



Sept Oct 2014

Edited by Bryan Gostlow
Distributed by Tony Harper

The Interview with Mike Stuart



What tool wouldn't you want to be without?

Apart from the obvious ones, I think I'd really miss my Olfa Compass cutter, which I use for cutting out wheel laminations, from balsa and also any roundels, or parts thereof, which I cut from painted decal sheet. Equally useful for cutting roundels out of tissue as well, of course.

Do you have a favourite model past or present?

I do have a soft spot for the Saab J-29 I designed when Rapier motors first came out – just 12 inch span, and the first plane I ever designed for that power source. It flew so well that I built two more at different sizes, including a big fat one for the Rapier L3. I've got a fourth underway, built a bit smaller to use up a stock of old L1 motors I still have, and I suspect a fifth will end up being built for electric ducted fan, in the light of all the progress that's been made recently with these power units. One big plus for me of the Saab's shoulder-wing layout is that it's very easy to launch (not my strongpoint!)

Never happier than when I'm . . . on the other hand I hate having to . . .

I'm never happier that when I'm cutting parts out from a light sheet of balsa with a brand new scalpel blade fitted in the knife. Similarly – the pinning down of the first strip of balsa over the plan is also a special moment.

On the other hand, I hate having to bend wire – my metal bending skills are awful, and my supposedly symmetrical parts never are!

What got you started?

I remember clearly my dad bringing home a Keil Kraft flying scale Fokker D.VIII when I was about 6 or 7 and making it at the kitchen table while I watched attentively. I'm sure it never flew, but I really wanted to have a go myself. Needless to say all my first attempts were models from either the Veron or Keil Kraft small flying scale range, and all those least likely to fly – I mean why build a Piper Super Cruiser when you could build a Spitfire? You'd think I'd be put off, but no. As soon as I'd failed to get them to fly, I'd be off down the local model shop to try another.

What do you fly?

Free flight rubber scale is my first love – from peanuts up to 40 inch "jumbos". I flew these models "just for fun" alongside my plastic modelling hobby for years, flying near home, or at Old Warden. Then about 15 years ago I discovered the challenge of competitions, after attending the BMFA Indoor Nats for the first time. It was quite a revelation to see the standard of the models being flown, and I relished the challenge of trying to up my game to compete with the modellers who up till then I'd only read about in "Aeromodeller". It helped a lot that they turned out to be such a friendly and helpful bunch!

A further "eye opener" was when I visited the Flying Aces Nationals in the USA for the first time – this would have been 2006. I'd never seen scale rubber models fly so well or for so long before, and I was keen to learn what I could about how the top US modellers design their planes. I've since designed several successful multi-engine rubber types, which I fly when I can outdoors, but they won't cope with some of our typical windy UK weather.

A time it came close to disaster or phew, only just got away with that!

I'd probably pick the winning flight by my electric powered Aichi Val at the 2008 BMFA Indoor Nats. The flight before this one had hit the roof trusses followed by a heavy crash, so before this flight I tried to reduce the time of the high power phase. As it turned out, I hadn't made much of a difference and the model headed for the roof again, and started flying through the roof trusses. Miraculously it missed all the vertical members, until the wing just touched something up there, which dropped it and upset the flight. It took a couple of gentle stalls to recover, then picked up the circling pattern again, miraculously (again) still circling in the centre of the hall. Eventually I could hear the motor second stage kick in, and the Val began to slowly descend, and approached to do a textbook landing. It was, I think, the most nerve-shredding model flight I have ever done, but the judges seemed to like it.

When I'm not aero modelling . .

I work as a plastics engineer, and spend much of my working day doing finite element analysis calculations, predicting the flow of thermoplastics into injection moulds. So, virtual modelling during the day, and practical modelling in the evenings and weekends. My wife Ros and I are active members of our local church, with my main responsibility being organising and maintaining the AV system. We both enjoy walking and cycling (the latter preferably on country lanes with gentle off-road excursions), and I still get a buzz from going to the occasional rock gig with my eldest son (prog metal bands being a particular favourite).

An unfulfilled ambition

I can't think of anything else new in the free flight scale world that I'd like to do – just want to carry on doing what I do now as long as possible. I do have a couple of "retirement projects" that I'd like to devote my time to as and when – namely the two 1/12 scale WW1 kits produced by Greg Thomas, the Bristol Scout and Nieuport 27. These fantastic kits deserve to have a lot of time and TLC spent on them.

Love the smell of . . hate the smell of . .

I love the smell of dope and balsa cement, though my long suffering wife definitely does not!

Old dog new tricks

I've never been able to bend my own reverse S prop hooks until Wally Farrell took me through it this year – I keep his example in my tool box as a reference. Still takes me a few goes to get a good one though! Should save me some money buying commercial examples, plus I can use exactly the wire size I need.

What's your covering material of choice . . and adhesive . .

Esaki tissue for everything – pre-shrunk on a frame for more fragile components. I still use the old method of doping the bare framework, and sticking the tissue on by brushing cellulose thinners through the tissue.

I use Titebond 1 aliphatic glue for my balsa structures. I like the long working time, and find it sands better than Titebond 2.

Cyano is strictly for emergency repairs – I hate the stuff.

Do you have a favourite model of Ray's

One I definitely want to build again is his semi-scale H.P.Herald design that appeared in Aeromodeller, with rolled balsa tubes for the engines. I was thrilled by the possibility of a rubber powered twin, but built it when I was still learning about the hobby, and never got it to fly. Those two Keil Kraft 5 inch props wouldn't have helped! Next time it will be as light as I can make it and have some decent props on it.

Where does it happen . .

I'm lucky to have my own "play room" containing my workbench and equipment, as well as a computer. Some of my newer finished models are hung around the walls – no room for them all, so the rest are in the loft. It's great to be able to just glue in a new wing rib or fuselage upright while I'm passing, and not have to tidy anything away when I'm finished. I try to keep things ticking along, even if it's just a few minutes every day.

If you could turn the clock back . .

Tricky question this, as most of the tools and materials we can get hold of nowadays are as good as or superior to those sold by the traditional model shops way back when. Having said that – I'd certainly stock up on some Modelspan tissue, and some original Jetex motors and fuel. And maybe some Jetex Tailored kits as an investment!

A modeller you admire . .

This one's easy – Doug McHard was my hero in the 70's, and a huge influence on how I built and finished my models. "Flying Scale Models of WW2" was the seminal book, pored over from cover to cover, and to my eyes his four models in that there looked impossibly perfect. I think ever since I've been trying to reach that ideal, but never quite reached it – probably never will. I only met him once, at Old Warden, and we had a nice chat, not too long before he died. I wish I'd got to know him a bit better when I had the chance.

If you haven't already visited Mike's flying scale model page then you're in for a treat:

<http://www.ffscale.co.uk/>

Out and about

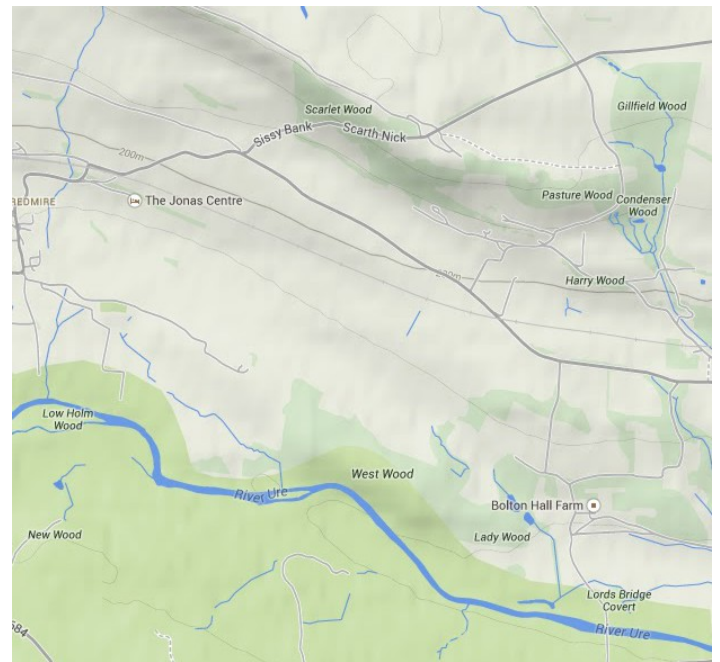
Tony Harper on hearing ghostly Vulcans

In the last issue your editor included a little piece from me under the "Great Covers" heading. In that piece I mentioned watching Vulcans from a view point called Scath Nick in Yorkshire. A few weeks ago I found myself back in the same area for the first time in many a year. My wife and I had decided to take a break at rather short notice and we stayed in Aysgarth in a nice quiet holiday lodge. Two weeks later it was not so quiet

as the first stage of the Tour de France passed through but while we were there it was very peaceful. On the second or third day we journeyed to Leyburn and after a little shopping we continued out along Whipperdale Bank. We passed the quarry on the left and my father's cousin's farm where I used to stay. Then on passed the Rangers houses to the crossroads where we turned left and on to Scarth Nick. (Its now got an "R" in the

name, makes it more posh sounding) I stopped where I had done all those years ago and looked out over the dale. I don't suppose much had changed from the last time I was there not that I would have remembered. The dry stone walls were still there and had been for, maybe, hundreds of years and so were the stone hay barns in the fields although some are now disused. So it wasn't difficult to imagine myself back watching those Vulcans all those years ago but it couldn't happen again. Yet, I could hear jet engines somewhere so I looked in the direction I thought the Vulcans had come from and that was where the sound was coming from now. This time the aircraft were smaller and the first had passed so I missed it but I saw the second and third. Not Vulcans this time but Tornados, I think they must have been the GR4 version and they were very loud and after passing they left a nice smoky trail as the Vulcans had done and the sound grumbled and mumbled for, what seemed, like minutes after. Then, another sound and looking in the same direction I saw a pair of Typhoons, smaller but a little easier to see as they were grey not camouflaged. I thought Typhoons were fighters and if so what were they doing down there. A quick search when I got home told me that they had been Typhoon F2's but were now Typhoon FGR4's most likely up from Coningsby. Presumably FGR means fighter, ground attack and reconnaissance. Just down the A1 there are two RAF stations, RAF Leeming and RAF Dishforth where Toucano units are based. These Toucano's, painted black, were all over the place flying low out through the dales to the Lakes and back.

Once upon a time you could see RAF Leeming and RAF Dishforth from the A1 but not any more they are hidden behind earth banks. I suppose it's a safety thing to stop motorists bumping into each other while watching aeroplanes. I might have a look again in another forty years or so.



Scarth Nick Yorkshire Dales National Park

Snapshot

"A view from the workbench"



There are several clues, but just who's workshop is this?

Competition results

Michael Marshall reports

The Ren Cup competition took place at Newmarket on the 23rd of July on a fairly warm and sunny evening marred only by a stiff breeze. The grass underfoot was green and luxurious, sprinkled with emerging mushrooms, and there were few other people and I only saw one dog. The breeze dictated a one and a half minute max and the contest was for three flights. Phil Haines was flying a newly built Campbell's Souper P30, Phil Bailey his last year's P30. Mick Staples and Clive King, Spencer Willis P30s and Andrew Moorhouse an own design P30. Chris Strachan flew a Veron Fledgling and Michael Marshall chose to have another go with a King Harry. Phil Bailey's initial test flight was nearly a fly away but he could not match that performance with his subsequent contest flights. Phil Haines was making his first flights with the Souper and managed to find one of the small trees that dot the park land. Chris after a late start put in good flights with his Fledgling dropping only four seconds. Michael Marshall was not so lucky achieving only one max. but Andrew Moorhouse studiously winding away with his P30, probably

more than a thousand turns each time, achieved a full house. Many thanks to Margaret Staples who took charge of score taking and timing and to Tony Harper who was also ready with the watches.

Hardened contest flyers took the modest retrieves as par for the course but more dedicated indoor flyers seemed surprised at the amount of walking. None the less a good evening was had by all.

1st Andrew Moorhouse	270 s
2nd Chris Strachan	266
3rd Michael Marshall	235
4th Clive King	199
5th Mick Staples	194
6th Phil Bailey	139
7th Phil Haines	106

Great covers

Aero Modeller June 1946



requested by Mme Treillis

I can guess what you're thinking, "A pusher canard like this should be a doddle to trim but I'm not sure about how you'd fit a D/T"

This 32" model was based by A Watteyne on his 44" Wakefield of 1939.

In the same issue, June 1946, was a piece about Cambridge M.A.S.

At Eaton Bray on Easter Monday, R. E. Bowyer, of the Cambridge M.A.S., flying his original "King Falcon" clocked 30 minutes o.o.s. on his first flight, the model being recovered from Dunstable after a flight of over three hours. At an earlier meeting on the club ground at Stourbridge Common, P. Firman's "Thermic 50" clocked 30:05 before disappearing via Histon towards Bedford. "Codger" Wood, whose model has been consistently clocking 3-4 minutes, lost the job after a flight of 10:59 o.o.s. Seem to be some good thermals round the banks of the Cam.

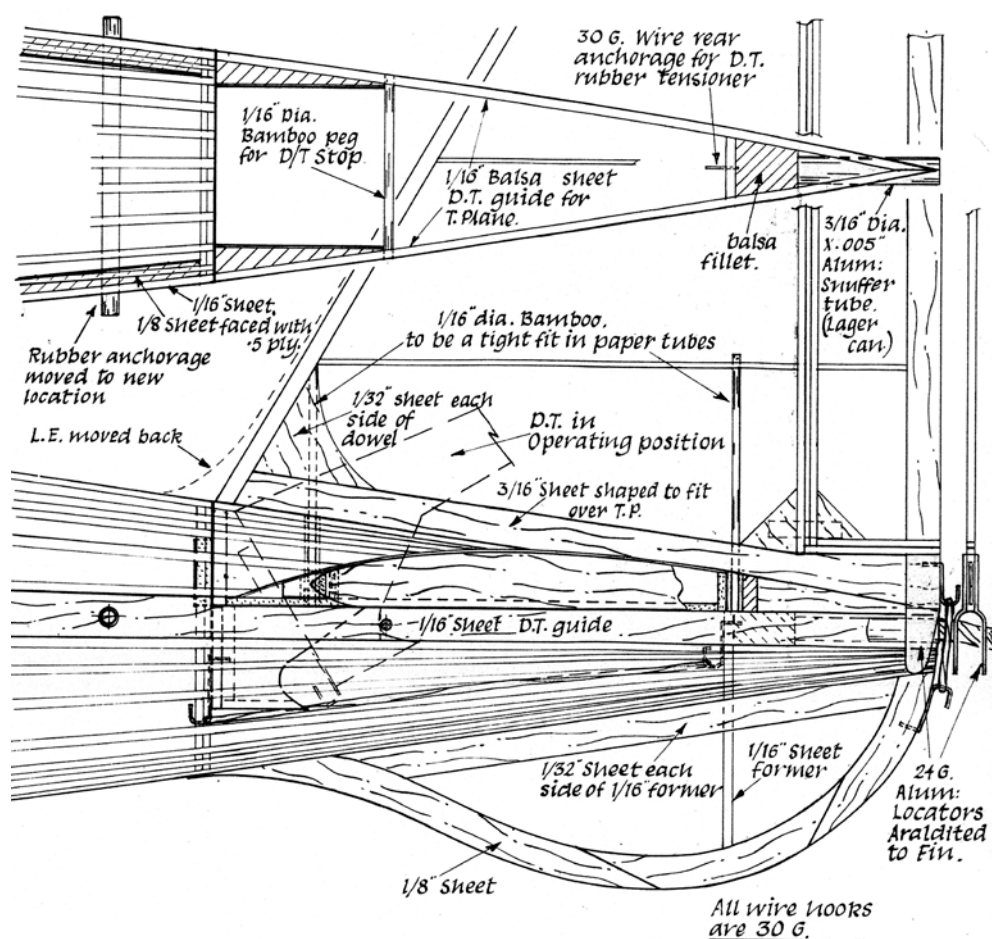
So there's your answer – in 1946 they didn't bother with D/T and you can download the plan from Outerzone.co.uk



Another clue to the modeller behind the workshop pictured on page 3

Before you can make one

first somebody has to draw it



I think you'll agree this is an outstanding example, but who created it and can you identify the model?

In the **May/June** newsletter this slot was taken by a one of Albert Hatfull's drawings. A week or so ago I was browsing the interweb when I came across this piece by **Chris Jenkins**.

Albert was born in 1926 in London. His family had a strong engineering and sea-faring tradition. However, he was into aeroplanes and from the age of 9 he cut his teeth on Megow and Guillow's kits. By all accounts he was a colourful character with a great sense of humour. He was fond of New Orleans jazz, followed the US model aircraft scene (Korda et al) and played the piano. He attended Tottenham Technical College, studied maths and draughtsmanship and developed an interest in aerodynamics. Sadly in 1942 at the tender age of 16, he contracted polio from a local swimming pool. This was a time when vaccination was not yet available. The disease restricted his hand mobility, but the wonderful thing is that he did not let it stop him from being creative.

Soon after the polio infection, the youthful designer created his first model for Keil Kraft. As it was wartime, he named it the INVADER glider and it became a best-seller. Before the age of 20, the JUNIOR 60 was created, quite literally "while the V2s were falling on London". Despite the polio, he built a

career as a proficient draughtsman. Engineering drawings and later patent work at the Science Library provided a living, but model aircraft were his passion. He designed dozens of planes, including the SENATOR in ca. 1950 and the SKYSCRAPER around the same time. The two models are very similar, the main difference being an undercambered fuselage on the SKYSCRAPER. Albert was clearly interested in aerofoil shaped "lifting" fuselage profiles. Interestingly, he did not report any difference in the performance of the SENATOR as compared to the SKYSCRAPER and the former became much better known, widely flown.

Apart from gliders (e.g. SOARER series) and rubber power jobs, he also designed many Jetex models. Of the jet designs, his personal favourite was the De Havilland VENOM. Many of his plans were published in the aeromodelling press. He even designed Keil Kraft's triangular trade mark logo! After Keil Kraft, he did some design work for Worcraft models (Dewsbury) and Elite models (Manchester). These included the Worcraft SCARAB - with lovely elliptical wing profiles and the Elite ELF, which like the SKYSCRAPER, sported a beautiful aerofoil shaped "lifting" fuselage profile. Ill health forced him into retirement in 1984 and he passed away in 2007.

designed and drawn by

Albert E Hatfull

Seen over Ely.

a report from **Tony Harper**

You may have noticed that there wasn't a "seen over Ely" in the last newsletter. I had told editor Bryan that there was nothing of note to report only the usual suspects, C130's and KC 135's. However, as soon as June had disappeared things started to move. The first of my notable sightings was a dear old Dakota. It was the BBMF's aeroplane which appeared from the general direction of Marham. I don't know where it was going and it didn't seem to know either. It wandered off towards Sutton and then turned towards Little Downham and then again turned towards the north. I should think it was off back to Conningsby but that's just a guess. The next aeroplane is almost certainly one of Duxfords residents, a clipped wing Spitfire. It came over the house one Saturday afternoon, again from the direction of Marham. I can't identify it only that it was camouflaged and had a high back. The BBMF have a clipped wing Spit but it is an LFXVIe and that has a bubble canopy.

One Friday afternoon and another Spitfire, it was almost certainly from Duxford and again I have no idea which one. It was a lovely afternoon and I was treated to a fifteen minutes of gentle aerobatics, pure magic. Friday afternoon seems a good time for pilots to get their "hours in" on a type before being allowed to display fly or just for a little practice. On the following Saturday, a little after midday another Spitfire flying line abreast with a Mustang came over Ely going North. They performed one large loop and then, still line abreast, continued on their way. It was most unexpected but never the less very nice. The Classic Wings Rapide has been about most Sunday mornings and it has changed its route around Ely.



It used to perform a large left hand turn which, I can confirm, does not give the right hand passengers a very good view of the City. Now it performs a figure of eight which must be better for all the passengers.

“ . . that nothing failed them” - i

The FIRST jet aeroplane, the E28/39 which later became known as the Gloster Whittle, arrived at the R.A.E. late in 1942 for an early assessment of the engine handling qualities. This aeroplane had been first flown at the R.A.F. Station at Cranwell by Gloster's chief test pilot Jerry Sayers on 15 May 1941.

My first experience of the jet engine occurred when I accompanied Air Commodore Sorley, then Commanding Officer at Boscombe Down, on a visit to Power Jets at Lutterworth. Frank Whittle showed us all round and we saw the engine running.

Perhaps the most convincing illustration of the power of this jet was the fact that even with that early engine it was impossible to throw a brick through the jet stream. It was just carried away downstream like a piece of cork.

The next aeroplane was once a very common sight around Cambridge and the surrounds and I expect some of our members may have flown in one. Those around Cambridge wore the colours of the University Air Squadron but this one was a very tasteful light blue. It was a de Havilland Chipmunk all very delicate and ladylike with its turned out toes. Now, as I sit here trying to make sense of my notes I recall a question I would like to ask. It concerns the Chippie, some time ago while listening in to the Cambridge frequency I heard a Chipmunk ask Cambridge control for permission to land at a private site near Smithey Fen. Does anybody have any ideas about this private site? It's not uncommon now to hear the words "private site" when scanning the airwaves. There is a private site at Downham Market, two or three around Bury St Ed's, one near Exning and, of course, the old airfield at Witchford. The one at Exning is on land owned by a certain Mr Gibson a local landowner and benefactor. When the weather is reasonable a Cessna 150 comes to Ely and stooges around for a few minutes. I presume it is from a flying school, most likely from Cambridge and it takes roughly the same course each time. Occasionally it performs a few gentle stalls and PFL's (practice forced landings) while still at altitude which seems a little odd. I thought the idea was to select a suitable field, make an approach and then climb out. How you can practice forced landings at three or four thousand feet leaves me somewhat bewildered! It's during the summer months that unusual and unexpected sightings happen. In the last week of July an air/sea rescue Sea King flew by to the West of Ely heading North/West. It was back again two days later. A very high B52 on August 1st going East to West. But before then I saw a most unusual sighting going into Mildenhall and I instantly jumped to a conclusion which turned out to be wrong. It was a Hercules with what I thought were prongs on the nose. Oh no, I have since found out that it was a AC130H gun ship and what I thought were retracted prongs were some sort of sensors and it just passed through on its way somewhere else. My final sighting was again a Hercules, it was on its way back to the states after passing through Mildenhall a week earlier. What made this unusual was that it belonged to the U.S Coast Guard.

When the E28/39 turned up at the R.A.E. it was first flown by the chief test pilot Group Captain Wilson. When he landed from his first flight I met him as he climbed out of the cockpit and asked him what his impressions were. To us it was an entirely new adventure and in some respects an almost unbelievable one to fly an aeroplane without a propeller. Wilson thought for some time before replying, then he said, 'Well it is the first aeroplane I have ever flown where you can actually see the fuel gauge moving while you fly.'

Allen Wheeler

“ . . . that nothing failed them”

The Inaugural Ray Malmstrom Cup

Saturday 14th June 2014 by John Copsey



Venue: Girton Football fields near Cambridge.
CD and Scorer: John Copsey.
Judges: Roger Ladds (F2B), Pete Tindal (Class II)

In Scotland they call it 'driech', grey, miserable, overcast and drizzling and that was exactly what greeted us on that Saturday morning in (er) mid June. But, hey, the wind was down and the field looked superb, so on with the show.

A few cars started to arrive out of the gloom and by 10.00 a.m. we had 6 for F2B and 4 for Class II (instead of Profile), and we even had a judge when the venerable Mr. Ladds arrived, courtesy of the loan of his wife's car. We also needed a judge for Class II as well and Pete Tindal kindly agreed to fill that role in between rounds of F2B.

F2B (2 electric, 4 IC)

The Drizzle abated around 10.30 so we held the draw and got going with round 1, whilst the Scorer tried to prevent all the paperwork from getting too damp.

With only 6 entrants, things went smoothly enough and we saw Pete and Roy Cherry vying for the early lead. The weather was steadily improving so onto round 2 and the CD's novel system of allotting the flying order managed to confuse everyone including the CD.

After a short break and a round of Class II (actually round 2, see below), F2B round 3 proceeded. Although the Sun had decided to show up, so had a bit of a breeze. This didn't cause too much trouble to the experienced flyers, except that there were a number of 'Nose Overs' on landing. Impressively, scores from almost everyone were improving despite the increasing wind strength.

In the final analysis, Pete Tindal shaded it with 2,027.9, despite Roy's valiant efforts at 2,017.6 and Brian Turner used home advantage to get third spot with 1,882.9. It was interesting to note that again, the first 2 places went to electrically powered models.

Class II (all IC)

It was decided that we would run round 1 of Class II first, thus allowing Pete to concentrate on F2B later, so four intrepid lads got going with a light drizzle still falling. It was soon clear that good scores were being posted in the, virtually, zero wind and Bryan Kenzie took full advantage of this. The surprise was that Steve Asque was in second place in only his 2nd. Competition. Was this a fluke I asque !

Only Con Spinkhs failed to post a good score, having suffered an engine failure at the top of his Vertical eights.

Round 2 was run at lunch time and in reverse order. Steve Mynott came back strongly and Con got out his trusty Super Clown to keep the numbers up. At this point Bryan Kenzie was walking it but there was a surprise in store.

By the time round 3 was run there was a bit of a blow and whilst the two Steve's both actually managed to post higher scores. Bryan Kenzie had problems in the high scoring manoeuvres and could not match them.

So who won ? By the tightest of margins (0.3 of one point) Steve Asque, with a combined best score of 931.5, won the Mercury Cup for best non F2B flyer. An amazing achievement at such an early stage in his Control Line flying career, so congratulations to Steve. Bryan Kenzie was second with 931.2 and Steve Mynott third with 928.

Final Analysis

So the inaugural Ray Malmstrom Cup is in the bag. I believe everyone enjoyed themselves, competitors and spectators alike., I know I certainly did. Two cups plus souvenirs were handed out. A few lessons learnt for future events (not necessarily C/L aerobatics!). A sincere thank you to both judges. A final chat will be held with Chris the groundsman to ensure there was no adverse press, but all in all, 'went the day well'. For full results see www.clapa.org/compresults.

Here's to the next one.

John Copsey

RAF Museum Hendon *Margaret's 2015 club visit*

I am planning a coach trip for next March and have had requests for another visit to RAF Hendon.

There is a new permanent exhibition featuring the 1st World War in the Graham White Hall which should be very good.

If you are interested please let me know. I am at most Club events. Entrance to the museum is free so it will be just the cost of the coach fare and refreshments if you forget your sandwiches!

More than one way to skin a cat

Covering with Polyspan

Polyspan is a tough, lightweight polyester covering material that is easy to apply and has a similar appearance to tissue. Both Flitehook and Mike Woodhouse stock Polyspan. Mike has three grades on offer: 15g/m², 25g/m² and 35g/m² [http://www.freeflightsupplies.co.uk/] though I've only got experience of using the 25g stock. They cut it off the roll and you may want to ask for it to be supplied rolled rather than folded.

If you're interested then Frank vonJaerschky has an excellent YouTube piece showing just how to cover a tricky undercambered wing.

[https://www.youtube.com/watch?v=2oJrkbC3vLc]

Snag: it is only supplied in white.

While at Old Warden in July I spoke to Andy Brough who uses Polyspan but then lays **coloured tissue** over the top.



cat #1

'Lofty Lady' was discovered in Vic Smeed's loft but at 52.5" was too big for an Aeromodeller free plan so Andy scaled it to 36" and came up with 'Lofty Lassie'. The motor is an Alpha and built by Tom Crompton.

Alan Hunter has been using Polyspan for a while on his larger models [ie not his 'tiddlers'] and has tried the 15g stuff but prefers the 25g as it can be sealed easily with thinned dope to which he adds a little plasticiser to stop it going brittle.



cat #2

Having tried a number of schemes his preferred approach is to support a panel, cut oversize, on an adjustable frame before airbrushing acrylic ink: Daler – Rowney acrylic artists ink [try Tindalls art shop on King Street, Cambridge or Hobbycraft] The result is, as you might have guessed, is immaculate.

Polyspan is applied with heat activated adhesive brushed onto the outline of the structure then gently heated to shrink out any wrinkles. Later, if you find a wing panel needs a bit of washout say, then get out the heatgun, gently twist the panel and lock in the adjustment.



cat #3 suitably far away and indistinct

My own efforts are not in the same league as these other guys but I've tried first covering, then applying a couple of thin coats of ns dope and finally, airbrushing on the same acrylic ink Alan uses.

As you may be able to see, I've experimented with using low tack Frisket Film to create a type of stencil [try hobbycraft on the Beehive]



A cat of a different hue . . . this superb model of Pete Illiffe's was spotted at Old Warden. He airbrushes with Tamiya acrylics. They are available in 23 glossy, 51 flat and 7 translucent colours. You may like to know that Chris Strachan also uses Tamiya.

“ . . that nothing failed them” - ii

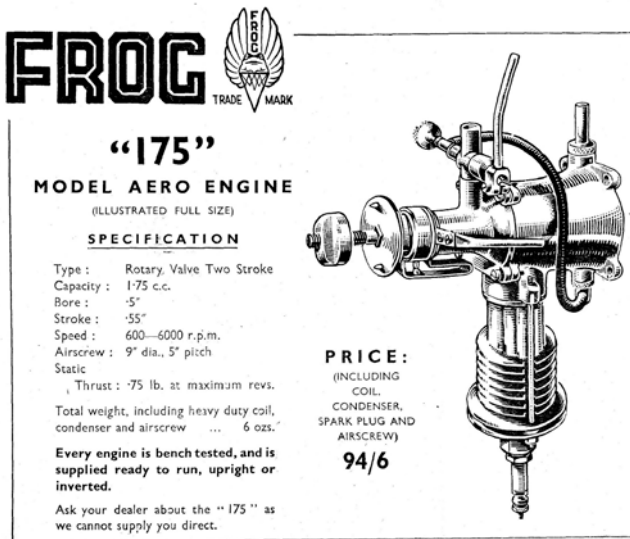
To illustrate the force of the jet stream of this little W2B engine of only 800 lb thrust it might not be out of place to mention what happened to Squadron Leader Davie's dog here. Davie had been put in charge of the flight which handled the E28/39. With his engineering degree from Cambridge and considerable experience in flight test work he was ideally suited to this post. In fact he did most of the flying on the E28. Whenever Davie took off his dog, a small black spaniel, used to come to see him off and was always present to meet him when he returned. The spaniel saw no reason to change this habit even if it was the E28/39 and security officers made a special concession in the case of the dog. On the first occasion when Davie flew it his dog faithfully came out to see the aircraft start up; then, unfortunately for him, he sauntered off, passing behind the jet just as the engine was being opened up. He was facing 'down jet' and about 100 yards behind'

He became aware of the stream of rather warm air passing over him but decided to hold his ground, standing still with all four legs planted firmly out in front of him. First of all, his hair all blew forward, then his large black ears stuck straight out down wind, until finally with a complaining yelp his grip on the ground failed and he bowled over and over 'down jet' until he came to rest a sad but much wiser dog in some bushes twenty yards away.

One may laugh now at Davie's dog's misfortune but he was by no means the only one who made that mistake. There was at least one reported case of a very senior officer indeed, at Fighter Command, who made a very similar error and had his trousers nearly torn off him as he disappeared into the shrubbery.

Allen Wheeler

“ . . . that nothing failed them”



FROG TRADE MARK

“175”
MODEL AERO ENGINE
(ILLUSTRATED FULL SIZE)

SPECIFICATION

Type : Rotary, Valve Two Stroke
Capacity : 1.75 c.c.
Bore : .5"
Stroke : .55"
Speed : 600—6000 r.p.m.
Airscrew : 9" dia., 5" pitch
Static Thrust : .75 lb. at maximum revs.
Total weight, including heavy duty coil, condenser and airscrew ... 6 ozs.

Every engine is bench tested, and is supplied ready to run, upright or inverted.

Ask your dealer about the “175” as we cannot supply you direct.

PRICE:
(INCLUDING COIL, CONDENSER, SPARK PLUG AND AIRSCREW)
94/6

In case you were wondering, the equivalent 94/6 would be £170.30 today.

Old Warden

"a bloody paralysing of an aircraft"



In 1914 Commander Charles Rumney Samson, a navy aviation pioneer, came back from the front and asked Captain Murray Sueter, the Royal Navy's Director of the Air Department, for *"a bloody paralysing of an aircraft"*.

The request was passed to the 29 year old Fredrick Handley Page and the outline design was approved on 4 February 1915, the HP O/100. Delivery of the improved 97 mph O/400 variant began in early 1918, and 549 were built before the November 1918 Armistice.

I've always felt that this was, by any standard, a hugely impressive achievement but I was blown away by **Roger Godly's** model which conveyed the sheer physical size of this plane.

Ask a man who *doesn't* know – part 2

that **Mick Staples** has a lot to answer for

In the July/Aug newsletter I looked at some of the data that Richard Staines has gathered together which covers a wide range of models. What emerges is a simple rule for power: you need between 50W and 120W of power per pound of model depending on what performance you're looking for.

These brushless motors with their electronic speed controllers don't behave like anything most of us have met previously and that can throw you at first¹.

Begin by asking yourself what you expect when you select half throttle – “more than 1/3 throttle but less than 2/3 throttle” but the motor could be a ‘tiddler’ weighing no more than 5g or some ‘monster’ pulling 90A from a 5s LiPo.

To get a feel for what's going on I ran a quick test with a regular Robotbirds outrunner:

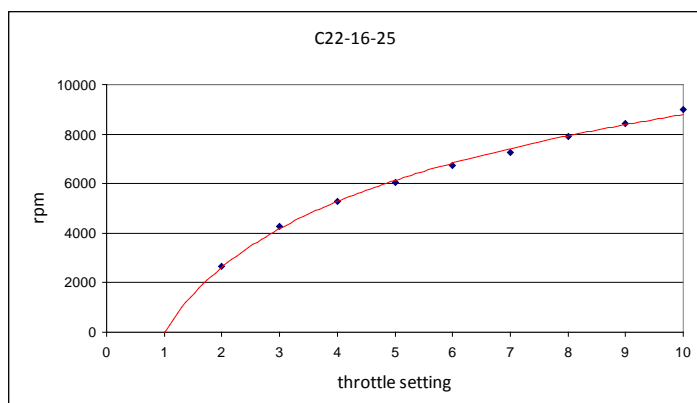
C22-16-25 KV 1800

2S LiPo

GWS EP 7035 prop



Using the marks beside the throttle stick as a guide I gradually increased the setting whilst measuring RPM



At the bottom end nothing much happens but the motor soon stirs and at setting 5 [mid travel] it is turning at 6000 rpm and reaches 9000 rpm at setting 10 [full power]. Just what you need. Now ask yourself how does the speed controller know to do that? If you're flying that 5g 'tiddler' or the 90A 'monster' it has quite a different job on it's hands.

My best suggestion is that the ESC has been designed to 'listen' to the motor and if it's turning too slowly it outputs more power, but if the motor is turning too fast it adjusts the power downwards. Feedback, in other words.

So how does the ESC know what the motor is doing? Well all motors as they turn generate electricity, for example, hybrid cars use the *motor* to re-charge the battery a bit as the car brakes.

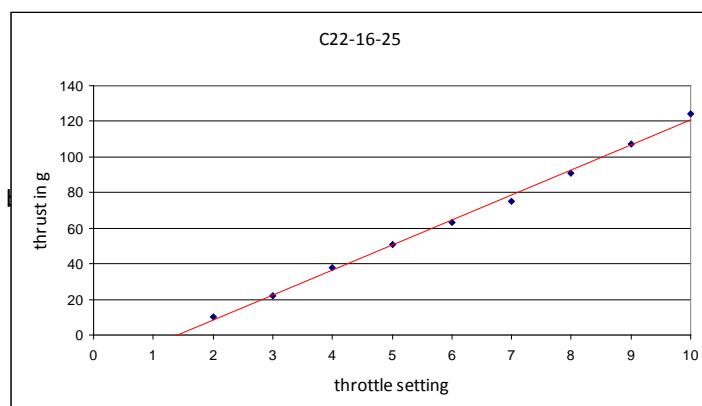
The output of the ESC is a stream of voltage pulses and in between the ESC measures the voltage that the motor itself is producing. Then it uses this information to control the speed of the motor. The clue here is that a motor spec refers to KV. The Robotbirds motor I tested was quoted as 1800 KV. Translating, it generates 1V for every 1,800 rpm as it turns, so at 3,600 rpm it

generates 2V and at 9,000 rpm it is generating 5V. *That's* how the ESC can keep track of what's going on.

Why are some motors rated at say 1330 KV [C22-20-20] and others at 2250 KV [C22-20-12]? Well, the first number is the diameter, the second is the length and the third is all about how many turns of wire have been wrapped around each pole within the motor. Fewer turns produce less voltage for a given rpm.

The very brave amongst you might like to note that 20t at 1,330 rpm are just about equivalent to 12t at 2,250 rpm.

For the second test I put the tachometer to one side and borrowed the kitchen scales, mounting the fuselage upright.



The result is pure gold and one of the reasons why brushless motors are such a delight to use. As you advance the throttle the thrust smoothly increases: 50g at mid travel to 120g full travel – what more could you ask for?

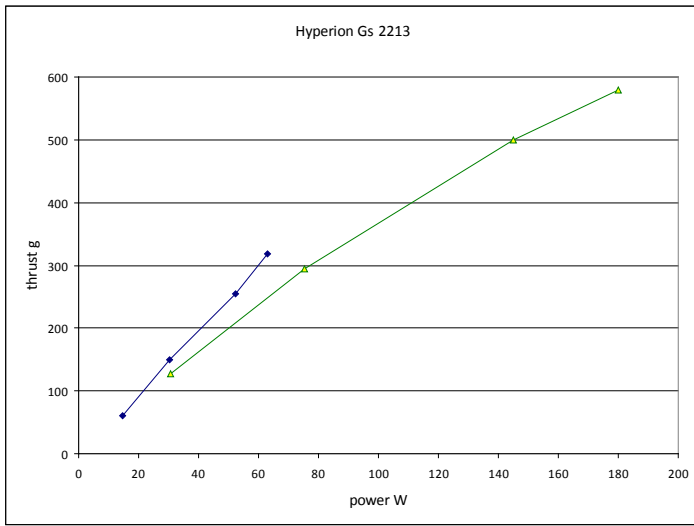
Gold but not magic. If you put too large a prop on your motor the ESC will *still* try to turn it at the speed your throttle setting demands by outputting more power and you could end up burning out the windings. On the other hand, make the mistake of putting on too small a prop and your ESC will find it needs very little power to spin it at the speed called for by the throttle setting and your model's performance will disappoint.

Finally, lets investigate how much power can you safely feed into one of these brushless motors and what's the effect of using a bigger LiPo pack.

I ran some tests on a Hyperion Gs 2213-14 outrunner fitted with an Aeronaut 9" by 5" folding carbon prop. Once again the fuselage was mounted upright on the scales and I added a power meter [it connects between the LiPo and the ESC]. The Hyperion data sheet makes clear that you should run the motor for no more than 30s at 28A or just 5s at 42A. So, for a 3S pack [nominal voltage 11.1V] the safe power for this test would be 28 x 11.1 or 310W.

To begin with I used a 2S pack and made a note of the power and thrust. The blue line shows a controllable response to the throttle with a maximum thrust of 300g at 60W – around 8A and so quite sustainable.

Changing to a 3S pack we have the green line and some overlap at the lower end. Push the throttle to the max and the thrust developed is almost 600g with a power input of 180W – around 16A, well below the 28A for 30s guideline with this prop.



Looking further into the datasheets and we're told an 11" by 6" prop would draw 35A at full power and a 13" by 6.5" 42A and could only be used in 5s bursts at full power around 456W! With a 9" by 5" I needn't worry. This is the motor and prop combination Richard has on his SkyLite Veloce from Hyperflight and it's not short of performance.

¹ elsewhere in this newsletter is an account of the country's top test pilots coming face to face with Frank Whittle's early jet engine on test. Between them, the best idea they could come up with, was to try and throw a brick through the jet stream . .

Overheard

Margaret Staples listens in

Indoor flyers don't do wind - heard on comp night at Newmarket.

That's Radio UN controlled - heard at Impington as a radio model flew into the trees.

I can do you a good line in props - heard at Impington as the second prop broke on the same model.

Where the Hell did that go! - catapult glider comp at Impington.

Model OOO behind trees at Newmarket - Ah there she is - I think the timekeeper was talking about the P20 and not the glamorous female walking the dog.

Go on give it a bit more wellie - control line area at OW.

One AM2.5 is bad enough to start, let alone 4 of the blighters on the same model - control line area at OW.

Stopped at OW- *You don't know me but I know you are Mick Staples, saw you in Aeromodellers in the 70's.* – no, I didn't know him but it shows I haven't changed much in 40 odd years!!

Gliding at Gransden



On being told he should release the canopy and climb out *before* deploying his parachute Mick complained that, "the RAF always had the decency to provide an ejector seat."

"The thing about gliders is there's no stoking up and I can concentrate on steering!"

Many thanks to both Margaret Staples and Peter Cunnison

Any better captions?



“ . . that nothing failed them” - iii

PHOTOGRAPHIC RECONNAISSANCE

After completing this operation I had a final talk with Air Commodore Boothman and several pilots, while such photographs as I had been able to take in spite of clouds were developed, before starting back for Farnborough. By that time it was getting late and it was clear I would not be back in Farnborough in time for supper. I tried to ring up the Mess to arrange for a 'hotplate' to be put out but no one seemed to answer. I thought of leaving a message with the telephone exchange where either 'Margaret' or 'Hilda' might have been on duty and they had a well deserved reputation for being able to get a message through to anyone, anywhere, at any time, but I still would not have known what the Mess were able to do about it. Presumably a similar affair

to this 'hot plate' business is well known everywhere. It certainly was very useful and worked well at the R.A.E. Staff Mess during the war. Only on one occasion do I remember a complaint about it which came from a recently joined test pilot who complained bitterly in the morning that he didn't think much of the food left out for him. After careful investigation it was found that the fault lay with the officer who, through inexperience and misunderstanding, had eaten F/Lt Davie's dog's dinner.

Allen Wheeler

“ . . . that nothing failed them”

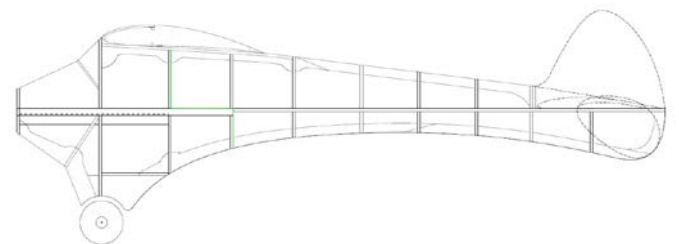
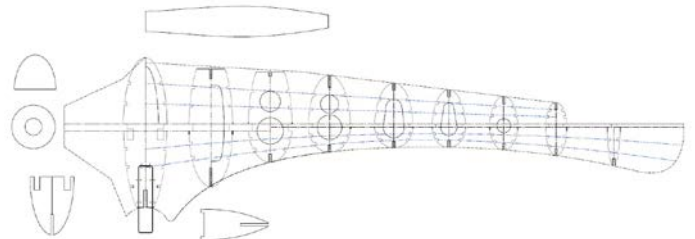
DraftSight

free drawing software from Dassault Systemes

Dassault Systemes have released a free piece of software called: DraftSight for 2D drawing.



John McIntyre and I have been looking into redrawing Albert Hatfull's Scarab with a view to getting the bits laser cut – one day!



Let me know if you're interested

Footnote

a comment or two from the editor

The drawing on page 5 was by *T.J. King 23.11.84.*

The model is Bob Copland's **GB3** of 1938

Who's workshop is featured on page 3? **Raymond Fella**



Thank you to everyone who has contributed to this issue. If you have fresh ideas or suggestions then please speak up. The newsletter doesn't write itself!