

Clear Dope



June 2026

The Chair

Derek Honeysett

Welcome to this June 2026 edition of Clear Dope.

We have had some fantastic weather recently, so lots of flying has been taking place at both of our sites. Hopefully this weather will continue throughout the summer. Sadly, as I type this, the weather for the coming week looks rather unsettled.

We have just managed to secure some evening flying at Thorney Island. The first of these sessions was last Thursday 28th May, when we enjoyed perfect flying conditions with a great attendance, especially when you consider that we only had permission from the Army the day before. We have six more evening sessions planned, so please check my recent email for dates. I will send out reminders in due course.



Those of you who fly with me know that I am always up for carrying out test flights. I am extremely grateful to the owners of these models for entrusting me with their pride and joy. Recent weeks have seen several such flights, including Dave's Mitsubishi Zero, Neil's Hawker Sea Fury and Piper Cub, Alex's very twitchy Riot, and two models from Tim's hanger: the Viper X and the modified Scimitar. I am pleased to say that all models have survived, especially Dave's Zero as a lot of work has gone into this fantastic scale model.

Hopefully I will catch up with you over the summer months.

Derek



Editors notes & Club News

Once again, a huge "Thank You" to all who have contributed to this issue of CD!

The next issue of CD is scheduled for early October: the deadline for submission of articles is **30th September 2026!**

Articles may be sent in any format to:

fsdibden@gmail.com

robin.colbourne0@gmail.com and/or

editor@cadmac.co.uk

You might like to consider build articles, repairs, model reviews, 'I learnt about modelling from that' ... the list is endless. We look forward to hearing from you!

Best, Fraser Dibden & Robin Colbourne

CADMAC Website

Should you have any pictures you would be happy for us to use as "cover" photos for the website, please send them to webmaster@cadmac.co.uk.

Pictures need to be in landscape format and you must own the copyright.

Wings Earned: Flying After Your 'A' Certificate

So you've passed your 'A' Test, the BMFA's standard proficiency check for fixed-wing model aircraft. You've demonstrated circuits, figure of eights and a safe landing under an examiner's eye. Now you can fly solo without a buddy-box or instructor alongside you.

The rules haven't gone away, though. You still need a CAA Flyer ID and Operator ID for any model over 250 g, must stay below 400 feet, and keep within visual line of sight at all times. Your club's own field rules apply on top of that.

The 'A' Certificate is a beginning, not a destination. Some may wish to progress to the BMFA 'B' Certificate and its aerobatic sequences; others settle happily into scale modelling, gliders, or electric flight. The choice is yours.

As club training officer, I would ask any club member who has now passed their 'A' Test and would like some help, encouragement or guidance to progress with learning some more skills, please let me know, so that we can link you up with a more experienced flyer willing to help at mutually convenient times.



Recently, Ray patiently showed me how to try out some rolls and loops at Portshole. For safety, we linked up a buddy box to my Spektrum NX8 and flew the E-flite Turbo Timber. Firstly Ray put the model into awkward situations to check that I was able to recover and then tried out the manoeuvres at a safe height to hopefully avoid a disaster! So, onwards I go to the next outing to test out my newly learned achievements... fingers crossed.

Mark Vroobel – please contact me on either Thorney or Portshole WhatsApp group

Red Arrows display at Thorney!

Caught on camera, an unexpected display by the legendary Red Arrows at Thorney Island, over the May Bank Holiday weekend.

CADMAC members were wowed by the display of formation aerobatics and manoeuvres in what was clearly part of the Team's workup for the 2026 season.

The weather was perfect, which provided an excellent opportunity to view this visually spectacular display. The team members did an impressive job; entertaining the watching crowd with formation flypasts, loops and rolls.

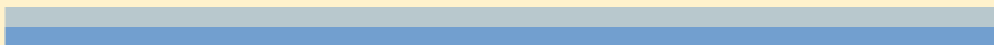


For more photos and to find out just how this amazing display came about, read on through this issue of CD ... !



Congratulations to our new member Charlie Goulding on passing his 'A'-test!

A hot Bank Holiday at Thorney.



Reflections on Popham 2026

Tim Kerss

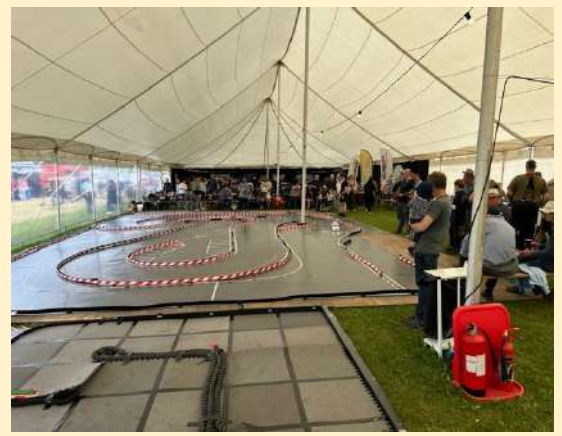
As we all know one of the main model events of the year was held at Popham in early May and, in my opinion, it turned out to be the best one yet.

Initially the omens weren't good; throughout the week leading up to the show, rain was forecast for both days, and a potential wash-out was on the cards. Luckily, however, the Met Office £2 billion computer was, as usual, way off the mark and in the event the weather was beautiful. In fact, it was positively tropical on the Saturday, when I attended. It certainly seems as if the decision a couple of years ago to move from September to May has paid dividends.

The show started at 10am and my plan was set; a full inspection of all the stalls and sellers to see if there were any bargains to be had, before settling down to watch the flying display.

In the event I arrived at 10.45 and it was soon apparent that part one of my plan had been somewhat foiled as, when arriving at the site entrance, I was met by a plethora of individuals with models under their arms proceeding back into the car park! It seems that others had the same idea!

Still, not to be discouraged, I stuck with Plan A and went around all the stalls and sellers. The variety of exhibits and goods for sale was incredible, and more than I'd seen in previous years. Non-flying exhibits included vehicles, boats and even cranes. In the marquee there was the opportunity to drive cars and fly FPV racing drones and, of course, the BMFA was there too.





Outside were plenty of sellers of models and related paraphernalia, new and secondhand:



Looking for a pilot?



Spot the sorry Skysword!



Whilst some of the used models were in good condition, many were not, and I couldn't help but feel that some, particularly the foamies, were ready for the skip rather than the secondhand market! A case in point was a pink "Skysword", much loved by me in the past, but in this instance severely dented with its controls hanging off; not something that I would have paid £40 for! My survey of all the stalls complete, and wallet still intact(!), it was time to take in the flying displays, and what a sight they were!

There aren't enough column inches to cover it all, however you can view both days in their entirety on YouTube - just search "Popham 2026", and highlights are nicely grouped on the Essential RC channel. Here are some general shots to give you a flavour of the atmosphere, and what was being displayed; suffice to say that it covered all ends of the RC spectrum:





The day's flying featured some awesome models, scale and otherwise, which were flown superbly by their respective pilots. The schedule was tight, but well organised, and there wasn't a moment of dead air.



For me, personally, there were elements worthy of note which added some fun and intrigue to this excellent event. Amongst these were:

Displays across the full spectrum of performance from large slow flyers such as the Bleriot monoplane to jets such as the Havocs and Goshawks, excellently flown to their full potential.



Spectacular aerobatic and 3D flying by models right up to Steve Carr's 55% scale Yak 54, whilst the Bleriot had to fight a nasty crosswind on landing at very slow speed and with basic controls!



Helicopters and gliders put through their paces too:



A Yak 110 powered by two petrol engines and a centrally mounted turbine gave the illusion of two aircraft flying aerobatics in close formation. This is a model of an actual full-size aircraft created by merging two Yak 55s together with a central wing section, and adding a turbojet engine!



A mass “foamie” flying session quickly degenerated into a demolition derby which started with attempts to knock a hovering Night VisionAire out of the sky and then, once that was achieved, turned into a free-for-all “kill everyone flying” challenge - utter carnage! I was particularly intrigued by the participant that chose to fly his 90mm Avanti in the melee - that’s £500+ worth of model!



A great display by the Basingstoke Model club of their streamer-trailing “Spitties” was followed by a similar event featuring “angry birds” chasing a flying pink pig flown by our very own Adrian Childs. After a somewhat hesitant start, the pig did well, and retained its streamer throughout the ensuing chase.



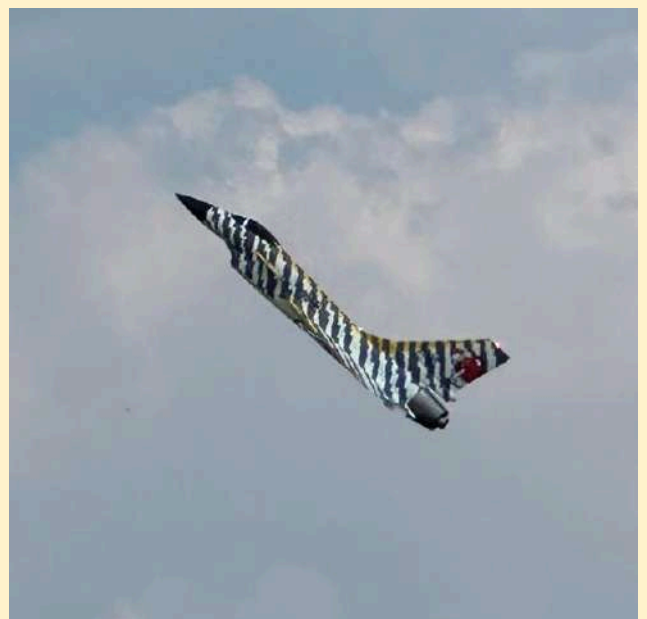
However, just when you thought that you'd seen it all, the crowd were wowed by a display of RC flying by 7 year-old Ruby and 9 year-old Teddy that would leave most of us wanting. Teddy's specialty was flat spins, Ruby's was 4-point rolls. Ouch!!!



All-in-all the show was a spectacular event, which was well worth attending.

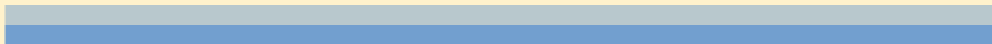
The best display? That, of course, was in the eye of the beholder; For example, for Ian Carby it was the Bucker Jungmeister.

My favourite? Well, you did ask, and I'm writing this. By a whisker it has to have been the J-10 turbine delta with canards and vectored thrust flown by Neil Garnett. I was gobsmacked from the moment it took off, wheels up, then held close to the deck before snapping into a vertical accelerating climb. The subsequent demonstration of flat spins, pirouettes and flips punctuated by fast passes, high-alpha flying, and hovering were simply amazing. Oh, how I so want one of those!



But therein lies the rub; I came away from the show feeling somewhat small, realising that I had been treated to a display by flyers and their models that are in a league above me. I'll never have the dedication, time or money to achieve what I saw, but it's a real treat to watch those who do. Of course such things need a sense of perspective, and everything is relative. Yes, this was a world-class display but at our club sites the flying is so much closer to home and, in so many ways, equally as exciting, fun and satisfying.

Roll on next year!



Flying Better Rolls

Jeff Cosford

When it comes to the 'B' test, most will say that flying the two consecutive rolls is the biggest challenge. BMFA guidance says:

"The examiner will look to assess that the candidate has:

Maintained a consistent height and heading throughout the exercise (a very slight barrelling of the rolls is permitted at the examiner's discretion depending on the aircraft used).

Made evident and correct use of the elevator throughout the rolls.

Used correct spatial awareness to position the centre point of the double roll directly in front of themselves."

"Flying Better Rolls" is the title of the YouTube video shared by Ian recently, and I watched it expecting it would give the usual advice about how to limit throws and correctly apply down elevator and possibly use of rudder.

But it was all about moving the CG rearwards. To test for this, fly an upwards 45-degree line, invert the aircraft and if it changes course coming back down (towards the canopy) the CG is too far forward. Do not rely on the manufacturer's setting, these are often conservative.

The video explains (better than I could) that a forward CG makes rolls more difficult: the plane will deviate more during the parts when it is in knife edge and also when inverted, requiring lots of compensation to keep it axial. The aim is to set the plane so it needs almost no rudder or elevator input.

The video is available here:

https://youtu.be/OyHEZXfHWVc?si=ma5yN_VNtwf1vNzN



I tried this on my Tasman, moving the CG back to 80mm, rather than the recommended 60mm. Battery to rear of the bay, see pic. Sure enough, rolls needed less down, and knife-edge needed less rudder. Yet it remains safe and stable – give it a try with yours.

The Skunk Works Hangar doors open - at last!

Tim Kerss

Avid Clear Dope readers may remember a teaser article from December's edition, in which I wrote about a couple of projects languishing in my hangar that, due to their unusual nature, I likened to work carried out in the infamous "Skunk Works". At the end of said article, I promised to reveal all in the next edition, but, unfortunately, the British weather had other ideas. As you are soon to understand, both models are EDFs which, due to their speed and wing-loading, required a hard surface and a solid wind "down the runway" for their initial test flights. These, therefore, had to be at Thorney and, as many of us will remember, during the first months of 2026 the prevailing wind direction remained resolutely across the main runway there for weeks, if not months, on end.

However, in mid-April, the Weather Gods decided to rectify the situation; so it was time to reveal all, and "Skunk Works 1 & 2" made their debuts. What follows is a brief description of both models and my thoughts about how they have turned out in the air.

Skunkworks 1: 3-engine 90mm Viper



I have to start my description with a confession; I did not design or build this model.

To explain, from the moment that E-flite released this version of the Viper, I was very keen to get my hands on one; it's the big brother of the 70mm, which was released to a fanfare of accolades and rave reviews. However, there was a problem - the price! I just could not bring myself to part with £650 for an object that could end up as a bag of bits on day one. So, I scoured the secondhand market, but, even to this day, examples are hard to come by. However, my prayers were answered when, out of the blue, this 3-engined version appeared on Facebook Marketplace for just half the going rate of a new one. I'd already dealt with the seller before, and it was apparent that EDFs were "his thing". This was just one of many that he'd experimented with, but he then wanted to sell it to maintain an ongoing throughput of new models. Clearly he had been inspired by Xfly's release of stand-alone 50mm EDF motors, and had decided to fix them to a number of commercially available models to bolster their thrust. In the advertisement for this Viper he simply stated: "don't ask me why, I just do this sort of thing"!

To me this looked like a very interesting and unusual project, and working on the principle that conversion back to a basic Viper was always an option, I decided to take a leap of faith and trust. A comparatively large sum of money was sent into the ether, followed by a sigh of relief when, a few days later, a large box appeared on my doorstep which, of course, had to be smuggled into the house!

During a subsequent hiatus of a year or so I found another route into the Viper 90 world with the purchase of another secondhand model; made by FMS from exactly the same mould as the E-flite version, but significantly cheaper. My experience with this model convinced me that it is, indeed, a superb EDF with excellent presence and handling characteristics in the air. However, it was this experience that persuaded me to dig out the “triple version” from the loft.



As you can see from this photo the model has two 50mm EDF units mounted on the rear fuselage, in addition to the main 90mm fan. The seller explained the two extra fans were powered via individual ESCs, but via a three-position switch on the transmitter which corresponded to off, half power, and full thrust. However, I wanted fully variable thrust, and reverse, tied to that of the main fan unit. That said, I simply didn't know if this was possible. My first task was to “tie” a separate channel on my transmitter to the throttle channel, and then to connect the ESCs via a “Y” lead to the receiver.



The results were not promising; one motor would power up, but not the other, and throttle control was intermittent, to say the least. Eventually I decided to replace both ESCs with brand new ones from the Hobbywing stable, and this solved the problem. Both motors powered up and down together, although a good deal of physical muscle and hot glue was involved in the replacement process!

Having fixed the ESC issue, there was a degree of scarring in the fuselage sides which has been covered by a number of suitably well-placed patriotic stickers.

The next issues to address were power supply and the model's balance.

Both auxiliary engines required 4S LiPo power, and needed to last for the duration of a full flight. Accordingly, and in response to a sale on Amazon, I chose to use 6000mAh HRB batteries to complement the 6S 5000mAh battery that would power the main 90mm fan.

I was surprised at how heavy the two extra 50mm fans were, and the effect that they had on the moment arm around the recommended Centre of Gravity. Accordingly, I found that, to balance the model correctly, the combination of LiPo batteries had to be placed well forward in the compartment under the canopy.

So, in the final analysis I had a viper with extra thrust, but it was considerably heavier than the stock version. My final concern therefore was how this combination would perform in the air.



As you may know, the E-flite Viper is a lovely model, with one big vice; at low speed it has a habit of tip-stalling, and there are numerous YouTube videos of this phenomenon, some resulting in a destructive arrival on terra firma. One way to counteract this issue is to apply crow to the ailerons. Having successfully experimented with my FMS Viper, I incorporated 10mm of up aileron with flap. This seemed to have improved low speed stability markedly by ensuring that, when approaching the stall, over-wing flow breakaway is from the wing root, rather than the tip.

And so to the first flight

As with all of my unusual models' maiden flights I asked Derek to take the controls. Range and control checks completed she was lined-up for take-off and, to everyone's relief performed exactly like a stock Viper 90! Absolutely no vices whatsoever; from take-off to the reversed-thrust landing she was a pussycat!



So, the obvious questions are: what, if anything, is different, and was it worth it?

The most common reaction from people who see the model for the first time is: “oh, that’ll be faster” but will it? Ultimately, the top speed of any aircraft is governed by the velocity of the efflux from its engines. By definition it cannot go faster than this, and in the case of this model that velocity had not changed. So, an increase in speed was never really on the cards.

What had changed, however, is the volume of air being pushed out of the back and so, as on a big bypass turbine, the static thrust will have increased. As Declan so eloquently put it on the day; the top speed is the same, but the torque has been wound up. And this is exactly what I subsequently found in practice; it still zooms past at the same rate as a standard Viper, but in a full-power climb it goes, and goes, and goes!

Was it worth it? Financially, yes; I can still revert to a standard Viper if I want, for considerably less than the price of a new one. Experimentally; definitely! Performance-wise; probably not, as the only noticeable difference is in a full-power climb up into the heavens.

So, in summary, following on from the autogyros, paraglider etc. another mad project from the Kerss stable which won’t set the world alight but is, at least, different and entertaining!

On which subject, Skunkworks 1 was closely followed by Skunkworks 2

Skunkworks 2: EDF power E-flite Scimitar



Yet another model from the E-flite stable.

The story behind this model goes back a long way. After a break from modelling over a number of decades, which involved working for a living and bringing up a family, I came back into the hobby/sport just as electric power was becoming a viable option for RC models. Having been nagged in the past for liberally spreading model fuel and oil over our dining table, here was an acceptable option that did not risk such trials and tribulations.

My early forays into this brave new world involved the purchase of a Parkzone F27 “Stryker A” flying wing, which offered high-performance flight, albeit with a brushed motor. Over subsequent years the design was further refined with successively named models, culminating in the F27Q, designed by Quique Somenzini, which flies on 4S brushless power, and is capable of 100mph+ performance.

The next product to appear from Quique's drawing board was the "Scimitar"; this was similar in design to the Stryker but bigger, heavier, and equipped with a variable direction pusher prop motor. It could also be fitted with retracts and, in this guise, was capable of spectacular manoeuvres including high rotational flat spins.



Unfortunately for E-flite the model wasn't a commercial success as, for many, it was seen as being "one step too far" in the Stryker line-up. And so it was that I picked up a brand new "fire-sale" example from Slough RC for just £60.



The model languished in my loft for a few years until I happened upon a YouTube video entitled "my turbine Scimitar". The example in the video had been modified to take a Jetcat turbine and, from first viewing, I knew that this was something that I HAD to do! Accordingly, the brushless motor was removed, the rear fuselage carved out and, yes, a Jetcat turbine purchased!

The conversion proceeded as planned right up until I had to buy fuel and find a suitable flying site from which to launch it. At that point the project stalled, and once again, the Scimitar went onto the back-burner.

However, things changed with my increasing interest in EDFs and, realising that the Scimitar wasn't an ideal airframe for a gas turbine, I decided to restart the project with an EDF unit instead. A search on the internet revealed that this had been done before and so, with suitable modifications to the mounting structure, the airframe was equipped with an 80mm fan, powered by a 6S 4000mAh battery. The latter fitted well into the fuselage, and early trials revealed



that in this fit the C of G lay comfortably within the recommended band. For the final setup the model was fitted with a Spektrum AR637T receiver and an Avian 100A ESC.



Initial ground runs indicated that the power train worked well and, so, shortly behind its stablemate, "Skunkworks 2" was rolled out at Thorney for its maiden flight.

Now, it has to be said that from the outset the model's Achilles heel was obvious. The Scimitar was released in 2012, at a time when electric retracts were in their infancy, and the set around which the model was designed are incredibly weak, and certainly not up to the job for a model with no flaps with a very high landing speed! In the event this has proved to be absolutely true; more of which later.

And so, once again, in early May, Derek found himself at the controls of yet another Kerss challenge. Fears about the undercarriage's strength were founded from the outset when the nose leg caught on a pothole during the take-off run, which had to be aborted as the wheel skewed through 90 degrees. As a direct result subsequently the wheels could not be retracted, but a second take-off attempt was successful up to about 10 feet off the ground, at which point the motor cut out as the battery drained to low-voltage cut-off level. Thankfully, Derek's superb piloting skills resulted in a fraught, but successful dead-stick landing back onto the concrete!



A week later, and loaded with a more powerful battery, the next flight was attempted. Success!



The model climbed away, albeit with considerable up-trim required to maintain level flight, but once everything had been stabilised, and trimmed out, the rest of the flight was unremarkable. Fast passes and (relatively) slow flight were uneventful, and after four and a half minutes it was time to land. Again, not an issue right up until nose wheel touchdown, at which point it slewed through 90 degrees, bent back and the whole show came to an undignified halt!

So, in conclusion, an interesting model which performs well and turns heads at the flying site. However, landings are an issue and, whilst having retracts is good from the point of view of aesthetics, belly landings onto long grass at the end of each flight may be the way to go Just like the Stryker, the Scimitar's predecessor!



Measuring a Large Model C of G

Ian Carby

(But not in front of the CFI)

I am aware that the mention of large models has some club Committee members shaking, muttering “Oh no, not more paperwork”, but some models are just a little too large or awkward to balance on forefingers and then flip over to locate that magic point.

It’s a shame that some of us avoid any form of mathematics due to boring school arithmetic, but hidden behind some weird symbols and odd terminology are often some straightforward concepts.

In this article we will cover a bit of algebra, a touch of mechanics and a flourish of arithmetic, but nothing too complicated.

Please be aware that alternative methods are available (at a cost), but in true Blue Peter fashion, we will be using items available in most homes, and a good place to start is with a list of items required.

- Model
- Paper and Pencil
- Sticky backed paper tape
- Tape Measure
- Load Cell
- Yorkshire Gold Tea Bag

There is probably one item that has already put you off and that is the Load Cell. A fully calibrated unit can be found in many kitchen cabinets disguised as a Digital Kitchen Scale, but if access is denied by the CFI, I found a great one on Amazon with remote display for £16.

This method of locating the C of G can (and is) used for many aircraft, but if you are conducting rearward C of G tests on a full size A380, you may need a longer tape measure.

Before assembling the whole model, mark on the masking tape the interval between expected C of G limits, and place on the fuselage side roughly where you expect the c of g to be, just to check that the exercise makes sense. Measurements can be made with or without fuel, or in the case of electric, with charged or discharged flight packs, just make sure that the batteries are NOT connected.

So, to the theory.

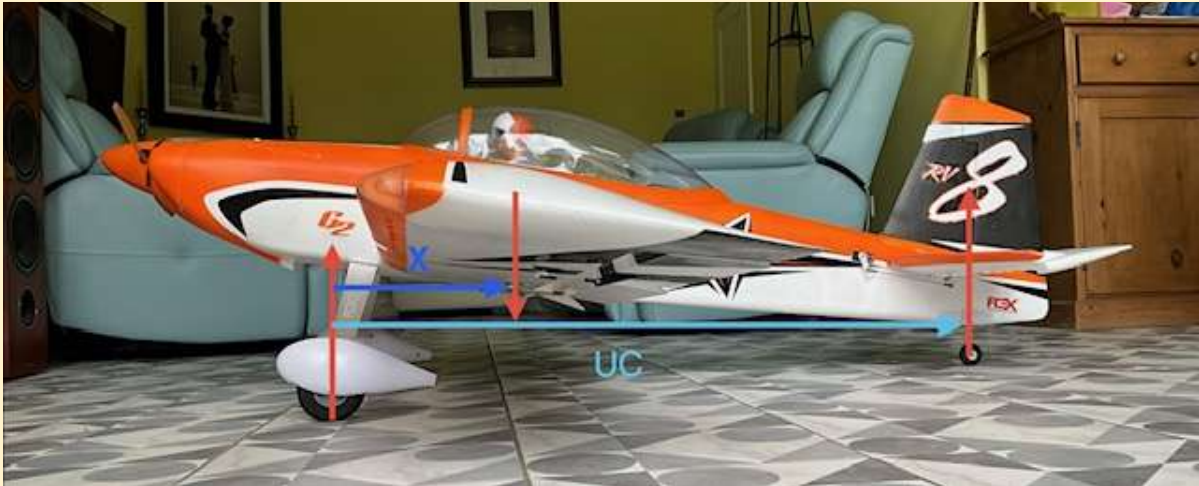
Here is the model to be measured. Standing on the ground, all is in equilibrium, so the mass of the model acting through the C of G downwards is balanced by forces acting up through the



main undercarriage and tailwheel. So that gives us our first equation given that MAIN is the weight on the undercarriage, and TAIL the corresponding weight at the rear.

$$\text{MASS} = \text{MAIN} + \text{TAIL}$$

The next term I will use is that of Moments, which is a posh version of torque, i.e. the product of a force and a distance. It's the principle behind a lever that is twice as long and needs half the force.



I can measure these moments from anywhere, but to keep things simple I will choose the tailwheel. Again, as the plane is in equilibrium, (I like that word), any clockwise turning forces around the tailwheel are in balance with anticlockwise forces. In mechanics this is called "taking moments about a point". Now the reason I chose the tailwheel, as although there is weight on this wheel, the force is at zero distance from the end of the lever UC, so it does not contribute any of the turning forces. All we have is the MASS acting anticlockwise at the distance (UC – X) along the lever through the c of g, and the clockwise force on the main undercarriage at a distance UC which we can measure. So, remembering that I said moments are a product of a force and distance, and that forces acting in opposite directions have opposite signs, gives us our second equation. If MAIN is the sum of weights on the main undercarriage, and TOTAL is the whole weight of the model acting through the centre of mass, then....

$$\text{MAIN} * \text{UC} - (\text{MASS} * (\text{UC} - \text{X})) = 0$$

This distance X is a bit arbitrary, as we really want to know the distance of the C-of-G from the leading edge of the wing, so I'm going to relabel some measurements, and it all becomes a bit messy, but please bear with it.

Before rigging and weighing the plane, I took a few measurements.





- A is the distance from the main wheels to the leading edge of the wing.
- B is the unknown distance from the leading edge of the wing to the centre of gravity.
- C is the length between the main undercarriage and tailwheel.

So here is the same equation but using the new terms.

$$\text{MAIN} * \text{C} - \text{MASS} * (\text{C} - (\text{A} + \text{B})) = 0$$

With a bit of algebra

$$\text{MAIN} * \text{C} = \text{MASS} * \text{C} - \text{MASS} * \text{A} - \text{MASS} * \text{B}$$

As it is B we are seeking

$$\text{MASS} * \text{B} = \text{MASS} * \text{C} - \text{MASS} * \text{A} - \text{MAIN} * \text{C}$$

Dividing through by MASS

$$\text{B} = (\text{MASS} * \text{C} - \text{MASS} * \text{A} - \text{MAIN} * \text{C}) / \text{MASS}$$

This tidies down quite nicely to

$$\text{B} = (\text{C} - \text{A}) - (\text{MAIN} * \text{C}) / \text{MASS}$$

And B is the distance we need to know from the leading edge of the wing to the centre of gravity.

For the purist amongst you, I seem to have forces, weights and masses all mixed up.

Well technically you are correct, but as gravity works the same on the whole plane, grams, kilos and newtons all sort themselves out.

Before measuring we need to consider units, so for consistency weights will be in grams, distances in mm. Also remember that the maths is very similar for a taildragger or trike, just that the C-of-G of a trike is in front of the main undercarriage.



So where next. Well to save time, I constructed an Excel spreadsheet.



Cadmac C-of-G Calculator

U/C to wing LE (A)	mm	30
U/C to Tail Wheel (C)	mm	1140
Port UC Weight	gms	1847
Stbd UC weight	gms	1805
Tail Wheel weight	gms	652
Total weight	Kg	4.304
Lateral imbalance	gms	42
C-of-G from LE (B)	mm	142.6952
To achieve desired c-of-g, then move battery and monitor Tail Weight		
desired c-of-g from LE	mm	143
Adjusted Tail weight	gms	653.36

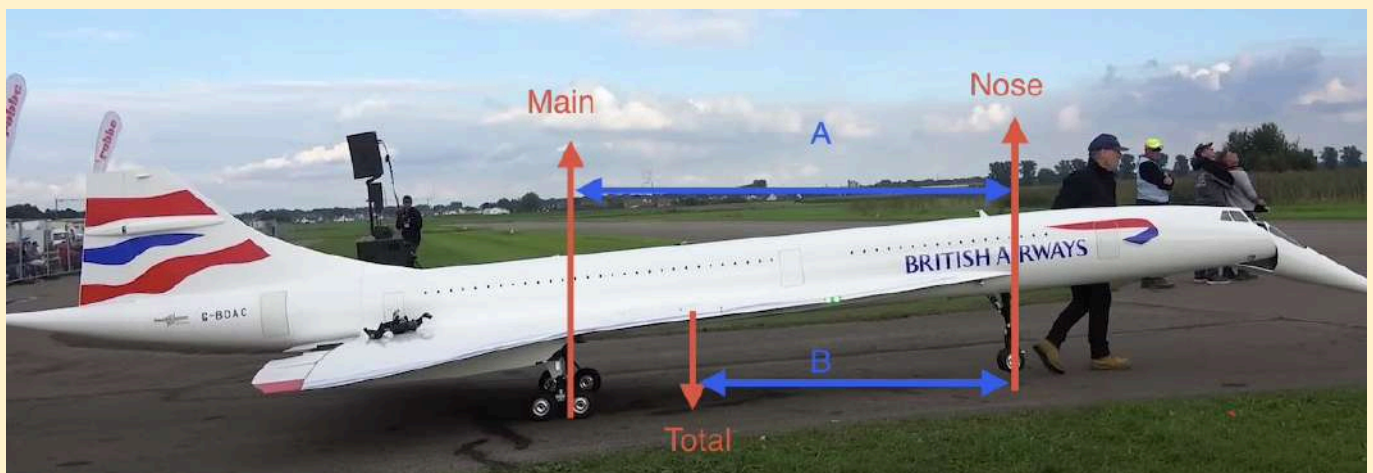


Once the plane was rigged, with the battery in a guessed position, I took some measurements. Then by entering the desired C-of-G and monitoring the tail weight as I moved the battery, I could mark off the optimal flight pack location. It may seem like quite a kerfuffle, but it took longer to rig the plane than take the measurements and this exercise could well save a model on its maiden flight or help with an oversensitive elevator.

And the teabag? Well after all this I could do with a cuppa!

And what about us jet guys preparing our models for Derek to maiden?" I hear the hoards cry.

The principle is the same, but I will take moments about the C-of-G, which is at some distance B from the nosewheel. As before the clockwise and anticlockwise turning forces about this point must be the same if the system is in equilibrium.





$$\text{NoseWeight} \times B = \text{MainU/CWeight} \times (A-B)$$

Or

$$N * B = M * (A - B)$$

With a little bit of the dreaded algebra

$$B = (M * A) / (N + M)$$

We now have the location of the C-of-G from the nosewheel, which can be marked on the fuselage using the sticky backed paper and compared with the specified datum.

For those of you that would like to play with my spreadsheet, it is available on the CADMAC website, or you may access it through this link:

https://cadmac.co.uk/index.htm_files/CofG5.xlsx (it will download it to your 'downloads' folder).

Please note that there is nothing original about these calculations. In fact they were all part of the old 'A' levels from over sixty years ago, but they are just as valid today as they were then.

Next time, as part of the 'How It's Done' series, we will discuss how a man who drives a snowplough gets to work in the morning.

Power Management and Risk Mitigation

Simon Woodhead



You know you're getting older and wiser when you start to assess risk before taking the plunge. I'm pleased to say this is an excellent example of risk evaluation and mitigation before leaping into the air. Although I've not gone through a formal documented risk assessment I have mentally considered my next flight failures whilst downing my third glass of a fabulous red. Whilst this doesn't exactly comply with the BMFA recommendations or guarantee first flight success, it does make me feel good and possibly provide some reassurance to our Club Chairman that one of his magnificent club members is considering appropriate due-diligence.

We take it for granted that when we move the stick all the servos behave as they should and there is sufficient power to manage a safe flight and landing. This is mainly because someone, the designer, has already calculated power consumption against power availability. Whilst this is a safe assumption for pre-built and kit models, it may not always be the case when you are building off a plan or 3D printing a Stl file, whilst following a basic assembly instruction or none at all. The importance of managing power came upon me when I was assembling my latest 3D printed creation. A twin 70 mm engine ducted fan F-something fighter with full vectored thrust, afterburner LEDs, wing slats, flaps, dual rudders and retractable undercarriage, steerable nose wheel etc-not to mention release mechanisms for 3 cruise missiles. A magnificent beast of a model sporting 14 x 9 g servos excluding the three required to launch cruise missiles. The wiring diagram provided with the stl down-load files leaves a lot to the imagination. So my concern was how to manage the power requirements to provide safe, reliable flights without unintentionally landing in the horse paddock. The first step was to understand a little of the relationship between the Receiver (Rx), the ESC (Electronic speed controller) and the battery.

The Rx, from a power perspective, is equivalent to a power distribution board, providing low voltage (circa 5 to 8 volts) to the servos, plus a signal controller to control servo movement and receiver circuitry, and that's about it. The power for the servos via the Rx comes directly from the BEC circuitry within the ESC. The BEC (Battery Elimination Circuit) is there to reduce the voltage of the flight battery from a relatively high of 12 volts plus to a lower voltage to power the Rx and servos. The important bit is the current rating of the BEC. If the demand from the servos through the Rx increases to or passes the BEC's current rating, then the voltage going to the Rx will drop. This is called a "Brown-out" and means the Rx shuts down before trying to re-boot itself - mid-flight! - or not at all. This is of course catastrophic for your model and anyone beneath the flight-path. I'm told that Spektrum Rx are particularly prone to this but any Rx will fail in this way if pushed hard enough. A quick way to test if your operating close to the Bec's current rating (other than measuring the amps) is to activate all servos with as many as possible near to servo stall or under load (place a little weight over control surfaces). If the Rx led flickers or goes out then you are too close to the Bec rating – Do not fly !

So how to avoid going low on power? First do some maths. Note the Amp rating of the BEC in the ESC specifications and compare that with the total current usage for all servos under load and in the stalled state.

For example, a 9 g servo draws:

1. Idle: 5 mA to 10 mA
2. Normal load: 250 mA to 500 mA
3. Stalled: 600 mA to 800 mA

So start adding up the number of servos to find the final most likely total current. Most models fly with between 5 to 7 servos which gives a total current usage of between 3.5 Amps to 4.5 Amps assuming only 2 servos are stalled and assuming no servo is at rest. So if the BEC is rated at 3 Amps then you have a potential problem. Whilst this may be a slight simplification of matters, given that I'm using worst case conditions for the servo status and I've made a lot of approximations; it is worth doing this calculation when you have a large number of servos on your model and you find an old ESC in your used box and think, "Let's give this a go!" Think 'Power' before you fly. Better still - before you build.

So how do we manage the problem and mitigate the risk? As I'm now narrating what I'm intending to do, we'll have to find out together on 'a Thorney strip near you' whether I got it right.

Getting it wrong is likely to see me putting a dent in the tarmac. At least we now have a near-by Defibrillator (Hanger 13 /// stand.well.clear) to recharge my Lipos or 'give resus' if it all goes belly-up.

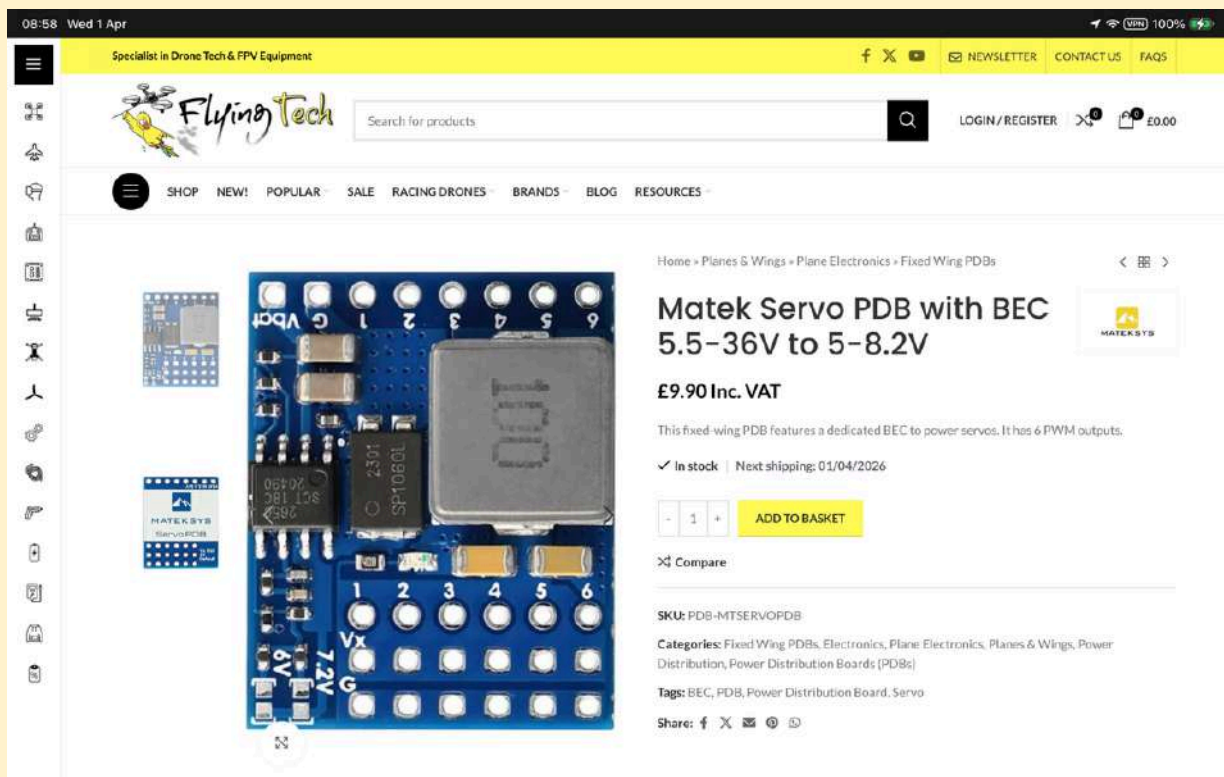
Talking of risk mitigation, perhaps we ought to put a Defib' next to the horse paddock. I'm not a vet but I presume the contraption works for horses too.

One obvious option of course is to buy a more powerful ESC with a larger BEC capacity, but let's explore another solution which is somewhat less expensive than a couple of 120 Amp ESCs. My risk mitigating instrument of choice is going to be a Power Distribution Board (PDB). A small printed circuit board (PCB) that allows you to power





servos from a separate small battery, whilst leaving the Rx to provide the servo signal. The PDB I have in mind is the Matek PDB with BEC.



The PDB is powered by a separate auxiliary battery. I'll use a 4 cell 2.2 Amp-Hour unit. There are pin-outs for each servo outlet. These will need to be soldered in place. A little tricky I think so practice your delicate soldering technique first. The input to the board comes from the spare Rx channel of choice. You only need to connect two wires, the black or brown ground lead and the yellow or white signal wire. Remove the central red power lead, which is not needed, as the power will now come from the auxiliary battery.

So that's the theory, now to put into practice what I preach. I'm intending to use 2 PDBs, one for the landing gear retracts (3 servos) and one for the two rudders, yaw vectored thrust and the nose gear steering (4 servos). This takes out 7 servos from the 14. I reckon seven servos pulling power through the BEC should be just fine, but I will check the maths.

Well, would you believe it! The current rating of my two ESC Bec's is 30 Amps a piece - they are whoppers with enough power to light up Littlehampton for a week. Who needs risk mitigation when you've got a big BEC?!
[\[In the clear morning air I noticed I made an itty-bitty error. I overlooked a little dot between the 3 and the zero. It's a 3.0 Amp Bec, not 30. An easy mistake to make. Looks like I'm in for a spot of mitigation after all.\]](#)

Thankfully common sense has prevailed: I went and bought two 10/30 amp (const/peak) BECs, 120 Amp ESCs and re-worked the maths. I'm going to plug the whole lot through the Rx and it's 'Reach for the sky' time - I feel younger already. We're good to go - to infinity and beyond! Plenty of amps now for the missiles! Sorry Mr Chairman, you're in for some sleepless nights. Now let's finish that bottle of red.

Merry Defibrillations to one and all.

So glad we had this chat!



2026 Diary Dates

For the most up-to-date details, please check the CADMAC website.

June	Thursday 11 th	Fishbourne	Light Flight & Electric on the field
July	Thursday 9 th	Fishbourne	Light Flight & Electric on the field
July	Saturday 11 th	Portshole	E-Glider Competition & BBQ
July	Thurs-Sun 9-12 th	Trundle Hill	NO FLYING - Goodwood Festival of Speed
August	Thursday 6 th TBC	Goodwood Aerodrome	Evening flying on the airfield
August	Saturday 8 th	Thorney	Gliding Competition Round 1
August	Thursday 13 th	Fishbourne	Light Flight & Electric on the field
August	Saturday 29 th	Thorney	Aerobatics Competition
September	Saturday 5 th	Thorney	Gliding Competition Round 2
September	Thursday 10 th	Fishbourne	Light Flight & Electric on the field
September	Fri-Sun 18-20 th	Trundle Hill	NO FLYING - Goodwood Revival
September	Sunday 27 th	Thorney	Scale Competition
October	Saturday 3 rd	Thorney	Gliding Competition Round 3
October	Thursday 8 th	Fishbourne	Table-Top sale
November	Sunday 8 th	Thorney	Remembrance Day Gliding Competition
November	Thursday 12 th	Fishbourne	Talk by Sussex Model Centre
December	Thursday 11 th	Fishbourne	AGM

Please also note that the MoD have granted us the following dates for evening flying at Thorney (1800-2100):

- Wednesday 10th June
- Thursday 18th June
- Thursday 16th July
- Thursday 30th July
- Wednesday 5th August
- Wednesday 12th August



CD Quiz June 2026 - Faces Past & Present

All have an aeromodelling connection. Should you need a hint, initials are down the bottom in no particular order.

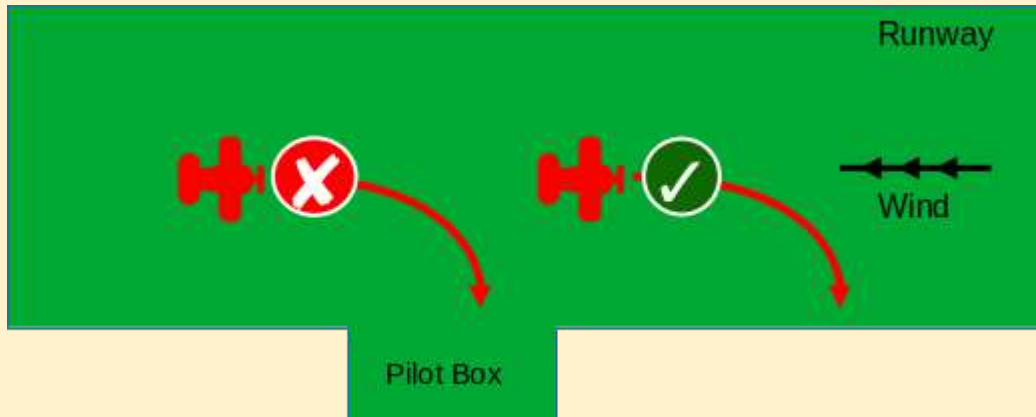


HP, CF, MR, CPLR, CH, MT, MT, EK, PS, PS, JW, JB, SB, DB, DB, TN, SC, WM, PH, PM

Safety Corner

We continue to see flyers not carrying out control checks immediately before takeoff, and/or taking off from an inappropriate position on the runway. Although we covered this last year, it bears repeating.

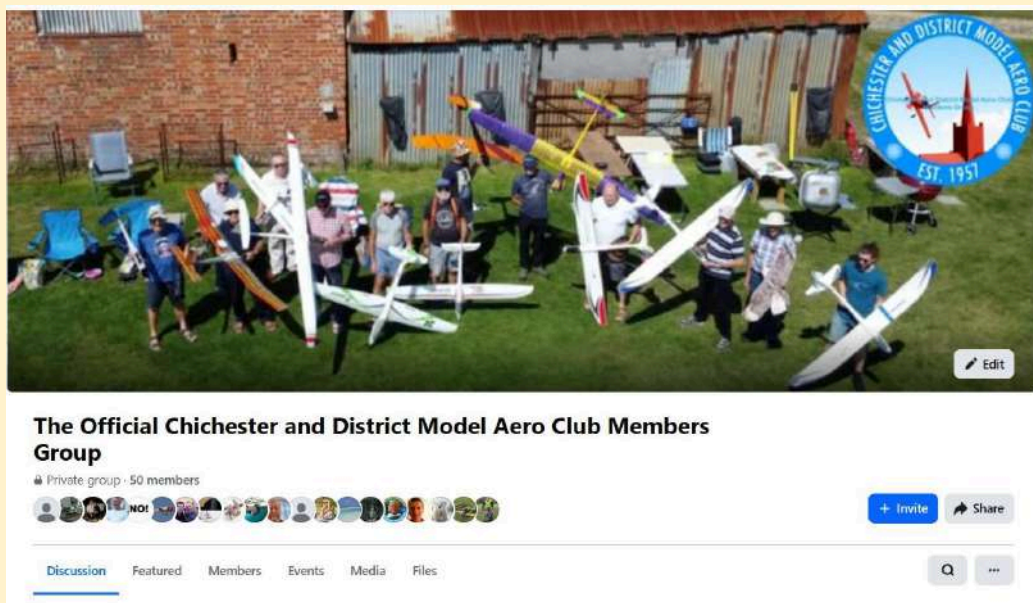
The most likely moment for a model to veer wildly off-course is at the start of the take-off roll. The combination of high power and low airspeed make the model difficult to control.



Therefore always start your take-off roll with the model upwind of, and away from, the pilot box!

This way, should the model veer inadvertently, nothing will be endangered!

CADMAC on FACEBOOK



Note that the Official CADMAC FaceBook group can also be accessed with the following link:

<https://www.facebook.com/groups/545578331713954>



Arun & Chichester (Air) Enthusiasts Society

AirACES

www.airaces.org.uk



Patrons – Sqn Ldr Richard (Dick) Kharegat RAF (Ret'd) – ex Vulcan, Victor, B52 Pilot
Sqn Ldr Rod Dean RAF (Ret'd) – ex Hawker Hunter Pilot and Display Pilot

PRESS RELEASE

Monday 22nd June 2026 - 1845 for 1930 hrs

Boxgrove Village Hall, PO18 0EE

“Solo 2 Darwin – in the Footsteps of Amy Johnson”

Presented by Ms Amanda Harrison



Do you have a dream that you have been told you can never do? Solo 2 Darwin is one woman's dream that she never gave up on, even through the dark days of cancer. Amanda is the true spirit of adventure, proving ordinary people can achieve something extraordinary. On 11th May 2019, Amanda took off in her 1942 Tiger Moth biplane, to honour the amazing Amy Johnson, who, in 1930, was the first woman to fly solo from the UK to Darwin, Australia in 19 days. Most adventurers choose a modern aircraft to fly around the world in. Amanda wanted an authentic adventure in a vintage biplane with its cockpit open to all the elements, for her solo voyage.

The Solo 2 Darwin adventure saw Amanda flying through spectacular scenery, extreme temperatures, two engine failures, mountains of bureaucracy and finally having to end this attempt with the warning of the possibility of being shot down. The talk will have you flying with Amanda, who, with trademark humour and tenacity, will have you experiencing the drama, the dangers and the sheer exhilaration of flying all by yourself in a tiny fragile aeroplane across the planet.

AirACES is an aviation talk society, providing its members with regular talks, given by experts in many different fields related to the world of aviation.

VENUE – Boxgrove Village Hall, The Street, Boxgrove, Chichester, PO18 0EE
6.45 pm for 7.30 start. Members £5, Non-members £10 and under 16s FREE.

Doors open at 6.45 no pre-booking, no reserved seating

For further information about AirACES, please see www.airaces.org.uk

Email: airacesuk@gmail.com or call Air Aces on 07423 670703

Red Arrows display at Thorney! (continued from page 3)



After they had landed the pilots expressed their satisfaction at the results of their efforts. "All in a day's work." explained Red 1, and Red 2 agreed; "we must do it again sometime." he said.

Rumour has it that for future displays they will probably be sporting their red flying suits, along with matching underwear, lipstick and nail varnish.

So, coming to a flying site near you soon!





Tony Reynaud with his new Avios Herc, now successfully maidenied!

Colin Martin with his impressive Chipmunk.



Tony Parrott with his outrageous DH Otter - possibly the most aerobatic aircraft we have ever seen (???). Has to be seen to be believed!

Duke Benson with his beautiful Corvus Racer.





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