The Electronic News letter of the Chichester and District Model Aero Club

Clear Dope

June 2018

Chichester and District Model Aero Club: Committee 2018
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Membership Secretary, David Stocker: 07896250804, david@stocker.idps.co.uk

Pattern Competition 16th June Thorney

Evenings at Thorney added to calendar

Restricted Electric Glider Competition 2018

This year this competition was run at PortHole
The day was overcast with light cloud with wind from the SW, a good flying day.
3 pilots came. Max Battery size to be 2200   Motor run was limited to 15 sec. Three rounds were flown 10 min max to aim for plus an extra 10 % for landing in the 5 meter radius circle.

In the first round the best time was Keith Watts, flying a Radian, with 5min 04 sec and Mick Blundell with 2 min 53 sec, who landed in the circle, Ray Beadle could only do 1 min 58 sec.
In the second round the best time was Keith with 3min 34 sec.
Keith got the best time in round Three with 3 min 45 sec.

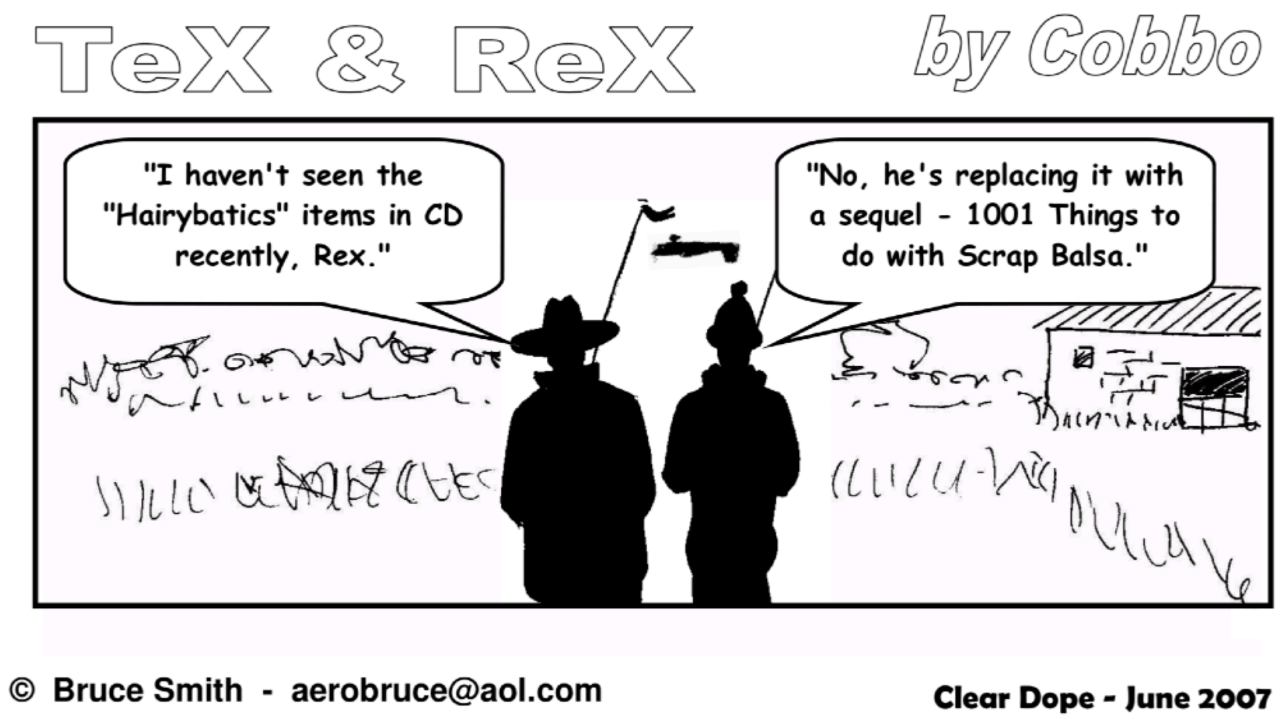
The result was,
First Keith Watts
Second Mick Blundell
Third Ray Beadle

Thanks to all came to time and record.

Cheers Ray

Unfortunately this competition escaped the majority of us who usually attend this type of competition probably due to lack of publicity and that it was held at Porthole anyway thanks to you three stalwarts why did fly.

Ken



The club Facebook page is now in its fourth year. It has over one hundred members. It contains many contemporary site reports, and has a wealth of photos in its archives.

Administered by Nick Gates.

HAIRYDYNAMICS No.1 THE TAIL-LOW = TAIL-HEAVY CONUNDRUM

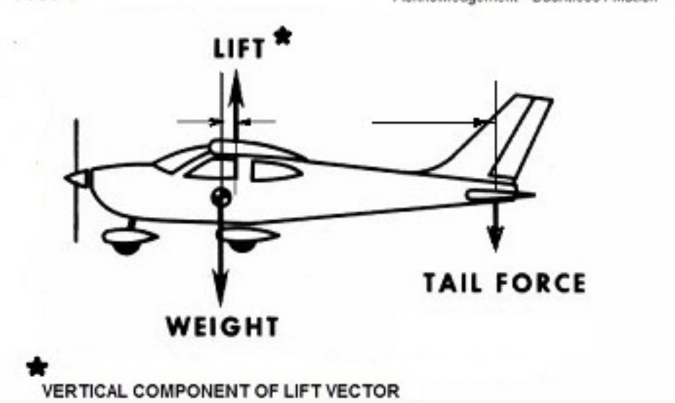
A comment often heard when a model is seen flying tail-down is that it must be tail-heavy and so needs more nose weight to compensate. That appears logical enough, and fits the picture of what we see, but things aren't necessarily what they seem. My belief is that the reverse is true, that is - tail-low = nose-heavy. I hope to show why in what follows.

A model flying tail-low, and so with the presumption of excessive tail weight, would need to have the tail providing positive lift to support that weight. But a positive tail-lifting force is inadmissible in the configurations we normally fly because it leads to instability in pitch, resulting in that frenetic switch-back ride into terra-firma. Such conditions can apply in full-size agile fighter aircraft, but it needs computer-controlled fly-by-wire to be viable.

If the model is stable in tail-down flight, and we are now persuaded conversely that it might be nose-heavy, then what different conditions must apply?

To set the stage, for positive pitch stability we would have the model weight (CG) a little ahead of the position on the wing where the distributed lift (plus the tendency of the wing to twist forwards), can be said to apply at a single point (Centre of Pressure). This nose out-of-balance now has to be corrected at the tail by a small down-force. It is small because it is applied at a greater distance from the Centre of Pressure than that of the down-force of the model weight - just all levers, really. We could equally set-up for neutral stability and needing no force in either direction at the tail. At this point we must also note that depending on the thrust-line angle, the propeller will apply a force in the vertical plane, which must be accounted-for.

FIG. 1



If we now grossly increase nose-weight, then we have to set up-trim at the elevator to provide greater balancing down-force there. This now comes to the nub of the question - why does the model fly nose-up in this condition, and not just fly level with exaggerated elevator up-trim applying this additional force?

The answer is that if any changes in the model's attitude allow the tail down-force to be reduced, the model will stabilise in this attitude, the level attitude/nose-heavy condition being unstable. The factors that allow this to happen are present when the nose is high.

There are four factors which come into play:-

A/ When the wing's section is cambered, and if its angle of attack is increased by a tail-down attitude, its Centre of Pressure point moves forward, reducing the excess nose-weight moment, i.e. the nose-weight has less leverage against the Centre of Pressure. Thus the heavy balancing down-force at the tail is reduced.

A wing section having no camber, i.e. fully symmetrical, has no significant Centre of Pressure shift with angle of attack change, so this factor does not apply.

B/ The tail is usually operating in the down-wash of the wing, and this assists the tail in providing down-force by causing the tail to operate at a small negative angle of attack. If the nose is raised, the increased down-wash angle will magnify this effect and usefully reduce the degree to which the nose is otherwise raised.

C/ The thrust-line is raised by the tail-down attitude, so a vertical component of engine thrust is created, reducing the nose-heavy moment, and adding to the effect mentioned in para b/. At 5 degrees thrust offset, the up-force at the propeller is 9% of the thrust, and that is appreciable. We can see also that excessive down-thrust will add to nose-heaviness effects.

D/ Note that as the nose goes up, the nose-heavy moment distance reduces slightly, reinforcing the effect of Centre of Pressure shift.

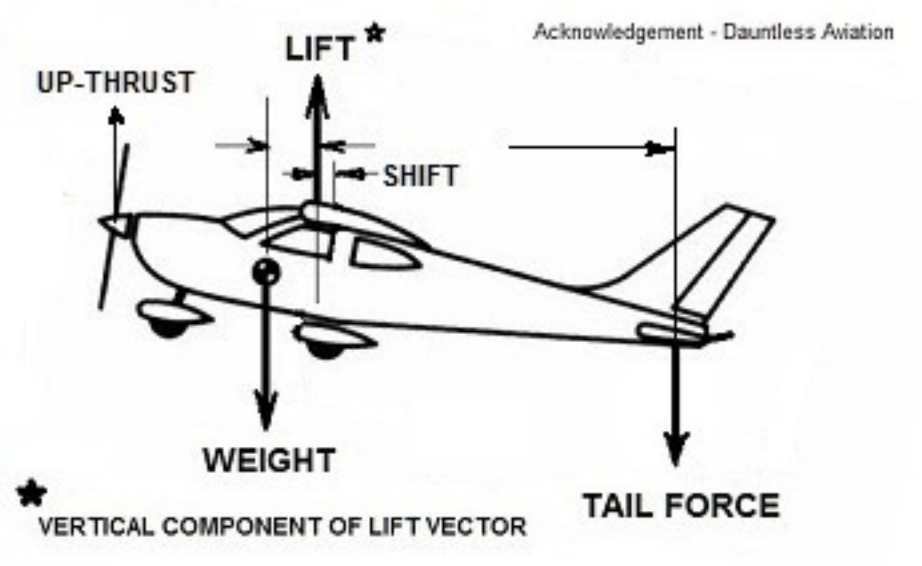


FIG. 2

The Proof of the Pudding.

Some years ago we had a new member experiencing this tail-down problem with his trainer model. He applied conventional logic and started to progressively apply nose-weight until he got to the point where the CG was placed at about 15% of the wing chord, and the model was only just flyable, hanging from its nose in turns and landing at high speed. He accepted the advice to strip-out most of the nose-weight until the CG returned to about 30% of chord. This did the trick and the model's problems were solved.

So apart from looking scruffy, what would have been the prognosis if he'd added still more nose-weight? With the nose so high, the wing was precariously close to the stall. In pulling more lift into a turn, it probably would have stalled, leading to a spin. Another aspect is that with so much down-force needed at the tail, the elevator authority would be further reduced and the landings have to be made even faster in order to maintain control.

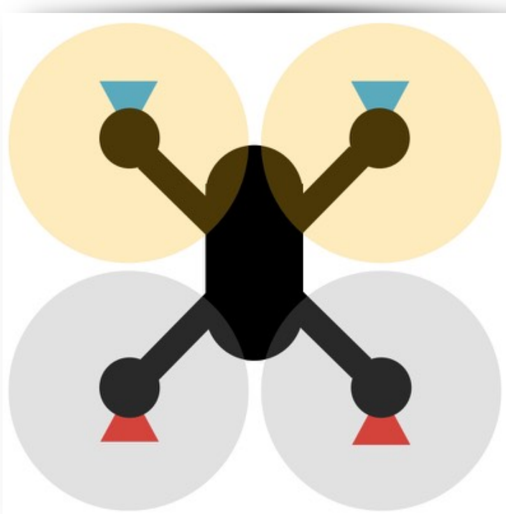
This then is my take on what is a complicated issue, and so criticism and comment are most welcome. I have chosen to refer to Centre of Pressure in this explanation for simplicity, when academics might choose to use other more complex tools. In the context used here, Centre of Pressure still remains valid.

Colin Stevens

DRONING ON (2) 'Flying' *from Bruce*

HELP! I'd like to start the second article by reiterating my sentiment in the first. Hopefully I'm not doing this alone. It's quite likely that much of what I write will be inaccurate/out of date/ mis-informed or just plain gibberish. I would sincerely like YOU to get back at me. Correct my inaccuracies - challenge my assumptions etc.etc. Please do, I don't mind - I need to learn and we have a great format in CDe for just that.

THE DRONE



Firstly lets look at the basic make-up of a drone and for simplicity we'll consider a quadcopter.
A quadcopter will essentially have a body and four limbs with motors and propellers. Two of the diagonally opposed motors will rotate clockwise while the other two will rotate anticlockwise and their respective props (when fitted correctly) will have the appropriate pitch angles. The Quad will also have some form of electronic 'three axis gyro' system built in. Invariably the drone will have two sets of LEDs - very often BLUE at the front and RED at the rear to indicate its orientation and it may also have differently coloured front and rear propellers, again to assist orientation.

These three physical attributes of a drone:
Contra-rotating Props, 3 axis stabilisation and colour orientation indicators are both inherent in and indicative of the difference between the flight characteristics of a drone and a normal fixed wing prop driven aircraft.

Contra-rotating Propellers.
Both prop driven fixed wing aircraft and rotary wing driven helicopters suffer from the torque of their rotating parts, which according to Newton's law will attempt to rotate the body in the opposite direction. However, since the drone has pairs of contra-rotating propellers all acting in the same plane, the torque effect is neutralised. Also, with four spinning props, each exerting some degree of gyroscopic stabilisation, the drone tends to be a very stable flying platform.

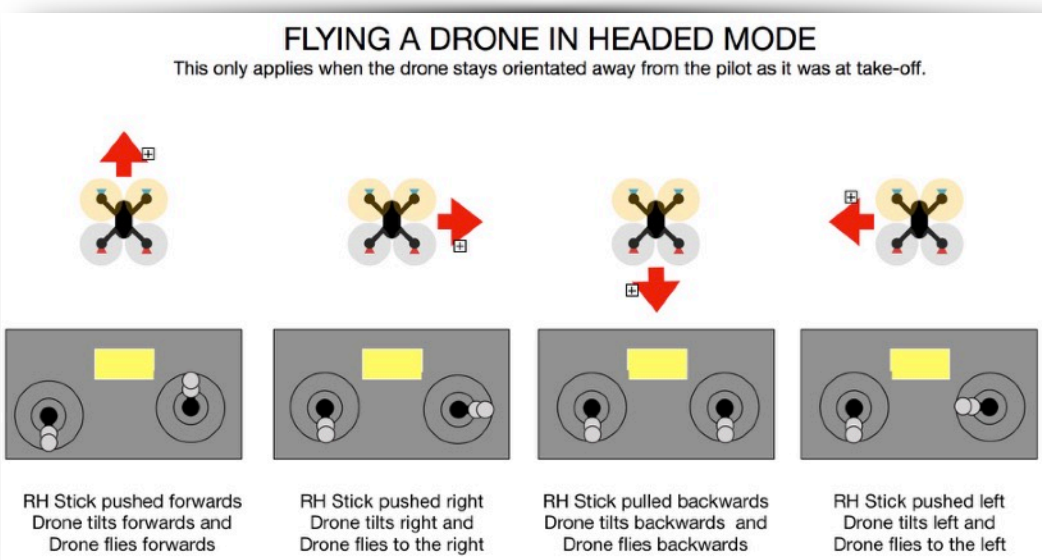
3 Axis Stabilisation
Above and beyond the gyroscopic stabilisation created by the props, a drone will also benefit from some form of in-built electronic stabilisation device which will control it's attitude in all pitch, roll and yaw components.

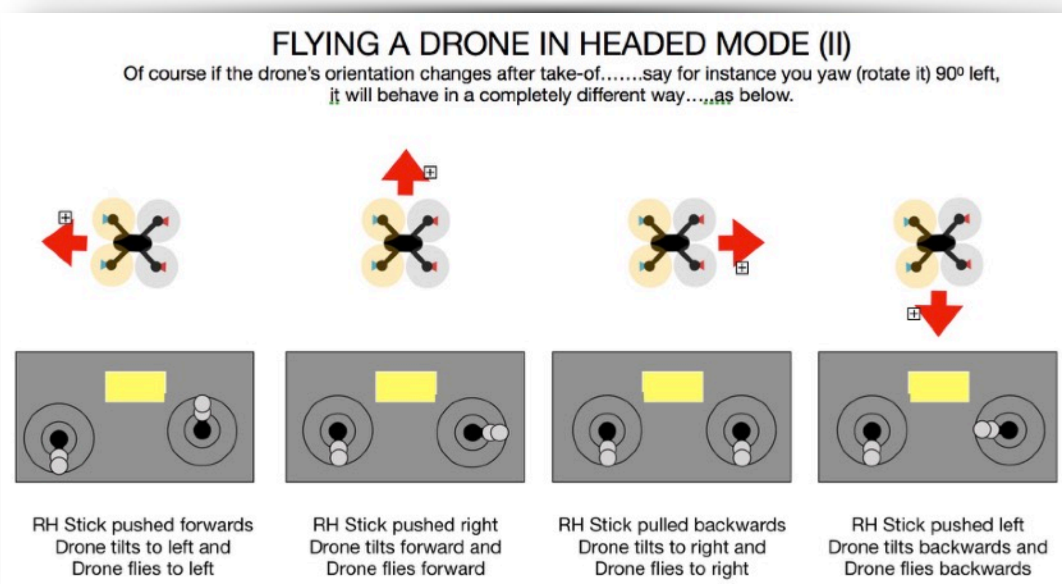
WOW! HOW FANTASTIC! So here we have a flying machine which is exceptionally stable and set up to level itself the moment we come off the control stick - how perfect can that be?
Of course the answer is - not all that perfect, hence the necessity for the drones third special attribute……..

Colour Orientation Indicators

The down-side of the almost symmetrical drone is that once it gets a few metres away, especially in a bright sky, its very difficult to tell from its silhouette which way it's facing and even if it's coming towards you or going away. Fortunately this isn't a problem with small indoor and slightly larger outdoor models which by necessity you'll keep close and by the time you get to larger, more expensive camera drones they've got a number of system options available to overcome this kind of orientation problem. (See later)
Flying Characteristics - Fixed Wing v Drone
For this exercise I will assume that Tx Mode 2 is being used so the left sick (gimble) controls the power and yaw, and the right stick controls the pitch and roll.

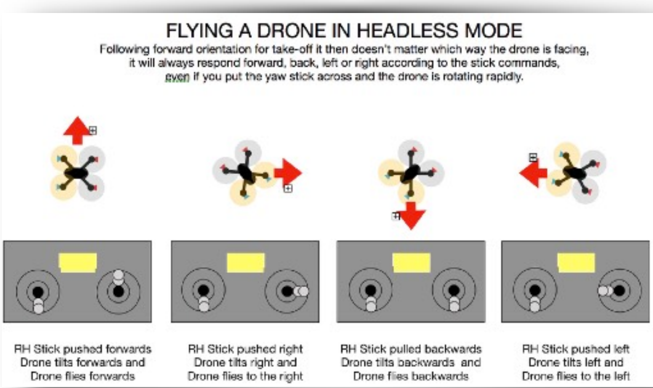
On a fixed wing aircraft, these four functions may each be associated with a particular control surface or attribute. e.g. Throttle = power/ height; Yaw = Rudder; Pitch = elevator; and Roll = aileron. However, since a drone can fly equally as well in any direction things become a little more complicated with the RHS (pitch and roll) controls can in some circumstances become interchangeable depending on whether the drone is moving forwards/backwards or left/right.Headed Mode
Most of the smaller cheaper drones fly in a 'headed' mode which basically means that as long as the drone stays pointing forward away from you, as at take-off, it will fly in the same direction that you move the LH stick.
In fact, attempting to fly a drone at distance in headed mode when it's not orientated front to back requires a great deal of skill and practise even for experienced fixed wing pilots. There are however, two systems in use which make it far easier for the camera drone pilot. These are:
(a) Flying in 'Headless Mode; and
(b) Flying in 'First Person View." (FPV)





Headless Mode

Many smaller drones which communicate by 'Blue Tooth' from a smart phone, and the more expensive drones which make use of Global Positioning Satellites (GPS) can be switched to this mode so that whatever their orientation the RHS stick commands will move the drone relative to the phone or transmitter.



Flying FPV

First person view flying relies on the drone's camera sending back real time video stream to the pilot's smart-phone screen, transceiver monitor screen or special goggles. With this system the pilot sees just what they'd see if they were sitting in the plane or drone, so orientation ceases to be a problem and the pilot can now, for instance, fly forward and steer the drone where they want to go by using the yaw (rudder) stick.

The down-side of toy flying is that you can't watch your screen and your drone at the same time so you haven't got 360º of aerial vision and you have little awareness of what's up there with you. Quite complicated laws govern this aspect of the hobby so we'll look at these in a little more detail next month along with the equipment needed. Also, we'll consider the various system which drones employ to maintain altitude….always important!

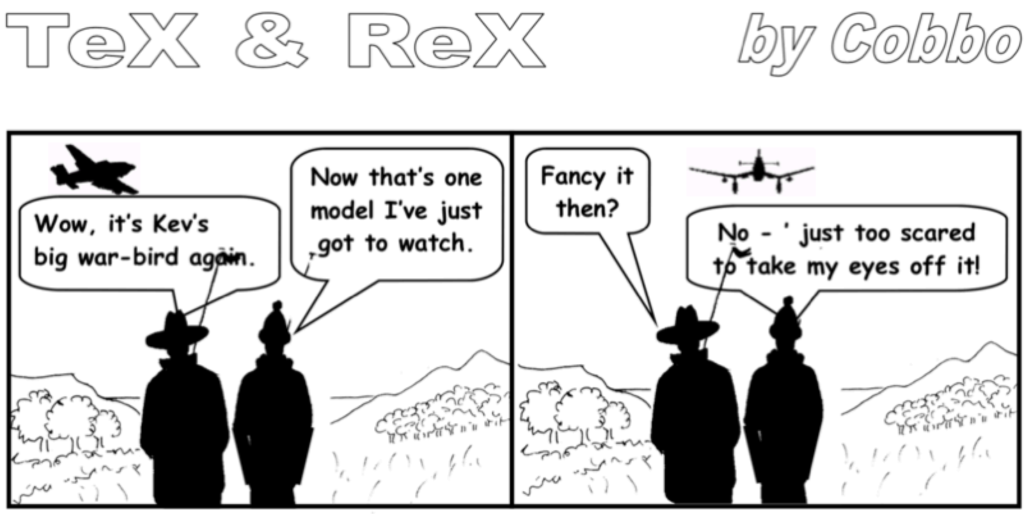
Any questions, comments or contributions to me at aerobruce@aol.com, please. They'll be greatly appreciated.

Club Program 2018

Wed 13th June	Evening at Thorney	**Electric only No Activity before 18hrs finish at 21hrs**
14th June	Club Night	**Light flight and Control Line**
Wed 20th June	Evening at Thorney	**Electric and I/C. no I/C after 20hrs No Activity before 18hrs finish at 21hrs**
Thur 28th	Evening at Thorney	**Electric only No Activity before 18hrs finish at 21hrs**
3rd July	Committee	
Wed 5th July Air Cadets	Evening at Thorney	**Electric and I/C. no I/C after 20hrs No Activity before 18hrs finish at 21hrs Please contact Donna or Derek re trainers**
Wed 11th July	Evening at Thorney	**Electric only No Activity before 18hrs finish at 21hrs**
12th July	Club Night	**Light flight and Control Line**
Wed 19th July	Evening at Thorney	**Electric and I/C. no I/C after 20hrs No Activity before 18hrs finish at 21hrs**
Wed 25th July	Evening at Thorney	**Electric only No Activity before 18hrs finish at 21hrs**
Wed 2nd August	Evening at Thorney	**Electric only No Activity before 18hrs finish at 21hrs**
7th August	Committee	
9th August	Club Night	**Light flight and Control Line**
4th September	Committee	
13th September	Club Night	**John Riall - Covering a Model**
2nd October	Committee	
11th October	Club Night	**Andrew Gibbs' Quiz Night**
6th November	Committee	
8th November	Club Night	**AGM**
4th December	Committee	
13th December	Club Night	**Subscription collection and table top sale**

Competition Calendar 2018

Date and time	Competition	Venue
Saturday 16th June	**Pattern**	Thorney
Saturday 23rd June	**Reserve competition day**	Thorney/Trundle
Sunday 15th July	**Electric All-up/last down No Gliders 2200ma limi**	Porthole Farm
Sunday 15th July	**BBQ**	Porthole Farm
Saturday 28th July	**Slope Day including electric powered gridwers**	Trundle Hill
Saturday 18th August	**Open Glider/open electric**	Thorney
Saturday 25th August	**Open Glider/open electric**	Thorney
Saturday 1st September	**Open Glider/open electric**	Thorney
Saturday 15th September	**Slope or electric duration**	Trundle Hill/ Porthole Farm
Saturday 29th September	**Reserve competition day**	Thorney/Trundle
Saturday 13th October	**Restricted Electric glider 2200ma 3cell limit**	Thorney
Sunday 11th November Remembrance Sunday	**Open Glider/open electric fun day Collection for The Poppy fund and a piece of Alison's cake**	Thorney



Clear Dope - May 2007

The power train can be obtained from HobbyKing

Zoot Suit Flying Days.
All Flying at Porthole

To all Zootsuit Flyers
Just a reminder that the Zootsuit fly-in days start on Friday March 2nd.
Get your model finished!!
Give it a different colour scheme
We don't want too many mix ups in the sky.
These are fly in days, the basic rule are a climb of 15 sec and a max time to make of 5 min per flight.
Each day is independent so the pilots on the day are against each other.
So it does not matter if you miss one,
If a running total is required this can be set later. **Ray Beadle**

Zoot Suit Fly-in Days. 2018
All Flying at Porthole

Friday **29th June**, Sunday **8th July**, Friday **27th July**,

Sunday **5th August**, Friday **24th August**, Sunday **1st September**, Friday **21st September**,

Friday **5th October** Sunday **28th October**, Sunday **4th November**

Time from Start, 15sec Climb, to landing or 5 min Max
Sunday Starts from 12 o'clock
Friday Starts 10 o'clock

Could the lock at the

Porthole gate lock you all please ensure gate is left with the and cable positioned bottom of the gate as

For those of you who have not yet discovered it, Nick Gates has set up a group page on Facebook its well worth a look

Here is the link:-

https://www.facebook.com/groups/Chichesteraeromodellers/

Now with 90+ members

Flying alone on Thorney is restricted to lightweight electric or gliders, and pilots are requested to concentrate on flying within the grass area to the west of the runway.

The Commander at Baker Barracks Thorney and the MOD have decreed that there shall be NO drone flying whatsoever

When flying at Thorney please keep an eye out for traffic(all kinds walkers, horses, bikes, runners, and low flying aircraft) coming from behind the flyers and inform them accordingly

When Driving Around Thorney be aware of young children on bikes

Please Try to leave Porthole as tidy as possible, making sure no fuel is left on site