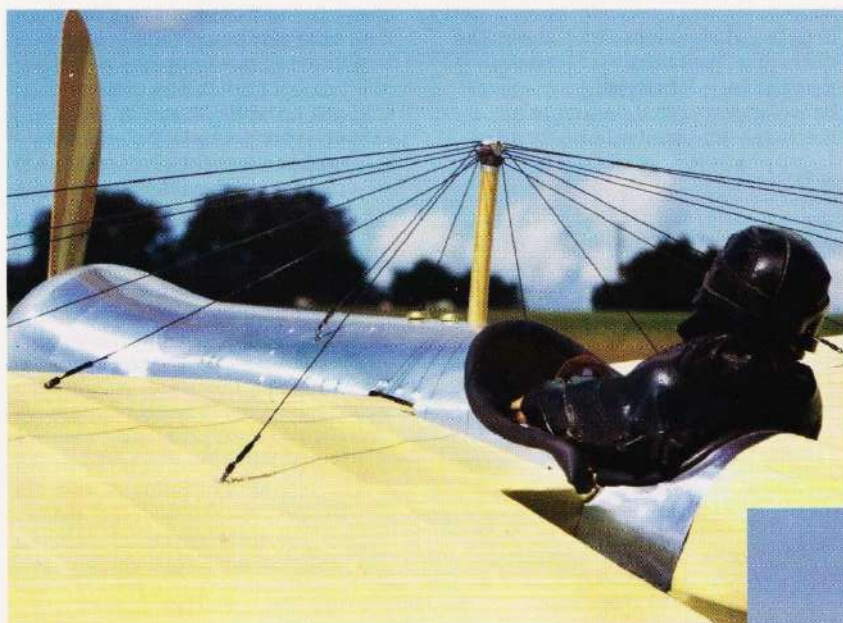


BLACKBURN MONOPLANE

ALEX WHITTAKER RETURNS TO THE DAYS OF PIONEERING AVIATION WITH HIS 1912 TIME MACHINE



and an 11" chord, she offers quite a bit of surface area to the air - much like the original. Although this is a sports-scale model, her proportions are as close to the full-size aircraft as I could manage, and I think she's turned out looking fairly authentic.

Being flown on her rudder, elevator and throttle means that, as well as period looks, the Blackburn has an authentic feel, too. Nevertheless, this nostalgia has its drawbacks: the aerofoil section is very slim, for example, and the model's balsa-and-ply cantilever wing quite literally depends upon its fishing-trace bracing. Similarly, although she'll get off tarmac on those scale Flair 3 1/4" Vintage wheels

A little something to whet the appetite - I'll tell you how she flies in the next issue.

To my eyes, Edwardian design has always combined elegance and practicality. Take the Blackburn 1912 monoplane, for instance. For all that its name suggests Northern qualities of dependability and industriousness, its refined and stylish lines evoke memories of a confident and outward-looking England in which the gentleman aviator enjoyed the brief Edwardian summer before the Great War brought an end to the era. The 1912 is equally refined aerodynamically, too: she's a fully formed and practical monoplane, built at a time when her contemporaries were still braced and be-strutted biplanes. No doubt the Blackburn's English designers were influenced by the efficiency and simplicity of the earlier Bleriot, but beyond this the 1912 remains idiosyncratically English.

SCALE CHARACTER

Built for an O.S. .52 Surpass four-stroke engine, my prototype 1912 weighs 4 1/2 lbs ready to fly (of which, one whole pound is the undercarriage), but with a 43" fuselage, a span of 56"



with no trouble, you may need to fit larger non-scale wheels when flying off grass. Anyway, assuming you're ready for this sort of pioneering experience, we'll get started.

An elegant and practical Edwardian design.

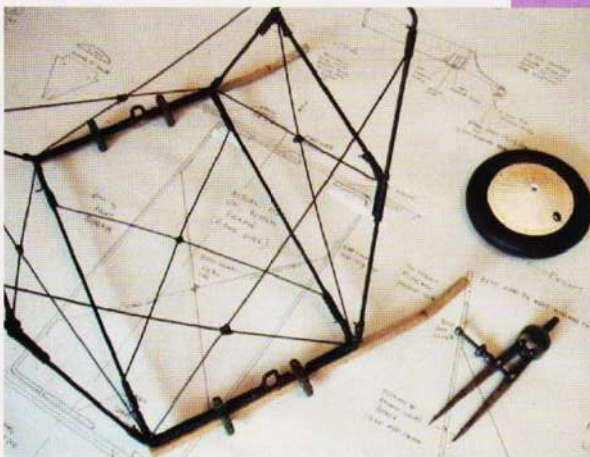
FUSELAGE

The predominantly balsa-built fuselage is made from a number of simple triangular 1/4" sheet formers linked at the bottom by a 1/2 x 1/4" keel and two 1/4" top stringers.



TOP LEFT: Tail feathers comprise liteply reinforcements, tinned copper wire hinges and piano wire rudder bearings.

The trickiest part of the build, but the most satisfying. The black nylon collar inboard of the wheel acts as a spacer-bearing. The axle is shown here at the top of its upwards travel.



Enjoy wire bending? If not, wire you looking? This gives you some idea of the completed wire work on the undercart before the wood is added.

At the front, the top stringers meet two same-size spruce (or ramin) stringers, which take the weight of the engine.

I built the fuselage inverted over the plan, with these upper stringers pinned to the board and all the formers cyano'd in place. To make life easier I also drilled the formers to take the control wires before gluing them in place. In addition, former No.1 - the engine bulkhead - was faced with liteply and fretted out to allow the pipes of the built-in tin tank to poke through. Next came the keel, followed by cross-strutting for the rear fuselage which adds both strength and scale appearance, making

for an assembly is that's very rigid but surprisingly light.

A simple ply tray is all that's required to mount the engine, and Micro-Mold or SLEC nylon piano-wire saddles are fitted to the 1/4" - square spruce (or ramin) undercarriage bearers ready to receive the undercarriage assembly.

At this stage, the forward upper fuselage is sheeted with liteply supported on balsa formers, though like the forward lower fuselage - which is sheeted in balsa and covered in



Using commercial leading and trailing edges and a fair bit of 1/4" square balsa the Blackburn's airframe is quick and simple to build.

Solartex - it will eventually be wrapped in polished aluminium litho' sheet. The distinctive Blackburn rear decking, meanwhile, is fabricated from square balsa longerons laid on simple un-notched semi-circular balsa formers.



My model has fewer of these formers than the real aircraft, and they're of a wider scale section, but you'd have to be looking closely to spot the difference! Besides, my design's not only quicker and just as effective, but also means that the 1/4" sq. balsa tail fits the rear decking exactly.

ENGINE & FUEL TANK

The real 1912 has a seven-cylinder Gnome rotary engine, of course, so to help disguise the model's O.S. Surpass .53 FS, I installed it inverted. This does bring the four-stroke's updraught carburettor very close to the bottom of the tank, however, which isn't an ideal position, but it works well enough.

This design also called for a built-in custom-made triangular tin tank to make best use of the space available in the triangular fuel bay.

You can fabricate the tank using model shop tin plate, which bends easily, can be cut with scissors, and is very easy to form using a ruler or bench edge. Allowing for a 1/4" overlap seam to receive the two flat

triangular end caps, make a dummy tank from cardboard to match your bay, then use this template to cut the real one out from the tin plate and solder it up with soft solder. It's actually a very simple job and it'll

take you less than half an hour to make, though as the tank is built-in you've got to ensure that it really is leak proof before you bury it. Finally, the feed and pressure tubes are made from short lengths of brass tube. There's no clunk since, as you won't be flying aeros (!) you won't need one.

Given the relative position of the fuel feed pipe and carburettor, I've prevented siphoning by running a loop of tubing from the tank fuel feed, up above the carburettor level, and then back down to the carb' inlet. To refuel, you simply pull this tube off.

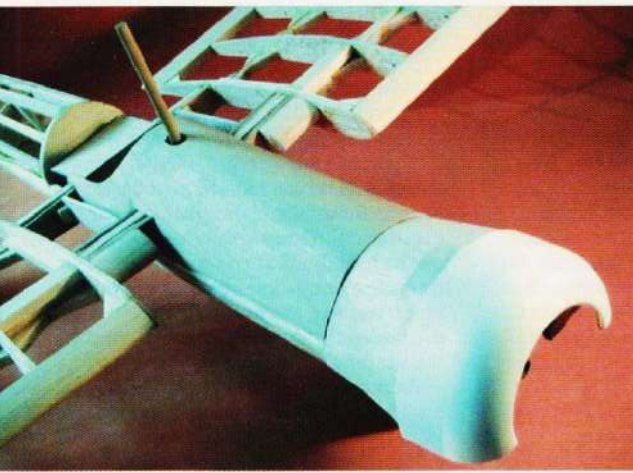
The engine half-cowl can be fashioned from balsa, or you could do as I did and choose a simple ABS cowl. You'll probably find one in your model shop or even the supermarket aisles, but you could also try Vortex Vacforms (www.vortex-vacforms.co.uk). Spray the cowl with car-shop aluminium paint, and screw it on.

In flight trials, I found that the only drawback to this inverted engine installation is that it makes using a glow start a pain: a remote glow is a much more convenient arrangement.

BUILDING THE WINGS

Being of parallel chord with simplified flat sheet tips, the wings are extremely simple and quick to build. After cutting out all the wing ribs, it took me less than an hour to make the basic panels - and I'm a slow builder.

The inimitable Fred Webb, Steve Webb's father, helped me choose the good stiff, speckled, quarter-grain stock for the Blackburn's ribs (Selecting balsa, by the way, can be an almost mystical experience, and one which I commend to you all).



FAR LEFT: Detail of the ABS cowling and the liteply sub-cowling before the litho sheet is added.

LEFT: Forward cowling decking is easily modelled in litho sheet using the template detailed on the plan.

After cutting out the ribs from the plan template, I employed the 'sandwich method' to finish them - pinning together a number of roughly-cut, slightly oversize blanks, and then sanding them as a block.

Commercial stock, from the model shop, was used for the leading and trailing edge, but note how the front and rear of the ribs need to be angled to match the stock that you use. When it came to the spars, I opted for the strength of spruce in view of the relatively shallow depth of the wing and its generous chord and span. On reflection, I think you could get away with balsa spars, and thereby make a useful saving on weight. However, if you intend to have the world's first bunting 1912, stick with the spruce.

Be sure to add all the simple gussets and reinforcements shown on the plan - they do matter. I used 1/4" square ramin reinforcements for all the wing-bracing anchor points, which retain the miniature split pins used to secure the nylon-covered fishing trace rigging. You should trial-fit the split pins at this stage, but don't epoxy them into the wing until after covering.

Like the forward fuselage top section, the upper fuselage centre-section is built up as an integral part of the wings from balsa formers with liteply sheeting. The wings themselves are joined with six simple ply dihedral braces, some which must be notched to clear the fuselage longerons. None of these elements will be visible on the finished model. The whole wing assembly is retained by two dowel pegs and a single bolt, which mates with a captive nut crimped and glued to a simple transverse ply plate within the fuselage. Remember to fill the thread with Vaseline before you epoxy up the nut, and let the glue go off properly before you fit the plate: if it falls off inside a completed fuselage, it's the very Devil to fit a new one. Don't ask me how I know...

TAIL FEATHERS

Since the 1912 has neither ailerons nor wing-warping, all flying control comes from its tail feathers, which are a doddle to make since they are mainly made directly over the plan from 1/4 square balsa. The scale semi-circular reinforcements are from liteply, which I stamped out from the sheet using Chinese wad punches bought from a market tool stall.

Rudder and elevator controls are a closed-loop set-up, and being a savage I just used crimped nylon-coated fishing trace and didn't allow for any adjustment. It would be better, of course, to add a closed-loop adjuster of the sort you can buy from Micro-Mold or SLEC, though space is a bit tight.

In the meantime, in a bid to be scale-like, I hinged the rudder with tinned copper wire wrapped around

centre of gravity - and is accessed from below through a small hole.

Since the elevators are split, there are lots of traces running to and from the elevator and rudder servos. To prevent them fouling each other, I



separated these wire runs horizontally by using a sheet of celluloid which, since it's transparent, makes quick visual checks easy.

The throttle servo, meanwhile, requires an interesting bend in the piano wire pushrod, but it's simple enough - especially if you establish the correct shape with very light bendy wire before copying it over

The Hon. Thomas Algernon Blacklock relaxing after a cross-country flight. Helmet, gloves, jacket, and goggles are all made from old shoe leather.

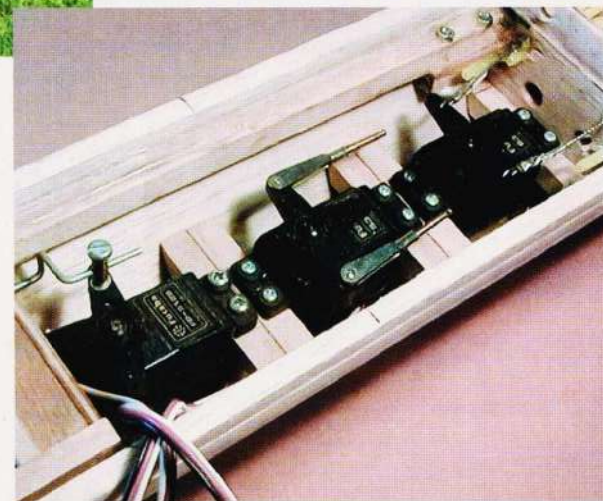
The three servos are mounted line-astern on ramin cross straps.



the piano wire rudder post, which in turn supports the ramin-sheathed tail-skid. I realise that this arrangement introduces a metal-to-metal bearing (as does the engine, I suppose), but there have been no problems with electronic noise.

FITTING THE RADIO

Or should that be wireless? Whichever, the three standard servos are mounted in line astern in the bottom of the V-shaped fuselage on simple 1/4" square ramin cross-braces. The receiver is tucked under the wing-top cowling - a location which helps to achieve a good forward





Easy-Solder K+S tin sheet is superb to work with and easily cut with scissors, but don't get it greasy by handling it. Note the card template with the 1/4" overlap joint marked.

to proper stiff piano wire. The switch is mounted through the fuselage, out of sight under the wing, and the pilot sits on the charge lead, hiding the plug under his leather jacket.

UNDERCARRIAGE

This looks complex, but taken methodically (and using a SLEC wire bender held in a vise, as I did) it's quite straightforward.



Part of the fuselage is actually integral with the wing. Underlying half-round formers are simply wrapped with liteply sheet.

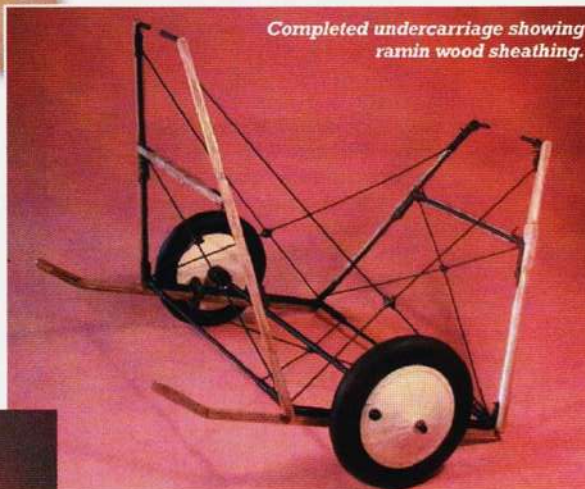
Oh alright, I threw away a few bits of badly bent wire making the prototype, it's true. But for me, the undercarriage was the single most satisfying part of the Blackburn to make since the finished object looks very scale-like.

Essentially, this is a piano-wire structure sheathed in 1/4" ramin (or spruce). The secret is to make the rectangular undercarriage base first and get it absolutely square. Then make up the two U-shaped main side-frames, and the various spacers and cross-spreaders, in pairs. In this way you are assured of overall accuracy. Before starting to solder, clean the piano wire with hot soapy water, then scour it with wire wool. Next, assemble every joint dry with tinned copper wire (not fuse wire) before soft soldering using the biggest iron you can beg, borrow, or half-inch. If you avoid touching any of the previously-cleaned joints with your fingers, and

use flux-cored electronics solder, all will be well. Just remember to wash the cooled, completed joints in hot soapy water to neutralise the flux.

The undercarriage is sprung with elastic bands, or miniature bungee cord, and a U-shaped piano wire fitting used to limit the cross-axle's upward travel.

For that scale feel, I used Flair wheels with the Antique Solartex covering that was first ironed and then sewn to the wheel rim through a series of 1mm holes drilled equidistantly at a 2mm pitch. To form stub axles for the wheels, use short



lengths of brass, cross-drilled for split pins, pushed over the ends of the axle and soldered into place. Fit simple nylon spacer-bearings mounted on the axle inboard of the wheels to keep them centred on the undercarriage.

The whole piano wire assembly was sprayed with matt black acrylic before the varnished ramin sheathings were epoxy glued into place. Mechanising the job of routing a slot in the ramin to accommodate the wire isn't expensive: I performed the task on a £40 Clarke's drill press with the aid of a £25 cross-vise and a £1 milling cutter which exactly matched the diameter of the piano wire.

Alternatively, you can use a round-section Swiss file to simply cut a groove in the ramin. Either way, if you get it right the ramin is a click-fit on the piano wire, even without the epoxy. Since it sits in the engine's slip-stream, the undercarriage was the only part of the model that I fuel-proofed.

As mentioned, the completed undercarriage is spring-fitted into the four nylon saddles inside the fuselage, just below the wings. This is not only simple, but affords a measure of crash protection. I went for scale-like undercarriage blocks made from home-milled aluminium to secure the distinctive longhorn skids to the main undercarriage frame, but you could dispense with these altogether, of course, and solder-up the whole lot.

COVERING & DETAILING

The airframe is covered with Antique Solartex, a superb, authentic-looking material that's also very tough. The upper fuselage litho' cowling and the lower front-fuselage litho' sheeting are applied directly to the previously covered wooden structure. You can use the template on the plan as a basis for your own cowling, trimming it down to your model's dimensions, then applying the rivet effect from the inside of the sheet using an old biro. After gluing the litho' sheet to the airframe, polish it with Solvol Autosol.

The oil and fuel filler caps (one of which hides the wing-retaining bolt) fitted to the top of the cowling are easily made using brass paper fasteners from an office supplies store or your local WH Smith. These fasteners, by the way, are also ideal for making the distinctive Blackburn brass 'contact' switch.

Onto the cockpit, and the instrument panel was made from a photocopied picture of the real thing, scaled down to size and then used as a marking-out template for the varnished liteply



dashboard: specially made instruments and photocopied warning labels were then added.

The distinctive Blackburn steering wheel was fabricated from fretted liteply sheet with a heavy meniscus of yacht varnish to shape the rim. Its spokes are made from litho' sheet, with a tiny steel washer for the boss.

Litho' sheet also served for all the sheet metal fittings, such as on the tail, and those triangular fishplates through which the rigging wires pass on the flying surfaces. When painted matt grey, the effect is surprisingly authentic - as authentic, I thought, as the pilot's flying suit, goggles, gloves and helmet, which were made up from scraps of shoe leather, and the cockpit trim made of the rubber insulation from an old mains cable.

Last of all came the rigging. The wing pylon is made of pine dowel with litho' fittings bound on with black cotton and located in a hole drilled in the wing dihedral braces. All the rigging is 20 lb nylon-coated fishing trace retained by the sort of small crimps you can buy from fishing shops (matt black wire and crimps look best). The top rigging is permanent, but the bottom rigging wires use M2 clevises which allow the wing to be stored half-rigged. Fitting the wing at the field then, merely involves springing four clevises into place.

Standing back and admiring my

Blackburn, I had to admit it - she looked good! Next month we'll move on to the final checks and begin the test flight programme.

FURTHER READING

The Blackburn is easy to build, relying on traditional British modelling techniques and patience. If you require more detail than this month's brief outline, I refer you to my Weekenders column between March and November 2000, which featured detailed information on the building of this particular model.



I based my Blackburn on the celebrated Shuttleworth Collection example, and heartily recommend David Boddington's (v.inexpensive)



Scale Picture Pack (tel. 01933 226427), which formed the basis of my design. DMFC flying pals helped me out, too. John 'Jack' Davies, the Poison Pensioner, loaned me his copy of David Davies and Mike Vines' excellent *Antique and Classic Aircraft* (Chancellor Press: ISBN 1-85152-815-6), which has some superb colour plates. Old mate Ron Maddock actually went to Shuttleworth and took some snaps for me when he was nearby on holiday. And finally, dear Les Bellion dug out an old *Aeroplane Monthly* (January

1998) featuring some ace flying pictures of the Shuttleworth example - whose pilot, incidentally, was the model for my Edwardian aviator.

Attention to detail sees a litho' cowl with rubber edging, a liteply steering wheel, and photocopied instrument faces and legends.

The wing is a simple constant chord affair, with ply dihedral bracing, and local reinforcements for the sheet tips and the rigging anchoring points.

TIME MACHINE

AS THE DUST SETTLES ON DEVELOPMENT AND CONSTRUCTION, ALEX WHITTAKER COMMITS HIS BLACKBURN MONOPLANE TO THE SKIES

Never imagine that just because I scribble for this esteemed organ and live the champagne lifestyle of an overpaid superstar modelling journalist, that everything in my garden is lovely. I have my worries and insecurities too, y'know. Lots of things can run through your mind before the maiden flight of a scratch-built model, to the point of losing a little sleep. You will certainly chide yourself for missing anything vital. Even at this late stage, earlier confidence may be lacking, and firm design decisions may be brought into question. In fact, you can get yourself into a right old state! Immediately before the 1912's first flight, the following niggles were uppermost in my mind:



She flies! Ultimate satisfaction, but not before overcoming a few pre-flight niggles.



- Had I really got the wing section correct?
- Did the chosen power plant adequately match the weight and wing area of the aeroplane?
- Had I got the C of G right?
- Had I got the wheels in exactly the right place for comfortable take-offs and landings?

In designing the Blackburn I'd gone as close to scale as I could, especially for things like the wing section, wing area, undercarriage layout and tail surface outlines. In fact Mr. Blackburn had made most of my decisions for me. So I hoped we'd both got it right.

Okay, I'll spare you the suspense... the first flight of the Blackburn 1912 monoplane went very well, but was not without event. To be truthful I had

still overlooked a few significant practical facts when I arrived at the field for the maiden flight, despite long preparation. That said the model was safe, and nothing had been left to chance in either the engine or radio installation; I'd put in far too many building hours for that.

First, although I had remembered to change the wooden (display) scale prop for the fibreglass flying prop, I had unfortunately forgotten to bring the appropriate prop-nut spanner. At the field I had to ask 'Tucano' Jim to loan me his. "Serpently, Alex," said James beaming, whilst lending me a big shifter which did the trick admirably. My old mate Paul Strawson was also there. Paul is a good man to have around on a test flight, with his vast scale experience and his particular way with O.S. four-strokes.

Ace test pilot Gareth Williams was on hand too, armed with sharp reflexes and his posh trannie.

We all had a bit of a discussion about the C of G. As with all my models I put this bang on the front spar, which is almost always at 25 - 30% chord, as a starting point. As for control, the maximum throws of the Blackburn's rudder are physically limited by the cut-outs in the elevators. So we began thereabouts and worked backwards - finally taking Gareth's advice to try about $\frac{2}{3}$ of the total throw.

Numerous questions go through a designer's mind before a test flight and hasty decisions made in the comfort of the workshop suddenly become much more critical.



Elevator needed a bit more thought. They are big powerful fans on the 1912, so we went for 1/2" up and 1/2" down (at the tips). Gareth borrowed my transmitter crystal and peg, and duly dialled all these parameters into his computer trannie. In a lucid moment I thought it a little incongruous that Gareth was going to fly this simple stick-and-fabric three-channel Blackburn on his all-singing, all-dancing, state-of-the-art, top of the range, blue label Futaba WC-2 ZAP 9. It made me smile, despite the tension.

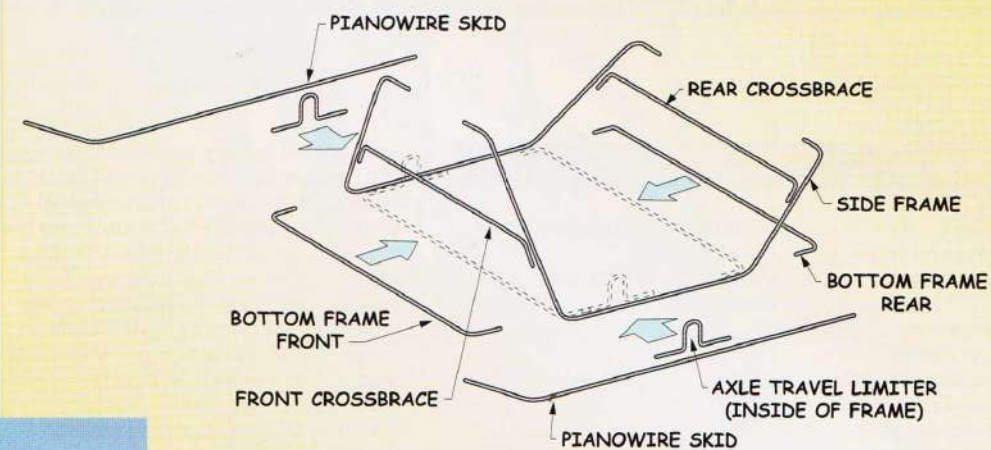
There was a short delay whilst I fuelled up. More teething problems,



which I hadn't quite thought through. You see the Blackburn has a triangular custom-soldered tin tank, shaped like a section of Toblerone tube.



I had deliberately built it without a clunk since I had no intention of aerobating an elegant Edwardian monoplane. Its brass feed pipe exits the fuselage below the carburettor, but there seemed to be a slight problem. Such is the head of fuel, the carburettor was being force-fed for the duration of the top quarter of the tank. There was no real way around this problem that I could see - short of not quite filling the tank. When the issue had occurred to me months earlier at the design stage I sort of glossed over it. I decided to tough it out and opted for a swan neck of fuel tubing, hoping the fuel would not all siphon from the tank into the inverted carburettor.



In the end it worked just fine, but re-fuelling was a bit messy.

The plot thickened. When I came to apply the glow-start to the plug I realised that I should have built in a remote glow plug ignition system. It was really finicky to apply the glow-start from beneath the fuselage, between the wheels

and up through all the undercarriage bracing. Anyhow, we eventually got it fuelled up, and the glow applied. By now my nerves were a bit frayed so I

aerodynamic problems and concentrate on the in-flight pictures. As you can deduce from all this palaver I need an army of supporters to get a new scale model aloft. Paul started the motor almost immediately, and we walked out to the strip. It was at this point that another issue occurred. The scale-sized wheels and my painstakingly accurate undercarriage just sank into the longish, wet grass on the strip. On full chat she just wouldn't roll forward with such little ground clearance, although, of course, she had been perfectly all right on tarmac. Darn! We had a brief pow-wow with the engine still running. At such moments a designer has to be decisive. I said to Gareth that I was for hand-launching the Blackburn... I just couldn't see me toddling off home, fitting bigger wheels overnight and coming back the next day. After all these months of design and build, I wanted to rock and roll! Besides which, the engine was running. Gareth possesses marginally less patience even than I, so like the good mate he is, he understood instantly.

"Okay, Al.," said he, completely matter-of-fact. I held her level and prepared to launch. The Blackburn is an absolute doddle to hand-launch since the undercarriage provides a comfy rest for the heel of your right hand. Two steps forward and checking

Illustrative breakdown of the wire undercarriage assembly - trust me, it's not as bad as it looks.

Yes folks, she's every bit the Edwardian gentleman's flying machine.

The prototype is modelled off the Blackburn that's housed in the Shuttleworth Collection.

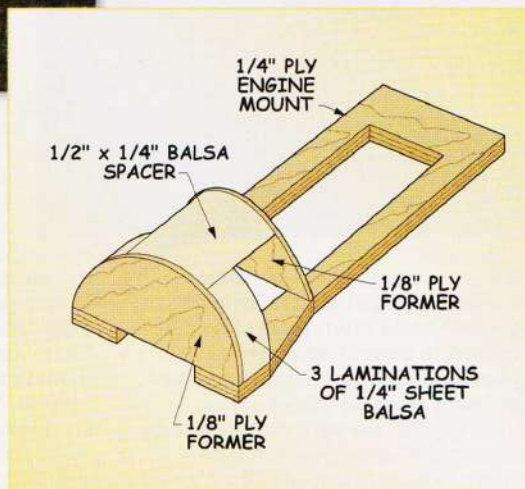
asked Paul Strawson to flick-start the ancient O.S. .40 four-stroke for me, which he cheerfully did.

Paul has a unique distinction. Over the years he has built every kit in the Flair Scout range, and the Blackburn was clearly right up his street. Paul said he liked the 1912 and, tongue in cheek, even suggested that Flair should kit it.

UP, UP AND AWAY

I had no worries about the actual test flight with Gareth on the sticks. I could relax, see how the model was flying, try to decode any

her wings were still absolutely level with the nose slightly down, I pushed her forwards into the air.



Detail of engine mount and forward decking.



DATAFILE

Name:	Blackburn 1912 Monoplane
Designed by:	Alex Whittaker
Model type:	Sport-scale Edwardian monoplane
Wingspan:	56"
Wing chord:	11"
Fuselage length:	44"
Wing area:	616 sq. in.
All-up weight:	4.5 lbs
Wing loading:	16.7oz. sq. ft.
Rec'd power:	.50 four-stroke
Power used:	O.S. .53 Surpass
Rec'd no. channels:	Three
Control functions:	Rudder, elevator, throttle
Wheels:	Flair 3 1/4" (okay for very smooth grass)
Radio used:	Futaba Field Force 6

"Flying across the sun the rays shone through the structure and rigging..."

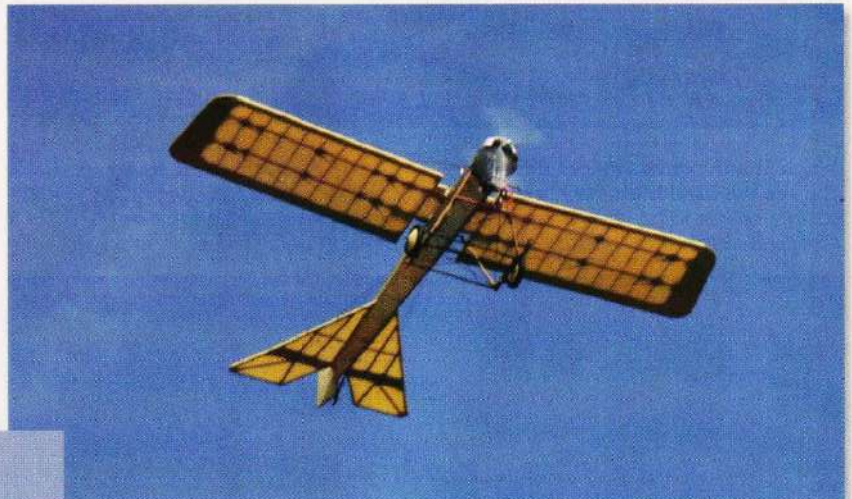
"Gareth wheeled her around back over the strip, and then in for a low pass. The scale pilot really looked as if he was in control..."

It was a relaxing anti-climax - she just sailed from my hand, didn't lose any height, and wafted off into the first circuit. I was absolutely delighted. No fuss, no drama, just an easy transition to perfectly stable flight. When Gareth pulled her gently left, banking into the circuit, I was utterly spellbound. After all those months of planning, reading books, studying photographs, drawing, building and finishing, here she was; floating about in her element. I can't describe the complete satisfaction and contentment of seeing my baby up there dawdling around. As the clichés go, she was worth every minute of the work, every second of the build.

and that my twenty year-old O.S. .40 Mk.1 was a bit marginal and should be replaced. I wasn't at all worried as an O.S. Surpass .53 was sitting idle in the shed, which would take all of ten minutes to swap. The model was certainly flying well enough, but just lacked a bit of power. Speed tests would clearly require a sundial rather than a stopwatch! The flight continued uneventfully, with me grinning like an idiot. The landing debate soon began, since we knew the fuel would be getting low. A couple of those gathered thought that she might dig-in and nose over with such little undercarriage clearance. In the event Gareth landed her right down the strip just like a Flambard, blipping the throttle in a scale-like manner. In fact, he brought her in for an absolute greaser - settling quietly onto her wheels and rolling out for a

became a bit flustered and had forgotten to add the necessary elastic band bungees to the scale undercarriage. In effect I was trying to get the Blackburn to take-off with its wheels at the top of the suspension's travel, thus dragging the bottomed-out undercarriage frame through the grass. Adding the elastic bands dropped the wheels to their proper position and restored the missing ground clearance. Nevertheless, slightly larger diameter wheels should be employed for rough-ish grass fields.

A new but simple commercial remote glow system (donated by Paul) stopped all that fussy bending over and fiddling with a glow-start. Finally, with the O.S. .53 Surpass replacing the O.S. .40 Mk.1 the Blackburn confirmed its character as an entirely practical, everyday flying



Gareth wheeled her around back over the strip, and then in for a low pass. The scale pilot really looked as if he was in control, with jaw set square and tan gloves gripping that big round steering wheel. Flying across the sun the rays shone through the structure and rigging, looking exactly like those famous Old Warden 'sunset' flying shots. To my eyes she looked every inch the Edwardian dragonfly. Gareth commented that control response was very positive

few feet before stopping. As an aside, I noticed that the inverted engine installation kept her remarkably clean.

FLIGHT LESSONS

The one practical restriction inherent in the prototype model was the relatively small size of the built-in tank, which limited flight duration to around twelve minutes. The test flight went far better than I could have hoped, and as a shakedown it pointed out some minor but useful lessons to be learned. In the air the Blackburn is stable, responsive and well harmonised. Landing speed is low and with a nice glide, despite all the draggy rigging. There are no apparent vices, and the model's light enough not to get into trouble. Although I'm biased I think she looks well in the air, too.

I realised that some aspects of starting and ground handling could be improved, beginning with the ground clearance. It was only then that the light dawned. During the hectic last-minute preparations I

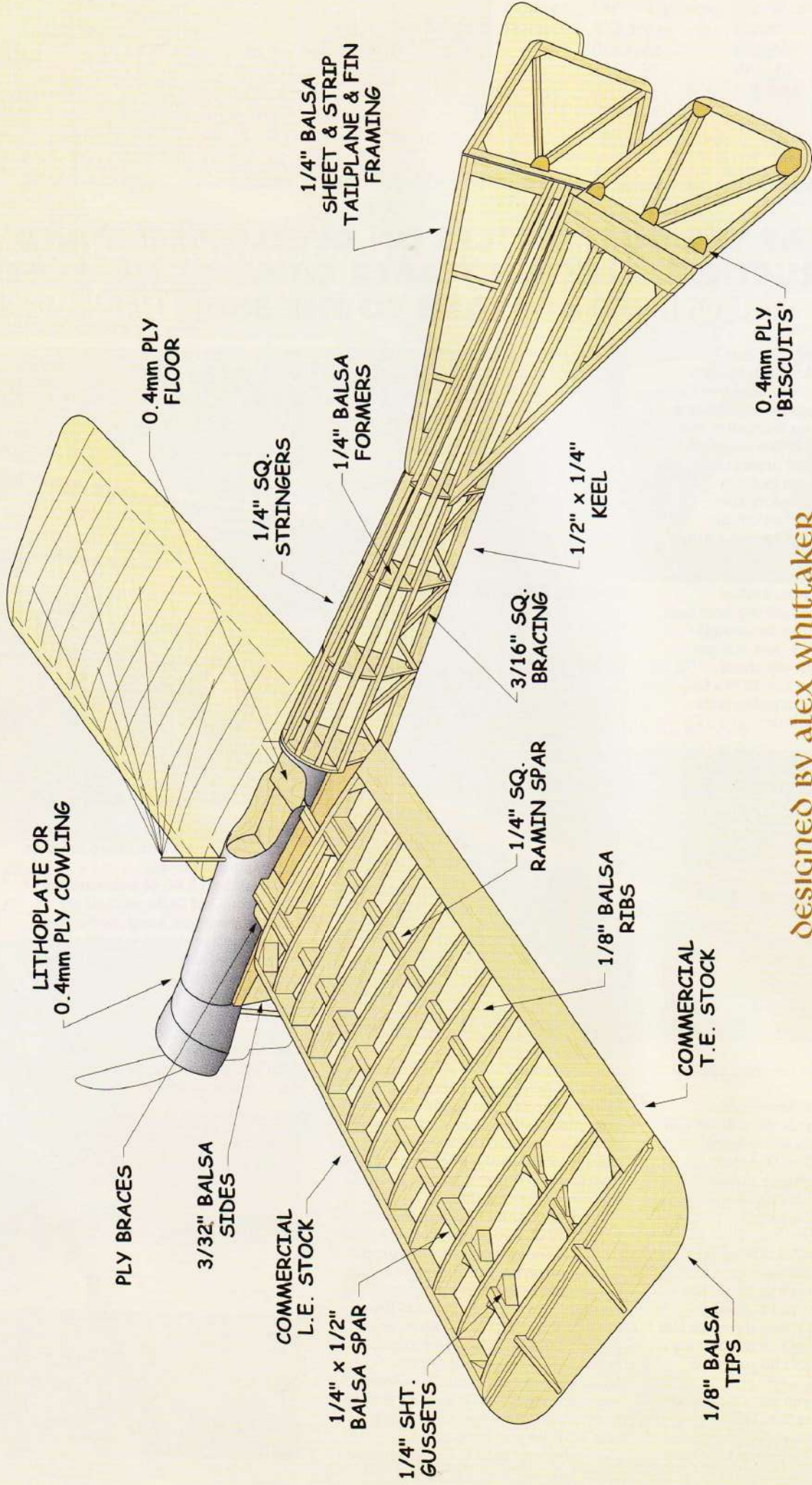
scale model. Gareth pointed out wryly that I seem to like fitting my oldest engines into my newest models!

ACKNOWLEDGEMENTS

Well, that's the story of my little Blackburn. Build a '1912 for yourself and you won't regret it. Quiet and stately, I think she looks her best just pottering about the sky in a westerly sun, the pilot's white scarf blowing in the breeze.

You've got the free plan, so there's no excuse. Get balsa chopping and don't forget to send me a picture of your completed model. Like the Oscars, I must thank my support crew: Gareth Williams - test pilot and philosopher, 'Tucano' Jim Owen - spanner specialist, and Paul Strawson - engine starter and scale adviser par excellence. Finally, I must acknowledge Gordon Whitehead's magisterial book 'Scale Aircraft', Eric Coates' Aeromodeller free-flight scale series (now a Nexus book) and numerous of the great Boddo's sports-scale articles over the years. The published plan was re-drawn from my tatty original by RCM&E's redoubtable Grahame Chambers.

a 56" span sports scale model based on the example in the shuttleworth collection, for 3 function R/C & .40cu.in. 4 strokes



designed by alex whittaker

Blackburn '1912' monoplane