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MODEL MAGAZINE**

# Flying Scale Models

**ALBATROS D.XI**



SUBJECTS FOR SCALE

**LUTON  
MINOR**

- Scale three-views
- Close-up detail study



**MYTHICAL BEAST  
WESTLAND  
WYVERN**

Black Horse Models big ARTF



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Strictly for electric power enthusiasts

For years 9 channel radios have been the sole domain of the elite.  
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## WESTLAND WIDGEON

**B**ack in the February 2012 issue of FSM, we presented Peter Rake's electric powered Westland Widgeon. We backed this full size free plan construction feature with the story of the full size Widgeon for which vintage aircraft restoration specialists **AeroAntiques** were in the stages of a total rebuild.

At that stage, the fuselage was the centre of attention, while wings etc were still stashed away awaiting their turn on the workbenches. A year on though, the project has moved on dramatically as the pictures here show.

Other restoration projects in which **AeroAntiques** are deeply involved include a DeHavilland Puss Moth and DH 84 Dragon, with Miles Sparrowhawk and Avro Avian lined up for work thereafter. Busy men indeed!



## OLD WARDEN FLYING DAYS

**M**odelAir, organisers of the annual model flying program at the Old Warden, Bedfordshire airfield of the Shuttleworth Trust's air museum have three events in train for the coming summer model flying season - no all purely scale, but certainly all a lot of fun in the usual relaxed manner that makes their events so enjoyable.

**MAY 11/12: MAYFLY - all types of model welcome** (10kg max weight for R/C). Gates open 9am both days, flying 9.30am - 6pm. C/L, F/F and R/C. Saturday is Ron Moulton Memorial Day (C/L comps over whole weekend); Sunday is David Boddington Memorial Day - informal comps for Trophies. Also Sunday is the Ebenezer Trophy and Mass launch day.

**JULY 20/21: MODEL AIR OLD WARDEN SCALE WEEKEND**  
All types of scale model welcome (10kg max weight for RC). Gates open 9am both days, flying 9.30am - 6pm. C/L, F/F and R/C - informal comps for Trophies.

**SEPTEMBER 7/8: MODEL AIR FESTIVAL OF FLIGHT**  
All types of model welcome (10kg max weight for R/C). Gates open 9am both days, flying 9.30am - 6pm. C/L, F/F and R/C. Sunday is Vic Smeed Memorial Day; informal comps for Trophies.

For Flying, Trading and camping info for each of these events, contact Sheila on 07799132999, see full details at [www.modelair.info](http://www.modelair.info)

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# NEW from the 'HOW TO BUILD...' series



## HOW TO BUILD... TAMIYA'S 1:32 P-51D MUSTANG by Brett Green

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This new book features an exhaustive step-by-step guide to construction plus two completed models, by Brett, Mark Glidden and a super-detailing feature by Roy Sutherland. Hundreds of images, reference photos and how to get the very best from your model - a must have before you build the model! Also features lists of after market parts and decals already available for Tamiya's Mustang...  
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## MORE INDOOR SCALE DATES

**B**efore the Indoor flying season gives way, hopefully, to fair-weather outdoor action, here are two more dates, advised by Andy Sephton.

### APRIL 7th: SCALE INDOOR FREE

**FLIGHT & R/C.** Note change of venue to: Walsall Sports Centre (University of Walsall), Walsall, Birmingham, UK WS13TA. Flying

only competitions for Scale Indoor RC ARTF/RTF and scratch built models. Practice for Scale Indoor Nationals with flying only competitions for CO2/Electric, Open Rubber and Kit Scale if numbers sufficient. Similarly for Peanut and Pistachio. Spectators welcome. 10.00am - 6.00pm.. For more detail contact Andy Sephton on 07872 625279 or [andrewjsephton@gmail.com](mailto:andrewjsephton@gmail.com) or see [www.scalebmfa.co.uk](http://www.scalebmfa.co.uk)

### APRIL 21ST: BMFA SCALE INDOOR NATIONALS, at Nottingham University

Sports Centre, University Park Campus, Nottingham, UK NG7 2RJ. Events: Open Rubber, CO2/Electric, Kit Scale, Peanut and Pistachio Scale Models all to BMFA Rules. Fun events for Air Race, Mass Launch and Bostonian models. Main events in large hall, Bostonian, free flight Fun Fly and (small) RC Fun Fly in small hall. Snack Bar and viewing gallery open. Spectators welcome. 9.00AM to 6.00PM. For more detail contact Andy Sephton on 07872 625279 or [andrewjsephton@gmail.com](mailto:andrewjsephton@gmail.com) or see [www.scalebmfa.co.uk](http://www.scalebmfa.co.uk)



## A GATHERING OF MOTHS

**T**he annual De Havilland Moth Club International's Rally has been a firmly established full size aviation event for many years now and for 2013, it returns once again to the open spaces of Woburn Abbey, stately home where the historic parklands first played host to club members' Tiger Moth biplanes and their brethren in 1980. For almost three decades, the event has been a highlight of the full size air display summer season, combining flying displays, club flying competitions, vintage and classic aircraft and also cars.

Over the August 17/18 weekend, owners of classic and vintage de Havilland types and other invited vintage aircraft will operate from a specially prepared grass strip in the venue's Deer Park which was once part of a wartime runway onto which Short Stirling and Avro Lancaster bombers were flown for dispersal amongst the ancient oak trees.

Aircraft will be on show in front of the club marquees and classic car displays. The event will also allow a special 'get up close hour' each day, when enthusiasts can take photographs and meet pilots. There will also be club flying competitions on Saturday and an air display on Sunday afternoon.



## BIG SCALE BLANIK SAILPLANE

**S**ince it was first designed in Czechoslovakia in 1956, the all-metal **LET L-13 Blonik** has commanded significant interest among R/C Scale glider enthusiasts and has been used widely in Russia, European countries and USA where it has been extensively employed as a training aircraft with aerobatic capability.

Horizon Hobby has just introduced a quarter-scale ARTF model of the type. It spans 165" (4200mm) and comes with moulded glass fibre fuselage and foam cored wings, finished in authentic Red Bull colour scheme.

Wing loading is 19.2 ounces per sq.ft and this fully finished airframe with Ultracote covered flying surfaces features electrically driven wing spoilers that eliminate any complicated control linkages.



## MONSTER MUSTANG

**W**ith a wing span of 99" (2,525mm) the new Ripmax Flying Legends North American P-51D Mustang is to 1:4.485 scale and is supplied in fully composite moulded ARTF construction. The airframe comes fully painted, with air operated retracting undercarriage and undercarriage doors installed, and control surfaces ready hinged.

Wings feature wing tip washout for low speed stability during take-off and landing and with 85cc petrol engine power, the aircraft offers good aerobatic capability.

Three versions of the kit are available:

**Q-FL100** - Airframe only: does not include retracts or door mechanisms - £1499.99.

**Q-FL100/B**: Airframe complete with gear doors fitted and air rams installed but without

retracts - £1699.99.

**Q-FL11/C**: Airframe complete with pre-installed air up/down retracts - main and tail - with scale oleos and specially produced aluminium main and tail wheels, with all air system ancillaries - £1999.99.

**Accessories:** Q-FL100/SC - Scale Cockpit - £149.99; Q-FL100/SP - Aluminium Spinner - £99.99.

Due to the specialised nature of the Flying Legends P-51D Mustang, it will only be available from a limited number of model shops.

Full details available from [www.ripmax.com](http://www.ripmax.com)





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# BLACK HORSE *Westland Wyvern*

**Looking for an interesting ARTF airframe to fly whilst you finish your scratch-built scale model?**

**T**he Westland Wyvern is a very distinctive British military aircraft. Depending on your viewpoint, it is either an ugly duckling, or an overlooked design, brimming with character. I admit, I tend towards the latter.

In service, the Wyvern was a disappointing and at times controversial aircraft. A child of the 1950s, it served in the Royal Navy Fleet Air Arm during the Suez Crisis, but pilots always had their reservations, and there were doubts as to her structural integrity. However, there is no doubt that the Westland Wyvern was an unusual British carrier-based aircraft, prototypes of which were built with both piston and turbo-prop power

plants. During front line service, there were 68 accidents, 39 aircraft were lost, and there were 13 fatalities. Initially, the Wyvern was also prone to fuel starvation on catapult launch, the high g-forces proving too much for the original fuel delivery system. One particularly lucky Wyvern pilot suffered a flame-out during a steam catapult launch at sea. The aircraft fell over the bow of the carrier, HMS Albion, and was chopped in two. The pilot, Lt. B.D. Macfarlane, successfully ejected underwater and lived to tell the tale!

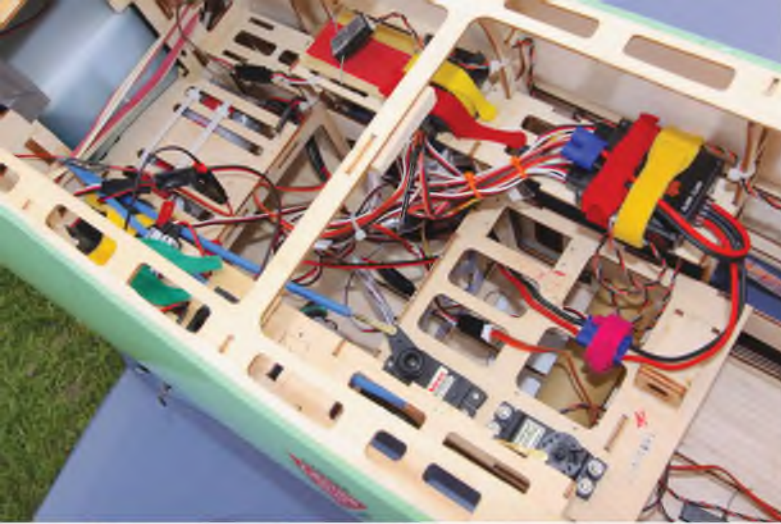
In action, the Wyvern was not much luckier. During the Suez Crisis, two were shot down by Egyptian light flak. The accident-prone Westland Wyvern was withdrawn from service in 1958.

“

***Back-tracking after landing,  
with full flap selected.***

”





**RADIO INSTALLATION.**  
**TOP RIGHT (Yellow/Red Velcro):** Spektrum AR12120 12 channel Receiver.  
**TOP CENTRE (Yellow / Red Velcro):** X-Plus Channel Expander, taking it up to 18 channels, for engine choke, ignition kill, 2 x gear servos, and 1 choke servo.  
**TOP LEFT (Yellow Velcro):** Spektrum TM1000 Telemetry Module. Monitors engine temp, ignition pack voltage and flight pack voltage.



**Elegant engineering.** Parallel grooves allow the balsa fuselage to take up the necessary tight curve for the wing fillet.



The ABS accoutrements can seem a bit plasticky at first sight, but they look convincing in flight.



Dave says the DLE 55 petrol engine produces easily enough power.

## Black Horse Westland Wyvern

On first sight, this is a large and impressive ARTF scale model. There has been no attempt to replicate (in semi-dummy format) the contra-rotating props that were a dominating feature of the full size aircraft, but this is still a pleasing rendition of the Wyvern. True, some may question the colour shades chosen, the gloss on the film covering may not be quite right, and necessary liberties have been taken around the prop area for practical purposes, but this is a very appealing model. Some scale modellers may even decide that the wheels are a bit small, but there is no dispute that the Black Horse Westland Wyvern has real



The Wyvern is quite a complex scale model, and requires a suitably capable radio system.

presence in the air. (Study of scale three views actually tends to confirm that the main undercarriage length is about right - Ed)

### Assembling The Wyvern

The model pictured is owned by Dave Fenton, a well known pilot of the Phil Kent Scale Comp Circuit. It took him two weekends to complete. Since Dave lacks a fully equipped workshop at home, he reports that she was built entirely on a Black and Decker Workmate.

Dave was very happy with the contents and quality of the kit. Indeed, he reports that

each component went together without any additional reworking being required. He says that when the model was finished, there was an odd moment when he realised just how big it was, and how small his car is - a tiny Mitsubishi Colt.

Luckily the Black Horse Wyvern displays much practicality. The tailplane and rudder easily remove with six screws, a feature which may be of great significance to many prospective buyers.

### Quality

In Dave's view, the build quality is exceptional. When I examined the airframe,

I was delighted to note one or two elegant engineering solutions. For example, some of the fuselage balsa sheeting has been internally grooved to achieve the delicate contours of the wing fillet and fuselage. The control horns and fittings are of excellent quality, and fit for the purpose, and the only modifications Dave has made concerned the electric retracts (see below).

Dave remarks:

*"I still can't believe how much aeroplane you get for £420 - and this includes the retracts".*

I thought this was a very fair price too, especially when you consider the costs of an

***The 88" span Black Horse Wyvern is lot of aeroplane for the money.***



Detailing could never be in the scratch-built class, but it is appropriate to the type of model.



The kit features working undercarriage doors.



It is refreshing to see a little-modelled British scale subject. Yellow/black 'Suez' invasion stripes add character.

“

**The Wyvern has a very attractive layout and colour scheme.**

”



The Wyvern's relatively large fin and rudder are faithfully modelled.



The distinctive "fences" on the Wyvern tailplane.



A pilot figure is supplied, as is some cockpit detail.



Tailwheel assembly and door provision is practical, and does not jar with the overall appearance.



### MODEL SPECIFICATION

<b>Wingspan:</b>	88 inches
<b>Length:</b>	81 inches
<b>Weight:</b>	11.5 Kg
<b>Engine:</b>	DLE 55 Petrol

all-moulded airframe of a similar size. In fact, when Dave flew his Wyvern at a recent Phil Kent Scale Comp, the model's appearance and price was certainly the talk of the pits. It does look like it would cost a good deal more, and at 88" in span, has undeniable presence.

#### Retract mods

After some 15 flights, Dave took the decision to replace the supplied Air Up / Air Down retracts with a set of Lado RS 999 electric retracts. This was because the early Wyvern kits featured plastic ends to the air cylinders, which tended to leak a little after a few flights. Subsequent kits have revamped retracts, and are now all-metal in construction. So keen was David, that he has now bought a second Wyvern!

#### Radio channels

This is a relatively complex scale model and Dave originally flying it on ten function Futaba radio gear. However, he wanted to

do more with the gear and door sequencing, so she became the test bed for his new Spektrum DX18. Currently the model is flying using the following 15 controls:

- Rudder
- Throttle
- Elevator x 2
- Tail Wheel,
- Ailerons x 2
- Flaps x2
- Gear Doors x 2
- Retracts x 2
- On-Board Choke
- Ignition Kill Switch.

#### Power-Safe receiver

Internally the model carries the Spektrum AR12120 Power Safe receiver (12 channels), and the X-Plus module, for full 18 channel capability. A TM1000 on-board telemetry transmitter is also fitted. This monitors engine temperature, plus ignition battery and flight pack battery voltages.

#### Lighting

David has identified two further channels for navigation, anti-collision, and landing lights and he intends to carry out this upgrade over the winter months.

#### Flying notes

David is delighted with the flying qualities of this model:

*"The Wyvern is a really easy aircraft to fly, with benign stall characteristics. There is no tendency to drop a wing, no matter how much I try. She flies big air manoeuvres with ease. The DLE 55 provides unlimited vertical performance when required. However she will fly and land at a snail's pace".*

Having now seen various Black Horse Wyverns fly at low-key scale comps, plus a Warbird meeting, I can vouch for Dave's conclusions. If you are in the market for an unusual scale ARTE Warbird, of a decent size, at a good price, I would suggest putting the Wyvern on your list. ■



# BRISTOL BOXKITE REVISITED

**PATIENCE AND DETERMINATION REWARDED! GARY SUNDERLAND, EPIC PROJECT TO FORCE HIS BRISTOL BOXKITE TO PERFORM AS INTENDED PAYS OFF IN GRAND STYLE!**

**R**egular FSM readers may recall that last year, my 1/5th scale model of the Bristol Boxkite hit the dirt in spectacular fashion on its second flight (see FSM September 2012). This destroyed the forward tailplane and booms, the undercarriage structure, but not the wheels - and the complete lower centre section. Nevertheless, the wings, tail

booms and tail surfaces survived more or less intact.

The following winter, (that is June to August down here in Australia), I reviewed the bits and decided that the crash had some advantages. All of the destroyed parts were those that really needed to be strengthened, made more rugged and/or made heavier, to resist landing loads and also to add weight to the front end, thus reducing

the need for lead ballast to get the fore/aft balance point to a workable position.

So, with renewed enthusiasm, the drawings were modified and new parts constructed.

The main change applied, was to approximately double the size of wooden parts and add these to an internal frame of piano wire. This is my usual method of constructing model undercarriages, which





has the advantage that, in the event of an overload failure, the broken part can have the wood fairing removed, the wire straightened and new fairings applied; just a few hours work and the structure is as good as new.

For the rest, the main effort was to reposition most items forward. For example, the dummy pilot and his seat, with the receiver battery underneath, was moved about two inches (50mm) in front of the wing leading edge; not to scale, but hardly noticeable in practice ... to my eyes anyway!

This made room for the heavy fuel tank and fuel of course, moved from the scale at 50% chord location to about 25%.

Another change was to restore the elevator gearing to approximately the same travel on both front and rear elevators, thus preventing the gearing problem in the original model. If this change resulted in too much control sensitivity, my last resort would then be to fix the foreplane and just drive the rear





elevator direct. However, the forward elevator is such a noticeable feature of the Boxkite that I was reluctant to abandon it, unless the flight test proved it to be necessary.

Another peculiarity of the original full size Boxkites was the elevator drive from the control column. This featured a normal control lever at the forward elevator, but the 'up' cable was connected to the

control column way up, just below the hand grip! Fairly obviously, this meant that this control cable would go slack when the stick moved forward. Control levers are always the same length in a cable system, to maintain tension. For this reason, my model used a pushrod under the forward plane to drive the elevator system. This was made of heavy wire and was fairly long, introducing the risk of a

possibility that the rod might buckle under load, so I looked again at the original design and installed the upper cable as per scale.

Blow me down - but this worked perfectly! The 'up' cable on top worked normally with back stick, but with forward stick, the top cable went completely slack, permitting the rear part of the front elevator to move upwards. So it is not

necessary to have tight control cables. The slack cable system was a deliberate feature of the early Boxkites and seams to function satisfactorily at full scale and on my model.

The modified Boxkite finished at weighing about 5Kg (11 lbs) with the centre of gravity at about 30%. Ground tests indicated that tail clearance and shock absorption were lacking and I copied the peculiar leaf spring arrangement of the original Bristol Boxkite by extending the wooden skid with some steel strip screwed on. This worked very well and shows that adherence to the original design is the best way to avoid problems.

There then followed a frustrating period of some months when various problems, mainly the weather, prevented any test flying. On the few occasions that conditions were favourable, with no wind, I was engaged in other activities, which could not be put of. It was early summer, in December here, when the Boxkite took the air again, one early morning, for a brief flight, which demonstrated that everything worked. But the pitch characteristics were too sensitive for comfort and some additional lead weight was required forward. I decided to move the balance point from 30% to 25% and found some car tyre balancing weights, which would do the job, attached outside the front booms.

Those were soon bolted on and I called John Lamont to organise an 'official' first flight and some photographs. When a suitable day was forecast, John drove across from Melbourne and we gathered at the local field, just in time for a brisk crosswind to develop, interspersed with quite a few playful thermals. This did not disturb the normal club flying, but even rigging the Boxkite was out of the question.

Finally, on the very last day of 2012, it all came together. The weather was perfect with zero wind and no thermals. A good crowd of club members turned up and fellow club member Mike Wheelan stepped forward with an incredible camera about a yard long! The Boxkite floated off the ground and pattered about the field just like a real one. I can report that the ailerons are very

effective, with little wing inertia to overcome. The elevators (plural) are reasonably effective now, but it is necessary to apply nose-up control with caution and to be prepared to check this by easing the control column forward as soon as the model starts to pitch up. The rudders do not seem to do much, in the air or on the ground.

Take-offs and landings are easy at seemingly zero speed but Taxiling on the ground is impossible. The nose skids keep the model safe and there is nearly no possibility of the model nosing in or turning over as some early aeroplane models do.

However, these remarks apply to flying in calm weather. Things will be very different when the wind comes up! No doubt that will happen to me eventually, as the model is intended for display flying. ■



# CHRISTMAS SCALE AT BARKSTON

*Alex Whittaker takes his cameras to this famed Icicle  
Event at RAF Barkston Heath*



Putting a wing-half onto the LMA Vulcan fuselage.



The indefatigable LMA Vulcan Team sort out the undercarriage!



The lads had to escort her back against the gathering gale.



I don't know about you, but come the end of Boxing Day, I can do with a break from too much festive food, and too much central heating. So, Dickie Scarborough's Xmas Week bash is a justified high point in my Scale calendar. Obviously, at that time of year, it is tricky avoiding the really bad weather. Therefore resourceful Dickie sets a day - plus its reserve - and makes his final decision the night before.

This year the auguries were good: he

picked the sunniest flying day for months! We had a truly great start to the day, though much later it did trail off to the normal 'Barkston Blow', ending with the trademark torrential showers. However, by then it did not matter - everyone who wanted to commit scale aviation had their chance, and flying was pretty much continuous.

It was so exhilarating to be out in the fresh air, chatting to pilots in the Pits, and munching the odd hot brunch from the

Blessed Burger Van. Just note that *Flying Scale Models* magazine is not merely a fair weather friend. On your behalf we sally forth in all weathers!

## Show stoppers

Xmas at Barkston has gained a happy reputation for first glimpses of what will become the New Year's show models. Indeed, some pilots were shaking down their new 'show beasts', so it was great to get sneak peek for you, camera in hand.



**THE TRADEMARK DELTA PLANFORM IS JUST VISIBLE IN THIS SHOT OF THE NEW LMA VULCAN.**

We even had the debut of a new UK traditional scale kit, of which more below.

**English Electric Lightning**

The first such beast was Ali Machinchy Jnr's new English Lightning. Now this is a fabulous bit of kit: exquisitely finished and with a true Lightning stand-on-her-tail performance. Now Ali is a great lad, and was clearly very busy getting her sorted despite the rain, so I did not trouble him for specific details, just yet. However, I did

manage to get a complete Lightning scale Walk Around in pictures, so watch this space. If I were you, I would make a pact with myself to see this Lightning perform at the one of the 2013 summer shows. She really is an immaculate gas turbine powered model.

**Bearcat**

Ali was also testing his new and impressive Grumman F8F Bearcat. This was unusual, in Royal Navy camouflage colours, but

non-authentic, having been copies from a WW2 Grumman Hellcat. More details when I have them.

**HP 42 'Helena'**

Old scale hands will remember that famed Peter Neate built a lovely Handley Page HP 42 'Helena'. Indeed, we featured Peter's exquisite DH Tiger Moth recently. Both that and 'Helena' went into storage after Peter's death. However, Peter's son John was eager to see his father's



**Bound to be a Star of the 2013 show circuit: Ali Machnichy's new Lightning.**



**Brakes deployed on the English Electric Lightning. Note superb panelling.**



**Beautifully observed nose detailing on the English Electric Lightning.**



**Ignoring the sheeting rain, Ian Redshaw takes Buzz Bunny for a proving flight.**



**Neil Armstrong stokes up the port engine on his C-47 Buzz Bunny.**

creations in the air again, so he came to an agreement with Ian Redshaw. The good news for British scale modelling is that both models will be on the show circuit in 2013. I have loved the HP 42 since my *Airfix* days, and this lovely radio model looks just stunning up in the blue. Whilst Ian was flying her, the wind became rather distracting. Soon, the HP's forward speed was little more than walking pace. Ian elected to bring her in to land, which he accomplished as if it were a fat calm day! The lads had to run after her just in case the treacherous Barkston gusts

flipped her over. This is another superb flying scale model not to be missed on the 2013 show circuit.

### **Dakota C-47 Skytrain**

I have loved C-47s since my school days when we watched the Starways 'Daks' fly in and out of Speke Airport. Therefore I was delighted to see an old favourite back on the circuit. This was the wonderfully careworn Buzz Buggy, now owned by Neil Armstrong. She is 5.8 metres in span, superbly weathered, and is powered by two Zenoah 62s. She looks

so utterly convincing, just like a high-hours front-line workhorse should. When she took to the air in the pouring rain you could feel the chorus of "Aaaaahs" from the pilots huddled around the burger van for warmth.

### **New scale kit**

A new UK scale kit is always a cause for celebration. It emerged at Barkston On Ice that *Willis Warbirds* have a new scale kit out now: a Yak 50. Very smart she is too, in her silver finish, with chequered nose-band, and yellow accents. Although only 312 full

**CRISP AND PURPOSEFUL: THE NEW ALI MACHINCHY ENGLISH ELECTRIC LIGHTNING.**



size versions were built, these did serve as aerobatic mounts, so the choice of other schemes is quite extensive. The *Willis* version is a handy size at quarter scale. She spans 94" and is designed for 46-62cc petrol engines. She is expressly designed for Unitracts gear. Like all *Willis Warbirds* traditional kits, prices will be very competitive. Also, they offer everything from a plan right through to a full CNC-kit with all the accessories. In this way you can calibrate your intended purchase to suit your needs and your budget. Ken Bones was flying the prototype, and she looked great in the air. Ken reported her as a delight to fly, and I believe him. Watch this space for more details down the line. In the meantime you could try Willis Warbirds on-line:

<http://www.williswarbirds.webspace.virginmedia.com/>  
Usual disclaimer!

**MiG 15**

Nowadays, scale gas turbine military



**Dennis Richardson's Macchi just before losing a wheel. Den still made a three-pointer.**



**Ali Machinchy's new Bearcat for 2013, undergoing trials. Flies well!**



**Richard Scarborough, in shades, sorts out his gas turbine.**



**The right clothing makes all the difference at an icy Christmas Fly In!**



Immaculate new crimson Hawk flown by Ali Machinchy Jnr. See her on the 2013 show circuit.

aircraft are all the rage, but *Fei Bao* kits were a new one on me. Martyn Little is the UK Distributor of this new Chinese jet modelling concern, although he trades under the name of [www.acejets.co.uk](http://www.acejets.co.uk). His colleague Phil Holder was flying his new *Fei Bao* MiG 15, complete with a Jetcat 120. It was very attractive in green and silver livery. I believe they also do it in full blooded Ruskie Red. The *Fei Bao* MiG is built to approximately 1/6th scale, so it is quite a handy size for the Club modeller. It is

designed for turbines with around 25/30lbs thrust, and it spans 79 inches. It is available in ARTF or RTF versions. To my eyes, the MiG flew very smoothly indeed.

### Aluminium Overcast

Dave Johnson, Head Honcho of the LMA has retired his large Vulcan, and replaced it with an even bigger one. This bigger, paler, 20 foot span Vulcan bomber stole the show. Mind you, there were one or two petite problemettes. First, the LMA Vulcan

Team had to lay under the model and perform intricate open-bay surgery on the undercarriage doors. They looked a bit forlorn in the chill wind, lying on battered sleeping bags under the wings, hacking away with razor saws. Then, on first run up, it emerged that one of the new gas turbines was somewhat below par. Dave and his uber-capable LMA Team swapped the dodgy turbine in about twenty minutes flat. When the time came to fly, the assembled pilots at the burger bar fell silent as she



Prototype of the Willis Warbirds new traditional scale kit, the Yak 50. As built and flown by Ken Bones.



The mad Barkston Blow had everything airborne, including the landing light protection buckets!



The nifty new Fei Bao 79" span MiG 15. See text. Fei Bao models are new to me.



Italian Stallion: Richard Scarborough's Albatros L-29 about to touch down.



Brian Cooper has had two of these sports-scale Kyosho Spitfires.



Ryan Edwards P-47 Thunderbolt Bonnie crossing the threshold. No pilot, Ryan?





Silver glinting in the low winter sun, Helena takes to the skies. Wow!

wafted skywards on that huge delta wing. I have seen, heard, and felt a real Vulcan fly, and trust me, this one is convincing. Put her on your show list too.

#### The Verdict

Well, the opportunity to see scale models flying whilst burning off all that Christmas plum duff was not to be missed. Providing you had the appropriate clothing, it was a

truly wonderful day out in the very fresh Lincolnshire air. Somehow, flying scale models always look better against that authentic Barkston backdrop, and flying was continuous. I had a seven-hour round trip from Wales to Lincolnshire, but I begrudged not a minute of it. Dickie's events are proper Pilot-To-Pilot meetings, and there is no trade, no crowd, and no hassle. Ideal in fact. ■

#### Diary Date 2013

Richard's next foray is the famed Barkston Warbirds Meeting. This will be held on the 13 and 14th April 2013. See you there.

**VERY FEW AIRCRAFT HAVE SUCH GRACE AND SHEER PRESENCE AS THE HANDLEY PAGE HP 42. I MEAN TO SAY, A BIPLANE AIRLINER!**



Yes, very short coupled, isn't it? Despite both builder and designer having concerns about that, the model performs very well indeed.



Don't look so worried Pat; you know it will fly well - with luck.

# Albatros D.XI

## PART 2

Concluding the construction of the electric powered model designed by Peter Rake and built by Pat Lynch.

### Finish & Assembly

The fuselage was covered first using lightweight film - *Lightex* from World Models. Because the fuselage was a mauve colour with green 'splodges', the film colour chosen was a pale purple. After rubbing back with 0000 grade steel wool and applying a coat of *Prymal* as a primer, the green parts were hand painted with *Humbrol* enamel. The fin was also covered in the mauve film and the rudder in white.

Rather than cut a slot in the covering for the fin, a slit down the centre of the fin position was cut, and the fin eased between the flaps of covering material and glued with CA. The flaps were then carefully ironed back forming a neat edge against the fin with no gaps or glue marks. The rudder was also fitted at this point, with the lower wire part epoxied into the leading edge (LE). A Mylar hinge was CA'ed in place as the upper support.

The crosses were painted by hand over a white background where appropriate. A black CD/DVD marker was useful to draw the edges of the crosses neatly and *Humbrol* enamel filled it in. The serial was drawn by hand using the marker pen and a photograph as a guide.

The tail servos were fitted to two spruce strips glued across the fuselage in the area between the under-carriage legs with the *Assan* 2.4 GHz receiver mounted on foam tape to the fuselage side. A simple hatch of 1/32" ply was covered in mauve film and is attached under the undercarriage (U/C) mounting screws.

The elevators/tailplane are covered in *Lightex* film - green on the upper side and a pinkish colour under. These colours represent (roughly) one of the colours of the lozenge pattern chosen. I had determined I'd take a low-tech approach to the lozenge production and hand-paint them. Although it was tedious, the end result was pleasing enough and gave me many ideas about how I'd tackle such a task in the future. After preparing the film surfaces, card templates were used to mark out a series of shapes for the first applied colour; I downloaded and scaled some suitable templates from the 'net. The colours were a bit brighter than I would have liked but the effect was OK. Using a small, flat brush about 6mm wide, the edges of each lozenge was carefully applied and then the centre filled in.

Getting exactly the right paint thinning and a suitable brush were the keys to success. After each set of same-colour lozenges had been applied and was dry, another card template was used to trace the next colour to be painted - and so on. I found a VERY light spray of flat clear acrylic gave a better surface to



All the basic structures, now you just need to cover them and assemble the model.

draw the shape on using a not-too-sharp 4B pencil (a sharp point proved a disaster!). It may also give extra 'tooth' for the paint. The painting was continued to the upper surface and ultimately to the covered wings. It was time consuming but the whole process was finished in a few days of spare time!

A study of various source on the 'net will reveal major discussions about the pattern direction, colours, edge treatment etc, but since little is known of this aircraft, any result would be hard to contest!

The painted tailplane and hinged elevator was set into its slot and checked for alignment. After any minor adjustments

by sanding the slot edges, some CA was run around the join and allowed to set. The ply elevator horns were CA'ed in place and painted flat black. An entirely optional step was to add some dummy rib tapes. These were often a salmon or blue colour and after a few trials I settled on blue-painted *Solar* because it adhered better over the painted surfaces.

With the tail parts happily joined to the fuselage, the servo-to-tail controls could be added. First, the servos were centred using a servo-tester and the control surfaces clamped at a neutral position. The pull/pull lines are of stainless stranded beading wire. The first wire is terminated

at a top elevator horn, run forward to the servo, looped through a small Cotter pin at the servo arm and back to the top of the other elevator horn. The Cotter pin is connected to an inner hole in the servo arm with an EZ-connector. Elevator travel is relatively small and the inner servo hole allows more servo travel. The wires are repeated for the underside horns to the other side of the elevator. The previously connected rudder pushrod is coupled to the rudder servo using an EZ connector.

After painting the wing lozenges and adding the rib tapes, the aileron servos were mounted on the ply servo hatch covers. The servos were wrapped in masking tape and CA'ed to the hatch with the centred horns positioned slightly forward, allowing more up travel than down. With servos centred and the hinged ailerons clamped at neutral, 16 SWG wire links were bent up and fitted. These are not adjustable - any fine tuning can be done at the transmitter. The servo cables were extended to exit via a hole cut in the centre section and enter fuselage in a short length of split plastic tube - hardly visible in the wing gap. The upper and lower wing crosses were now hand-painted and everything was ready for final assembly.

Before making things rather difficult for myself, the various detail bits were built up and added. Little detail is available of the DX1, but the few photos show a couple of Spandau machine guns, a curved windscreen, some metal side panels and carburettor air intakes.

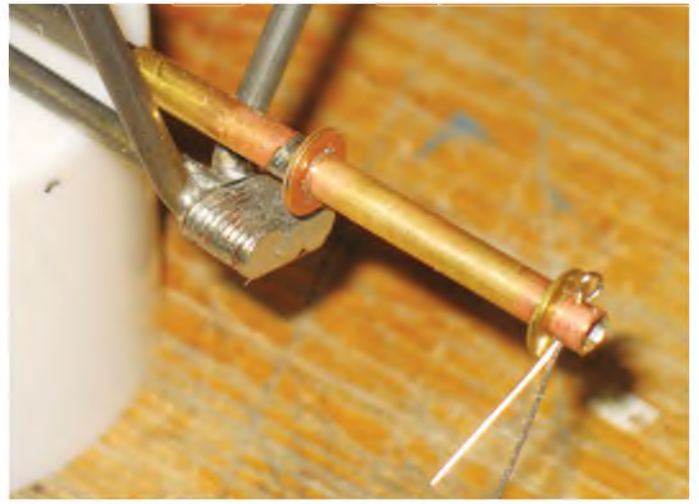
The guns are very simple assemblies of balsa block shaped to suit the many references available, a slotted card jacket plus some tube for the barrel. The



The obligatory naked model shot reveals the relatively simple construction involved.



Here you see how Pat changed the aileron style, but still managed to use the cut parts.



A brass tube axle extension and split pin wheel retainer adds a scale-like appearance. Elastic thread will provide suspension.

slotted jacket was made by punching a series of holes in a piece of card and cutting between every second hole to form the slots. The card was formed around some dowel and glued into a tube. A disc of plastic filled each end and a short barrel finishes it off. After some grain-filling and sanding, the guns were sprayed flat black and given a metallic look by rubbing some powdered pencil-lead into paint with a finger. The rear block was chamfered underneath to fit neatly on the forward deck.

The windscreen is a section cut from a plastic tumbler with a strip of aluminium foil formed into a 'U' shape and CA'ed around the edge. Three little tabs were cut around the bottom edge of the plastic screen and these were glued into slits in the fuselage top. Carburettor intakes were of plastic tube and the side panels of aluminium sheet. The serial numbers on the rear fuselage were hand applied with a black DVD marker pen. The home-made foam pilot was stolen

from another model (an SE5a!), suitably re-clothed, and glued to the servo rails under the cockpit.

The actual assembly is now quite straightforward. The top wing was fixed to the centre section (CS) struts with nylon saddle clamps using the plan as a guide, and the servo leads fed down to the receiver. The lower wings were slid into place on their wire dowels and the brass securing strap screwed in place across the fuselage. Now the diagonal lower wing struts were eased into position and left loose while the two inter-wing struts were screwed in place. If all is well, the whole assembly should be square and as the plan shows. I epoxied the lower ends of the four braces into the lower wing and left the fuselage ends free to move slightly. After checking that the tailplane was parallel to the upper wing and the leading edges of the two wings were in line when viewed from above, I was happy that she was almost done!

A rudimentary dummy rotary engine

was created from short lengths of balsa dowel fixed around the inside of the cowl and under the motor. Some fine model railway corrugated aluminium was wrapped around the dowels to look vaguely like cooling fins. A spinner was built from glass-covered foam and fixed to a ply backing disc behind the 15 X 8 APC-e prop. The prop had been 'wood-grained' to look a little less obscene. A scale four blade is in the pipeline.

### Flying

Although Peter had shown the battery position as just behind the firewall, I was unable to make the DXI a little nose heavy as desired for a maiden flight. Two 2200 3S LiPo packs were fitted in parallel - one each side of the motor in front of the firewall. A simple balsa partition and a hinged flap underneath secured the batteries in place. The 60 amp Turnigy ESC was mounted behind the firewall.

The maiden flight was delayed several weeks to windy Spring weather and other



Although not put into production, the DXI looks every inch the fighter.

## SPECIFICATIONS

**Span:** 57"  
**Weight:** 4.5 lbs  
**Power:** Turnigy 4260, Turnigy 60 amp esc, 2 X 2200 3s LIPO in parallel  
**Prop:** APC-e 15X8



Although no lightweight, the DXI has proved a rock steady, well mannered little model.

problems, but finally - it happened!

The control throws were set with ailerons at 1/2" up and 1/4" down, rudder at about 1.5" each way and the elevator 1/2" up and down. After a range check and another control surface test, the D.XI was taxied out onto the strip and the throttle opened tentatively. A bit too carefully as she immediately nosed over in the first pothole our field is famous for - and the

forward CG didn't help. Another go, easing the throttle up to maximum and she taxied dead straight and slowly lifted off - without any tendency to drift left or right. After a steady climb and throttled back to about half, the Albatros cruised around - rock stable and apart from a little up elevator, no trim was needed.

A few circuits later, she was landed - somewhat inelegantly, but always dead straight

and predictable. Later flights have been made with smaller, lighter batteries and the tendency to nose-over is greatly reduced. Also, more up-elevator with some expo has been set to give more authority while at low speeds when taxiing and landing.

With an all up weight of over 4.5 lbs, this is not a floater, but the entirely predictable performance is making her a favourite in my fleet. ■

# CUT PARTS SET FOR THE

## Albatros D.XI

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This month's full size free plan feature is supported by a laser-cut set of ready-to-use balsa and plywood components. This provides all the parts that, otherwise, you would need to trace out onto the wood before cutting out.

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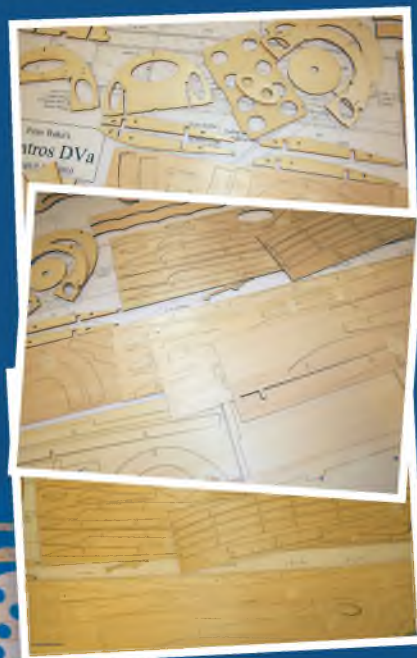
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# Luton Minor

*Looking for a super simple scale subject to model? Then this British homebuild type might be just one for you.*

**T**HE Luton Minor originated in 1936 in a response to the many accidents that had led to the banning of the amateur-built, French-designed *Mignet Pou du Ciel* ('Flying Flea'). A replacement was needed for amateurs to build and C. Latimer-Needham designed a machine with the Flea's tandem-wing layout, but with normal tail to ensure effective control. Trials, spread over two months, proved this arrangement still not ideal, so the design was revised and the prototype *Minor* was built by the small Luton Aircraft firm. This was G-AEPD, with 35 h.p. Luton Anzani V-twin engine, fabric covered fuselage, V-struts and short undercarriage.

Prior to coming on the market the design was further improved and all succeeding machines had a simpler tailplane, parallel struts, ply-covered fuselage and taller main undercarriage. Complete with Anzani engine, the Minor sold for £225 - or a set of materials and drawings could be had for £115. Building instructions printed in a magazine popularised the Minor in 1937.

Naturally, the examples of the Minor subsequently built reflected their creator's individuality in detail, although one went so far as having an Austin Seven engine, with which its life was short! A works production prototype G-AFBP had a 34 h.p. A.B.C. Scorpion engine, but the 25 h.p. Sprite, 30 h.p. Carden Ford and de-

rated 28 h.p. Scott engine were more usual.

Of the pre-war registered machines, G-AFIR was home-built and flown pre-war with an Anzani, but on force-landing in a cornfield, had to stay put for three months until the corn was cut! After WW2, G-AFIR was unearthed by Arthur Ord-Hume who completely rebuilt the entire airframe and fitted a French Mengin engine, though red tape prevented flying at the time. Consequently a 37 h.p. JAP was substituted but, unluckily, a force landing broke 'FIR's back during tests. Repairs, including a new wing, is depicted in the accompanying drawing.

G-AFIU was likewise fitted with a JAP engine while 'GEP was completed by L. R.



G-ASXJ seen here and at right, is a classic example of the variations that comebuilders have applied to the basic Luton Minor design. Photographed at the PFA Rally, Cranfield, in September 2003, this example is powered by a 55 hp Lycoming O-145-A2 flat-four engine.





Miller with a J AP. A further JAP-Minor was G-AHMO.

Most active of the Minors in the immediate post WW2 years was G-AMAW, built by Flt. Lt. J. R. Coates, D.F.C., completed in 1949. This had the famous veteran 34 h.p. Bristol Cherub III driving a propeller carved by the owner, and this combination gave a rate of climb comparable with that of the Tiger Moth.

A most sound, cheap aeroplane, each Minor is, like most ultra-lights, the result of much diligent uphill work by the most genuine flying enthusiasts.

### Construction

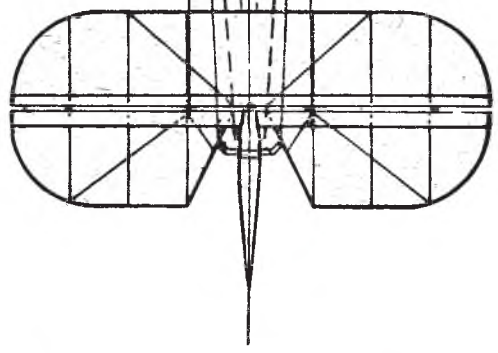
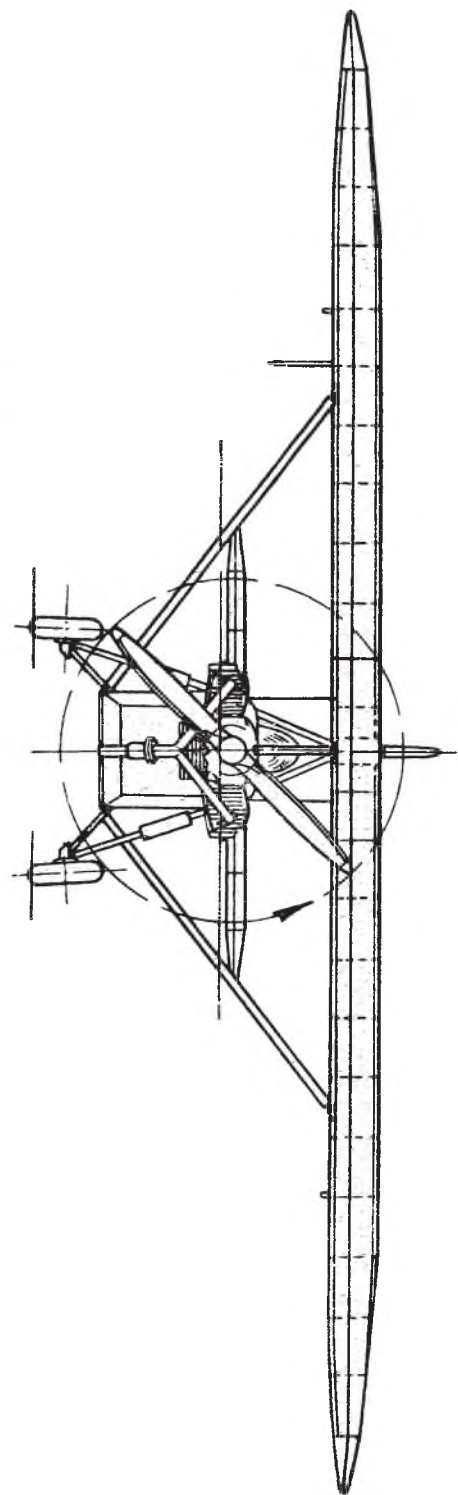
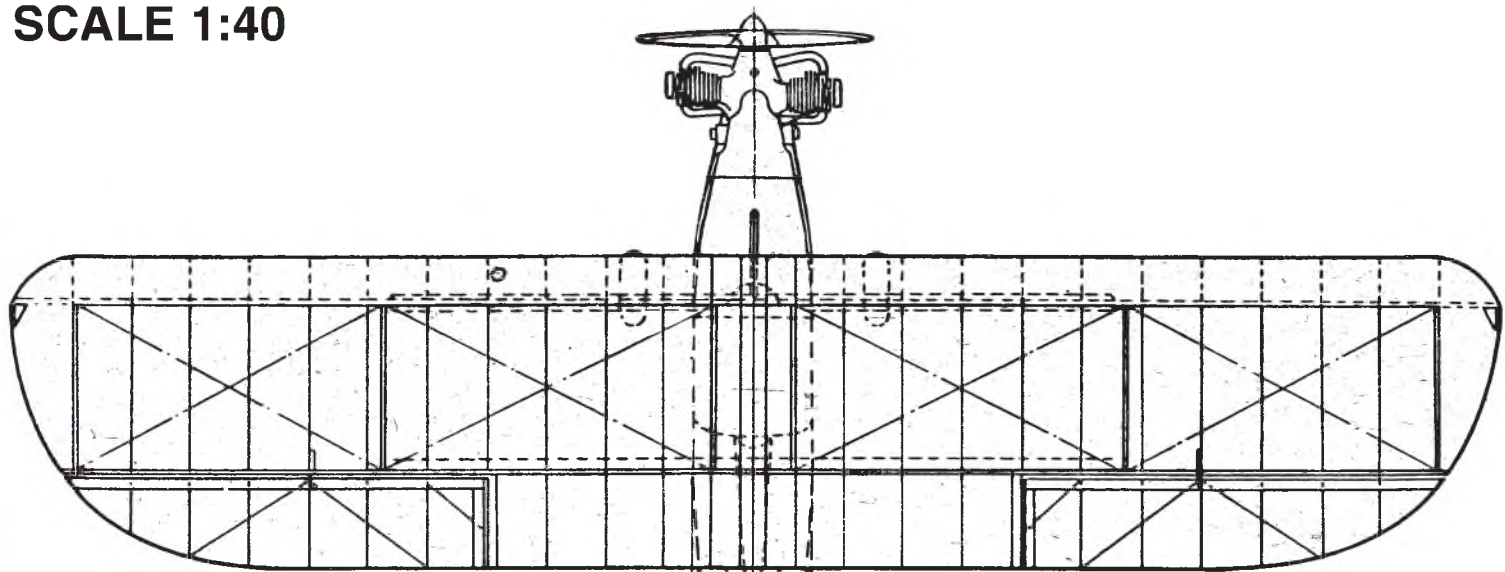
All wood. Fuselage has basic Warren-girder structure with 1" sq. longerons and 1/2" in. spruce struts. The whole fuselage, including decking, is covered with 1/16 in. ply. The wing has two plain spruce spars, lattice ribs with top and bottom ply webs. Wings may be made in one piece or in two halves, detachable on the centre line. In both cases, each half has two bays, wire braced with spruce compression struts. Leading edges are ply covered, while ailerons may have ply or fabric covering. Tailplane and elevator each have single plain spar and ply ribs

### Specification

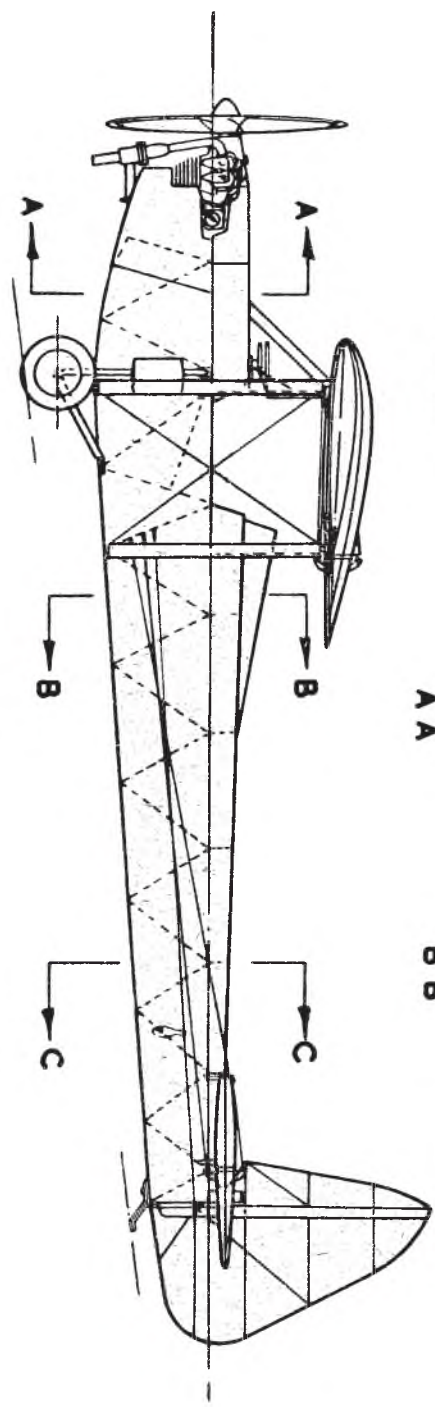
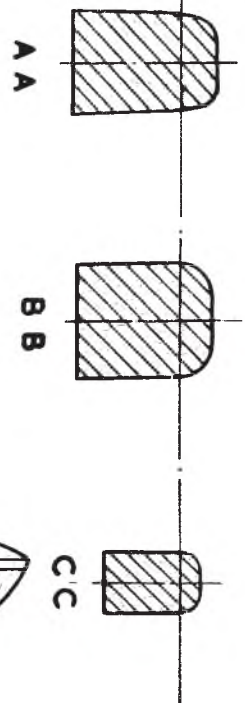
<b>Wingspan:</b>	25 ft.
<b>Length:</b>	20 ft. (G-AFIR with JAP 21 ft.)
<b>Wing Area:</b>	125 sq. ft.
<b>Empty Weight:</b>	380 lbs.
<b>Loaded Weight:</b>	600 lbs. (*FIR: Empty 340 lbs., Loaded 620 lbs.). Max.
<b>Max.Speed:</b>	80 m.p.h.
<b>Cruise Speed:</b>	70 m.p.h.
<b>Landing Speed:</b>	30 m.p.h.
<b>Take-off run:</b>	80 yds.
<b>Landing run:</b>	30 yds.



SCALE 1:40



WING RIB. TWICE SCALE.



1: This Luton Minor was built by L.R. Miller and is powered by a JAP engine. Variations to airframe include the rear decking, with three flat faces.  
 2: G-AFIR is a pre-WW2 registered example originally Anzani engine powered.  
 3: The same airframe, rebuilt after WW2 with French Mengin engine.  
 4: The prototype Minor with 'Safety First' insignia on rudder.



with spruce flanges. Rudder is similar. Lift struts and wing pylon from steel tube. All metal fittings from mild steel sheet.

Colour. G-AFIR has fuselage and wing leading edge in bright red. Remainder is doped aluminium. Registration in red on

aluminium and aluminium on red. Two trim lines down fuselage sides in aluminium dope. Cowling is bright aluminium. G-AGEP has saxe-blue fuselage with white letters, rest is aluminium doped with black letters outlined with white on wings.

G-AMAW has light copper/bronze fuselage with scarlet nose trim line and registration. All flying surfaces are aluminium doped with scarlet letters. Name *Swalesong* in scarlet with white Yorkshire rose on rudder.



One of the most successful early post-WW2 examples of the Luton Minor, Flt.Lt. Coates taxis out G-AMAV for a display at the 1949 Battle of Britain Day.

# Luton Minor

*As a design specifically created for homebuilders, individual examples inevitably vary in detail, with changes subject to what inspection authorities would tolerate. But this one, G-ASXJ, a post WW2 creation, is a useful benchmark in most aspects, the major deviation being the modern Lycoming flat-four engine.*



1: Junction of the fin/tailplane/fuselage, showing the fin leading edge fairing.

2: Rudder post and tailplane seat.

3: Tailplane seat, viewed from leading edge.

4: Lower fuselage side, showing the lower wing strut anchor point and the upper main undercarriage anchor point.

5: The front and rear cabane struts.

6: Detail of the front cabane strut upper anchor point.

7: Rear upper cabane anchor point.

8: Front cabane strut lower anchor point.

9: Cockpit windscreen.

10: Cockpit surround, also showing the aileron control cable exit that runs up to the wing underside.

11: Further view of the windscreen, viewed from rear.

12: Cockpit instrument panel.

13: Rear of the cockpit seat.





14 & 15: Two views of the Lycoming Flat Four engine. 16: Simple engine cowl and exhaust stack. 17: One side of the engine, viewed from underneath. 18: Upper wing strut anchor point and cables. 19: Faired main undercarriage leg. 20 & 21: Lower and upper aileron control horn and control cable links. 22: Pitot head, right hand wing. 23: Rudder horn and control cable. 24: General view of the tailcone. 25: Fin/rudder hinge line. 26: Simple tailwheel unit. 27: Another view of the main undercarriage anchor point on the lower furlage, also showing the lower wing strut attachment.



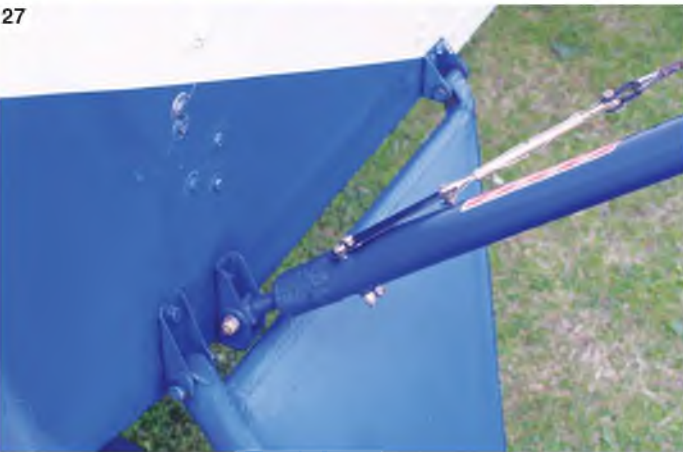


28: The main undercarriage, viewed from the rear.

29 & 30: Two views of the main undercarriage spreader bars, showing the faired shock absorber/dampers.

31: Main undercarriage wheel, showing the inner face and hub.

32: One of the main undercarriage spreader/bar upper anchor points.





**PART 4**  
PAINTING & FINISHING

# MILES M.38 MESSENGER

Peter Shaw complete the construction sequence of his Graham Smith-designed, quarter-scale, 100" (2540mm) wingspan Miles M.38 Messenger, for engines in the region of 1.20 cu.in.

I have now reached the painting stage and am coming to the end of this project. This is the time when I really get worried as a poor paint job can spoil all the hard work in building the model. As a rule, I use a

two-part epoxy which gives a good finish, isn't prone to cracking and is definitely fuel proof, not just fuel resistant.

Among the photographs shown here is one of the in-situ model undercarriage leg and as a comparison, some photos

of a full-size Messenger under refurbishment are included. These show just how close the Graham Smith plan design is to the full size.

Finally, I am going to give a brief history of Messenger G-AKIN. As





David Toyer's Miles Messenger, built from the Graham Shaw designed plans.  
(Photo: Alex Whittaker)



The fuselage masked up and the first coat applied - a slow cure means a lot of rubbing down will be necessary, before the final coat.



All the glazing in place and carefully masked up - time spent applying adequate masking is crucial to the final finish.

previously stated, I enjoy the researching of prototype aircraft, but my task was made relatively easy on my model as I belong to the *Miles Aircraft Collection*, and Peter Amos - the guru on Miles Aircraft - was as always very helpful. The

Putnam book '*Miles Aircraft since 1925*' by Don L Brown was also a great inspiration and provided detail of true measurements, etc. There is also a book covering the early years of Miles, written by Peter Amos, and it is well worth

buying - it really is a work of a master.

### G-AKIN

Originally, the aeroplane was designed as a private venture to be a military air observation post spotter. The fuselage of



Detail of the U/C leg that Peter turned on his lathe as detailed last month - compare to the full-size shot shown on following pages.



Panels and tail fairing are painted separate to the main model airframe assemblies.



Detail of the wing foot well moulds and finished mouldings.

## Summary of the model build

- The published plan (MF21) is everything a good plan should be. A credit to Graham Smith the designer - it is very accurate, detailed and well laid out, so very much worth the money.
- Working on large models is easier in many ways than small ones - older fingers can get into the larger areas, so more detail can be added. However, it is also very easy to get carried away with detail.
- The costs of building increase exponentially with size.
- Transporting large models calls for a degree of ingenuity, however, the Messenger will fit into an average estate car, or similar.
- Skill level increases with size - it's harder to hide mistakes.
- The larger model should fly better (I have yet to find out, but will give a report as soon as the weather improves).

an Miles M.28 Mercury was married to a one-piece wing with wide chord and non-retractable external flaps. To counteract the high pitching moments of the flaps, it was necessary to incorporate three fins. The end result was an economical, easy-to-fly, all-wooden monoplane with STOL performance, capable of flying in and out of rough fields with tree obstructions, in all weathers - just what the Army needed!

So, following its first flight, two hundred and fifty aircraft were ordered by the MoD, but only 21 had been delivered before the war ended.

The Messenger had great potential as a private light aeroplane and construction continued at Reading and Newtonards in Northern Ireland. Civil Messengers were fitted with Cirrus Major 3 engines, in place of the Gypsy Majors of the Military Mk.1 version and the main external difference was the fitting of the oval windows, rather than the original square windows.

Messenger G-AKIN was built at Newtonards in 1947, then flown to Reading for fit-out and finish. It was sold to R. Spiller & Sons, based at Sywell in Northants and its claim to fame is that it has been owned by the same family, and based at the same airport all of its life (it is still there, but has been passed over to a Trust, the members of which maintain it in flying condition).

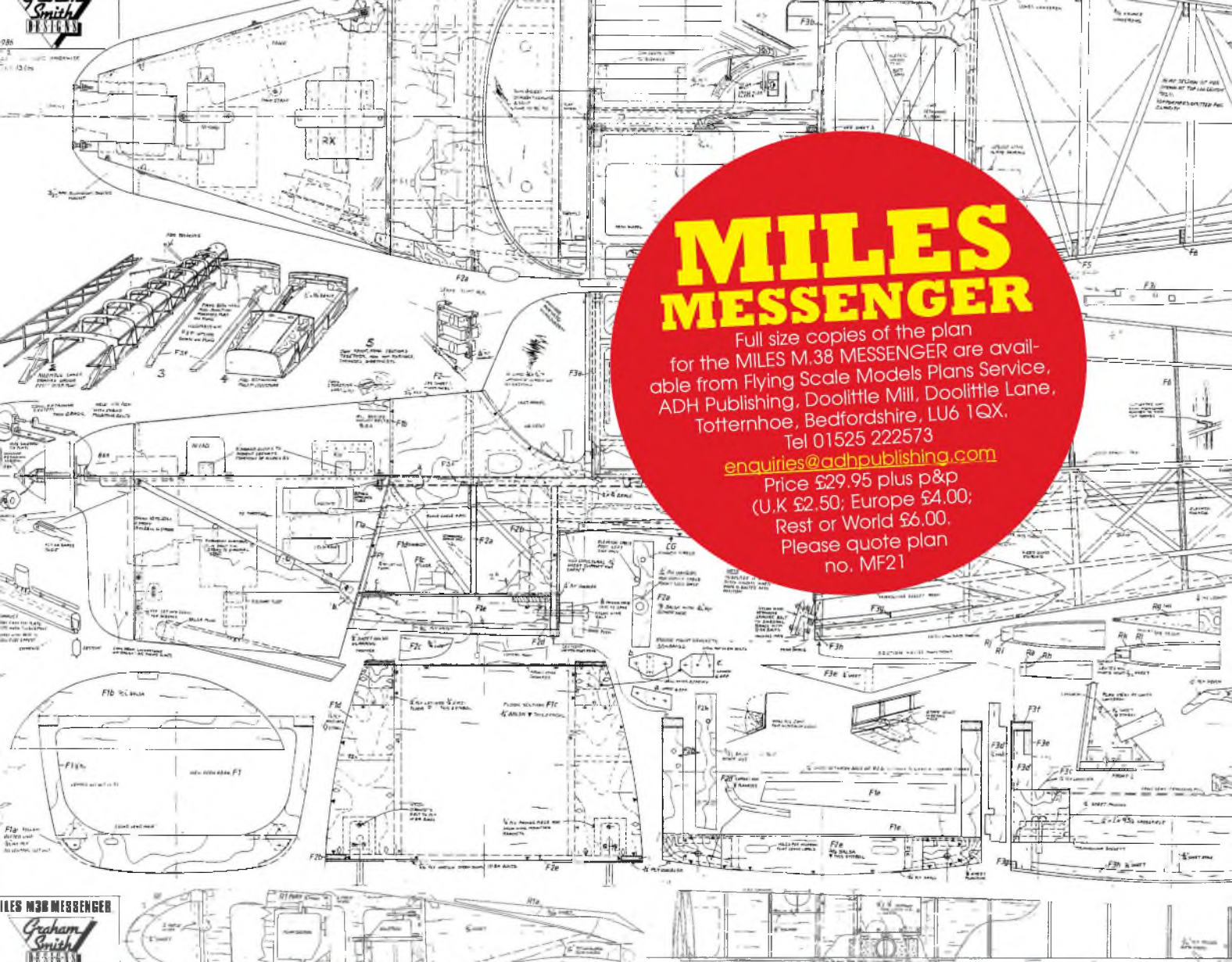
Throughout its life, this aircraft has been flown by Norman and A.J. Spiller and was a familiar sight at air race meetings in the 1950s in its maroon red and cream livery.

During the 1980s, G-AKIN was flown by Chris Parker for Mr Spiller and was a regular visitor at many air shows.

If you get chance to see it at Sywell, it is really worth the trip. I hope my model does it justice! ■

### Specifications - Model

**Span:** 100" (1/4 scale)  
**Motor:** 120 4-stroke (Saito)  
**Functions:**  
7 channel (aileron/flaps on separate channels)



# MILES MESSENGER

Full size copies of the plan for the MILES M.38 MESSENGER are available from Flying Scale Models Plans Service, ADH Publishing, Doolittle Mill, Doolittle Lane, Totternhoe, Bedfordshire, LU6 1QX, Tel 01525 222573

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

Price £29.95 plus p&p (U.K £2.50; Europe £4.00; Rest or World £6.00.

Please quote plan no. MF21



## CUT PARTS SET FOR THE

# MILES MESSENGER

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

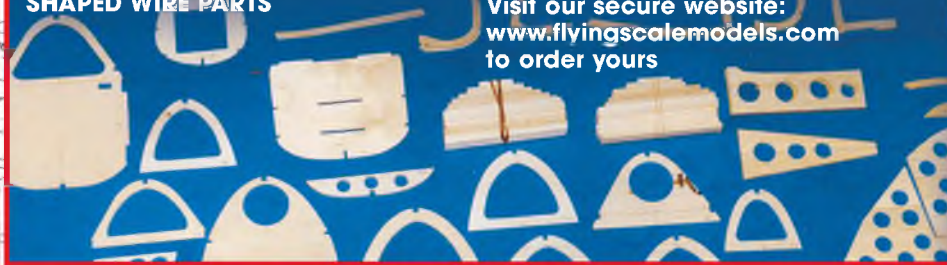
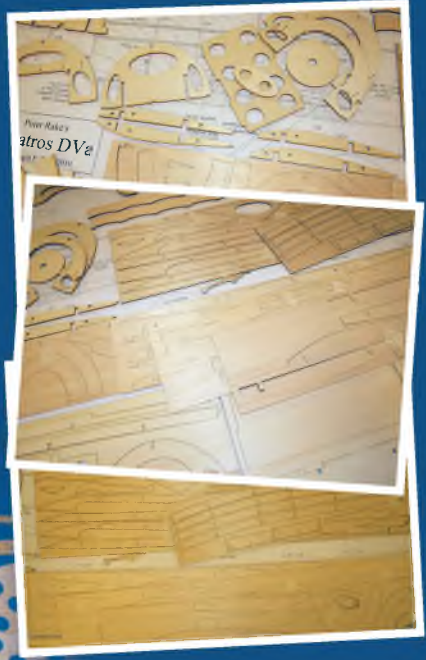
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**Price £250.00**  
plus carriage (UK) £11.50, (Europe) £26.00

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# MESSENGER FULL SIZE



A full-size M38 under restoration - a great source of documentation.



Full-size tail fins showing access panels and elevator trim tab detail.



View of the full-size rudder and elevator linkages.



View inside the full-size fuselage showing the ply formers and skin panels.



Shot of one of the aileron hinges.



A full-size leg for comparison with Peter's representation.

## Specification and data: G-AKIN

<b>Span:</b>	36ft 2ins
<b>Length:</b>	24ft
<b>Height:</b>	9ft 6ins
<b>Engine:</b>	Blackburn Cirrus Major III
<b>Wing area:</b>	191sq ft
<b>Wing section:</b>	NACA 23018 (root), NACA 2412 (tip)



# MONTY'S MESSENGER - THE PERSONAL AIRCRAFT OF FIELD MARSHAL BERNARD MORTGOMERY



Ken Osborne



Peter Graeber



# THE BOYS FROM THE BUSH

John Lamont reveals the outstanding scale models of two Australian modelers with a taste for unusual subjects to replicate in miniature

**K**en Osborne and Peter Graeber live a long way from what might be called the centres of modelling in Eastern Australia, i.e. Sydney and Melbourne, but as members of the very active Twin Cities Club they are both dedicated and innovative scale modellers. A recent very long telephone conversation with Ken led me to request more information on their modelling endeavors, with particular emphasis on the unusual prototypes that they seem to prefer.

## Waterman 'Aerobile' (Ken Osborne)

Ken offered the following comments on his attraction to the *Aerobile* and the model he built:

"I must admit that the 'Aerobile' didn't start as all my own idea as the late Bob Parker built a Co2 free flight version some years earlier. Documentation was not a problem as Bob had the lot and had helped many a builder with that hard-to-get information over the years. I settled on 1/5th scale as I had decided that an O.S. 70 FS was about what the budget would allow. This proved to be a good choice for the 2.34m wingspan non-aerobatic low wing loading model."

Waldo Dean Waterman was born in 1894 and built a glider at the age of 15 using information from the March 1909 issue of the then new *Mechanics* magazine. After several attempts, he managed to control the machine with minimal damage.

In 1933 Waterman began work on the design of a roadable plane, (which he dubbed 'Whatsit'), that was to be the first in a series of tail-less aeroplanes. Next came the 'Arrowplane' and finally a roadable version called the 'Arrowbite'. Powered by a



The full size Sikorsky S-43 amphibian



Peter Graeber's magnificent 102.4" (2600mm) wingspan Sikorsky S-43 uses two electric motors that each deliver the equivalent of a 60-size two stroke glow engine. The model has been successfully flown from both land and water.



Studebaker engine, this aircraft was stall and spin proof and well suited to both its air and ground roles. (Waterman's 'Whatsit', being a canard, in basic principle, identical to the advanced modern-day Beech 'Starship').

In 1935, US Democrat Eugene Vidal became Director of Aeronautics and, shortly after taking office, advocated a broader usage of private aircraft. He proposed a small two place aircraft, low wing, take off run of 800 feet and able to clear a 35-foot obstacle in that distance. The aircraft was to land in 400 feet after passing over the same obstacle. It also had to be non-spinning and stallproof, with a top speed of 110 mph and a landing speed under 35 mph. This performance was to be achieved on a 100 hp motor and the aircraft was to cost \$700.

In early 1937 'Arrowbile 1' was completed. During flight testing it was found to be very sluggish and on landing it was found that a tape sealing the joint between the fabric and metal along the front spar had peeled away and formed a vertical ridge 38mm high, creating a spoiler which impaired the airfoil and

affected the ability of the wing to produce enough lift. After the tape was removed, the aircraft leapt into the air and performed beautifully. It was very stable; impossible to spin, stall or perform aerobatics, yet possessed all the requirements for take-off, landings and turns up to vertical banks. It was a great day, February 21st, 1937. Controlling the plane with two controls rather than the normal three was a snap, pushing and pulling the wheel nosed her up and down and turning the wheel produced bank and turn at any degree without induced skidding.

'Arrowbile' was demonstrated at the 1937 National Air Races at Cleveland with great success. It was landed in front of the grandstand, the wings were removed and it was then driven around in front of the crowd while a second machine took off and performed in front of the masses. Waldo was sure that many thought about having their own 'Arrowbile' to fly at weekends and to commute during the week. Especially housewives doing their shopping! However, the \$700 aeroplane did not quite evolve; the nearest was the





**A project not to be undertaken lightly, Ken Osborne's Facetmobile is to a scale of 1:2.85. Originally powered by an O.S. 70FS, it eventually needed an O.S.120FS for a satisfactory flight performance.**

Piper Cub at \$995 in 1939. The best that Waldo could come up with for the 'Arrowbile' was \$3,000 but some orders were taken at the Air Races.

In all, seven Arrowbiles were built with No.7 being somewhat different to the first six. No.7 was named 'Aerobile' and was given to the Smithsonian Institute in 1957.

**Facetmobile (Ken Osborne)**

The Facetmobile model was built in 1998 with Bob Parker again supplying the three-view drawing. On completion, it came out

at 1.61m wide x 2.08m long and 380mm deep (tricky to define a wingspan on a shape like this!), which results in a lot of drag. The full size aircraft was 4.6m wide x 5.84m long so the scale is 1: 2.85, or Commodore Wagon friendly! With a flying area of 15 ft.sq. the loading is a very light 11.25oz/ ft.sq.

First test flights with an O.S. 70FS engine were marginal and installation of an O.S. 91FS produced only a slight improvement. The final solution was the installation, about of an O.S.120FS, which produced a

performance more in keeping with requirements, although it is still a fair weather machine.

**Granger Archæopteryx (Ken Osborne)**

Ken's continued interest in tailless aircraft after the 'Aerobile' was to lead to the Archæopteryx, the Granger Brother's unusual project of 1930.

In 1926 the Granger Brothers, who were Nottingham lace makers, decided to build a glider, but after little success they enlisted



Paul Graeber's Miles Hawk Speed Six spans 63" (1600mm) and is electric powered. It features a balsa/plywood airframe, covered in glass fibre sheet, that Paul produced himself.



Ken Osbourne's Waterman 'Aerobile' has been an entirely successful scale model project, powered by an O.S. 70FS.



The full size 'Aerobile' on display at the Smithsonian Institute in Washington D.C., USA.

the help of Captain C.H. Lattimer-Needham (who later designed the Luton Minor) to help with the *Archaeopteryx* project from 1926 to 1930. The first flight was reported as trouble-free and the aircraft continued to fly for six years, with the two brothers both learning to fly, before it was put into storage until 1968, when it was given to the Shuttleworth Trust and restored to flying condition.

The restoration took three years and the aircraft was next flown in June 1970, 34 years after its previous last flight. With no-one keen to be first to test it, a coin was tossed and Squadron Leader Lewis won (lost?). After landing, he reported that he was not impressed by the aircraft and a second flight by Neil Williams drew a similar response. It was amazing that the Granger brothers had taught themselves to fly in this unusual and underpowered aircraft.

Ken's model of the *Archaeopteryx* is built

from his own drawings which were developed around three-views and a magazine report on the full sized aircraft by Dennis Bryant. At 2.08m wingspan it scales at 1:4.39 and is powered by an O.S. 48FS, which has not been overworked in this calm-weather-only model.

### Miles Hawk Speed 6 (Peter Graeber)

Peter Graeber was active, with Ken, in the Twin Cities club in the 1980s but gave up the hobby to spend more time with family and work. When Ken visited with a small, electric powered model Spitfire in 2006 the bug returned and Peter, with a background of working with fiberglass, made moulds to produce a fiberglass version of Ken's model. Now firmly back into modeling, Peter's next effort was a Miles Hawk Speed 6, constructed with a balsa/ply framework and covered with

fiberglass sheet that he produced himself.

### Sikorsky S-43 (Peter Graeber)

Peter's latest model is a scratch-built *Sikorsky S-43* amphibious aircraft powered by two electric motors.

The full size S-43 first flew in 1935, and was a smaller version of the Sikorsky S-42 'Clipper'. It accommodated between 18 and 25 passengers, with a separate two-crew forward cockpit. The S-43 was known as the 'Baby Clipper' in airline service and was used primarily by Pan American World Airways for flights to Cuba and within Latin America.

An S-43 was purchased and flown by Howard Hughes in preparation for test flying the ten-engine Hughes H-4 'Hercules' (the 'Spruce Goose') and Hughes' S-43 remains the last example of this aircraft type flying. ■



Ken Osbourne and his Grainger Archaeopteryx.



The full size Grainger Archaeopteryx at Old Warden



# Albatros C.X

Dr. Mike Hawkins FRAS reveals the build of his  
1:15th scale Albatros two seater

**O**ver the trenches of the Western Front, it was the two-seaters and not the fighters, that did the useful work. Nevertheless, the glamour goes to The Red Baron, Mick Mannock and company, whose aircraft are modelled more often than the usually anonymous heroes who took the aerial photographs, directed the guns and dropped the bombs.

It was ever thus! Building a model of a WW1 two-seater may involve a little more work than a fighter, but with the time consuming standards to which our leading modellers detail their creations these days, that is not usually a serious factor. The original aircraft may be larger than a fighter, but a visit to *Top Gun* or a *Large Model Association* meeting shows that the scale can easily be

adjusted to suit present requirements. I used to build models in the 70 to 100 inch wingspan range to take to the United States for the *Quarter Scale Association* Meetings at Las Vegas, now sadly ended with the closure of the Club. Tightening airline baggage restrictions and the personal effects of Anno Domini have put a stop to that sort of thing and the interior capacity of my ageing Mitsu van is now the





main limitation on model size.

Photos in this magazine show the remarkable craftsmanship and detail many modellers now achieve. I can only admire, but I cannot emulate.

Any aircraft design is a compromise and with the above factors in mind, I present the description of my current Albatros C.X. Once again, Kuhn Sukasom Hiranphan, the Editor of the *Thai R/C Core Model Magazine* has done wonders with the flying shots.

### The Aircraft

Dipl.Ing. Robert Thelen was the Chief Designer of the Albatros Werke who believed in incremental development of his basic designs. The evolution of his fighters from the D.II to the D.III and then D.V are

well known. The two-seaters followed a similar pattern from the angular C.I to the widely used C.III and then in stages becoming more and more elegant, the C.VII with a rounded fuselage then, with the 260 h.p. Mercedes, the C.X. At the end of the line, with a fully streamlined and elliptical fuselage, was the C.XII.

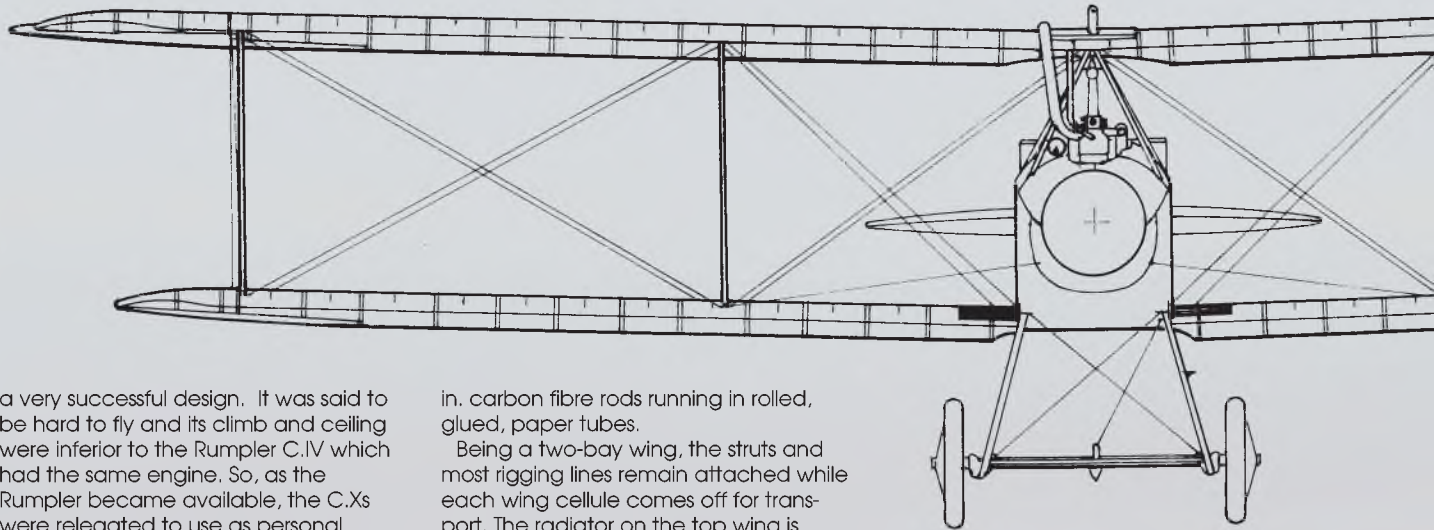
Unfortunately, the elegant curves that make the aircraft so attractive to me as a modeller, did not necessarily improve the performance of his designs. The flat-sided D.III fighter was developed into the fully rounded D.V. However, the Austrians did not like the large light alloy spinners which sometimes broke up, so they left them off. The resulting flat nose must have produced a lot of turbulence so they rounded off the front fuselage and the Austrian D.III was

then the fastest of the Albatros fighters, as has recently been confirmed with superb full size replicas built in New Zealand and Austria.

In the same way, the flat-sided C.X was developed into the fully rounded C.XII, which must have been much harder and more costly to build, but had exactly the same top speed. The reason for this, in my view, is that a wing does not need a fairing when it meets the fuselage side at right angles but when it tucks into a curved section, turbulence will result from interference between the airflows around the wing and the fuselage. This is why a Spitfire has a wing fairing and an F4U Corsair does not.

The Albatros C.X, introduced to service in 1917 with 400 built in five factories, was not





a very successful design. It was said to be hard to fly and its climb and ceiling were inferior to the Rumpler C.IV which had the same engine. So, as the Rumpler became available, the C.Xs were relegated to use as personal transports and training. By January 1918, there were none of them left on combat duties.

Nevertheless, I felt it would make an attractive and colourful model. These days, where possible, I choose the easier way out, so I made it a flat sided C.X rather than the more elegant C.XII

Judging by my 1/8th scale Albatros J.1, in *Flying Scale Models* for August 2007, I felt it ought to fly well.

For the full story, photographs and drawings see *Windssock Datafile No.114. The Albatros C.X.* by the late P.M.Grosz which includes colour details researched by Ray Rimell.

### The model

The Albatros was a large aeroplane at 14.36 m span and at 1/6th scale this comes out to 94" (2388 mm) on the model. Just what my RCV 130 had been waiting for.

The weight is 12 1/2 lbs. (5.6 kg.)

in. carbon fibre rods running in rolled, glued, paper tubes.

Being a two-bay wing, the struts and most rigging lines remain attached while each wing cellule comes off for transport. The radiator on the top wing is screwed in place as a joiner.

### Fuselage

The fuselage is built using 1/8" Lite-ply in the front and 3/32" balsa sheet and planking in the rear. This has to be done neatly since the unpainted, varnished fuselage is a thing of joy to behold. Interior control wires guides for the closed loop elevator and rudder controls are from 1/8" in polyethylene (I think) tubes.

The engine is mounted on old-fashioned wooden bearers offset to port - just like the original - as this gives strength to the nose. A dummy six cylinder Mercedes is built round the engine but is removable with the cowling.

### Motor

The RCV 130, which has never missed a beat, runs on a 15 x 8 Master prop at 8,500 rpm, full chat. A 12 oz. tank is more than adequate.

### Wing

The wings were built in the usual manner with balsa leading and trailing edges and 1/4 in sq. hardwood spars fore and aft. Spruce seems to be just about unobtainable these days (at least where I live), so I used some 1/4 x 1.1/2 inch lath obtainable from DIY shops in 12 foot strips and cut it down to 1/4 square x 36 in. with my Dremel saw. It is not as strong as spruce, but is stronger than hard balsa and seems adequate in practice.

The wings join in the centre, using 1/4

The fibreglass spinner is made without a lathe, as detailed in FSM for March 2012.

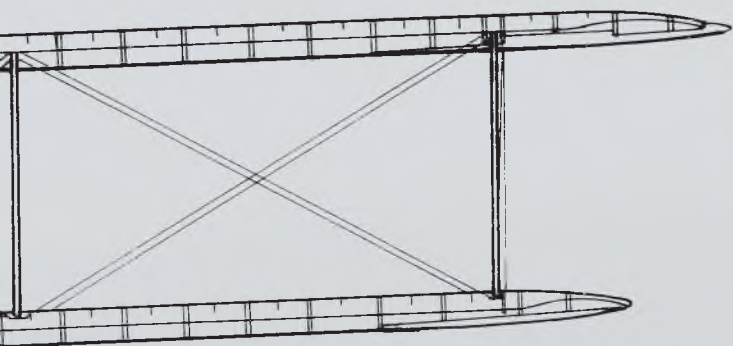
### Covering and colours

The wings and tail are covered with Antique Solartex. Rib tapes are torn Solartex, 3/16th in. wide and ironed on.

There is a choice of colour scheme depending on the constructor of the aircraft modelled.

I chose an aircraft described by Peter Grosz as being built by the Bayerische





Scale 1:50

Flugzeug Werke and used as a V.I.P. personal transport.

The fuselage was unpainted although the yellow colour comes out very dark on the orthochromatic film then in use. After rubbing down, the fuselage was given several coats of 'Teak' polyurethane varnish the result of which gave me delight.

The wings and tail were *Antique Solartex* underneath and painted two shades of green and red-brown on top.

I used cut out vinyl sheet for the markings on the fuselage and tail, but painted the crosses on the curved fabric wing surfaces. A similar unit marking was seen on a Rumlper C.IV and it is possible that this aircraft was relegated to transport duties once the Rumlper took over its operational work.

I finished off with a coat of sprayed polyurethane furniture varnish, thinned with cellulose thinner and with a spoonful of matting agent (French Chalk) added. This has proved to be fuel proof.

This aircraft also had its guns removed and the vertical 'organ-pipe' exhaust was not fitted, so I could use the standard silencer on the RCV.



The wheels had no covers fitted, enabling me to use the 5 in. wire wheels bought in U.S.A. some time back.

In the rear seat I put His Ultimate Excellence, as supplied by Pete Richardson of *Pete's Pilots*. No one has yet asked how the pilot dared to have his chin strap unfastened with such a passenger in the back.

### Rigging

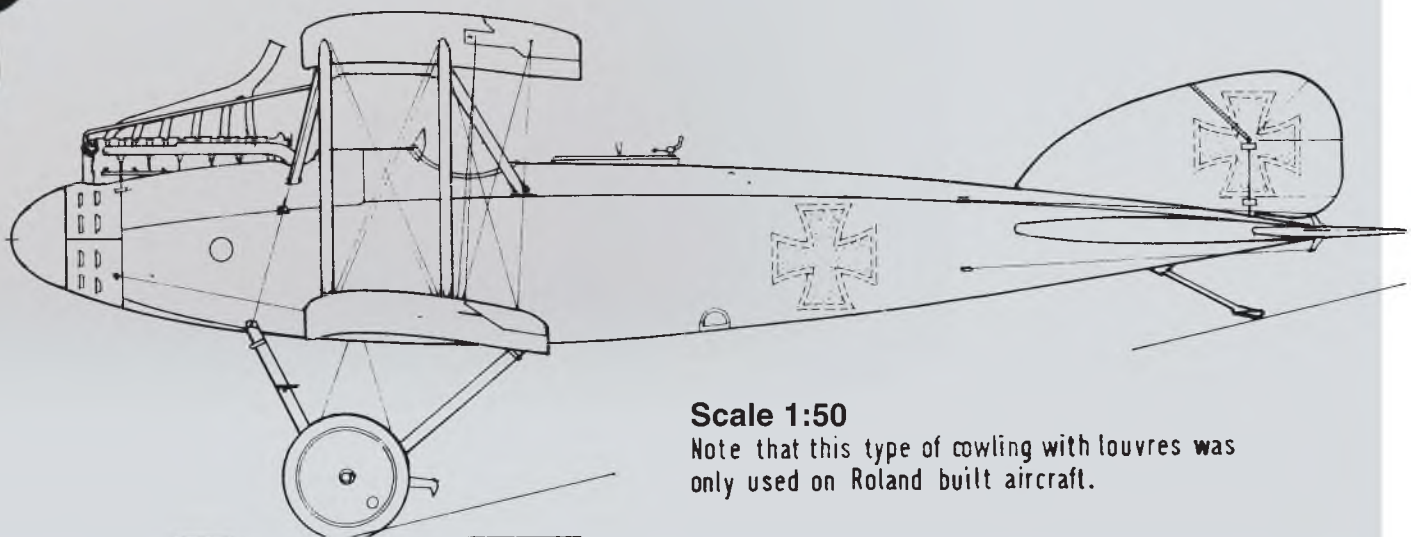
None of this RAF Wire nonsense! 90lb. test nylon covered cable for the main wires and 60 lb. for the strut cross wires. 4-40 clevises and

rigging couplers were used to attach and adjust the main rigging.

### Radio

I first flew it with my Futaba 6 EX 2.4 GHz radio. Hitec HS 225 servos are mounted in the upper wing and work the lower ailerons by extension cables as in the original aircraft.

HS 625s are used for rudder and elevator and the battery is a 6 volt 1000 mAh. I later changed to a Hitec Prism 7 transmitter with a 2.4 GHz module and an Optima 6 Rx. This Tx has a switch for



Scale 1:50

Note that this type of cowling with louvres was only used on Roland built aircraft.

Scale 1:50

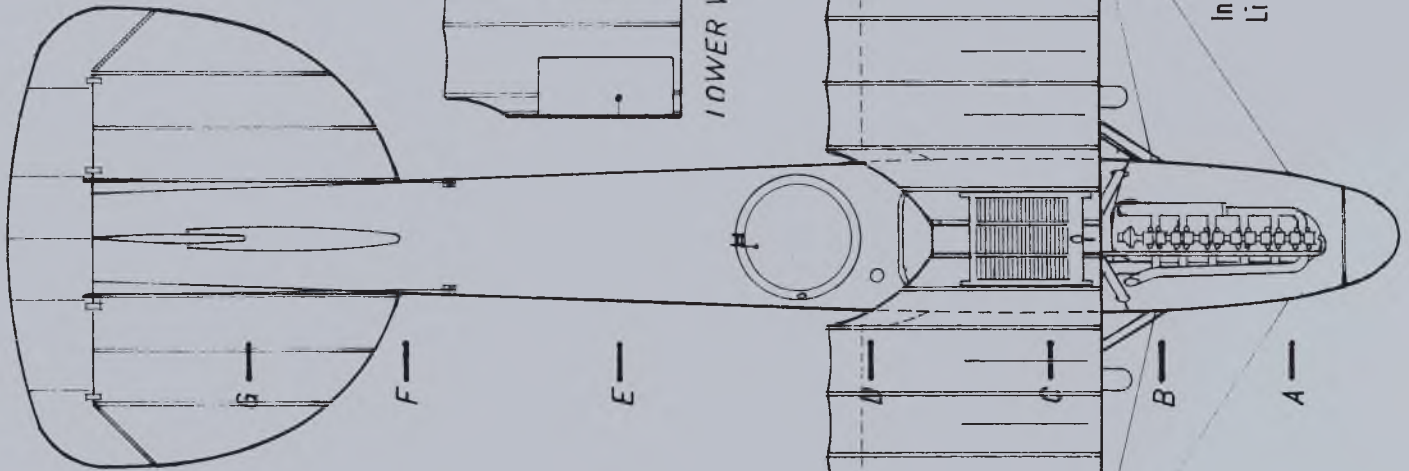


Dr. Mkie Hawkins FRAeS and his 1/6th scale Albatros C.X. RCV 130 powered.

Aileron control cable pulleys

PLYWOOD COVERED I.E. (TOP SURFACE ONLY BOTH WINGS)  
LOWER WING.

Insignia further inboard on Li & Rot. built a/c.



optional rudder/aileron coupling.

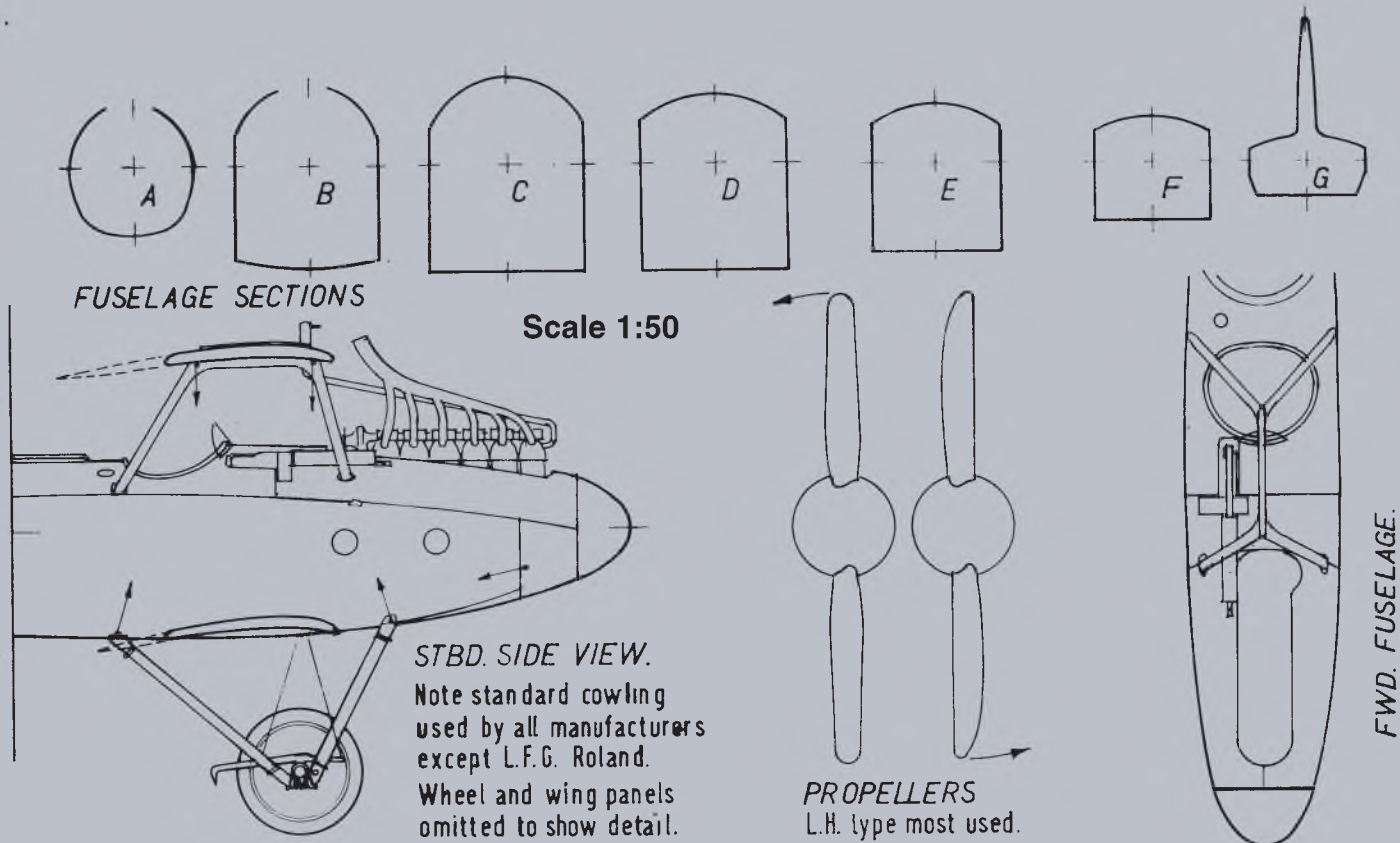
### Flying

The Albatros C.X was a large and sedate two-seater and that is how it flies. Take off is straight and positive and there is more than enough power for normal flight. I just have not tried abnormal flight. A rudder gyro is not needed.

My Albatros J.I uses coupled aileron and rudder. The first time that I tried it on the C.X, I had 60% rudder mix and this was too much, lurching round turns. Reduction to 40% was smoother and more comfortable.

One possible snag with the Hitec Optima system is that the minimum operating voltage of the system





when operated on 4.8 volts, is 4.5 volts and pro rata for 6 volts. If the voltage reaches this level for only a fraction of a second, bells, whistles and sirens sound on your transmitter by telemetry. Large capacity batteries and low current drain servos are a good thing, but experience with the Futaba gear suggests that this is really rather

overdoing it.

Since I fly off tarmac, I have added detachable wire hoops under the lower wing tips to avoid scrapes and the claw brake on the axle does not operate lest I dig up our runway.

Landings are slow and steady but I had not realised until I saw the photos, how

much up elevator was needed.

I have three Albatri, (Albatrosen, Albatrosses?) in my stable, the J.I, the D.XI and now the C.X. If only the rain would stop maybe I could get out to fly them again!

**Dr Mike Hawkins FRAeS.**  
 mikeh@samarit.co.th



# Techno Scale

Mike Evatt st

**S**lough Radio Control Models claim to be one of the UK's leading radio control model suppliers. Browsing their website at <http://www.sloughrc.com> leads one to think that they are right. The company has been trading since 1972 and in addition to its online business; it has large retail premises in Slough - staffed by a knowledgeable and helpful team - and boasting an incredible range of stock. Their excellent and well-renowned Mail Order service is quick and secure. The screen-shot shows the Hirobo Eurocopter AS365 Dauphin. The Dauphin 2 is one of the most recognised helicopter shapes in the world, featuring a 'Fenestron' tail fan system, which has been developed to the point where it is hard to tell the difference compared to a conventional tail rotor.

The Pioneer Flight Museum based in Texas was established to preserve the memory of aircraft from the early days of flight, specifically dating from the years before World War II. Many of the museum's aircraft are flyable, while others are projects being restored or built to flying status. The PFM is a group that is

dedicated to the preservation, restoration, and reproduction of aircraft and other historical artefacts from the beginning of flight to the early years of WWII. Point your browser at <http://pioneerflightmuseum.org> and be enthralled.

Jim Kiger of Replicraft maintains a web presence at <http://www.replicraft.us.fm> and is a man with a mission. He wanted to produce the most accurate and the most detailed scale drawings of WWI aircraft ever made available. Jim does personal research to ensure that only the most authentic information is used, such as original factory drawings, maintenance and production manuals. These are structural drawings, and are not to be confused with model plans, but any good scratch builder can convert them to a model. His latest - a Hanriot HD.1 was developed from 159 original factory drawings and other miscellaneous sources. Truly a labour of love.

Aviation Design is the Leading European manufacturer of Jet models. Based in France, this company has web pages at <http://www.adlets.com> Here I

was drawn to their 1/5 scale version of the Mirage 2000. The Mirage 2000 is a famous French delta, single engine, fighter built by Dassault Aviation. This model was fully CAD designed. It is a true scale model, with all the panel lines and rivets engraved in the fuselage. It is a big model, but very aerobatic with good roll rate and incredible high angles of attack are possible. In flight it is very realistic and impressive with big turbine sound and afterburner lights.

<http://www.proctor-enterprises.com> is the internet home of Proctor Enterprises. Founded over 35 years ago it has the slogan - 'The Very Finest in Scale World War I and Vintage Model Aircraft Kits and Accessories' Their Fokker DR.1 "Triplane" by VK Models kits makes the point. The Fokker 'Driedecker' was designed by the talented Reinhold Platz as a response to the sensational debut of the Sopwith Triplane in April 1917. This 47 inch span model version pushes all the right buttons. It is the ultimate crowd pleaser.

Looking for something different? The Dornier Do.335 is famous for being one of the most spectacular, unusual, and



The Hirobo Eurocopter AS365 Dauphin is available from Slough Radio Control Models.



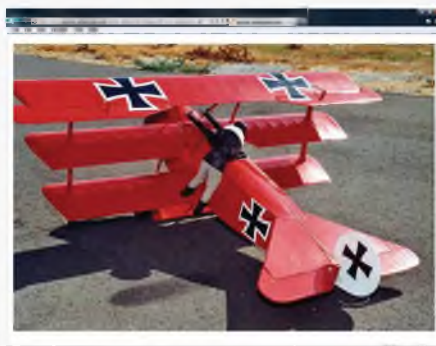
The Pioneer Flight Museum is based in Texas.



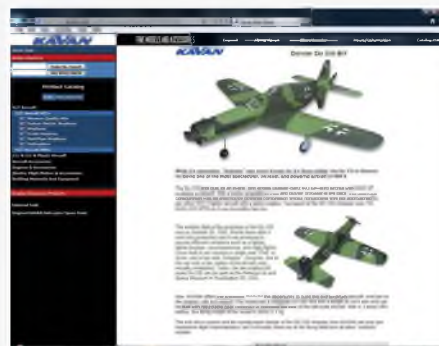
If you want accurate drawing of a WWI warbird go to Jim Kiger.



Aviation Design's version of the Mirage 2000 is big and powerful.



Proctor Enterprises stock the Fokker DR.1 "Driedecker" by VK Models.



The spectacular Dornier Do 335 from Kavan.



# talks the digital highway for more TechnoScale Topics...

powerful aircraft of WW II. The Do.335 was built as an in-line, twin engine Diamler-Benz 603 powered aircraft with a tractor propeller in front and pusher propeller in the back. Kavan of Germany at <http://www.kavanic.com> offers the ambitious modeller the opportunity to build this extraordinary aircraft, and just as the original, with two motors! The model has a wingspan of 1393 mm and can be built with retractable gear to complete the look of the full-scale aircraft.

Anthony's **Pete-N-Planes** of Australia specialises in mail order purchases via the internet, and with their secure shopping cart system, the internet brings their store to the comfort and convenience of your home. The screen-shot shows the new version of Hyperion's Nakayima Ki84 Hayate 25e 'Frank' for electric power. This new kit has numerous improvements in radial engine mounting, superior battery hatch, easy CG adjustment, and stronger retractable gear. Wingspan: 1140 mm Flying weight: 1350 - 1550 g. Check it out at <https://www.petenplanes.com.au>

**Williams Brothers** began their operation in 1960 in a small garage in Hunnington Park, California. Their first moulds were for nylon bell-cranks and hinges. This was because they needed those items for their own airplanes, and felt that other fliers would need them also. Although now under new ownership the business has continued to grow exporting product world-wide. Take a peek at their website at <http://www.williamsbrothersmodelprodcts.com> - there are some excellent scale goodies in the R/C Accessories section.

**Tony Nijhuis Designs** at <http://www.tonynijhuisdesigns.co.uk> is the official home of model aircraft design & innovation from one of the leading and most respected authorities on model aircraft design.

Scrolling down the menu you will find Tony's own models. His B-50 model has been four years in the making. The model has a span approaching 19'. Each electric motor is rated at 3kW but is only using approx. 1,500W giving a total of around 6kW available power. The B-50 is a variant of the B-29 Super

fortress and was one of the last great piston engined bombers of the 20th Century extending operations well into the 1970s.

Tony's monster is powered by 4-Max Electric Motors (4 x PPO-6367-230) and 4-Max LiPo Batteries (8 packs of 4S 5,300mAh LiPos). Check them out on 4-Max's website at <http://www.4-max.co.uk> Their Purple Power Professional Series of Outrunner motors are built to satisfy the most demanding flyer. They feature .2mm thick stator plates, stronger N45SH magnets, lower resistance windings, larger Japanese bearings and a harder shaft. Their Purple Power Professional LiPo's are getting quite a name for themselves for great performance, sustained punch and long life.

And Finally! Something for the control-line enthusiast! Log-on to <http://www.fesselflug.eu> and take a look at the fabulous detail of Stephan Ratsch's P-47. The site contains many other control-line scale images as well as some articles in English such as 'How to make Carbon Propellers'.



The new version of Hyperion's Nakayima Ki84 Hayate for electric power.



Excellent scale goodies from Williams Brothers.



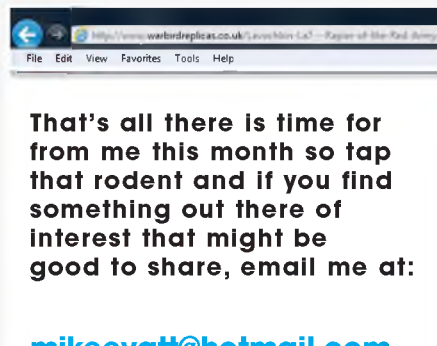
Tony Nijhuis' monster B-50 spans 19 feet!



4-Max's Purple Power Professional Series of motors and Lipos are making quite an impact.



The fabulous detail of Stephan Ratsch's P-47 control-liner.



That's all there is time for from me this month so tap that rodent and if you find something out there of interest that might be good to share, email me at:

[mikeewatt@hotmail.com](mailto:mikeewatt@hotmail.com)

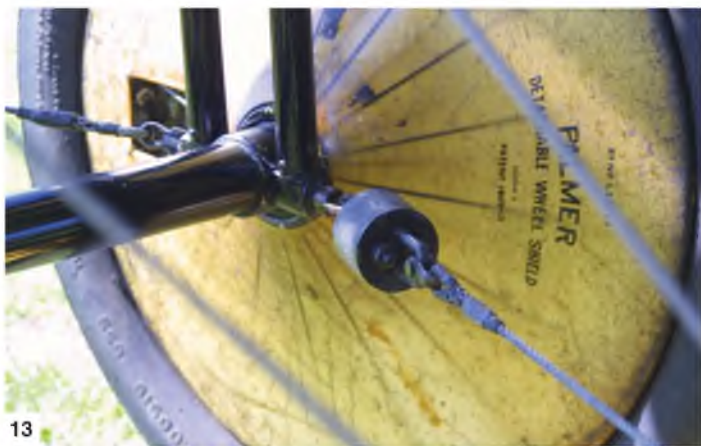
# AVRO 504K

Further essential close-up detail for anyone wishing the model this all-time classic biplane carried over from Part 1 in last month's issue



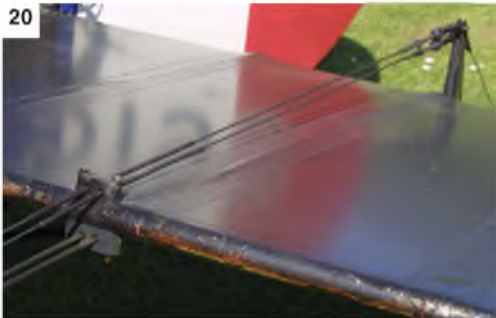


1-6: One of the most prominent features of the Avro 504K is the anti-noseover skid mounted on the main undercarriage.  
 7: Avro logo on the wheel axle bearing. 8: Main undercarriage shock absorber. 9: Upper main undercarriage strut anchor point.  
 10 & 11: Rear main undercarriage strut anchor points. 12 & 13: Mainwheel inside face and axle. 14: Mailwheel viewed from the outer face. 15: Mainwheel viewed directly from the rear illustrates the profile.





**16 & 17:** Two views of the fuel tank above the upper wing. **18: & 19:** The heavily braced tailskid. **20 & 21:** Two views of the elevator control runs, showing the guides on the tailplane leading edge. **22:** Elevator control horn and duplicated control cables. **23:** Tailplane underside, showing the strut braces. **24:** Another detail of the elevator control cable, showing the threaded adjusters. **25:** Wing tip protector hoop mounted on the lower underside wing tip.



**26:** Lower aileron control horn, also showing the control surface centring adjusters. **27:** Aileron cable pulley on the wing that turns the cable through 90 degrees. **28:** Aileron control cable at the fuselage centre section underside. The aileron cables are all external to the airframe. **29:** Lower wing at the fuselage, showing the cockpit access tread plates. **30:** Rudder control cables and control horn, showing the exit positions. **31:** Rudder horn and duplicated control cable.

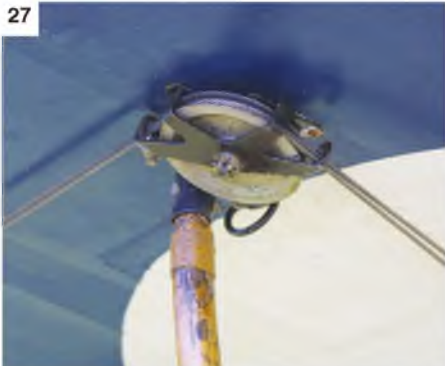




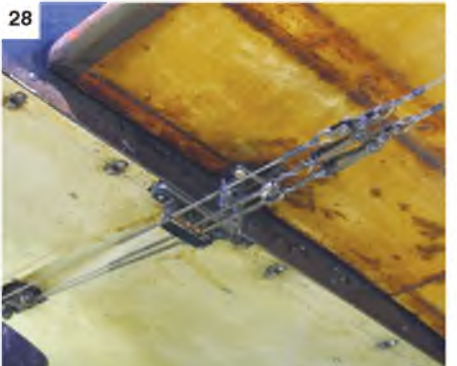
26



27



28



29



30



31



# THE QUIET ZONE

R/C SCALE ELECTRICS BY PETER RAKE


**Y**es, it's that time again: another thrilling instalment of the never ending saga that laughingly passes as an electric flight column. Last time I left you, after much preamble, I was just about to investigate suitable structures for building your own electric powered model aircraft. As I'm sure you'll recall, I was aiming this item more at newcomers to aeromodelling: those who may have received, or bought, one of the little ready-to-fly models that model shops are so keen on stocking. Yes, they are attractive models and can be flown to very good effect. However, in the hands of a total novice, many become nothing more than a source of radio gear to fit into another model in very short order. Anyway, I dealt with that aspect last time, so won't dwell on it here. I also briefly indicated what sort of model you could successfully hope to fit the gear into. That being the case, and because I'm not really feeling very talkative today, I'll get straight down to the topic at hand without my usual reams of waffle. Fear not though, I'm sure I'll become more inclined to ramble as the column progresses. I usually do, so can see no reason why this time should be any different.

## What model

As I mentioned last time, because this could get quite deep and fairly complicated, I intend to deal with structures in an ordered way. Now that really has to be a first - some sort of organisation to the column.

Seriously though, it is important to work this way because not all RTF models are created equal. It's absolutely no use me detailing the type of structure used for a lightweight tiddler if the gear you have available comes from one of the larger models available. Therefore, we'll be working our way up through the size range, dealing with each type individually.

Since the very small and less conventional stuff was briefly covered last time, now we come to the not-quite-so-small models that use conventional radio



AN IDEAL SCALE SUBJECT FOR A FIRST MODEL. THE STAHLWERK (THIS ONE IS 36" SPAN) IS EASY TO BUILD AND HAS GOOD PROPORTIONS FOR BEING EASY TO FLY. I HAVE AN 18" VERSION ALREADY DRAWN.

gear. What do I mean by 'conventional'? Basically, this means that after you've finished cannibalising your severely unwell RTF model you'll be looking at a receiver, servos, speed controller and motor unit. Many will have the servos, or at least two of them, mounted on the receiver board and the speed control built into the receiver. If so that's a good thing because it keeps installation simple and everything nice and tidy.

However, don't worry if your particular set-up uses separate components (components that are deliberately separate, not ones that have become separated) that will work just fine too, but the installation will look a little less tidy. It doesn't matter whether the servos are linear output (the arm moves forwards and backwards) or rotary output (the arm pivots on its axis); either is equally suited to our needs. What is important is that everything works properly before you install it in your new model. Once you are satisfied with the operation of your radio equipment and motor, it's time to start looking for a suitable model into which it can be transplanted.

### Decisions, decisions

What model you choose will depend on two main factors. Firstly, what size motor you have available. As I said last time, if

your model came equipped with a 6 mm geared unit, and your ESC (speed controller) will cope with the extra load, I'd definitely suggest going for a 7 or 8 mm motor unit which will allow you to build slightly bigger and heavier models and still have sufficient power that they aren't constantly at full throttle and struggling to stay in the air. That's important while you are learning to fly properly because it's difficult enough when you have adequate power and isn't helped in the least by having to fight the model into the air.

The next issue we have to look at is what style of model you build. To help assure success, it really needs to be something fairly easy to fly and not particularly difficult to build. Bear in mind that the 'classic' trainer is a high wing monoplane and you should be able to visualise the sort of model best suited to your needs. As well as the multitude of non-scale, vintage style models out there that make admirable trainers, scale types like Piper Cubs, Cessnas and Aeroncas are all good candidates.

Because the model needs to be light, rubber power kits, suitably modified, form a very good basis to work from. What you will need to do is to make control surfaces and hard points for attaching your motor and radio gear. What you shouldn't need

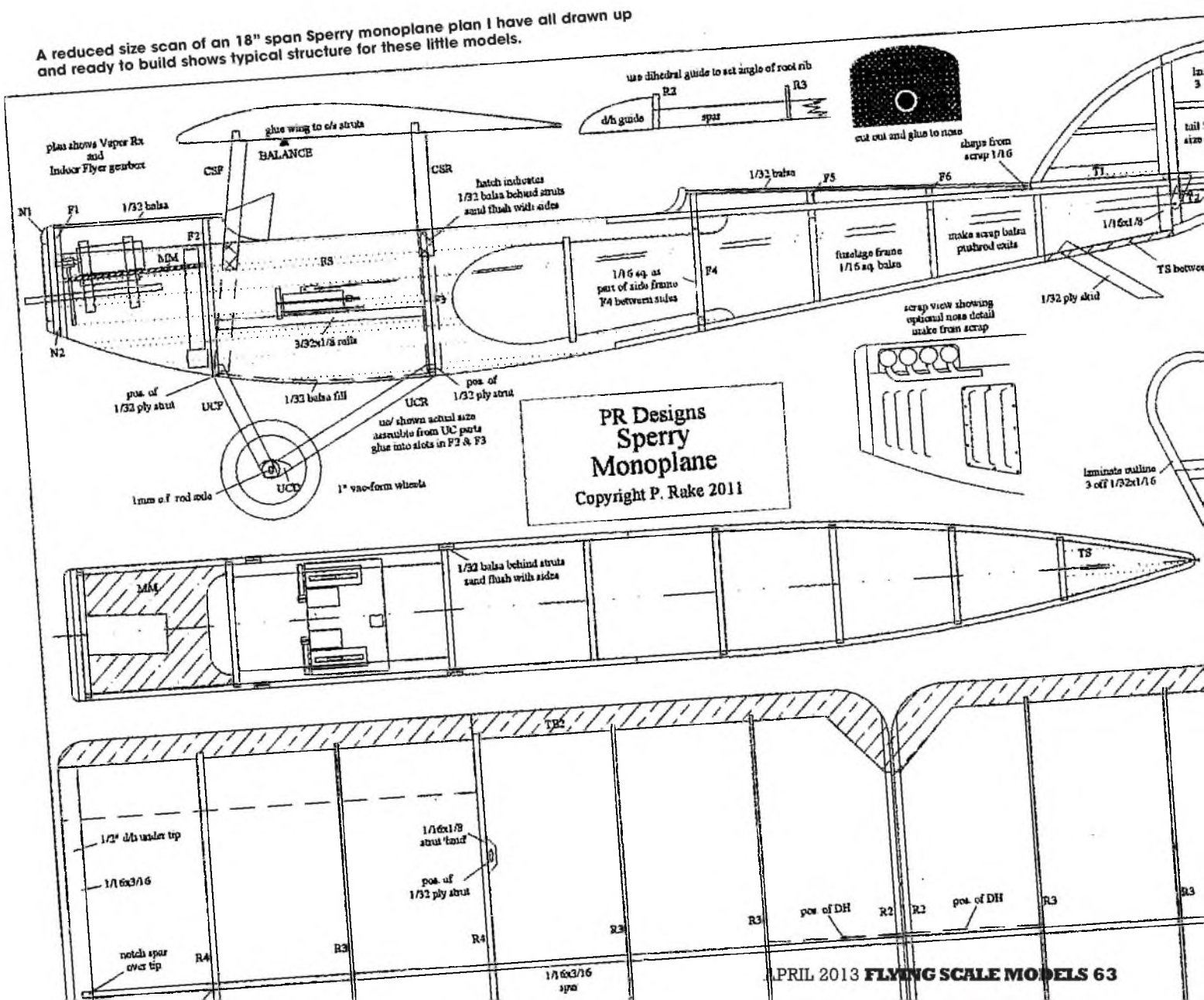
to do is 'reinforce' the structure - with the possible exception of where the wings join and attach to the fuselage. At all times, remember that you are building a model to fly, not to survive a severe crash. Attempting to do the latter is an exercise in frustration. All that tends to happen is that the model gets heavier than it ideally should be, which means it either won't fly on your gear or has to fly faster just to stay in the air.

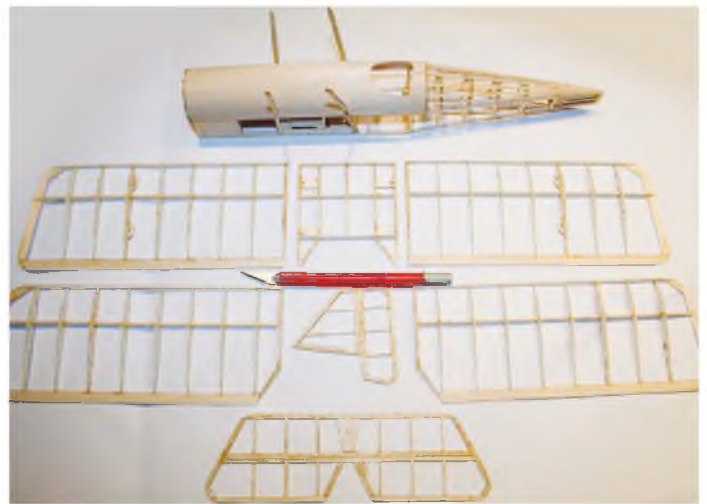
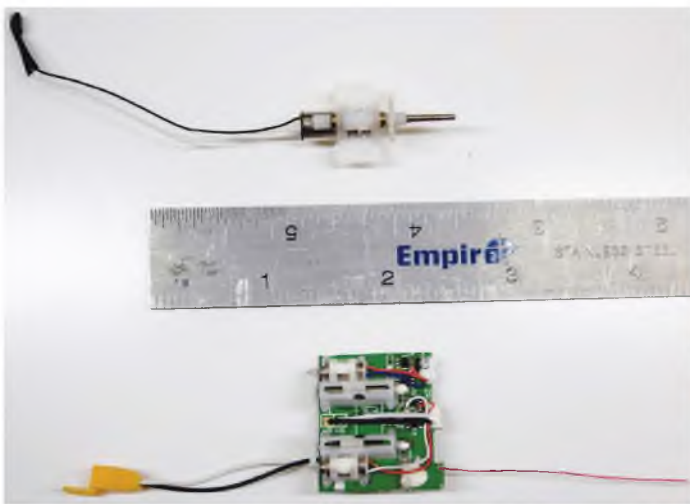
Flying faster makes it more difficult to control and that makes it more likely to crash. Being heavier, and flying fast combine to make it hit the ground harder, thereby negating the effort you put into making it crash resistant. It's a simple fact of life that light models fly better and, because there is less mass and inertia involved in a mishap, they tend to survive better. Although we are currently dealing with small models, this is true throughout the size range.

### Down to basics

I'm currently involved in drawing up some models that are precisely what we are looking at here. At around 18" wingspan and with an estimated flying weight of about 2 ounces, these are deliberately designed around just the sort of radio gear you have to hand - a three channel receiver 'brick', 7 or 8 mm geared motor

A reduced size scan of an 18" span Sperry monoplane plan I have all drawn up and ready to build shows typical structure for these little models.





**ABOVE LEFT:** Salvaged from a little Pipe Cub RTF this is typical of the sort of gear you should have in front of you. I'd replace the 6 mm motor with something bigger. **ABOVE RIGHT:** As you can see, this SE5a strongly resembles a rubber power model in structure even though it was designed specifically for radio control.

and a single LiPo cell. Throughout the design process I kept one thing in mind: reinforced rubber power model.

Try to imagine what we need from our model. We need the motor and radio gear to be securely mounted, but everything else can be little more than a frame to hold the tissue covering in shape. Therefore, if you are working with a rubber power kit or plan, add a small amount of 1/16" balsa sheet in the areas you need to be sturdy (around the nose and wing seat) and then eliminate any excess structure from the rest of the model.

Many rubber power models use far stronger fuselage structures than we require, simply to absorb the crushing and twisting forces imparted by a fully wound rubber motor. In our electric powered models, those forces are absent, with the rear fuselage being nothing more than something onto which to hang the tail surfaces. As such, multiple stringers on a flat-sided fuselage (a very popular rubber power building technique) are unnecessary and can be eliminated.

What we need is a reasonably rigid 'box' that ties together motor, radio equipment, wing and landing gear, which can be the basic kit structure with sections of sheet let into it. Alternatively, as I prefer, a largely sheet balsa front fuselage onto which is grafted a lightweight, but rigid rear fuselage structure. This will form the very 'heart' of our model and must be straight and square if the remainder of the model is to follow suit. You can say what you like about being able to trim out flight irregularities caused by misaligned structure, a model that is straight and accurately aligned will ALWAYS fly better.

Now, keeping to the theme of lightweight models, at this size wood hardness can make all the difference between a model that files easily on the available power and one that barely struggles into the air. The sheet used for our front box needs to be no more than medium hard but the longerons (the main beams running the length of the fuselage - usually one on each corner) should be quite firm balsa - not rock hard by any

means, but definitely not the very soft balsa you so often see in shops. If you can't find balsa strip of the right grade, buy a sheet of fairly hard balsa and cut your own strip. I specifically said 'fairly hard' because it always seems that strip cut from a sheet comes out softer than the sheet appeared to be.

How do you tell what is the right grade? It will come with experience, but a simple way to check is to hold one end of a selection of strips, with the strips horizontal. The strips that bend the most are the soft ones and those that bend least are harder. That enables us to quickly eliminate the softest strips and put them back into the rack.

Now, while nobody is watching, try the 'squashability' test. Take individual strips between your fingers and squeeze them slightly. What you are looking for, in the case of material for longerons, is strip that compresses very little, if at all. Sort out a few strips of that, they're cheap enough to buy more than you need, and then move on to the strips that do compress a



**Laminated outlines impart great strength but without adding the weight of more heavily built, cut sheet outlines.**



**Bass struts glued into formers is a good way of eliminating the need for wire and are adequately strong on the tiddlers we are talking about.**



**Although this model is 45" span, it uses many of the techniques discussed here. I can see this is another one for me to scale down. The beauty of small models is that they are cheap to build.**





**EVEN LARGE MODELS USE A SIMILAR STRUCTURE, JUST A LOT MORE OF IT. THE HEINKEL HE-51 SPANS 55" AND WILL APPEAR AS A PLAN ARTICLE IN A FUTURE ISSUE.**

little (just a little). These are likely to be medium weight balsa and are ideal for the remaining strip parts of the fuselage.

Much the same applies to the wood you need for the wings and tail surfaces. Main members, such as wing spar and leading edge should be quite firm because these are the parts taking all the flying loads. Medium balsa is fine for everything else. Save the lightest, and exorbitantly priced, 'competition' grade wood until you are more used to working with these small models - after all, a model that never gets finished because you keep crushing the poor little thing is of no use to anyone.

### Heavy metal

No, not my favourite genre of music (yes, I'm afraid I'm just an old headbanger at heart), I'm talking about the wire components of our model. The thing with wire, any wire, is that it's heavy and should be avoided if at all possible for small models. Where it is needed, use the lightest gauge you feel you can get away with. If it isn't quite as stiff as you'd like, landing gear being an area that comes to mind, hard balsa or bass wood fairings will serve to stiffen things up without adding

too much weight. You'll probably need fairings anyway, so they may as well work for you.

Another alternative, and only the particular model you choose to build will determine whether or not it's applicable, is to just use bass or thin ply for the landing gear. You could also replace the wire parts with carbon rod, but that sometimes proves a bit fragile.

Similarly, if at all possible, replace wire struts with ply or bass. Rubber power models often use balsa struts, and these too should be replaced with bass or ply - the one and only area where we are allowed to add weight rather than remove it.

### Overview

It doesn't really matter what model you choose to build. As long as it's an easy to fly prototype, be it scale or an attractive sport design, and you feel capable of building and converting it that's all that matters. At this stage you want a model that will virtually fly itself whilst still allowing you to choose where it flies and for how long and, more importantly, where it lands and what sort of arrival it is.

Choose your wood carefully and keep thinking 'lightweight' throughout the build. Don't be tempted to 'improve' the strength of the model because you probably won't be, just making it heavier. An adage I often use is that weight is the key to success with these models; the lighter the weight, the more likely you are to succeed. The beauty of a lightweight model is that, barring a worst-case scenario, when things don't go quite according to plan, there isn't enough mass or speed to cause any major damage. Often a minor 'prang' causes no damage at all and you just carry on flying the model.. What damage there may be will be minor in nature and can often be repaired at the flying field - remember to take a tube of CA glue with you.

There you have it, a brief tutorial on how to build small models for electric flight. Much of what has been discussed here can also be applied to larger models too. There are, however, certain points that are specifically worth looking into for those models so you know pretty much what to expect next time around. In the meantime, if you want to contact me I can be found at:

PETERRAKE@aol.com ■

# Classifieds



## For Sale

**AERO WWI Magazine.** The Journal of the early Aero-plane. Packed with Vintage information. 9 copies Circa 1984. Offers and more details a\_c\_usher@yahoo.co.uk

**SKYWAYS Magazine.** The Journal of the Airplane 1920-1940. Packed with Early Aviation Information. 11 Issues 1 - 12. No issue 6. Offers and more details a\_c\_usher@yahoo.co.uk

### ENGINES -

E.D.Bee, paw 1.49, Am 25 and cox texaco 0.049, All £25  
Co2 motors -  
Cox 0.49 With co2 conversion £25. New model teknik gm-300t twin with r/c throttle £60  
Gasperin g-24 (new) £25  
Brown campus a-23 (new) £30. 2 Telco co2 motors £15 each. Ceto micro receiver & 4 servo to work with futaba transmitter £50  
13 Scale aircrafts 18-28 inch spans suitable for rubber or co2 power - £50 the lot  
All items collectable or plus p&p  
Contact: Malcolm walls 01262.420611 (east yorkshire)

**Model aircraft,** Hi Boy 62.5" wingspan with engine and servos, concept 3D helicopter with engine, servos and gyro. PCM high quality 5 channel radio model Net J35P electric engine starter, purpose made spares tray, control panel, fuel pump used very little and in excellent condition. New batteries needed.

Price: £350 ono.  
Contact: 01787 228133.

**Vintage Sanwa** "green" 4 channel 27mhz SP41T plus SP41R Rx. Including set X'Tails 4 SM391 1/2 servos plus 2 switch harnesses. Needs new Tx Nicads.

Price: Offers.  
Contact: john.seacombe@wanadoo.fr  
0033 545 29 03 56.

**Spring air retracts,** 1 pair, suit 5mm or 3/16" legs for up to 15lb model. With all air accessories and instructions. Good condition.

Price: £35 plus £1.95 p&p  
Contact: 01535 663137  
Yorkshire.

**Still have over 40 motors** for sale including diesels. contact for a list. Will trade for pre 1945 Aeromodeller mags.

Contact: gray37@sky.com

**Miles Hawk Speed 6,** Phil Kent design, 86" wing span, airframe only and all servos.

Price : £250 or VNO  
Contact: 0151 486 2495.  
Liverpool.

**Aeromodeller annual 1951,** original cost 5 shillings, average wage £7? i purchased two in the same year by mistake.

Price: £19.50  
Contact: 01733 553745  
marriottsolent@talktalk.net

## Wanted

**Small diesel engines** or broken for spares aircraft kit. Single channel gear. Frequency monitor 27hz or 35hz. Top price paid.

Contact: 01782 317815.  
07547 182338. Stoke on Trent.

**Looking for complete kit,** Vernon Cardinal free flight model.

Contact: 07546 450456.

**Gliders large vintage** balsa, 100 inch plus, repairs accepted.

Contact: 01769 540490.

**Copy of Air Enthusiast** quarterly No 3 or Article "Those Benighted Rolands" By P. M. Grosz.

Contact: 01484 711406.

**Rustler Tiger Mk3** in excellent condition.

Contact: 07876 447246.  
steve@drennan999@btinternet.com

**KeilKraft "3/9P" kits** particularly JRTs, 1950s, Chevron boxes only. High prices paid. Plan copies would be helpful if kits unavailable.

Contact: 02392 527202.

A unique reader service, send us a good colour picture of your model and we will print it with your description at no cost. Alternatively have your free private lineage classified featured in FLYING SCALE MODELS. Just send it to one of these options:



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- Comfortable fit - rubber nose pieces and side-arm inserts, plus good flex in the frames, ensure you'll feel great wearing them
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- Polarised Nimbus and Innovation Plus sunglasses have not one but two sets of polarised interchangeables, a light-enhancing set and smoked Cat 4's, all for an amazing £44.99 UK RRP (See the next page for more information on polarisation)
- Worn by many of today's top pilots, including 3D Helicopter Champion Dominik Haegele, plus F3A legends Wolfgang and Roland Matt, and Sebastiano Silvestri



### ACE

Ace sunglasses have been specifically designed and manufactured for radio controlled modellers, with interchangeable lenses for different light conditions

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# SPEKTRUM SERVOS WHEN CONTROL COUNTS

Spektrum gives you more than the best 2.4GHz technology available. It also gives you a rapidly growing line of high-performance servos for everything from sub micro helis to giant scale 3D models. And all are engineered to last with the best gear train components and the latest in processor and motor technology.

A2010 2.5 gram Ultra Micro Servo



2.5g  
18.1x8.0x16.9  
.08/0.06 (3.3/4.8v)  
0.11 @ 3.3v-0.18 @ 4.8v

**ULTRA MICRO**

A2020 Nanolite Servo



4.1g  
19.7x8.3x22.8  
0.08 @ 4.8V  
0.86 @ 4.8v

**NANOLITE**

A3010 Digital Hi Speed Servo



8.6g  
23.6x11.5x25.5  
.09/.08 (4.8/6.0v)  
1.3 @ 4.8v-1.6 @ 6.0v

**SUB MICRO**

A3020 Hi Speed Aircraft MG Servo



12.6g  
23.6x11.5x25.5  
.09/.08 (4.8/6.0v)  
1.3 @ 4.8v-1.6 @ 6.0v

**SUB MICRO**

A3030 Digital Hi Torque Servo



8.6g  
23.6x11.5x25.5  
.12/.10 (4.8/6.0v)  
1.66 @ 4.8v-2.0 @ 6.0v

**SUB MICRO**

A3040 Digital Hi Speed MG Servo



12.6g  
23.6x11.5x25.5  
.12/.10 (4.8/6.0v)  
1.66 @ 4.8v-2.0 @ 6.0v

**SUB MICRO**

A4000 Micro Servo



17.2g  
28.0x12.7x27.4  
.14/.11 (4.8/6.0v)  
2.5 @ 4.8v-3.0 @ 6.0v

**MICRO**

A4010 Micro Servo



17.2g  
28.0x12.7x27.4  
.14/.11 (4.8/6.0v)  
2.5 @ 4.8v-3.0 @ 6.0v

**MICRO**

A4020 Digital Aircraft MG Servo



20.0g  
28.0x12.7x27.4  
.14/.11 (4.8/6.0v)  
2.5 @ 4.8v-3.0 @ 6.0v

**MICRO**

A5030 Mini Digital Aircraft Servo



21.6g  
28.0x14.7x27.4  
.12/.10 (4.8/6.0v)  
1.4 @ 4.8v-1.8 @ 6.0v

**MINI**

A5040 Mini Digital Aircraft MG Servo



23.6g  
28.0x14.7x27.4  
.12/.10 (4.8/6.0v)  
1.4 @ 4.8v-1.8 @ 6.0v

**MINI**


A6000 Sport Aircraft Servo 6.5Kg



42.0g  
41x20x39  
0.14 sec (6.0v)  
6.5 @ 6.0v

**STANDARD**

A6010 Sport Aircraft Servo 7.2Kg



49.0g  
41x20x39  
0.14 sec (6.0v)  
7.2 @ 6.0v

**STANDARD**

A6020 Digital Aircraft Servo 10.5Kg



42.0g  
41x20x39  
0.19 sec (6.0v)  
10.5 @ 6.0v

**STANDARD**

A6030 High Torque Aircraft Servo 20Kg v A6050 Standard Aircraft Servo



52.4g  
41x20x39  
0.15 sec (6.0v)  
20.5 @ 6.0v

**STANDARD**



36.5g  
38.3x18.4x36.6  
.16/.14 (4.8/6.0v)  
1.3 @ 4.8v-1.6 @ 6.0v

**STANDARD**

A6060 Standard Digital Aircraft Servo



36.5g  
38.3x18.4x36.6  
.16/.14 (4.8/6.0v)  
1.3 @ 4.8v-1.6 @ 6.0v

**STANDARD**

A6110 High Voltage Standard Servo



36.5g  
38.3x18.4x36.6  
0.2/.14 (6.0/7.4v)  
4.1 @ 6.0v-5.5 @ 7.4v

**STANDARD**

A7000 Retract Aircraft Servo



42g  
44.0x22.2x27.3  
1.5/.12 (4.8v/6.0v)  
17.3 @ 4.8v-18.7 @ 6.0v

**RETRACT**

A7040 High Voltage Retract Servo



42.0g  
44.0x22.2x27.3  
1.92/.139 (6.0/7.4v)  
14.0 @ 6.0v-19.2 @ 7.4v

**RETRACT**

A7010 Thin Wing Servo



14.5g  
27.4x10x27.2  
.13/.11 (4.8/6.0v)  
3.3 @ 4.8v-3.5 @ 6.0v

**WING**

A7020 Digital Wing Servo



14.5g  
27.4x10x27.2  
.11/.09 (4.8/6.0v)  
3.4 @ 4.8v-3.6 @ 6.0v










**WING**

A7030 High Voltage Wing Servo



14.5g  
27.4x10x27.2  
.22/.15 (6.0/7.4v)  
2.5 @ 6.0v-3.5 @ 7.4v

**THIN WING**

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