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Kevin Crozier, RC Model World Magazine

In-flight shots courtesy of RC Model World Magazine

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RC MODEL WORLD
JANUARY 2015 • ISSUE #372

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PRE-FLIGHT

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Welcome to the January issue of RC Model World. As a true model flying enthusiast I get a bit twitchy if I cannot get out for a few flights every weekend. Things are getting a bit soggy out at the local flying fields right now but we are still managing to get something into the air, even though I end up more mud spattered each successive week! This past weekend was no exception, but with the additional joy of having sheep back in the field. Which means that you really have to look where you are treading – which is fine until you step back whilst in the pits…

In such conditions I always find it helpful to have a model with a short landing roll, as this minimises the chances of 'pick up', if you get my drift. My natural predilection is for a nice aerobatic or scale model, but these can roll on a bit. So now is the perfect time to swap over to an agile – and slow landing – 3-D model, which I can bring in at a snail's pace and hopefully drop onto a clear piece of grass. The new ST Acrobat that we reviewed in the last issue is a perfect choice, and I'm thoroughly enjoying using her to brush up on my 3-D skills.

Indeed, on our last flight this past weekend, I was admiring her as she held a nice prop hang (and mentally patting myself on the head for being able to hold it for more than a few seconds), when I noticed that something was bulging from the nose. A quick flip into straight and level flight showed that the bulge was in fact the LiPo trying to worm its way out of the battery bay! A quick landing was called and the Acrobat landed safely, thankfully between the danger areas of our natural minefield.

Flipping the model over soon revealed the problem – the battery hatch was nowhere to be seen! Surely a bright white piece of foam couldn't be that difficult to find, so I began trudging up and down under the approximate flight path of the model. By this stage I was alone at the patch, so I could walk around freely and try to find that darned piece of foam!

Despite my best efforts, however, my search proved fruitless and so I gave up, pondering how I could replicate the hatch on my way back to the car. I thrust my hands in my jacket pocket to warm them up – and felt something with a very familiar shape! As Captain Mainwaring would say, "You stupid boy!" Ah, the joys of getting older…!

Right then, what do we have in store for you in this first issue of 2015? Our reviews this month include the sleek Ripmax Dagger delta, as well as a diminutive Yak 54 from Great Planes. I also get the chance to throw the Hacker Vagabond slope soarer around a bit, and we use the aforementioned ST Acrobat to test out the smartphone controlled AR636 three axis receiver from Spektrum.

Our Feature Plan this month centres around a scale racing plane for .25 engines, the Scoville Stardust, whilst on our Free Plan you'll find not just one, but two small fun flying sport models, the high wing G-HUGH and HUGH-2, its low wing sibling.

Other features include a timely article on making skis for winter flying, and we take a look at the history of model flying with a novel twist, as we reveal what it was like to be an aeromodeller inside the Soviet Union.

All this is topped off with some of our regular columns, including a new series on scale model gliders by one of the UK's top soaring correspondents, Chris Williams.

There's just one last thing for me to do this month and that is to wish all of our readers, advertisers and contributors a very Happy New Year. Let's hope that 2015 brings a lot of perfect weather for model flying!

Kevin

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RC MODEL WORLD

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TAKE OFF

R/C news and views

NEW YEAR GREETING FROM HANNO

Following on from our review of the Modellsport Schweighofer Curare 60 in the October and November issues, we have had the great pleasure of re-establishing contact with the designer, Hanno Prettner. Hanno is fondly remembered as one of the greatest R/C aerobatic pilots of all time and he garnered many British fans with his regular appearances at the much-missed Sandown Park Model Symposiums.

Hanno has kindly sent in a photograph of his own Curare in flight, complete with a personal message for all RC Model World readers, which we are sure you will enjoy.

Thank you, Hanno. And Good Flying and a very Happy New Year to you and your family too!

NOT SO QUICK!

Tony Deane, who authored the piece on the E.D. Radio Queen in the December issue, has written to say that the model took a little bit longer to build than the 12 days mentioned in the article:

*"**Wow – we made the front cover!** Thanks for the presentation; the article came across very well.*

Just one small point... It took two months and twelve days from rib cutting to flight, not just twelve days. I wish I could build that fast!"

Thank you for pointing out our inadvertent time shift, Tony. Still, at well under three months that's still pretty fast for an all built up model!

EMERAUDE SS

Kevin Murray from Weymouth has sent in some pictures and details of his neat Emeraude SS, which he built from the RCMW plan. (Plan number MW3627, available from www.trapletshop.com)

"I thought you might be interested in some pictures of an Emeraude SS built from the feature plan in the March 2013 issue of RCMW.

It has a Laser 80 up the front and Spektrum radio in control. The canopy was homemade from some corrugated plastic roofing sheet from B&Q and a balsa plug. The undercarriage is from Carbon Copy, the covering is Oracover and the trim is Solartrim.

All up weight is 3.6 kg, a little more than quoted but she flies just fine. She is easy to land and take off, and mildly aerobatic. All in all a very nice model."

Congratulations on your delightful model, Kevin. We like your reference to a well-known Keil Kraft stunter on the fuselage side. And we have to agree it does look like the control liner's big sister!

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LET'S BE CLEAR

Andrew Rawlinson, the man responsible for Product Marketing in the Hobby RC department of Revell GmbH (UK Branch), writes to clarify the status of the Great Planes RealFlight 7.5 flight simulator:

"I was just looking through the December issue of RCMW and wanted to comment about the RealFlight 7.5 feature in 'Shop Window'.

Please note that there are four versions of the system, with the Interlink version being available in both Modes 1 and 2.

The RealFlight 7.5 is a standalone system that will be available in multiple forms (see below) and is not just a free download for existing RF7.0 owners, although this just happens to be an added bonus for them.

The various versions of RF7.5 will be as follows:

GPMZ4530, RF7.5 Interlink (Mode 2) – SSP £144.99
GPMZ4531, RF7.5 Interlink (Mode 1) – SSP £144.99
GPMZ4534, RF7.5 Wireless Interface (SLT) – SSP £84.99
GPMZ4535, RF7.5 Interface – SSP £84.99
GPMZ4536, RF7.5 w/Tactic TTX650 – SSP £154.99

For details: http://www.realflight.com/"

DOWNUNDER DOINGS

Control liners at the Christian Traders meeting included a Fierce Arrow, Kawasaki Swallow, Peacemaker and a modified Firebird

Antipodean contributor, Peter Kraus, who lives in Brisbane, recently returned from driving down to Sydney for family matters, returning via a large model meeting at Gratton Field near Ipswich, only a couple of hours from his home. Peter relates:

"On the way down to Sydney we stopped at Obadiah Lodge, a little ways south of Port Macquarie and home of Christian Traders, the Australian distributor of a number of useful aeromodelling goodies, including Perma-Grit (handled by Traplet in the UK) and various glues, mufflers etc.

On the day we were there they were having their annual control line fly-in. Steve Keep also demonstrated his very sophisticated UAV modification of a Skywalker X8. He could fly this from his laptop or tablet; it could fly itself around, return to base unaided and land via a parachute so that model aircraft landing skills were not needed by the operator.

On the way home a few weeks later we detoured via Gratton Field at Calvert, near Ipswich, QLD, to attend a large model fly-in. This time the weather was superb. Warm, light winds, blue skies with just a few fluffy clouds. No competition, no judging, just a friendly fly-in. There were quite a number of beautiful aircraft in attendance and a reasonable crowd gathered to enjoy them.

Spectator facilities at Gratton are excellent. Food, drink, on field camping and cabin accommodation are available and a good time was had by all.

John Knox, a professional broadcaster and full size aviator with aeromodelling sons, again provided commentary. The registered pilots all wore a number on their back so from his vantage point in the tower John could let the crowd know who was flying and details of the aircraft as he had the information sheet with him, a system that worked well."

Steve Keep's sophisticated modification of a Skywalker X8 on its launching rail, and making a safe return to earth

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

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ARTF kit includes 17" x 12" carbon prop and TC-A-5030 400KV (G601) brushless motor.

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SPECIFICATION:

- WINGSPAN: 1600MM
- LENGTH: 1660MM (65.3 IN.)
- WING AREA: 48.7 DM2
- WING LOADING: 83.6 G/DM2
- WEIGHT: 2400-2500 APPROX.
- MOTOR - BRUSHLESS G601 5030 KV400

REQUIRED TO FINISH:

- ESC: 80 AMP (OPTO)
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- BATTERY: 22.2V (6S) 4500 MAH 30C LIPO
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The E-flite FJ-2 Fury recreates the famous Navy jet fighter so you can enjoy scale jet flying at your local flying field. Accurate in outline and fitted with an efficient EDF system, this FJ-2 delivers rock-solid performance. Built into the included Spektrum AR636A receiver is an AS3X system that's been specially tuned for this aeroplane. All you need to start flying is the 3200 mAh 4S 14.8 V LiPo flight battery, a suitable charger and your favourite full-range 4+ channel aircraft transmitter with Spektrum DSM2/DSMX technology.

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www.propguy.co.uk

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www.microaces.com

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www.trapletshop.com

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Frank Skilbeck puts together Ripmax's fast building and even faster flying delta

DAGGER

Delta wings have always been associated with fast aircraft. In the past I've owned the old SAS Delta powered by an Irvine 46, which was a good way of getting my speed fix until I had a trip to A&E due to having a finger-propeller incident when holding the model to start it, as it had no undercarriage. So when the Editor asked if I'd be up for reviewing the Ripmax Dagger delta for electric power it was too good an offer to turn down.

The model is a handy size, featuring a conventional balsa and ply construction with film covering. It is designed around the popular 2200 mAh 3S LiPo, with an option for a 4S for those who like to push the envelope. This promises a spectacular roll rate!

Frank holds the Dagger, ready for the maiden flight. It's a handy size for nipping out for a quick flight or two

Not Many Pieces

The model is provided in a large colourful box, with graphics showing the colourful upper and lower surfaces. Sensibly, the lower surface sports some large yellow stripes, which should aid orientation of what promises to be a fairly nippy model. Opening the box reveals that all the components are not only packed in their own protective bags but are also separated by foam for additional protection. The box even has a handle built-in to make it easy to carry around when you've made the purchase at the local model shop or model show.

Unpacking the components shows good quality construction. The wood cutting is all very crisp, the joints being well glued with no observable gaps. Similarly, the covering is to a pretty high standard; there's no need to run an iron over this one and the only issue I had was when removing the tape that held the elevons to the wing for shipping, as it pulled a little of the trim away. But this was easily stuck back down.

Assembly instructions are provided in a step-by-step photo manual, which has instructions in both English and German. Top marks to Ripmax as these are very clear and easy to follow.

Components are well packaged and protected

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Colourful box will grab your attention in the model shop

First thing is to hinge the elevons to the wings, this being done using the standard furry hinges and thin cyano. Next job is to fit the elevon servos onto the wing hatches. Ripmax recommend their SD200 or equivalent servos for this, but I had a couple of metal gear 12 gram servos liberated from a previous ARTF model so I used those. They are fitted to the panels using some hardwood fixing blocks that are epoxied to the panel and then the servo is screwed in place.

The servos are then installed into the wings, which are short enough not to need any servo extension wires to connect them to the receiver and the open structure of the wing makes it easy to thread the servo wire through. Once the servos are in place they can be used to line up the elevon horns, which connect to the servo arm using a standard pushrod with a threaded clevis at one end and a swing keeper at the other, after you've bent the rod to the correct length. It's all very easy using the supplied hardware. And with the servos and control horns being on the upper surface they are well protected on landing.

The instructions show the wings being glued onto the fuselage. But I deviated from them as the film on the wing has to be cut away to glue on the vertical stabilisers and I thought this would be easier to accomplish before the wings were attached. So after cutting away the film on the vertical stabilisers and epoxying on the supporting triangular sections, I offered these up to the wings and removed the appropriate amounts of film.

The wings are joined to the fuselage using two plywood wing joiners, which slot through the fuselage and into the appropriate slots in the wing. Before gluing I did a dry fit and this showed the wings were a very good fit onto the fuselage, with everything fitting snug without any undue force. Then it was a matter of applying epoxy to the wing joiners, slotting them into one wing, applying more epoxy to the wing root and fuselage where the film is absent, slot the wing onto the fuselage and repeat with the other wing. After checking for alignment I held them in position with some masking tape.

Not many parts, but construction and covering were to a high standard. There was no need to run an iron over the review model

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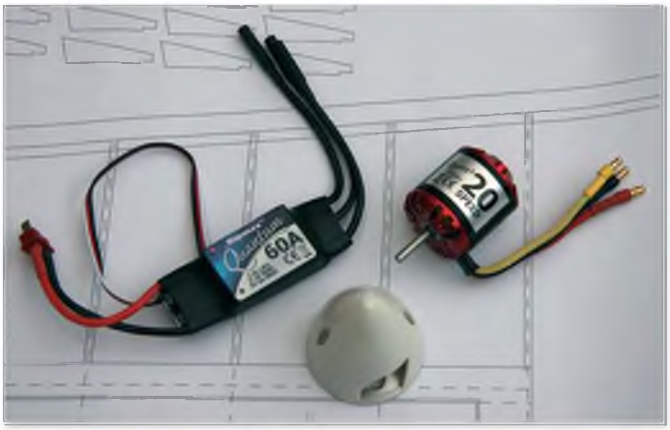
Once the epoxy had set I then fitted the ply landing skids into their respective slots on the underside of the wing and moved on to the vertical stabilisers. These are set at an angle to the vertical and while the triangular sections were already profiled, Ripmax have provided a Depron template to set the stabiliser angle. I found that using a bit of masking tape to hold this in position on the wing and then using some more tape to hold the stabiliser in position while the glue set worked well. But it did mean that you had to wait for it to set before freeing up the template to move onto the second stabiliser.

Power Train

Once the fuselage was complete it was time to install the power train. The model is supplied for you to fit your own power train, but Ripmax had provided the Quantum II-20 1250 KV motor and 60 amp ESC as recommended in the manual, to go with a 7 x 7 prop and 3 or 4S 2200 mAh LiPo – depending on whether you have some bicycle clips on or not!

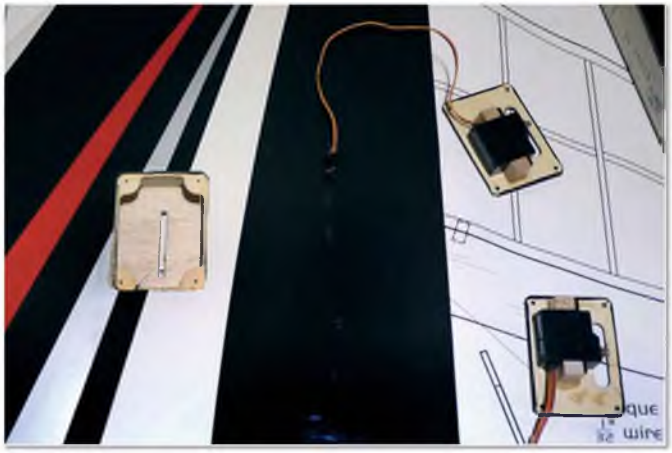
Note the Quantum II-20 motor comes with a prop driver that bolts onto the rotating can. But the model is set up for installation using a collet type prop driver, which clamps onto the 4 mm diameter shaft and you'll need one of these if using the recommended motor. Also the bulkhead is a fairly substantial item and the mounting screws provided with the motor weren't long enough, but it was pretty easy to cut some M3 screws to the correct length and to slot the motor into place, using some thread lock on the screws for security.



Recommended Quantum 60 ESC and Speed II - 20 1250 KV motor

View of wing interior. Construction was very well executed and all joints looked to be well glued

Elevons were fitted to the wings using standard furry hinges, glued into pre-cut slots



Servos are mounted to removable panels on the upper wing surface

Elevon linkages are commendably short

Wings are glued onto the fuselage sides with two ply spars for support. All parts were a good fit

Fins are attached using the supplied Depron template for alignment

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The space for the motor is fairly tight and some care has to be taken to route the wires so they don't foul on the rotating can, but the fuselage formers have some cut outs to allow for this and with some careful routing and a bit of tape they can be routed to clear the motor.

The 60 A ESC has plugs already fitted to the motor wires but they are too large for the connectors from the motor. But as the motor comes with mating connectors and the wires from the ESC to the motor have to be shortened to stop the wires bunching up and touching the motor, this was not an issue.

Using a 4 mm collet type propeller adaptor, the supplied metal backed spinner and 7 x 7 prop were attached. They fitted pretty well, leaving only a small gap between the spinner and fuselage.

The self-adhesive decals were cut out and fitted at this point. There are only four of them and they are very easy to fit, and they finish off the model nicely.

Radio Set Up

As per my normal practice with electric models, I used a separate receiver battery to set up the control throws to prevent accidental operation of the motor. If you decide to set up the model using the ESC BEC power supply then please make sure you have removed the propeller. I set up the elevon mixer, control throws and exponential on my transmitter to match those recommended in the manual, noting that rates are only recommended for the ailerons.

There is an additional recommendation that low rates are used for the first flights as high rate gives a 'spectacular roll rate!'

At this point I checked the weight and balance. The all up weight, using a 188 gram 3S-2200 LiPo was 905 grams, and a 4S increased this to 947 grams. The design of the plane is such that the battery is on the centre of gravity so changing packs doesn't affect it. With the receiver fitted behind the battery I found that the Dagger balanced on the recommended point without the need for any additional weights.

Once all set up I plugged the ESC into the receiver and checked that the motor turned in the correct direction, or to see if I needed to swap over two of the leads between the ESC and motor to reverse the direction. I also installed a telemetry sensor that recorded amps, volts, mAh used and also motor rpm (the extra yellow wire in the photos).

I then did some static power tests. On a 3S battery the 7 x 7 prop pulled 24 A at 13,850 rpm and was very smooth up to 13,000 rpm but it then showed some vibration. Fitting a 4S pack, the vibration increased as the rpm went above 14,000 rpm. Despite rebalancing the prop I couldn't get the 7 x 7 prop to run smooth at the higher rpm that a 4S battery could give, and as we had good weather and the publishing deadline was looming we decided to give it a go with a 3S.

Flight Testing

The first attempt at flying was met with failure, as I didn't use full power due to the vibration and I didn't have the recommended elevator movement dialled in (operator error!). This led to the Dagger flying into the ground and breaking the prop.

At this point we contacted Ripmax about the vibration and they advised some modifications. They also sent a propeller driver that they have developed to go with the motor (see separate panel on this). While waiting for a spare 7 x 7 prop to arrive I fitted an 8 x 8 prop, which gave 35 A and 13,000 rpm on a 3S battery and ran very smoothly. So reconvening on a slightly blustery day we were ready to try again.

This time the Dagger, with the benefit of the correct elevator movement, was away like a rat up a drainpipe! A few clicks of trim and it was cutting through the air at a fair lick. But before I could enjoy the high-speed thrills the photographer reminded me that I needed to do some low slow passes so he could capture it. While the Dagger would fly slowly the controls felt sluggish and tight turns at low speed saw the nose drop pretty promptly.

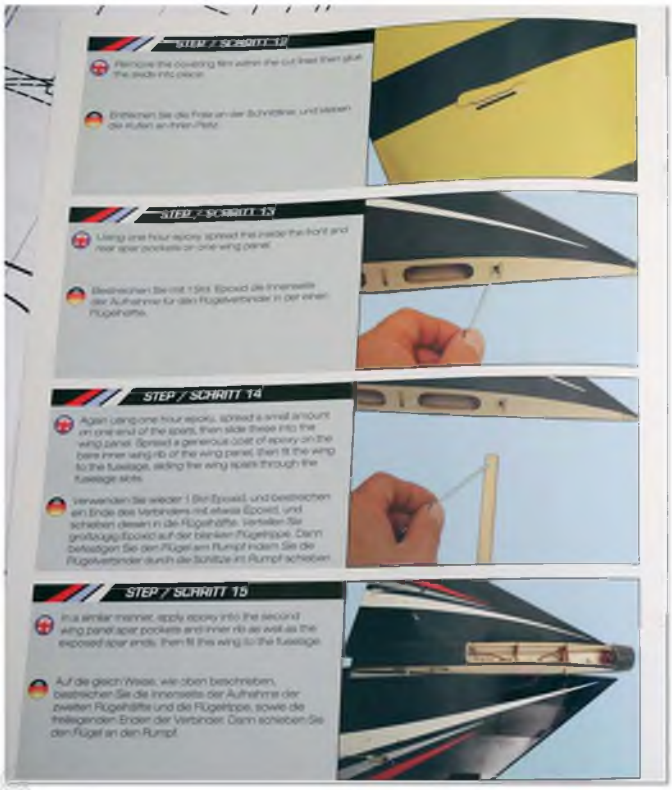
But once the photos were out of the way it was time to see what the Dagger could do. Even at half throttle on the 8 x 8 prop and 3S LiPo combination it flew around with authority. Loops could be a big as you like and the roll rate was very respectable, even on low rates. It lived up to the promise on high rates, being about three rolls per second! Even on the high rate setting the Dagger was never twitchy, just very responsive and great fun.

After about eight minutes of mixed flying, slow for the photos and checking out the high-speed aerobatic capability, my telemetry alarm (set for 1500 mAh) went off. Landing was simply a matter of lining the Dagger up with the runway, gliding in and flaring close to the ground, where it settled and slid along the wet ground for a couple of metres.

After several flights with this set up I obtained another 7 x 7 prop and decided to give it a go on a 4S combination. This time it got away fine and was nipping around on half throttle, but on opening up to full throttle the vibration came back and caused the motor mount to come loose, cutting short the flight.

Motor is a tight fit. A 2200 mAh 3S or 4S battery fits behind the ESC, over the Centre of Gravity

Motor, spinner and the optional Ripmax prop driver. Note how the prop driver butts up to the front bearing for enhanced support



Colourful manual is very clear and useful during the build

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Summary

The Dagger is great little model that goes together well. It looks good and flies very well. The 7 x 7 prop and 4S LiPo combination is sensitive to set up and I couldn't get my system balanced sufficiently to get a smooth run. But the 8 x 8 prop and 3S LiPo combo seems to suit the Dagger down to a tee, and it also uses the very popular 2200 mAh 3S packs, which many fliers already have. They give flight times of 5 to 8 minutes, depending on how much welly you give it.

Flight performance is excellent and it has enough speed on this set up for all but the very committed speed junkies, recording 147 km/hr (92 mph) maximum on my GPS telemetry sensor. So if you just want an easy to fly, responsive model that is still pretty rapid then the Ripmax Dagger and Quantum motor on a 3S with an 8 x 8 prop is a great combination.

For the ultimate speed freaks I'm sure there will be fliers fitting even higher KV motors with smaller diameter propellers. And as long as these setups are well balanced the airframe should do them justice. **RCMW**

Bright underwing stripes are a good idea on a fast delta. Contrasting colours show up well

Obligatory garden shot of the completed model

On a low fly by for the camera

Clubmate, Pete, gives the maiden launch (thanks Pete!)

Finger slots in the lower wing provide a secure grip for hand launches

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Dagger cuts through the air with ease. Even on half throttle it is pretty nippy

Roll rate on high rates matches the 'spectacular' claim. Barry, the photographer, did well to capture the Dagger half way round!

Like most deltas, Dagger is easy to bring in for landing

Motor Woes

As noted in the review I had problems getting the recommended Quantum II-20 Speed motor to run smoothly on the recommended APC 7 x 7 prop and 4S LiPo combination at high rpm, especially using an existing propeller driver that I had. We reported this back to Ripmax and they quickly sent us an alternative propeller driver, which sat right against the front bearing. They provided the following recommendations:

- The front circlip and washer on the motor should be removed
- The rear motor grub screw should be loosened and the shaft moved back by 2.5 to 3.0 mm in the rear housing. This is to put the circlip groove inside the front bearing so the shaft cannot pivot around this area if the propeller is not perfectly balanced
- The new propeller driver should be slid fully home on the motor shaft
- The propeller driver will only have the correct clearance between the spinner backplate and the nose of the model when the shaft has been moved back
- Only use the APC 7 x 7 propeller recommended. Check for good balance after reaming
- The propeller needs to be reamed to 6mm using a metric reamer. Do not ream to 1/4" using an imperial reamer as this could result in the propeller not being centred properly. Ripmax sells a metric reamer under part number T-RT646

This new propeller driver will be supplied as an option and will come with a set of instructions specific to the Dagger and the Quantum II-20 Speed motor. It has been developed specifically to address the high rpm and Ripmax stress the need for accurate fitment and balance of the propeller.

Note: After our aborted efforts with a 4S, I tested the 7 x 7 propeller and 4S LiPo combination without the spinner cone and was rewarded with smooth running all the way to full throttle. The propeller was turning at over 15,500 rpm, so once I've located a balanced spinner we'll give this combination another go and I will report back.

MODEL WORLD DETAILS

MODEL INFORMATION

NAME:	Dagger
MANUFACTURER:	Ripmax
DISTRIBUTOR:	Ripmax
PRICE:	£74.99
MODEL TYPE:	Fast delta
CONSTRUCTION:	Built up balsa and ply with heatshrink covering
PARTS SUPPLIED:	Airframe
PARTS REQUIRED:	Servos, receiver, LiPo, motor set

R/C FUNCTIONS

1: Elevon 1
2: Elevon 2
3: Throttle

MODEL SPECIFICATIONS

WINGSPAN:	850 mm (34.5 in)
WING AREA:	2800 sq cm (3.06 sq ft)
LENGTH:	710 mm (28 in)
TARGET WEIGHT:	920 g (32.5 oz)
REC. MOTOR:	Quantum II 20 Speed
LIPO:	2200 mAh 3S or 4S

DISLIKES

Vibration issues on 4S

LIKES

High quality construction • Great flying performance
Goes like the proverbial on a 8 x 8 prop and 3S LiPo
Handy size • Good instructions

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BUILD YOUR OWN... LOW WING TRAINER

In the final part of his series on building a first low wing model, Peter Maw describes setting up the Renegade and making its first flight

Straight and level, and upside down with barely any control movement

Oh no! We've spent the last couple of months building our new pride and joy, got admiring looks from other club members (or they think you are mad for building your own plane) and now it is crunch time (not literally, we hope).

What should I expect when the plane takes-off for the first time? Will I know what to do? The answer, as always, is to prepare yourself and the plane properly.

It is going to fly faster and respond to control movements quickly and crisply. No more wallowing around corners like a lot of high wing trainers. And it will keep going in whatever direction you point it until you make a control input to change the direction, including up and down. Finally, you will find there are many more flying days as planes like the Renegade handle quite strong winds with ease.

A Little Bit Of Theory Helps

The Renegade has what is called a symmetrical wing section. This is the same shape underneath as on top, unlike high wing trainers, which have flat-bottomed or semi-symmetrical wing sections. Trainer wing sections provide safety and stability because they cause lift, which makes the plane go up, and the dihedral (the angle at which the left and right wings join each other) makes the wings fly level. The symmetrical section of the Renegade does neither of those things, but there is no need to panic; it is still a stable and easy plane to fly, just not in the same way you are used to.

A symmetrical wing makes for smooth flying and because the forces created by control surfaces are the same on both the top and bottom of the airframe the results are predictable. For example, the plane will roll around its own axis without much effort, so horrible barrel rolls will disappear from your flying pattern. However, if you tilt the wing to any angle there is no force being applied to return it to horizontal, so you will have to create it by applying opposite aileron.

Setting Things Up

During the build of the plane we paid plenty of attention to making gap free hinge lines and getting the control horns to be in line with the hinges. It is also important to make sure there is no play in the control runs, because the plane will react badly to flapping control surfaces. Once servos are connected to the control surface and powered up there should be no movement of the surfaces if you push against the servo arm. This means servo arm holes should be a clearance fit and use metal connectors and clevises throughout. I have used swing keepers on the servo end of the control rods as they are perfectly adequate for this size of plane, but I would not use them for anything powered by a .40 engine or higher.

The advantage of building solid control rods becomes obvious here, as it is virtually impossible to completely prevent sloppiness with snake type connectors. We know this plane is going to fly substantially faster than any trainer, and when diving, coming out of a loop for example, speed can build rapidly. Any play in the hinges or connectors will allow control surface flutter.

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A steady climb out with about 2 mm of elevator movement

You will hear the distinctive rattling of the control surface just before it detaches itself from the rest of the plane, rendering the model uncontrollable and turning it into a basket case.

The second major reason for making sure that the hinges are tight is that the amount of movement is tiny. If you followed the information on the plan the control movements for elevator will have been set at 12 mm (1/2") up and down, with ailerons having 12 mm (1/2") up and 8 mm (3/8") down. Rudder movement will have been set at around 30 mm (1¼") each way. This is fine for a starting point. The plane benefits from the aileron differential, which means it makes sense to read the radio manual and programme it in. Differential reduces drag under the wing, so helps it rotate, giving more axial rolls and smoother turns.

Expo And Rates

One thing that will definitely be different with a low wing aerobatic plane is that any stick movement will create a response from the plane. There will be no doubt that you have done something, as there often is with a high wing trainer. However, the movement of the ailerons and elevator is miniscule in a normal flight pattern. The pictures of the Renegade upside down and in a roll show it has hardly any surface movement to create the desired manoeuvre. There is barely 1 mm of down elevator holding the plane in straight and level inverted flight,

On approach, the nose is pointing slightly up and the elevator has only 1 mm or so of up deflection. When the plane is a few inches above the ground, cut the motor and feed in more up elevator to slow the plane as it touches down

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and just 3 to 4 mm of aileron movement to make a smooth roll. Flying smoothly needs small positive movements of the sticks and getting used to that type of movement is a big part of the learning curve. Find out how the plane flies using linear responses to the stick movement, as expo discourages small stick movement.

Although it is tempting to think expo will make life easier because you can slop the sticks around like a pudding spoon, the crisp control responses that occur with a linear stick movement disappear. Once you know how the plane reacts to control movements then you can set up expo to smooth out your flying to suit your style.

Rate switches are not really there to make normal flying easier by de-sensitizing the stick movement. Expo can do that with more subtlety if you want it to. Low rates can be unsafe in situations where a lot of movement is needed quickly, such as landing cross-wind or when the plane gets caught in an up or down draught at low level. Rates are good for making some aerobatics easier to perform or more precise as the flying gets better.

For example slow rolls can be very difficult to control if you are trying to keep the aileron stick at approximately 50% movement while moving it backwards and forwards to keep the plane level with elevator and at the same time banging in both left and right rudder as the wings go vertical. That is when rates are really useful. If they are programmed to only produce 50% of full movement at full aileron stick deflection then the stick can be pushed over to its stop, which means you only (!) have to worry about the up and down elevator movement, and the timing of the rudder input, so that is a third of our brain power saved.

This 3-D aerobat has a massive amount of movement on the aileron to control roll rate at low speed. Something will be badly wrong with the Renegade if you try this much aileron!

Let's Get Cracking

If you have used an old engine then there is no need to worry about its reliability, providing it is plumbed in correctly, so that's one less thing to worry about. Range check and check that all controls are going the correct direction before starting the engine. For your first flight ask your club mates if you can walk out to the take - off strip and stand behind the plane; it is so much easier than standing in the flight box and watching the plane travel across your field of vision. Explaining that it is safer for them normally sorts out any objections. You will learn to take - off standing in the pilots' box later on.

If you haven't flown a tail dragger before the sequence is reasonably straightforward. Hold in full up elevator and about 25% right rudder. Power up the plane and as it starts moving ease off the elevator so that the plane is running on two wheels with the nose level. Adjust the rudder movement to keep it straight into wind using small stick movements (that is why you want to stand behind it on its first take - off). Start slowly feeding in up elevator as the plane speeds up and then it will take - off. If you kept it pointing into wind the plane will climb out with the wings level. If you didn't, be prepared to use aileron to straighten the wings. With a new plane get it as far away from the ground as quickly as possible, so once it is flying add a small amount of elevator and get it pointing skywards. Level out at a height where you can still see it and feel comfortable, and reduce power to give yourself some time to get used to the machine.

You will immediately notice that as soon as the wing is banked and up elevator is fed in the plane starts turning. If you didn't learn how to use rudder to maintain height in a turn with your high-winger now is the time to find out how to do it. For a left turn put in left aileron, add enough elevator to pull the plane round the turn, then apply right rudder to maintain height, and vice versa for a right turn. The easy way to remember is that on a left turn both sticks are moved to the centre of the transmitter, if turning right both sticks are moved to the outside of the transmitter.

Try a simple loop and roll to see the aerobatic capabilities. There is plenty of power with the Renegade set up, so it is easy to loop with about 50% up elevator. Make sure the plane is pointing directly into wind with level wings before the loop starts. As the plane goes up keep the wings level with aileron if needed. Ailerons work the same way whether the plane is right way up or upside down so no extra thinking is needed. If it deviates from its heading use rudder to push the nose back to the correct heading. As the plane reaches the top of the loop cut the power to about quarter throttle. This will keep the plane at a constant speed and as the plane comes to the bottom of the loop ease off all the elevator and the plane should continue straight and level. Much nicer and easier than with a high-wing trainer.

Rolls will be axial and just need a dab of down elevator as the plane is inverted.

Once you have mastered those manoeuvres then things will just get better as you think of more things to do with the plane.

About 50% of the elevator movement has been applied on take - off, which gives a very steep climb

Ease off the elevator to reduce the rate of climb

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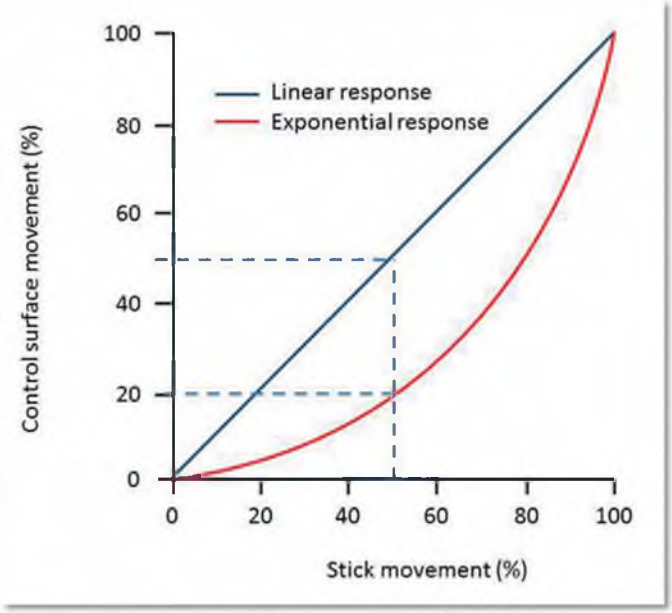
On a slow roll there is virtually no control surface movement on the ailerons. This is about 30% stick movement



With linear movement 50% stick movement gives 50% control movement. With expo programmed in 50% stick movement gives 20% control surface movement

Now The Scary Bit

The plane has to come back to the ground. An 8 oz fuel tank and a 0.36 two - stroke gives around seven minutes of full power flying. This type of plane has very little frontal area and will not slow down very quickly when the power is cut back, which means a long approach is best. As speed does drop off the elevator tends to control the speed of the plane and the throttle controls the rate of descent, which is not necessarily what you expected. Applying more up elevator increases the angle of attack of the wing, making more drag and slowing the machine down. Increasing the throttle makes the prop swing faster, and that puts more air over the wing, which increases lift, so the plane stops dropping out of the sky.

This type of plane needs flying in; just cutting the throttle isn't enough to make a nice landing. As the plane almost touches down virtually all the up elevator is applied, but this is only done when the plane is inches from the ground. Any earlier and you risk a stall and a broken plane. As you get close to full up elevator the engine is cut to idle and the plane will sink gently to the ground. Keep the up elevator on until the plane finishes the landing roll to prevent it tipping on its nose.

There, that was simple, wasn't it? Don't bang the sticks around too much and you will have great fun flying your first low winger, which will last for ages. **RCMW**

The rudder is fully deflected to the right and is not quite holding the plane level, so a bit more rudder can be added to the control throw

Swing keepers are OK for small planes like the Renegade

Hardly any frontal area means very little drag, so long approaches are the norm with this type of plane

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MODEL WORLD DETAILS

MODEL SPECIFICATIONS

MODEL NAME:	Renegade
WINGSPAN:	51" (1295 mm)
LENGTH:	43.75" (1110 mm)
FLYING WEIGHT:	4 lb 3 oz (1.9 kg)
ENGINE:	0.25 – 0.36 2-stroke glow (ASP 0.36 used)
RADIO:	Ailerons, Elevator, Rudder, Throttle
CONSTRUCTION MATERIALS:	Balsa and Ply
COVERING MATERIALS:	Heatshrink film

PLAN DETAILS

NAME:	Renegade
BUILD CATEGORY:	Intermediate
PLAN NUMBER:	MW3373
PLAN PRICE:	£16.99

A Renegade Laser Cut Wood Pack (WP3373) is also available, priced at £56.99. Plans and parts are subject to Postage and Packing charges at standard rates.

Copies of plan number MW3395 are available from RC Model World (Plans Service), Traplet Publications Limited, Traplet House, Pendragon Close, Malvern, Worcestershire WR14 1GA, England, Telephone: + 44 (0) 1684 588599, Fax: + 44 (0) 1684 578558, Email: orders@traplet.com or order online at www.trapletshop.com

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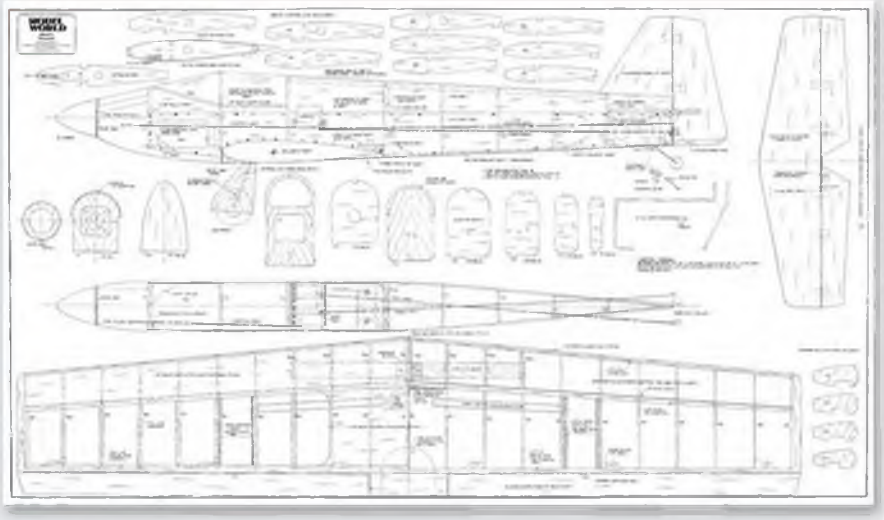

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SPECIFICATIONS

Wingspan: 1321mm/52in

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Wing Area: 586.3 sq.in

Flying weight: ~1393g / 49.13oz/3.07lb

Wing loading: 12.06oz/sq.ft

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LMA AT ELVINGTON 2014

The Large Model Association show at Elvington is unique because of the mixture of model and full size aircraft displays. Neil Hutchinson was there to capture the action

An LMA 'old faithful', Ken McCormick's B-17, flown by Andy Johnson. Four Zenoah 38 cc petrol engines power this huge model. It also features flashing machine guns and engine smoke

This has got to be the model of the show! The Fokker E.1 Eindecker flown by Gerhard Reinsch. The model flew very well in difficult wind conditions

The Eindecker is very aerobatic. The Valach petrol engine provides plenty of power for the 19.9 kg aeroplane, including high vertical climbs

There is always plenty of variety at Elvington and 2014 promised to be the best yet. The only fly in the ointment would be the weather. After several weeks of good weather things started to go downhill during the weekend. There were strong winds on Saturday, which meant the original show programme had to be abandoned and the show took on a fly-in approach; those who wanted to fly queued up and took their turn. Sunday would be a total washout, with torrential rain for most of the day.

Elvington now attracts several full size aircraft and the list is starting to get longer. The visitors included Neil McCarthy with his Newcastle Jet Provost, who did several excellent displays before (and when he came back from) a show in Northern Ireland. The guys from Breighton airfield, Simon Ducker (Yak) and Simon Johnson (Soko J-20) also flew several times, putting on a great display of formation flying with two totally different aircraft. For the second year running we also had the Avro Vulcan. What a fabulous sight to see this huge jet aircraft. It was even more poignant, in my view, because this is its penultimate flying season. 2015 will be the Vulcan's last flying season. The reason? A lack of serviceable jet engines, as they are all becoming time expired. There were a couple of very nice Austers that also dropped in to see us, too.

The pilot is looking a bit pasty though after all those aeros!

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(L-R) Andy Johnson, George Mergatroyd and son Adam, with the Vampire

Left & Above: Another brand new model, Andy Johnson's de Havilland Vampire at its first LMA show. Andy still has some work to do, such as finishing the cockpit, but it does look very good in flight

Left & Below: Andy Wynn's Hawker Tempest V made its LMA show debut. Built by father Colin from a Vally Aviation plan

Eye Catching

Two models caught my eye, from totally different eras and also different types of build. Andy Johnson flew his new de Havilland Vampire, which is scratch-built, and Gerhard Reinsch flew his Fokker E.1 Eindecker, an ARF model.

I'll start with the Eindecker. To say it's an ARF model is far from the truth, as there is a lot of work to be put in before you can fly this model. It's designed by Paolo Severin and is available from Toni Clark Practical Scale. The model replicates the original Eindecker's wing warping capability with some very complicated rigging. This is even more fascinating because it is also linked to the joystick in the cockpit. The model is 40% scale, which gives it a wingspan of 4.04 metres and it weighs 19.9 kg. A Valach VM 120B2-4T petrol engine powers the highly manoeuvrable Eindecker with ease. Gerhard had no problem flying the model in the plus 25 mph winds. There are some nice extras for this model too; the scale dummy engine is beautiful and hides the Valach perfectly.

Andy Johnson's Vampire is a totally different model. It was scratch-built by Andy, with help from George Mergatroyd. They built the whole model in less than six months. Andy wanted a model around the 12-foot mark and to use a Wren 160 jet turbine power unit. He asked Falcon Aviation for help. What they came up with fitted the bill perfectly. The Vampire would have a wingspan of 12' 3" and weigh 60 lb. Andy also needed a good undercarriage for the Vampire and David Brown of Premier UK Retracts came to the rescue with a lovely undercarriage set. The nose wheel is a work of art and looks very scale. The Vampire looked very well in its yellow and black colour scheme and according to Andy, she flies like a big trainer.

There were also many old favourites at Elvington too. It was nice to see John Townsend again with his superb Miles Magister. John was paired up with Ian Turney-White, flying his equally superb Bristol Bulldog. Both pilots were in good form and put on some very good flying in the difficult wind conditions. Ted Alison's large scale Lightning is another big model that the crowd like to see. Dave Johnson put on a fine display with the Lightning and then went on to demonstrate his large Vulcan bomber. The Fighteraces team were in action several times throughout the day with their WW2 fighter aircraft.

As usual there are too many models and flyers to mention, but they all did a superb job and showed how good they are when the weather is very nominal. Elvington is becoming a classic LMA showground because of its variety of models and full size aircraft. There is also a large trade presence, too. It is most certainly in the 'something for everyone' category and it is a show that should not be missed by modellers and aviation enthusiasts alike. I'm sure 2015 will be even bigger and better.

RCMW

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FULL SIZE FOCUS

A very unusual aircraft, the Soko J-20 Kraguj, flown by Simon Johnson. Highly manoeuvrable and very noisy, it's a superb display aircraft. I'm surprised no one has built a model of it – yet!

The unique Avro Vulcan! Another superb short display from this elegant aircraft before she left to display in Northern Ireland

Above & Below: Neil McCarthy always puts on a fantastic display with his Newcastle Jet Provost

Left & Below: Another model flown by Andy Johnson, the DH Sea Vixen AFW2 built by George Firth. The model is scratch built and has a 7 ft wingspan

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Dave Johnson's Avro Vulcan is always a great show model, and it reflects the public's affection for the real thing

Vulcan take-off being filmed by a Quadcopter Pro

The film crew - Dave Halton, pilot, and Paul Carr working the camera

A Gee Bee racer in action. As usual there's plenty of action during their racing slot!

Phil Clark's Douglas A-24 doing a fast flypast during the WW2 Fighteraces slot

Topflite ARTF P-47 flown by Richard Scarbrough. The model is powered by a DLE55 petrol engine and has a wingspan of 89"

Even the very tricky wind conditions didn't deter the 3-D aerobatic flyers

Fly Eagle ARTF Viperjet flown by Mark Conlin. A JetCat P180 jet turbine powers the 2.7 m wingspan jet, which weighs 19 kg and flies very well

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Ian Turney-White about to start the huge Bristol Bulldog's JPX 425 cc flat twin petrol engine

The huge Bulldog coped very well in the strong wind. Ian Turney-White put on a superb display

John Townsend's huge Miles Magister trainer. This is one of the oldest large models still being flown at LMA shows

Rob Gardener's amazing Chinese J-10 Dragon. Rob is still getting used to this complex model but his displays are getting more adventurous

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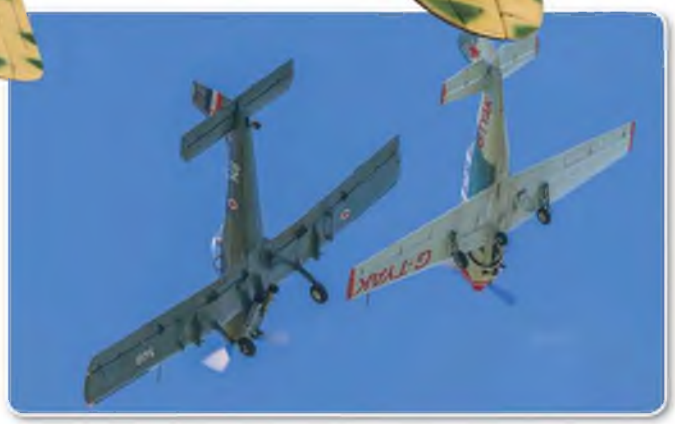
This is another model that seems to have been around the LMA show scene forever, Phil Robertshaw's Heinkel HE111. The model is going to fully refurbished over the winter

Paul Crawshaw's lovely DHC Chipmunk. This model was originally built by Brain Rawcliffe and was built from a Mike Smart plan. A Saito 36 cc four-stroke petrol engine powers the Chipmunk



The full size Yak and Soko of Simon Ducker and Simon Johnson put on another superb display

This beautiful Auster was one of several light aircraft to visit Elvington on the Saturday

Getting Ted Alison's English Electric Lightning ready for flight

Ted's 1/3rd scale Lightning has now been fitted with more powerful Merlin 160 jet turbines, which Dave Johnson used to the maximum during a great display

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YAK 54
3D E-PERFORMANCE

Josh Spiers assembles a small scale electric aerobat from Great Planes

There are Extras, Edges, Caps and Yaks by the score out there in the marketplace. Most of them are in the smaller sizes, being made from one type of foam or another. So what makes this latest offering from Great Planes different and ups its desirability to another level? The fact is that this model is of all balsa and ply construction. Of 41" (1040 mm) span, it is beautifully designed and built, and Hobbico are not afraid to flaunt it by using a clear film covering, enhanced by an attractive red white and blue colour scheme.

Everything in the box was well packed and wrapped, with no travel damage whatsoever. But I was disappointed with the amount of wrinkles in the covering, some of which stubbornly refused to vanish no matter what I tried. This, I suspect, may have been down to the fact that the base clear film may not have been fully shrunk before the coloured trim was applied, thus preventing any more shrinkage.

Apart from that little niggle everything else was as it should be, so a good perusal of the manual followed with brew in hand.

Josh likes to call this pretty one-piece model his Krasavitsa (Beautiful Girl)

Fast Build

It says ARF on the front of the manual and for sure it is! The wings have just four jobs to do before they are ready to be offered up to the fuselage, namely fit the supplied horns to the ailerons, glue the ailerons to the main panel using the furry hinges in the pre-cut slots, fit a decent 9 gram servo into the servo slot and, finally, use the carbon rods supplied to connect the servo to the control horn.

Before you can offer both the panels up to the fuselage you must first trim away the covering over the recess. My personal means of achieving this is with a heated piece of pushrod wire that melts the covering as you run it along the outside edges. It also seals the edge of the film to the balsa, preventing any creep at a later date. All of the cut outs on the fuselage were done using this method.

With a bit of practice you soon learn how hot to heat the wire so as not to burn the edges and also what speed to move it to achieve a nice sealed cut. If you end up having to get a fire extinguisher out then it's safe to say you got it wrong!

With the wing panels ready to glue to the fuselage and put to one side, I built the motor box for the Rimfire 10 outrunner and glued it into place on the front bulkhead, followed by a trial fit of the motor to check it all fitted as it should. I then screwed the elevator and rudder servo into place as shown in the book, as I find it easier to do as much of the fitting out on a one piece model before it's glued together, reducing the amount of hangar rash inflicted in the process.

There are two long lengths of carbon fibre rod that are the pushrods for the elevator and rudder, which have to be slid into place down the fuselage from the tail end. There are no guide tubes to help you achieve this and on one side one rod stubbornly refused to enter the fuselage no matter what. I then inserted the rod from the front, through the holes in the formers, which I found easier. I got as far as the rear former by the exit hole, only to find the reason why entering or exiting was not possible...

The laser cut exit hole was set too low on the vertical former, and so was out of line with the exit slot. A quick burst of aeromodelling with a suitable drill soon had the problem sorted, allowing autopilot to be re-engaged for the rest of the assembly. By the way, apart from the crinkly film, this was the only problem found during the whole assembly of the Yak.

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One Piece Model

With most of the bits and bobs done it was now time to stick the little critter together, starting from the tail end. I found that it helps if the tailplane and elevators are in place, as it helps to line the wing panels up when they are glued to the fuselage sides. The manual shows the panels going on first. But after a dry run, I went for my method as it is difficult to be certain that the panels are exactly square to the fuselage and using the tailplane as a reference made the job, for me, a lot easier.

The wing panels have a protruding spar at the root that is slotted to fit together when the panels are glued in place. After this, you need to glue two ply pieces either side of the spar as reinforcement, making a bullet proof join that only a catastrophic crash could break.

At this point I connected the elevator and rudder servos to the pushrods and moved on to the assembly of the undercarriage. This consists of two white painted alloy legs, which need to be attached to the wheels and red plastic spats. I reinforced the inside of the spats with thin glass sheet as the site I fly from is a pebbled common, which has a tendency to destroy spats any chance it gets. Hopefully I may get a season out of these now, but time will tell. No breath being held at this point!

Not much more to do now as far as the assembly goes, so back on with the motor to enable the cowl to be fixed in place. A lot of Great Planes models have their cowls held in place by magnets and this Yak is no exception. Three magnets are glued into recesses on the front bulkhead and then a ply ring is inserted into the rear of the cowl to which the opposing three magnets have been glued. You must be sure to get the opposing polarity the right way round, so that they attract and not repel (I got one wrong, but no idea how!).

Plenty of nicely finished parts are found in the box

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The cowl ring is then placed against the bulkhead and the cowl slid over it and pushed back to the correct length as shown in the manual, making sure that the colour stripes all line up. You then tack glue the ply ring CAREFULLY to the cowl. When the cyano is dry the cowl can be removed and fully glued in place.

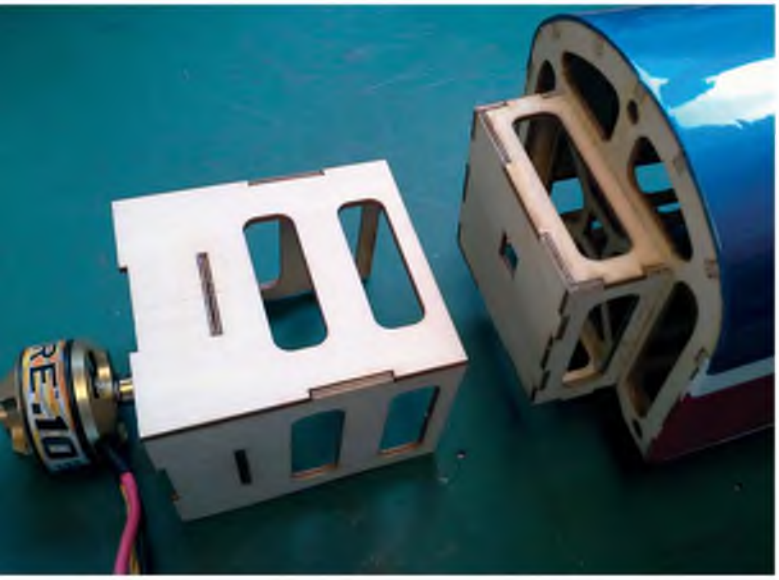
With that job done all the radio gear can be inserted and the controls set up as per the manual. The canopy is taped on, which is the recommended method in the book. At this point I have to hold my hands up and say that on the second flight my canopy came unstuck at the back due to the build-up of air pressure in the fuselage. "More tape, more sticky, Josh!", so you might choose to do it differently, bearing in mind that access to the servos is through the canopy.

For those pilot purists out there, rest assured that when I can find a pilot bust of the correct scale, which doesn't weigh a ton, the Yak will change from drone mode to piloted operation.

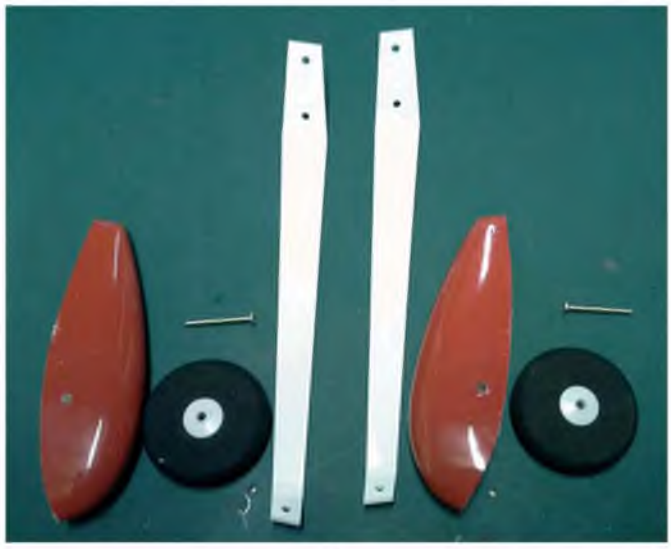
Supplied with the kit was the Rimfire upgrade motor (35-30 1250 KV) and a 35 amp ESC. The tech note that comes with this package suggested using a 1300 3S LiPo and an 'E' prop in the range of 10 x 5 to 10 x 7. As I had a 10 x 5 in the prop box that is what got fitted for the maiden flight. The watt meter showed 25 amps, 275 watts static on this combination, which should be ok for this model, weighing in fully loaded at 1 lb 12 oz. I have also tried an 1800 3S battery, which does increase the wing loading a smidge but it does help penetration in windy weather.

With all this late season good weather we have been experiencing this year it was a real change not to have the Yak sitting moping in the workshop waiting for a suitable day for the maiden flight. Bearing in mind the low weight of this model, it follows that I also wanted a day with very little wind, which duly coincided with my next regular session at the field.

Hobbico's recommended motor set was used for this review



The motor box for the Rimfire 10 outrunner is glued to the front bulkhead



The two white painted alloy undercarriage legs need to be attached to the wheels and red plastic spats

Cowl ring uses magnets to fix the cowl to the fuselage

Two ply pieces are glued either side of the spar as reinforcements

A clear view of the wing joint without the clamps in place

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Beautiful Girl

By the time I got there the cantankerous weather gods had decided that I could have no wind, but a clear blue photogenic sky was not part of the deal.

As I had already done all of the pre-flight checks, it was just a question of loading the LiPo and prepping Roger, a club member, as to my intended flight envelope for him to capture the Yak in its element using his huge camera.

Take - off was a non-event, with the Yak tracking straight across the strip, using just a tiny hint of rudder to keep it straight. Lift off was achieved with a squeeze of elevator and into the circuit we went for a quick trim. Ailerons were spot on, with just two or three clicks of up on the elevator to achieve a neutral flight path.

Most of the first flight was taken up with posing my Russian 'Krasavitsa' for the camera, so after five or six minutes a landing was called and she was popped onto the strip with no dramas. The taxi back proved the benefit of my spat reinforcement, as they were unfazed by the bumpy ground and showed no damage after the half dozen or so flights she has had to date.

The second flight was my chance to find out what she could do, which is a fair bit, and probably more than I am capable of. The 10 x 5 prop gave pretty good vertical and would hold the hover ok, but struggled a bit on the punch out. Tracking through a loop was accurate upright or inverted. You really had to abuse the elevator to upset her and she was very reluctant to flick out of a loop, preferring to mush instead.

The vertical lines were pretty well straight and stall turns very accurate with the powerful rudder, either left or right. With the C of G set at the recommended 79 mm back from the L/E it will flat spin beautifully upright or inverted, but again it would benefit from a bit more 'juice'. With this in mind I changed the 10 x 5 'E' prop to an APC slo-fly 10 x 4.7, which measured 29 amps 330 watts on the meter. Now we are talking! More punch, more vertical — and more flicky, spinny stuff. Yummy!

The second flying session was much windier, and was a good opportunity to see how this lightweight aerobat would cope. Very well, as it happens. Yes, it was buffeted about a bit, but you could still fly a pattern and even landing in the turbulence didn't faze her. Just make sure you still have amps in the tank to fly her in.

It was on this blustery day that I also tried the 1800 3S batteries, which did help the flight path through the sky. But I have yet to use them in a flat calm to see if the slightly extra weight affects the performance in any way.

Flight times vary depending on how greedy you are. On the 1300 packs, going up and down the rev range, I get approximately 5 to 6 minutes. And with the 1800 pack I get 7 to 8 minutes. But as I said earlier, I have not had chance to use the latter in a flat calm flying session, so it could be longer.

To sum up then, this is a very well built 41" ARTF one piece model that you can pop in the car for a 'quickie', doesn't cost an arm and a leg to get in the air, and it will fly like a larger model. You can set it up to rip snort about the sky or tone it down to gracefully aerobat in a more relaxing manner. The manual is excellent, which is what you would expect from Great Planes. All in all the Yak 54 3D E-Performance is a very worthwhile addition to the hangar.

And it does look so pretty, my little 'Krasavitsa'. **RCMW**

There's plenty of room to adjust the battery position to find the best balance point

From a low angle the Yak looks bigger than its 41- inch wingspan

Lined up and ready for her first take - off

Into the air for the first time, with just a bit of up trim required

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Josh is smitten: "You can set it up to rip snort about the sky or tone it down to gracefully aerobat in a more relaxing manner"

Underside shot shows off the neatly built airframe. All flying shots courtesy of Roger Laskey

It is suggested that the canopy is taped on, but it obviously needs a bit more sticky stuff than this!

Like its full size counterpart the Yak 54 excels at aerobatics

MODEL WORLD DETAILS

MODEL INFORMATION

NAME:	Yak 54 3D E-Performance
MANUFACTURER:	Great Planes
DISTRIBUTOR:	Hobbico (in the UK)
PRICE:	£110.99
MODEL TYPE:	3-D aerobatic
CONSTRUCTION:	Built up balsa and lite-ply
PARTS SUPPLIED:	Airframe
PARTS REQUIRED:	Servos, Receiver, Motor, ESC & LiPo

R/C FUNCTIONS

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

MODEL SPECIFICATIONS

WINGSPAN:	41" (1040 mm)
LENGTH:	38" (960 mm)
WING AREA:	356 sq in (23 dm)
WEIGHT:	24 — 27 oz (680 — 765 g)
MOTOR USED:	Electrifly Rimfire 10 (35-30 KV 1250)
ESC USED:	Electrifly Silver Series 35 amp
LIPO:	1300/1800 to 2150 3S 25C

DISLIKES

Covering difficult to tighten up in some areas • One set of pushrod exit holes didn't line up

LIKES

Very pretty model • Great at 3-D, but is also good for more relaxed aerobatic flying • One-piece model fits easily in the car

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Peter Miller looks to Formula 1 and Goodyear pylon racers as the inspiration for his latest R/C designs. First up is the Scoville Stardust

SCOVILLE STARDUST

A little while ago I bought two books, Goodyear and Formula One Air Racing by Robert Hirsch, Volumes One and Two. Each book had over 70 three-views of racing aircraft, with a page of photos. Inspiration for years to come.

The Scoville Stardust first flew in 1952 and was then raced until 1956, when it crashed. The pilot survived.

These racing aircraft are small. Stardust had a wingspan of 16 feet. If one designs them to be true scale they have big fat fuselages and very little wing area.

I like to stretch the wings and slim the fuselages down so that they look like the originals but are not true scale. This stretching produces a very attractive looking model that flies really nicely. It also has the advantage that, because they are not true scale, I do not get annoyed when people use their own colour schemes on the model. I have used the correct colour scheme but made the underside of the wings solid blue to help with orientation.

Wing area is 430 square inches, and the weight is only 3 lb 12 ounces. This means that the model flies beautifully on a .25 glow engine.

Stretching the full size design produces a very attractive looking model that flies really nicely

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Flying

What can I say about the flying? Well, take-offs are smooth and straight. On low rates it is docile and will roll and loop smoothly and easily. Inverted needs very little down elevator held in. Go to high rates and you can really tear the sky up. Spins are fast but recovery is instant upon releasing the sticks.

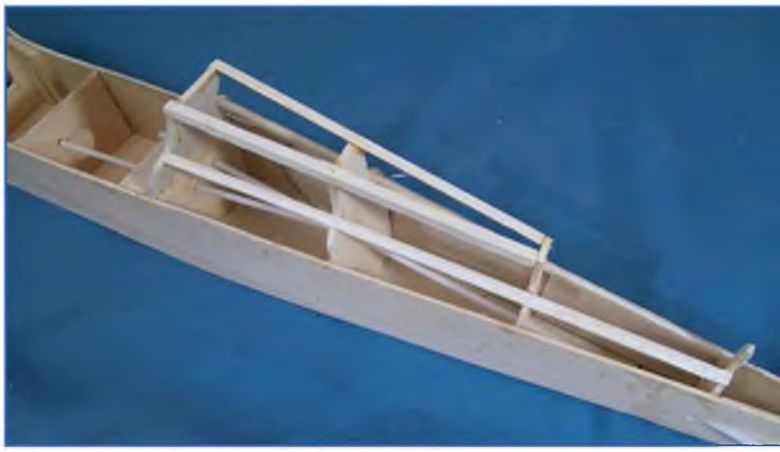
Landings are great, and it is easy to pull off real greasers. Admittedly my first one was in the ploughed field just before the threshold of the runway! But even that was pretty smooth.

I handed it over to Stuart Pickett, who flies my models while I take the flying pictures. He was soon making close passes for the camera. After that his reward is to be allowed to go and play with the model. He always puts it through every contortion that he can think of. He had no complaints with any of the handling so we were both happy. I am sure that anyone else who builds the model will be just as happy with it.

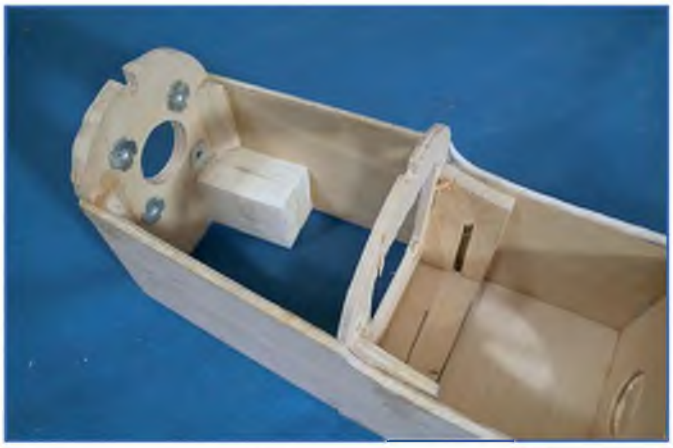
Next add the stringers and triangular stock to the rear turtle deck and fit F-4a at the angle shown. Fit the snake outer tubes. Make up the ply plate for the wing bolt and fit it. The bolt should come through vertically. I used a 1/4 UNC nylon cap head bolt from Modelfixings and also bought a 3/16" Tee handled hex key at the same time. This saves a lot of fiddling around and slipping out of screw slots with a screwdriver through a little hole in the belly. Cover the bottom of the fuselage with 1/16" sheet. The grain should run across the fuselage.

Now glue 3/32" sheet vertically to the fuselage sides and leave to dry. You can fit the front turtle deck at the same time. Once the glue has dried, wet the sheet and apply heat while bending it over. You will need to do some cutting and trimming, especially with the rear sections of the turtle deck. Once shaped and bent over, glue the sheet in place and hold it down with map pins; these short pins hold the sheet much better than normal pins as they can be pushed fully home.

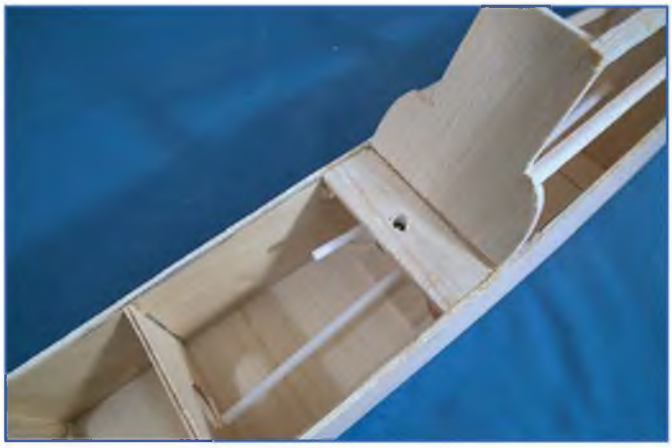
First stage in assembling the fuselage. This must be done over the plan



Starting to build the rear turtle deck. Stringers and triangular wood in place



Inside the nose showing the blocks for the silencer recess and the undercarriage mount



Fitting F-4a. The plate for the wing bolt has already been fitted

Fuselage Construction

The fuselage construction is fairly standard but is slightly more complicated due to the shape of the top decking.

Start off by cutting out all the parts and gluing the doublers to the fuselage sides. Note the doublers under the tailplane. I have found that these add tremendous strength in the event of a knock on the tailplane, either while transporting the model or in a cartwheel landing.

Fit the blind nuts to F-1 at this stage, as it is easier than when the former is glued in place. Lay the plan view down on the building board and join the fuselage sides at the tail end. Add formers F-3 to F-7 while keeping everything aligned over the plan. Leave the assembly to dry.

Pull the sides in at the nose and glue. Again, leave to dry. While the glue is drying prepare the undercarriage mount and adjust the shape of the triangular stock that goes behind F-1, as that is not a right angle joint.

Fit the undercarriage mount and add the blocks that will be shaped to form the recess for the silencer, also the triangular stock that you shaped. You can also fit the tailplane platform now.

The underside of the nose is made from 1/2" sheet. There is an oil cooler under the nose on the full size and I did a very basic representation of the shape on mine, but I would not really bother. It makes covering even more fiddly.

The upper part of the turtle deck is much easier. The sides are just flat pieces glued on and then the top is shaped from 1/2" sheet.

The cowling is built by my usual lazy method. Glue the nose ring to the spinner back plate using scrap 1/16" spacers and CA glue. Mount the engine and fit the spinner back plate and nose ring. Then build the basic cowl between the nose ring and F-1 with 1/2" sheet. Once the glue is dry remove the engine and carve and sand to shape.

The apple cheeks are built using C-1, C-2 and C-3 formers. Of course, C-1 is not used for the right side. The sides are made from 1/8" sheet and then the tops are made from 3/8" sheet. The front of the left cheek is shaped from a couple of laminations of 1/2" sheet.

The underside of the fuselage is finished off with a couple of 1/8" sheet stringers. Fit a solid block between the stringers where the hole for access to the wing bolt goes.

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The top fairing over the wing is built on the wing, with the wing bolted down firmly. Note that the holes for the wing dowels in F-2 are marked too low; this is to allow fine adjustment by some careful filing out of the holes.

With the wing bolted in place fit the formers as shown. Then fit the 3/32" sheet in the same way as the rest of the turtle deck was made. This will take some careful trimming and shaping to get a good fit over the wing. Once again, wet the sheet and bend it over before gluing down. I used sheet right over the top of the head fairing but you could use a scrap of 1/2" sheet if you wanted to.

The undercarriage is fitted with saddle clamps and then a scrap balsa infill, made from 1/4" sheet, is fitted over the tip of it and shaped to match the rest of the belly of the model.

The fuselage is now complete.

Fuselage assembled and ready for sheeting

The lower turtle deck sides are glued vertically to the fuselage sides. With a bit of wetting and some heat and they are bent down to the formers

Underside of the nose showing the roughly hollowed out silencer recess and the U/C mount

Wing Construction

The wings are very easy to build. Follow the sequence and you will have warp free wings. Having said that, watch out for warps in the ailerons, but more of that later.

The spars run from end to end. By making scarf joints at the end of a 36" piece of 1/4" sq, you can get away with three strips. Pin the plan down so that the leading edge is a little over the edge.

Laminate two R-1bs to the R-1as. The idea is that this forms a hole for the 1/4" wing dowels. It works well. Prepare the trailing edge spar and the aileron leading edges.

Lay down the leading edge sheet. This is joined under R-1. Also lay down the trailing edge sheet, which incorporates the ailerons. Glue on the bottom spar and leave to dry.

Glue on all the R-2s but do not glue them to the leading edge sheet yet. Add the trailing edge, butting it up against the rear of the ribs. Fit the aileron leading edges, and the aileron ribs.

Fit the top spar. Note that if you sand a very small radius on the lower corners of the top spar it is much easier to fit into the slots on the ribs. Fit the R-1 and R-1a and b assemblies.

When the glue has dried fit the 1/8" sheet leading edge, the spar webs and all the hinge blocks, ply plates for the horns and the infill at the centre. Spar webs should be in front of the spar.

Now raise the leading edge sheet and glue to the bottom of the leading edge. If you let the leading edge overlap the building board you can use map pins to hold it in place. Otherwise support the sheet with scraps of trailing edge stock. I glue the sheet to the LE with aliphatic resin and then use superphatic to glue the sheet to the ribs.

Plane and sandpaper all the blocks and rear spars to match the ribs. Trim down the leading edge to match the ribs.

The top sheet can now be fitted. I use masses of clothes pegs or other clamps to hold the sheet to the spar and map pins to hold it to the leading edge and ribs. The trailing edge sheet is held down using map pins, or you could hold it down with strips of balsa and pins.

Add the trailing edge, which is made from hard 1/8" sheet, cut down to 3/8" wide. Shape the TE before cutting the strips from the sheet. Once everything is dry the wing can be lifted from the board.

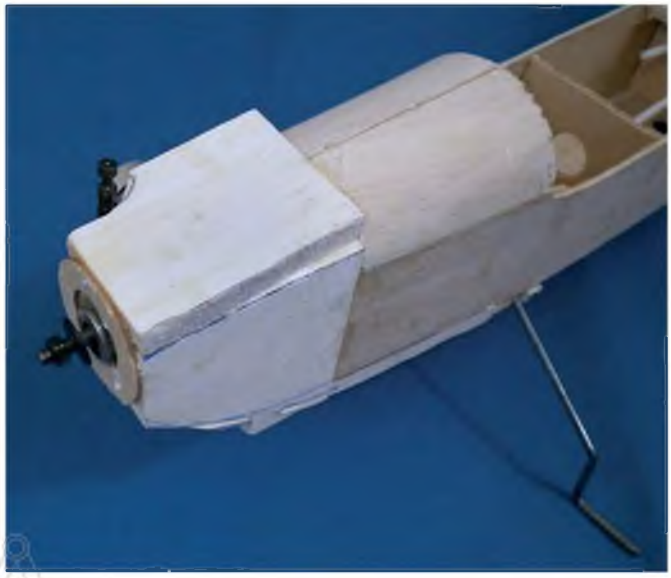
Fit the ply servo mounting plate and the aileron bellcranks. Then fit the centre section sheet and add the capstrips.

The ailerons can now be separated from the wing. Mark them as they are handed. Shape the aileron leading edges to a 'V'.

Fit the blind nut to a ply plate and fit it to the wing. It must be parallel with the centre line so that it lines up with the bolt. The wing can be fitted and the top fairing built up as described in the fuselage instructions.

Fit the wingtips and install the bellcranks. The bottom of the bellcrank bay is covered with 1/16" sheet, with a 1/32" ply reinforcement around the slot for the pushrod. The slot allows the pushrod to be installed after covering.

The wing is complete.



Stage one of building the cowling

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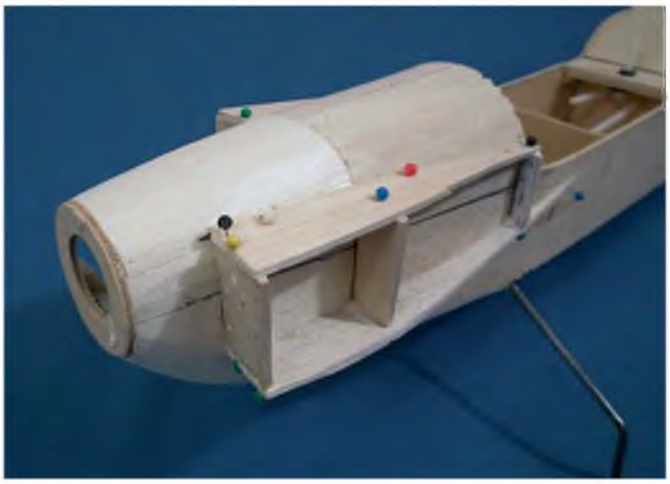


Cowling shaped and starting to build the apple cheeks

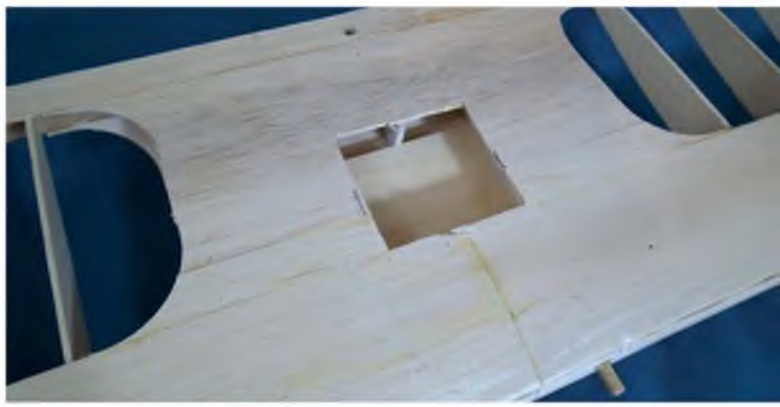
Right side apple cheek ends at F-1. You could build a detachable cowl if you wanted, just make sure that there is good airflow through it

Building the wing fairing. This must be done with the wing bolted down

After some careful shaping and quite a bit of filler, you will have a nice fairing

Basic wing construction. Very simple to build with parallel chord and no dihedral

Complete wing with ailerons separated



Servo bay before fitting the servo

Bellcrank bay. Note the reinforcement to the pushrod slot

Close-up of the blind nut mounting on top of the wing

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Spat mounting. The bolts have stiff nuts fitted and are cut off. A cutting disc is the best tool for this. The wheels are not soldered on but could be

Spats

The spats can be built up from two layers of 1/2" sheet and one of 1/8" sheet. Then two pieces of 1/16" ply are fitted either side.

The spats are held on with 1/32" brass strips soldered to the legs. I soldered 3 mm screws to more brass plates; these screws come out through the side of the spat into the bracket and then stiff nuts are fitted to retain the spat.

You could find fibreglass or plastic spats if you preferred, or even leave them off. But they do look good.

Tail Unit

This is very simple as it is just cut from 1/4" medium grade sheet. The elevators are joined with a 14 SWG wire joiner.

Some people look at my designs and think that the tailplane looks too small. Trust me, it isn't. It is 15% of the wing area and that is plenty. My models are stable in pitch, fully controllable and aerobatic.

Covering

I have used the scale colour scheme for this aircraft but the underside of the wing is solid blue now. The original aircraft has the same pattern on the underside, which can be confusing when the model is inverted.

As the model is quite a complicated shape, I found that I needed to work with smaller than average pieces of Solarfilm Supershrink Polyester, the nicest covering material that I know.

I covered the sides, then the lower part of the rear turtle deck and finally the top in two parts. Each apple cheek was also covered with two pieces of material.

It does take patience and practice but it looks great when finished. The wings are nice and easy but the top fairing needs some care.

Do make sure that the bottom of the wing is different to the top to help with orientation.

Be aware that the ailerons can be warped when covering. A bit of work with the covering iron will get it out again but do check.

I painted inside the cowl and silencer recess and then fuel proofed the engine bay. Once the model has been covered you can glue on the tail surfaces.

Installation

I used my Spektrum radio driving four Hitec HS322 servos. There is room for standard size servos in this model. I like using a single servo in the middle of the wing at this keep the tips lighter, which means faster and more precise rolls. The aileron servo is mounted with servo mounting brackets.

The receiver sits on the floor just behind F-2. The battery is held to the fuselage side behind the servo with hook and loop fastening. Do not use self-adhesive Velcro on the fuselage side; use the 'sew on' type and epoxy it into place. But use the self adhesive type on the battery.

The 6-ounce fuel tank goes in behind F-1 and the bung comes through the hole in the former. I use silicone sealant round the bung as this seals the hole and holds the tank in place. The tank can still be removed easily by just pulling or pushing it out.

Close up of the engine installation

On low rates the Stardust is docile. It will roll and loop smoothly and easily

I used an SC .25 engine turning a 9" x 6" propeller, which provides plenty of power for aerobatics. These are good reliable engines.

The C of G is set at 2½" back from the leading edge, which is a nice, safe location. If you want to try moving it back, be careful. I don't think it needs any experimentation along those lines.

The controls are set at:

Ailerons - high rate 1/2", low rates 1/4"
Elevator - high rates 1/2", low rates 5/16"
Rudder - high rates 1", low rates 1/2"

The elevator low rate seems ideal for most purposes and I would start off the first flight with everything on low rates.

Well that about covers everything. ***RCMW***

Ready to race!

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Go to high rates and you can really tear the sky up

Inverted needs very little down elevator held in

I used an SC .25 engine turning a 9" x 6" propeller, which provides plenty of power for aerobatics

MODEL WORLD DETAILS

MODEL SPECIFICATIONS

MODEL NAME:	Scoville Stardust
WINGSPAN:	43" (1092 mm)
WING AREA:	430 sq in (2730 sq cm)
WING LOADING:	20 oz/sq ft
LENGTH:	39" (990 mm)
WEIGHT:	60 oz (1800 g)
RADIO FUNCTIONS:	Throttle, Ailerons, Elevator, Rudder.
RECEIVER:	Spektrum
SERVOS:	Hitec HS322
BASIC CONSTRUCTION MATERIALS:	Balsa, Ply, Spruce
COVERING MATERIAL:	Solarfim Supershrink Polyester
CENTRE OF GRAVITY:	2½" from Leading Edge
IC POWER ENGINE USED:	SC25
PROP:	9" x 6"

I used the correct colour scheme but made the underside of the wings solid blue to help with orientation

PLAN DETAILS

NAME:	Scoville Stardust
BUILD CATEGORY:	Intermediate
PLAN NUMBER:	MW3721
PLAN PRICE:	£13.99/US $23.99

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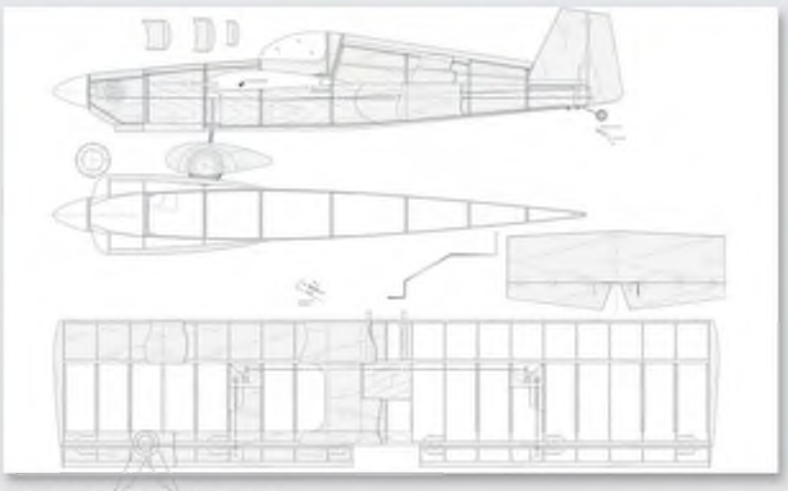

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SPEKTRUM AR636

Horizon's latest AS3X gyro stabilised six-channel receiver promises easy gain control at the flying field

Clear packaging provides good protection for the AR636 before it reaches the final customer

On its own the AR636 is much like any other Spektrum receiver and provides a good, solid radio link

Key to getting the most from the Rx is the Audio Interface lead. The jack plugs into a smartphone or tablet

Anyone who has flown one of Horizon Hobby's AS3X (**A**rtificial **S**tabilisation **3** A**X**is) equipped R/C aeroplanes will likely have formed a high opinion of this exciting new technology. We well remember our first acquaintance with an AS3X plane, it being one of the diminutive UMX series of micro scale models. The quivering controls seemed like black magic at that time, and their calming effects on what would otherwise be difficult to fly small scale models still impresses us every time we fly a UMX machine.

AS3X then made its way into Horizon's larger Bind-N-Fly kits, such as the VisionAire 3-D trainer and the Splendor F3A pattern ship, where its ability to pacify even quite large R/C models was a real eye-opener to the benefits of gyro stabilised aircraft.

More recently AS3X has continued to evolve, being at the heart of the SAFE (Sensor Assisted Flight Envelope) technology found within Horizon's latest kits, such as the F4U Corsair S that we reviewed last month. SAFE's impressive self-righting ability means that it's almost impossible to get into trouble, even when flying a WW2 warbird that would have previously been reserved for expert pilots only.

So when we found out that AS3X equipped receivers were coming onto the market for fitting to other aircraft we just had to have one to explore their benefits even further. To make things even easier for general use the latest AS3X receivers, such as the AR636 tested here, can be linked up to a PC, smartphone or tablet, which promises to make them even easier to set up (the versions in the Splendor etc. use a traffic light system to change the gyro gains, which can get the brain cells working overtime, especially if you don't have the manual to hand!).

At the time of writing Horizon have chosen not to release the SAFE functions for use with this receiver. But we are reliably informed that they are working on making them available for AS3X receivers in the future.

Open The Box

As with other Spektrum receivers the AR636 is well presented in a clear flexible plastic box. The unit is protected in a vac formed moulding, which also serves to prevent damage to the two aerials, one long and one short. Small card boxes surround the Rx and they support the flexible outer box. These boxes also contain several important accessories, namely an AS3X USB Interface lead and an AS3X Audio Interface lead. The former allows the Rx to be connected to a computer, whilst the latter is used to connect it to a smartphone or tablet.

A separate bag includes a piece of double-sided foam for mounting the receiver in a model, as well as a bind lead set and

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a short servo extension lead. This lead is invaluable as it allows access to the Bind/Programming port if the Rx is mounted with the servo connections in an inaccessible place. It is important that the Programming port is easy to get at as nearly all the setting up for each model is done by plugging the Audio lead into a smartphone or tablet, rather than on the transmitter as is the normal way.

Lining the back of the packet is a long, thin box and this is packed with instruction sheets for the Audio and USB leads, as well as a User Guide and a Quick Start Programming Guide. The Quick Start guide shows how to install, set up and bind the receiver, as well as containing drawings that show the correct direction of the control surfaces when the AS3X system is in operation. It's worth keeping a copy of this in your transmitter case as a handy reference when making set up changes at the flying field.

At this point it is worth mentioning the excellent series of AS3X setup videos on the Spektrum RC channel via YouTube. Titled 'Spektrum AS3X Step 1' through to 'Spektrum AS3X Step 15' they are well worth watching to get a full understanding of the set up process.

It's worth keeping the Rx firmware up to date using the USB lead. It's easy and quick to do

Additional accessories. The short extension lead is useful if the programming port is difficult to reach when the Rx mounted in a plane

Copious instructions are provided

Transmitter Setup

We used a new Spektrum DX6 to test this receiver. It is compatible with a wide range of DSM2 and DSMX transmitters, but if you own one of the more recent sets with telemetry, like the new DX6, you can also set it up to make gain changes to the gyros in flight.

Setting up a transmitter is easy as practically everything is left as default. Following a model memory reset, simply input a model name but leave the aileron, elevator and rudder settings at their default values. Changes to servo reverse, sub trim, travel adjust, expo and dual rates are all done via the app on your smart device.

If you want to use Flight Modes – and not doing so would be a bit of a waste of this receiver's capabilities – then you also need to allocate a channel for this function. With the first four channels allocated to throttle, aileron, elevator and rudder, this leaves Gear and Aux 1 spare. We chose to test this receiver using the ST Acrobat that we reviewed in the last issue; the Acrobat has a fixed undercarriage so we could have used Gear, but Aux 1 seemed a logical choice.

After resetting the Tx, a check of the Rx Port Assignments screen should show that Port 6 is allocated to Aux 1. You then need to go to the NEXT screen (Channel Input Configuration) to define the switch you want to use to operate Aux 1. This switch will then become your Flight Mode switch; we use the short 3-position switch on the top right panel of Spektrum radios, switch G. If you have activated the Spoken Flight Mode feature of your radio then you should hear it speak out each Flight Mode number as you cycle through the switch positions.

If you only want to change the gyro gain settings of the AR636 on the ground by plugging in the smartphone interface lead then the Flight Modes will be in the same sequence as shown on your phone. But if you want to enable the Relative Gain feature and change the gain settings while you are flying then you may find that the Flight Modes get reversed. The fix is very simple and simply requires reversing the channel allocated to Flight Modes using the transmitter's Reverse menu.

Initial Setup menu. Either use the Wizard or work your way down from the top to set up a new model

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Installing The Receiver

The AR636 must be mounted parallel to the roll, pitch and yaw axis, with the servo ports facing the front or rear of the aircraft. It can be mounted upright, inverted or on its side, left or right. This gives eight possible orientations, all of which are clearly shown on the Receiver Orientation screen of the phone app.

The receiver can then be bound to the transmitter. The binding process is the same as with any other Spektrum Rx and Tx. Once bound the bind plug can be removed and the servo lead at the end of the Audio Interface can be plugged in to the same port.

Time now to download the AS3X app to your smart phone or tablet; we used an Apple iPhone, but an Android app is also available. Both iOS and Android apps are free to download.

After powering up the receiver the Audio Interface lead can then be pushed into the audio jack of your phone or tablet, making sure that the volume is turned up to full. If all is well then a pair of circular arrows in the top right of the app screen will start to rotate to show that the receiver and app are communicating with each other.

If the Rx is connected to the app for the first time then a Setup Wizard will automatically start and guide you through the setting up process. If you inadvertently drop out of the wizard don't worry as you can continue setting up your model using the Initial Setup menu.

Initial Setup

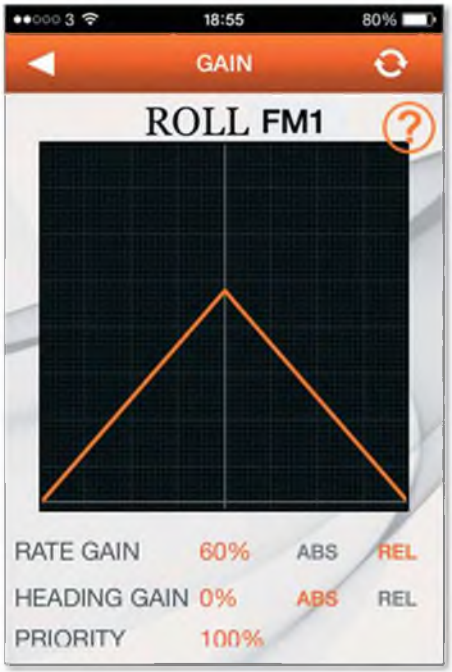
The first icon in the Initial Setup menu allows you to name the model and to tell the app which Rx and Tx you are using. You can also input a photo of the model if you have one.

Receiver orientation is next and is where you tell the app how your Rx is mounted. You can swipe the drawing of the receiver on screen to change its position until it matches your real installation.

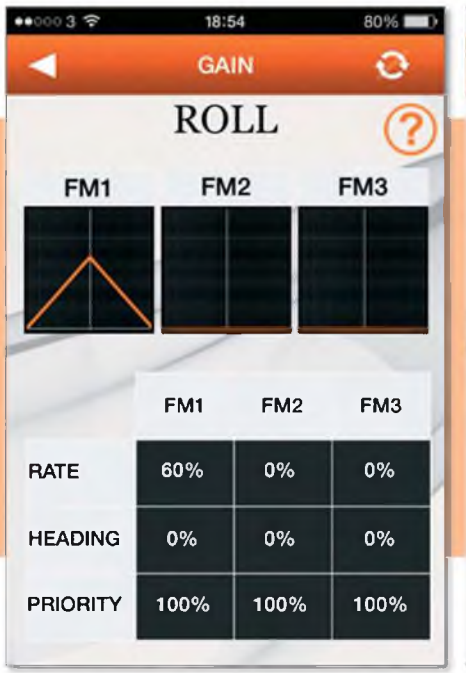
The app then asks which channel is assigned to change Flight Modes, in our case Aux 1. It then asks you to confirm the Wing and Tail types of your model, much like the same menu on a transmitter.

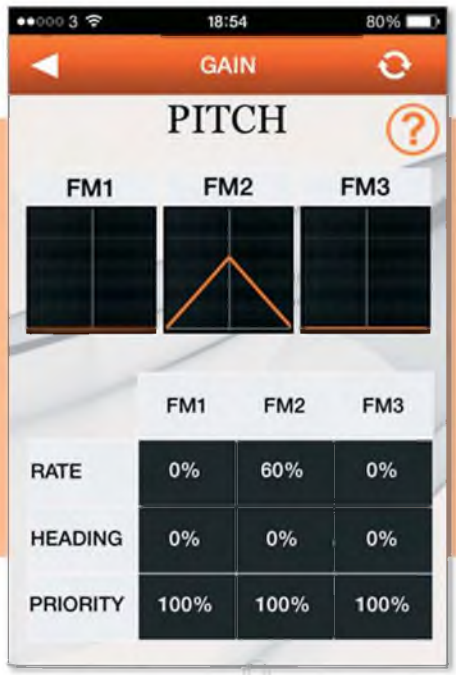
The Settings menu is used to set model parameters, with the transmitter being left at default settings

Exponential settings have been applied to allerons on all three, flight modes. Quick changes are made to the curves by swiping the graph up or down. Then tap for fine adjustments



Rate gain changes are made by swiping the sides of the graph up or down. Swiping the middle changes Heading gain, while sideswipes change Priority settings. Easy and intuitive





It should be possible to set up Relative gains for each axis in just one flight by using a different flight mode for Roll, Pitch and Yaw. After the flight the gains can be recorded and input to a single flight mode

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Tapping the Dashboard icon brings up all the settings for each Flight Mode on a single screen. You can make quick changes by tapping each number. This screen shows that a Rate gain of 60% has been input, with Relative (Tx inputs) enabled but all other gain values set to zero and Absolute, meaning they cannot be changed via the transmitter

Control Surface Setup is next. Simply tap the relevant surface on the drawing of an aeroplane and a set of options appear, including Reverse, Subtrim and Travel.

Failsafe Behaviour is next on the list and by default this moves Port 1 (typically Throttle) to a preset position, usually idle. The other Ports are set to hold, but you can change them independently to a Preset if you wish.

Port Assignment is next and this should match the channel assignment of your transmitter. As you would expect it defaults to Spektrum's usual channel assignments, but can be changed if you wanted to emulate, say, a Futaba set up.

Back to the Setting menu now and the next icon is Expo. The exponential settings for Roll, Pitch and Yaw are shown as graphs. They start as linear but are easily changed to curves by swiping up or down the screen. If you find it difficult to reach an exact value just get somewhere near and tap the screen. Tapping either side of the graph line will increase/decrease the values one percent at a time.

Dual Rates are next. They have a similar graphical display and values can be swiped/tapped out in the same way. For both Expo and Dual Rates you can change the Left and Right values independently if required.

A whisk icon leads you to the Mix menu, where you can add your favourite mixes, and there's also an About icon which provides information such as the Firmware version installed in the receiver. Firmware can be kept up to date using the USB interface lead.

The last major icon, but one that is critical to the success of this very capable receiver is the Gain & Priority icon.

Gains And Priority

The AR636 has two types of gain. Rate gain affects the stability of each axis. Low rates mean less stability, while high rates can give oscillation in flight. So the best settings are those that give the greatest stability for each axis (roll, pitch and yaw) without inducing any oscillation.

Heading gain is only active when the controls are centred and it provides corrections to maintain the aircraft's direction until the pilot gives another control. It is used for manoeuvres like hovering or knife-edge flight. Low values result in the model not maintaining direction, whilst high values cause oscillation.

Priority reduces rate gain as the stick is moved away from centre. 100% priority gives maximum stability around centre stick, but also gives full control to the pilot at maximum deflection.

You can set up these parameters differently on each axis and for each flight mode. Each gain value can also be flagged as Absolute or Relative. Simply put, if you choose Absolute then the settings are fixed and can only be changed between flights by plugging the smartphone in to make changes. Relative, however, allows Rate and Heading Gain changes to be made via the transmitter in flight.

In Flight

As recommended in the setup videos on YouTube we left the gains at zero in Flight Mode 1, and started with a conservative 20% rate gain on each axis in FM2, but no heading gains. For FM3 we set rate gains of 30% and added heading gains of 30% to each axis. All settings were absolute, so any changes had to be made on our smartphone between flights.

The reason for zero gains in FM1 is to give you an escape mode in case you have set your gains too high and one or more of the controls start to oscillate badly. If this happens you can switch the gyros off instantly by flicking to FM1.

Our test flights of the Acrobat went well and we found that our 30% maximum gain values did not cause any oscillation. Our assessment of the effects of switching on the gyros in FM2 and FM3 were a bit subjective, but we did feel that they helped to stabilise things in the stiff, gusting wind.

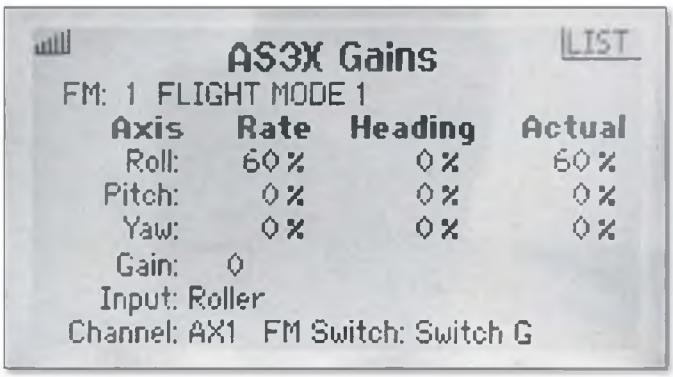
We did not feel, however, that the effect was as noticeable as when flying ready set up AS3X models like the Splendor, so back in the workshop we resolved to increase the gains and to make them Relative, so we could change them during flight.

In the final set up video on YouTube, which demonstrates how to set up Relative Gains, a test regime is mentioned whereby the gain on each axis is set up using a separate flight mode. So for our model we dedicated FM1 to Roll, FM2 to Pitch and FM3 to Yaw. Knowing that 30% rate gain was possible in flight, we set a maximum gain of 60%. Then, by winding the DX6 roller back to a mid value of 50, this gave us back 30% as our starting point.

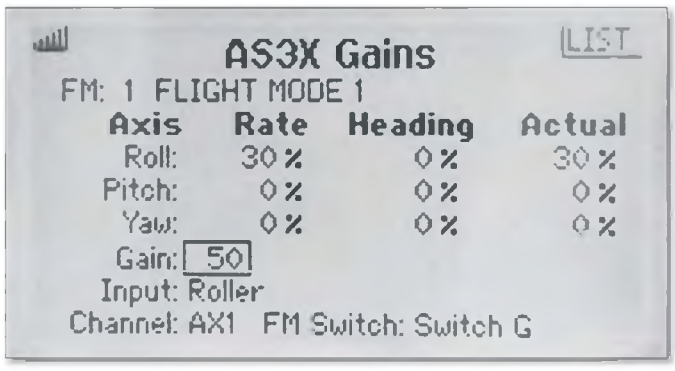
Any Drawbacks?

During the initial set up we had a few minor communications issues, whereby the app said we had connected an invalid receiver. It also sometimes asked us to recycle the power to the receiver.

We found that it was important to return to the Settings screen after making changes as this meant that the changes were implemented, usually accompanied by a twitch of the servos. After a while these twitches became quite reassuring, giving an audible confirmation that any changes had been made.



The AS3X Gains screen is only enabled after allocating one of the telemetry channels to AS3X. Here we can see that a maximum Rate gain of 60% has been input using the smartphone. Relative must have been selected for it to appear on this screen



Rotating the roller on the DX6 brings the Gain value to 50, i.e. half of full travel. As you would expect the rate gain is now reduced to 30%

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Unfortunately we did have some issues when attempting to set up the Relative Gains. First we struggled with the Flight Mode reversal mentioned earlier, but this was easily rectified after Horizon told us to reverse the FM channel (Aux 1). We then found that it was impossible to set up the three flight modes to adjust Relative gains as strange values started to appear on the AS3X Gains screen on the transmitter when in FM2 and FM3. Flight Mode 1 did, however, seem unaffected so we decided to use this to set up each axis over three flights, changing to a new axis each time and winding up the gain until the control surface being tested started to oscillate. Well that was the plan...

Starting with roll, we flew the model and wound up the gain to maximum. No oscillation was detected on the ailerons, so the model was landed and the phone connected in order to increase the top end gain. With this done the model was put back on the strip and we took off. It was immediately obvious that something was wrong with the controls, so the power was cut and the Acrobat hit the ground nose first. This resulted in severe damage to the nose, but the bulk of the airframe was okay so she will live to fly another day.

Back in the pits it was quickly apparent what had gone wrong. The aileron and rudder controls were reversed. The root cause of this was that the AS3X app was showing a different model name called TEST. This was a test set up that we had input in order to take screen shots for this review; it was almost a direct copy of the actual model set up, with one major difference – we had not bothered to reverse the ailerons and rudder!

100% our fault, of course, as we should have made sure that the phone app was on the same model name as the transmitter. And we should have done a full control check after making any changes. But in our defence, we are very surprised that the app did not flag to us that we were trying to sync a different set up to the receiver. We guess that we have become so used to Spektrum's marvellous ModelMatch technology that we thought that such model mismatches were a thing of the past, if only with this brand of radio.

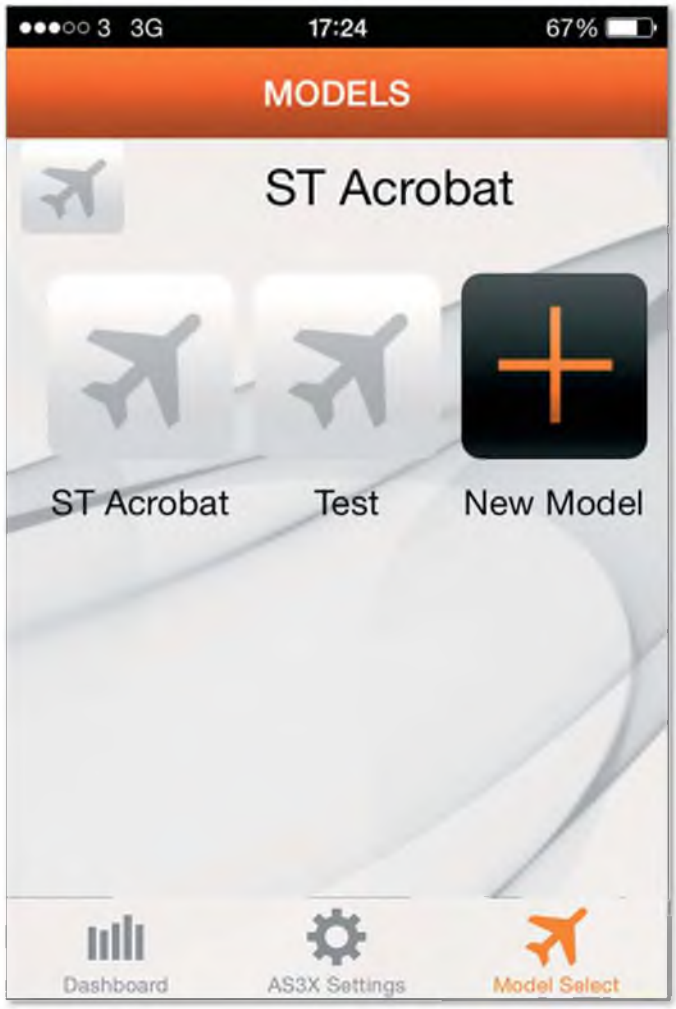
In Conclusion

Despite the unfortunate and premature end to our flight tests we really do like the technology behind this exciting new breed of receiver. As a radio control Rx the AR636 works great, as you would expect from a well-established brand like Spektrum. And the AS3X technology, whilst still fairly young, has been around long enough to convince us of its worth for a wide range of model aeroplanes, whether calming down a tricky to fly scale model or providing a helping hand when trying out 3-D style aerobatics.

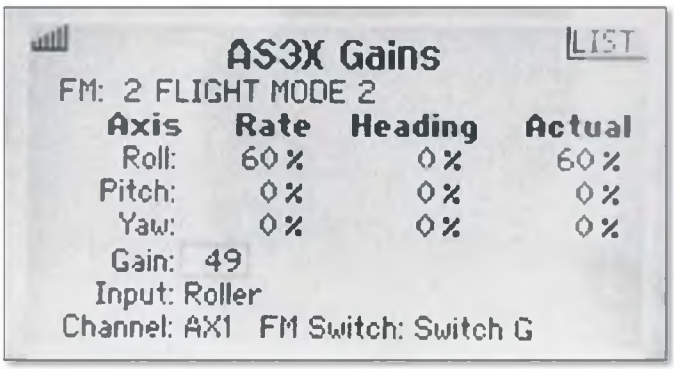
As for the smartphone set up, despite a few communications glitches setting it up proved largely trouble free. And any queries we did have were quickly answered by watching the relevant AS3X Setup video on YouTube. In flight, using the fixed 'Absolute' gain settings, it all looked very promising indeed.

The idea of using Relative gains to alter the settings in flight promised much and this facility had us really excited. But the issues we encountered did dampen our enthusiasm a little bit. And the crash at the end, caused by allowing us to sync an incorrect model set up was a real surprise, as we've long believed – with Spektrum at least – that 'wrong model syndrome' was truly a thing of the past. Seems we were a bit quick off the mark with that one!

But let's not end this review on a sour note. For the most part this receiver does a great job and we can easily see the use of smartphone setups becoming the norm over the next couple of years. With the comms issues ironed out and some form of ModelMatch reinstated to prevent unnecessary crashes, the AR636 looks to be at the vanguard of an exciting new era in radio control technology, just like Spektrum were before when their 2.4 GHz radios swept all before them. **RCMW**



Models screen. Be warned – it is possible to select an alternative model set up and for this to sync to the receiver. So be sure that both the transmitter and the AS3X app show the same model before making set up changes via a smartphone at the flying field



Something is not right here! In our TEST setup Flight Mode 2 is used for gain changes to the Pitch axis. But at 49 on the roller it flips to Roll. FM1 was unaffected by this so we used it exclusively for Relative gain testing, but this would need three flights to set the gyros instead of just one

MODEL WORLD DETAILS

MODEL INFORMATION

NAME:	AR636 6CH AS3X Sport Receiver
MANUFACTURER:	Spektrum
DISTRIBUTOR:	Horizon Hobby UK
PRICE:	£79.99 (inc. USB and Audio Interface leads)

DISLIKES

- Incorrect relative gain values in Flight Modes 2 & 3
- Allows incorrect model setups to be synchronised between smartphone and receiver • Occasional communication failures

LIKES

- Easy to set up • Transmitter settings can be left as default
- Free app available for iOS or Android devices

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HANGAR 9

We Get the Point

GIANT SCALE

Giant Scale Beauty Inside and Out

P-51D Mustang 60cc ARF | HAN4770

Wingspan: 2.36 m (89.0 inch)

Size: 60cc

Inverza™ 62 ARF | HAN5195

Wingspan: 2.24 m (88.0 inch)

Size: 60cc

Hangar 9 products are available from all good model shops. For details of your nearest dealer look on our website horizonhobby.co.uk, contact us by telephone: 44(0)1279 641097, or by email: sales@horizonhobby.co.uk.
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Like you, Hangar 9® designers have a serious passion for modelling that goes hand-in-hand with a fanatical appreciation for full-scale aviation. So when we design a giant scale model, it not only has to look right, it's got to fly right too—otherwise, what's the point, right? That's why Hangar 9 airplanes maintain accurate outlines right from the start. Then we apply our years of modelling experience to make each design strong and lightweight. You'll also love our convenience features that make having a giant scale model worthwhile. Fuselage top-hatches provide easy-access and our plug-in wings connect while the airplane stands upright; no special fixture is required. But it's in the air where a Hangar 9 giant scale airplane's true beauty shines with flying qualities so friendly that no one could ever accuse you of owning a hangar queen.

1/4 Scale Super Cub PNP | HAN4975

Wingspan: 2.69 m (106.0 inch)

Engine: Evolution™ 33GX Petrol Engine (included)

Servos: Spektrum® A6180 Digital Servos (included)

Super Decathlon 100cc ARF | HAN1070

Wingspan: 3.50 m (137.0 inch)

Size: 80-120cc

Spitfire Mk IX 30cc ARF | HAN4495

Wingspan: 2.05 m (81.0 inch)

Size: 30cc

HANGAR 9®

To learn more about the entire selection of Hangar 9 giant scale planes, visit

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A PAIR OF HUGHS

For this month's free pullout plan, Roger Vaughan offers up two easy build sport models

Get two for one with this month's free pullout plan as Roger Vaughan describes this pair of quick build foam sportsters

Why Are These Models Named G-HUGH and HUGH-2? Well, it all started with a design to encourage my grown up nephew to get involved in making and flying model aeroplanes. His name is Hugh – need I say more!

The little trainer (G-HUGH) came first, to teach Hugh to fly, and then after discussion with our editor, Kevin, I added the contrasting (HUGH-2) so that we could offer a 'two in one' free plan.

The Same...

...But So Different

Both these models follow the same basic simple structure, mainly from 6 mm Depron. However, there the similarities cease!

G-HUGH is an easy-to-fly basic trainer and an ideal first build from plans. In calm conditions it floats around 'hands off'. By contrast, HUGH-2, equipped with a 3S battery and a much more powerful motor seems ballistic.

A casual glance at the drawings will show that each model has a different power plant. Anthony Hill of All Electric RC Models suggested the appropriate motors and watched some inaugural flights of both models. We think that his suggestions were spot on!

Both models go easily in the boot of my car and I can ring the changes during a flying session between gentle relaxed flying with G-HUGH – the trainer – and all the aerobatics I can manage with HUGH-2 – the whizzer.

Due to the basic similarity of structure, I will describe the build for both models together, just noting any major differences as we get to them.

Top Tip

Put all your non-foam friendly glues away in a drawer before starting on these models. One squirt with the wrong glue on Depron can wreck a lot of work!

Many sheets of Depron have an unseen 'grain'. When building these models cut all parts lengthwise in the most torsionally rigid direction. Start with the tailplane and elevator, which are cut out as one piece. Mark the hinge line and make a 2 mm deep groove for the carbon fibre joiner rod, which is glued in with five minute epoxy resin flush with the top surface.

While this is drying cut out the fin and rudder outline in one piece, noting the small tag which fits in a slot in the tail of HUGH-2, and into the top of the body of the trainer. You can round off the edges of both items with fine sandpaper if you wish. Separate the rudder and sand a 45 degree bevel on its leading edge. Hinge the rudder with Blendherm tape, making sure that it will move freely in each direction. Finally, add the 1/16" ply horn.

By now the glue will have set on the tailplane and you can proceed to separate the elevator and chamfer its leading edge. Then hinge the elevator and add the horn. Lastly, cut the centre 'V' between the elevator halves away. Job done!

Making The Wings

The wing is cut out in one piece and framed with hard 1/8" x 1/4" balsa. Mark the centre chord but do not separate the wings yet. Make a single cut for each dihedral brace and, using very fine sandpaper folded in two, carefully ream this cut so that the 1/16" ply you are using for the brace is an exact tight fit. If your ping pong ball pilot is to keep smiling he does not want the wings folding during violent aerobatics and careful fitting of these dihedral braces is your only insurance against this problem.

Divide the wings and with the tips propped up at the correct dihedral angle (3/4" under each wing tip for G-HUGH) sand the inner edge vertical. Epoxy the wing panels together and, with the dihedral braces also glued in place, ensure that the wings are propped up at the right angle.

I suggest adding some thin gauge piano wire to the centre leading and trailing edges of the trainer wings. This will prevent the wing retaining bands from digging in and it also helps hold the wings at the correct dihedral angle.

You can round off the leading edges but leave the centre section of HUGH-2 square to fit the slot in the fuselage sides. Do not attach the prepared aileron for 'the Whizzer' until you have fitted the wings to the fuselage.

Top Tip

Cut a long length of Depron to the width of the formers and inside centre section of the fuselage, and then cut parts to length as required. This saves time and ensures that all the formers and parts are exactly the same width.

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G-HUGH makes a great low cost trainer, but also doubles up as a relaxing sports model

If you want something a bit livelier then HUGH-2 will not disappoint.
All flying pictures courtesy of Andy Stone

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It's worth taking the time to cut out a kit of parts before starting assembly. HUGH-2 components pictured here

The Fuselage

Hopefully you have been encouraged by the ease of construction so far. Make a kit of parts for the fuselage and assemble the parallel section on formers F1-F3, ensuring all is square. Now add the tapered rear and front sections but leave the rear bottom section open until you have installed and wedged the two servos firmly in place. Note that F4 (front top) on both models is left free as a battery access hatch. Fit the tail structure and make the piano wire connections to the servos. It's worth checking now that they work properly before closing the bottom of the fuselage. With the skid added you can carefully insert a vertical cocktail stick support though the skid and up into the fin. Drilling the foam will tear it, so put the stick in a pin vice and ream it into the foam.

The motor mount comprises of two ply formers, M1 and M2,which are glued together before fitting. This arrangement makes a strong, simple bond to the fuselage front sides and bottom.

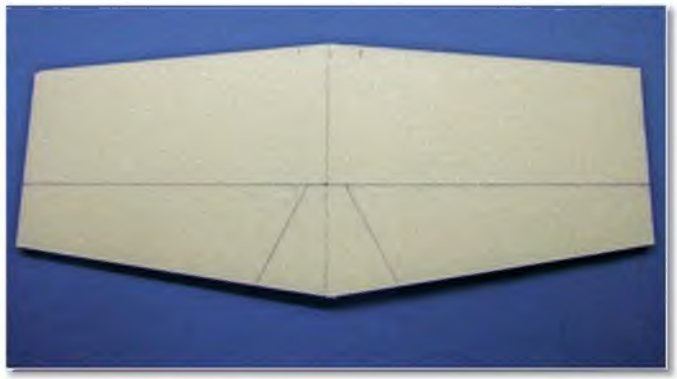
Top Tip

For small motors, like the ones used in these models, face your motor mount with a layer of soft mounting material (2 mm Depron is ideal) and attach the motor with self-tapping screws. Use the screws to adjust the thrust line, compressing the mounting material as necessary.

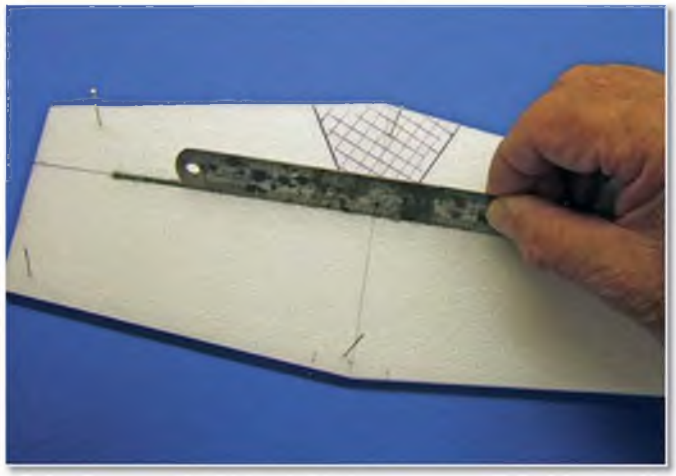
The Undercarriage

The undercarriages of both models are made from 2 mm aluminium strip, with 2 mm bolts for the axles.

Cut the 1/16" slot in the fuselage and fit the 1/16" ply U/C mounting plate (U2) in place. Scrap Depron supports U2 and also gives a firm surround for the undercarriage band holding dowels. When all is dry cut away the section of fuselage below U2. Glue this to the centre underside of the undercarriage to make a fairing to the fuselage.



Cut out the tailplane and elevator from one piece of 6 mm Depron



After making a slot for the 2 mm carbon fibre joining rod use a straight edge to push it in place, then remove any excess glue

After separating the elevators, use a steel rule on its side to set the hinge line spacing before final application of Blendherm tape

Fitting The Wings

The trainer wing is simply banded in place, but HUGH-2 requires a little extra work. First insert the wing into the fuselage slots and ensure that everything is true and square before gluing (again, I used five minute epoxy here).

Now you can add the two ailerons. After fitting the aileron servo decide where the actuating rods will exit the fuselage and cut the necessary slots. For simplicity, I used mini E/Z connectors on all the horns on these two models.

In a laughable attempt to make HUGH-2 more streamlined I rounded off the corners of the fuselage. In my view the trainer looks much better with nice sharp square corners to its body.

G-HUGH wing being framed with hard 1/8" balsa

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Fitting The Radio

The ESC's rest on the bottom nose sheeting. I then made a simple shelf to fit over the ESC and support the battery. Access to the receiver on G-HUGH is easy – just remove the wings. However, because HUGH-2's wing is a permanent fixture there is no access from the top to the space reserved for the Rx below the wing. So what do we do?

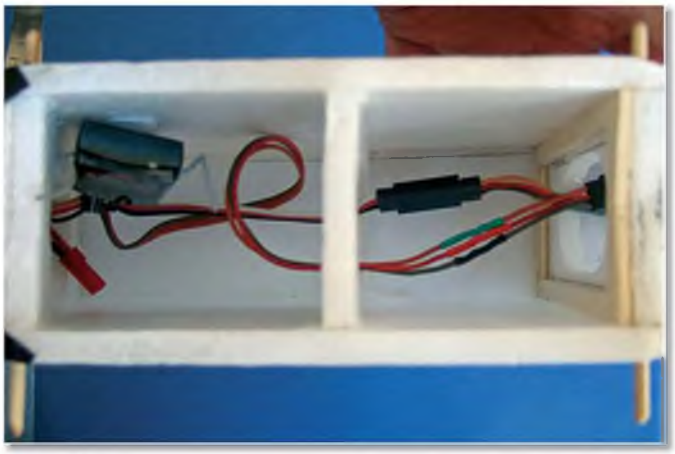
Simply cut a rectangular hatch in the centre bottom. Fit the radio, making sure everything is working well and then replace the temporary hatch with Blendherm tape. If you need to get at the radio simply cut the hatch away again. Yes, I know its crude but with these models simplicity is the order of the day.

Though not essential, you can easily make a simple metal cowling for the models. Cut the cowling oversize from an old drinks can, trim to fit and stick it on with double-sided tape.

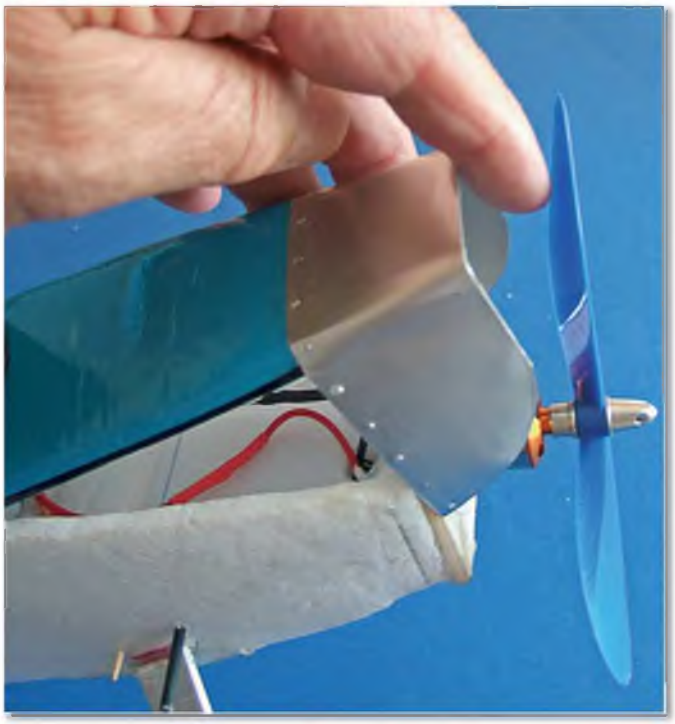
The front body top (F4) serves as an access hatch for the batteries. You could use magnets or other forms of catches to secure these. Once again I opted for a practical, if makeshift, solution. This was simply a rubber band stretched over the hatch top and attached to the U/C dowels!

Decoration

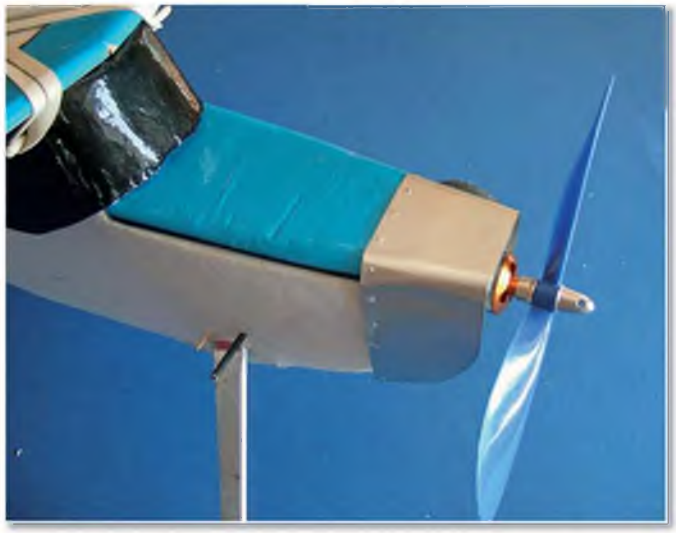
Small models look best with a very basic colour scheme. Letraset 'Safmat' self-adhesive printing film is ideal for details like registration letters. Give the area where the Safmat is to be applied a couple of coats of thinned PVA glue which when dry should give a good contact surface. Other colour trim is best cut from Solartrim.



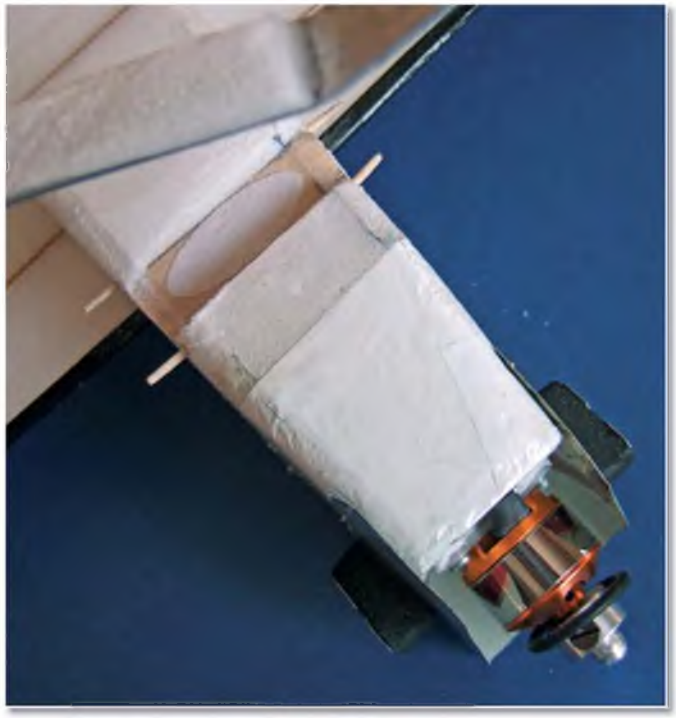
Inside G-HUGH there's plenty of space for the receiver under the banded on wing



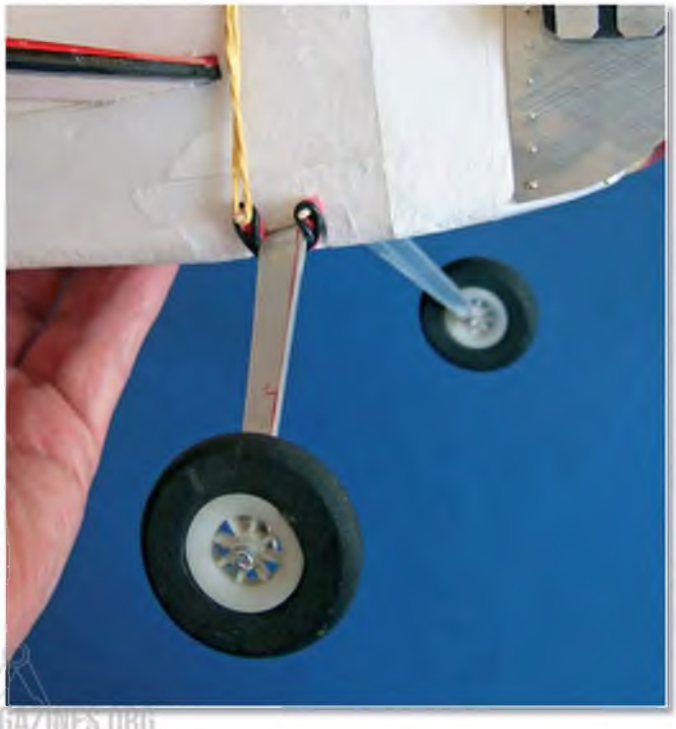
G-HUGH's front hatch lifts up to access the battery bay



A neat cowl is easily made from a piece of old drinks can



HUGH-2's removable undercarriage is simply banded on



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A temporary radio hatch is cut out of the underside of HUGH-2, and taped back when the receiver is in place

HUGH-2's full-length front hatch wedges under the drinks can cowling and provides access to the aileron servo and battery bay

Ping-pong pilot view also shows the location of the tail servos (the same on both models). All control horn hook ups use small E/Z screw-lock connectors

Flying G-HUGH

With a 5" x 3" prop fitted to the little Suppo A 1510 motor and a 2S 500 mAh battery in the nose, the 8 ounce G-HUGH flew steadily away from a smooth hand launch in almost flat calm conditions. The climb was gentle and once height was gained the stall characteristics were explored. The main indication of the approaching stall was a tendency for lateral stability to decrease, with the wings beginning to wobble. Nose down and power on soon had G-HUGH flying steadily again.

The marginal power means that take-offs need a very smooth strip, but hand launching is easy. Landings are a dream, with the model floating in and the forward undercarriage minimising the risk of a nose over. I used little Loom Bands to secure the undercarriage.

If you are fairly new to flying model aircraft get an experienced flyer to help you and get used to flying G-HUGH in very calm conditions. From time to time all of us misjudge a landing. Should this happen with either of these models, the wheels will fold back and the only damage then is to your pride!

Flying HUGH-2

Having become accustomed to the benign handling of the trainer, I was taken a little by surprise when HUGH-2 took to the air for the first time. My ping pong ball test pilot reckoned that the first ten seconds were "Terri-flying"!

A 7" x 6" prop was fitted to the Suppo 2208 and an 800 mAh 3S battery installed. With this set up HUGH-2 weighed in at nearly 12 ounces and felt a little nose heavy. Under full power HUGH-2 shot away from a hand launch. The model skimmed across the field, giving me a few adrenalin packed moments before reduced power and up trim enabled a circuit to be completed, with a safe landing. The C of G was moved back a little and subsequently all was well. Be prepared to experiment with the C of G and settings on your model to suit your flying style.

I was now confident enough to ask Andy Stone to take the flying photographs. My sincere thanks go to him for his efforts, particularly as this was the first time he had taken pictures of flying model aircraft.

HUGH-2 takes-off easily from our grass strip. Just point it into wind (making sure you are wide awake) and open the throttle! As you might expect this heavier and faster model needs strong 'O' rings to secure the wheels.

On Finals!

If one of these simple little models appeals to you then give it a go.

I mentioned earlier that I like to take both models to a flying session and I enjoy the different experience each offers. So having constructed your favourite, why not turn the plan over and build and fly its partner?

Have fun! **RCMW**

If you are new to model flying then get an experienced flyer to help you. Get used to flying G-HUGH in calm conditions

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G-HUGH is an easy-to-fly basic trainer and makes an ideal first build from plans

With HUGH-2 be prepared to experiment with the C of G and control settings to suit your flying style

MODEL WORLD DETAILS

MODEL SPECIFICATIONS

MODEL NAME:	**G-HUGH (Trainer)**	**HUGH-2 (Whizzer)**
WINGSPAN:	26"	24"
WING AREA:1	30 square inches	120 square inches
WEIGHT:	8 oz	12.5 oz
WING LOADING:	8.9 oz per sq. ft.	14.5 oz per sq. ft.
MOTOR USED:	Suppo 1510	Suppo 2208
PROPELLER:	5" x 3" or Gunther prop	7" x 4" or 7" x 6"
BATTERY:	2S 500 mAh	3S 800 mAh
ELEVATOR MOVEMENT:	Low 1/4", High 3/4"	Low 1/2", High 3/4"
RUDDER:	Low 3/8", High 3/4"	Low 1/4", High 1/2"
AILERONS:	Not fitted	Low 1/4", High 5/8"

The author gets ready to launch HUGH-2 for a whiz round the flying patch

CONTACTS

Aluminium for undercarriage:	B&Q or Wickes
Motors, R/C equipment, etc:	All Electric RC Models. Tel: 01782 788778
Letraset Safmat:	Hobby World or artist supplies shop

PLAN DETAILS

NAME:	G-HUGH & HUGH-2
BUILD CATEGORY:	Beginner
PLAN NUMBER:	MW3727
PLAN PRICE:	£11.99

Plans and parts are subject to Postage and Packing charges at standard rates.

Copies of plan number MW3727 are available from RC Model World (Plans Service), Traplet Publications Limited, Traplet House, Pendragon Close, Malvern, Worcestershire WR14 1GA, England, Telephone: + 44 (0) 1684 588599, Fax: + 44 (0) 1684 578558, Email: orders@traplet.com or order online at www.trapletshop.com

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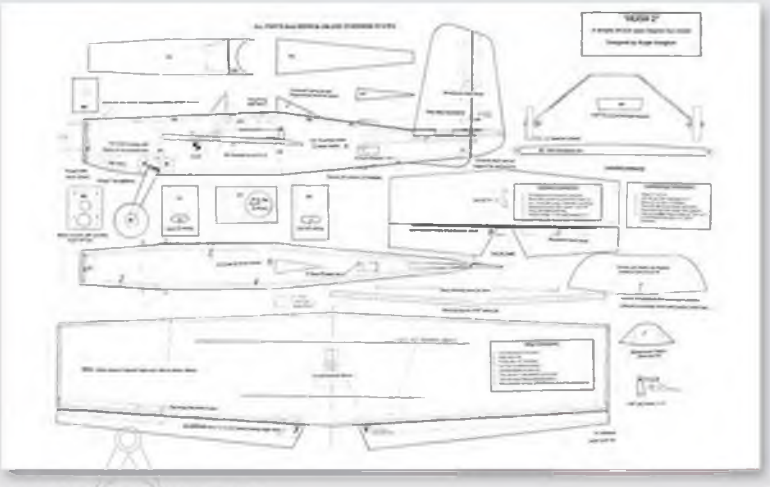

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AEROMODELLING IN THE USSR

Donatas Pauzuolis tells the story of model flying, Soviet style

Today we live in quite amazing times where it is much easier for modellers to access quality equipment at affordable prices, mainly thanks to the World Wide Web. In the past it was a very different story. Being from Lithuania, I am very lucky to have experienced part of that old time reality and I am now amazed at today's possibilities. Lithuania was part of the Soviet Union until 1991, and has only been an independent country for 21 years. My coach and father, Rimutis Pauzuolis has shared some very interesting stories about the history and first steps of aeromodelling in our country. I hope by reading this article, you too will appreciate how far we have developed our sport over the years.

Da-Gi cluster (model club) members from left to right: P. Motiekaitis, S. Spokevicius and cluster leader, A. Pranskietis (1938)

P. Motiekaitis with one of the first aeroplane models with a mechanical engine (Kaunas, 1938)

Aeromodelling in the USSR

In early 1960s my father, Rimutis Pauzuolis lived in Panevezys, a small town next to a military airfield, where he saw MiG-15 fighters flying each day. As a young boy his dream was to learn to fly. Naturally at that time becoming an aeroplane pilot was extremely difficult, so he decided to sign up to the local aeromodelling cluster (a class for young people teaching them to build and fly model planes). This was the closest he could get to aviation at that time. The first models they built were free flight gliders that took from 6 to 12 months to build. No kits were available, never mind ARTF's (almost ready to fly). Everything was designed and built by the modellers themselves. Building materials and tools were also very difficult to come by and young aeromodellers had to search for wooden planks to work with.

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At that time balsa and covering film were impossible to purchase. Paper, which is heavier and more fragile than the modern films we use today, was used to cover the models. Even basic items such as sandpaper were not available. Basically, the only tools that were available for everyday use were knives and wood planes, meaning the modellers had to be inventive and design their own tools. The work became much easier when the cluster's instructor mounted a small cutting blade on to an electric motor. This made it possible to cut the thin wooden strips needed for model building. Occasionally the opportunity arose to purchase good quality building materials, however this was not always easy to obtain. An example of this was told to me by my friends in the Alytus aeromodelling group...

In the early 1960s an opportunity arose to purchase good quality plywood. Plywood was in great demand amongst modellers because it was perfect for making spars, motor mounts, etc. The problem was that the plywood had to be collected from a different town some 60 km away and none of the modellers had any transport. So great was their desire for the plywood they set off on foot and returned carrying the large plywood sheets by hand! It was a two-day trip going back, with only one option to sleep in fields next to the plywood.

Vilniaus city competition group photograph (1950)

Siauliai city modeller, A. Stungurys, preparing for launch (Kyviškes, 1955)

Control Line

In the early 1960s control line models were very popular in the Soviet Union and around 1965 Lithuanian modellers started to build them. The main problem they faced was the lack of engines. The first engines showed up around 1968 and the first test flights began. However, these engines proved to be unreliable.

Control line planes with rocket engines (Moscow, 1965)

At that time my father, Rimutis was conscripted into the Russian army. After serving his time, he enrolled in university. Studying at the technical university gave my Dad knowledge and understanding about many things that helped during his future work with aeromodelling. Following university, he started his working career in engineering. Dad's newfound knowledge and tools enabled him to make adjustments and fine tune the small engines ready for some serious practice. The first engines available were the Rythm 2.5 cc and the MK12V, also 2.5 cc.

During a competition in 1974 the Panevezys group took first place. And because of their success the authorities granted them more support and materials to work with. In 1976 the Lithuanian team took 16th place out of the 17 teams in the entire Soviet Union aeromodelling championships. Then, following my father, Rimutis becoming the team coach in 1977 the first successes began. During the 1977 Soviet Union championship, the Lithuania team took third place out of the 17 teams. Despite good results in the control line section there was still a big lack of good tools and materials, especially radio control systems.

Radio Control

The first good quality Futaba radios to reach the Soviet Union were distributed to the Russian and Ukraine modellers. This was because Moscow was the capital city and the famous Antonov factory, which supported aeromodellers, was located in Ukraine.

Unfortunately, in Lithuania it was not so good. As coach of the national Lithuanian team my Dad was motivated to do all he could to obtain radios and engines for the upcoming championship. He raised the funds and was granted permission to travel to Moscow to the Headquarters of Dosaf. Dosaf was the organisation responsible for all air sports and activities in the USSR. Rimutis' objective was to get materials and equipment as early as possible. Travelling by train he reached Moscow but unfortunately the Dosaf Headquarters was located outside the

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USSR F2D (C/L Combat) Champions, G.Sablinskas and R.Pauzuolis (1981)

city and the only way to reach it was by foot. After two hours of walking during darkness and in the middle of a deep winter he reached his destination. Something not many people today would venture to do!

Dad's dedication paid off and he was granted two radios and a small amount of other equipment. However, knowing the situation in Russia at that time, Dad had come prepared bearing gifts! He had brought some farm produce including roasted meat. Suddenly the Dosaf workers became really friendly and Dad was given the rare privilege of taking as much as he wanted. The only problem he encountered now was getting all this equipment (three Novaprop radios, one sheet of balsa, some Pirelli rubber for F1B models and several engines) back to the train station in Moscow.

Unfortunately some of his excitement for the team turned to disappointment when he returned to Lithuania. He discovered that only one of the three radios was working. There had been no way for him to check the radios in Russia because they didn't come with batteries. All transmitter batteries at this time were self-assembled from various electronic devices such as hearing aids.

It may look like a vintage photo, but this shows a free flight season opening competition in 1988

During team practice it was then discovered that the one Novaprop radio that was working had very little range, resulting in several models crashing. Bearing in mind it took approximately one year to build a plane this was devastating and shows us the tough reality of aeromodelling in the past.

In 1978 one modeller smuggled a Graupner radio to Lithuania, risking arrest or even imprisonment! Quite good quality KMD engines became more readily available and in larger quantities. Having the better quality radio enabled the Lithuanian team to practice more and compete at a higher level than before. The group managed to obtain 20 engines that my Dad disassembled to find parts that matched perfectly, giving great compression and a naturally good performance. From these 20 engines only 12 were rebuilt that were good enough for use by the pilots and giving them a chance to practice. Such brand products as Nova Rossi, OS and Super Tigre were an unreachable dream.

Top & Above: Petras Akinis and his Albatros DV German fighter

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Jak-6 of Petras Akinis

Control line Su-26 by Rytis Kalinauskas next to the full scale Su-29 flown by Jurgis Kairys

Rytis Kalinauskas' control line Su-26 in action. Scale 1:4.3, wingspan 1.8 metres and a RTF weight of 5 kg

Soviet Scale

The Lithuanian control line team started serious preparation in 1980, and again third place was reached. Finally, in 1981, the Championship title was won by Lithuania. Unfortunately due to political reasons the Lithuanian team was not allowed to represent the Soviet Union and participate in the World Championship. Life was more difficult in the former Soviet Union for non-Russian people.

Not only was control line combat rising in popularity, several people started building control line scale models. Petras Akinis was the modeller who started this activity with great passion. He built several models but most successful were the Albatros and Jak-6. The Albatros DV was a WWI German biplane. The model was built from scratch and took two and a half years to make. The plane had 10 cc Moki glow engine and was controlled by four control lines (up, down, engine rpm, special effects). The wingspan was 135 cm and the scale 1:7.

The Jak-6 was originally built in 1942 as a light transport aeroplane by the Soviet army. Again the model was built from scratch, with the work taking five and a half years. The plane was built to a scale of 1:6. Petras had to invent many features on this model, including retractable gear, the bomb dropping

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The control line airfield in Vilnius is still used to hold national championships. There are plenty of pit benches!

mechanism and so on. For example, to make the scale wheels special moulds were built that matched tyre protectors of the original aeroplane. His Jak-6 had two MVVS 6.5 cc engines; each engine was modified and had two glow plugs. The plane was controlled by five lines (up, down, engine rpm up and retractable gear using a single line, retractable and rpm down, and last was bomb dropping). Wingspan of the Jak-6 is two metres.

Another active control line model enthusiast in Lithuania is Rytis Kalinauskas from Kaunas. He built a copy of Jurgis Kairys' Su-26. Rytis' Su-26 is at a scale of 1:4.3, with a wingspan of 1.8 metres and a RTF weight of 5 kg. It was a really big model, and at the time when it was built control line scale rules did not allow engines bigger than 10 cc. So, Rytis had to design and produce a gearbox able to use a bigger prop. A bigger prop was necessary because of the huge round cowling. A later model was powered by a 15 cc glow Super Tigre engine. The plane was controlled by four control lines (up, down, rpm, and one special effect). These models still fly today and Rytis and Petras still continue the tradition of scale control line aeromodelling.

Russian Radio

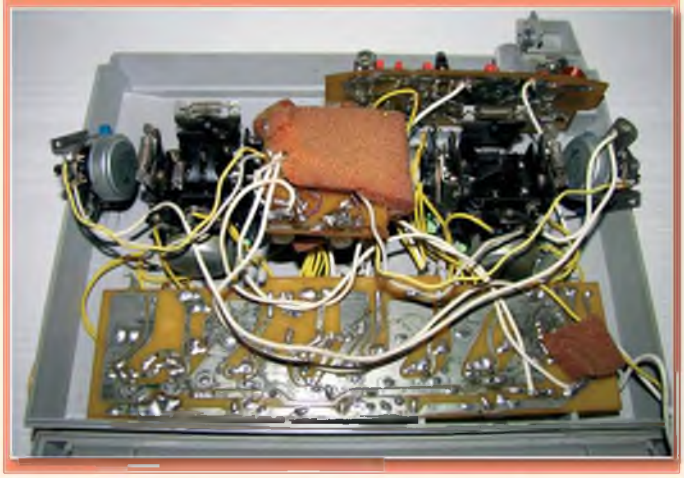
The situation with R/C equipment was even worse. I will give you a few good examples for comparison. Radios were unreliable to say the least. We all know that the first step when learning to fly is tough. Even these days, with almost perfect working radios, pilots can crash planes because of their lack of skill. In the past there were no experienced people or simulators that could teach you how to set up and fly R/C models. Add to this the bad quality radios, and the results were that almost 100% of the models built from scratch crashed.

Russian manufactured receivers were BIG (40 mm x 60 mm x 120 mm) and the weight of a 5-channel receiver was just over 200 grams! Today's modern, ready to fly indoor planes weigh up to 100 grams and some Spektrum receivers are lighter than 2 grams!

Servos too were built differently; they had a big case, two sliding (linear) servo arms and five wires, and understandably very poor characteristics. A 54 g servo made in the USSR should have had 0.3 kg of torque and the servo arm would move 12 mm, according to the description of the manufacturer. In reality there was just 0.2 kg of torque and a maximum 4 mm of servo arm movement. In addition to this it could not hold centre and shook constantly. In comparison to today, the tiny 4.4 g Hitec 5035HD servo has a way better performance, 0.1 s/60 degree and 0.8 kg of torque. I can just imagine what the old time modellers would say if they saw modern digital brushless 30 kg torque servos!

The radio set did not include a receiver or transmitter batteries. That was the 'homework' for each modeller. The only option light enough was the 220 g, 450 mAh batteries that could be removed from hearing aids. This necessitated the purchase of two hearing aids to have enough batteries to power the receiver and the servo for just one plane.

Supronar 838 radio. This R/C transmitter was produced by the Soviet Union in 1980



Servo evolution - on the left, barely working Soviet Union produced servos next to high-end digital servos that we have today

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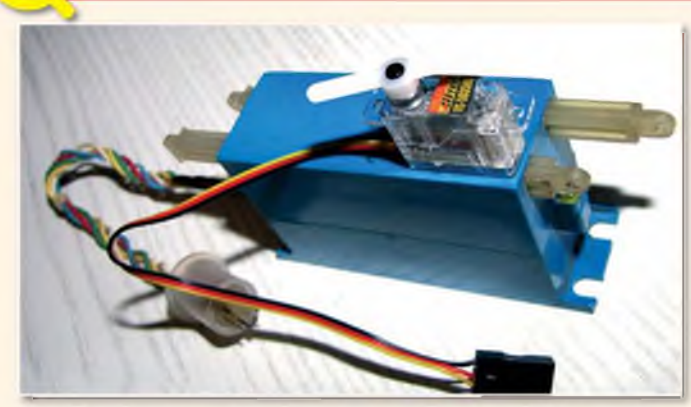
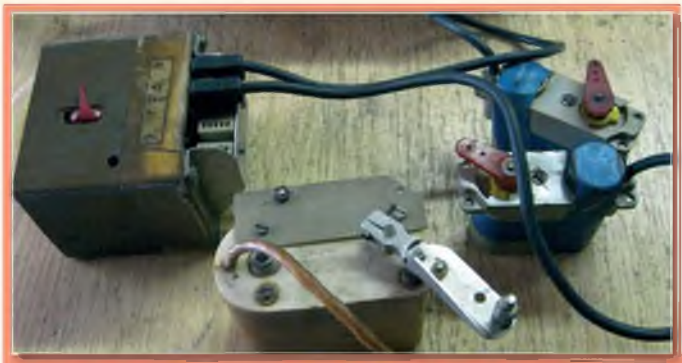
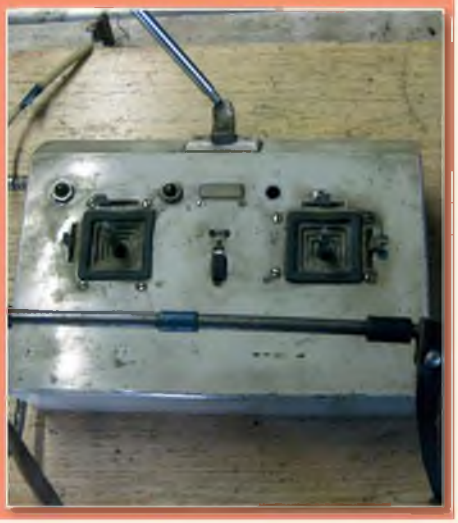


Tiny Hitec 5035 on top of an old Soviet servo. Hitec is about 10 times lighter and at least four times more powerful



Working radio system built in 1969 in Belarus. This radio was designed and hand-built by a brilliant modeller, Lesnikov Valeriy Ivanovich



Self-Built R/C

Naturally, such a situation was not acceptable for many modellers. One of them was Lesnikov Valeriy Ivanovich from Belarus. He reached most of the highest achievements in university and aeromodelling sport, becoming multiple Champion for control line aerobatics and racing. However, the same as all modellers, he had a dream to fly R/C models. Instead of using non-working Soviet produced radios, Valeriy decided to develop and build his own radio.

Work began in 1963, when he started developing and assembling his own construction radio. Purchase of components was very difficult; some parts were bought at a market, some parts were exchanged for bottles of vodka, some were made by hand. Finally, his first radio was working, using 27 MHz, later modified for 35 MHz. Unfortunately his first radio was stolen and never found, just before its first major competition. So a second radio had to be built. This new radio had trims and even options for retractable gear. It worked without a single failure and was used to win the USSR F3A Championships in 1976 in Charhov city. Valeriy is still an active modeller today and he is chief helper in national aerobatic competitions.

In 1997 the situation in Lithuania changed noticeably. It was now possible to buy or bring equipment from other countries and many modellers bought Futaba radios. This was the date from which R/C aeromodelling in Lithuania made its first serious steps. Today, the Internet is open and our modellers have access to equipment worldwide. **RCMW**

Around 1991, when working radios become available in Lithuania, R/C gliding became popular. A group of active flyers from Alytus start to practise and evolve to world-class F3J and F3K pilots

La-5 and Bf-109 R/C scale models made for a movie titled 'Vienaragio Medziokle'. From left to right: R. Ramanciuckas, V. Zuravelis (USSR Champion in F4C), J. Kanisauskas, S. Brazdzius, A. Narkevicius, D. Babenskas (Kaliningrad, 1988)

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LET IT SNOW!

Don't let the white stuff stop you from flying this winter. Terje Gimming describes a quick and easy way to make some skis for your favourite model

Terje's Nieuport, ready for the first snowfall of winter

In Norway, where I live, there is snow on the ground for about half the year and skis for models are a necessity. My own design for such skis is simple. They are quick and easy to build and can be installed on the plane in a minute. Even if there is snow on the ground in the UK for only a few days or weeks, I think it might be fun to try out how it is to fly with skis.

The drawing shows skis for a small model like my 42-inch wingspan Nieuport 11 (built from a Traplet plan, MW3380). The ski sole is made from 1.5 mm birch ply. Cut a piece that is somewhat longer than the two skis added together. Bend it in the steam over boiling water (being careful not to scald yourself) and put it under pressure overnight, as shown in the photos. Cut the piece in two and build as shown on the drawing.

When installing the skis on the model let the front tip point upwards by 5-7 degrees relative to horizontal flight.

The same procedure may be used for larger models but the dimensions need to be increased. My Beaver, shown in the photo, has a flying weight of 2.4 kg. The ski sole has been increased to 2.0 mm, with a length of 300 mm and width of 70 mm.

The skis should be made water resistant, if not waterproof. So give the soles at least 2-3 coats of cellulose lacquer before they are painted. If you have ski wax you may put that on as well. Instead of ski wax, wax from an old candle will also work. That is what we used when I was a kid when we went ski jumping. Just brush the wax on and smooth it out with a piece of cork. **RCMW**

Softening the ply over boiling water. Keep your hands well away from the steam

Clamp it in a U-shape overnight

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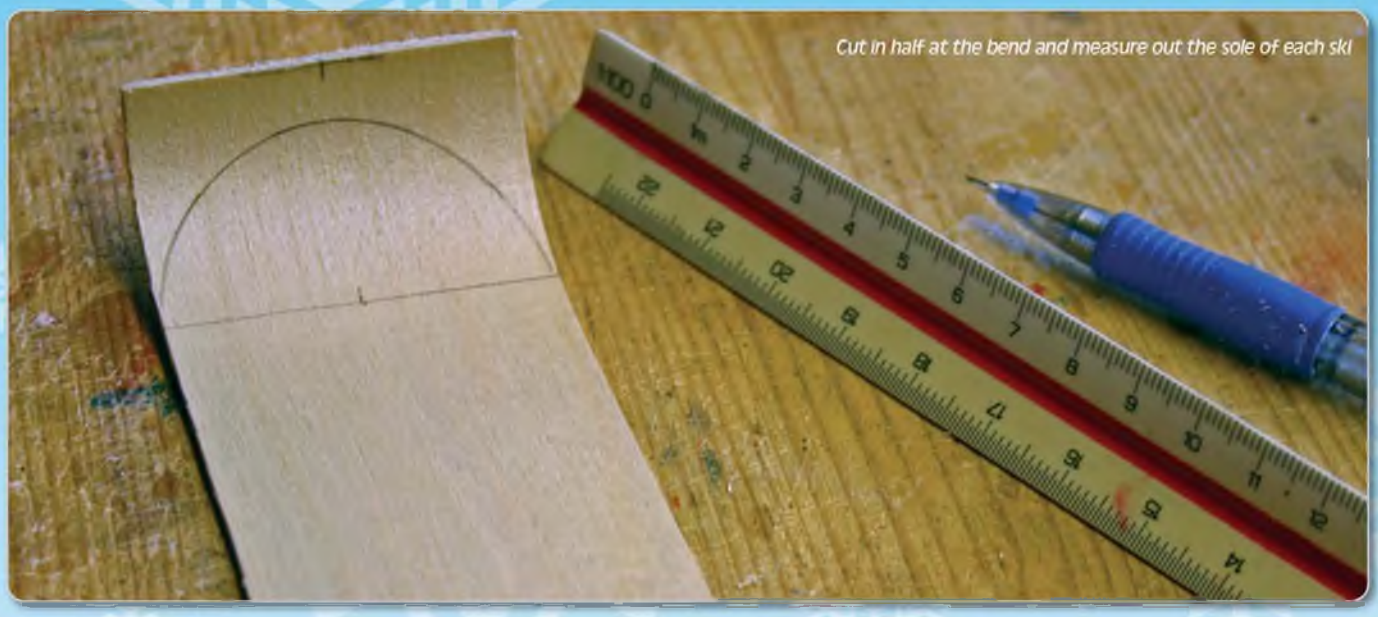

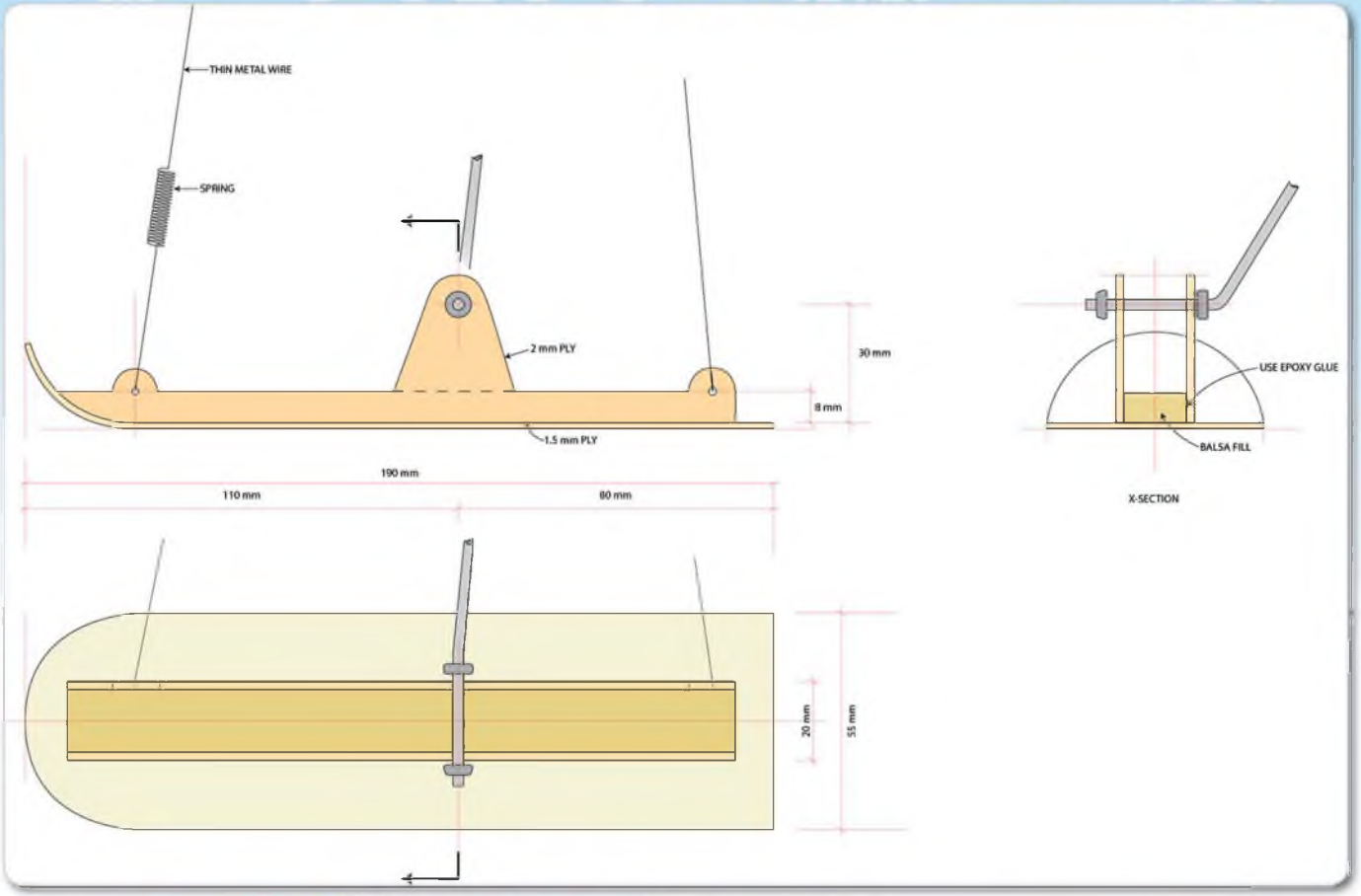

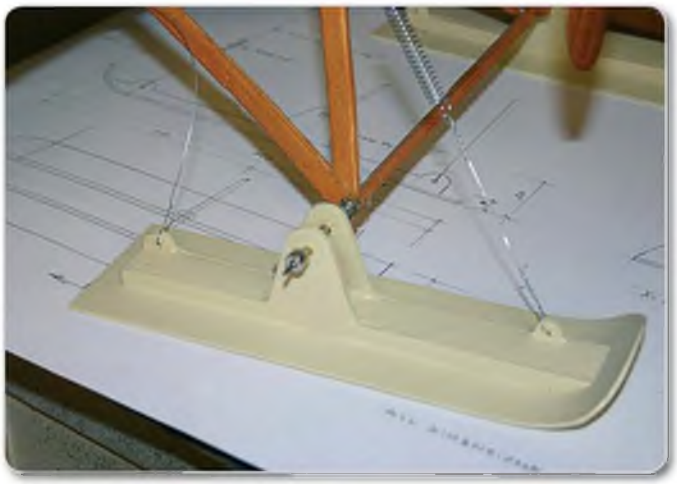

A finished ski, showing the bracing wires

Ski dimensions can be changed to suit different models, so don't be afraid to experiment. Here's Terje's bigger Beaver, with matching red, waxed skis

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VAGABOND

Kevin Crozier gets some more stick time with Hacker Model Production's all-foam aerobatic slope soarer

With large control surfaces the Vagabond promises extreme aeros in stronger winds

In the last issue I gave a brief introduction to the Vagabond, just to tide things over until I had an opportunity to fly her in more suitable conditions, the first flights having been undertaken in calm conditions.

After a long wait a fresh wind blew on to the face of our local slope, which promised some aerobatic action. But before I get to that point in the story, let's chat about how the Vagabond goes together...

Let's Rule!

Construction starts by cutting long slots in the sides of the nicely formed fuselage. This is not as worrisome as it looks provided that you have a long straight edge (preferably a steel rule) and a supply of sharp, new scalpel blades. New blades are essential to provide a clean cut. (Near the end of the assembly I tried to make a small incision with an old blade and it caught and made a jagged edge. So don't be mean with the Swann Mortons!)

Following the precise measurements given, a 3 mm deep slot is cut on both sides of the fuselage. Full length glass fibre rods are then pushed into the slots and zapped into place with thin CA. I found it best to use some tip tubing to run the glue sparingly along the top of the slot, where it quickly wicked into the foam. After a few minutes each slot was given a blast of activator spray to harden off any surplus glue. A similar procedure is followed along the top of the rear fuselage. The addition of these three stringers, although very thin, really does stiffen the structure up by an impressive amount.

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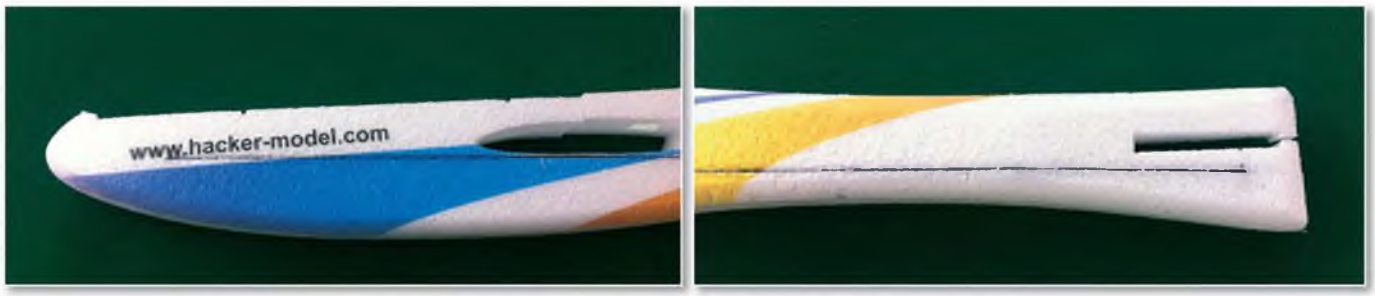
Notable accessories include the laser cut horn sheet (far right), the U-shaped wing retainer (centre left) and the 3-D printed canopy pins (bottom left)

More slots are required for fitting the pushrod outers. These need to curve in a precise way, so a cardboard template is provided to make guided pencil marks down each side of the rear fuselage. This works extremely well.

Time now to fit the ply radio plate to the front of the fuselage. Pay particular attention to the photograph that shows the position of some small rectangular slots next to the holes at the rear of this plate. These slots are designed to accept the tabs projecting down from a pair of vertical pushrod supports, made from laser cut ply. I didn't pay attention here and it wasn't until after gluing the plate in place, I found that these tab holes were on the wrong side, meaning that the plate was upside down.



Slots cut for the glass fibre stringers run the full length of the fuselage

This meant that one support would be too close to its servo, while the other would be too far away. Correcting this was pretty easy, by drilling and rasping out some matching holes on the correct side using my PermaGrit needle files. But it was time that could have been better spent on continuing with the next stage of the build. Which is...

Fitting the central wing former. This piece of laser cut ply fits neatly into the wing shaped slot in the middle of the fuselage. It needs to be glued in at the exact centre of the fuselage, so it's well worthy taking your time and measuring twice before reaching for the cyano.

All Moving Tail

Vagabond features an all-moving-tailplane (AMT). This, combined with ailerons of nearly half the wing area, promise fairly wild control movements for 'extreme slope soaring'. Since you would be up a creek without the proverbial paddle if you got this assembly wrong, I heartily recommend that you dry assemble everything before applying any cyano as the photograph showing how to make up the tail is not one of the better ones.

The control horns supplied are laser cut from clear acrylic sheet, and the fixing tabs need roughing up before gluing them in place. With the rudder horn secured, work moves back to the front of the fuselage.

Canopy

The slim black plastic canopy has two dimples on each side, which mark the positions of holes needed for its locating pins. After drilling them out, and making some slots in the foam at the front and rear of the radio plate, which are required to seat the canopy correctly, it's time to fit the pins.

The canopy pins are white plastic affairs, which appear to have been 3-D printed as they have a stepped, rough texture. They work fine though and appear to be nice and strong. The rough finish also helps the cyano wick around them, fixing them firmly into place – a little too firmly as it turned out!

This time, in my defence, I did follow the instructions to the letter. The procedure involves fitting the canopy and then pushing the pins through the previously drilled holes and into the ends of some thin tubes mounted transversely just under the radio plate. A drop of thin cyano then wicks under the oval head of each pin and fixes it to the side of the canopy. The instructions warn about the danger of using too much cyano, which could leak into the tubes. But although I promise that I only used a drop as prescribed, every single one of my pins were well and truly glued into their tubes!

The instructions recommend using a flat bladed screwdriver to pop the pins out of the tubes. But all this did for me was to start denting the edges of the thin plastic. So a more drastic course of action was needed...

I started by slipping a razor saw into the gap between the canopy and the foam body and gently cutting through each pin. This released the canopy. I then used my mini drill to drill out the centre of each pin head and glued short pieces of cocktail sticks into each hole, effectively replicating the pins. A small diameter drill was then used at slow speed to ream out the ends of the plastic pins that had been glued into the holes.

Thinking about this now, all that is really required is to run a light smear of petroleum jelly (Vaseline or similar) over each plastic pin before pushing them into the tubes. This will stop them sticking if any glue does disappear down the holes!

Connecting Up

Back to the tail and it's time to glue the AMT and the fin/rudder in place. You'll be pleased that you practiced with the AMT when, after gluing the mechanism in place, you are rewarded with a smooth operating tailplane. You may also wonder, as I did, if you'll ever need all that control movement!

The elevator and rudder pushrods need making up next. The control surface ends are fitted with L-shaped wire ends. These wires simply rest against the ends of the pushrods, where they are fixed in place with lengths of heat shrink tubing. Thin cyano is then wicked into the ends of each tube to fix everything together. This is neat and simple to do, and seems to work well.

The L-shaped ends are inserted in the outer holes of the rudder and elevator control horns, where they are retained by small rings, glued on, that are laser cut from the same sheet as the horns. I thought that it would be good to sand off the small connecting tabs from these rings, but all I managed to do was to lose one on the floor of my shed. Rooting around down there, I found several things that had pinged off when building previous models and which were of no use now, but of that tiny see through ring there was no sign – I'm sure it will turn up in another couple of models time though! In the meantime, I fashioned another ring by cutting the end off a servo arm.

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Time now to prepare the servos. Since some mini servos come with short arms, Hacker thoughtfully provide a set of laser cut extensions. These can be bound to the arms with thread and fixed with cyano. However, the Savöx servos I used were long enough without them. It should be noted that the arms on the aileron and elevator servos need to be offset slightly at neutral. All pushrod connections are made using screw lock connectors.

The aileron servos are mounted in pre-cut holes in the underside of the wing panels. You'll need another sharp scalpel blade to remove the clear film that covers them, and you may also need it to clear away some foam, as I did. The instructions also show cyano being applied to the edges of the film to help stop it lifting away from the surface of the wing.

After wrapping the servos with tape, the book shows more cyano being used to fix them in place. But being mindful of this adhesive's ability to work its way into places where it's not wanted, I used a thin layer of epoxy instead. Even with the servo case taped up, with my luck I had visions of the gears and motor being well and truly stuck!

The aileron horns are also to be found on the clear laser cut sheet. As with the rudder horn the gluing tabs need roughening each side before being inserted into slots that need to be cut in each aileron. Thin cyano is then wicked into each side of the horn to fix it in place. Thicker cyanos should be avoided as they will not seep into the foam by very much at all and this will result in a weaker bond. Short wire pushrods are supplied to connect up the servos. They have Z-bends at the horn ends, with screw-locks being used at the servo ends.

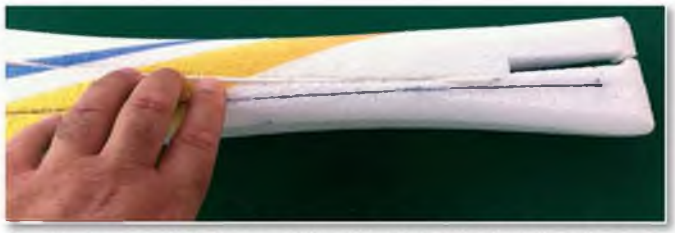
Back now to the fuselage, and the rudder and elevator pushrods can be screw-locked, making sure that the control surfaces and servos are at neutral. Excess pushrod material is shown being snipped off, but I parted them off using a cutting disk in my Dremel. Those vertical pushrod supports can now be fitted (in the right pair of holes!) and cyano applied where they rub up against the pushrod outers.

The wings are now slid into position over their joining wire, with the roots butting up next to the ply former previously glued in to the middle of the fuselage. Retention is simply by means of a U shaped piece of wire, which is pushed through two lasered out holes in the radio plate and into the foam beneath.

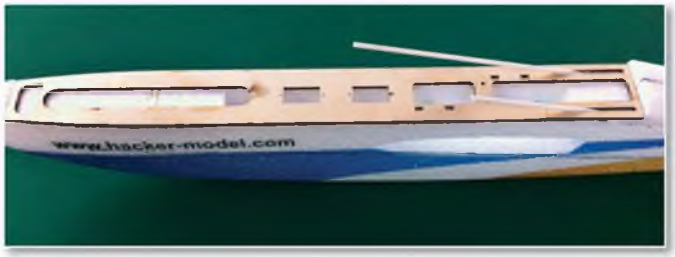
This completes the Vagabond and the only job left is to establish the correct Centre of Gravity. This is best done by sliding the Rx battery pack to-and-fro on top of the radio plate, with the canopy resting lightly on top. When the best battery position has been established, the foam in that area can be excavated to provide a snug fit for the cells. Easy!

All that remains to do is to set the controls as per the diagrams in the manual, and to mix them as required to give flaperons and airbrakes. This was made easy for me due to the various glider functions available on my JR XG8. Chances are that you will find the full movements available to be a bit extreme, so it's worth setting up a couple of less adventurous flight modes, at least for the initial flights, to give you a chance to trim the model properly.

A template is provided to accurately mark out the slots for the pushrod outers



An outer is pressed into place, and then thin CA is wicked in to keep it secure

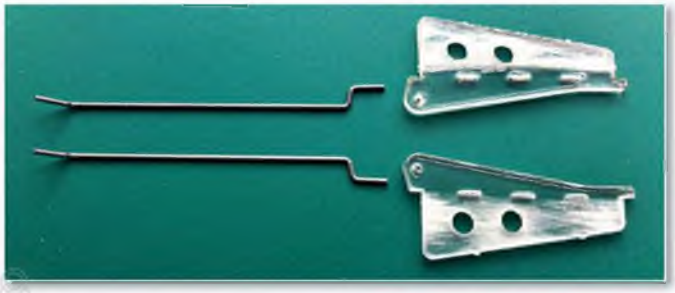


I glued the radio plate on upside down by mistake. Note the two pairs of holes for the vertical pushrod support plates are misaligned. More holes were easily made

The AMT swivels around a carbon spar that passes through two plastic plates glued on either side of the tailplane centre piece

Detailed dimensions are given for marking out all the slots required for mounting things like the rudder control horn

Pushrod ends are secured with heatshrink tubing, with a drop of thin CA at each end



Aileron pushrods and horns. The tabs on the bottom of each horn need to be roughened up before gluing them into the ailerons

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Even with a slimline receiver and mini servos the radio is a tight fit. But keep it neat and it will all fit

Chequerboard finish on the underside of the wings and tail provides a good contrast during aeros

The All-Moving-Tail, large rudder and enormous ailerons all point to the Vagabond being a very agile flying machine

From gentle winds to a good blow, Vagabond will allow you to fly in a wide variety of conditions

A Bit Of A Blow

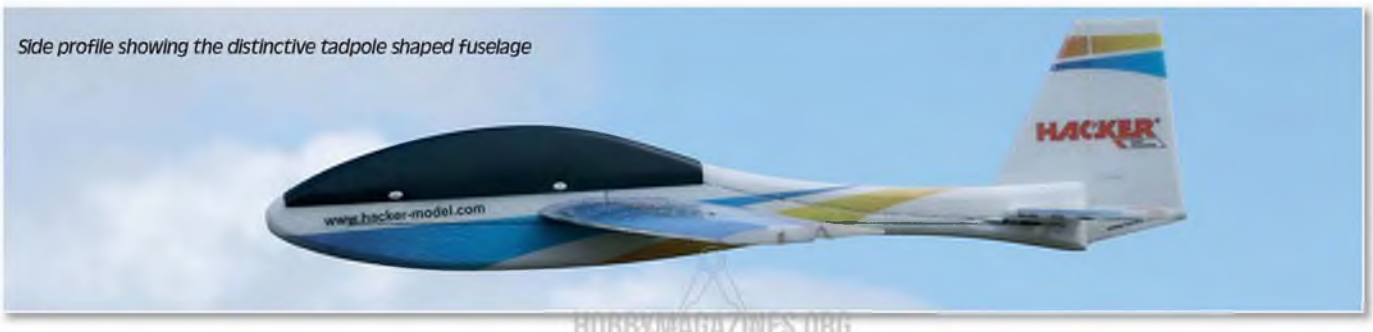
For our second trip up the Malverns to fly the Vagabond we had to settle for a 10 mph wind, which whilst it was still a bit low for the job in hand, was a darned sight better than the light puffs of air that we had christened the model in the first time around.

At least this time the glider could be pushed out into the still somewhat limited amounts of rising air and climbed up to a reasonable altitude before exploring her aerobatic credentials. As you would expect she made light work of the usual sport slope aerobatics. My initial impression was that she would benefit from a bit of ballast to get her moving and working the wing a bit more. I guess the easiest place to fit this would be to bolt on some plates of lead either side of the fuselage under the wing, but it needs building up slowly so as not to overstress the relatively thin wing.

Whenever the wind picked up a bit it was possible to get the nose down and to build up a lick of speed, during which times the Vagabond showed off her agility to great effect, allowing me to crank her round in tight passes for Barry's camera. This bodes well for some spirited aerobatics in stronger conditions. However, in the relatively light wind I was unable to make much use of the extreme movements in Flight Mode 3, and rather than the slope-side 3-D that I was hoping to explore all I could manage was some tight loops! Still, in those brief flashes of fast aeros, I could see that there is plenty of potential still to be unleashed from this nimble R/C glider.

Taking Vagabond back up to a safe height it was time to test the braking effect of the mixed flaperons and elevators – or at least it would have been if I had remembered to flick the appropriate switch to engage the mix! Eventually I got my brain working and I could start working the throttle stick to assess the braking performance – full throttle equates to zero braking, while idle equates to maximum droop over the length of the wings.

Again the light wind conspired against me, as in such light conditions the Vagabond could be dropped onto the ground with ease without any braking being required. But my limited testing did show the need to mix in some up elevator to prevent the nose from dropping too much when full braking was applied. As with the aeros, I can see the potential of the extreme control surface movements possible with this model and I look forward to exploring them more over the coming winter months.



Side profile showing the distinctive tadpole shaped fuselage

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Another thing I needed to take on board is the need to switch off the braking mix before attempting to continue normal flight. This time I forgot to flick that darned switch off, and over the course of the next few minutes the throttle stick slowly dropped back down to idle as I worked the rudder. I thought things were getting a bit sluggish and was cursing the wind for dropping off when in fact what had happened was that I had slowly engaged full braking and the poor Vagabond simply dropped out of the sky – fortunately onto a patch of soft(ish) gorse!

I started this review by wanting to see if the Vagabond was a tough bird that I could fly in all conditions when I deemed it unsafe to fly my favourite moulded machine. And while the relatively light conditions I have flown her in so far haven't really been a true test of her potential, she has had to put up with quite a few unplanned arrivals, mostly caused by losing slope lift or finger trouble as explained above. So for me, she fits the bill perfectly and I look forward to really wringing her out in a strong nor' westerly. **RCMW**

In the light but steady wind inverted flight proved very easy

Vagabond floats overhead as she climbs up for another bout of aeros

...Mind the camera – I'm coming in! Vagabond arcs up the slope for landing

During brief spells of stronger wind the Vagabond showed off her true aerobatic potential

MODEL WORLD DETAILS

MODEL INFORMATION

NAME:	Vagabond
MANUFACTURER:	Hacker Model Production
PRICE:	£112.80 (from T9HobbySport)
MODEL TYPE:	Aerobatic Slope Soarer
CONSTRUCTION:	EPP foam with clear film covering
PARTS SUPPLIED:	Airframe and accessories
PARTS REQUIRED:	4 x mini servos, receiver, 4/5-cell flight battery

R/C FUNCTIONS

1: Ailerons (mixed to give flaperons and braking)
2: Elevator
3: Rudder

MODEL SPECIFICATIONS

WINGSPAN:	1510 mm
LENGTH:	975 mm
FLYING WEIGHT:	600 g

DISLIKES

Nothing so far

LIKES

Quick build • Fuselage template makes cutting pushrod slots easy
Robust when assembled • Surprisingly flyable in light winds

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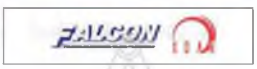

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TOP GUN 2014

Barry Vaught captures the action at the popular US scale meet

Richard Earnst's Fokker V23 -1/4 scale, 86" wingspan, 21 lb, DLE35RA power, self-design, Futaba 10C radio

Novelli Sandro's BAE Hawk Mk.66 - 1/3.5 scale, 118" wingspan, 47 lb, Jet Cat 160 power, Busa kit, Futaba radio

First time Top Gunner, Tim Len going over his flight plan with the judges

Tim Len taking off in his first Top Gun. Cessna 182, 1/4 scale, 120" span, 45 lb, DX18 radio. Tim is a member rcacf.com (Remote Control Association of Central Florida)

The best scale model aeroplane builders and scale pilots in the world attended Frank Tiano's Top Gun 2014. Top Gun has raised the detail level in scale aircraft to even higher standards every year.

The competition started with several days of Pro Am flying and beautiful sunny Florida weather. But for the first time in 30 years there was a rain delay, which limited the finals to one day. The pilots were then restricted to only one pass before the judges, which made the competition extremely difficult.

With a steady 20-knot crosswind only the best pilots were able to finish their pass successfully. There were times when full right rudder and full down elevator were just not enough to maintain control in the heavy crosswinds.

Top Gun Is...

David Ribbe and his MiG 15 won Top Gun 2014, the culmination of six years of work, patience and expertise. David did the 3-D CAD drawings and made the cockpit, landing gear (including tyres), rims, brakes and air cylinders for the retracts for his MiG-15. He wanted to build a larger MiG, lightly loaded that would fly fantastic, and he did. Alclad II is a spray-on aluminium covering that is basically two-dimensional aluminium platelets suspended in solvent. It feels like aluminium to the touch when completed. It was applied with an Iwata airbrush and took 14 continuous hours for the fuselage. All linkages are inside, including those for the ailerons that are in the thin wings, with no hatches for the servos, which are built in. There are over 20,000 rivets on the MiG-15. David's model is 89" span, 1/4.5 scale, has JetCat P140RX power, and uses three air systems for retracts, brakes and accessories (canopy, speed brakes, drop tanks). It uses JR 8911HV servos.

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Curtis Switzer's very scale LC-47H - 1/9 scale, 129" span, 40 lb, twin MVVS 1.8 power, CARF kit, Jeti DS 16 radio

Marco Bennincassa's F100, 1/4 scale, 45 lb, JetCat power, Fei Bao kit, Futaba18MZ radio

PJ Ash from Warbird Alley flew this Zero. Weighs 42 lb, 1/4 scale, 118" wingspan, Q100 power, Meister kit, JR12X radio

Steve Burnett's F4 Phantom Blue Angel, 1/8 scale, 34 lb, Cheetah power, BVM kit, JR12X radio

Other Awards

The perfect model aeroplane couple award should go to Brazilians, Eduardo and Ana Paula Esteves, who have been flying at international events for over 20 years. When a couple discover the way to do things together, life becomes better. Their PT19 took third place in the Pro-Am Prop Class.

The PT19 has a 118" span, is 27% scale, flies on ZDZ 60 cc power, with a XOAR prop and JR electronics. One of the interesting features of the PT19 is the custom pilot; Brazilian dentist, Roberto Bianchini used a photograph of Frank Tiano and from that he carved the head in wax and had it plastic injected. What a fabulous way to honour Frank Tiano, who has done so much for our sport.

Todd Bixby's 1911 DH1A is a work of art and the detail is overwhelming. The DH1A was awarded Best Military Runner Up. Todd is most proud of the airframe because it was the most difficult to build. The 164" span D-H1A is third scale for DLE111 power. Built from John Clark plans, it uses Spektrum DX18 radio.

Doug Pierce's Fokker DR-1, 1/3 scale, 100" wingspan, 35 lb, GT80 engine, BUSA kit, Futaba radio

Family Affair

Every aeroplane at Top Gun has a wonderful story and I wish there were room to tell you about all of them. Top Gun is like a family reunion and everybody becomes your family. Never pass up an opportunity to attend Top Gun. You won't be disappointed.

I was thrilled to visit different tents full of aeroplanes and pilots, and making many new friends. Everyone was preparing their aeroplanes for the day's competition. To visit the Warbird Alley tent is like closing your eyes and waking up on an airfield during WWII. Frank Sinatra music is playing and the pilots are smoking cigars and thinking about the days ahead. Mark Milo welcomes everyone and makes their visit so cosy that you have a hard time leaving. One of my favourite photographs of Top Gun 2014 is the Warbird Alley Wave photograph, which shows a large group of Top Gunners with their hands in the air enjoying being with each other and just having fun. This is what it is all about and the main reason we do what we do.

Congratulations to all the builders, pilots, Frank Tiano Enterprises, sponsors, vendors and volunteers for helping to bring Top Gun 2014 to a very thrilling conclusion.

RCMW

Brazilians Eduardo and Ana Esteves's PT-19, 27% scale, 118" span, 35 lb, ZDZ 60 cc power, Fairchild plans, JR radio. Pilot figure is of Frank Tiano, made by Roberto Bianchini. Roberto carved the head in wax and had it plastic injected

Dustin Buescher's F-104, 1/5 scale, 45 lb, King Tech power, Skymaster kit, Spektrum 18QQ radio

Rei Gonzalez's beautiful Vampire, ¼ scale, Kerry Sterner kit, all wood, Jet Central Cheetah, DX18 radio

Lou Centrangelo's Spitfire Mk.9, 1/4 scale, 102" wingspan, 36 lb, 3W 110 power, CARF kit, Spektrum DX18 radio

Tom Kosewski's Fokker D6, 1/3 scale, 105" span, 40 lb, Q100 power, GTM kit, Futaba radio

When the flying is done, the chilling begins... Mark Milo makes you feel so welcome it is very hard to leave Warbird Alley

Pedro Sanchez's P-47 rests in a Warbird Alley tent. The P-47 was awarded Best WWII, Best WWII Performance, and second place in Pro-Am Sportsman

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Steve Thomas and his Rallye Morain, 1/3 scale, 140" wingspan, 48 lb, 3W 150 twin power, AirWorld kit, Jeti Duplex 16 radio

Todd Bixby's 1911 DH-1A won Best Military Plane. Has extreme detailing and stitched wing covering. 1/3 scale, 63 lb, DLE 111 power and built from the John Clark plans

Warbird Alley Wave! This unbelievable group of gentlemen show what Top Gun is all about

R. J. Gonzalez's BVM MiG-15, BVM Viofan, DX18

Congratulations to Joe Castelao, Ali Machinchy and Henry Nguyen for coming first in Team with their Cougar F9F

Franco DiMauro's Thunderbird T33, 1/5 scale, 90", 50 lb, Rhino Power, Fei Bao kit, Spektrum DX18 radio

David Wigley's own design Bristol Beaufighter won Top Gun in 2013. 1/5 scale, 138" wingspan, 82 lb, twin BME 102 power, JR12X radio

Scott Harris' L 1011 Tristar, JetCat P100 power, DX18 radio

MiG-15s were very popular at Top Gun

Rod Snyder's Super Sabre F100D, 1/7 scale, 65", 38 lb, JetCat P-160 power, JR12X radio

Reinol Gonzalez's F84F Thunderstreak, 1/5 scale, 86", Rhino power, Michael Knol kit, JR12X radio, 2nd place in Team

Azza Stevens' Fouga Magister, 1/5 scale, 90", 28 lb, King Tech 120 Power, Avonds kit, Spektrum DX18 Radio

Dean Copeland's T28, 1/5 scale, 98" span, 36 lb, DA100 power, Iron Bay kit, Futaba 18MZ radio

Rich Feroldi's Albatros D5A, 1/3 scale, 119" span, 50 lb, Q100 power, self drawn, Futaba radio

Richard Crapp's Ryan PT22, 1/3 scale, 98", 34 lb, Laser 300V power, Switzer kit, Spektrum radio

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Matt Lupri's P-51D Mustang makes a dramatic arrival. 1/4 scale, 100", 43 lb, 3W85 power, CARF kit, JR 8303 radio

Ali Machinchy and Graeme Mears' T-33 Shooting Star, 1/4 scale, 110" length, 43 lb, King Tech power, Scale Jets kit, Spektrum radio

Peter Goldsmith's F104, 1/5 scale, 133" length, 43 lb, King Tech 180 Power, Skymaster kit, Spektrum DX18 radio

Top Gun 2014 Champion MIG-15 by David Ribbe. 90" span, 1/ 4.5 scale, 36 lb dry, JetCat 140SX power, own designed, Spektrum DX18 radio

Dave Pinegar's SBD5 Dauntless, 1/5.5 scale, 85", 30 lb, Saito 300 power, Jerry Bates plans, Futaba S-Bus radio

Above & Right: Bob Violett at the controls of his F80, 1/7 scale, 73", 22 lb, EVF125 power, self designed, JR12X radio

Good friend and fellow photographer, Carl Layden with his Lancaster bomber, which he custom built so it would fit in a box in overhead storage on a commercial jet. 4% scale, 48" wingspan, 10.6 ounces. Congratulations, Carl on your Critics Choice Award for free-flight mass launch

Mike Barbee's T-34B, 1/3 scale, 137", DA200 power, Bob Patton design, Futaba 18MZ radio. At 115 lb this was the heaviest aeroplane at Top Gun 2014

Team Horizon and all their trophies

Team Japan: Masakazu Oiwa with Mitsubishi Zero Type 21 and Takashi Imai with Mitsubishi Zero Type 52

Dustin Buescher and his F-104, with his trophies

Frank Tiano presenting the Top Gun 2014 Trophy to David Ribbe. Congratulations, David!

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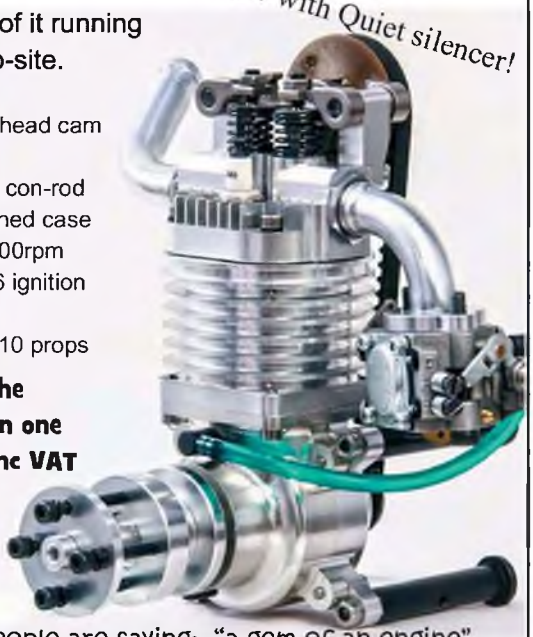

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PYLON RACING AT THE NATS

Barrie Lever gives us a taste of the action from the pylon racing course at the 2014 BMFA National Championships

Bruce Illingworth's sleek F3D racer. All models flown in both classes of racing were of fully moulded construction

Barrie Lever starts his Q40 racer, assisted by Nathan Attridge, whilst the starter waits to begin the heat

Quarter 40 is the new, close brother of F3D, although the Q40 planes use stock, commercially available equipment

Vendetta Q40 racer of Daren Graham is prepped and ready to start. Note the forceps used to clamp the fuel line and prevent a flooded engine

Daren gets ready to start his Jett 40 QM-2 engine, assisted by Mark Aubrey. All start line pictures by Mark O'Neil

The annual pilgrimage to Barkston Heath was met with a degree of trepidation by the pylon racing community this year for a couple of reasons. Firstly, due to the disastrous loss of access to Barkston Heath at any time other than the Nationals, then this would be the first race meeting of the year. And secondly there was a major change of site layout, with the pylon racing area now taking over from the old show line flight area.

Entries for the 2014 BMFA Nationals pylon racing were somewhat diminished due to the uncertainty of flying site availability, and that the electric pylon racing (F5D) group were attending the World Championships, which had a date clash with the British Nationals.

Double Act

Two classes of models would be flown on the International size pylon race course over the weekend; these were F3D, which is like the Formula 1 of pylon racing, and the other class being the new close brother of F3D, which is Quarter 40.

Racing started in the early afternoon of Saturday, with initial concerns about the change of location being quickly dispelled as the race course was set out nicely down the centre of the main runway, which makes flying and lining the model up on the race course a little bit easier.

Despite the fact that this was the first race of the season for most of the competitors, this does not mean that preparations had not been taking place behind the scenes. In F3D it was well known that Paul Bardoe had probably test flown more than anyone else. Paul had been quite clever and used demonstration flights at model shows to try out

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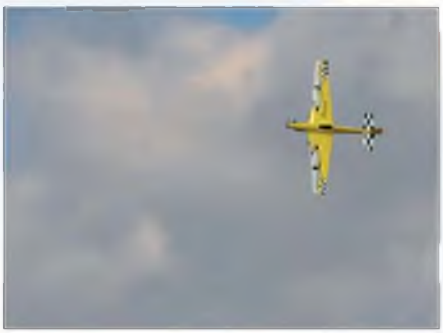
Barrie adjusts the Jett 40 QM-2 needle setting in Nathan Attridge's Strega race

Nose up attitude to get a partially lean setting to warm the engine prior to release

Last second tweak from Barrie, as Mark watches for the starter's green flag

They're off! Barrie gives the Strega an energetic push



Nathan's Strega rips around the No. 3 pylon

Chris Illingworth's F3D machine awaits its turn at this fast and furious event

Pylon models get a fair bit of punishment and composite repair techniques are a necessary skill, as the reattached tail on this F3D racer shows

Nathan shows Barrie's Vendetta to the timekeepers and course officials

new power plant set ups. And although Quarter 40 is an event for stock equipment this had not stopped Nathan Attridge spending quite some time in selecting the best Jett 40s from his and Barrie Lever's armoury. This effort by Nathan at the test bench was to prove of great benefit during the course of the event.

Winning Times

We would normally expect times for F3D to be around 61 to 62 seconds for the top three or four competitors in, with the very fastest flyers dropping below 60 seconds for the 4 km course. The same course would normally be flown in around 64 to 65 seconds for the stock commercial equipment based Quarter 40 class. Disappointingly, with the exception of Ben Jones, the first couple of rounds of F3D did not produce the times to be expected. However the Nathan Attridge prepared Quarter 40 engines and airframes produced pleasing times in the 62 to 63 second range and came close over the weekend to breaking the British record for Quarter 40 held by Dean Gibbs at 61.5 seconds, so all of the test bench work paid off.

Racing Engines

The engine of choice in F3D is the Metkemijier MB/Profi 40, with just one competitor choosing the new Italian built DKT F40. All of these engines used carbon fibre propellers of either home or commercial manufacture and glowplugs the Globee type. In Quarter 40 the fast engines at this meeting were Jett 40s running AMA and FAI approved APC pylon race propellers and Merlin glowplugs.

All competitors used sack based fuel tank systems. These fuel tanks resemble a bladder fuel tank, like those used in some control line models of old, the difference being that the sack is not artificially enlarged, rather it is placed with the confines of a plastic fuel tank and the exhaust pressure collapses the sack. The big advantage of this system is that a bubble free supply of fuel is delivered to the engine, with associated running improvements. Tanks were either of Tetra or Jett manufacture.

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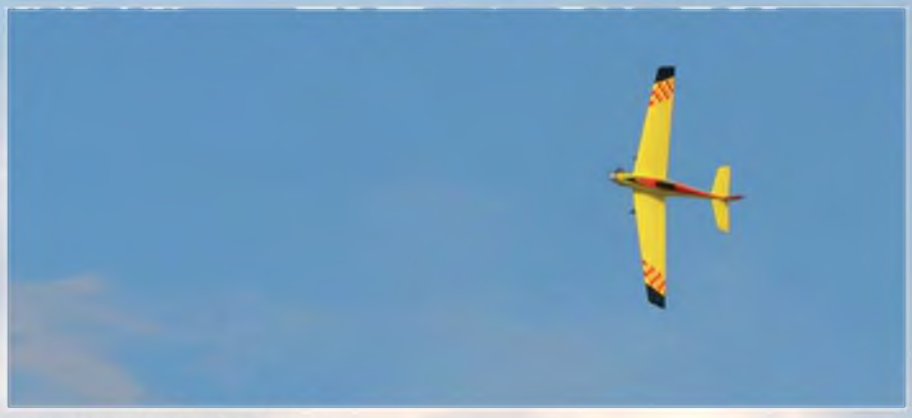
Barrie is back on the needle, this time maxing out his own engine



Vendetta arcs round the No. 3 pylon

Close up on the Jett 40 QM-2 on the front of the Lever Q40 racer

Nathan releases the Vendetta for a rapid take-off

Model Details

Every model flown in both classes of racing was of fully moulded construction. F3D winner Ben Jones used a combination of European built Dago's and Australian manufactured Minute Man airframes. Eventual Quarter 40 winner Nathan Attridge used the Italian constructed Strega, although Nathan is threatening to build his own composite Quarter 40 airframe over the winter of 2014-15; we look forward to seeing if this develops to a race ready airframe.

A variety of radio equipment was used, with the only trend being towards the use of high voltage Rx power supplies and the appropriate servos, which were predominantly manufactured by Hitec. We now see little future in the 4.8 to 6 volt servos where the highest performance is required, as the higher voltage systems with lower current consumption just outperform the lower battery voltage systems in every respect.

The HV Rx supplies lower current consumption and, coupled with the very low internal resistance of Lithium based batteries, this has enabled a useful and noticeable reduction in Rx pack sizes. No longer is it necessary to carry excessively large NiMHs to combat that battery chemistry's high internal resistance and potential Rx brown outs.

Despite all of the initial reservations about this year's British National pylon racing championships the event ran well and the eventual winners produced times worthy of international competition.

RCMW

Quarter 40 podium: 1st – Nathan Attridge, 2nd – Barrie Lever, 3rd – Daren Graham, with caller Mark Aubrey

F3D podium: 1st – Ben Jones and caller Geb Jones (with Callum Jones), 2nd – Ollie Witt and caller Dave Cline, 3rd – Paul Board (assisted by Paul Bardoe)

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ROTARY WINGS

Richard Morris adds a few planes to his heli column as he reports from the first LHC Manufacturers and Distributors Model Show

I had several great flights at LHC with the R22

Now that is low, even for the Horizon team!

Sean Brown's Wellington bomber releases its bomb over the lake

Distinguished guests. From left to right: Sean Brown, Mike Brewer, Sir David Jason and Tony Stephenson

For quite a number of years now I have attended the Leamington Hobby Centre fly-in. But this year rather than organising the normal Saturday fun-fly, followed by the Sunday scale helicopter competition and fly-in, it had been decided that things would be different and there would be a Manufacturers and Distributors Model Show. This show would consist of a private trade and guests day on the Friday, followed by two public days on the Saturday and the Sunday.

For those who do not know, Leamington Hobby Centre is more than a model shop. It's a unique venue that has its own purpose built boating lake, complete with a miniature aircraft carrier. The flying site boasts two runways, one normally occupied by I/C models and the other electric. In addition to this there is also a small indoor flying area, a workshop, a car track, refreshments and other facilities. In fact LHC is possibly the only place in the UK where you can buy, build and operate your model without having to go anywhere else. There is also the added bonus that, should you happen to have a mishap, there is a workshop on site so you can soon be up and running once more.

Prior to the show the guys from Horizon Hobby UK descended upon the venue with vans and lorries full of products to showcase at this new event. Sean Brown and his willing staff made ready the grass runways and after many hours of toil everything was ready for Friday 5th September; this was the private day when invited guests could attend.

The weather forecast for the weekend was good, although somewhat misty for the Friday, which stopped several people flying in to the event. For those who do not know, Sean Brown is the Managing Director of Heli Air and a number of guests would have arrived by helicopter, but unfortunately they had to cancel due to poor visibility. Fortunately, however, some did make it and amongst those arriving by air was actor Sir David Jason (probably best known as Del Boy from Only Fools And Horses), who is one of LHC's regular celebrities, and Mike Brewer of Wheeler Dealers fame, who would be doing the commentary for the weekend.

During the afternoon Sean flew his large Wellington bomber on its regular bombing run over the lake and I think, for the first time ever, everything went to plan and the bomb was actually released at the correct time and scored a direct hit in the middle of the lake!

Saturday was the first of the public days and with no admission charge this meant that there was a constant stream of people attending. With both runways in constant use there was always a model or two in the air. The main runway was where the Horizon Hobby team showcased their models, while the LHC regulars flew from the smaller second runway. In addition to these two runways a number of small models were also flown from the lake, in between the running of various boats. Add to this the constant driving of various

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This is how it should be done. A low inverted hover – impressive!

Mike Brewer returns to the pits with a slightly second hand helicopter

Flying together? Now that is what I call clever. And they say that the camera never lies?

Some proper scale flying

Mike Brewer in his element, with a microphone in his hand

model cars and you can appreciate that there was always something to watch.

Early on Saturday evening, once all the public had gone and the show was officially closed, it was time to relax and enjoy the hog roast, along with a few drinks before retiring.

Once again, on the Sunday, the weather was just about perfect for flying models. And as soon as the gates opened it took very little time for the show to fill up. Again there was a constant flow of people, in and out, all day, with a great deal of interest being shown in the models, which after all was the idea of the event. Towards late afternoon things drew to a close and the crowds started to drift away, bringing to a close the first Leamington Hobby Centre Model Show.

In conclusion, there is no doubt that this event was a success and with no admission charge it promoted all areas of radio control modelling in a very positive and exciting manner. I look forward to being at this event next year, as it looks like it should go from strength to strength.

Finally a big thank you goes to all those that supported the event, especially to Marcus Faulkner for some of his photographs which help to capture the show's unique atmosphere. **RCMW**

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An Horizon Hobby Inverza trying to be a helicopter

Knife-edge flight with a large model like this Decathlon so low to the ground is not easy

My turbine Huey. Always impressive when flying around

A pair of Blanik gliders, one with a turbine and one with a pair of ducted fans, thrilled the crowd

At every opportunity there was a model flying off the lake

Team LHC. Left to right: Mike Brewer, Rob Norman and Craig Stubbs

Team Horizon with Mike Brewer and Sean Brown. Perhaps they are new recruits?

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3rd Jan, 7th Feb, 7th March, 4th April, 2nd May, 6th June, 4th July, 3rd Oct, 7th Nov, 5th Dec '15
Indoor Fun Flying at Furzefield 2015. Furzefield Sports Centre, Mutton Lane, Potters Bar, Herts EN6 3BW. 6 pm until 10 pm. Flyers £8, spectators £2. Contact Mike Quille, Tel: 020 8500 3549 or Email: mp.quille@live.co.uk

8th Jan, 5th Feb, 5th March, 2nd April, 7th May, 4th June '15
Waltham Chase Aeromodellers Indoor R/C Small Models Meetings. Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. 7 pm to 9.30 pm. £4 for fliers and £1 for spectators. Flyers will be required to show proof of insurance. All models will be weighed before flight, and judged on their suitability for the venue on the evening. Alan Wallington, Tel: 01489 895157 or www.wcaero.co.uk

10th Jan, 7th Feb, 14th March '15
Waltham Chase Aeromodellers Indoor R/C event. Main Hall at Havant Leisure Centre, Civic Centre Road, Havant, Hants PO9 2AY. 7 pm to 10 pm. Free-flight models may not be flown at these meetings. £7 for flyers and £1 for spectators. Flyers will be required to show proof of insurance. Alan Wallington, Tel: 01489 895157 or www.wcaero.co.uk

10th Jan '15, 14th Feb, 14th March, 11th April, 10th Oct, 14th Nov, 12th Dec
North London MFC Indoor Radio Control Meetings 2014. Furzefield Sports Centre, Potters Bar, Hertfordshire EN6 3BW. Saturdays, 6 pm to 10 pm. All up weight for fixed wing 225 g, 36" span and helicopters 400 g. BMFA insurance required. Flyers £9, spectators £2.50. Contact Peter Elliot, Tel: 01707 336982

24th Jan, 28th Feb, 28th March '15
Waltham Chase Aeromodellers Indoor R/C event. Main Hall at Fleming Park Leisure Centre, Passfield Avenue, Eastleigh, Hants SO50 9NL. 7 pm to 10 pm, except December event, which is 2 pm to 5 pm., Free-flight models may not be flown at these meetings. £8 for flyers and £1 for spectators. Fliers will be required to show proof of insurance. Alan Wallington, Tel: 01489 895157 or www.wcaero.co.uk

8th March '15
2015 BMFA South Eastern Area 40th Crawley indoor meeting. K2 Leisure Centre, Pease Pottage, Crawley, West Sussex, RH11 9BQ. 11 am to 6 pm. Regret no R/C. Lots of comps and plenty of fun flying time. Please contact Competition Sec CADMAC: John Dart, Tel: 01293 420830, johndart17@aol.com or cadmac.org.uk

GENERAL

4th Jan '15
Croydon Aviation & Military Model and Toy Collectors Show. tAirport Hotel, Purley Way, Croydon. 10.30 am

7th March '15
Brightlingsea MFC Swapmeet. Alresford Village Hall, Ford Lane, Alresford, Essex, C07 8BL. 9.30 - 11.30 am. Entrance £2, tables £3 (set up from 9 am). Contact Bob Goodenough for info and pre-booking tables (essential), Tel: 01206 303749 or www.forjac.co.uk

20th March '15
DADMAC Auction at Chivas Community Suite of Dumbarton Football Club, Castle Road, Dumbarton. Book-in items from 5.30 pm, Auction kicks off at 8 pm. Entry fee, but no commission on sales. Trade stands, exhibits, bar/bar snacks available. Auction forms available on website: www.dadmac.org.uk Contact: Maurice Irvine, 01475 689711

16th/17th May '15
'Mayfly', includes the Ron Moulton Memorial Day (Saturday), Ebenezer Bert Striegler Trophy & Ebenezer Mass Launch (Sunday), and SAM35, with various Control Line events throughout the weekend. Directions: Old Warden Airfield, Beds. SG18 9EP. BMFA 'B' certificate to fly on the R/C flight line at these events. All pilots are required to show proof of insurance and BMFA membership, which shows 'B' certification. Please carry these documents with you on the airfield, as you will not be allowed to fly without them. This is a requirement of the Shuttleworth management. All types of model are welcome at all events (maximum weight 10 kg). Contact: Ken and Sheila Sheppard; Email: modelair.oldwarden@gmail.com or phone 07799 132999

19th/21st June '15
Weston Park International Model Air Show organised by Wrekin MFC. Weston Park, Weston Under Lizard, M54 Junction 3 and 8 miles off M6 Junction 12. Full size display both days, Top pilots, on site camping, over 100 traders. Contact Steve Bishop, Tel: 01952 587298, Email: stevenbishop@blueyonder.co.uk or www.westonparkmodelairshow.co.uk

27th/28th June '15
Wings & Wheels Model Spectacular, North Weald Airfield, Essex, CM16 6AR. With some of the best exhibits, models, pilots and trade presence to be found anywhere in the world, this is a show you cannot afford to miss. No price increases for 2015! admin@wingsnwheels.net or Tel: 01242 604126

25th/27th July '15
'Scale Weekend', includes David Boddington Memorial Day (Sunday). All disciplines of scale models are encouraged, and non-scale can also fly (10 kg max weight). Informal competition trophies are awarded on the Sunday, including: Flight Director's Trophy (Best of Show), RCMW Trophy (Best In Scale), Shuttleworth Trophy (Best Shuttleworth replica), Britannia Trophy. Directions: Old Warden Airfield, Beds.SG18 9EP. BMFA 'B' certificate to fly on the R/C flightline at these events. All pilots are required to show proof of insurance and BMFA membership, which shows 'B' certification. Please carry these documents with you on the airfield, as you will not be allowed to fly without them. This is a requirement of the Shuttleworth management. All types of model are welcome at all events (maximum weight 10 kg). Contact: Ken and Sheila Sheppard; Email: modelair.oldwarden@gmail.com or phone 07799 132999

26th/27th Sept '15
Festival of Flight including the Vic Smeed Memorial Day (bring and fly one of his designs). Vintage R/C models welcome, all disciplines of sport flying also welcome. Directions: Old Warden Airfield, Beds. SG18 9EP. BMFA 'B' certificate to fly on the R/C flight line at these events. All pilots are required to show proof of insurance and BMFA membership, which shows 'B' certification. Please carry these documents with you on the airfield, as you will not be allowed to fly without them. This is a requirement of the Shuttleworth management. All types of model are welcome at all events (maximum weight 10 kg). Contact: Ken and Sheila Sheppard; Email: modelair.oldwarden@gmail.com or phone 07799 132999

Coming soon!

With the indoor flying season in full swing we'll be looking how the experts set up their F3P aerobatic models, guided by Donatas Pauzuolis

Scale Competition Round One Winner!

Traplet Publications in association with PANDAs and Bickershaw MFC sponsored the RC Model World flying-only scale competition. As featured in the October 2014 BMFA News.

Round one 1st place with 169 points out of 200 the Minicab flown by designer Dave Womersley was a real crowd pleaser!

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ENGINE	.40 TO .60 CU. IN. 2-STROKE

This well known Ultralight is ideal for your first scale model being reasonably easy to build from these Dennis Bryant Plans. The large 2-sheet plans are very highly detailed and construction is from all wood.

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WINGSPAN	72"
RADIO FUNCTIONS	4
SCALE	1:6
WEIGHT	5KG APPROX.
ENGINE	.60 CU. IN. 2-STROKE

This 1:6 scale model is from the Dennis Bryant Elite Plans range of the 1927 2-seat tourer and is very stable in fight and makes another ideal first scale model. Constructed from the 2 large well-detailed plan sheets from all wood.

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MILES M.14 MAGISTER (68") ★★★★

Plane specifications	
WINGSPAN	68"
RADIO FUNCTIONS	4
SCALE	1:6
WEIGHT	5KG
ENGINE	.40 TO .60 CU. IN. 2-STROKE

This 68" span model is on 2 large sheet plans from the Dennis Bryant Elite Plans range. It is well detailed and construction is all wood to produce reasonably easy model to build and fly.

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WESTLAND LYSANDER (81") ★★★★

Plane specifications	
WINGSPAN	81"
RADIO FUNCTIONS	5
SCALE	1:7.4
WEIGHT	5KG
ENGINE	.60 TO .90 CU. IN. 2-STROKE

This is probably the most famous of all STOL aircraft from WWII. Superby detailed on 3 large plan sheets from the Dennis Bryant Elite Plans range, the model is constructed from all wood and shows working flaps. This is a builders model that is reasonably easy to fly.

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STAMPE SV.4B (62") ★★★★

Plane specifications	
WINGSPAN	62"
RADIO FUNCTIONS	4
SCALE	1:5.3
WEIGHT	5KG
ENGINE	.45 TO .80 CU. IN.

This is a very accurate scale model of the popular Belgian trainer, best known for its role as a team aerobatic aircraft. The 2 large sheet plans are extremely accurate from the Dennis Bryant Elite Plans range to a scale of 1:5.3 and construction is of all wood.

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DH82A TIGER MOTH (66") ★★★★

Plane specifications	
WINGSPAN	66"
RADIO FUNCTIONS	5
SCALE	1:5.3
WEIGHT	5KG
ENGINE	.60 TO .80 CU. IN

These superbly detailed plans from Dennis Bryant Elite Plans range of this famous RAF biplane have been described as the best for this classic aircraft, and is therefore a truly a competition winner and a firm favourite for Scale Modellers.

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COMPER C.L.A 7 SWIFT (63")

Plane specifications	
WINGSPAN	68"
RADIO FUNCTIONS	4
SCALE	1:6
WEIGHT	5KG
ENGINE	.60 2-STROKE OR .90 4-STROKE

This is a quarter-scale model spanning 63" of the famous racing aeroplane of the early 1930s from the Dennis Bryant Elite Plans range and is constructed from the superbly detailed 3 plan sheets from all wood.

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FIESELER FI-156 STORCH (70")

Plane specifications	
WINGSPAN	72"
RADIO FUNCTIONS	4
SCALE	1:6
WEIGHT	5KG APPROX.
ENGINE	.60 CU. IN. 2-STROKE

This is the smaller 1/8 scale version of this famous WWII German STOL reconnaisance aircraft from the Dennis Bryant Elite Plans range. Plans are 2 large well-detailed sheets, and construction is all wood. Plan also show adjustable flaps and fixed slats.

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MACCHI C-202 FOLGORE (61")

Plane specifications	
WINGSPAN	61"
RADIO FUNCTIONS	5
SCALE	1:7
WEIGHT	5KG
ENGINE	.40 TO .60 CU. IN. 2-STROKE

This was the best Italian fighter of WWII and is to 1:7 scale from the Dennis Bryant Elite Plans range and highly detailed on 2 large sheets and shows mechanical retracting undercarriage installation. Construction is all wood. This is a very elegant model that flies as good as it looks.

PLAN MW3450
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HAWKER TYPHOON

Plane specifications	
WINGSPAN	81"
RADIO FUNCTIONS	5
SCALE	1:7.4
WEIGHT	5KG
ENGINE	.60 TO .90 CU. IN. 2-STROKE

One of the best fighters of WWII. This model, from the Dennis Bryant Elite plans, is ideal as a first warbird, and the large cowling is ideal for 4-stroke engines around 10 to 15cc.

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HAWKER FURY 1 (60")

Plane specifications	
WINGSPAN	60"
RADIO FUNCTIONS	4
SCALE	1:6
WEIGHT	5KG
ENGINE	.60 CU. IN. 2-STROKE

Pride of the RAF, and considered to be one of the best looking biplanes of all times, the fury is superbly drawn on 2 large sheets from the Dennis Bryant Elite plans range.

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BRISTOL BULLDOG

Plane specifications	
WINGSPAN	63"
RADIO FUNCTIONS	4
SCALE	1:6.4
WEIGHT	5KG
ENGINE	.60 CU. IN. 2-STROKE

The RAF fighter of the 1930s, famous for its air displays is drawn to 1:6.4 scale on 2 well-detailed plan sheets from the Dennis Bryant Elite Plans range and is constructed from all wood.

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SILENT SCALE

This month we are pleased to welcome Chris Williams as our new columnist on scale gliding topics

Author's re-built Scheibe-Loravia Topaze from the Traplet plan

Topaze in action at White Sheet (Barry Cole pic)

Author with the new scaled up version of the smaller 1/4 scale Kaiser K11 motorglider

Dave Stokes' lovely Slingsby Petrel displays her lines at a White Sheet fly-in

As this new column comes in at the nab end of the event season, I thought it might be an idea to look back at some of the highlights of the scale soaring calendar for 2014.

On a personal note, the year started with the maiden flight (I nearly typed 'midden flight': I've had a few of those!) of my 1:3.5 scale Scheibe-Loravia Topaze. Its previous demise was something of a mystery as it had impaled itself against the hill on the almost exact same spot as it had on a previous occasion, both times without any apparent cause or reason. At the time I mentioned to my flying pal, Motley, something about a new Bermuda Triangle, but it has to be said he was somewhat sceptical, making some rather acerbic comments about the efficacy of my thumbs.

The Topaze required a new fuselage and a new colour scheme, the one chosen pinched from a rather colourful Slingsby Swallow, based, I think, in Spain. Installed in the model was my new FrySky gear, to be manipulated by the Taranis transmitter. All was well for a few minutes, until one of the many of the Taranis's functions manifested itself by saying 'A1 critical!'. Well, there's something about the 'C' word that sends an automatic shiver through the sphincter, especially as this message implied that the on-board battery was losing the will to live. Subsequent investigations were unable to determine the voltage fluctuations that were taking place, and eventually a 6 V battery replaced the 4.8 V, as the FrSky receivers brown-out at a slightly higher voltage than the MPX ones I had been using.

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Event Director, Steve Fraquet gives Geoff Crew's mighty 40% Phoenix K8 a launch

This Paritech DG303 Akro caught at the Purbeck Convention

Neville Mattingley's Slingsby Sky at the penultimate TVSA aerotow

Things didn't end well on this Antonov A9's maiden flight

My pal Smallpiece (he's my other pal) has become something of a Taranis guru since he acquired his just before me. Not only has he programmed his to lower and raise the U/C on one of his gliders at a pre-determined height set by the vario, he's also managed to fit an on-board starter to my old 3.5 scale Tandem Falke, which confers all sorts of street cred on his person when the motor bursts into life in the pits, or in mid-air. (Despite my many requests, he adamantly refuses to give the model back.) The Topaze flies a sweetly as she ever did, I'm thankful to be able to report...

Slope Or Aerotow?

This year, the White Sheet Club, in the person of scale secretary Steve Fraquet had a much better time of it, as only two of the four scheduled fly-ins were wiped out by the weather, a much better batting average than in previous years!

There is sometimes a divergence of opinion as to whether 'tis better to fly from the slope or from the flat, courtesy of aerotow, but in my experience, the more time a modeller has put into his creation, the more he wants to see it in action, preferably close up and personal, with the wind whistling over the flying surfaces. On a good day, the slope is the perfect venue for this sort of thing, and on the two separate occasions, we were treated to many such displays.

One that sticks in my mind was the first slope outing of veteran modeller Dave Stokes with his 1:3.5 scale Slingsby Petrel. He had opted to do this build the hard way, representing the Petrel in its original 1930's configuration, with what seems like hundreds of varnished ply panels. This is truly a work of wood crafting art, and on the day the Petrel really looked the part as she whistled and sighed past in a series of low passes.

Purbeck Convention

Early in the season a new event took place on the south coast entitled the Purbeck Convention by organiser Terry White, once famed for his Purbeck Sailplanes range of glass gliders. Being on the south coast there are, as you might expect, a fair range of southerly-facing slopes, so it came as no surprise when the big weekend came around that the wind blew steadfastly from the north. Some pretty fast footwork by Terry secured permission from one of the local farmers to use a slope that faced north towards Poole Harbour, and thus the convention was able to take place.

Given the historic connection to Purbeck Sailplanes, the models were predominantly of the glass persuasion. The slope itself was densely forested, nearly all the way to the sea, and on the Saturday, the wind light and fitful at times, so it took an act of great courage to chuck an expensive all-moulded model into the void, knowing there was no place to land out! On the other hand, of course, these sailplanes are pretty darned efficient, so apart from one loss due to wrong-model-syndrome all the biggies made it back to the top over the weekend.

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Goodbye To Siege Cross

Sadly, 2014 saw the end of the TVSA's reign at Siege Cross Farm, near Thatcham in Berkshire, as this light aircraft field has been sold to developers. It has been nearly a decade that we have been aerotowing at this venue. A narrow strip, bordered on one side by trees and on the other by an aerial array, we have had some challenging conditions over the years, but when the wind and weather were in a cooperative mood, some excellent flying was had by all. A sad occasion, then, when we gathered for the final photograph. But I hear on the grapevine that the organisers are actively investigating one or two alternative sites.

Plenty of challenges for Richard Vale on this 3rd scale Wampir's first aerotow

Farewell Siege Cross: the gang bid goodbye to nearly a decade of events at this venue

Antonia Gigg's 5th scale up-and-go ASH 25 pictured here at Middle Wallop

Ghostly Affairs

The first of the Ghost Squadron's aerotows at Middle Wallop was packed with interest and excitement. (It was not really the first, as that was wiped out by the weather, but it was the first event to be successfully held).

Terry Holland had brought along his new 1/4 scale Antonov A9 for its maiden flight, to be carried out in the capable hands of veteran pilot Dave Stokes. This model represents what technology has made possible these days. Designed by Jim Owen, the free plan is downloadable from the SSUK website, as is all the documentation currently available for this subject. On top of that, another of the forum members can supply a laser short kit to accompany the plan as well. Alas, the maiden flight did not go well, the model ending up hanging vertically behind the hapless tug, before being released to fall to earth, there to be reconstituted into its component parts.

Another free plan, this time drawn by Jilles Smits in Australia, is that of the SZD-20x Vampire-2 flying wing, built by Richard Vale to one-third scale. This is an impressive looking model, especially given its unconventional shape, but Richard had quite a fight on his hands due to the very narrow speed range in which the model would handle in a predictable fashion. It later transpired that the wing joiner boxes had become unsecured, and later modifications improved the model's characteristics greatly (all pretty scale really, as the full size had similar problems).

Perhaps the greatest excitement of the weekend came about when not just one, but two ARF K8s shed one of their wings. To the astonishment of all, both pilots landed their stricken machines more or less conventionally without further damage. They modestly allowed that it must have been their superior piloting skills, but as one of them was my pal Motley, I suspect that they might have employed some new iPhone app to get the job done. Subsequent to this there was much forum discussion on the rights and

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wrongs of such ARFs, but Motley simply rolled his sleeves up, dug out his spare set of wings, stripped them of their covering and actually put some spars in there. His mods were later tested by moi in a series of continuous loops at the White Sheet event and pronounced fit for purpose (K8s thus modified are now said to have their Certificate of Mottification).

From The Williams Workshop

Just a quick snapshot, then, of the scale soaring scene in 2014, but there were two more items to come out of the Williams workshop, thanks to being recently retired, a condition that does wonders for productivity.

The first was the scaled-up version of my 1/4 scale Kaiser K11 motorglider, which, at 3rd scale came out remarkably light in the avoirdupois department at around 19 lb. Running on two 5S LiPos, powering an EMax BL5335 motor, the K11 fairly leaps off the deck to the extent that half-throttle is usually all that is required.

The other item was yet another Minimoa, this time the one-off two-seater version, for which I was inspired by the very comprehensive research and documentation that sailplane historian Vince Cockett had put up on the SSUK website. In a vote of thanks for the hard work that Vince and his collaborators had put in to the project, my plan was donated to the website, where it is available as a free download. In conjunction with this, I have also put up a comprehensive build log so that any prospective builders can follow the build process step by step. (www.scalesoaring.co.uk/)

Fitted with flaps, drop-off dolly and a working headlamp, the Minimoa's first aerotow at Middle Wallop became more interesting than it should have been when I forgot to drop off the dolly on take-off. Given the sensibilities of leaving anything lying around on an active military airfield, I had to release early and find a suitable place to drop the wheels from where they could be easily retrieved.

Not a bad season, then, at least for events, although I sincerely hope we get a more slope-friendly wind directions in 2015, because as anyone who wields a camera knows, that's where you get the best shots. **RCMW**

Geoff Crew's stricken 40% K8. Amazingly it landed more or less conventionally

Scottish modeller, Brian Sharp travelled to Middle Wallop with this 1/4 scale K11 from the Traplet plan

Four Minimoas at Middle Wallop, three of them built by anorak-toting author

Author's latest Minimoa in action at White Sheet

CONTACTS
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THE SPORT CHANNEL

This Month's Wise Words

Not for the first time in its history this column seems to attract little quirks of synchronicity. It can take the form of an incoming mail from a reader unwittingly pulling together strands from other items we've featured. And so it was as this edition was being written.

Last time out we covered Wayne Drinkwater's Keil Kraft Snipe free-flighter and the lead-in to that piece had name checked the big Mercury Matador of Graham Crawshaw, which had appeared previously. We also reported on our visit to one of Gloucestershire's top model events, the Vintage meeting at Cocklebarrow Farm.

So imagine my surprise when about half an hour after sending off the copy for last month's column, a mail arrived from none other than Graham Crawshaw with a picture of – a KK Snipe! Graham has converted his Snipe to R/C (I think it's the first one I've seen) and powers it with a DC Wasp .049. Alongside is another R/C rendition of a long time favourite, a Junior 30 with an MP Jet .040 diesel.

Both are undeniably cute projects and perfect examples of what's possible with such designs and today's R/C equipment.

I would take an educated guess that the Junior could be built from the plan of 'Buckle's Baby 30', designed by the great British Vintage movement pioneer, the late Ben Buckle in the early 1980s.

A half size rendition of Albert Hatfull's Junior 60, kitted by Keil Kraft in 1946, itself one of the most enduring designs of its era (I've lost count of the number built in my club!), the Baby 30 has been a popular small free-flighter and radio subject over the decades as equipment has shrunk and got lighter.

A nice coincidence. Another example of the Keil Kraft 'Snipe' reached us just as last month's mag went to press. Graham Crawshaw's has R/C and a DC Wasp .049 glow. Posing alongside is another KK favourite, a 50% Junior 60. Possibly from the Ben Buckle plan? See text

"Every single moment is a coincidence..." (Douglas Coupland)

After receiving Graham's mail, I felt prompted to dig out my own copy of the Baby 30 from the depths of my filing system (no, we're still not a 'paperless office'!). As soon as you look at it, it cries out to be built. And with its tidy proportions it's a natural 'take anywhere' model. Back in the summer I had a friend's electric version specked-out in a thermal, probably higher than most self-respecting micro models care to venture!

As I looked over my plan, I remembered yet another small tie-in with our recent items. I actually bought it from Ben Buckle himself at what I think was the very first Cocklebarrow Farm meeting in the early 80s.

The Baby 30 is still listed in the Buckle family plans range. Check it out and the famous kit range on the company website: www.benbucklevintage.com

Back To 'Back To Front'

We do love canards here. Through the years we've had much correspondence about them and we've seen them move further into the modelling mainstream. I remain totally biased though, as a small canard glider was one of my earliest successes.

Surprisingly, the canard still remains an impenetrable mystery in some circles, as demonstrated in a story told to me recently. I heard from a modeller who has been giving help and advice to a flyer (and, apparently, a general aviation enthusiast) who has been making steady progress with a fleet of ARTF models for the past few years.

Our correspondent describes how his pupil called by his workshop one day for a chat and spotted a new canard project on the building board. He was instantly baffled at this seemingly haphazardly deconstructed aeroplane. What was the tailplane doing at the front? And what were those fins doing stuck back there on the wing?

Our contributor realised that his visitor thought that this must be some freakish novelty experiment. How could an aircraft possibly fly backwards like that? He was genuinely perplexed.

The writer explained that the model wasn't actually intended to fly 'backwards' at all and that all its components, in their locations, were all travelling in the right direction! This was a well known and proven layout called a 'canard', the history of which is as old as aviation.

The visitor replied that he had never heard of such a thing and wouldn't have thought it possible. Our correspondent asked him if he'd heard of the Wright Brothers and their 'Flyer', the most famous canard of all. Although he'd heard of them, he'd never noticed what their aircraft actually looked like! He was given a gentle and friendly explanation of the aerodynamics involved, but didn't seem totally convinced.

Our writer reflects that if he had a pound for every wisecrack he'd heard about his canard 'flying backwards', it would fund a new model!

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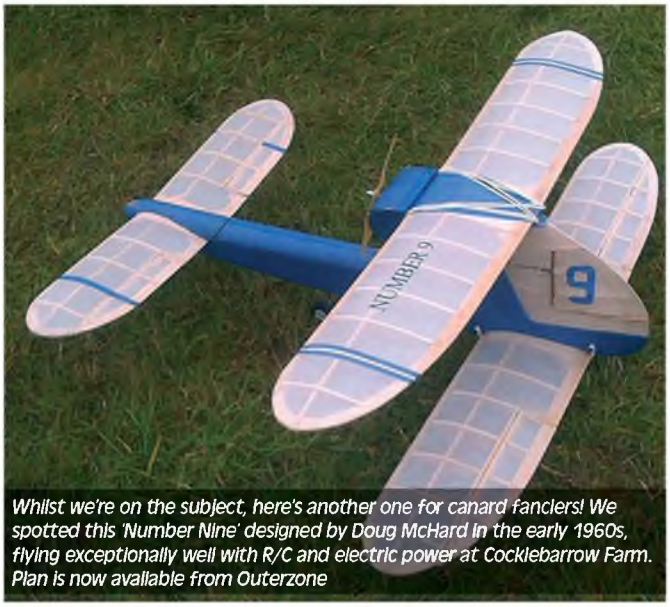
Extraordinary free flight rubber powered Wright Flyer. Snap-together foam and plastic kit is no lightweight, but it does fly surprisingly well



Whilst we're on the subject, here's another one for canard fanciers! We spotted this 'Number Nine' designed by Doug McHard in the early 1960s, flying exceptionally well with R/C and electric power at Cocklebarrow Farm. Plan is now available from Outerzone

Wright About Now

And this just in...

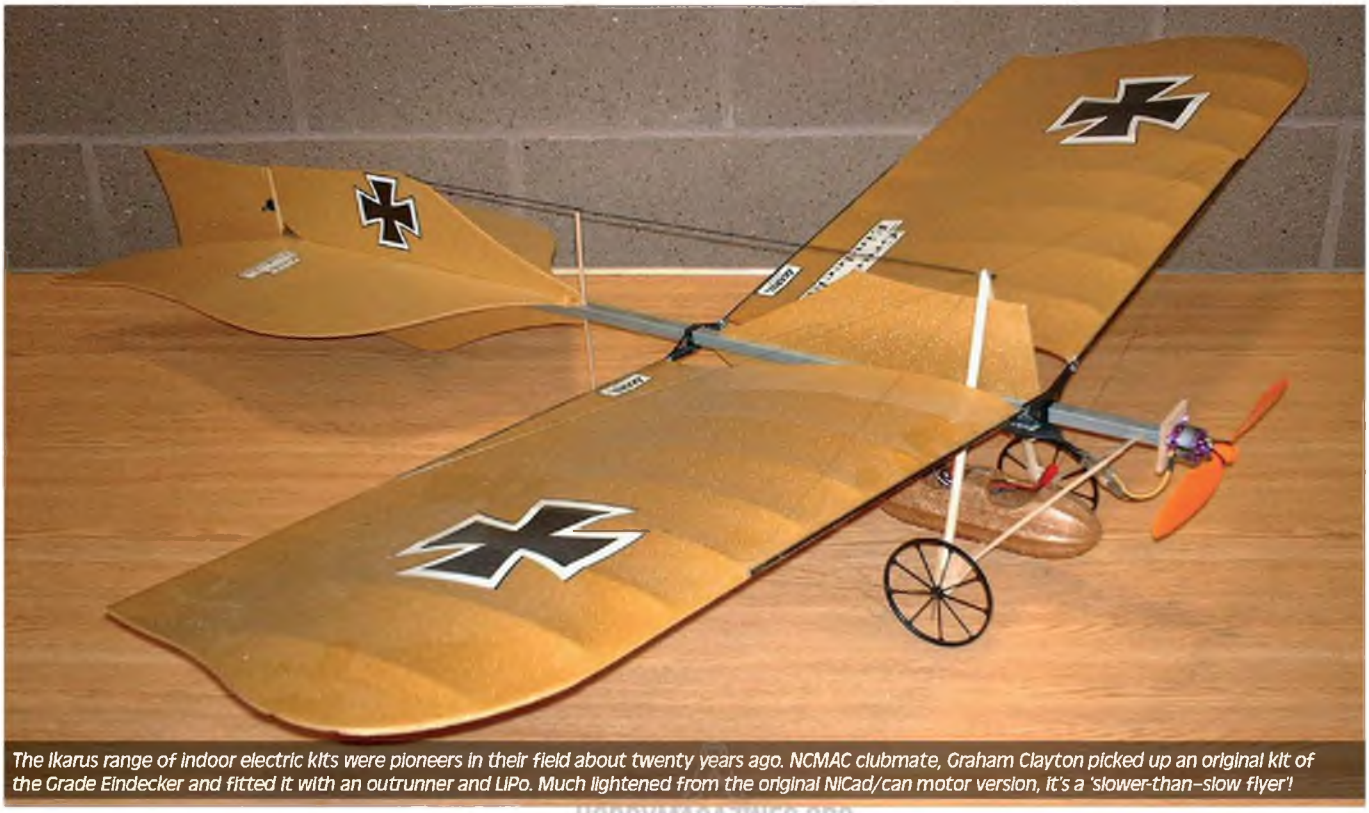
Speaking of the Wright Flyer, the Hobby King company are offering an unusual snap-together foam and moulded plastic, rubber powered F/F, semi-scale Flyer via their website.

An example turned up at our indoor venue recently and created a lot of interest. The design of this model is truly ingenious. The moulded Depron-type foam surfaces and plastic frames interlock accurately and the twin props are driven through a gears and shaft drives! The level of engineering for such a small rubber model is remarkable.

The motor comprises eight strands of 1/8" rubber wound in situ from the front through a geared 'starting handle' arrangement, while a brake lever holds the props stationary.

We couldn't help but notice though that, ready for flight, it was really tremendously heavy for a rubber F/F model. Undaunted, the owner wound it up ready for its test flight. With the brake flipped off, the props whirred impressively and the Flyer sailed across our hall in a rock steady, dead straight line, timed at fifteen seconds - quite acceptable for a fun model.

However, the owner is now looking at fitting R/C, with very little overall modification. As this kit is quite inexpensive, it could provide the basis for many such conversions.



The Ikarus range of indoor electric kits were pioneers in their field about twenty years ago. NCMAC clubmate, Graham Clayton picked up an original kit of the Grade Eindecker and fitted it with an outrunner and LiPo. Much lightened from the original NiCad/can motor version, it's a 'slower-than-slow flyer'!

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Future Vintage?

For many it's not easy to associate a field as contemporary and fast growing as indoor R/C with Nostalgia models. As far as I can tell the earliest experiments with indoor radio flying (as conducted by hobbyist modellers, that is) date from the late 1950s. Examples that appeared in the model press of the day employed much enlarged versions of lightweight indoor F/F structures, using single channel, rudder only radio and Cox .010 and .020 glow engines (often de-tuned to keep airspeeds down in restricted spaces).

The first electric R/C model I can remember was an angular stick and tissue biplane called the 'Hut Humper', which appeared on the cover of a model mag in about 1969 (anyone remember it?). It had a tiny-geared Micromax motor and pulse proportional radio. It was probably at the limit of what was possible then.

Right at the end of the 1970s the US model press reported on the first ever all-R/C indoor meeting, organised by a group of outdoor electric enthusiasts who'd attempted to slim down their evolving NiCad based technology and produced some highly ambitious models, including several large scale subjects.

Improving electric power systems and much lighter micro radios saw indoor electric become a practical reality through the 1980s. It was in the 1990s though that it began to make its mark commercially.

The early kit designs really did an admirable job of getting the best from the available power trains and radio systems of their day. Examples of them still put in appearances at venues around the country even now. We've had the likes of various Butterflies and IFO's down our way not long ago. Their proportions make them look huge in comparison to the average models of today, but fitted with modern LiPo's and outrunners their wing loading drops dramatically, with a resulting increase in performance.

The German company Ikarus made early inroads into the field with their range consisting of the Grade Eindecker, Bleriot and Demoiselle. All featured sheet and moulded foam components and aluminium fuselage booms. They all looked suitably charming and antique, and flew beautifully. An example of the Grade, built from an original kit, turned up at our sports hall last month and amazed us all.

At less than half the weight of its NiCad equipped predecessors, it wafted around the hall on just a few clicks of throttle. If anyone is flying any other pioneering models from indoor electrics early days, please let us know.

In The Bleak Mid Winter

I knew that our Fleet Gallery feature would come into its own at this time of year. Reader, Tim Bland lined up his collection for this photo shoot at the height of the summer, displaying a wide variety of interests.

Tim writes: *"R/C models: Wot 4 Foam-e, Telemaster, Quasi 40, Limbo Dancers (assorted), Cougar 2000, Junior 60, Jumper 25 and Uno Wot.*

Control line models: Sig Chipmunk, All American, Sig Twister, Kismet, Jamieson special, Swedish AM Mustang, Brodack Tigercat, Foxt and Cardinal. All operational, all flown! Also combat models: Yeti, Hallam Swift stunter.

Thanks to my wife Tina for helping carry the models out on the hottest day of the year."

Great pictures, and what we wouldn't give for some of that sun now! Thanks to Tim and Tina for their work in setting up the shoot.

Despite changing times and modelling habits the winter project is still an important part of so many modellers' year. If you are in the process of expanding your fleet, send us some photos, please.

With another flying season not so far around the corner now, a very Happy New Year to all SC readers and thanks for your continuing support.

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

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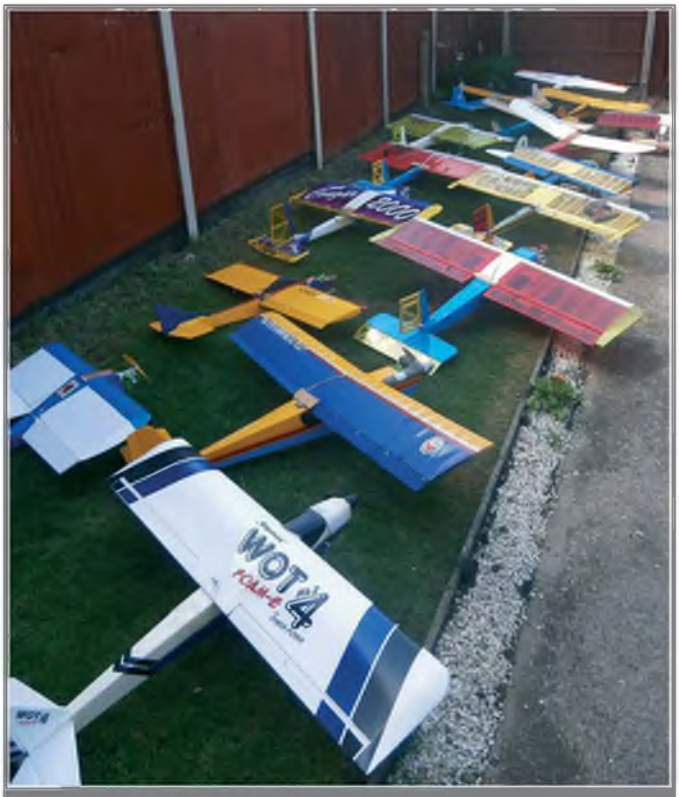

If anyone needs inspiration for a winter project, just take a look at Tim Bland's fleet, assembled for us on the hottest day of last summer. Great collection of R/C and C/L models. Show us what you're working on this winter

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The Seasonal Sale ends on 31st January but check out these last minute bargains!

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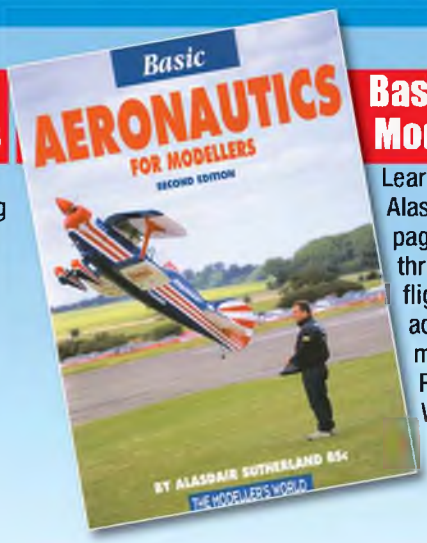

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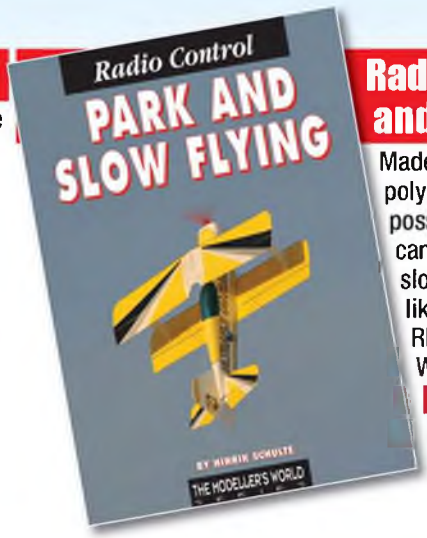

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ON THE COVER

Steve Warltier describes how he took a 3-D ARF and made it into a Top Gun contender

What started off as a tongue in cheek promo for PAU (Performance Aircraft Unlimited), an ARF manufacturer, gained a highly respectable fourth place in the prestigious world class 'Top Gun' event.

The idea was conceived by my long time friend, Steve Thomas, a British ex-pat and owner of Bob's Hobby Centre in Orlando, Florida. Having recently taken on the distribution of the PAU line-up of ARF's, he convinced PAU's owner, Tahitian born Herve LeJeune to put a PAU entry in to Top Gun as it would be a novel and effective method to promote the brand.

Enter yours truly, who was invited to join the team and bring the project from ARF to Top Gun standard. The subject chosen was the popular Extra 300SP, a 43% size model that Herve had previously campaigned on the 3-D circuit. One of the Top Gun rules is that no model can compete with plastic film covering, so this meant our donor aircraft had to be completed stripped of its covering and redone using a traditional fabric, glass cloth and paint system. This was the original concept...

Scale Details

Having got to work in bringing the model back to its framework state, things took quite a change when we elected to rework all the flying surfaces to scale dimensions, along with eliminating the 45 degree bevels and hinging them as per full size. Having gone so far the decision was made to scale out the top deck and canopy fastening. Full cockpit detailing and a pilot were also installed. Other details were added to complete the picture, such as the panel fastening screws, horizontal indicator bars, antenna, etc.

The model was finished in BASF automotive paint, clear over base colours, applied using multiple masks to achieve the design and decalage to represent its full size counterpart. The full size subject was based in Germany and owners Heike and Hans Sauels were extremely helpful in providing the documentation. Both were amazed and delighted with seeing their aeroplane in miniature! I understand that the full size was sold and is now flown here in Britain.

The original DA170 engine was replaced with a DA150 to give a more scale like performance and a smoke system added. For guidance a Jeti system was installed, operating digital hi-torque metal geared Hitec servos all round. The prop? What else but a Falcon carbon fibre!

It was quite a push as the timeline took in only the work required for the original concept. It was, however, completed and test flown the week before the event. Mutual friend, Curtis Switzer, a previous Top Gun award winner, was conscripted to fly the plane and he was ecstatic about the looks and flying qualities as he put it though its paces in the shakedown flights.

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At Top Gun

As for the event, we really didn't know what to expect. The model was well praised and photographed on public display, but what would the judges think? We were entered in the 'Unlimited Class'. With the largest number of entries this is often referred to as the 'cheque book class', as most of the entries are painted in the mould, 'money no object', composite jets. Eyeing the competition we consoled ourselves with the thought that what we were really after was the exposure.

In Static Judging each model goes through 'Static', where separate panels of judges mark specific criteria, such as scale outline. They are not concerned with anything else but that. In turn the model is moved from table to table and judged on accuracy of colour and markings compared with the full size, scale detail and, finally, skill and craftsmanship. We scored OK – the judges liked it! They were very complimentary and helpful, pointing out where, using our photos and documentation, we had lost a few points. Judging and marks at this level are crucial as often half a point can mean a place on the podium.

As you are aware this year's Top Gun was somewhat marred by heavy rains, which meant the flight schedules were severely reduced to one flight only. So for Curtis it was a nerve racking one-shot deal. The flight plan was to open with an 'Air Show Entry', climbing high from take off and making a dramatic entry, flying four rolls with smoke on at 45 degrees and levelling out in front of the judges. Dramatic it was and our hearts were in our mouths as the exit was perilously close to the deck! It had the desired effect though and had the crowd out of their seats. Curtis completed the rest of the manoeuvres with consummate easy and accuracy, gaining high marks and giving Team PAU fourth place.

Not too shabby for a first time team entry!

'The Prop Guy', Steve Warltier with the PAU Extra 300SP, 1/3 scale, 38 lb, DA 150 twin power. Picture by Barry Vaught

The donor aircraft with its covering partially stripped down

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Next Issue

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The Osbournby Model Flying Club has been putting on Traplet Unlimited competitions for some years now and they were rewarded with some exceptionally good weather for their last event in October. Phillip Kent reports on some great scale flying.

FEBRUARY 2015 ISSUE ON SALE THURSDAY 15TH JANUARY

David Huck is a long time modeller renowned for making models in fibreglass from his own hand-produced moulds. After his quarter scale models he decided to move on to a 1:1 project, taking on a crash wrecked Druine Turbulent D.31. Chris Bowler was there to document one modeller's ultimate scale build.

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