Impington
Model Aeroplane Club
Founded in 1946 by Ray Malmström

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www.impmac.co.uk

Edited by Bryan Gostlow
Distributed by Tony Harper

Setting the bar high

Peter Iliffe delivers another stunning model

Another *Mayfly* at Old Warden and another stunning model from Peter Iliffe. In case you're not sure what you're looking at, well this is a twin ducted fan Me 262 rc model built in Pete's familiar balsa monocoque fashion. What you see has no stringers or formers (any more), it's a 1/16" shell.
He's put a lot of effort into detailing the cockpit and even arranged with David Banks for a bespoke Adolph Galland pilot.

Whilst you're admiring Dave's pilot don't miss the superb moulded canopy and Pete's paint detailing.

The lines are not drawn but masked and air brushed, even the serial number on the fin uses a stencil.

stencilled serial number

servos have come a long way

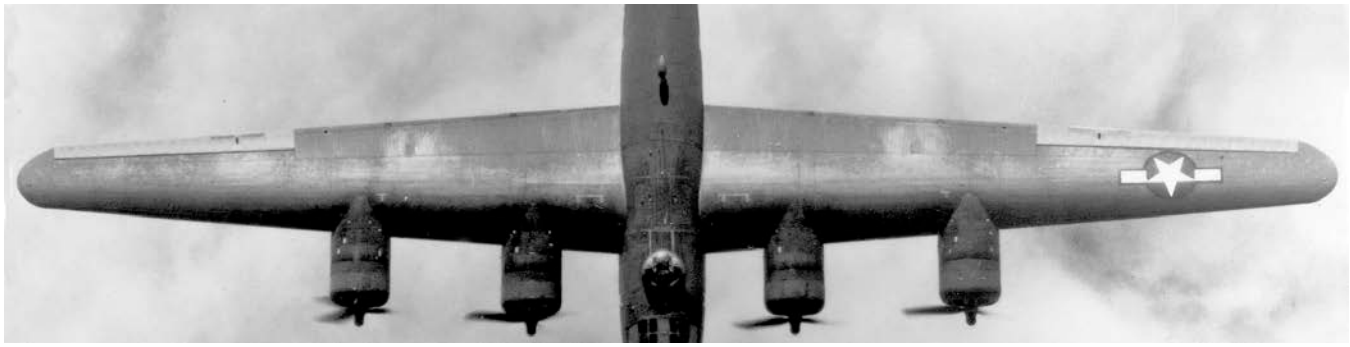
Have you spotted the rudder and elevator linkage in this photo? Maybe not, but would it surprise you to know that there's a servo buried in the fin?

neat isn't the word

Are you inspired?

Best of all – Pete is happy to get the model out of the box and talk about it!

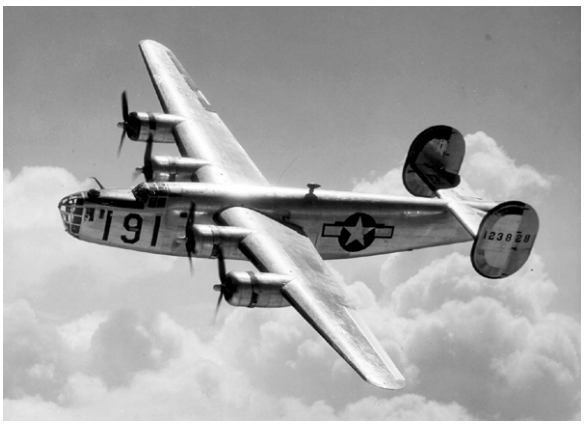
And this is?



In the summer of 1937 a man called Davis walked into the office of the president of Consolidated Aircraft. He had developed a wing "in reverse", starting with a basic low-drag teardrop shape which he went on to modify into a was relatively thick section. Being 'deep' he believed it allowed a high aspect ratio and would offer reduced drag when compared to designs then in use. Better still, it would offer considerable lift at even small angles of attack. Naturally, they sent him packing.
It so happened that Consolidated had a problem with a new flying boat design, the XP4Y Corregidor, which wouldn't unstick. The penny dropped, maybe the Davis section would provide the lift they needed. They called him back.
Consolidated agreed to construct a model for wind tunnel testing at the California Institute of Technology. Initial tests were disappointing but once the instruments were re-calibrated fresh tests showed significantly improved results – so good in fact that they were now unbelievable! More re-calibration and testing followed.

The Davis wing in use on the XP4Y Corregidor vindicating the design

Consolidated were already working on a secret project, a new bomber to replace the Boeing B-17 Flying Fortress. They selected the Davis wing for this new project Model 32 which was to become the B-24 Liberator.
Only later was the reason for the Davis wing's performance properly understood. Largely through accident, the shape maintained laminar flow further back from its leading edge, to about 20 or 30% of chord compared to the 5 to 20% managed by most aerofoil sections of the era. Although other designs later greatly improved on this, with some designs maintaining laminar flow to upwards of 60% of chord, the Davis wing represented a great improvement at the time.



B-24 Liberator and another Davis wing

what prompted this?

Well I'd been thinking about what Mike Gaster had to say in the May newsletter about laminar flow over wings and about work he'd done with his own Lancaster at Cranfield.
Intrigued I got in touch with Cranfield to ask if they had a decent photo. Joy Hardy replied attaching not one but three photos.

thanks to Joy Hardy and Cranfield

It was while reading up on Mike's work on laminar flow that I stumbled on the Davis wing and the story behind the B-24.

So, I took myself off to see the reopened American Air Museum at Duxford hoping to see a Liberator and *that* wing. Don't know what you think, but I felt that the museum is much improved. I enjoyed reading the stories of the people who made, maintained and flew these aircraft . . even the guys who laid the airfields.
Sure enough, there was a B-24 Liberator which you could walk around and see – all except the surface of the wing itself. Blow!

Laminar flow will come up again, by chance, in this newsletter but here's something I *discovered* about Mike's Lancaster. I say discovered but then the first two people I mentioned it to knew about it all along [curse you both, Harper and McIntyre]
Having been preserved as it were by accident, the Cranfield Lancaster was chosen for the Battle of Britain Memorial Flight and so you've probably seen quite a lot of it over the years.

local story

While I was at the American Air Museum I saw this photo of a guy holding up a 108 US gallon drop tank.

Faced with wartime metal shortages, and needing to extend the range of fighter aircraft, these drop tanks were made of Papier-mâché. A British design using resorcinol glue-impregnated kraft paper which could cope with not only the range of temperature they were subjected to but also the effects of the fuel dissolving the glue – for a few hours at least. But you'll never guess where many of the 13,000 were made [keep quiet Harper and McIntyre] only *Spicers paper factory* in Sawston on the southern edge of Cambridge.

Model Junction

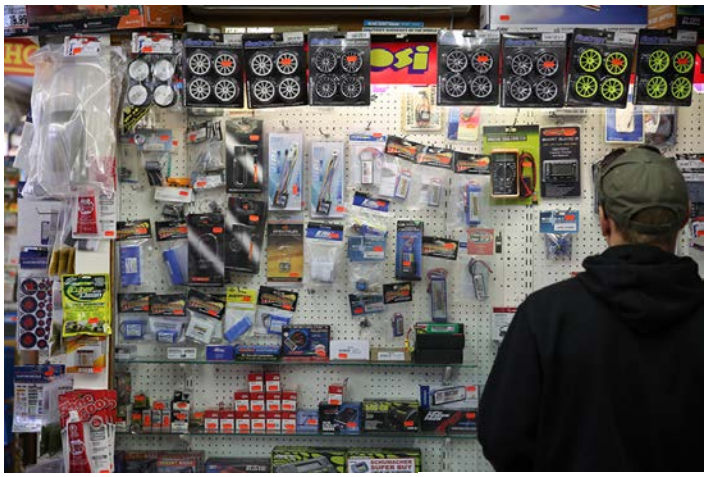
fancy a trip to Bury Saint Edmunds?

Model Junction at 10 Whiting St, Bury Saint Edmunds

I find myself turning more and more to this friendly model shop in Bury. Parking is cheap and there's a tea shop just up the road serving toasted tea cakes – what more could you ask for?

It's my first call for balsa and spruce but they have a good range of other bits and pieces, fittings and glue. GHW – even spinners

balsa, spruce and ply



they pack a lot into a small space

These days no model shop can stock everything, but David and Owen give it their best shot. Above all, you feel you can ask and about anything model related and get informed, friendly advice. They don't have what you want? – not a problem, they'll order it and even put it in the post.

Owen taking a call

If you think Model Junction is just about railways then you're missing a trick.

Mayfly at Old Warden

Sunday in photos

Gordon recovers, but what's the model?

1938 Chambers R-1

You can find a photo on the interweb of Chris S with one of these at Middle Wallop in 2011 where he recorded a 2 m 49s flight. *Easy Built Models*

Clive Anderson, another IVCMAC regular

Steve about to fly, so the chances are Tony is nearby

here he is - worried for a minute there that he's spilt coffee on his coat

Tim Gray, not with a Scarab for once but a 1946 Pigmy

Phil Stubbs brought out his Humbug

Phil also flew his Pushy Plane – featured in AeroModeller July '95

No prizes for guessing the name of this design, but can you name the designer?

and available from Outerzone.co.uk

Paul Jefferies flew this 'Wee Snifter' by Doug McHard

build quality! another view of Peter Burroughs 'Answer'

I've read that the *Answer*, a Gordon Murray design, seemingly ticked all the boxes at Keil Kraft where it was adapted and marketed as the *Scorpion*.
Original plan can still be downloaded from *Outerzone.co.uk*

Ron Johnson's Javelin

Ron explained that he struggled to trim this model until he thought of adding Gurney Flap to the trailing edge. Job done!

look closely and you can make out Mike Staples in the back there

Remember Roger Simmonds at the public meeting back in March talking about how to design and print these models? Well he showed they don't just look pretty but fly well too.

That Cup

a trip to South Kensington

Do you recognise this chap?

When Raymond Fella and I heard that the world's oldest clock and watch collection had found a new home in the Science Museum we took ourselves down to there to have a look. After a break for lunch we went up to the Flight Gallery on the top floor. It was while we were up there that we thought about the chap in this photo – he's Jacques Schneider, balloonist and aircraft enthusiast.

It was while we were looking at the eponymous trophy that Raymond's mind turned to the equally famous Ren Cup.*"You should write about that in a newsletter some time."*

So when we got back I contacted Andrew Moorhouse and asked to borrow the cup for this article.

Now I'm aware that many of you will know a lot more than me about the Ren Cup, first presented to Terry King in 1974, but here goes.

On the base is recorded the names of all those who have won the cup down the years

Ren-models Challenge Trophy

Here's the list:

1974	T. King
1975	R. Malmström
1976	D.F. Sharman
1977	T. King
1978	T. King
1979	V. Simcock
1981	G. Waters
1982	V. Simcock
1983	C. Strachan
1984	T. King
1985	T. King
1986	T. King
1987	R. Fella
1988	R. Pressnell
1991	R. Julian
1992	A. Moorhouse
1993	M. Marshall
1994	M. Marshall
1995	K. Knell

1996	M. Marshall
1997	A. Moorhouse
	M. Marshall
1998	C. Strachan
1999	C. Strachan
2000	T. King
	C. Strachan
2001	C. Strachan
2002	C. Strachan
2003	C. Strachan
2004	T. King
2005	C. Strachan
2006	C. Strachan
2007	C. Strachan
2008	M. Marshall
2009	C. Strachan
2010	C. Strachan
2012	C. Strachan
2013	M. Marshall
2014	A. Moorhouse
2015	A. Moorhouse

If you aspire to win the Ren Cup, just so that your moment of triumph isn't spoilt, you should know that the lid no longer fits all that well. It wobbles. Some say this goes back to the time when Terry King ran over it with his car but I couldn't possibly comment.

And that other trophy, not even a cup, well trust the French to go over the top.

over the top?

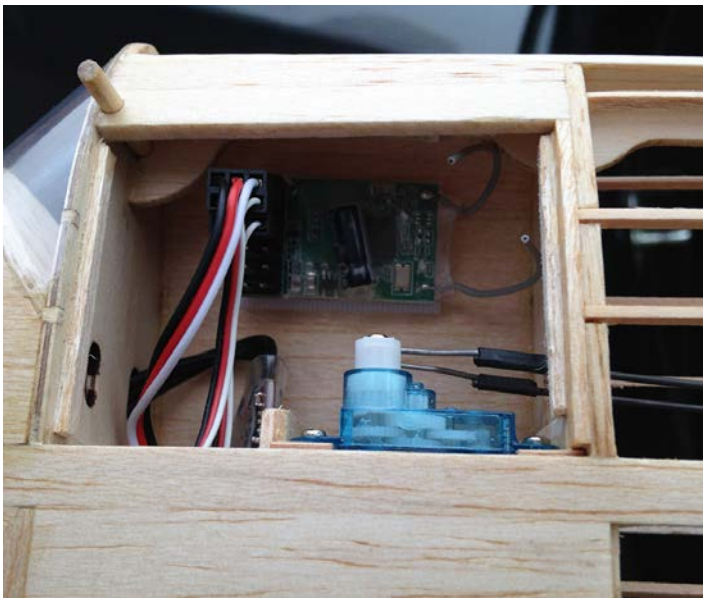
Michael Marshall adds:

This year's Ren Cup competition at Newmarket Wednesday the 22 June at say, 7 pm.
P30 or any rubber model wingspan not exceeding 25 inches, three flights, max to be decided on the night.

Friends of Scarab

an update

Tony Neal has been flying his Scarab for a week or two now and Graham Grant brought his to Old Warden, meanwhile Alan Hunter has been taking a knife to balsa and has come up with a typically ingenious solution.
When I built mine I just buried the receiver behind the main ply former [bringing out a connection in case I ever needed to re-bind]. Alan has gone one further by including a hatch and an ingenious sliding servo tray – not forgetting a hole to view the bind led.



Meanwhile Richard has been wowing us with his flying of the larger Scarab. At 52.5" it is half as large again as the regular 35" version.
I was interested to know how the weight of this larger one would turn out. Averaging the weights of Richard's, Albert's and my own gave 181g or 6.34 oz. Now if you make every part half as big again you get 1.5 x 1.5 x 1.5 = 3.375 times heavier and so we might predict that Richard's large Scarab would weigh 610g or 21.5 oz As it happens Richard's weighs just a tad more at 671g or 23.67 oz but then, as you'll know if you've seen it fly, he's given it plenty of go! A rule of thumb, for gentle flying, you should aim for 50W/lb, maybe more if you're looking for performance. Richard has made do with 149W/lb and the soaring performance reflects this.

I'm pretty well out of the regular kits, but recently one or two people have shown an interest. I've revised the drawing of the tail spar and asked Charlie at the Manzano Laser Works to cut some more of the 52.5" kits.

Tailless Aircraft

Granger Archaeopteryx

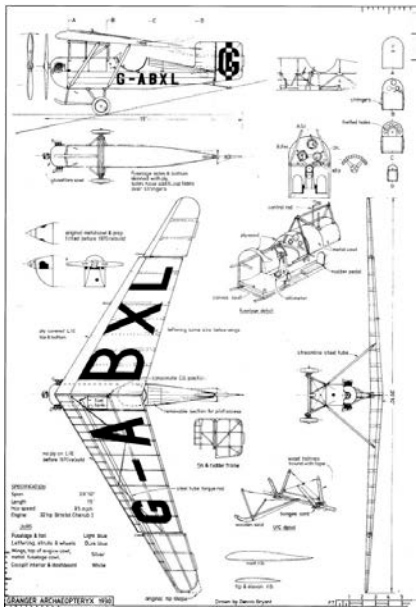
Chris Strachan brought along a delightful tailless model to the March public meeting.

The Granger Archaeopteryx is a British single-engined, tailless parasol monoplane designed and built in the late 1920s by two brothers, R F and R J Granger. Can you believe they taught themselves to fly with this.

Since featuring this little plane in the May newsletter I've tried to interest several people in building one. So far, without any success.

the original flown

I even scraped together a plan of sorts.



With a modern transmitter selecting *elevons* is a as easy as pie and scaled to say 24" or 30" for electric this might make an unusual small field flyer. Any takers?

Brian Golding

Night Heron

After seeing what some of us wrote about Brian in the May newsletter Ivan said, "I've got one of Brian's paintings. Would you like to see it?"

Brian's Night Heron

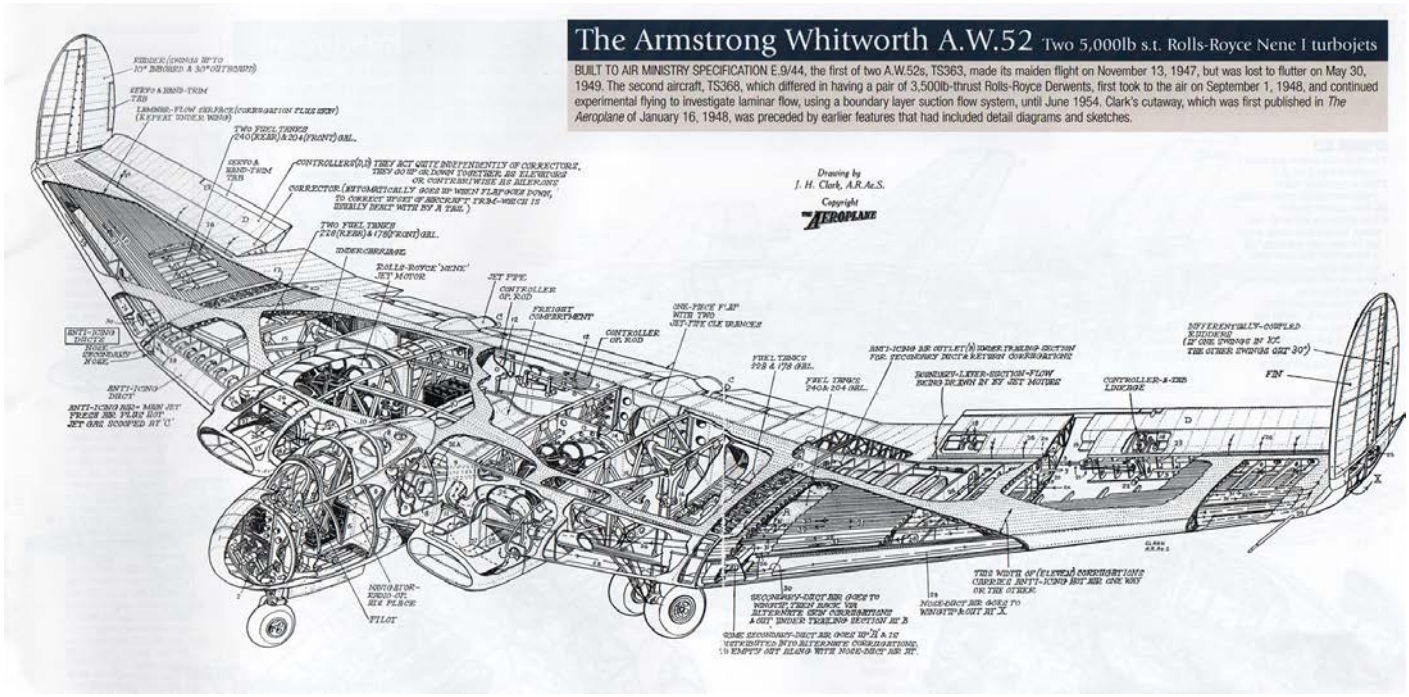
Apart from saying a huge *thank you* to Ivan for letting me see the painting there's really nothing to add.

Advertisement

Margaret has a 16" television with aerial, suitable for Caravan or Mobile home . Good working order and free to a good home.

Cutaways

Armstrong Whitworth A W 52



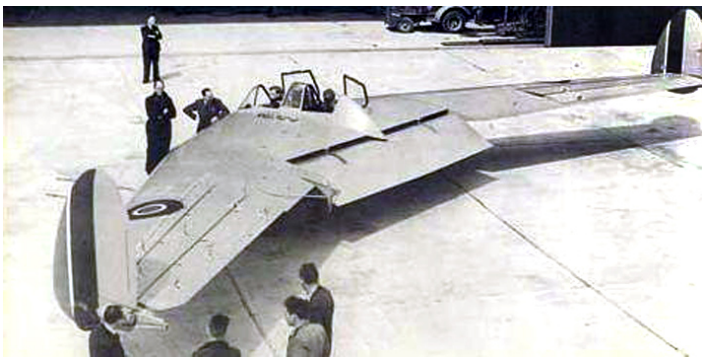
Browsing the stalls at Old Warden I came across a booklet of *Classic Cutaways* from the 1950s. Well, I've always been drawn to cutaways and parted with 50p quite happily. This drawing by J H Clark was first published in *The Aeroplane* of January 1948.

Armstrong Whitworth had been a major manufacturer of other people's designs but as the war ended they proposed a flying wing airliner. Powered by up to six engines this was to be large enough to provide for passenger head-room within the wing. The designer John Lloyd worked closely with Farnborough to develop a laminar flow wing, which was critical to the design. The wings were built with great attention to surface flatness and each was built in two halves [upper and lower] from the outside inwards, starting with pre-formed surfaces. Stringers and ribs were added before the two halves were joined. The resulting surface had a smoothness better than 0.002" or 0.05mm
Lloyd's first wing could be fitted to a Hurricane fuselage and when tested at Farnborough performed quite well, but only for a limited time. As dirt and flies soon accumulated on the surface and broke down the laminar flow.

Sensibly AW began with a largely wooden glider of around 54' span, half the size of the proposed 90' A.W.52 powered version. The airliner was to have been twice as large again.
In tests the glider was towed by a Whitley bomber to 20,000' and released leading to around a 30min test flight to touch down. All this began in March 1945.

Higher speed testing called for the A.W.52 with two Rolls-Royce Nene engines buried in the wings. The crew sat in tandem in a nacelle so that the pilot was just forward of the wing leading edge,providing a better view than in the glider. The pressurised cockpit was slightly off-set to port. The engines were mounted in the wing centre section, close to the centre line and so not disturbing the upper wing surface. By November 1947 the A.W.52 was ready but tests were disappointing as laminar flow could not be maintained so maximum speeds were less than expected.
As in any tailless aircraft, take-off and landing runs were longer than for conventional aircraft because at high angles of attack, downward elevon forces were much greater than those of elevators with their large moment.

In May 1949, while investigating elevon flutter, pilot J Lancaster experienced pitch oscillation at 2 cycles per second. With structural failure imminent he ejected using his Martin-Baker seat, the first pilot to do so in a 'live emergency'.
It was just as well that he was flying alone that day as the second crew member wasn't provided with an ejection seat. Some accounts have the plane recovering and landing in reasonable fashion. note: potential free flight subject



Minimoa

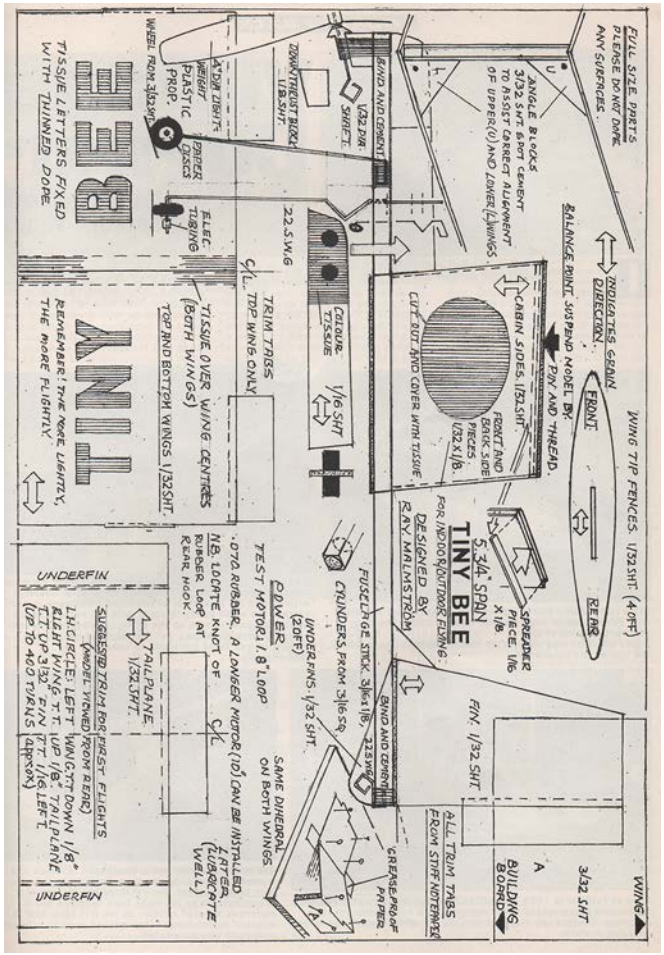
Terry completes his glider

photo: Garry Flack

Garry has been over to see Terry and came back with this photo of Terry's Minimoa.

Ray's Tiny Bee

Aeromodeller February 1997



Richard Staines came across this article in the Aeromodeller and wondered if it was Ray's last published plan. With a span of just 5¾ inches it could well be one of his smallest designs.
With lightweight gear is anyone up for building an rc version of one of Ray's designs?

a prop, *but what was it off?*

Can you identify this prop?

answer revealed in Footnotes

Flugwerft Schleissheim

a trip to Munich

Spot the dummy . . though I'm still not sure why the pilot of the F-104 "Starfighter" in seat 3 paused to untie his boots before ejecting

Many of you will know about the Deutsche Museum in Munich which opened in 1903 and which expanded with the opening of the Flugwerft Schleißheim's Aviation Museum in 199. Established in 1912 as the first airfield for the Royal Bavarian Flying Corps it served both military and civil purposes.I've been hoping to visit for some time.

Lots of full-size as you might imagine and with more than a nod to gliding but aeromodelling isn't neglected.

RTP set up in one gallery

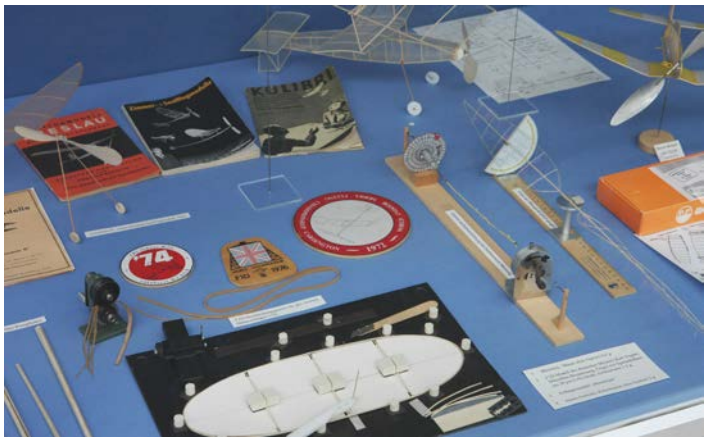
Several times each day a large Zeppelin model of around 5m was flown out of its case and around the exhibits.

I passed a couple of display cases packed with i.c. engines, some more familiar than others.

E. D. Hunter – *I didn't know they'd named an engine after him*

This case was a nice touch, covering the field of indoor flying.

It contained Peanut, NoCal, an F1D with variable pitch prop, a torque meter, building jig as well as sample kits.



Varied and well-presented collections that complement the excellent museums we have here in the UK.

Fairchild F24 W46 in the foreground and a busy gallery behind

Otto Lilienthal gets a gallery almost to himself

Not everything has been moved across from the original Deutsches Museum in the centre of Munich, an example being this unusual Rumpler C IV

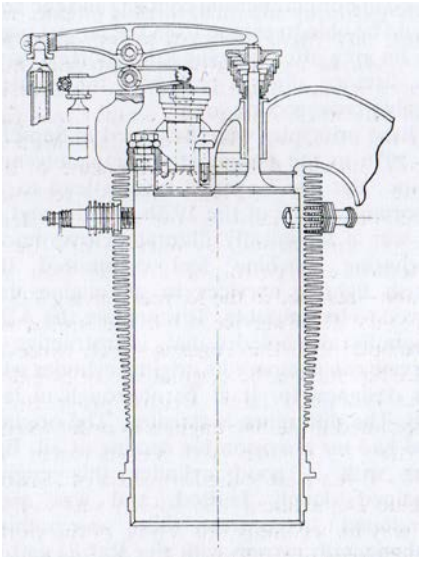
ABC Dragonfly – *cancel the others*

just as well the Armistice came when it did!

January 1918 and British engine supplies were in a state of crisis. Over 400 SE.5a fighters were waiting for engines, while hundreds of others had French-built Hispano-Suiza engines whose reduction gears were unevenly heat-treated and known to be dangerously unreliable.
This was a time when rotary engines were reaching the limits of weight and power. W O Bentley had developed the BR.2, a 230 horse power 9 cylinder engine which powered the Sopwith Snipe and was to be the last type of rotary engine used by the RAF. It weighed 490 lb and used 20 gallons of fuel per hour together with 16 pints of oil.

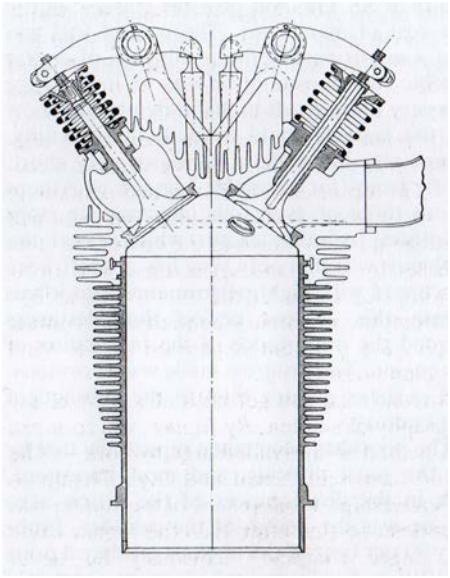
Hendon's Sopwith Snipe and BR.2 engine [photo Mark Edwards]

Over at Bristol, Roy Fedden was designing the Cosmos Jupiter, a 550 hp nine-cylinder single row radial engine weighing 995 lb an engine that was eventually to be a world beater, but only ready for flight in May 1919. *You can see a Jupiter VII when you visit Shuttleworth.*
Meanwhile a technically illiterate Government purchasing machine committed to the ABC Dragonfly radial of which much was promised. The nine-cylinder Dragonfly, designed by G Bradshaw, was simple and easy to produce and was predicted to give 340 hp for a weight of 600 lb. It looked like everything an aero engine should be. Air cooled, with copper plating on the steel cooling fins, it seemed the model of a simple design and Bradshaw carefully explained how every detail had been planned for easy mass production.


section through the Dragonflies cylinder

In January 1918, and against the advice of his technical staff, Sir William Weir decided to make the Dragonfly virtually the standard engine for all future fighters and bombers.
The Nieuport Nighthawk, selected as the standard single-seat fighter, was designed around the Dragonfly. It was planned to phase out production of *all other engines* except the Roll-Royce Eagle and Siddeley Puma. Orders for the Dragonfly were placed with Vickers, Beardmore, Crossley and ten other manufacturers for 11,500 engines.
Only once it got into full production was it discovered that it was a major disaster. For a start it weighed not 600 but 656 lb. It didn't give 340 hp but 295 hp at the rated speed of 1,650 rpm and a maximum of 315 hp when overspeeded to 1,800 rpm. Even running at partial power most of the upper parts of the cylinders glowed dull red. By far the most difficult, and most important task in the development of the piston aero engine was the design of the cylinder and Bradshaw's Dragonfly didn't even come close.

Even more fundamental was the fact that vibration was appalling and after only an hour or two in the air engines literally began to break up. Frantic measures were taken to remedy the deficiencies.


the mostly aluminium head designed later at Farnborough

By sheer chance Bradshaw had designed the Dragonfly to run at the critical torsional-vibration frequency of the crankshaft. The crankshafts swiftly broke, but not before the hub of the wooden prop had been charred or even ignited by the heat generated from friction.
Of the 11,050 engines ordered 1,147 engines were built, but only nine or ten actually flew.
In Bill Gunston's book, Plane Speaking *a personal view of aviation history,* he makes that point that Britain was spared an engine crisis only by the fact that the Armistice was signed in November 1918.
The only other engine still in production at that time was the Rolls-Royce Eagle, all other types having been cancelled.

You can see an ABC Dragonfly at the Science Museum.

Indoor Nats

IVCMAC modellers excel

John Valiant writes, *I have attached some pics of this year's Indoor Nationals entry which came 7th with two best flights total of 72 seconds.*

I literally finished the model the night before so had to start trimming in the three forty minute flying sessions.
I started with a very short rubber motor to see how it would behave. It showed promise from the start with a steady downward circle. A little less nose weight next time extended the flight. All seemed well so I changed the motor to a longer length which then required more nose weight. A time of about 25 seconds was being achieved so I thought I would get two qualifying flights in. By this time the first session was nearly over so I gave it another wind and handed my official sheet for a flight time to be recorded to the time keeper. For whatever reason it only managed 5 seconds. I could not see that anything had changed so another wind for a practice flight. Walked out into the hall and released the model again. This time it was back to making a 25 second flight. I let the rubber rest and rewound for another official flight only for it to do 6 seconds. My third official flight was even worst because I clipped the tail plane on release to do only 2 seconds.
I then had to wait 2 hours before the second session which brought even more problems with a prop blade coming out of the spinner, breaking the tip of the wing and catching the model after hitting the hall wall only to knock off the two 20mm cannons on the wing. The second session was spent repairing the model.
But I managed in the third session to get the model trimmed out flying in nice steady circuits to just below the height of the hall to make 35 and 37 seconds.

John Valiant's Fairy Firefly

John didn't have it all to himself

Chris Strachan entered Rubber with a Howard DGA-3, CO_2 with a Sorrell Hyperflight, Peanut Scale with a Beardmore Wee Bee and Glider.
Chris said that he no longer holds out hope winning the Peanut Scale as the standard has simply gone up and up, but he likes to achieve the best flying score. Well his 209s was comfortably ahead of the second place score of 124s set by overall winner Mike Hadland with a Bucker Jungman.

Chris Strachan's Howard DGA-3

Garry Flack entered this Westland Wyvern in Pistachio Scale and won.

He chose to model the Westland Wyvern again in the Peanut Scale

Then he and John Wynn entered the Pylon Race and won!

If you'd like to see more then you can't do better than look up Mike Stuart's flying scale model pages on the web. In particular, look up: www.ffscale.co.uk/page3af.htm

My 3 years with the Jetex company

by John Osborne via Terry King

I first joined the Jetex group when they were owned by Sebel Products Co. and was taken on to replace a guy who was being called for national service.
The design team was then Joe Mansour, Bert Judge and myself. After a period of odd jobs I then became a member of the design team. I quickly became aware that Jetex was under a handicap as everything we designed had to be made from materials in store as no new materials were to be purchased unless absolutely necessary.
Although Bert and I had many disagreements regarding what was thought we should be designing for modellers off the shelf it was always a good humoured discussion, for I liked Bert and found him a good boss.
Being a member of an Air Scout group I was well aware that flying free flight models in a city was difficult, for instance our Jetex was done round the pole indoors and outdoor flying was control line models. Retailing scale models of the 'Tailored' series of kits was OK but I never saw one fly in the real meaning of the word.
It was my argument at the time that control line models off the shelf may well have made more profit for the company. Dear old Bert's often quoted saying that, "you can fly a brick on wires" brought an end to this debate always . .
The first project I had was to produce a kit of parts for a rubber band powered launcher to fire a model missile. This I did with Bert's approval although I personally thought it was not much of a flying toy. I was proved right much later when a gentleman from Graupner on seeing a sample of a finished model pulled a face and shook his head sadly.

A lot of our time was building show models for exhibition and stores like Gamages in London.
At this time we were also engaged in building a balsa glider for a guy called Barry Bucknall to design and build on television for children. Needless to say it had to be dead simple, cheap and a sure flyer.

There were a lot of bread and butter jobs like tiny flying planes to be a thrown away promotion in a cereal packet. Also a plastic model of Donald Campbell's Blue Bird car and also his speedboat. As I remember, they worked very well.
If my memory serves me no new flying Jetex models were designed up to the time that I left. However, this may have been due to the race to produce Jetex's own solid propellant and fuse. Joe Mansour and Bert Judge spent long hours running into weeks designing an extruding machine. We were all mixing and testing various formulas for a solid fuel of our own in order to get around the ICI patent. Nobody wore a mask or gloves and I think Health & Safety today would have closed us down.
Eventually a solid propellant was found although it was hot and there were concerns of damage to models. It was while testing and observing the effects the fuel was having on the motor cases that I had the misfortune to have a motor explode in my face sending hot particles into my eye. I was lucky that Bert rushed me to hospital and thanks to fast treatment I have no ill effects. It was due to this event I think the discussion was made to scrap the old motors for steel ones, for safety's sake.

There is a longer story regarding the building and setting up of equipment to produce these solid pellets and the effect this fuel powder had on the first employed plant operator, but I think I will leave it there. I would like to issue this warning – from what I have seen Do Not breath in the residue of the pellets or get any of this powder from pellets into an open cut.

If you've enjoyed this piece then you should know that Roger Simmonds has a splendid website: archivesite.jetex.org *packed with information and articles.*

Footnotes

You'll be receiving this newsletter about the time we celebrate 70 years glorious years of IVCMAC.
Timely perhaps to say thanks to Ray and all those who've put themselves out over the years to keep a unique club going.

That prop – page 11 – if off a Wright "A"

As always, if you've contributed to this newsletter then perhaps I can add my thanks too.