Clear Dope

December 2025

The Chair — Derek Honeysett

Welcome to this Christmas edition of Clear Dope. Unfortunately the weather has now changed and flying opportunities will need to be taken when gaps in the wind and rain allow. Flying on a cold frosty morning can be fine as long as the wind chill is not dropping the apparent temperature too much.

In December we have our AGM. Please try and attend as it's *your* club and it's *your* opportunity to have your say. As Tim pointed out in a recent email, we are also looking to fill several committee posts for 2026.

I have not done that much flying recently, although I have been spending a lot of time in the model room. My E-Flite Viper is finished, complete with its unique colour scheme, and I have started the Kyosho Oxyalys patternship. I have to say I am disappointed with the quality of the Oxyalys film covering; it is really easy to damage and seems to lift easily.

Some of you at Thorney recently saw me crash a small vintage model. This was caused by reversed ailerons as a result of changing the aileron servo, and not checking the control directions.

I could have easily kept this quiet. However, I feel it's better to be up front about mistakes, as we can all learn from them. It just shows that these incidents can catch all of us out. Even Chris Foss at his recent talk described an occasion he had with reversed ailerons.

How did this happen?
I changed the servo, as I was not happy with the security of the arm on the original servo and assumed the direction would be the same. I didn't check this after installation, and being eager to get in the air at Thorney, I also did not check the controls prior to take off, something I usually do.

I have certainly learnt from this to my cost, although thankfully it wasn't one of my better models. Please take my mistake on board and double check control directions before your next flight.

Will this model fly again? Hopefully! See you at the AGM.

Editors notes & Club News

A huge “Thank You” to all who have contributed to this issue of CD – your magazine!

The next issue of CD is scheduled for February 2026.

Please note that the deadline for submission of articles for the next issue is **30th January 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!

Merry Christmas!

Fraser Dibden & Robin Colbourne

Thursday 11th December we will be holding our AGM and subs evening.

The AGM will start at 7.30pm, and will be held in the Small Hall in the Fishbourne Centre.

The Small Hall is situated next to the Main Hall, and is where we have had our pre-AGM refreshments in previous years. It also features a bar, so drinks can be purchased. As usual there will be a good (free) supply of seasonable nibbles (mince pies, sausage rolls etc), to keep you going throughout the evening.

The AGM is an important event in the CADMAC’s calendar, and we request that you attend if at all possible. It’s your chance to find out about, and have your say in, the running of the club.

One of the main topics that will be covered is the election of members for next year’s committee.

The majority of current members are prepared to stand again, however, it is apparent that we will need to fill the positions of *Entertainments Rep, BMFA Rep, and Competitions Secretary.*

It is worth emphasising that ALL positions on the committee are up for re-election; so, if you want to put yourself, or anyone else, forward for election for the known vacancies, or ANY OTHER committee position, please let Tim Kerss (Secretary) know. The only criteria is that you will need a proposer and seconder on the night.

On November 12th, Chris Foss gave an enthralling presentation at Fishbourne. A well-attended and fascinating lecture! Chris described his early days flying free flight at Chobham Common, the first UK thermal soaring competition and flying target drones in the Middle East, Chris entered the World Scale Championships on several occasions, firstly with his Loving Wayne WR-1 and later with a Dalotel, a French aerobatic design. His dedication led to him winning in both 1992 & 1993.

After the interval, he told how redundancy led to him setting up his model kit company; initially working from home, then setting up in an old village hall. He would drive around the country to collect foam wings for his gliders from Pat Teakle near Bristol, and power model wings from Oxford. He also delivered stock to the many model shops which stocked his designs.

Wood selection is one of the unique selling points of his kits. Chris described how he matches fuselage sides, selects the lightest wood for rudders, and in the early days, would send 20% of the wood back to Solarbo for being unsuitable.

Not content with modelling, Chris found time to take up full-size gliding, firstly at the somewhat rustic, eccentric Ringmer Club, later moving to the Southdown club at Pulborough. These days, he gets his kicks on the track at Goodwood, driving a Focus ST and an Aston Martin Vantage.

Chris still flies models regularly and bought along his electric Wot 4 which sported a large sub-fin for crisp stall turns and a removable battery tray for positive location and quick changes.

CADMAC Gliding Competition Round 3 — Derek Honeysett

Saturday 18th October saw round 3 of our series of annual gliding competitions. Once again there was a keen wind from the south east, although this did drop a little during the afternoon. Due to the strength of the wind, we were able to run two classes of both electric and bungee launched gliders, with nine members entering the electric and six for the bungee.

Despite the conditions being overcast and breezy, there were pockets of lift around and some members returned some decent times in both classes.

Here are the results of the E-glider competition. It should be noted that the best three rounds count towards the total, also some members only managed to fly one round, mainly due to damage to their models, Declan also managed to crash his model before the rounds during a practice flight.

Adrian with his ‘Hi Lite’ was the winner. This model manages to climb to a great height in the twenty seconds allowed and doesn’t come down that quick either, although Tim with his ‘Night Radian’ was close on Adrian's heels.

E Glider						
Name	**Model**	**Round 1**	**Round 2**	**Round 3**	**Round 4**	**Total/Position**
D. Cousens	Palio	-	-	-	-	-
K. Knox	Cularis	2.27	-	-	-	2.27 6th
T. Reynaud	Gentle Lady	2.32	4.00	4.13	4.09	12.22 3rd
A. Childs	Hi Lite	10.00	7.19	9.40	6.06	26.59 1st
D. Honeysett	Solius	4.52	4.01	3.11	2.55	12.04 4th
B.Pethers	Gentle Lady	1.54	-	-	-	-
T. Kerss	Night Radian	7.12	5.24	5.54	7.05	20.11 2nd
D. Benson	Adventure	3.49	4.30			8.19 5th
Luke	Bixler	1.46	-	-	-	-

The bungee launched gliders found the conditions almost perfect, with a good height being attained before the release of the bungee. Although lift was sporadic, the same format regarding the scoring applied, and again some members only managed one or two flights.

Bungee Launched Glider						
Name	**Model**	**Round 1**	**Round 2**	**Round 3**	**Round 4**	**Total/Position**
A. Childs	Algebra	7.13	6.49	4.03	5.21	19.23 1st
K. Knox	Amigo	1.29	4.38	-	-	6.07 5th
D. Cousens	Bird of Time	6.27	3.16	3.48	6.36	16.51 2nd
D. Honeysett	Centi-Phase	3.17	3.19	4.39	4.27	12.25 4th
R. Colborne	Red Thing	3.21	6.09	3.56	3.05	13.26 3rd
B. Pethers	Gentle Lady	1.28	-	-	-	-
D. Benson	Thing	3.23	-	-	-	-

Those of you that know your gliders will probably recognise some of the models used in the bungee class, all of them being from the seventies and eighties except Declan's Bird of Time being a modern ARTF of the classic design.

This is the last round and the results of all three competitions will be added together to decide the winner. For me it was a shame it was a little windy on all three rounds, as I have a new E-glider that is going to be very competitive in lighter winds. Hopefully these glider competitions may inspire more of you to come and join us next year.

Remembrance Day Gliding Competition — Derek Honeysett

I thought I should start this report by giving you the history behind this competition. Historically, as a mark of respect, CADMAC never flew on Remembrance Sunday. It should be pointed out that this came about because the members flying at Thorney were almost all flying I.C. The stopping of model flying on remembrance Sunday remained in place until the start of the gliding event.

In 2011 on Remembrance Sunday, I was standing in my garden looking towards Thorney Island, and noticed that the then-resident microlights were flying. I thought "we are missing something here; if they can fly, so can we". I then came up with the idea of having a glider competition on the afternoon of Remembrance Sunday, where members make a donation to fly.

In due course I contacted the Station Staff Office with my plans, which were met with unanimous approval, and in November 2012 the first competition took place. Over the coming years I think we have only missed two Remembrance Sundays: the first due to high winds, and the second due to flooding at the gatehouse. Since 2012 we have raised a few thousand pounds for the British Legion Poppy Appeal.

On Sunday the 9th November, the forecast looked promising, with a maximum of 15mph wind plus a risk of rain later in the afternoon. Both E-glider and bungee launched gliders were going to be flown. There were ten competitors for the e-glider and five for the bungee, plus some other members who came to watch the fun and make a donation.

The E-glider class got underway first. Models ranging from a vintage Gentle Lady to warm-liner rocket ships were flown. Jeff's Excalibur and Tim's Aggressor were able to gain extreme height in the twenty second motor run allowed. Tim had to change models after the first attempt as the motor fell out of his Radian, apparently a common problem. Nick was flying a retro Alpha Compact, which also has a very powerful motor and slightly longer wings, enabling him to get the longest time of the afternoon. Overall, because of the conditions, times were a little low.

E Glider					
Name	Model	Round 1	Round 2	Round 3	Total/Position
K. Smith	Radian	3.21	2.50	3.38	9.49 6th
T. Reynaud	Gentle Lady	3.14	3.09	3.19	9.42 7th
N. Gates	Alpha	5.25	5.35	7.38	18.38 1st
D. Hayward	Milan	2.18	2.09	-	
J. Cosford	Excalibur	5.22	5.26	4.37	15.25 3rd
T. Kerss	Aggressor	6.53	5.01	4.50	16.44 2nd
R. Colbourne	Radian	5.02	1.32	2.17	8.51 8th
C. Martin	ASW 28	3.50	3.55	3.49	11.34 5th
Luke	Bixler	1.46	-	-	
D. Honeysett	Solious	4.58	4.37	4.38	14.13 4th

The five entrants that took part in the bungee launched gliders enjoyed the moderate breeze, ensuring that the models reached a good height before release. All of the gliders flown were retro designs, - for example my EMP Corona was from the early eighties. Jeff brought along another early design called Blue Beast, with a span of at least three meters. Nick was flying his Nymph, Dave had a very nice Cambrian Elan, and Declan his Bird of Time.

As usual using the bungee was not without its drama, firstly it snapping in two places causing delay while looking for parts of elastic. Robin managed to get into a spiral going up the line, resulting in the model planting itself like a fence post! Dave had difficulty from a poor release, but thankfully his model was not harmed.

Bungee Glider					
Name	Model	Round 1	Round 2	Round 3	Total/Position
D. Honeysett	Corona	4.03	2.54	3.43	10.40 3rd
D. Cousens	Bird of Time	6.20	5.02	7.27	18.49 1st
J. Cosford	Blue Beast	5.20	4.51	4.45	14.56 2nd
D. Hayward	Elan 100	3.20	-	-	3.20
N. Gates	Nymph	3.23	2.35	-	5.58

Overall the afternoon was a great success, with £300 raised by donations. Once again I would like to thank those of you who supported the event either by flying, turning up on the day or making a donation, plus my wife Alison for baking a cake. I have emailed the total raised along with a few photographs to the Army at Thorney Island and the money has been submitted to the British Legion.

Gliding has always been well supported in CADMAC, and as Tim said to me “I think people like it because it is something different”. Now is the time to get yourself an E-glider or Thermal soarer ready for next year’s competitions!

Some of your committee spotted
Celebrating Halloween!

New to Flying - Start here

Simon Woodhead

Beginners corner - Part 3: Learning how not to fly; First Steps and the Fear of landing

In the last issue of Clear Dope, I described my first adventures into taking my maiden flight on Dartford Heath. The lessons learnt were considerable, and transformed my approach to this fabulous hobby. So what did I learn?

- Understanding the principles of flight and control is essential to the successful building of your first model, testing it and taking your first steps into the air.
- Ask a club member to check your model over before take-off.
- Do ask an instructor to set up a buddy-box. This is a second transmitter connected via a wireless or wired link to your own Tx. This gives you an opportunity to fly with the knowledge that there is someone ready to bail you out of trouble if needed or perhaps take-off and land whilst you learn how to keep it airborne. At this point in your aviation journey the learning curve is incredibly steep. If you're not in control within a second or two after taking-off, your beloved model is in pieces at your feet and learning opportunities come to an end.

So what happened next in my journey of aviation discovery? An instructor took me up on a buddy-box so that I learnt a few skills in the basic principles of take-off, flying circuits and landing. I was now armed and very dangerous to go solo. I can remember those first solo flights so clearly. The feeling of elation at take-off followed quickly by the fear of “How do I get back home and land?”. This fear stayed with me for several months until I learnt a few fundamental pre-flight preparation and flying skills. Very definitely worth considering….

1. Perform a preflight range check between your model and the Tx. This will give you confidence that your beloved bird will not fly away into the distant horizon.
2. Returning to the earth is inevitable. No point in wasting emotions in fearing the inevitable.

On the subject of pre-flight checks this would be a good time to introduce you to SWEETS.

The SWEETS acronym is there to remind you to check Sun and Wind direction. You need to take off into wind and have the sun at your back, not in your eyes, during the flight circuits. Then think of Emergency recovery / landing options and the Environment. For instance, is there a tree inconveniently positioned for your landing approach, or potential access to the strip for the general public. Check your Transmitter for the correct switch /model selections, and finally a Safety check over the integrity of your model from the Prop to the Tail. This is nicely documented in the BMFA hand-book and is integral to the BMFA ‘A’ certification, so have a good read.

So back to my flying adventures. The trick and the challenge of course is to return to the same field as take-off and land sufficiently gently to keep your pride and joy in one piece. The best way to avoid this fear is to practice circuits and final approaches to the landing strip, giving yourself confidence that you can return home and get close to a landing configuration. If you feel confident, make figures of eight in the opposite direction so you build up confidence flying in both directions.

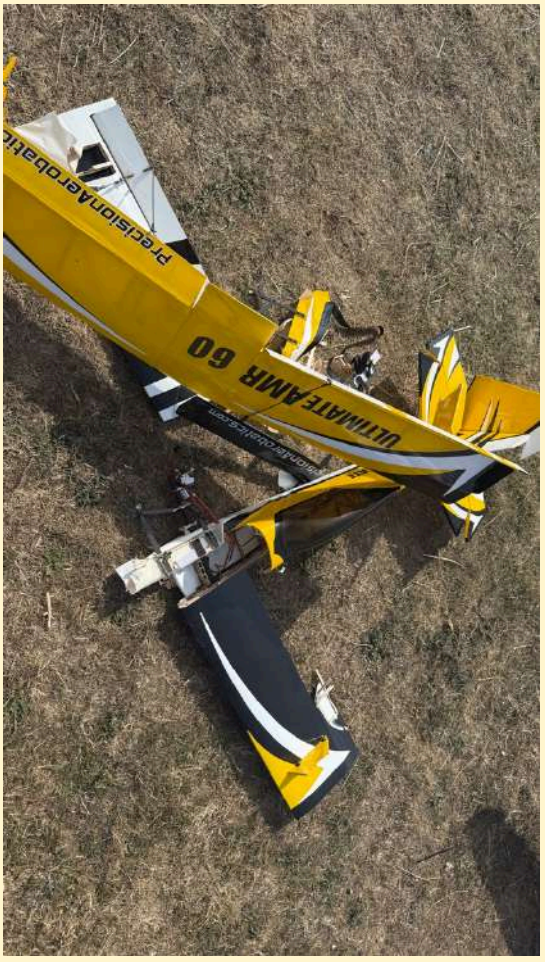
In my journey to overcome this fear of returning home and landing, I totally wrecked three trainer models. Whilst the root cause was of course a pilot error in every case, I find this so demotivating, so I prefer to think of these misfortunes as an OOOPs moment (Operator Operational Oversight that Sucks). The term ‘crash’ or ‘wrecked’ is also far too emotional, so I’m going to borrow Elon Musk’s description of an ‘R.U.D.’ – Rapid Unscheduled Disassembly, or if it’s a bin job, a ‘Total RUD’.

So armed with my maiden wings, many RUDs, an occasional total RUD, and several OOOPs, I ventured skywards. My first solo flight was with a second-hand trainer purchased from a local model shop. No preflight checks and away I went up into the blue yonder.

Take your pick for what happened next.

a. A fly tickled my nose - I went to swat it and dropped the Tx
b. A nearby aviator was performing a loop, nicely over the top and down the other side before thumping into my bird dead centre - no survivors
c. An unintentional manoeuvre on my part and the brutal recovery resulted in the wings parting company from the fuselage.
d. I accidentally hit the motor off switch and didn't realise until too late.

Well, all four scenarios have happened to me during my brief exposure to this hobby, but on this fateful day it was the loss of the wings that took me by surprise and brought my flying day to an abrupt end.



I launched it high,
It climbed and soared towards the sky,
Upon my command it dipped and dived,
..and then from no where it all went horribly wrong.

No pre-flight airframe integrity checks of course, I hear you say, but this is surely an unlikely event, how often do wings part company from the airframe in mid-flight? A bit like lightning striking twice in the same place. Well I have news for you!

Those of you who attended the recent Peter Doe memorial aerobatics competition on Thorney Island, will bear witness to the sad separation of the upper wing from the fuselage of my Precision Aerobatics yellow bi-plane, whilst performing and recovering from a triple lutz manoeuvre. (If you've not heard of the triple lutz, this is a description for any manoeuvre that doesn't go as planned, followed by an overzealous recovery). This accident was no divine retribution for my poor church attendance, but an OOOPs moment in forgetting pre-flight air-frame integrity checks. The result of course, for all to see, was my pride and joy falling from the sky with style followed by total RUD - or was it the other way around?

So, onwards and upwards. I worked my way through three Durafly Tundra trainer models in quick succession. These are a wonderful trainer; so forgiving yet tremendous fun, with wheels large enough to cope with even the deepest rabbit hole.

But why did I need three of these versatile and forgiving flying machines? I'm rarely embarrassed to share my stories of woe, with one or two exceptions. This is one of those. After a fabulous morning flying in perfect weather had come to a close, I strode home from the airstrip looking forwards to a couple of glasses of my favourite red.

Then an idea from nowhere came upon me. I had one unused battery, so rather than discharging via an appropriate discharging unit, I thought I would run a static test on the model at maximum thrust for 5 minutes –

Durafly Tundra

much quicker than waiting for the discharger to do its business. Scientifically a good idea I reasoned, as after 5 minutes of normal flight the battery is discharged to about 40% - perfect.

So standing astride my model in the garage with the motor throttle on maximum, I waited whilst browsing YouTube videos on my phone. After a couple of minutes I started to smell burning, but after looking around, could see nothing amiss. My soldering iron and tumble dryer were definitely off, so max throttle to the end! A minute later I noticed smoke rising from between my legs, followed by a horrific sound that I can only liken to a Pterodactyl scream from 'Jurassic Park'. I had only a second to react; taking my rapidly melting and smouldering model outside and quickly removing the battery. Destruction was total.

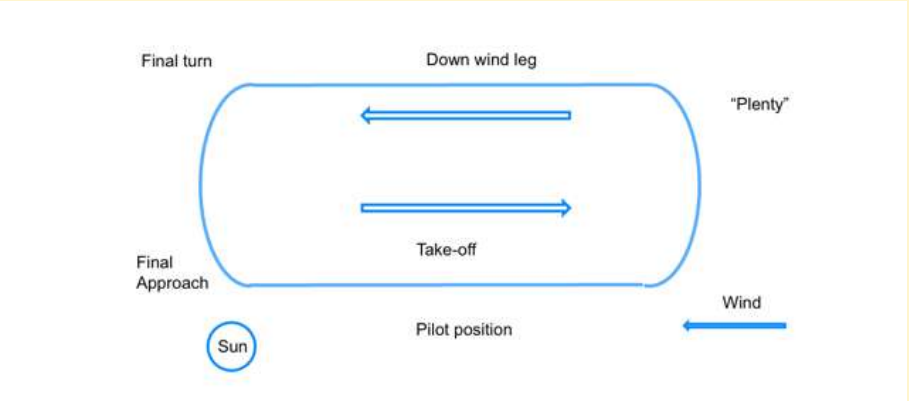
I won't bore you with the lessons learnt and scientific explanation of what happened, but a modicum of common sense would have averted this embarrassing OOOPs moment.

So, Tundra number two rolled out of my hangar, ready to do battle in the skies above Littlehampton. By now I was beginning to get the hang of a good take-off (and battery discharging). The secret is a gentle initial acceleration to get the wheels moving, then quicker acceleration to at least 80% power, using the rudder to keep straight, before gently pulling back on the elevator control stick. Keep the wings level until sufficient height has been gained to make the first gentle turn away from the airstrip. The reason for the initial gentle acceleration is important, particularly with small wheels. If you accelerate too quickly from a standing start and a wheel catches on a stone or bumps in the grass, then your model might do a 90° turn left or right, on full power. Make sure you are in full control before applying maximum throttle. I nearly decapitated a fellow aviator who was standing by the strip when this happened to me. He/she or them - we have to be so careful with pronouns these days, was not happy, understandably so.

The only other point to mention is the importance of having a safe escape plan if the take-off is going wrong and you need to abort. Decide beforehand which direction to move the rudder in an emergency, guiding your bird away from people as you reduce throttle. This will keep you and other fellow aviators safe if an abort is necessary.

So returning to my early fears, the challenge for me at this stage of the learning curve was setting up the final approach prior to landing. I had many failures with minor RUDs but only one catastrophic total RUD that I feel compelled to share with you.

The trick is to gain plenty of height after take-off in preparation for the downwind leg. If you're not sure what plenty looks like, grab the Tx firmly in your left hand and in your right execute a perfect Nazi salute, snap your heels together if you must! The extension of your right arm at a distance of 100 metres is plenty . If you're questioned on this doubtful display of patriotism, say your Grandmother was an Oberleutnant in the Luftwaffe - that should keep 'em quiet.



So on the downwind leg, as you enter into the final turn, keep the nose down slightly and ease off the throttle, keeping the turn as gentle as possible. This is where it can go horribly wrong and exactly where I experienced my total RUD. I took the turn too steeply without sufficient airspeed and the inside wing stalled with catastrophic consequences. For a fabulous explanation of the science behind this, check out last month's Clear Dope article by Robin Colbourne, 'Wind Gradient'.

Finally, as you exit the final turn, aim for yourself. This may seem like a daft thing to do but it's so easy to completely miss the runway. When you're about 50 metres from the end of the strip, correct your path and line up with the strip using a kick of the rudder, or ailerons. Continue over the strip gaining height until you meet "plenty", then around again.

Whatever the outcome of those initial forays into the blue, remember the perception of how well you flew has got nothing to do with your take-off, landing or magnificent manoeuvres; it's all about how you walk back to the pits and greet your fellow aviators.

On no account apologise for your shortcomings, inexperience or obvious incompetencies. Neither should you attribute any blame to your model settings or a lumpy wind for your atrocious performance. To do so, is definitely not cool. Remember you are a commander of the skies, an ace, an airman of professional standing. So instead of making excuses, try the Hollywood hero's walk back to the pits.

Tally ho - Here we go!

As you retrieve your beloved bird from the strip - I am of course referring to your stunning model – or if you prefer, your flying machine; remember to disconnect the flight battery. Normally you wouldn't do this until you reach the pits but for the hero's walk it's critical you do it now! Next, sling your bird over your left shoulder, with her (his/their) feet - I mean tail facing forwards, whilst carrying your Tx by the handle in your right hand.

You need to walk purposefully with a slight swagger. Try to imagine that the Tx is your flying helmet and the bird over your shoulder is a spare Sidewinder that you didn't need. As you approach the pits, nonchalantly toss your helmet (Tx) to the club chairman – I hope you remembered to remove the plane's flight battery. Unsling your Sidewinder (bird) from the shoulder and place it on the ground, put hands on your hips and say in a loud voice "Nice-one babe". I have tried this only once and it ended in tears. I have the prop scars across my back to prove it!

Merry Christmas

Going My Own Way

Alan Cozens

Following my long training (thanks for Jeremy's everlasting patience!) I decided that I had broken enough propellers, and that maybe there was a fix for this problem. I thought the answer might be to design a large slow flying high wing trainer with a pusher prop.

My resulting design is 60 inches span, 6 channel, with ailerons and flaps. The receiver is a Spektrum AR 631. The construction is a balsa fuselage and tail, with hot wire-cut foam wings of Clark Y section. The proportions are entirely intuitive, and drawings are nothing more than outlines sketched on a piece of hardboard.

The key problem with the pusher layout is the weight of the motor behind the wing, resulting in difficulty achieving the correct CofG position. The solutions were to build the tail components and rear fuselage as light as possible and fit an oversize battery far forward. The heavy 4S 4500 battery provides very extended flight times (15 mins plus) however the resultant wing loading is high for a trainer - about 20oz per sq ft. Static tests with the whole aircraft on a vertical pivot at the c.g. showed that the strong pusher airflow over a central fin gave a fierce and unacceptable rotation to the right, so the twin fin layout was chosen.

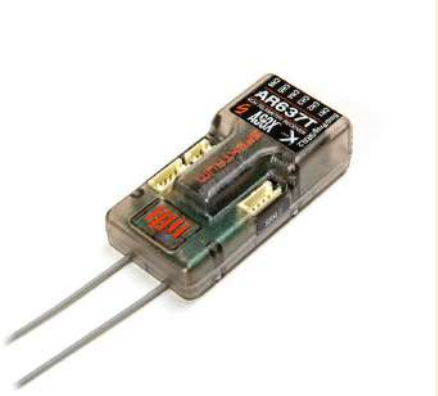
Derek test-flew it last August, just a short time before I moved to Hertfordshire. It flew well, but the need for rudder/aileron mix was pointed out and implemented. Adrian then flew a brief check flight and all was OK. Up here with St Albans MAC, I have had 14 successful flights, unfortunately spaced round recovery from my very painful fractured vertebrae T 9. The model flies with ease and excellent stability, my wooden ccw pusher prop not so much as scratched! It does fly faster than hoped due that heavy battery and highish wing loading, and the nose wheel leg has been slightly bent twice. But the model remains in as new condition – however, I have to admit that the SAMAC strip is very smooth grass and very forgiving.

With Best Wishes to all my friends at CADMAC

Spektrum Receivers with Gyro Capability

Paul Cohen

Gyro receivers, oh yes, a very controversial topic. I have heard – and read – differing, and rather polarised viewpoints. One school of thought says that one should not need these devices. Not only do they hamper the growth of ability, they become a crutch, upon which over-reliance develops. One should be able to fly (some models excepted) without such fripperies. The other school of thought – and it must be said, expressed by some very experienced pilots – is that these are merely an aid, and if they are selectable, and in an emergency save a model, then why not? After all, electronic aids, like mixing and expo are not only routinely used, but encouraged. So which view is correct? I would say both. I don't think they are mutually exclusive viewpoints, as long as over-reliance does not become the norm.



My interest in these devices came about in a somewhat roundabout way. Staring up at my aircraft – not to mention gliders in competition – I really had no clue as to their altitude. In order to satisfy my curiosity, I started casting about for a receiver with a barometric pressure sensor, to be conveyed via telemetry of course. In the course of this, I came across the AR637T, which also offered gyroscopic capability. Being a natural fiddler (a somewhat questionable ambiguous characteristic), I thought exploring these features might be an interesting experiment.

I am going to deal with three Spektrum models, the AR637T, introduced in 2020, the AR631, introduced in 2021, and the AR636 introduced much earlier in 2014. These dates are significant, as will be explained.

I duly purchased the AR637T, and as usual with Spektrum, the written instructions were unfathomable, and so I resorted to YouTube. There is an excellent series of chapters produced by Horizon Hobby which took one through the whole kit and caboodle, start to end.

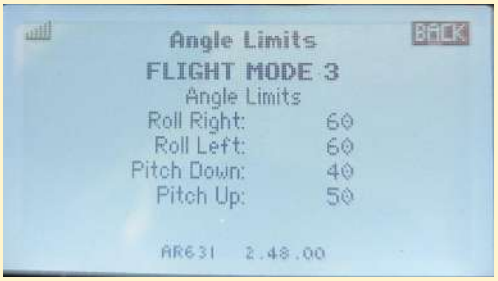
The AR637T has ports for a voltage sensor, XBUS for a telemetry device (e.g. a GPS module), and SRXL2 for a remote receiver. (It will also provide motor RPM if a SMART ESC is connected. I don't use one.)

So the device itself offers gyro capability in two flavours, AS3X (Artificial Stabilization - 3-aXis) and SAFE (Sensor Assisted Flight Envelope). AS3X is a feature designed to counteract temporary disturbances, like a wind gust. If a gust unexpectedly lifts a wing, the ailerons momentarily twitch to counter the lift. And of course, this effect applies to all three axes. It is recommended that an analogue control on the transmitter is assigned to adjust AS3X gain (typically using the rotary knob), as the ideal gain is just below where oscillation starts. That can really only be determined in flight. The overall effect is to smooth flight.

Adjusting parameters from the transmitter

SAFE is somewhat more severe. It will not allow the plane to exceed pre-set angles of roll, pitch and yaw (the envelope). If the plane is upside down and diving, enabling SAFE and letting go of the sticks will upside it and level it again. Allegedly.

I didn't think the setup was too scary. I would suggest getting a Spektrum programming cable (not expensive), downloading the free Spektrum programmer to a PC (sorry Mac users), and doing both a factory reset on the receiver plus a firmware update. Also, you should make sure you are using the latest firmware for your Tx.



The receiver needs to be mounted securely. Clearly a wobbly receiver is not going to give good results. I use double-sided Gorilla tape which seems to work. OK, Velcro is secure, but a little too soft. The receiver is not fussy about how or where it is mounted, or its many possible orientations, but it must be square to the fuselage, and preferably vaguely near the CofG. Once bound, a new menu item will appear on the Tx – 'Forward Programming'. This will produce a 'First Time Setup' and walks the user through each step. I have only used the default settings, as fear prevents me doing otherwise, but of course the user can change all sorts of values if so desired. I won't explain any more, as (a) the aforementioned YouTube does a very good job, and (b) it would bore you.

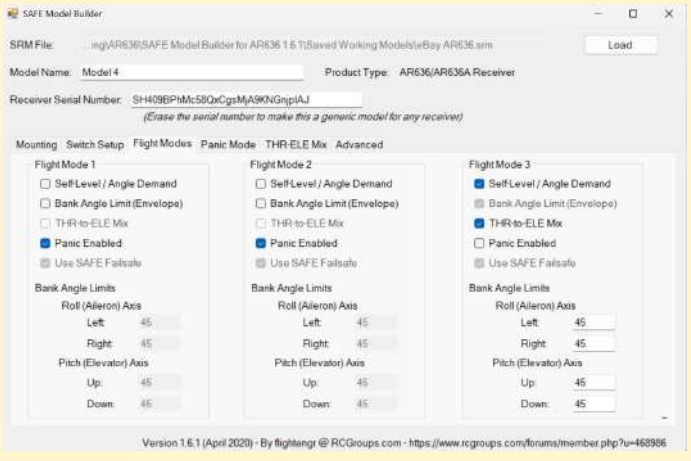
In use, I have it set up on a three-way switch: No AS3X or SAFE, AS3X only, and AS3X and SAFE (which can be on a 'Panic' button too. but I ran out of channels on my Dx8G2).

In general, I have it turned off. Certainly, SAFE is very restrictive. Steep turns, let alone aerobatics, are impossible. But it's a bit like riding on two wheels. You don't expect to hit a pothole, but if you do, maybe it's good you were wearing a helmet. So, it's there if I need it (and so far, I haven't). I don't notice a whole lot of difference with AS3X, but I suppose it must do something, but still being a novice, I don't believe I have the requisite sensitivity to tell as those more experienced do.

Some interesting effects can be achieved with SAFE. I tried heading upwind in a reasonable breeze, pulling the elevator right back, which caused the plane to pitch up to the maximum angle allowed (40 degrees in my case) and no further, and then controlling altitude with the throttle alone. Thus I could 'kite' the plane and turn with the rudder. Of course, I know those more experienced can do this anyway, but I can't.

I have since acquired some cheaper AR631s (which have gyros, but no telemetry or ports), and have put one into my small foamboard scratch-built model, as these can be very twitchy. The setup is very similar to the AR637T.

The AR636 is a totally different kettle of worms. The good news is these can be picked up pretty cheaply second hand; not much more than a vanilla 6-channel receiver. The bad news is that – until you get to know them - they are a real pain in the patooski to set up. Because they were introduced before Forward Programming was a thing, all the setup needs to be done before installation. As before, you will need a programming cable, and the free Spektrum Programmer App from Horizon. As with the other receivers, firmware can be updated, and Horizon provides a set of files for all their Bind'n'Fly range (.srm files), which can be loaded into the receiver and then fitted into that, or a similar model. Do note – and this is essential – that you must NOT reverse any surfaces via the transmitter, they must all be set to default, but reversing is done in the App, if necessary. You can also change gains, set up mixes and aircraft type – all in the App, not the Transmitter. In addition, large trim changes should be made mechanically, not with the trim switch, or use the app. (There is a Bluetooth device - Spektrum BT1000 - that works with iOS or Android and



Setup using the Spektrum programming app

can be used to make field adjustments rather than lugging a laptop around, but its capability is more limited. I have no experience of it.)

That may be enough. However, if you want to get really down and dirty, then download a piece of free software from a guy called flightengr – the SAFE Model Builder. In this, you modify the .srm file, and set up the way switches will work, receiver orientation, and panic mode.

I won't even begin to try and explain the methodology, but a Google of Spektrum AR636 AS3X & SAFE Receiver How-To is an excellent 26-minute video explaining the use of both pieces of downloaded software. I have the same switch set up on the AR636 as with the more recent receivers.

So, The Bottom Line:
Do you need one of these? No, of course not.
Could it be useful? Maybe.
For the inexperienced pilot like me, it can be useful as a 'Just In Case'. For the experienced pilot though, flying something somewhat inherently unstable AND expensive on a gusty day, it could turn out to be an insurance policy.

SPEKTRUM – Secrets & How To's — Ian Carby

Much like all of us of a certain age, I find that the unique language of instruction manuals to be written in gobbledegook, which was never a subject covered in my (long forgotten) education. So, I thought it would be handy to deconstruct some of the mysteries I have discovered in recent times. Like many others, I use Spektrum gear because of its availability. Other makes are available, just not used by me.
I will start with a brief explanation about digital communication, how to make use of the sim card slot and then a couple of how to's on expo's and mixing.

The important concept to remember about digital communication is that it is a two-way conversation. Unlike the old AM and FM days, in the digital domain the transmitter is not constantly broadcasting. It sends packets of information to the receiver and then listens for a reply. The receiver, of course, is unaware of the exact contents of packets sent, but each packet is constructed to a pre-defined structure, and the receiver can tell if a piece of the packet is missing. The receiver then sends back a 'received ok' message (ACK for acknowledge) or a 'not ok' (NACK) and awaits the next packet. The process then continues many times each second.

With Spektrum receiver types that end with a T, the signal returned to the transmitter includes telemetry information such as variometer, altitude and battery voltage. I have found though that even the most basic types send back information about the quality of the received signal. So how is that of use to us?

Well on the lowest level, the transmitter keeps track of how many packets are lost by the receiver and logs this information as Fades and Holds. If the odd packet is corrupted it is ignored, so for an instant control is lost, but only for a very short period and this is a Fade. If a series of packets are lost, then this is more serious. The receiver holds on to the last good packet and uses this until reliable communication is re-established.

Next time I will discuss why communication can fail, how to access the data broadcast by the receiver, and a guide of how to make sense of the information.

In the meantime, happy flying.

The VOLTIGEUR

Declan Cousins

Inspired by the antics of the Pretincic Brothers I decided to venture into the world of 3D extreme flying. Their review of the Hobbyking Voltigeur was really entertaining, and its ability to fly using 35C 2200mAh 11.1v batteries was great news - as these are the only batteries I possess.

So there I am at 6:20am on a Sunday morning with my finger hovering over the 'Increase bid' icon on eBay, a secondhand Voltigeur firmly in my sights. This is a well-used earlier version, with aluminum undercarriage and heavily stained wing tips due to smoke units previously fitted.

Of course I'm hoping that few souls will be up with the lark - and that I just might be the early bird who catches the worm. With only three minutes left to go, there appears to be only two bidders and the current bid is mine at £12…. I can't believe it. I quickly re-read the listing; airframe, all servos installed and operational, motor including spinner and 13" x 6" prop, ESC unit, undercarriage including spats - almost too good to be true. The countdown reads one minute left to go and I'm ramping up towards a state of nervous incredulity.

Then of course the fun and games start, with two new bidders popping up. The rest is history as they say, and after some frantic last second keyboard fumbling I miraculously manage to become the new owner, for the princely sum of £32!

A few days later I'm on my way back from Farnham with the Voltigeur nestling in the back of my little Skoda. The seller, a delightful ex-member of the Border Club, who has moved on to fixed wing FPV drones, was pleased to see it go, with no remorse over its eventual sale price. In fact he apologized for its patinated appearance, gained over several years of fun flying and hoped I would enjoy it as much.

A quick detour to my good friend Ken Knox on the way home proved invaluable. Yes, I had packed my transmitter, a new 2.4GHz receiver and a fully-charged flight battery ready for the occasion. No, not to attempt to fly it in Ken's back garden… but to set it up ready for the maiden.

Ken has regularly pointed out that I really need to up my game and get to grips with the nuances of my Futaba T9CP transmitter.

"Really Dec, how long have we known each other? It's about time you started to focus on how to bind the receiver, correctly set up the flight surface orientation, correct throws, throttle cuts and general stuff of aeromodelling. Now, stop blubbering and pay attention".

Anyway, after the usual abuse / banter and numerous cups of tea, the Voltigeur was ready for its first sortie at Thorney.

The following Sunday proved to be unusually clement, a light breeze, clear skies and almost warm for mid November. A murmuration of starlings flashed across the runway as a couple of skylarks welcomed our arrival. As did some of our regular weekend fliers - with wonderful encouragements like, "Good to see something different from that foamy Wot 4 that you've been flogging to death for the last season." to "Remember to lift off before you hit the grass" - all the usual flight line banter and camaraderie that is part of club life.

After range and pre-flight checking it was time to get airborne. One important thing remained to be done. "Oh, Derek sorry to bother you - any chance of carrying out a maiden?" Derek obligingly carried out his own pre-flight checks, just in case!

Cleared for take off … the Voltigeur tracked straight into wind and quickly became airborne. Apart from a couple of clicks on the rudder she appeared perfectly trimmed; unbelievable!
At three mistakes high Derek tested the stall, resulting in a gentle drop of the nose. Then he put her through a series of loops, rolls, spins and inversions; culminating in some quite spectacular knife edges. It was during the last of these manoeuvres as the airframe accelerated, that we noticed an unusual buzzing noise. Puzzled, Derek tried some tests - full power on = buzzing, half throttle = intermittent buzz, low throttle normal or no buzz. Derek immediately decided to land - safety first, and brought her in gracefully.

By now a few bystanders were offering suggestions as to what might be the cause. One suggestion that the esc might need re-programming. With the flight hatch removed everything was checked over, the ESC was nice and cool and everything appeared intact. Ground tests at full power revealed nothing. Then Jeremy noticed that the cowling immediately aft of the prop appeared slightly abraded - almost as if it had been roughly sanded. The cowling is held in position by two powerful magnets - and should be further forced back towards the bulkhead during flight. We removed the prop and cowling to check the motor was securely mounted - it was. Another test flight and the same strange buzzing came back - but only on full power this time. After landing we noticed slightly more abrading on the cowl nose. This time we neatly wound some insulating tape around the entire cowl seam to see if it would help the magnets do their job. Result, it did - problem solved.

Once again airborne, Derek put it through its paces this time without any discernible buzzing, and then asked if I'd like to take control. “In your usual manner Dec, inverted and flying towards us” - Of course I screamed and immediately ran away!

When I eventually took control, I found it a complete joy to fly - as if we were on rails. My own haphazard versions of Derek's aerobatics felt exhilarating with a blistering roll rate, and yet she could also be extremely docile. Needless to say I was delighted.

However something caught me out: my battery consumption!

Being used to flying my Wot 4 foamy on 3s 2200mAh for up to 10 mins, with a series of undisciplined maneuvers, the Voltigeur came as a completely different proposition. After a spirited 5 minutes there was a sudden power drop off. On landing I discovered my flight pack was down to 2% ! Well, ‘Every day's a school day’ and I certainly learned a salient lesson. After some sound advice from Jeremy I managed to bring my little 3s back to life.

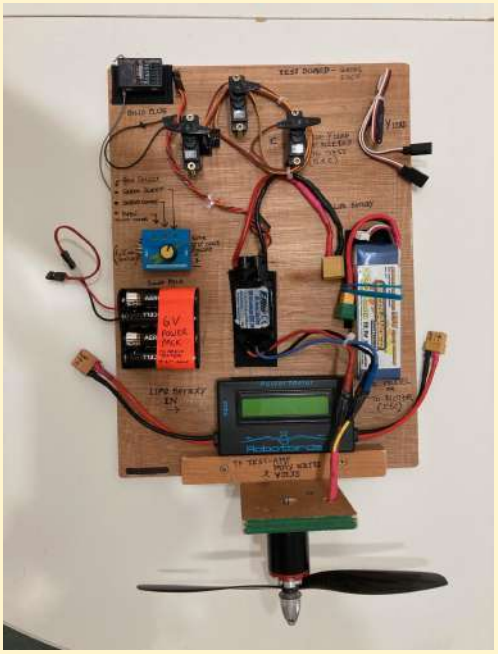
The following weekend proved to be a very different story with a bone-numbing chill pervading the whole airfield. By the time I arrived, virtually all had flown and gone, except for Jeff, who kindly stayed on to keep me company. I had five fully charged 3s packs and Jeff wasn't able to stay too long. So, between the two of us we flew the Voltigeur virtually continuously between battery pit stops. Jeff loved its flight characteristics and was amazed the 3s gave it such performance - albeit for limited duration. On examination he suggested replacing the 13x6 prop with a 12x6. My Gemfan 12x6 arrived yesterday.

A big thank you to Ken, Derek, Jeremy and Jeff for your help and guidance.

So here’s to some winter flying with my amazing Voltigeur… Oh, and a very Happy Christmas to all and best wishes!

TESTING Pre Maiden – Servos, ESC, Motor

Lee Seaman



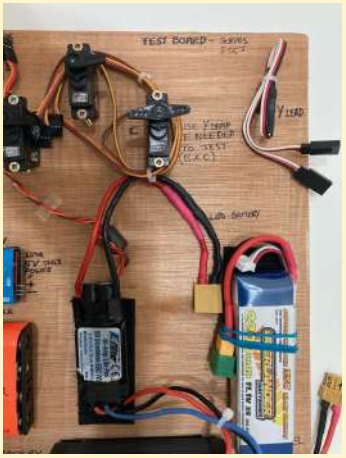
This works for me as it is convenient, efficient and cheap to assemble; my homemade, Blue Peter-inspired, A4-sized workshop testing board, which I can take from the workshop into the warm when setting up or testing my essentials.

As you'll see from the pics it's not pretty, made from bits and bobs, but it does work and in a number of very useful ways.
The board itself, as you can see, is quick to put together and none of the items are fixed to the board, just screwed or fixed in place with Velcro. For those of us with five small bananas for fingers I find it invaluable.

We all aim for the most efficient motor matched to the perfect prop. Servos centred pre-installation, an ESC that works as it should, and the receiver bound before installation. I find if I'm able to lock these down accurately it saves a whole lot of time faffing around in the model with my fat fingers doing what I could have done with more space pre-assembly on the board, and it is much easier to change out and adjust items as needed.

Once all is set as it should be, from manufacturer's recommendations plus a quick visit to eCalc (free internet set up program), I prefer to get into the air ASAP, where the maiden flight generally tells us whether our choices or recommendations all work once trimmed. If I set up using my board with these basic inexpensive test tools, I'm way less likely to set fire to my model or transport home a bin bag of bits!

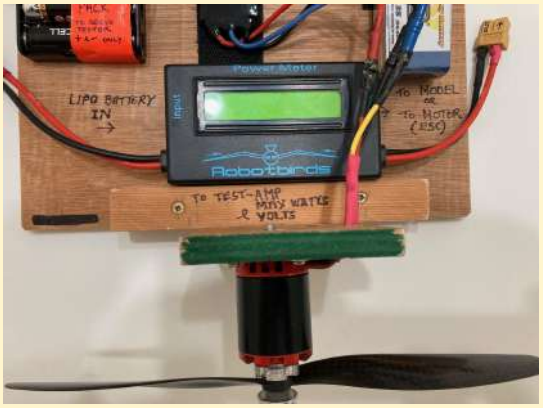
SERVOS – First, ensuring they are fit for the model in question. I also ensure every time that they are centred and free moving. This saves a lot of pulling and adjusting when they are glued or screwed into place, which can be very fiddly depending on their placement. With the small blue servo tester (£10 on Ebay) and 5V or 6V power supply wires soldered onto a JR male plug minus the signal wire, this is plugged into the RH power-in side from the four-AA battery holder. A small button on the tester selects any of three modes, each indicated by a light. It cycles from manual to centre then auto full-sweep. This takes care of ensuring each servo is doing its job and you'll soon see and hear if it's not. If the servo is digital it may chatter (which is common). Slightly quicker manual cycling from low to high will usually counter this. I prefer to test one servo at a time, although there are three sets of pins on the tester's left hand side, and each can be used with a Y-lead too.



ESC test – This little tester does have another function too; ESC/motor tester. This is done by connecting the ESC JR plug lead to the left hand side of the tester (which is normally used for the servos). With lipo and motor (prop removed for first connection) connected, and with the dial pre-turned left to its lowest position anti-clockwise; when connected, it should sound its initial beeps, confirming the throttle low point, after which you can cycle the motor to confirm all is good.

I prefer a little performance headroom from the ESC choice, so if 40A is recommended, I choose 50A whenever possible. The three-pin JR plugs pushed

into the throttle can by their very nature be easily dislodged, or fit loosely if not firmly pressed into place, which is not ideal; so the testing hopefully takes care of that and you can look to change or adjust as needed, pre-install.



MOTOR testing – I prefer to have projects connected to the Watt meter once the receiver is bound. To bind the receiver I usually connect the 6V AA power pack directly to any channel with its power connector. No fuss, receiver ready to go.

The Watt meter when running, will show Voltage, Wattage and Amp draw. If the prop and motor are well matched at max power, it should indicate the numbers as per manufacturer guidelines. The lipo is connected into the female XT60 and to the ESC's female connector. This can be connected at the field, though by then it's a bit late to change when only minutes from your first flight. Full bursts at no more than 10 seconds will let you know if it all matches. Depending on the numbers you can change the prop down or up in size to ensure the motor delivers no more or less than max (Watts and Amps). With a good pre-test base by eCalc or following manufacturers guide, I find these tests to be little more than fine tuning confirming the right choice of kit.

Failsafes — Robin Colbourne

What is a Failsafe?
A Failsafe is a set of pre-programmed commands which the model's receiver will give to the servos in the event that it loses the signal from the pilot's transmitter.

Both the BMFA (annex B, 3.12) and CADMAC handbooks mandate as follows:
"Any powered model aircraft fitted with a receiver capable of operating in failsafe mode (i.e. PCM receivers, Digital Signal Processing (DSP) receivers or 2.4 GHz equipment) must have the failsafe set, as a minimum, to reduce the engine(s) speed to idle on loss or corruption of signal."

At the last committee meeting this topic came up and started a debate about the settings to use. Here are my own thoughts after some research on the topic.

Which Receivers have Failsafe?
Most modern receivers are likely to have Failsafe. Generally this means those that come with transmitters incorporating an LCD screen and selector buttons, allowing settings to be altered and saved. Many transmitters on which servo reverses and mixers are set by sliding individual switches do not have Failsafe. In the event of a loss of signal, the servos will either hold their last position at which a signal was received, or return to the neutral position.

Some modern basic transmitters (e,g. Spektrum DX4e) use the stick position at the time of binding as the Failsafe setting. If yours is in this last category, it is important to have the throttle stick in the closed position when binding the receiver. Should you find you have to use the servo reverse switch to get the correct throttle response, then, as a precaution, re-bind the receiver.

How are the Failsafe commands set up?

Scrolling through the system set up menus should reveal one called 'Failsafe'. Upon selection, a series of bar charts indicating the movement of each stick will be displayed. Using the selection buttons, choose the channel to be set and move the relevant stick, rotary knob or switch to display the desired failsafe command position. Save this setting and repeat the process for each other channel.

What settings should be used?

This is where the debate starts. We want to avoid a 'flyaway', but we also want the model to come down in a safe manner (i.e. with minimum kinetic energy). Loss of signal is most likely to occur when the model is at a considerable distance from the transmitter, so it may already be getting near to where uninvolved people and their property are. When discussed by the committee, one thing we all agreed was that the throttle should be closed. After that, a lot depends upon the type of model. We want the model to go the minimum possible distance downwind, whilst coming down in an attitude that keeps its forward speed to a minimum and its vertical descent rate steady.

Possible options include:

1. Gentle circles at minimum sink rate (small inputs of rudder and up elevator)
2. A spin (full rudder and full up elevator)
3. A deep stall (model maintains a nose up attitude with full up elevator - works better with an all moving tail, and a more rearward centre of gravity)
4. A sideslip (ailerons and rudder in opposite directions, model crabs so fuselage acts as an airbrake)

If a glider, powered glider or vintage-type model had the Failsafe set for minimum sink circles, it could easily continue to climb if it entered a thermal. A flat spin or deep stall would be the best option in this case.

An EDF jet with a high wing loading, on the other hand, is going to come down quickly, so it is up to the owner to determine which option gives the lowest descent rate, whilst limiting how far the model can travel from the point of loss of signal. If a flat spin with a nose-up attitude is achievable, this may be the best option.

Secondary controls

Minimising damage to the model should be considered secondary; however, minimising the descent rate is likely to mean undercarriage should be up and flaps down to some degree. On a glider, preventing a flyaway is the primary concern, so if airbrakes are fitted, the failsafe should open them.

Points to consider

When the failsafe operates, you will have no say in which direction the model heads.
Keep in mind that the model may not be straight and level at the point that the transmitter signal is lost, so the failsafe control inputs may make a bad situation worse. If one of the failsafe options is more likely to work in a wider range of flight attitudes, this would be the one to go for.

Subtrims

Subtrims are a way of adjusting the servo neutral point from the transmitter. If these are altered, they will have a knock-on effect on the failsafe settings, so be sure to re-check the failsafe positions after any adjustments.

Gyros and flight stabilisers
Research and test for any interaction from these when the Failsafe is enabled. With the model in Failsafe, move it in all its axes to see any unexpected control surface movements.

Programmable speed controllers (ESCs)
These have their own settings which could clash with the receiver failsafe settings. Check the manual and any online videos for your particular set up.

Ground testing the Failsafe
Some receivers have a failsafe test button. If yours doesn't, or the receiver is hard to access, switch the transmitter off to test the settings. On electric models, ideally test with the propeller removed. If this isn't possible, use a tiedown on a model with undercarriage, or ask an assistant to securely hold the model with their hands away from the prop when you test it.

On engine-powered models, be sure the throttle shuts to the engine stop position, not just to idle. Petrol powered models with a receiver-controlled ignition cut switch should have this included in the failsafe settings.

What now?
Fly the four different manoeuvres to see which is the most appropriate to your model, then set the required servo positions up on your Failsafe.

Flight Testing
If you are feeling brave and plan to test the failsafe in the air, do so only after testing it repeatedly on the ground first. A lot of transmitters won't operate straight away once switches and the throttle stick have been moved from their initial positions.

Return Home
Although the article has been aimed at flyers of 'traditional' R/C aeroplanes, some of you also fly drones, which have a Failsafe option to return to a pre-set home point. It is imperative that this is programmed for the site at which you are operating. More modern 'off the shelf' drones do this as part of the pre-flight initialization, but do check to be sure.

Footnote
Some years ago, whilst being trained on a military fixed-wing drone system, our instructor told of one they sold to the Irish Army. After their initial training with the manufacturer, the soldiers returned to Ireland and did some more flying to get really comfortable with it. They then deployed to Chad on a UN peacekeeping mission, only to suffer a loss of signal on one of their early flights.

Needless to say, they had not reprogrammed the 'Return Home' point since arriving 'in-country', so the drone had set off for the Emerald Isle, 3000 miles away, never to be seen again.

Some Thoughts on Declan's GeeBee R3 Racer Colin Stevens

I was very pleased to see the video of Declan Cousins' GeeBee R3 Racer posted on the original CADMAC Facebook site - https://www.youtube.com/watch?v=YCbFBVgOiZc. I recall the difficulties it posed on that day, and thought it would be constructive to look into these to see what issues emerge.

The GeeBee R3 design was never intended to fly; it being only a conceptual pipe-dream of aero-related graphics designer Mirco Pecorari, head of Aircraft Studio Design - https://aircraftstudiodesign.com/, created, it is said, in mitigation of the rather ugly designs of the earlier full-size GeeBee racers.

The design, with its striking and almost sensual design, has been kitted widely as an RC model, but has built a reputation for being tricky to fly, with dubious yaw (directional) stability, which I think to a seasoned modeller, would not come as a surprise.

I like always to go back to first principles in this kind of exercise, by which I mean is to study the model as a mass having momentum, suspended by lift operating at the model's centre of pressure (CoP), and in the first instance is under stable conditions, meaning that all forces on it are in a state of balance and equilibrium. So, looking at these properties in flight, and how they might affect the R3:

Level Flight

Pitch plane - the model is held stable by (usually) a small down-force at the tail, balancing the mass at its centre of gravity (CG), which is set slightly ahead of its CoP, no magic, just levers. Pilots with no nerves often place the CG right at the CoP and enjoy the "flying where last pointed" experience. Eyeballing the plan view of the model, the ratio of tailplane/elevator area to wing area, and the tail moment, look generous, so no issues here. Rolling plane - here we can employ dihedral of the wings to provide lateral stability against gusts and other disturbances, but with control available we usually keep the wings flat, to make the model more responsive. So no real issues here, just more workload on the pilot keeping a tricky model tidy.

Yaw plane - what we are looking for here is sufficient excess of side-area of the fin/rudder plus fuselage side-area behind the CG, to overcome the effects of side-area ahead of the CG. Should the model deviate in yaw, these surfaces then find themselves at a small offset to the airflow, and with the rearward surfaces dominant, thus providing a self-restoring force.

Here is where I think the R3 falls short - its limited yaw stability. It has substantial side-area ahead of the CG, given the large undercarriage legs and spats, with the bulbous forward fuselage detracting from the stabilising

effect of the rear vertical surfaces, which look very small in any case. Considering the exaggerated size and bulk of the undercarriage in a very forward position, its contribution to instability is plain to see. Also not helping, to a lesser degree, is the narrowing of the rear fuselage when compared with more conventional designs.

And so - Into the Turn - where things get interesting…

We initiate the turn by applying aileron to unbalance the lift from each wing, and thus cause the model to bank. We also pull back a little on the elevator stick to "pull" the model into the turn - meaning that we have to increase the wing's AoA to increase its lift, since in the bank, the lift force is now slanted, with its vertical component supporting the model's mass being reduced. The horizontal component of lift is now pulling the model into the turn. Secondary effect - the demand for extra lift means an increase in drag, so more thrust is needed in the turn if height is to be maintained. If neglected, the model can side-slip into the turn, a stern test for its yaw stability.

With the R3, we are dealing with a model likely to have limited yaw stability, which can be exacerbated by other factors. In most cases, problems are initiated by aileron reaction, which then feeds yaw instability. If the deviation is caused by a different mechanism, e.g. a gust, then we are at the mercy of yaw stability alone.

Our concern over aileron reaction is that the increase in lift and associated drag of the rising wing, coupled with the reverse effect in the dropping wing, tends to pull the nose away from the turn during the rolling phase, inviting some excitement from directional instability. Magnifying the strength of the reaction is the placement of the large outboard ailerons Drag placed that far out has much leverage, being so far from the CG, when compared with the narrower strip ailerons used on our pattern models.

Given that significant modification of the model is impractical, the need then is to first see by what can be done to eliminate, or at least reduce aileron reaction, by attempting to balance the drag of each wing during the rolling phase.

1. Optimise aileron differential by restricting the downward movement and increasing the upward.
2. Modify the aileron design by moving the hinge axis rearward, so that the rising aileron's bottom leading edge is projected into the airflow, creating some balancing drag (Friese aileron). Not an easy task.
3. Increase the rudder power? We can increase the throw, but I think its effectiveness is limited by its poor aerodynamic shape, and by operating at a low Reynolds Number (RN). "Big models (high RN) fly better

than small ones" - how many times have we heard that? But it's generally true by virtue of the higher airspeed and larger dimensions of surfaces discouraging airflow from wandering-off in unwanted directions or becoming unstable. This is borne-out even by the R3, with very large-scale versions seen flying well in YouTube videos. Being shallow and long, both fin and rudder are reduced in effectiveness, with the likelihood of airflow being easily able flow around their upper and lower edges under the pressure differential.

4. Any other palliatives? Any improvements to yaw stability? Unmodified - very few.
5. Clutching at straws here - try a more forward CG? It would marginally reduce the forward side-area moment.

Which leaves -

Given that very little can be done to change the configuration of the model; aileron and rudder control throw optimisation seem the only tools available and these are only going to be of help during the rolling phase of a turn. In straight flight and constant bank the pilot has to be alert to flight deviations, but keeping-up the speed should assist the corrective action of the vertical tail surfaces.

So good luck Declan and Derek! Enjoy the model as an adrenaline rush, and give us a show and amaze us. I look forward very much to seeing this impressive model take to the air again.

Just my take again then, on a fascinating model and its peculiarities. Comments and criticism are most welcome.

A Thorney problem and a sticky solution — Tim Kerss

Following on from my “Skunkworks” article in the last edition of Clear Dope, I had hoped to include a report in this edition about the first flights of the two machines that have rolled off the production line. Unfortunately, for over a full two months, the weather conditions at Thorney Island have been less-than-favourable for this venture. On the days that I have been available to fly, the winds were invariably fresh West to South-Westerlies; not down the runway, as will certainly be required for the models concerned.

So, it’s been another couple of months of FMS Olympus-bashing, scraping the model in over the grass for short-field cross-runway landings, and testing the impact resistance of the new home-made wire retracts to the full!

The upshot is that I can’t make any promises about Skunkworks’ test flight programme until the gods grant us a day with suitable wind conditions, and, of course, a test pilot who is mad enough to fly them!

However, a recent requirement to repair a broken plastic fixing on, of all things, a garden hose sprinkler, inspired me to make a small contribution to this edition.

Firstly, my apologies to those who know about this already. However, a while back I was browsing the Internet when my eyes were drawn by the headline “The ultimate bonding solution” on a household “hints and tips” website.

In a nutshell, the article stated that superglue can be turned into super-superglue by the addition of baking soda, followed by rapid curing with an activator. Intrigued, I read into the subject more, and learnt that the addition of graphite, instead of baking soda produces an even stronger bond.

The effectiveness of this bonding method was demonstrated in a video by breaking a plastic ruler in half, and repairing it using said method. The ruler was then bent again, and it snapped in an entirely different place; in other words, the bond had been stronger than the material. The video stated that graphite scraped from the lead of a pencil would do the job, but I went the whole hog and bought a bag of graphite filings on eBay.

Coincidentally, I had a bottle of Mitre-Bond (aka superglue) left over from a recent building project, and I have now conducted numerous repairs to plastic objects with impressive results. The technique that I use is to first apply the superglue to the surfaces to be joined, then sprinkle some graphite filings on top; then mix the graphite in using a toothpick and repeat until a black paste has been formed. Join the surfaces, hold together, and spray with activator. The bond forms within seconds, and has a metallic appearance.

One word of warning. Although incredibly strong, it’s not pretty, being black/dark grey in colour, and with a paste-like structure it would not be suitable for fine or invisible joins. That said, it seems to be effective at bonding plastic components that, hitherto, I wouldn’t have expected ‘conventional’ adhesives to join. When all else has failed I have used this method with very promising results.

One example was on my Blade 230S RC helicopter on which one of the canopy mounting lugs had broken. Initially, I tried to repair this with epoxy, but to no avail. The canopy puts significant strain on the lug and the bond kept breaking at the fuselage join. I then used the above method, and the lug repair has been absolutely firm and rock solid ever since.

Other repairs to plastic frames and components have been successful too, including the motor mount on my Night Radian after it crashed at this year’s Poppy Day gliding competition. On launch the folding prop assembly failed, and the entire motor ripped itself out of the fuselage. This was due to the sudden imbalance caused by one of the propellers departing the show; exactly the same failure as experienced by Jeremy on his Radian XL, as he described in a recent edition of Clear Dope. Clearly a component that’s not up to the job! E-flite, are you reading this?

Unfortunately, I can’t offer any scientific or meaningful data to support the information in this article, and maybe I’ve just been lucky with the fixes that I have made. However, I can vouch for the fact that the repair to the garden sprinkler is holding together well and, as a result, my newly laid lawn is still alive!

Loving Wayne WR-1 'Loving's Love' Robin Colbourne

Back in the early 70s, Chris Foss, already well known in model glider competitions, appeared in RCM&E with his first scale competition model, the Loving Wayne WR-1 'Loving's Love'. Chris's model was a departure from the norm for most scale competition models of the time, being neither a military nor an aerobatic type; instead it was a tiny racing plane.

Although this aeroplane was slightly odd, both for its diminutive size at 20ft wingspan and its inverted gull wing; the designer and builder turned out to be even more unusual.

Neal Loving was born in 1916. His father was the first black optometrist in Michigan. The sight of a De Havilland aeroplane flying over (maybe a DH4 mailplane?) set Neal on a life in aviation, studying aeronautics at a technical high school in Detroit.

Rejected by other flying training schools on account of his race, he joined the all-black Ace Flying Club where he met Miss Earsly Taylor. They became good friends and set up the Wayne Aircraft Company. The two of them joined the Civil Air Patrol, but again found themselves rejected when they tried to join the local squadrons. In the end they started their own all-black squadron which offered flying instruction and parachuting.

In 1941, Loving completed the S-1 glider of his own design and flew it regularly. In 1943 he crashed the glider and had to have both legs amputated. By 1946 he was flying again, and was quoted saying, "the nice thing about artificial legs is that you can be as tall as you like and wear any shoe size you want."

Loving and Taylor opened the Wayne School of Aeronautics in 1947. With Loving designing five and building five different aircraft starting with the WR-1, named 'Loving's Love'. In the 1951 National Air Races he became the first double amputee and first African-American to be licensed as a racing pilot.

By 1954, Earsly Taylor had married and moved to Kingston, Jamaica to open a flying school. Loving flew Loving's Love 2200 miles to visit her and her husband Carl Barnett; later marrying Carl's sister, Clare.

In later years Loving became an engineer at Wright Patterson Air Force Base, devising methods to measure clear-air turbulence. After retirement, Loving kept flying for another nine years. He died of cancer in 1998.

In 2023 the Experimental Aircraft Association inducted Neal Loving into their Hall of Fame.

Diary Dates

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

2025

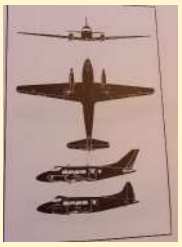
December	Thursday 11th	Fishbourne	AGM

2026

January	Thursday 8th	Fishbourne	Talk by Matt Takhar from Matt Takhar RC
February	Thursday 12th	Fishbourne	Talk by Rod Dean - Flying and Display of Vintage Piston Aircraft
March	Thursday 12th	Fishbourne	Talk by Jon of Microaces
October	Thursday 8th	Fishbourne	David Draper - 80 years of Aeromodelling

CD Quiz

Contributed by Robert Horton

A 	B 	C 	D 
E 	F 	G 	H 
I 	J 	K 	L 
M 	N 	O 	P 

1 point for each correct aircraft name, 1 point for each correct manufacturer, plus 1 bonus point for each correct grouping of 4 aircraft (4 groups of 4 aircraft).
Total available points = 36.
Source info and silhouettes from Jane's World Aircraft Recognition Handbook, Derek Wood 1987.

Answers in the next issue of Clear Dope.

CADMAC October 2025 Quiz Answers

1. Aluminium alloys are used in full-size and model aircraft components due to their high strength to weight ratio. Aluminium alloys have roughly the same density as:

A. Carbon fibre reinforced plastic B. Birch plywood C. Oak **D. Granite**

2. True or False?

Each inch of pitch of a propeller turning at 10,000rpm is worth approximately 10mph of movement though the air if blade aerofoil gains are ignored. i.e. 6" pitch at 10000rpm = 60mph. **True**

3. EPO, EPS and EPP are all materials commonly used on our 'foamie' models over the years. In these examples EP stands for:

A. Electric Powered B. Elapor **C. Expanded Poly** D. Economy Plastic

4. In aviation, 'Phillips Entry' refers to:

A. Druine Turbulent G-APNZ, which the late Duke of Edinburgh entered in the 1960 King's Cup Air Race.
B. On an aerofoil such as the Clark Y, the curve on the underside up towards the leading edge, to reduce drag at lower angles of attack.
C. The X-shaped hole in the top of a crosshead screw.
D. The socket where a microphone lead plugs in the face of a Dutch-made airborne radio transceiver.

5. Storage charge voltage per cell on a Lithium Polymer battery is:

A. 0.1v B. 3.7v **C. 3.8v** D. 4.25v

6. What would the nominal no-load maximum RPM be for a 1400KV brushless motor running on a 3S Lithium Polymer battery?

A. 4200 B. 14,540 **C. 15,540** D. 17,640

6. Why might you choose to run Lithium Polymer battery packs in parallel?

A. More thrust B. To prevent the speed controller overheating
C. Longer duration D. Lighter wiring

7. A brushless motor is described as a BR2212. To what are the numbers most likely to refer:

A. 22mm diameter x 12mm long stator B. 22 gram motor with a 12mm long shaft
C. 22 gauge wire stator with 12 turns per coil D. 22 magnets on a 12mm radius

9. Aileron differential is used to:

A. Reduce adverse yaw in turns B. Improve roll performance when inverted
C. Prevent aileron servos being overloaded D. Make the model less sensitive.

10. A low wing model tends to dive as power is applied. What corrective measure could be used to prevent this?

A. Droop the ailerons
B. Up thrust on the motor
C. Down thrust on the motor
D. A lower pitch prop

11. Washout is used to improve an aircraft's stalling characteristics. How is this achieved?

A. The wingtips are at a higher angle of incidence to generate more lift at low speeds
B. The left wing tip is at a higher incidence to generate lift to counteract the torque from the motor
C. The wingtips are at a reduced incidence so they are still flying after the centre section of the wing has stalled, so the aircraft stalls without dropping a wing.
D. The tailplane is at an exaggerated negative angle of incidence, so the wing can't stall.

12. On what type of aircraft are you most likely to find reflex?

A. A canard
B. A biplane
C. Duran Duran's world tour jet
D. A flying wing

13. After a few heavy landings, a tricycle undercarriage training model became hard to keep straight on the ground and took longer to get to a point that it will rotate into a climb. Turning the wire main undercarriage legs around improves matters. Why?

A. The legs have bent, causing toe out and pushing the main wheels back. Reversing them gives toe in, keeping the model straight. The rearward bend is now forward, putting the mainwheels closer to the centre of gravity, reducing the required tailplane downforce needed to rotate on takeoff.
B. The time taken to turn the legs around has given the trainee pilot a breather, so he is better able to focus by the time of the next flight.
C. The battery and/or fuel tank has moved forward as a result of the heavy landings, altering the centre of gravity and in turn the ground handling.

14. Induction / Compression / Ignition / Exhaust is a process which applies to which engines?

A. Four Stroke
B. Two Stroke & Four Stroke
C. Four Stroke and Gas Turbine
D. Two Stroke, Four Stroke and Gas Turbine

15. On models with retractable undercarriage, it is common to use a separate battery for the retract servo(s). Why?

A. Retract servos operate on a different voltage to the receiver and other servos.
B. They need a larger capacity battery
C. To avoid the receiver battery being flattened by a stalled retract servo
D. Because the retract battery is mounted in the wing near the retract servo(s)

16. Your high-powered brushless electric model, which has downthrust and sidethrust built in, noses over, breaking the prop. Someone offers you a prop of the right diameter and pitch, but it is of the opposite rotation to yours. Which of these statements is correct?

A. It can't be used, as the airflow will push the model backwards
B. It can be used. Swap a couple of the motor leads, then everything else will be as before.
C. It can be used, swap a couple of the motor leads over and be aware that the side thrust and down thrust will now be in the wrong directions.
D. It can be used, swap a couple of the motor leads over, note side thrust will be in the wrong direction and the model will swing the opposite way on takeoff.

17. Your model on 2.4GHz appears to stop responding to commands as it is flying away from you. Which of these is most likely to regain control?

A. Turn your transmitter off and on again.
B. Get a fellow modeller to switch their transmitter on and see if they can get control of it.
C. Put both sticks to full movement for all controls
D. Turn the transmitter so its aerial is at right angles to the model.

18. If you set up coupled aileron and rudder (CAR) on your transmitter in line with normal conventions, which of these is true?

A. Aileron stick input will move the rudder in the same direction. Rudder stick input will not move the rudder.
B. Aileron stick input will move the rudder in the same direction. Rudder stick input will move only the rudder.
C. Aileron input will move the rudder in the opposite direction. Rudder input will move only the rudder, but in the right direction.
D. Moving either the rudder or the aileron stick will move both the aileron & rudder in the same direction.

19. You are up on The Trundle and your aerobatic slope soarer is struggling to penetrate in the strong breeze. A fellow flyer offers you some lead to use as ballast as he says this will make it fly faster. Where should you put the lead?

A. In the nose
B. On the centre of gravity
C. Behind the centre of gravity
D. Halfway along the wings to reduce wing bending.

20. You are at Portshole and the grass is due for a cut, Your model is barely at flying speed by the end of the patch although the prop is still well clear of the grass. Which of these is most likely to help?

A. A smaller, finer pitch prop
B. A larger, finer pitch prop
B. A smaller, coarser pitch prop
C. A larger, coarser pitch prop

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 8th December 2025 - 1845 for 1930 hrs
Boxgrove Village Hall, PO18 0EE

"More Aerobatic Display Flying"

Presented by Mr Chris Burkett

Chris Burkett is a man of many talents, a dynamist covering the fields of both aerodynamics and hydrodynamics, and consultant to a variety of industries from F1/race car and Americas Cup yacht hull design to renewal energy and wind and marine turbines. Since 2006 he has been a display pilot of worldwide standing and is no stranger to AirACES, returning to give more insights into the world of global aerobatic display flying, with further tales and photos of his recent adventures, spanning the globe and including China, India, Nigeria, the Middle East and the Philippines. Closer to home he will include UK air displays and private events.

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 6.45pm. 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

Safety Corner

BMFA Safety Review Committee - Summary of Incident Reports for 2025

These 26 reports are those logged using the BMFA 'mandatory occurrence reporting' system that required onward submission to the AAIB (Air Accidents Investigation Board). They represent approximately 10% of all initial submissions, logged from March to October 2025.

Control System	No. of Incidents	Percentage
Free Flight	1	4%
35MHz RC	None reported	0%
2.4GHz RC	25	96%
Total	**26**	**100%**

Summary: -

Principal Cause	No. of Incidents	Percentage
Pilot error		
Loss of sight – orientation/distance	7	27%
Loss of sight – sun, haze, mist etc.	3	11%
Inappropriate model for wind strength	4	15%
Mishandling	2	8%
Pre-flight check oversight	1	4%
Sub Total	***17***	65%
Technical		
Electrical failure / control system	8	31%
Structural failure	1	4%
Dead-stick	0	0%
Sub Total	***9***	35%
Inconclusive*		
Lack of report detail, opinion	0	0%
Total	**26**	100%

Model Recovery

Model Recovery	No. of Incidents	Percentage
Recovered	6	23%
Not Recovered	20	77%
Total	26	100%

Third Party Involvement

3rd Party	No. of Incidents	Percentage
3rd Party Involved	2	8%
3rd Party Not involved	3	11%
3rd Party Damage	1	4%
3rd Party Injury	0	0%
Unknown	20	77%
Total	26	100%

CADMAC only filed one report during 2025 (the club's first ever). These stats highlight that one or two other CADMAC incidents during the year may also have warranted the filing of an AAIB report. If in doubt, please contact a member of the committee to help assess whether or not to file a report – the process itself is easy.

These are some highlights from the BMFA notes & recommendations:

- Approximately two thirds of all incidents involved the pilot's actions often contributing to a "flyaway" and or not taking appropriate/best actions once a problem has arisen, hence these incidents are essentially preventable.
- Approximately half of the incidents mentioned above were simply due to losing sight of the model by flying too far away, across the sun, into cloud, haze, mist, etc., or the pilot being distracted.
- Nearly 80% of the incidents involved models that have not been recovered. This is a significant increase compared to previous reports, and causes concern with the AAIB, primarily as there is no information regarding any potential injury to uninvolved individuals and or damage to property.
- Encourage pilots to be mindful about flying at the limits of visibility, either due to distance or sun/cloud. Uncontrolled flight out of sight presents a serious risk of injury or damage to 'non-involved' third parties. Far better to take action to bring the model down nearby, than risk a flyaway.
- Encourage members to fit location finders to help recover lost models or perhaps make use of onboard GPS telemetry.
- Encourage members to consider the environmental conditions and what actions to take if something should go wrong, **before** they commit to flight.

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