourite operation and I was glad when it was finished. If it all goes right it looks great, but any gaps will look very amateurish. I will leave you to decide from the photographs which mine turned out to be! Then add the cabin floor and the front sheeting.

I liked the temporary tail platform idea to enable the rear end to be built up, planed and sanded to profile before permanently fitting the tail surfaces. It is always difficult to finish off the fillet between these items, just be careful to use only a small spot of CA to hold them in position while shaping.

Making up the cowling is one of those jobs that can be done while waiting for the glue to dry on other parts of the kit


Clamping the front formers in place


Clamping up the rear fuselage while the glue dries



Chamfering the longerons allows the fuselage to be pulled in at the rear


A nice, straight fuselage ready for decking


Planking the rear turtle deck. Note the temporary tail platform

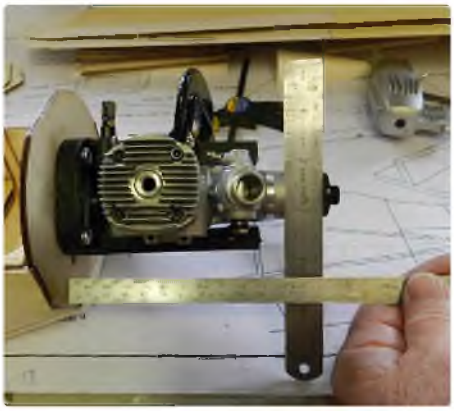


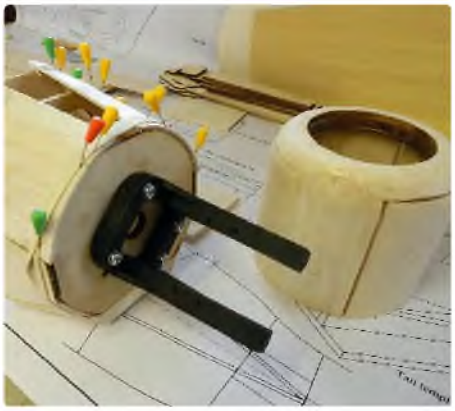
The temporary tail platform allows the tail fillets to be blended in perfectly

Engine Mount

I just happened to have in my stock an OS 46 AX, as fitted to the prototype, so everything was easy to position and fit. After bolting the engine mount on with the supplied star nuts and cap screws the engine was fixed with 3 mm cap screws and lock washers.

I fitted the cowl differently to the instructions as I wished to be able to remove this to get easy access to the engine. So I cut part of it away and used screws to fix it directly to the firewall. A loose piece covers the cylinder wall, leaving the head poking out for cooling. This is just fixed in position with two magnets and can easily be removed.


Measuring up prior to fitting the cowl


Adding the front sheeting

Tail Surfaces

Next, hinge and shape the elevator. The option is given to fit a rudder, so I split the one-piece balsa rudder/fin, shaped this up and hinged it.

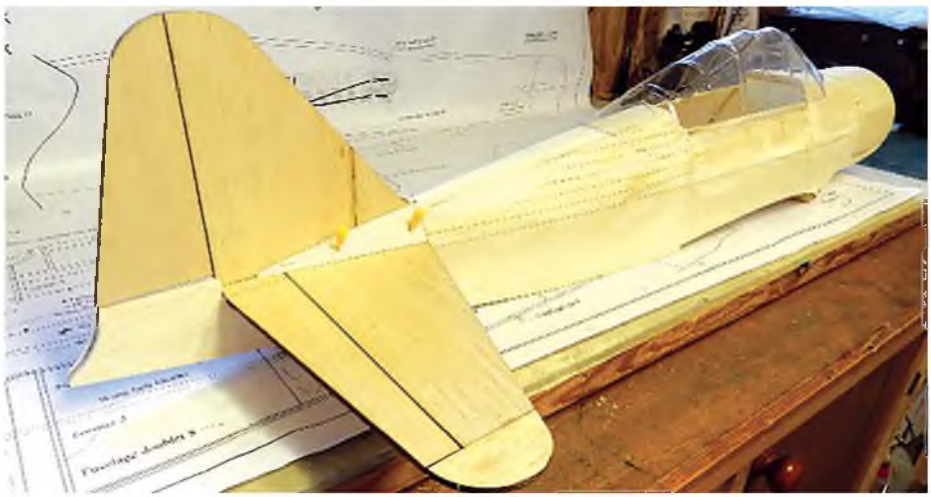
Removing the temporary platform, the tail unit fitted straight into position and on checking it was found to be accurately positioned to the wings and fuselage centre-line.

To operate the rudder I drilled through the rear in line with the rudder hinge, put a bend in that exited the rear end half way down at 90° and connected this to the pushrod snake with a screw on clevis.

The rear tail end piece, made from 1/4" balsa sheet, seemed to be very vulnerable so I strengthened this up with a fillet of balsa on both sides running back to the fuselage sides and faired in.

I waited to fit the clevis until the servos and pushrods were in place so that the final position of these would be correct and not subjecting the servos to overload.

Left & below: The 1/4" tail end piece seemed vulnerable so I strengthened it with a fillet of balsa on both sides, running back to the fuselage sides and faired in



Radio And Pushrods

Throttle, rudder and elevator servos were fitted, with slight fettling required to the cut-outs to fit them. I would have fitted a 'closed loop' system to the rudder, as per the option suggested in the instructions, except the servo tray was already glued in position with its cut-outs being either side of the centre-line. Not wanting to hack this around to get the rudder servo in the centre of the tray I decided to stick with what was there, so I opted for 'golden rod' [sic] pushrods. These were easy to fit and are sturdy and firm in action. I supported these about halfway along their length in the fuselage to prevent any bowing.

I could now fit the rudder and elevator clevis and attach the pushrod ends. It all seemed to work without any problems.

Fitting the radio, and all other bits temporarily, I did a quick C of G check, moving the battery about to get it somewhere near. I could now fix the receiver in its final position and temporarily fit the Rx battery.

I opted for snake pushrods, supported about halfway along their length to prevent any bowing

Fuselage Underside

The fuselage underside is planked. Therefore, the pushrods must be fitted prior to this, as it will restrict entry to the inside. Fit the balsa sheet cross grain, using CA for a quick job, trimming to match the fuselage sides.

The tank can then be piped up. Some foam down the sides to 'snug' it in position and a strip of balsa behind ensures no movement. The whole fuselage can now be finally shaped and sanded, leaving the cockpit canopy fitting until after final finishing.

Finishing

I was initially uncertain what finish I would apply. Solarfilm would have been easy enough and Solartex is easier to apply, but can be heavy when painted. Glass cloth, applied with epoxy then painted, can also be heavy and cleaning brushes etc. is a pain.

I had seen details of Poly C, a polyurethane water based varnish, which seemed easy to apply over a lightweight 25 g glass cloth. It would take longer than applying film but I decided to give it a try.

It is recommended that you first apply a coat of sanding sealer, then sand down, apply the lightweight cloth while painting over thinly with Poly C. It went on very easily, dried within 30 minutes and was very sandable, although multiple coats had to be applied to cover the cloth weave with sanding in-between. I sprayed the Zero with Halford aerosols to keep the weight down and then fuel proofed it with clear polyurethane.

In the end, I was very pleased with the overall effect and learned quite a lot. I cut some roundels and leading edge marking from sticky backed vinyl and was very pleased with appearance of my new funfighter.

Test fit of the crystal clear, large canopy

Setting Up

The flying surfaces were set as recommended at 8 mm high and 6 mm low on the elevator and ailerons, with 50% and 30% exponential, and 15 mm and 9 mm on the rudder, again with 50% and 30% exponential.

The C of G required 40 g on the tail to bring this spot on at 60 mm from wing leading edge. The range is quoted as 60 to 65 mm. *(The C of G for this kit has been amended to 65 mm - KC)*

Being a new engine, I ran a couple of tanks of fuel through it to run it in.

Radio installation. Note the rear mounted battery to help balance the fighter at its forward balance point for the maiden flights

Reviewer's mod! The top of the cowling was made removable to allow easy access to the engine but it needs to be well secured in flight!

Flying

After the mandatory photographic session we were ready to fly. A double check of the control surface directions and movements ensured that everything was working correctly. Well, we couldn't put the moment off any longer. So over to my test pilot, Jonty Walkenden:

As per usual for this time of year, the chosen day was pretty grey and not particularly warm either, with an 8 to 10 mph north-easterly breeze, but at least it was coming down the strip!

A little problem raised its ugly head in that Neville's modified cowl fixing gave up the ghost, and the needle valve retaining grub screw came loose, so the mixture had to be adjusted via the short knurled section. So, we flew the Zero minus the upper cowl section!

Once we had the motor 9/10 peaked (remember it is basically new), Neville gave the Zero a nice level, slightly nose up launch. Given that the Zero is actually not that large a model, with a honking .46 on the front I fully expected an immediate torque roll to the left and so it was. Nothing drastic, a quick jab of right aileron rectified that, but to get the Zero to climb away instead of acting like a homesick Meerkat I had to hold in a handful of up elevator whilst getting Neville to reach over and give me a large dose of up trim.

Once it was trimmed for level flight I throttled back to about 1/3 throttle and flew the flyby passes for the photographers to take their airborne shots. Nothing untoward happened, and given the large amounts of expo on aileron and elevator I asked for (well, it's meant to be fast and smooth, and who wants an overly responsive axe murderer of a model on its first flight?) it just swanned around looking decidedly 'different' in the air. A few basic loops and bursts of 'giving it the beans' later it was time for a landing.

After one go around I throttled right back and dragged the Zero in level whilst increasing up all the while. Now, the Zero is certainly not a lightly loaded 3D model but it surprised me in that it didn't exhibit any nastiness and touched down smack in the centre of the strip like a trainer, and at a very low speed. A real plus point for an everyday model in my book…

Two more flights, this time using the power more, made me think that a .32 motor would be more than adequate, and this would benefit the set up of the model as well. With the C of G at 60 mm from the LE the plane is nose heavy, so much so that lots of up trim was required for level flight and so, when inverted, needs virtually full down elevator to overcome (and this on mid rates, which actually gave quite small loops, and bank and yank turns etc.). This made nice rolls quite hard and during the few tries I had at knife-edge it pulled so hard to the canopy that I thought better of it.

Despite the forward C of G, as tested, the Zero showed real promise and once the balance is moved rearwards I've no doubt it'll come into its own. It certainly looks nice in the air and it needs a Corsair to play with – hint, hint!

Neville holds the Zero firmly as Jonty advances the throttle on the still new O.S. 46 engine

A firm, straight launch gets the Zero smartly away for her maiden flight

After the modified top cowling started to lift the Zero was landed to stop it flying off. You'd be unlikely to find a dark green part anywhere in this sheep field!

Subsequent test flights were made with the top cowling removed. At least the new engine was well cooled!

Zero is fast and smooth through all the usual warbird aerobatics

MODEL WORLD

MODEL INFORMATION

NAME:	Zero Funfighter
MANUFACTURER:	Funfighters.co.uk
WEBSITE:	www.funfighters.co.uk
AVAILABLE FROM:	Balsa Cabin, Rapid RC and Nexus Modelling Supplies at model shows. Or direct via website or phone 07598 282898
PRICE:	£89.99 plus £10.00 P&P
MODEL TYPE:	Sport scale warbird
CONSTRUCTION:	Balsa and ply with foam veneered wings
PARTS SUPPLIED:	Airframe and hardware
PARTS REQUIRED:	Engine, receiver, servos, Rx battery

R/C FUNCTIONS

1.	Ailerons
2.	Elevator
3.	Throttle
4.	Rudder

MODEL SPECIFICATIONS

WINGSPAN:	43 in (1092 mm)
QUOTED WEIGHT:	3.3 lb (1497 g)
FLYING WEIGHT:	4 lb (1814 g), covered in 25 g glass cloth
ENGINE:	O.S. 46 AX

DISLIKES

Assembly manual requires updating with correct photographs and some text

LIKES

Very good laser cutting • Looks very scale like in the air Will fly fast and furious, as intended • Scope for personalising the aircraft, like adding a rudder • Crystal clear canopy fits well

Pulling in up elevator for landing, the Zero does not exhibit any nastiness and lands at a very low speed

Update From The Manufacturer

Since this was an early kit, Cambria Funfighters have sent us some additional notes:

Thin Mylar hinges – As long as the surface is roughened before gluing this is a tried and tested method. We've never had a failure. Even in severe crashes the wood is still glued to the hinge.

Rudder servo offset – Having the servo offset to one side produces no noticeable effect and is regularly used with the Funfighters.

Forward balance point – The C of G is now amended to 65 mm. The Rx battery should be as far back as possible, and the elevator and rudder servo as far to the rear as possible without fouling the wing bolt.

Torque roll from hand launch – We have developed a take - off dolly for the Funfighter range which will alieviate these issues totally. Details are available on the Cambria Funfighters Facebook page.

Smaller engine – For scale flying a .32 has enough power for the Zero but causes problems fitting the exhaust due to cowl size. For the same reason the prop is pretty well swamped. Three degrees of right and down thrust will sort the torque reactions with the .46 AX. ***RCMW***

Druine Turbulent DR1

In the second part of his articles about building a scratch built Druine Turbulent, Chris Bowler cracks on with the wings

While Sid King was busy with the fuselage, I began the wings by photocopying a further set of the plans, including one in reverse to build the opposite wing over. You may think this a bit OTT but I very rarely manage a build without mucking up at least one plan sheet! As usual the plan was pinned to the bench and covered in clear film before work started. The main and rear lower hardwood spars were pinned into position over the plan and a check fit of the wing ribs made.

It is vital to use a dihedral template to set the root rib at the correct angle. I also needed to be careful to keep the tabs on ribs at this stage. The outer shorter outer ribs benefit from packing up at their trailing edge to keep them aligned.

When happy with the fit they were glued into place, checking carefully for vertical with a square at each stage. There are seven full chord ribs, with four shorter ones that form the recess for the aileron. Top spars were added, held into place with pins and weights to keep them firmly in place.

Once dry, a substantial hard balsa former was glued between the rear spars to form the support for the aileron. This would have pieces of balsa block added later and carved to a fit for the recessed hinged ailerons. Balsa block at the hinge positions would need to be added to the rear of the former for the hinge tubes. If you prefer, the insert between the rear spars can be a lamination, with the hinge points incorporated.

The upper trailing edge sheet was added, as was the 'false' leading edge of the slot in the wing. This must be left a little 'proud' in order to accommodate the top wing sheeting, added later. The wing has a false leading edge that was also added at this point. To obtain the aerofoil shape, balsa square was added to the false leading edge and later sanded to shape.

Ribs glued in place with reinforcing sheet on the ribs at the aileron spar

Setting the dihedral angle. Do this on both wings

Favourite Job?

The wing spar webs come next. My favourite task? Emphatically not, but it has to be done. The first three rib bays have plywood webs to give added strength where the wing joiner will be slotted. A good tip is to remove the rib where the spar will fit before adding the webs. I also made sure any excess glue was cleared out, as this could impede the wing joiner from sliding into place.

Once that was done, I added the other balsa webs in place on both sides of the spars. Fourteen balsa and six ply webs, plus twelve for the rear spar, so for a pair of wings that's 64 in all! It just takes a little time and patience. Could be worse – it could have been a biplane! With that done the balsa sheet was added from the sixth rib to the tip rib, reinforcing the rear of the wing at the aileron area.

For the tips, Sid chose to have a central balsa core with half ribs making the shape and ply formers sanded to shape for the tip itself. I made an alternative version by cutting correctly shaped one piece ribs from the plan, slotted at their tip for the curved and shaped ply piece to slide into. A single piece of ply could then be cut ready to sand to the correct tip profile. A slightly different technique but either method is practical. In both cases balsa pieces were added top and bottom to give enough material to sand to an aerofoil section.

Balsa sub-ribs were glued to each of the end ribs at the leading edge to form the support for the aerofoil shape of the wing slot. Balsa sheet was then glued into place to form the curve of the wing slot. This has to be done before the slot formers are added as they glue to the sheet. The area was sanded to profile with the leading edge at the rear of the slot, then the riblets were added before the top sheet was put in place later.

Holes drilled in the root rib to make cutting the slot for the dihedral brace easier later

Wing joiner/dihedral brace in situ. Make sure it is well glued!

Ply spar webs to support the wing joiner

Sid's wingtip build method uses a central balsa core

I used open structure wingtips. Start by clamping the laminates before sanding to section

Open structure wingtip with single piece slotted ribs

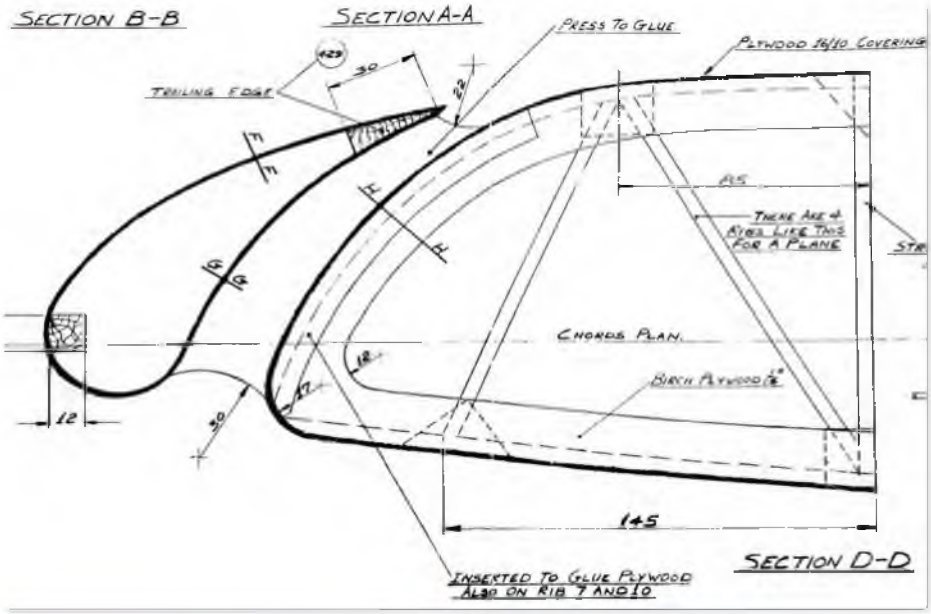
Open structure wingtip after sheeting

Wing Slots

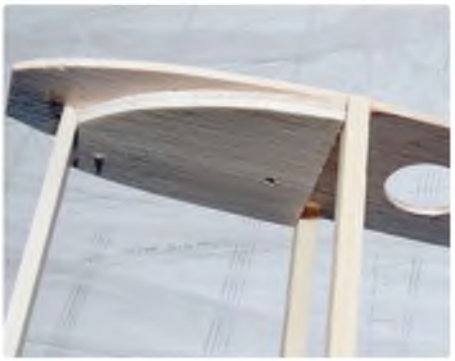
The wing slots are a real characteristic of the Turbulent and it was important to include them. Some modellers have made versions of this type and not included them, only to regret it later. It is a challenge but well worthwhile.

There was no indication as to how to make these so a quick trip was made to the airfield where the full size is being restored and I scrounged a drawing of the full size leading edge support pieces. All ply, as per full size. The leading edge of the rear part of the slot is sheeted and sanded to an aerofoil section before these ribs are added. These fit between the false wing leading edge and the slot rear spar. The first attempt was a failure as I cut the profile too shallow. Further attempts were made and the correct profile and slot width was attained.

The slot ribs have to match the profile of the sanded slot leading edge. On one wing I made a full length leading edge but this caused a few problems when forming the slot. On the second wing I glued the formers in place on the pre-fitted slot sheet and completed the wing leading edge with a section let in. It is essential to obtain a consistent width to the wing slot, top and bottom. I confess to a bit of head scratching with this but in the end it produced a workable and reasonably good looking final product.



Slot section from the full size plan



A balsa tip doubler is used to form the curve of the slot inner sheeting

Inner slot skin with spacer ribs fixed in place

Finished slot needs care when covering

The full size slot was referred to for build information

Next Steps

At this point some decisions needed to be made. The undercarriage is bolted through the main spar on the full size so I decided to follow suit. Now this may be an error as it means I will end up with a one piece wing. The undercarriage was constructed at this stage and it required five brass brackets to secure it in place. These I made up with a sprung oleo leg and adjustable drag strut ends. This process has been described in a previous article in RC Model World.

The wing joiner needed to be glued in place before attempting to locate the bracket positions. You could do a dummy fit and drill the holes, but locating them again after fitting the joiner would be a bit of a lottery!

The brackets were clamped into place without the bolt holes being drilled. The oleos were then loosely bolted into place to gauge the correct height, allowing for the width of the yet to be added sheeting. The hole positions were marked onto just one of the brackets in each set while the set up was clamped in place. They were then removed, centre punched and drilled to clear the 4 mm bolts. Great care had to be taken when clamping the drilled brackets to make sure they stayed in exactly the right place.

Very carefully, using a rotary tool and a 90° right angle attachment, I drilled through the spar web and wing joiner. I left the bracket in place and positioned its opposite half. After clamping it in its exact position, I then very carefully, using the rotary tool, allowed the drill to pass through the previous hole and let the drill mark the surface of the other bracket to indicate the hole positions.

I then removed it and drilled the holes accurately with a pillar drill. It was then replaced and checked for correct fit, and to make sure the bolts lined up. This is a precise operation and you only have one chance! The process was repeated for the other brackets.

The drag strut bracket was bolted to a thick triangular ply piece glued into the corner of the second wing rib and wing spar. It is slightly proud to allow for the sheeting. The bracket is bolted through brass tube and held in place with a self locking nut. Care was taken not to over tighten as this would allow some rotary movement at this point; it can be tight but needs some movement.

For all undercarriage brackets add a backing plate for the nuts to bite into

All nuts used were of the self locking type. It is important that where there is a bracket on one side of the spar that a brass backing piece is made for the other side. It is useless tightening nuts and bolts onto wood. The holes will widen with vibration and use, and then you will have a real problem to sort out!

I now had a skeleton wing, with undercarriage brackets fitted, ready to be sheeted. To fit the undercarriage to the other wing the two halves needed to be joined prior to any sheeting being added in order to drill the bracket locations accurately.

Sheeting

The 1/8" sheeting on the Turbulent is considerable and is angled at the root end, top and bottom. It also has very characteristic scallops along the rest of the leading edge sheet. I cheated a bit and opted to make these in one piece, added after the bulk of the sheeting was in place.

The sheeting is in several sections and I opted to do the difficult piece first, the underside, because of the bracket openings. The sheets were laid up on the ribs and left oversize at the leading edge. I made up the leading edge sheet from the slot position and joined it to the sheets that made up the angled piece and the centre section sheet to rib three. These were laid flat and joined with super glue. This large sheet was then offered up, the bracket position marked and also the position of the drag strut ply support. Apertures were made for the brackets and again the sheet was laid over to check the fit.

All Good!

Copious glue was put on the spars and the sheeting was laid into place. Masking tape was used to secure the leading edge and many copies of magazine and newspapers laid over the whole lot to maintain the wing profile.

I don't know about you but this is one of the jobs where no matter how much you double check, when committed to glue and everything fits, it is always a relief!

The top is a repeat process without cut outs.

Hard Points

The wing is held in place by two bolts. At the trailing edge I cut a section of balsa sheet away to allow a piece of 1/8" ply to be let into the surface, top and bottom. After gluing the first piece of ply for the plate into the bottom sheet, I made ply riblets to the same profile as the wing ribs but slightly smaller to allow for the thickness of the ply. These were epoxied into place on the bottom sheet, then the top piece of ply was added to complete a strong mounting point for the wing bolts.

Ply ribs and plates for the wing bolt stress area

The End Is Near!

A card template was made with the shape of the scallops cut out. This was carefully checked on the wing to ensure the rib centres were aligning with the scallops. With the card taped to the wing to make sure everything was in line a template was used to mark up the balsa sheet. It is much easier to cut them out on the bench than in situ; you just have to take great care with alignment. With scallops cut out of the sheet it was offered up, glued in place and repeated for all four wing surfaces.

Once that was done tedium set in again when all the capping strips needed to be cut from 1/8" sheet and glued in place top and bottom. It was time consuming but the end result was rewarding and the wing wouldn't look 'right' without them.

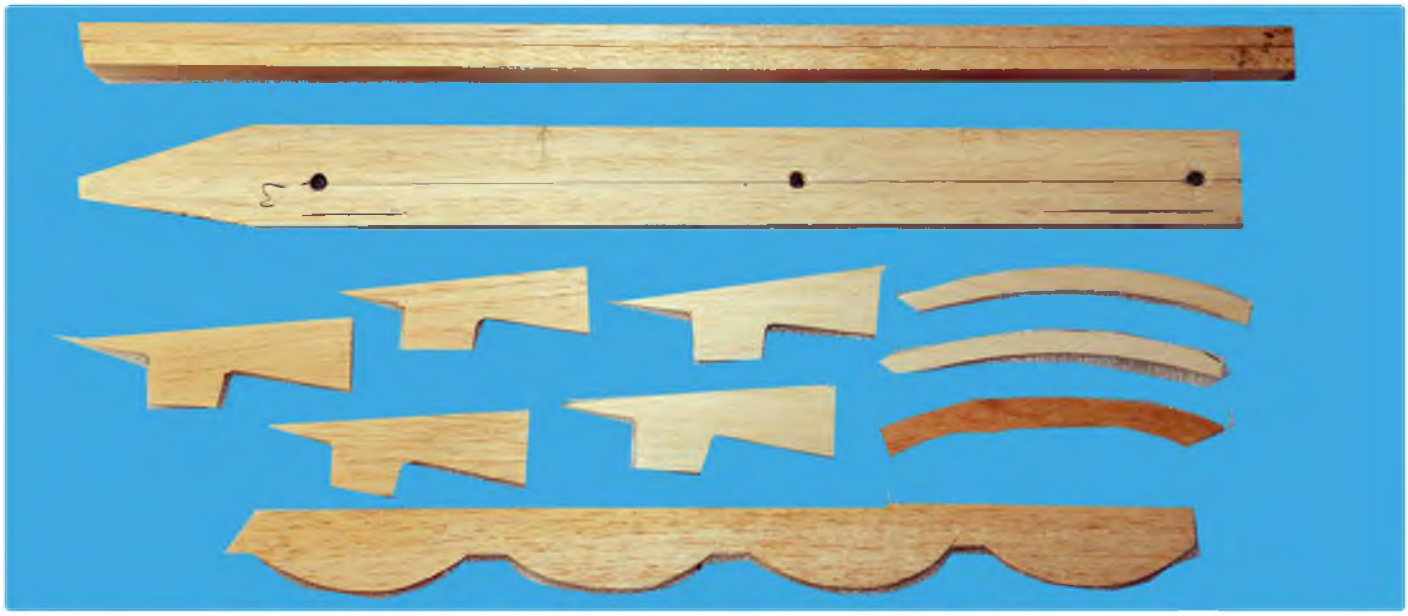
Tip sheeting was added, as was the balsa square at the trailing edge. Then the whole wing was given a light sanding. I added balsa square to the trailing edge for the length of the aileron, to be sanded to shape to accommodate the hinges and aileron leading edge.

Top sheeting pinned and weighted to keep it in place. Note the separate scalloped piece

Ailerons

The ailerons can be built using a central core and then laminations made up for the leading edges. The lamination can be extended at the rear for the hinge points to give correct centres. Alternatively the ailerons may be built similarly to the wing by pinning the ribs in place and adding a solid leading edge, with balsa blocks at the hinge positions. The leading edge can then be laminated, planed and sanded to the correct shape. Hinge positions can be marked and the tubes set in place.

I needed to be very careful here as the hinges have to be recessed into the aileron leading edge in their tubes, while the tubes in the wing trailing edge need to be slightly proud to allow for full and free movement. I did not require massive aileron travel but ensured that adequate movement was available. I cut control horns from PC board material and epoxied them into place in a balsa 'sandwich' at the appropriate rib positions.



Aileron components

Ribs pinned to leading edge of aileron

Aileron hinge point and spar with added balsa to form the curve

Completed aileron with scallops

Finishing Touches

With the wings joined the undercarriage was removed to enable the covering to go on. Before covering the whole wing was given a fine sanding and two coats of Balsaloc to help with adhesion of the covering. I used silver Solartex from a 10 metre roll, leaving plenty to cover the lower part of the fuselage and tail surfaces!

The leading edge of the wing top and bottom was painted Carnival Red. I cheated with the registration numbers, having them made from self - adhesive vinyl sheet. The wing numbers are quite large, with a smaller set for the fuselage. You can, of course, paint them using masked shapes but for a small outlay you can have them cut and in place in no time!

That completes the wing build. Now to complete the fuselage, tail and fin...! ***RCMW***

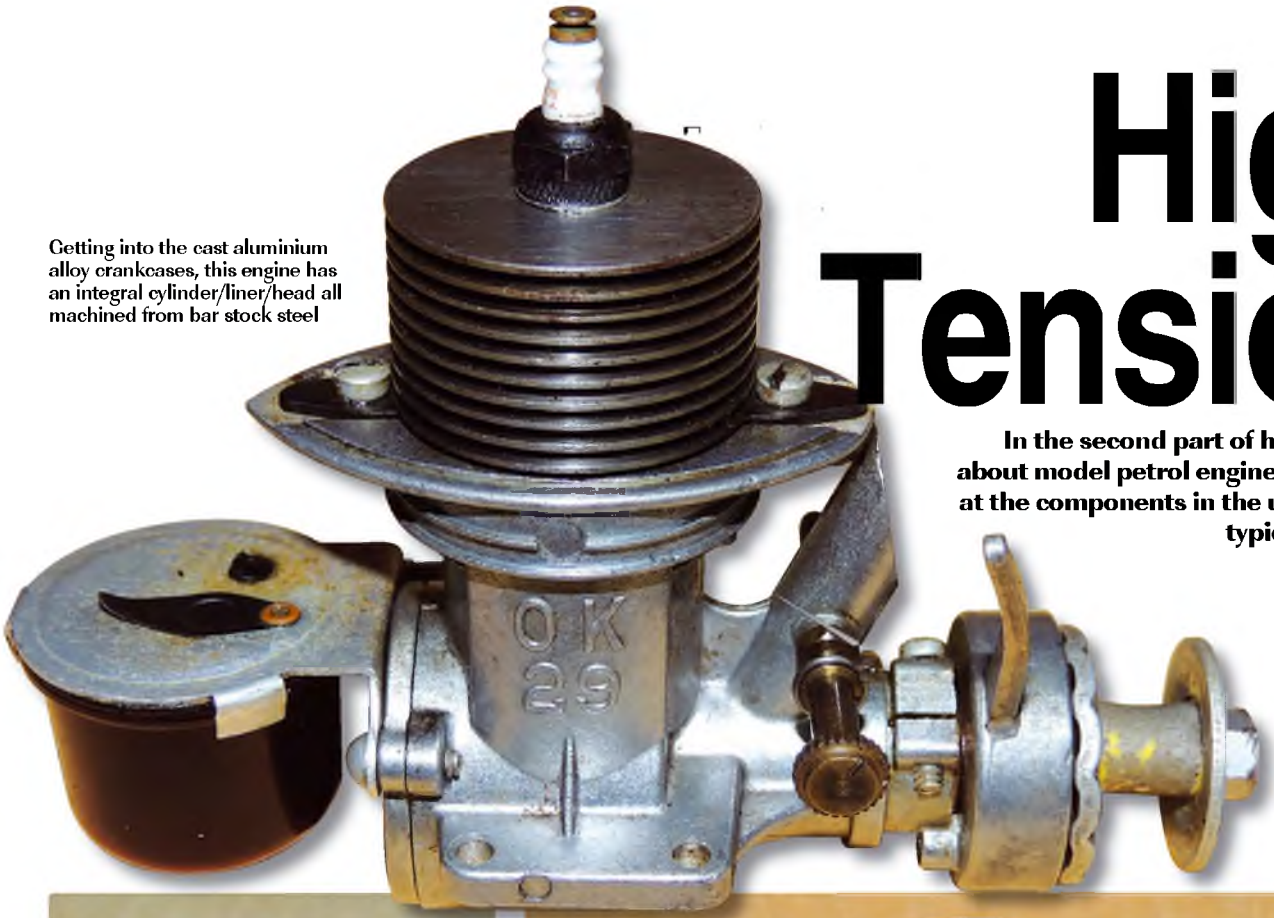
To Be Continued

Plenty of room is needed to cut the covering!

All the effort of making a nice scale model reaps its reward at the flying field

High Tension

In the second part of his new column about model petrol engines, Ivan V looks at the components in the upper part of a typical 'gas' motor



Getting into the cast aluminium alloy crankcases, this engine has an integral cylinder/liner/head all machined from bar stock steel

From a quite old DIY kit I have to build a medium capacity petrol four-stroke, this is the casting for the cylinder/liner – all in solid (damned heavy) cast iron

Another view of the OK 29. Those two small tags with the slotted screws retain the entire top end of the engine to the crankcase

Name That Part

Okay, moving on with our petrol engine discussion, I am going to deal with the upper section of the engine and the use of common terms. The reason for this is to give some readers an insight into the correct names and terminology when dealing with their engine.

I have heard it in model shops, and I have received it in conversations at flying fields when a modeller is asking something about his engine or a part that is a problem. Along the lines of, "Hey Ivan, you know that Fizgig 69 engine I have?" (Maybe I do – probably I don't or I haven't seen his engine!) "Well, the thingy that goes into little chamber on the side of the bit where the screw goes in has bent. How do I get the screw out and where can I buy another thingy?" Blimey, mate, I haven't a blasted clue, as I have no idea what you are talking about.

Another common one that has crept into common terminology when describing an engine: "It is an ABC (whatever) .90" and, "Does it have a ring or is it non ringed?"

"I just told you – it is an ABC so it doesn't have a ring!" Well, here we go into the field of arguments if you want to keep on...

This is the area with which I am going to deal – the parts of your engine and how they should be named, as well as some of the history of the development of our engines.

While I definitely will expand the range of petrol engines to cover most of those available, for this beginning section I want to discuss the top section of a reasonably large petrol engine of the two-stroke variety. The top section to which I refer is that part attached to and above the crankcase – the part with the cooling fins. Err...what is it called?

Well, depending on which school you attended it might be the 'upper cylinder', the 'barrel', the 'cylinder' or the 'liner'. Well, one is correct, two are acceptable and one is incorrect.

The part is the cylinder of the engine. It is the upper cylinder, but that is unnecessary as its position explains that unless it is a radial engine. And besides, later on, when we look at four-strokes, we will deal with 'upper (and lower) cylinder' matters.

The term 'barrel' is often used and is reasonably acceptable but it is a bit old school. 'The barrel of your engine' (referring to motorcycles) was common years back but these days most folk prefer to use 'barrel' when they are talking about their favourite tipple!

Look at the socket screw lurking in the shadow of the exhaust manifold. Sometimes it can be just damned difficult

This is the access for that screw – not at all a friendly design

A sample of commercial Tee type Allen keys. They are available in a range of hexagon sizes and lengths

My custom socket tool machined from a high tensile socket head cap screw. Lock the nuts tightly together – use the bottom one for loosening and the top one for tightening

With a stroke of luck the socket also fits 1/4" spark plugs, so I fitted a loose fit Tee bar that can be held in position by winding up the top nut

Some of these spark plugs are quite long so I drilled into the shank of the tool to allow a full-in fit

The one term that is definitely incorrect is 'liner' and as there is a fair bit of information in this field we will leave it for a little further on.

With A Lid?

Many engines these days, both two and four-stroke, have monolithic cylinders, a terminology that has become common in recent times. This refers to a cylinder that has a solid base and incorporates the cylinder head all in one piece. To me the term 'monolith' grates a bit as a monolith is a large stone (simple example) yet the word monolithic can refer to massiveness, rigidity and uniformity, which is probably the reason the Saito company refers to the cylinders on their engines as 'of monolithic construction'. I rather like the term 'mono construction'.

In my early days this form of cylinder and head (on motorcycle engines) was referred to as 'unit construction' or 'fixed head' and it was a bit of a pain at times when engines needed very regular decarbonising. The poor quality oil used for two-stroke engines caused a rapid carbon build-up and this had to be removed from the combustion chamber to retain the general performance of the engine. If the head was part of the cylinder you needed long scraping and cleaning tools and, sad to say, most often this was a screwdriver which did more to cut grooves into the head metal than it did to remove the carbon.

These days oils are so much better and carbon build-up is not such a problem if you use a good quality oil, which we will discuss some time further on. In any case, if you do have an engine that needs decarbonising or general cleaning, a blast with bicarbonate of soda is the way and, again, this will be a future topic.

If the engine has a mono construction cylinder it is attached, most commonly, by socket head screws (parallel metal thread screws – not bolts, as a bolt needs a nut to secure it) though the cylinder base into the crankcase and, in many engines, the screw heads are accessed through the holes bored down through the fins. For these you need a long Allen key and, maybe, even a lever for effort as you will be using the short end of the key to do the work. I have a thick wall tube for the job and, in many cases, a long series Tee Allen key.

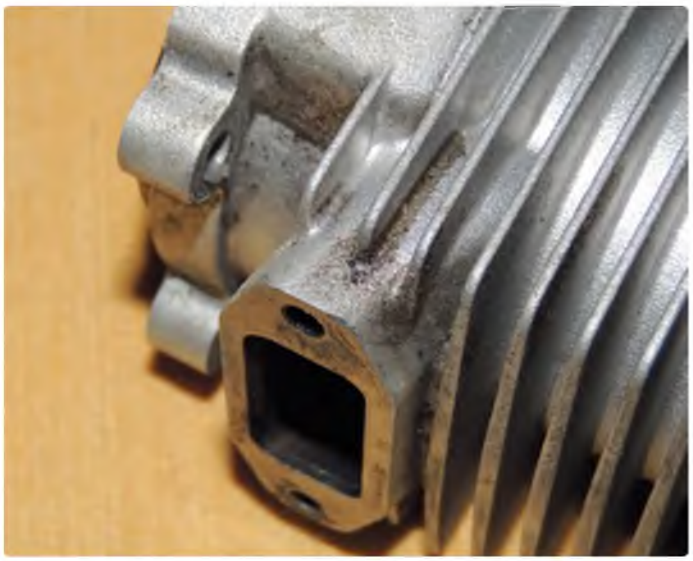
I strongly advise you to not use a ball ended Allen key as even the highest quality of these can and will break the ball off if a lot of effort is applied, and then you have a very nice problem – an almost inaccessible socket head screw that is very tight in its position and it has the socket full of jammed ball end. A real hair tearer that has been known to induce rude words and fits of tantrums. (I'll tell you how to fix this later on.)

Another method of attachment – and this also is used at rare times when a separate head is used – is the use of full length screws or studs. Way back when, it was a hot topic if a motorcycle you had or was interested in had this method of retaining the head or heads – 'it has full length studs' or 'a studded barrel'. So what? Big deal and sometimes not so great if high tensile studs were not used, as the studs would stretch and there would be leaks under the cylinder head. If work was done on the engine and the head removed – and this applied to many car engines as well – the studs had to be re-tensioned (using a torque wrench) after so many miles otherwise the fit would become loose and the head gasket would blow.

As a point of interest, the very reliable six cylinder Holden engines (from an Australian

Some cylinders have super easy access to the base retaining screws...

...but some are not so friendly with access being very difficult



These will certainly try your patience, particularly when you realise you will need special tools for the job

car) used long, very high grade cylinder head screws and these were fitted with a special compound (like a rubber gasket material) on the threads that engaged into the crankcase. The recommended torque setting was surprisingly low and there were strict instructions that the head screws were not to be re-torqued at a later time. It worked a treat and many of these engines ran up phenomenal mileage without the sight of a spanner.

Back to the model engines, those engines using full length screws or studs need careful consideration if you are to work on them. One particular brand of high quality petrol engine has a studded cylinder and the retaining nuts on the head are not only very difficult to access but they are also in a small diameter cavity in the finned head that requires a special socket to loosen or tighten them. The first time I worked on one of these engines I had nothing in my vast tool collection that would do the job or, if a tube spanner would have fitted it would not have been strong enough (structural integrity) to do the job. I certainly had a number of high quality sockets of the correct hexagon size but the outer diameter was too large and I did not fancy 'modifying' my expensive sockets. Plus, they are damned hard to machine due to the hardness.

After a bit of head scratching I reverted to one of my favourite tricks – make a socket for the job. For this purpose I used a high tensile (Unbrako brand) socket head screw. I machined the head diameter of the screw down to fit in the cavity (in the head), attached two nuts (locked together) on the threaded end of the screw, then attacked the job with a normal ring (or open ended if you like) spanner with great success.

In hindsight I considered that the designer of this brand of engines (very high quality) had intentions of discouraging the casual engine fiddler from disassembling his engines (good after sales service was available) by making it very difficult to access the fasteners (screws) of the engine unless the person had a bit of reasonable knowledge and could do the job with the special tools required. As well, it was of extreme importance that the fasteners were evenly tensioned to prevent cylinder distortion.

A Side Track

I need to go back quite a few years now to put you in the picture of the development of petrol engines for model use, and those for full size aircraft, as these developments have a bearing on our modern model engines with the processes and types of production. Sit comfortably and wind back the clock to the era of the 1930s and 40s.

From the first powered flight at Kitty Hawk by the Wright brothers, it was very rapidly became evident that there was a future in man carrying powered flight. Being as competitive as we are it was a constant competition to build bigger and better aircraft, fly further and have greater control over the billowing beasts.

Well, the aircraft industry certainly advanced reasonably rapidly and the first of the record flights were attempted. As it was well proven that mankind could join the birds, so to speak, the next quest was to design and produce powerful and reliable engines and that is where we almost came to dead stop as the rotary engines held the top position for a considerable time.

They were heavy, unreliable, induced incredible gyro forces to the aircraft and they did not have a carburettor. Engine control was by switching the ignition on and off – and hoping the forward airspeed or the inertia of the heavy rotating engine was adequate to fire it up again. While car engines were being developed in leaps and bounds there was a great difference in the requirements of a car engine and one that could carry aloft an aircraft, with weight being the first consideration.

It was at this juncture that the ratio of power to weight became important and, later, added to that was the consumption of fuel, the power that could be developed from the fuel used and this was a huge stumbling block. It was still a time when extremely low grade 'petroleum spirit' was purchased from an apothecary's shop (today, a chemist's shop) and it was generally in large bottles and the like. This was okay for a little flit around basic roads in your family flivver but an aircraft engine consumes gallons and more gallons per hour – they are incredibly thirsty.

I am sure most readers have had some experience with methanol fuelled glow ignition engines and how they go through the fuel. As a guide, it is roughly 2.5 times more

The head nuts on the cylinder studs of this twin engine are not at all easy to access but..

...nowhere near as difficult as these. One of the dome nuts is shown, as is my socket in position

You can see how far down you have to go to reach the stud nuts. Certainly not a job for pliers or vice grips (hee-hee)

per given time than a petrol engine of the same swept volume (capacity).

Now, imagine this... At one stage of aircraft engine development, Rolls Royce developed an immensely powerful engine (I think it was a Vee 12 from memory) and it was fuelled with methanol. I find it hard to imagine the size of the fuel tanks in the aircraft, particularly when you consider the engine was normally aspirated (carburettor and a blower) without the benefit of fuel injection. That engine had…err…a short history.

Apart from the problems of the very low grade petrol of the time, the biggest problem was the manufacturing of the engines and the metals used in that manufacturing process. We take for granted these days a non ringed aluminium alloy piston that can run at extremely high rpm for many hours in a chromed liner (as an example). No such luck in those development days as aluminium was a bit of an unknown quantity, as far as alloying it with other metals and elements. Steel was a little better but not much, so good old reliable cast iron – the heaviest of the lot – was employed for many applications.

One thing about cast iron, it is the one metal that can be used for a similar metal application – cast iron piston rings in a cast iron liner, for example – and this is against a lot of metallurgy principles where dissimilar metals are best to use with each other in rub or wear situations.

Early full size engines suffered many failures and this was down to the unsuitable metals, early lubricating oil (they used gallons of the stuff when running), cooling problems and, mainly, the fact that it was still a reasonably dark area, with nothing in the past to act as guidance. While accuracy in machining was extremely good, especially considering the machines of the time, the biggest hurdle was the metallurgy, producing alloys suitable for the parts.

It was generally well known that steel was an alloy of iron and carbon and then there were alloy steels – other ingredients such as chromium and molybdenum (Cr+Mo) were added to produce what is generally known now as 'chromoly', commonly referred to as aircraft steel or, most commonly, aircraft tubing (it is also the main steel alloy used for bicycle frames). The addition of nickel produced a stainless steel but, whilst this is reasonably common knowledge these days, along with, say, high silicon aluminium alloy, it was a dark art of experimentation in those times.

The catalyst that really moved technology on in leaps and bounds was, unfortunately, the advent of a world war and the race for air supremacy provided the vital lift needed to produce the magnificent engines that, even today, still exist and work.

For a really great insight into the development of aircraft engines, get hold of a copy (best from a library as it commands enormous prices on the rare book sites) of 'The Power To Fly' by L.J.K Setright – a definitive on the subject and a book that takes a lot of effort to put down once you start reading.

What About Us?

Well, you can see a parallel of the aircraft industry of those past days in our own early model engines. The hobby of aeromodelling goes back before the war but that event was, no doubt whatsoever, the spur that kicked the hobby to an incredibly wide audience. Men, young and old (and a few women), wanted to build model aircraft – models of the aircraft that flew constantly overhead towards a battle zone, models of aircraft made famous by air aces and models of aircraft documented in aerial battles.

To me it seems odd that many model engines were developed and manufactured during the years of conflict as I would consider the resources available would have been limited, as would the manufacturing of them be seen to be a frivolous venture in such trying times. Maybe the development in the early 1930s was a bit of a trigger and many of those aircraft are now referred to as the Golden Era of aviation.

As the interest grew so did the demand for model equipment. Balsa was not so common, so other timbers were used, resulting in reasonably heavy aircraft. As to engines, petrol power reigned supreme, simply because that was the only fuel and type of engine commonly known about. It was not until 1946 that the glow plug came on the scene and even then it took a long time for its acceptance as many of the (then) current petrol engines could not be converted as the compression was low (low for

Due to current demand there are some magnificent petrol engines now available and this DLE twin is one of my favourites

This very large, slow flying (scale speed) Fokker will putter around for hours with a slow revving, large capacity petrol engine and with not much more than a cup of petrol used

methanol use), the simple fuel management spraybars were unsuitable for the high volume methanol use (2.5 time more than petrol) and many of the engines would not have been able to cope with the stresses of alcohol fuel performance.

Many manufacturers saw the potential market for model aircraft engines and production began, in many cases, without the requisite knowledge required to produce such a demanding item of machinery. Quite a lot of the quickly produced engines advertised in glowing terms in popular magazines were an abject failure. Many were so bad they would not even run, let alone last for any period of operation. These became known as 'slag engines' and it is sad to think of how many hopeful aeromodellers were caught with these pieces of junk that were no better than a paper weight.

On the other hand there were many very well made petrol engines, in spite of the lack of materials knowledge and the machinery available for turning out the bits and pieces. Here we look into some interesting aspects of materials used and methods of fabrication which are the cornerstones of our modern engines and the kick-off point for styles and developments.

I began this article discussing the terminology relating to cylinders, barrels and liners and how they presented on model engines. Looking now at some of the very early model petrol engines we have an interesting parallel to some of our most modern engines. Model engines have been, for quite a while now, emerging from a period of manufacture that was strictly cylinder and liner – the liner was an insert (more on this later). We are seeing more and more an integral liner – a cylinder in which the liner is part of the fabrication. Maybe a full circle in some ways as that is how many of our early engines were designed and manufactured.

One simple reason was that there was not a suitable material for a separate cylinder that would not create a problem with the coefficient of expansion. Many early petrol engines were, virtually, all cast iron as this was the metal with the best known qualities at the time. Complete engines and engine kits were available that had only some internal parts that weren't cast iron and there were many blueprints available for home builders to cast their own parts. Imagine that – melting and pouring iron for cast work in the backyard!

(Okay then, how's this for an eye opener…I had details of a modeller in the UK who had modified the house wall behind the kitchen fireplace so he could use the area as a furnace, in which he melted cast iron and that required a temperature around 1,200º C, which would really get the kettle boiling in a jiffy!)

The cylinder was of mono construction (as in the one component). It was a finned outer cylinder with the internal bore finished to serve as the liner. The few I had years back were interesting engines for the time and they ran quite well (again, for that period of time) but they did require some careful handling if they had been very well made with a good finish. In these cases the cast fins (part of the main casting) would have would have been machined to a fine finish and slightly tapered – thicker at the base – so the outer section was quite thin for good heat dissipation.

All well and good but it was cast iron and this metal has one disadvantage – it doesn't take at all well to bending, flexing or distorting. Rather than be subject to a bit of bending or flex it simply breaks and so many of those cast engines had broken fins from light load applications or serious breaks from a bit of heavier contact.

As steels and alloy steels were developed these materials were utilised in the fabrication of model engines but they had one disadvantage – casting these materials was a completely different ball game to that of cast iron and this work was in its fledgling stages so parts fabrication was the order of the day and this led to some very interesting engines and fabrication techniques.

In my next article I will tell you about the simplest connecting rod you have ever seen and how it is fabricated. It is made up of several parts and, best of all, it works and works well. ***RCMW***

FISHER DELTA 3D PRINTER

IMAGINE PRINTING YOUR OWN PARTS AND ACCESSORIES AS AND WHEN YOU NEED THEM

At £399 the Fisher Delta makes quality 3D printers affordable

Includes free roll of white filament so that you can begin printing straight away using one of the many free software packages online. This amazing printer is designed in the UK so quality and durability are guaranteed and upgrades and UK support are readily available. Traplet also gives you access to free video download of instructional information on building your printer and guidance on beginning to print. Get a taste of what your printer can do by visiting www.trapletshop.com and click on our '3D Printing' tab – there are five fascinating videos to watch before you buy.

Printing your own 3D objects, parts and components is easier than you might think – if you can imagine it, chances are you can print it! Make your model as detailed as possible, without having to search for those elusive and expensive parts.
Replace those broken parts without having to send your item back to the manufacturer, or pay a fortune for components.

So versatile you will wonder how you managed without it!

Assembly
The Fisher Delta is supplied in kit form with component parts which are quick and easy to assemble by following the comprehensive online instructions, requiring only a few basic tools. All electronics are supplied ready to use with pre-made wiring harnesses – no soldering is required. Also available as a fully assembled unit at an extra cost.

The complete printer fits neatly into a corner of your desk or workbench, is quiet and odour free in operation and requires only a standard mains socket for power. An Ethernet port on the printer provides control via an easy to use website interface.

Parts
Parts printed from the supplied roll of PLA filament are very light and extremely strong, perfect for all modelling applications; whether structural or decorative.

3D printing is the perfect way to make bespoke scale details for all types of models. The builder of this big 1:3 scale RC model of a Druine D-31 Turbulent aircraft needed to represent the parts of the VW engine that protrude from the side of the cowling. He was able to supply reference photos and drawings of the full-size engine, so creating a 3D printable model was fairly straightforward. He'll need to do some sanding/filling/finishing before painting and detailing it, but it should look just right when installed in the model.

SPECIFICATIONS

Firmware
- Calibration: automatic bed levelling and machine calibration routine
- Layer resolution:0.3mm 0.05mm
- Build surface: Removable bed, uncooled Buildtak print surface (For printing with PLA). Heated aluminium plate available as an upgrade, (allows printing with ABS,PETG, PC, HIPS, and many more).
- Print speed: 0.4mm nozzle, up to 16mm3/s
- Motion: Up to 250mm/s, 4000mm/s2 acceleration, segmentation free real time delta movement
- Nozzle: 0.4mm diameter, maximum operating temperature 300°C, warm up time ~ 60secs.
- Power adapter: 100V/240V, 60W.
- Software:Machine control: On board web interface available via ethernet, USB control also available
- Standalone printing from onboard microSD card

Software
- 3D model processing:Slic3r open source software (free download - no license required) can generate G Codes for the Fisher Delta from .stl or .obj 3D model files.
- Supported platforms: Windows/Mac/Linux
- Prints G Code files generated by Slic3r and other open source slicing software

Materials
- Standard 175mm diameter filament (PLA Plastic)

For more information or for technical support please email info@traplet.com
To order visit www.trapletshop.com or
telephone our friendly Customer Services team on: **01684 588599**
All orders are plus postage and packing.

In The Loop

Keith Jackson updates us with events at the 2016 Triple Crown aerobatic competition

Team Ireland were victorious in 2016. Left to right: Shane Robinson (Oxai Axiome), Mikey Blake (Oxai Hybird), Niall O'Sullivan (Oxai Adventure) and James Murphy (Oxai Axiome)

The F3A Home International, otherwise known as the Triple Crown, is an annual event held between England, Scotland and Ireland. Pilots eligible to represent the English team were determined via a league table system, which is run by the GBRCAA. It uses the results from the four Centralised Team Trial events run for the BMFA by the GBRCAA and details of these can be found at www.gbrcaa.org/competitionresults.htm.

A similar system is used by the Scottish Aeromodellers Association (SAA) and the Model Aeronautics Council of Ireland (MACI).

Four pilots from England flew, drove and sailed across to Enniscorthy in Wexford, Ireland to compete against teams from Scotland and Ireland. An 'International' team was also run and included members from each of the three nations.

Historically the English team used to comprise of pilots who hadn't made the 'A' team; i.e. those chosen to represent the UK at European and World Championships. The intention of this was to expose those pilots to international competition in order to gain experience of the protocols and pressures that being involved in these events can cause.

This is not to be underestimated as no matter how cool the pilot is on home turf, standing in front of a panel of international judges and the world's best pilots in blistering heat or strong winds can be very off putting for the aspiring pilot.

Another facet of this is the problem that different judges judge manoeuvres differently or, in other words, judges have preferences in what they want to see and this is inescapable in the subjective world of F3A. This is something the FAI F3A subcommittee has been trying to minimise in recent years by holding judging seminars and releasing presentations of how they expect the current FAI schedules to be marked. More information on these can be found at www.fai.org/ciam-documents and www.gbrcaa.org/schedules.htm

Safe to carry on an airline? Transmitter box and flight batteries typically used in F3A

Ultimately it is the job of the pilot to present a schedule that is acceptable to all judges whatever their individual criteria, which is why attending events like the Triple Crown is so important for the aspiring pilot.

Pack It In

Travelling to Ireland might seem a trivial task in this day and age, with options of both air and ferry travel being available. However, when you add a 2m model and fuel/LiPo batteries into the equation, things can quickly get very complicated. Several months before the event English Team pilot Adrian Harrison and myself had elected to fly into Dublin and from there hire a van to drive down to Enniscorthy. The flights were nice and cheap initially but, as expected, when we factored in a 2m model box the price took a bit of a hike.

Checking through the mass of online information regarding sporting luggage allowance seemed to suggest that our boxes would be okay as long as they remained within the 15 kg limit; any heavier and things would get very difficult indeed. Adrian was able to use an old cardboard model box from a previous F3A model but I had no such box available and so I decided to make one. It is not that difficult to make such a box but if it was to remain within 15 kg and be strong enough to protect the model and survive rough handling, some thought was going to be required.

Eventually I settled on a box produced by Alan Cooper Packaging (alancooperpackaging.co.uk) made of 4 mm Correx, which arrived folded up in a very compact jiffy type bag. It opened up to provide a volume of 300 x 600 x 2050 mm, which was quite impressive considering how small the package was to begin with. To strengthen it I framed the box internally with 20 mm strip wood, reinforced with metal brackets at the joints. Cutting polystyrene formers to support the model components took quite a long time but provided brilliant support and protection. The whole package with the model packed weighed in at 11.6 kg and worked very well indeed.

The next problem was the issue of transporting batteries as both Adrian and myself were using Lithium Polymer cells for power. We took time to go to our respective airports and ask directly whether it would be permissible to carry LiPo packs across with us on the flight. Sadly, we were met with completely contradictory statements from both the airlines and airport security. This meant there was a real risk that if we decided to fly across with our LiPos that we could get into a situation where they could be rejected at the last minute by one of the concerned parties, which would effectively mean we would be out of the competition even before we'd landed.

Fortunately, fellow team member Brian Hoare agreed to transport our batteries as he was driving and taking the ferry over to Dublin. International team member Chris Halgreen decided to risk flying over and indeed he was able to carry all his LiPos with him on his flight, which just served to highlight the overall confusion that exists about the carriage of Lithium Polymer batteries. Subsequently all the travel plans for the English pilots went without issue but it was definitely a case of 'failing to plan is planning to fail'!

After driving down from Dublin we arrived at the Country Model Flying Club site midday on Friday afternoon, in the middle of the predicted monsoon type weather that had entered Ireland's airspace in the morning. This weather was to last all day and prevented any practice flights for the English team prior to the competition. Checking into Treacy's Hotel in Enniscorthy allowed us plenty of time to assemble the models and ensure their readiness for the start of the competition the following morning.

Team England (left to right): Gerhard Fehringer, Keith Jackson, Brian Hoare and Adrian Harrison

English Team

The English team comprised Gerhard Fehringer, who represented the UK at the recent European Championships in Germany this year, Brian Hoare, Adrian Harrison and Keith Jackson. In addition our International team member was Chris Halgreen, who had joined the GBRCAA this year after emigrating from Botswana and who'd flown very well at the recent BMFA Nationals to place second overall in the FAI P-17 class.

Scottish team members Steve Burgess, Colin Elgey, Wolfgang Schiebel and Malcolm Harris

Scottish Team

The Scottish team included legendary pilot Steve Burgess, who had already won the individual ranking in the Triple Crown numerous times, even before I began my F3A career in 1995. Also flying for team Scotland were Malcolm Harris, Colin Elgey and Wolfgang Schiebel.

The International team comprised of Paul Houlihan, Gordon James and Chris Halgreen

Irish Team

This year's Irish team included Shane Robinson, James Murphy, Nial O'Sullivan and Mikey Blake. Shane Robinson has been Ireland's top F3A pilot for many years and began competing in F3A in 2001 at the Triple Crown in Bantree, Ireland. He has represented his country at several World Championships in past years, eventually reaching a top 30 ranking in Argentina 2007. James Murphey is a relative newcomer to the world of F3A but he has progressed rapidly and represented Ireland in the European Championships in Germany this year, reaching 41st position, which was a fantastic achievement so early in his career.

Kudos To Country MFC

The event at the Country Model Flying Club was run by Brian Carolan and a dedicated group of club members, who helped present the site in a fantastic condition with multiple flight lines and who provided food and beverages throughout the competition. As I've said before people who volunteer their time and expertise to help run these events are the salt of the earth and they are absolutely essential to the smooth running of these events.

The event got underway early Saturday morning in absolute calm and sunny conditions, the complete opposite to the previous day's weather. Judges for the day were Dave King and Dave Foley, both from Ireland, and Ross Donovan who served as the Scottish judge. No judge was available from England to attend this competition, which was a real shame, and was to have implications in the scoring of competition flights, as alluded to earlier.

Flying in absolute calm conditions, believe it or not, can be almost as hard as flying in windy ones. The lack of a defined airstream can cause significant difficulties in holding a consistent heading up and down the flight line. Spin entries are also difficult where the requirement to initiate a clean stall needs the nose of the model to rise as the airspeed drops to zero.

A lack of a headwind can cause the model to wallow and sag into the spin, causing a significant downgrade. The pilot has to be very switched on to counter this and raise the model's nose without causing the model to zoom upwards, which itself attracts a significant downgrade.

A perfect spin entry requires the model's Centre of Gravity to track a horizontal line, with the nose of the model rising and the airspeed decreasing until the model stalls. At this point the model will drop forward or may also drop a wing prior to rotation in the spin. If the entry speed is too fast the model will zoom upwards prior to the stall; if the speed is too slow then control of the model will diminish and it will follow an arcing path into the rotation, which is initiated by the relevant control inputs. The point in the latter condition is that the model airspeed is not zero at the stall and, consequently, it is forced into the spin.

Flying progressed without any delays through the Saturday with a variety of models and styles being demonstrated. Shane Robinson flew his Oxai Axiome/YS 185 CDi, which was the only IC powered model of the event. Mikey Blake used Japanese pilot Koji Suzuki's ex-Hybird biplane, acquired after losing his own model to a crash during the 2015 F3A World Championships in Switzerland. Niall O'Sullivan flew an Oxai Accuracy/Brenner Contra Drive system powered by a Neu F3A-1 motor, and James Murphy an Oxai Axiome, but in this case powered by an electric motor. At this point I have to say to that both Axiome's flew very well in the mixture of conditions that were to come.

Spin entry requirements

Niall O'Sullivan with his Oxai Accuracy biplane powered by a Neu F3a-1 motor/Brenner v3 Contra Drive

O.S. OMR-4043-172 brushless motor with gearbox fitted into Mikey Blake's Oxai Hybird biplane

Far Out!

The Irish pilots, being locals, were used to flying in the very windy weather present prior to the start of the event and generally flew quite far out from the judging position, between 175-200 m. The Scottish pilots also mimicked this approach, with Steve Burgess and Malcolm Harris guiding their Sebart Mythos S Pro/Hacker C54 through a smooth and controlled display of FAI P-17.

This was quite different to the way I saw Steve flying a few years ago when he adopted the slower, closer flying style at 150 m. This doesn't sound like a big change but at this distance if your timing isn't quite right or you fluff an entry/exit to a manoeuvre, the knock on effect can be disastrous for the whole schedule.

It looks great when flown that close but is very difficult to do convincingly. Flying at 175 m and beyond allows bigger, faster manoeuvres that are easier to control but has the drawback of being subjectively less involving and, more importantly, should attract a judging penalty of 1 to 2 points (out of 10 for each manoeuvre) depending on how far beyond 150 m the pilot is flying.

Malcolm Harris (left) and Steve Burgess of team Scotland with their Mythos S Pro/Hacker C54

Team England stuck to the rules of flying at 150 m and drew a variety of scores, some expected, some bewildering and some inexplicable, such as a mixture of sevens and zeros for manoeuvres like spins and snaps. This is not uncommon, even at the highest level of F3A. Years ago the majority of the French F3A team, including World Champion Christophe Paysant Le Roux, received several zeros for their very axial snap rolls. A hasty modification followed to the more barrely presentation and their scores recovered immediately.

As mentioned earlier, knowing what the judges want to see is paramount to success! Not having an English judge at the event certainly had a deleterious effect on the overall scores attained.

Brian Hoare flew his trusty Sebart Wind S pro/Brenner Contra drive well despite the worsening conditions that prevailed through the day. Designed by San Marino pilot Sebatiano Silvestri, this model is a typically reliable, low cost solution to F3A and can be bought in the UK via Dumfries Model Centre. The Contra Drive propeller system, designed and produced by Brenner Sharp in the US, can be obtained from Bondaero in both v3 and v4 versions.

Second English pilot Gerhard Fehringer recently represented the UK at the 2016 European Championships in Germany, finally attaining a 58th position at the end of the preliminaries, which was a great

English team pilot Brian Hoare with his Sebart Wind S Pro/Brenner V3 Contra Drive system

achievement for his first international event. At the Triple Crown he used his Oxai Galactik running a single, three-bladed propeller to control the model's speed in flight as opposed to the increasingly more popular contra drive propeller system.

Third and fourth English team positions were held by Adrian Harrison and myself, both flying the BJ Craft Agenda/Hacker C54 motors, using the Ralph Schweizer contra drive propeller system (CRS). These models perform amazingly well and their light weight enables them to be flown very slowly at the correct distance from the flightline to maximise scores. The Agenda, being a development from last year's BJ Craft Inspire, features two piece plug in wings and an all moving tailplane, and are also available in the UK from Bondaero.

As the first day of the Triple Crown progressed, the weather changed from sunny and flat calm, through to breezy and eventually quite wet. This was to be the best of the two competition days as Sunday dawned with very strong winds, resulting in the competition being closed after one round.

In this round the two Oxai Axiome's fared very well, being flown extremely fast at distances in excess of 200 m. In contrast I tried to fly my Agenda too slowly for the prevailing conditions whilst maintaining the 150 m distance and suffered lower scores accordingly. I'm happy to chalk that down to not enough experience with the model in difficult conditions and I'm still very happy with the model as a whole.

So after four rounds the team event was won by Ireland and the scores obtained are shown in the table below. Next year the event moves to England and hopefully the goodwill and camaraderie shown to all in Enniscorthy will follow. ***RCMW***

Triple Crown 2016, Enniscorthy, Ireland
Team Results

	Round 1	Round 2	Round 3	Round 4	Position	Team Score
Ireland						
Shane Robinson	1000.0	1000.0	973.0	1000.0		
James Murphy	956.8	983.0	1000.0	939.3		
Mikey Blake	950.3	972.3	956.3	891.5		
Niall O'Sullivan	894.2	940.4	941.8	882.9		
Total	*2907.1*	*2955.3*	*2929.3*	*2830.8*	***1***	***8791.7***
England						
Adrian Harrison	874.7	855.3	881.5	718.0		
Keith Jackson	976.2	980.6	973.0	908.9		
Gerhard Fehringer	825.1	900.0	894.0	835.1		
Brian Hoare	684.7	759.6	792.2	757.1		
Total	*2676.0*	*2735.9*	*2748.5*	*2501.1*	***2***	***8160.4***
International						
Paul Hoolihan	755.9	748.9	769.2	663.8		
Gordon James	786.2	868.1	891.9	741.9		
Chris Halgreen	805.6	868.1	885.7	765.7		
Total	*2347.7*	*2485.1*	*2546.8*	*2171.4*	***3***	***7379.6***
Scotland						
Colin Elgey	684.7	612.8	632.0	548.1		
Wolfgang Schiebel	514.0	655.3	704.8	533.6		
Steve Burgess	954.6	921.3	997.9	921.9		
Malcolm Harris	734.3	714.9	854.5	642.1		
Total	*2373.6*	*2291.5*	*2557.2*	*2112.1*	***4***	***7222.3***

Adrian Harrison flew his BJ Craft Agenda/Hacker C54 with CRS Contra Drive system to eighth place overall

Individual winner, Ireland's Shane Robinson with his Oxai Axiome/YS 185 CDi

Turbulators on Shane's Wind helped in the windy conditions

Jetco Navigator

Peter Kraus builds a vintage seaplane from an old kit but uses 2.4 radio and a brushless motor to satisfy modern expectations

I live close to a body of water that tends to be calm in the evenings, especially at low tide. So the thought naturally occurred to me that it would be nice to have a seaplane. Although I have been building models for a very long time my recent aircraft acquisitions have all been ARF electric foamies. I started to look at the various, rather nice, flying boats available but I must confess to some guilt as I had spent my allocated money on models that I really want around and here I was looking to spend more.

Like most long time modellers I have numerous kits and half built planes stored in my workshop, most for many years. Among these was an original, circa 1960 Jetco kit of a Navigator flying boat, bought years ago from the estate of one of our elderly club members who had passed on.

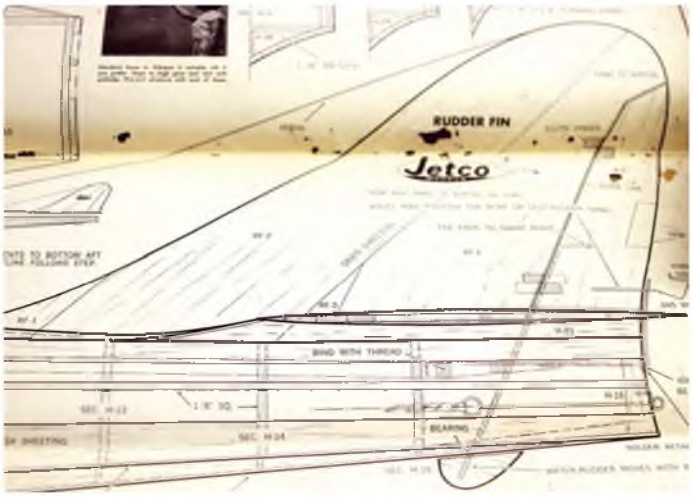
Not only would building the Navigator give me my flying boat but it would also be fun and reduce by one the number of kits waiting to be built. It would also serve to polish up my rusty building skills and allow me to experiment a bit before embarking on other projects which, notwithstanding the years they have lain dormant, are cherished items on my bucket list.

Preliminary Thoughts

The Navigator is a 52" span flying boat with an NACA long planing hull. It was designed by Don McGovern and kitted under the Jetco brand name by the C.A. Zaic Company of Brooklyn, New York. All great names in their day so it really is a nice exercise in vintage nostalgia.

It was designed as a free flight or single channel R/C model for use with the rudimentary radio control systems available in 1960, rudder only or rudder and throttle, or even elevator! Yes, on only one channel and, as much as those small engines of that day could be, it could be throttled too! As such I expected it to be inherently quite stable and therefore suitable for a beginner flyer, or in my case an old guy with rusty thumbs. But in those days people who built models actually built them, if you know what I mean. But this model is not a beginner's build.

The 1960 Jetco Navigator kit

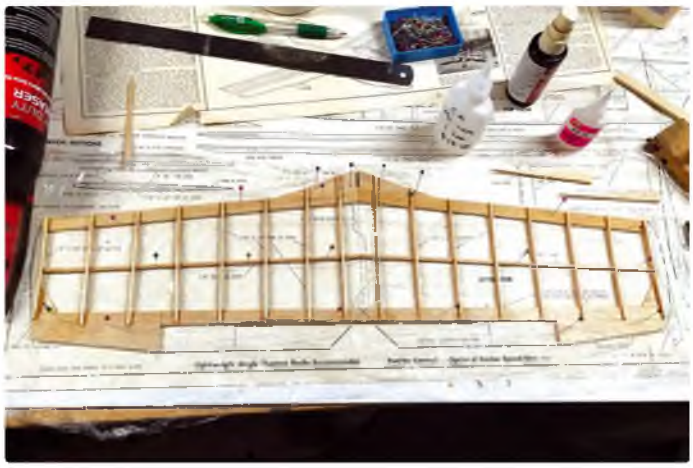


The plans had suffered from silverfish over the years

Power Selection

The original was for minimum power of an .049 cu in engine, or .8 cc in British English, up to .10 cu in or 1.5 cc, the latter being recommended for water operations with radio gear on board.

Electric is the way to go today. I have a Precision Aerobatics PA Thrust 10 motor which I guess is the equivalent of a good 1.5 cc but I didn't want to risk this fine motor on the water, so I looked for a cheaper equivalent. Fortunately I miscalculated and bought a Turnigy Park 480 850 KV and a 45 A ESC. This motor is about twice the weight of the PA Thrust 10 and is more powerful. Despite its low cost it seems very well made and with excellent reviews. I stopped worrying about the weight when



The tailplane takes shape

My old balsa stripper was useful for making missing balsa strips. It's older than the kit! A stiffer blade would be even better

A bit of sanding soon forms the tailplane ribs

Positioning the uprights on the fuselage sides. See text

Make sure the fuselage is straight!

A floor for the battery, and the former at the front of it, were put in during the early stages of fuselage construction

Sanding the planking. I would bevel the edges on assembly if doing it again

I checked and found that at 80 g it is on a par with the venerable ED Bee and is much more powerful than the dear old diesel. Also, today's radio gear is but a feather compared to what they had in 1960.

The other aspect of the electric gear is cooling. The motor will be up on a pylon in the breeze but the ESC and battery had to be protected from water so they would reside in the hull/fuselage as any airflow over them would also allow ingress of water. As the motor requires a 30-35 A ESC this leaves plenty in reserve, the whole power train just loafing along with a 3S battery and, hopefully, creating sufficiently little heat to dissipate in the space available in the hull. That's the theory...

Glues And Covering Materials

To build the model I used aliphatic resin and CA glues, not the original balsa cement. I built many models as a young bloke using cement and although this is still available the new stuff is so much better.

The original could be covered in tissue or silk. Although some of my traditionalist friends who build old aeroplanes still use tissue, I am very pleased not to, at least on the open areas where it will tear just because it sees your finger coming. Solarfilm is great but somehow not quite in the right spirit for a model such as this.

The tougher alternative to tissue was silk, or nylon which is readily available. I got some nylon from a haberdashery store, it's cheap and tough and will shrink OK with dope but is not heat shrink. That's just as well as the lady getting it off the roll gently folded it for me to take home. Unfortunately this put creases into it which don't come out with dope, so either get it rolled when you buy it or use a very gentle dry iron before applying. Dope the structure first then apply dope through the cloth to stick it to the framework. Get it reasonably smooth, then coat the entire surface with dope to seal and shrink it.

There are some very good modern lightweight heat shrink fabrics that I think would do the best job but they cost more than I wanted to spend. However, I did use some old heat shrink film on some parts, which I have had for over 20 years. It needs painting so it does not come under my category of 'plastic films'. It has an adhesive on one side (to my surprise, the dull surface) but as this was old I felt it was as well to use some Deluxe Materials Cover Grip to ensure it stuck. Balsaloc is similar.

The servo rails and pushrod outer tubes were put in place while still accessible

The undercarriage securing strips were marked out and holes marked with a centre punch before drilling and cutting out. Note the use of a marker pen, not a pencil

How the undercarriage is secured

A wheel collar at the top will secure the nose gear leg

The wing centre section takes shape

Building the wing outer panels is easy. The spar is lifted off the board by packing to keep it clear of bottom covering

Outer panels attached. The left one needs LE sheeting at this point

The wing floats take shape

For sheeted areas on the tail I used tissue. Good old Modelspan isn't so easy to get so I just bought a pack of ordinary tissue paper from the newsagent and it does the job, more or less, on solid sheeted areas.

To seal the balsa I used dope, which is still available. Brushes can be cleaned with acetone but I don't bother; I just soak the brush in a bit of acetone for a minute or two before its next use. To seal balsa and fill up cracks make a putty with dope and talcum powder. This sands beautifully and although it pre-dates epoxy and micro-balloons by some years it's still very useful but without any structural strength.

Before even thinking of covering don't forget that, although the Bible may tell us that in life love covers a multitude of sins, with model aircraft it's sandpaper! Sandpaper includes Perma-Grit tools and it's remarkable how quickly block balsa gets shaped with these. Do it outside though. While on that subject, make sure your area is well ventilated when using dope.

I found that the nylon and dope were quite practical. You can even adjust it by brushing some more dope, or even just acetone, over bits with wrinkles and then pull on it and hold for a moment until the dope dries out a bit. I did this where needed to get it smooth before doping the open areas.

It did seem a tad heavy for use on a light model so after covering the bottom of the wing, and as I found the above mentioned heat shrink material in the dark recesses of my workshop, I decided to use it for the top of the wing and for the tailplane. I tried it on the underneath of the hull but found that it wasn't that easy to use on the concave sheeting and here I would have been better off with dope and tissue, or nylon if extra strength was needed on the hull bottom.

As you can see, I didn't use modern coverings as I wanted to use what I had, for economy as much as for keeping in the right spirit. The whole exercise was to experiment, polish my rusty skills and use what I had on hand. I am NOT recommending mixing covering methods!

Plans And Design

While an experienced modeller can use the plans alone, the instructions were most helpful. However, the plans do have all formers and ribs illustrated so if anyone does want to build a Navigator the plans can be found on-line.

Don't forget to plan ahead with regard to placement of radio gear, in particular a spot for the battery pack where you can access it after the plane is complete. Make arrangements during the building, not after! I didn't want to compromise waterproofing by cutting hatches so the wing has to come off to access the innards. The wing is held on by rubber bands over dowels, as per the original. It would be no problem to alter this to nylon bolts if desired.

I used flexible 'snakes' for pushrods to avoid the openings where conventional pushrods exit the fuselage. I didn't bother with ailerons; they are little use on a model designed for rudder only, unless you reduce the dihedral and I didn't want to alter the model that much – or worry about water getting into wing servos!

For today's proportional radio gear I enlarged the elevators. These, and the

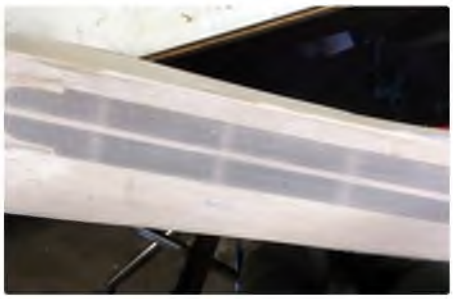
Shaping the nacelle. It's cosmetic but make sure the firewall is at the correct angle

Ready to cover

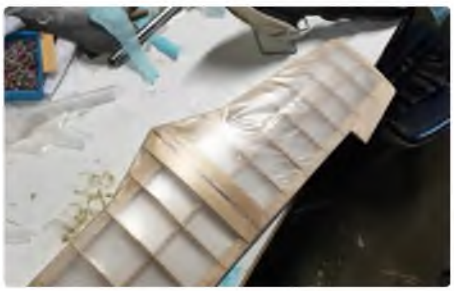
Dope and talc filler. It sands smooth very easily

Doped tissue is easily trimmed with a light touch of the sanding block

Nylon stuck to wing outer frame, awaiting doping



The nylon was good on the fuselage sides. Even without the covering I was surprised at how light and rigid the fuselage is. There was no carbon fibre in 1960!



The old film covering does a good job on the tailplane

Nylon on the wing undersurface, doped and shrunk. Another coat of dope would have been good

Old fashioned cloth strip hinges on the rudder. Note the balsa strips let into the rudder sheet to counter warping

vertical tail, are from 1/8" sheet, nowadays 3 or 3.2 mm sheet balsa. This is a bit thin for hinges, unless you use film hinges. The hinges shown on the plan are from cloth strip, as we always used on the control line models we built. They are still ideal for this type of structure. I did use balsa cement for attaching the cloth strips. Of course, it's going onto a doped surface and dope and cement are actually the same thing, cement just being a bit thicker. You can actually make your own by dissolving old cellulose photo film in acetone.

Shortcomings And Mistakes

Laser cutting hadn't been invented in 1960 and this kit illustrates just how much better it is than die-cutting. Anyway, it's no use complaining about a no longer available kit and I am sure that this applies generally to all old kits.

I had some difficulty envisaging the structure of the hull step but it all fell into place once I did get the idea. Crisper die-cutting and a picture would have helped so I have drawn one but I would have appreciated a diagram in the instructions.

I made the mistake of building off the original plan. This is a 56 year old kit. Although the balsa has survived quite well and the few missing plywood bits were readily fabricated, the plans were moth-eaten by silverfish. They have done the job but will need to be mended with Sellotape as they fell apart in use. I would have been much better off to either print the plans from the internet or use a photocopy of the kit plan.

I followed the technique in the instructions for marking the position of the uprights on the second fuselage side. Bad idea! The way to go would have been to tape the sides back to back with some masking tape and mark the second side from the first. Basic stuff and I should have known better. But then that's one reason I'm building this model, to shake the cobwebs out. That made for a rather untidy interior, but who looks at that? The important thing is to make sure your joints are sound, the fuselage is straight and the wings and tail have no warps.

With regard to the latter, the vertical tail is made of 1/8" sheet in two pieces, butt joined for width, with the grain the same way on both. I let in a couple of bits of 1/8" with the grain at right angles to the main bit of sheet. Without this the fin WILL warp.

A removable undercarriage is illustrated on the plans. I was able to buy a suitable undercarriage sold as spare parts for a Horizon Hobby foamie. These are ideal, the wheels being light and the whole lot being cheaper than wheels bought separately. I used a bit of piano wire to modify the main gear with a rear strut as per the plans and to replace the nose wheel strut. Note that this cants back to allow for castoring.

The plans show all this. What they don't show is how to stop it falling out after take-off from land. I drilled a hole vertically right through the nose block and epoxied a bit of K&S brass tubing in to take the nose leg. The picture shows how this works. Take off the top wheel collar and slide it out for flying off water.

On the subject of the nose block, I subsequently had to excavate it and put in about 50 g of fine lead shot to balance the plane. I covered that over with some epoxy and micro-balloons, and sanded it smooth. It would have been better to make a cavity while shaping the nose block as there is otherwise little opportunity to put lead well up front for the inevitable balancing act at the end.

I used more tubing through the fuselage to plug the main gear into. To stop the gear falling out I soldered it to a strip of thin brass sheet on each side and a screw in the middle will hold it on the fuselage, reinforced behind with a bit of ply and the threads hardened with a drop of thin CA, as per usual.

When preparing this, mark out the sheet first and centre punch where you want to drill it. Then drill before cutting the strips free of the sheet – see pictures. In the old days I would have cut up a tin can for the sheet, but these days they are all corrugated so I used K&S brass, which is better.

I should also have completed installing all the radio gear as soon as the framework was finished sufficiently to allow this. This is because the windows were put on last, after the radio installation was complete. This allowed for better access while fiddling about with battery locations etc. I realised at the end that the window installation would have been neater if they were put on before the covering, although others may have better ways of installing the transparencies.

My biggest mistake was trying to hurry the finishing. When you put paint onto a surface it will exaggerate any faults or irregularities. It won't cover them up. I should have used more dope to fill the weave of the cloth and tissue. I also checked for compatibility of different finishes on a bit of scrap. No problems showed up, until the one time I didn't check and just went ahead and tried a light coat of primer finisher over an area of paint. This left an area with which I wasn't very satisfied!

I should have bitten the bullet and bought one of the nice, light, modern covering fabrics available now if I didn't want the weight of nylon and lots of dope. Partly it was because I wanted to use what I had on hand and partly because I live some distance from proper model shops, which stock the right stuff.

It was inevitable that at some stage the aircraft was complete, the radio in and set up, and all systems were go. I had tried it out in a pool and it floated alright, so I was fresh out of excuses and had no choice but to commit aviation with it if I were to retain any shred of self respect.

The covering film used on the tailplane would not accept any glue so I couldn't use the cloth strips. Be very careful when cutting hinge slots in 1/8" balsa!

I used some scrap sheet to increase the gluing surface for the tailplane, after getting the pushrod outer in the right spot! Don't forget to strip the covering from the tailplane where it attaches so it is stuck balsa to balsa

Floatation test in the pool. No leaks!

Flight of the Navigator! She took to the air easily, with bags of power from the modern brushless motor

Flying

The appointed day arrived, but with the wind a bit more fresh and gusty than desirable. As this old one's thumbs were rusty, my friend Col at the club had organised for Graham, a very good flyer, to do the honours while I got behind the camera. Much to my delight the Navigator took to the air easily, with bags of power from the Turnigy 480 with a 10 x 6 wooden prop. Fitted with a 1300 mAh 3S battery, she handled the wind well. She flew in a stable and predictable manner, as expected of a free flight/single channel model.

The motor, being mounted so high, is interesting. The recommended up thrust proved a little much with the power available and she tended to climb under power, probably due to the large flat bottom wing supporting its 1100 g. So I shall put in a little down thrust relative to the current position.

The 45 A ESC was just loafing along and was just a tad warm at the end of the flight, but not enough to be a concern. The nose wheel leg needs a little tweaking, as does a small warp in the tailplane, but otherwise I had no problems and I look forward to a calmer day and flying her myself. I also have to renovate a small dinghy I have so I can take her down to the water's edge, minus undercarriage, in due course.

So, seaplane acquired, one less kit to build and my workshop skills reactivated. Mission accomplished! **RCMW**

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INDOOR

18th Feb, 18th Mar '17
Waltham Chase Aeromodellers Indoor R/C Meetings, at Fleming Park Leisure Centre, Passfield Avenue, Eastleigh, Hants SO50 9NL. Each event will run from 7 pm to 10 pm. The Main Hall at Fleming Park Leisure Centre is a ten badminton court size sports hall, with a very high and obstruction free ceiling, and is particularly suitable for lightweight indoor R/C models. Please note that free-flight models may not be flown at this meeting. Admission to each meeting will be £8 for flyers and £1 for spectators, whilst accompanied children will be admitted free. Junior flyers will be charged as adult spectators. Flyers will be required to show proof of insurance. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. Tel. 01489 895157, or see our website: www.wcaero.co.uk

28th Feb, 28th Mar, 25th Apr, 30th May, 27th Jun '17
Waltham Chase Aeromodellers Small Indoor R/C Model Meeting, at the Main Hall at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. All meetings will run from 7 pm to 9.30 pm. This is the venue at which we hold our popular indoor F/F meetings, the hall is not large enough for conventional shock flyers, but has proved suitable for smaller indoor R/C models. Models to be flown at these meetings are to be limited to a maximum weight of 95 g (3.5 ounces) for fixed wing aircraft, in flight trim, including battery (not to exceed a 2-cell LiPo pack). Helicopters are to be limited to a rotor diameter of 12" (305 mm). All models will be weighed before flight, and will be judged on their suitability for the venue on the evening. Admission to the meetings will be £4 for flyers and £1 for spectators, whilst accompanied children will be admitted free. Junior flyers will be charged as adult spectators. Flyers will be required to show proof of insurance. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. Tel. 01489 895157, or see our website: www.wcaero.co.uk

4th Mar '17
Waltham Chase Aeromodellers Indoor Meetings, held in the Main Hall at Havant Leisure Centre, Civic Centre Road, Havant, Hants PO9 2AY. The events will run from 7 pm to 10 pm. Please note that free-flight models may not be flown at these meetings. Admission to each meeting will be £7 for flyers and £1 for spectators, whilst accompanied children will be admitted free. Junior flyers will be charged as adult spectators. Flyers will be required to show proof of insurance. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. Tel. 01489 895157, or see our website: www.wcaero.co.uk

4th Mar, 1st Apr, 6th May, 3rd Jun, 1st Jul, 7th Oct, 4th Nov, 2nd Dec '17
Indoor Flying at Furzefield, Furzefield Sports Centre, Mutton Lane, Potters Bar, Herts EN6 3BW. Times will be from 6 pm until 8 pm, flyers £9 and spectators £2. Rubber, free flight and small electric models only, wingspan will be limited to 20 inches. Enquiries to Mike Quille,020 8500 3549, Email: mp.quille@live.co.uk

11th Feb, 11th Mar, 8th Apr, 14th Oct, 11th Nov, 9th Dec '17
North London MFC Indoor meeting, at Furzefield Sports Centre, Potters Bar, Hertfordshire EN6 3BW. From 6 pm until 9 pm. All up weight limited for fixed wing 225 g, 36 inch span, helicopter 400 g. BMFA insurance required. Contact Peter Elliott, Email: ianelliott56@btinternet.com

GENERAL

19th Feb '17
Northwich Swapmeet, at Northwich Memorial Court, from 9:30 am. The swapmeet for both vintage and modern model aircraft engines, kits and accessories. After a time away this popular swapmeet is back at the original but redeveloped venue, that includes a swimming pool, concert hall and restaurant. More than ample FREE parking, and a brand new £80 million shopping centre nearby for 'her indoors' as well! Full details on venue, including a booking form and map etc. visit www.northwichswapmeet.co.uk

4th Mar '17
Brightlingsea MFC Swapmeet, at St Osyth Village Hall, Clacton Road, St Osyth, Essex CO16 8PE, from 9.30-11.30 am. Entrance £2, Tables (set up from 9 am) Single £4, Double £6. Refreshments available, hot drinks and bacon sandwiches (Have your breakfast with us!). For further information and pre-booking tables contact Bob Goodenough, Telephone 01206 303749, or check out the website, www.forjac.co.uk

5th Mar '17
Bedworth & Burbage Aeromodellers Swap Meet, at Bulkington Working Mens Club, Chequer Street, Bulkington, Bedworth, Warwickshire CV12 9NH. 10.00 to 14.00, Entrance: £2. Under 16's Free. Table setup time 9.30. Cost £5 per table, tables must be booked in advance. Ample parking on site and hot food and tea/coffee available in Club. For more details contact Eric Heathcote on 07914 382930

5th Mar, 2nd Apr, 7th May, 4th Jun, 2nd Jul, 6th Aug, 3rd Sep, 1st Oct, 5th Nov, 3rd Dec '17
Wessex Soaring Association Monthly Slope Fly-In, for unpowered gliders and e-soarers. Saturday or Sunday, wind dependent. Slopes located in south Wiltshire, approx. 5 miles east of Shaftesbury. All welcome. Contact Pete Carpenter for details: Email: pete.carpenter12@gmail.com or tel: 07919 903742

11th Mar '17
Long Eaton Model Aero Club Swap Meet, at Trowell Parish Hall, Stapleford Road, Trowell, Notts. NG9 3QA. 9 am for sellers, 9:30 am for buyers until 12 noon. Tables cost £5, which includes one seller, additional helpers £2. General admission for buyers £2. For more information contact, John Wright, Telephone 01159 394448, Email: janwright27@btinternet.com, Barry Parkinson, Telephone 01159 731954

17th Mar '17
DADMAC Auction, hosted by the Dumbarton and District Model Aircraft Club, this Bring & Buy Auction will take place in the Chivas Community Suite of Dumbarton Football Club, Castle Road, Dumbarton. Book-in items from 5.30 pm, Auction kicks off at 8 pm. Entry fee, but no commission on sales. Bar and food available. Auction forms available on website: www.dadmac.org.uk, contact Maurice Irvine on 01475 689711 for more details

19th Mar '17
LMA Haydock Park 2017, at Haydock Park Racecourse, Warrington Road, Newton le willows, St Helens WA12 0HQ. A new event that gives the chance to see those new winter projects up close and personal and to chat to the designers before the start of the new flying season. Doors open at 10 am, cost is £5.00, under 16's free (when accompanied by paying adult). LMA members with valid card £3. There is free car parking on site. A Bring and Buy will also be hosted and is £10.00 per table plus entrance fee.

19th Mar '17
The Great Southern Model Auction, at Mountbatten School, Romsey, Hampshire SO51 5SY. The doors open at 9 am, auction starts at 11 am. Entry £5, under 16s free. Refreshments available. Minimum lot £10. Pre-booking of auction lots is strongly recommended, contact Paul on 07500 175897. See at hmfa.bmfa.org/ for more details

1st & 2nd Apr '17
Hobby Corner April Fool Fly-In, hosted by the Wrexham Model Aircraft Club, situated midway between Wrexham and Ruthin (Postcode (nearest) LL11 3BB. OS map reference SJ167500, latitude 53.04155 and longitude 3.2434105. At what will probably be the first fly-in of the year we aim to give the novice flyer the confidence to go to other fly-in's during the 2017 season. Slots will be arranged throughout the day for different ability levels. No A-cert, no problem. Instructors on hand. Possible A tests on the day (strictly by appointment). Well kept grass strips, and there is a portaloo which will be clean at the start of the weekend and serviced throughout but there is no water or electricity. However, copious fresh (drinking) water will be available both days. There is no fee for the flying, though camping and caravan charges are £2 per night and £10 per night respectively. The Club strictly observes BMFA rules and recommendations. Good quality hot food both days. Please contact for further details and register for Go/No go weather updates 5 days and 24 hours before the event: bob.davis.design@gmail.com or 01490 413276

8th & 9th Apr '17
PSSA 'Fly for Fun' event, The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or email: webmaster@pssaonline.co.uk

14th Apr '17
Watton Radio Model Club Bring & Buy, at Hingham Sport/Social Club, Watton Road, Hingham NR94HB. Sellers from 5.30 pm. £5 per table additional helpers £1. Doors open 6 pm, entry £1.Bar open refreshments available. Further details contact Martin Pawsey, 01953 883892, Email: martin.pawsey@btinternet.com

28th to 30th Apr '17
The ProWing International Trade Fair will take place at the airfield in Soest/Bad Sassendorf (40 km East of Dortmund/Germany). 9 am to 6 pm (9 am to 5 pm Sunday). Admission is € 8.00 (children up to 13 years free). More than 100 exhibitors will be presenting their products including: engine powered planes, gliders, helicopters, jets, gas and electric engines, turbines, and electronics and equipment for R/C models. Accommodation is available close to the airfield, you also can use the camping area directly at the airfield endowed with electricity and

restrooms. For further information and details on camping accommodation check out the website at www.prowing.de

13th & 14th May '17

MULTIPLEX Airshow 2017 will again be held at Bruchsal airfield near Karlsruhe. MULTIPLEX and HiTEC team pilots from all over the world will fly demonstration schedules with their contest and display machines. Admission and parking are free. Don't forget to put the date in your calendar! Address: LSV Bruchsal - Otto-Lilienthal-Weg 1 - D-76646 Bruchsal, GPS coordinates: 49°07'59.4"N 8°33'59.2"E. Further details from www.multiplex-rc.de

20th & 21st May '17

PSSA 'Fly for Fun' event, The Bwlch, Bridgend, South Wales. Meet at the 'Ice-Cream' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Steve Houghton on 07762 256126 or Email: Steve.houghton59@gmail.com Further information at a470soaring.blogspot.co.uk

10th & 11th June '17

Airborne@Sumners Ponds Model Show 2017. This popular model show will be back for a 5th year at Sumners Ponds Fishery and Campsite, Barns Green, near Horsham, West Sussex RH13 0PR. Airborne will once again cater for R/C helicopters and planes, as well as control line flying in the main flying area, with FPV racing in its own dedicated field. The main show fields will cater for model boats on the lakes, R/C cars, tanks, trains, kites with other model and hobby related stalls and kiddies rides. Show times, entry fees and further details can be found here: www.facebook.com/airborne.sumnersponds, www.sumnersponds.co.uk

16th to 18th Jun '17

Weston Park International Model Air show, organised by Wrekin MFC, at Weston Park, Weston Under-lizard (M54 Junction 3 and 8 Miles off M6 Junction 12). Helifest RC helicopter flight line all weekend, with commentary by Dave Bishop (D.B.Sound) and Nik Johnson. A host of top pilots and fantastic Trade support over with 100 Traders. Full size display all 3 days, inc. the Swift Display Team. Show also includes: Quad Racing and Quad Fair, Off Road Buggy Racing, Model Boats and other family attractions. On site Camping available, with Night Show spectacular Friday and Saturday night, with Evening entertainment. For more information contact Steve Bishop 01952 587298, Mobile 07758 895068, Email: stevenbishop@blueyonder.co.uk, show website www.westonparkmodelairshow.co.uk, Trade Enquiries Peter Whitehead 01952 684169

24th & 25th Jun '17

Wings and Wheels Model Spectacular, North Weald Airfield, Essex CM16 6AR. Only 2 miles from Junction 7 M11 motorway. 9.30 am – 5.30 pm. Enormous R/C Model Show with model air displays all day with commentary from Nik Johnson, Bring and Buy for modellers, Boat Pool and indoor display, masses of Traders, R/C tanks, trucks, hovercraft, daleks and lots more! On site licensed bar and catering. Weekend camping available. All enquiries: www.wingsnwheels.net, Email: admin@wingsnwheels.net, Tel: 01242 604126

1st & 2nd Jun '17

PSSA 'Fly for Fun' event with the Lleyn MAC, Nr Abersoch, North Wales. Meet at the Londis car park in Llanbedrog for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: webmaster@pssaonline.co.uk

1st & 2nd Jul '17

Woodspring 2017, at Woodspring Wings model airfield Claverham Drove Yatton , North Somerset. Signposted from the M5 J20 and BS216TZ will get you close. 10 am to 5 pm both days. Our 25th Anniversary show and we're working on some very special attractions this year, in addition to our normal full flying programme from top teams and pilots, more traders than ever and a chance to eat and drink in the wonderful Somerset countryside. Camping available for the weekend. Watch facebook and our website, www.woodspringshow.co.uk for updates

9th Jul '17

North Somerset Modellers Society Model Show, at the The Helicopter Museum, Weston Heliport Locking Moor Road, Weston-Super-Mare, North Somerset BS24 8PP. From 10 am to 5.30 pm. See Museum website for admission charges. Free parking, restaurant. Raffle for a Helicopter Flight (not on the day). For more information please contact: John Annegarn on 01934 417742 or john.annegarn@sky.com

18th to 20th Aug '17

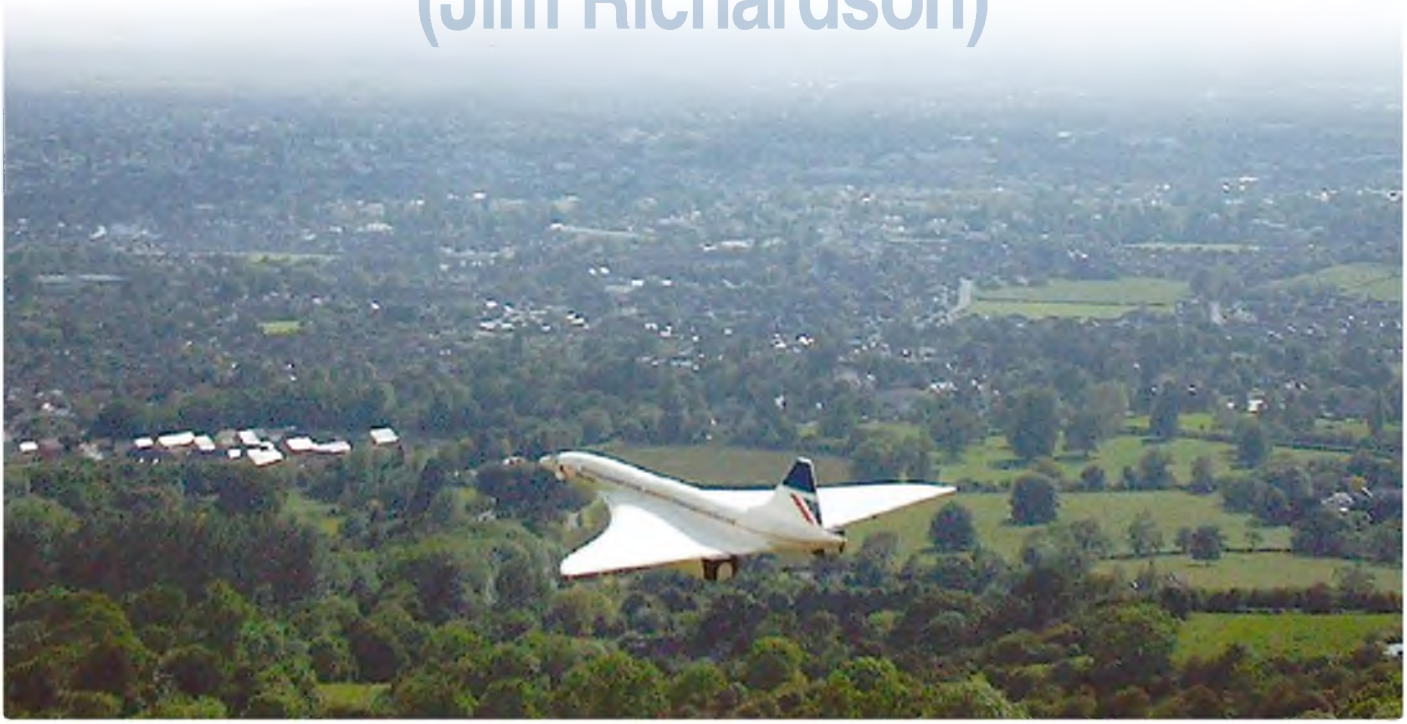
Festival of Flight at Ragley Hall, run by the Wrekin MFC. New dates confirmed, further details to follow but show will include many famous international flyers from the UK and Europe, as well as the amazing Richard Goodwin with his full size Pitts Special, which will guarantee to give the event that special Wrekin MFC touch, plus the Glider FX team will be there all weekend, running concurrent with the air display but on different parts of the park. There will be the Helifest model helicopter competition and display, Quad First Person View Racing, a large Boating Regatta on the eight acre lake and Model Car Racing.Saturday evening will featuring laser lights fireworks and light show! A large trade participation is anticipated as well as a swap meet. Admission prices: Adults £14.00, children £7.00, family £30.00, camping £65.0 pre paid, £70.00 on gate. For more details contact: Steve Bishop, Tel: 01952 587298, mobile 07758 895068. Trade enquiries call Peter on 01952 684169. www.festivaloflight.uk/

The Sport Channel

Gray relates a tale about a PSS flying session with a Concorde that got a few double-taking!

Horst Fenchel prepares to launch his converted robbe foam Concorde to kick off an extraordinary slope session that we thought wouldn't happen. See text

"If you want to be a better photographer, stand in front of more interesting stuff..." (Jim Richardson)



The Concorde heads off over Cheltenham, battling a stiff breeze that picked up after flat calm and rain. Light model coped extremely well. In-flight realism due to Horst's piloting skill already evident here

This Month's Wise Words

Well, not only is a new year well underway, it so happens that it's a year which gives this column a perfect pretext for a couple of 'special' editions. But don't get too excited; this month's is merely to mark the fact that in 2017, as mentioned recently, I will have been active in our hobby for 'A Very Long Time' (don't ask...).

Our subject is one that's received a disproportionate level of mail in relation to its actual column space. We're still getting comments about my completely fluke in-flight photos of freeflight models at the Oxford MFC's 'Scale Fest' last year. While I'm very pleased to have taken them, I maintain that more luck than skill was involved.

But a handful of modelling friends, each independently, made more or less the same point: "If your pics of the Shackleton/Lysander/etc. are lucky accidents, what would you call your 'Concorde Over the Cotswolds' sequence?" What's that? Of course, you wouldn't know about it until now, but I thought that on this small special occasion, I would tell you a story about a PSS flying session and the resulting photos which happened more or less by chance.

Back in 2012, during his last UK holiday, my long time friend Horst Fenchel from Marburg in Germany stayed in the Cotswolds and we got a lot of flying in. Horst, as always had brought a large fleet of models, filling his car and roof box. One particular day, the weather was looking just right for a session on our favourite slope in Gloucestershire, overlooking Cheltenham.

Having checked the wind speed and direction, we loaded up with a good selection of gliders for any eventuality. To my great delight, Horst decided to bring along his foamie PSS Concorde. Converted to pure glider form from the robbe twin electric kit that was briefly popular just over a decade ago, the little airliner really looked the part cruising the slopes in Horst's videos. I wanted to see it in action for myself and we seemed to have the perfect day for it.

We set off full of enthusiasm, but as we travelled the 20-ish miles to our slope site, the weather decided to take a perverse turn for the worse. Approaching Cheltenham and taking the road up to the top of the hill, we watched the sky darken and rain start to spot. We exchanged a few multilingual expletives but pressed on.

We pulled into the car park in a heavy downpour and the wind had died away to nothing. We scowled at the black clouds now clipping the slope itself. We sat in the car for a full hour, sustained only by deluded optimism and a flask of coffee, but the rain fell and the parking area became a mud bath.

We decided to abandon the mission and to take the main road into town to avoid the hill's tracks which now resembled a rally course. Then, as we drove through Bishop's Cleeve, the rain suddenly eased off and a shaft of sunlight lit up the road ahead.

We stopped in town to review the situation. The storm had broken up and a stiff breeze had blown in. More and more blue sky appeared, with dramatic high cloud formations. After a few more expletives,

Climbing into wave lift now and truly looking the part. An airline poster from a vanished era

Could you tell the difference?!

we both realised that the rising wind was bang-on to the hill and within half an hour, we were up on the slope with our models rigged.

To celebrate our turnaround in fortunes, Horst decided to fly the Concorde first and I readied my camera expectantly to capture it. I didn't have great hopes for it though – my camera at the time was a little Premier DS-5080, bought in a Tesco supermarket offer some years before. It had taken many images for this column but had never distinguished itself with flying shots...

Horst wasted no time and launched the Concorde off into the lift. The lightweight delta bucked and bobbed in the turbulence, but got away safely. Under Horst's skilled guidance, the Concorde streaked across the slope and looked the perfect picture against the backdrop of Cheltenham and scenic cloudscapes.

I called to Horst to try a few low passes for some pictures. He obliged as I inexpertly fumbled with the shutter button and tried to get the model actually in the screen. The results, on the camera's screen in daylight, didn't look good.

We made the most of our reclaimed slope session, flying several more models until dusk fell. We headed home well pleased with our efforts. I'd almost forgotten about the photos, but Horst insisted that I transferred my images onto my computer. Once uploaded, we could hardly believe our eyes. If ever there were lucky flying shots, here they were. And now I can show them to you for the first time.

A full size Concorde never flew in quite this fashion over the Cotswolds, but many who've seen this photo set have done double-takes on first viewing. The illusion of the local landmark TV towers have caused many expressions of shock though they're a couple of hundred yards away behind the slope and the model is no more than fifty feet from the camera!

I do however remember real Concorde flights over our area long ago. In the early 1970s, the British prototype did a lot of test flying from Filton and Fairford and was often in the skies of Gloucestershire.

I vividly recall one occasion on another rainy day, in 1972 when I was walking up to my club's flying site (the weather didn't bother us then...) when with a massive roar, out of the drizzle and overcast appeared the Concorde, nose drooped, undercarriage down and flaps deployed, on a low-speed trial. It flew circuits around our town like this for ages, which I witnessed whilst trying to fly an increasingly soggy rubber model.

Just to fast-forward a little, do any SC readers remember the Concorde kit by 'Unique Models' during the 70s and 80s? It flew really well and was a masterpiece of foam-cutting. I built a couple of them! If you had one and indeed, any of the Unique range, please tell us about it.

Contributions, please to The Sport Channel c/o the Traplet Publications address. All Email correspondence to: gray_rcmag@hotmail.com **RCMW**

What is wrong with this picture? Precisely nothing! All achieved through Horst's flying and your author wielding a cheap digital camera!

"Thank you and please fly with us again." If you're a modeller and are looking for such things, a few details will probably give away that this Concorde is a model, but it hasn't happened yet!

Not everyone grasps the illusion first time... If a real Concorde had tried this over the Cotswolds, what do you think would have happened?

Mission accomplished. Fotografenmeister Horst gives his professional verdict on our successful joint venture!

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MODEL WORLD Next Issue

DON'T MISS OUR APRIL 2017 ISSUE!

Fairchild PT-19

Thousands of WWII US and Commonwealth pilots started their careers flying Fairchild's Primary Trainer-19. Despite structural issues with their wooden wings nearly a hundred of those PT-19s still fly, many in variations of the US Army's blue and yellow colours. Those cheerful colours made it easier for student pilots to see other novices as they trundled around their training fields and now those same bright colours can be used to aid those pilots who, like designer Bill Bowne, have 'mature' vision. So when Bill looked for a new, easy to see building project the PT-19 came to mind. Bill's version is a stand-off scale model, simplified to save weight and reduce complexity. It's a near 1/10 scale electric model of 45 inch wingspan for a 1400 KV motor and an 18 A ESC, powered by a 3S-1000 mAh LiPo.

It's A Stick Up!

In a new series of articles, John Bristow of Deluxe Materials fame guides us through the history of adhesives and how they have been adapted for model aircraft use. Titled 'The Strength Inside Your Model', John charts how the almost unbelievable advances in adhesives technology over past years have benefited aeromodelling, starting from the early 'cement' products that had a strong, unpleasant odour, dried slowly (compared with cyanoacrylate) and became brittle with age. Then came balsa cement, which was stronger than balsa wood. Two part glues came much later, the first of which was Aerolite from the aircraft industry. And where would we be without 'superglues', which were discovered much earlier than you may first think – in 1942 to be precise! Besides recalling the interesting history of model adhesives, John goes on to describe how modern adhesives work and details some of their applications.

APRIL 2017 ISSUE ON SALE THURSDAY 16TH MARCH

The Dark Flight...

Just in for review from MacGregor Industries is the Bat-Safe, a new design of LiPo charging and storage box with a patent pending 'Flame Arrester' design that keeps a battery fire safely contained whilst filtering the sooty smoke, cleaning it and safely releasing it through a series of holes on the top of the box. Even though we store our LiPos in ammo boxes we had a big shock to see one go off like a flame thrower when viewing one of the videos on the Bat-Safe's Kickstarter web page. That was with just one 4S pack inside and we have a few more LiPos in each ammo box than that! It looks like we'll be needing more than just one of these safe boxes... When used for charging you can charge up to a pair of 6S-5000 mAh LiPos locked safely inside the unit.

PLUS... *More features, columns and reviews from across the complete spectrum of the R/C model-flying hobby*

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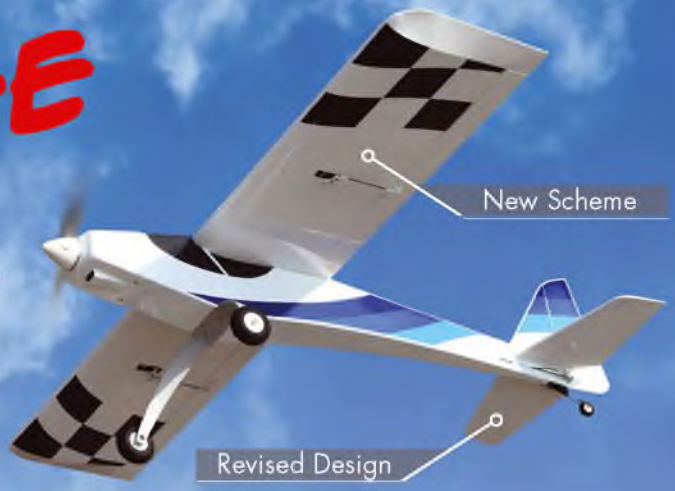
80CC £122.53

50CC £91.88

Ripmax

WOT4 Mk2 -E

BY CHRIS FOSS



Part No: A-CF003A

SSP: £119.99

The overwhelming popularity of the original Wot4E meant that a new version was always on the cards, and through working closely with Chris Foss this new model has a revised lightweight structure plus a bright new colour scheme. Being an 80% scale example of the ubiquitous Wot4, the Wot4E is the perfect size to use commonplace 3 cell 2100-2500mAh LiPo batteries.

The Wot4-E is a brilliant all around model that is ideal for small field use, yet it is large enough to hold its own at the busiest of flying sites. The prebuilt balsa/ply structure is both strong and lightweight and covered in iron-on film. So only minimal assembly and installation of the motor and electronics is required.

With the same great flying characteristics as its larger brother this really is a superb performing sport aerobatic aircraft, with the thick wing section being very forgiving at low speed.

Specification:

Wingspan: 1199mm (47")
Length: 1055mm (41.5")
Weight: 1420g (50.5 oz)
Servos: 4 Mini (Required)
Radio System: 4-5 Channel (Required)
LiPo Battery: 3S1P 11.1V 2200mAh (Recommend)
Speed Controller: Quantum 40A Brushless (Recommend)
Electric Motor: Quantum II 36 Brushless (Recommend)