

# TORQUE BACK

Vol. 11 No. 13

December 2011 - January 2012



## FPV

### A bird's eye view

find out more inside this issue



Is it a Boat?

Is it a plane?

Is it small?

Is it big?

No, it's a Tiger Moth...



For

## 2011

The news letter of the Hobart Model Aero Club inc.

[www.hobartmodelaeroclub.org.au/](http://www.hobartmodelaeroclub.org.au/)



**COCKPIT TORQUE—COMMITTEE NEWS****Over flying at Kelly Field**

I had reason to visit Mr Saxby in the house on the entrance road to ask him if he was interested in doing some slashing for the club, he has given a quote to cut the grass to comply with council regulations

Mr Saxby mentioned that on Saturday 26 November (week before the xmas lunch) a large white plane flew overhead when he was in a paddock adjacent to his house ,I said I would mention it at club level.

We modellers have to be vigilante when flying especially if you are flying with a southerly wind .If you are uncertain how far North you are flying , get another person to go to the gate and have a look .You may surprised how far up you are flying .

Tony Gray

**GALLEY TORQUE—CHRISTMAS LUNCH****Christmas Lunch December 2011****Christmas at KF.**

The Christmas dinner was held on the 4th December at the clubroom at Kelly field. There was a very good turn out with approx. 40 people. Including two visitors from Ulverstone, Mark and Karen Leverton (club members). With the fire roaring and unfortunately mother nature was also roaring. Apart from the short lull in the wind the



weather was not conducive to much in the way of flying. Perhaps it was more suited to have a swap and sell instead. There was a good lot of stuff on offer in the shed. There were several aircraft (funny that) in ARF and kit form (yours truly has now acquired a couple, bad idea these sales :-)), engines, two very nice futaba radios, landing gear, other accessories and odds and ends all just in time for Christmas. I am sure that I missed about 90% of what was there on offer. All in all a great sale and some very good bargains were there to be had. There was a very nice selection of OS motors from a 20—90 (if my memory serves me correctly) they included some four stroke and some two stroke engines. There was also at least one electric model there.

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Hobart Model Aero Club inc.

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Front cover photo:- Peter Hubbard's Phoenix Tiger Moth powered by an OS 40. (just in case you want one for Christmas they are no longer made. Peter tells me however they make a similar one in electric power.

**GALLEY TORQUE CONT**


The only flying that was consistent was that of the good cheer and laughter had by all on the day. Tony Gray managed to get his cardinal airborne but, had a hairy landing so I am lead to believe. Chris Rowe and Peter Allen only got as far as the gate before

mother nature turned again. Apart from the wind it was a . very nice day. Congratulations to all, we raised \$346.00 including donations, sales of club T shirts and donated rope to the club. As I sit here in my comfortable chair I would like to say thank you very much for the fantastic job the ladies did on Sunday. Colleen and Jack were on holidays and had only just returned to Tasmania on Thursday afternoon prior to the lunch.



They kindly went down on Saturday to prepare the club rooms for Sunday lunch. On Sunday they arrived at KF at 7.30am to prepare the Christmas lunch

By Ed and Tony Gray



## MEMBER PROFILE—TONY SHEPPARD

### **Your first aircraft encounter - Full Size or Model - can you recall?**

One of my first memorable experiences was a flight from Welkom to Durban in South Africa in the 1960's. The plane was an ex air force Dakota that had seen better days. Very hot day with lots of turbulence and the pilots must have battled all the way. I remember being very sick for about three hours.

### **How long have you been an aero modeller**

My Dad introduced me to control line flying in about 1965. My brothers and I would go and watch him and a friend fly on a tailings dam at a mine site in West Africa.



### **Your first model aircraft - details please**

My first model aircraft was probably a control line flying wing, I think that it may have been called a Satan. I built it and my brother flew it as I was too scared of crashing it. Definitely had a Taipan diesel that used to kick. I still have the scar on my right hand index finger.

### **Your first full time Employment**

My first full time employment was as an auditor with a firm of accountants in Melbourne. Nine months of every year was spent on the audit on National Mutual Life. I soon got bored of auditing and joined a tax practice.

### **Your present Employment (or last if now retired)**

Self employed. My wife and I own and operate a furniture retail business in Hobart.

### **Name three model categories in which you are currently interested**

I have electric and glow models for radio control. I do have a control line on my workbench, it has been there since April and is still not complete. I also have a couple of Tomboys on the go, they have been on the bench for a year now. Probably have too many models and not enough time.

### **Have you been involved in other Hobbies i.e. Boats, Trains etc...**

My wife and I are watercolour artists and spend a lot of our free time travelling and painting.

### **Do you have confidence aero modelling will survive the iPod age?**

I tend to think that people are slowly getting over the advances in technology. iPods and computers will eventually become like radios and TVs were to us years ago.

### **Do you have a current project on the building board**

I am currently building a 5th scale F-8F Bearcat. It is a "challenging" RTF. Will be powered by a 26cc petrol motor, unless I change my mind and put electric in it.

**MEMBER PROFILE—TONY SHEPPARD**
**Favourite model engine**

I have a couple of Saito four strokes at the moment. I have always preferred four strokes due to their sound,.

**Best memory of model building or flying**

My best memory of model flying is of my brothers and I watching my late father and his mate flying a small control line plane in Ghana. I don't think that my father ever flew a model again and my brothers never took up the hobby.

**Favourite place in Tasmania (other than Kelly Field).**

It would have to be the East Coast, Freycinet, Coles Bay and Swansea.

**SILLY SEASON STUFF**
**The FAA Inspection**

With the number of airline disasters lately, the FAA now sends an inspector to the North Pole to check out Santa Claus's sleigh before allowing him to fly on Christmas eve.

The inspector arrives and checks the reindeer and they look good, he checks the harness and it looks okay, he checks the sleigh and it is also okay. Then he says, "Santa, lets take it up for a check ride and if everything looks good I'll certify you to fly."

Santa hitches the reindeer up and taxis onto the runway and just as he's starting his take-off roll he looks over and notices the inspector has a pump shotgun on his lap. "Hey! What's the shotgun for!?" Santa yells.

The inspector says, "Well, Santa, I'm really not supposed to tell you this, but there is going to be an engine failure on take-off."

*(Not particularly funny but, I leave it in anyway as you might find it funny Ed.)*


**Funny Links** (for junior pilots)

<http://www.noradsanta.org/en/>

<http://www.santaclaus.net/SantaTracker.asp>

<http://www.youtube.com/watch?v=uXvI9cHa-ss>

<http://www.northpole.com/>

<http://www.airservicesaustralia.com/> (Santa tracking)

Dear reader,

If there is an issue you wish to raise with the editor or any other issue that bugs you feel free to contact me directly rather than indirectly, gels@netspace.net.au or phone 6272 7472 or 0417 520 970 Ed.



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## SCALE TORQUE

**Stand-off Scale Competition**

6th November

*By Tony Gray*

Earlier this year I was at Kelly field and there were five scale-looking models flying. I realised that we would not need many more models to have a fun scale event. When the calendar of events was drawn up it included our stand-off scale day.

I might add there were some reservations – would anybody enter, and how would we judge the event? I asked Dave Christian, Gavin Hallam and Geoff Leverton to help run the event. We worked out the criteria and decided the static judging would be from a distance of five metres and this would have a maximum of 10 points awarded. A kit or plans-built aircraft received a half to one point more than an ARF.

The flying consisted of three sections. Take off, in the air realism, and landing and would all receive a maximum of five points each.

As the day grew closer it looked like we would have approximately seven entries, and the weather forecast would be ok for the morning.

Just by chance, Mike Van Niekerk arrived with his Super Chipmunk. He was unaware that there was a competition being held on the day– the old email address again !

By start time we had 16 models that had completed a judging form. Jim Dicker suffered an unexplained radio failure before the static judging commenced – only three models on 36meg. The static judging was underway about 10:30am. Statistically Andrew Hutchinson and Michael Van Niekerk had 8.5 points each. By

the time the flying was to commence the wind had increased so the smaller models flew first. There were a couple of landing accidents such as nose-overs.

Andrew Hutchinson flew his Corsair and made a couple of attempts to land and on the third attempt caught the wingtip and it rolled onto its back – cracking the fuselage. He then flew his Stearman and put on a polished display with a perfect landing in windy conditions and received the maximum of five points. The next best landing was Michael Rutledge with four points. As the wind had strengthened considerably, quite a few of the entrants decided not to fly.



**SCALE TORQUE CONT..**

All the entrants voted for the model of their choice and this was won by Chris Rowe with his Turbulent. First place was awarded to Andrew Hutchinson with 22 points and in second place was Mike Van Niekerk with 18.5 points.

By about 11:15am seven models had flown and were judged in the air.

Pilot	Aircraft	Power
Michael Van Niekerk	Super Chipmunk	OS 120
Andrew Hutchinson	Stearman	3W 157
Andrew Hutchinson	Corsair	3W 56
Michael Rutledge	Cessna 172	OS 61fs
Tony Sheppard	RV4	Saito 90
B McCallister	RV3	OS 61
Chris Rowe	Pottier P705	OS 15



The event was finished by lunch time. We moved to the clubrooms for presentation of the prizes and a bite to eat at "Colleens Canteen".

Many thanks to Garth Wilmot who donated a flight box for first prize and Bryce Atkinson who donated a power panel for second prize. The Pilots Choice was Chris Rowe who received a club t-shirt and a pair of 3 ½ inch wheels. Chris Rowe said "he would never build a model large enough to use these wheels", so they might be up for grabs as a prize next year!

I must thank all the modellers that entered and made the day a success. I also must thank the judges for their time and effort – maybe we'll have another one about April?



**INSTRUCTOR TORQUE****The months training**

Really nothing to report once again! The weather continues to give us little chance of decent flying conditions, the odd morning here and there, is about our allocation. One bright moment - Basil Byrne now has his bronze wings. Congratulations Basil



Incidentally, I know we do tend to misrepresent the weather much of the time - but I did get a good check on what at least to me seems to be an endless run of poor flying conditions recently from my my car service records. The only usage that's changed is the number of trips I make to Kelly Field. This year I'm down well over 4K Km from the previous two years.

I did learn something interesting about electric models though, which I can pass on. Like much of life, the authenticity of this is not verifiable but is accepted wisdom so believe it or not as you wish but I've hedged my bets and adopted the rule.

The leads between the battery and the ESC should be kept as short as possible. This has nothing to do with the valid desire to avoid excessive voltage drop which also mandates leads as short as possible but is another consideration altogether. I purchased a 70A ESC for a model and noticed a recommendation that the ESC / battery leads should be less than 7" in length. I wondered about this and did some checking. It turns out that leads longer than 6 to 8 inches can result in damage (failure) of the ESC from some sort of resonance generated in the leads with the motor running. Keeping the leads below 6" sounds simple but in practice it can be difficult to do while still ensuring cooling for the ESC. Also if it is a problem one has to ask why do batteries come with leads close to the allowed 6" which, when joined to the leads in the ESC means a connection considerably longer than recommended? One way or the other as far as the owner is concerned a modification to the leads will normally have to be made to meet this requirement which at best is a pain in the butt.



If you've had an ESC failure it may be sensible to check the length of the leads though I suspect most failures are a result of overload. The general industry rule of thumb incidentally is to use approx. 2/3 of the rated limit on electronic and electrical equipment as a practical maximum. By this I mean if an ESC or switch is rated at 60A then 40A should be considered a sensible maximum load. No manufacturer ever underestimated the capacity of his equipment which is tested in controlled conditions, the sales people will of course then add their spin, and finally we add the vagaries of installations and age. So because say an ESC is rated at 70A treat this limit with reserve and in this instance for continuous operation 50A could be considered a safe upper limit for good service life.



The leads between the ESC and motor are not subject to the same restriction and can be any length subject to adequate size.

We now have three training aircraft including one electric model. The result is a load our solar cell charging system which puts out just a bit over 1A cannot handle. We are working to improve the situation but if anyone intends to use the trainers, first - when you arrive check the batteries, and second, if they are down a bit, use your car battery to charge them up. Should not take long. Do the same when you are getting ready to leave so the next member has a full battery. Do not just moan about it!

**INSTRUCTOR TORQUE**

Where is our hobby going? - provided the pix reproduce ok what you should be seeing at first glance is a pretty ordinary semi scale foamy normally operated with 4 smallish EDF units. The hand in the photo gives the scale and the bare model with electric motors and no battery weighs a little under 2Kg. What's interesting are the two inboard motors. Two tiny turbines each putting out 2 Kg thrust. They spin at 240K RPM and cost in the region of \$1800 each complete with all needed accessories. This power rate ratio must give the model a frightening vertical performance in that without considering any help from the two EDF units which in themselves are capable of keeping the model in the air it still has approx. twice the thrust needed to maintain a vertical hover. Ok so they are expensive but think back to the early days of radio when good equipment was similarly expensive. I've no idea of the production runs for these little turbines but probably in the low hundreds at best. Now consider the cost if the manufacturer could produce them in the tens of thousands. It is not hard to see a small turbine costing much the same as a good quality 4 stroke.

Are turbines difficult to operate? No - starting is now done by electronics, with ATK (Kerosene) the only combustible material needed and given a motor in good condition starts are immediate and fool proof. Once running, all they need is a good fuel supply and battery power, so, given an acceptable purchase cost, turbine operations are well within the capabilities of the average modeller.

Maybe you laugh at the idea of thousands of turbines but production numbers can be larger than I ever thought. I read recently that the largest model engine manufacturer, Cox, have produced close to 50 million of their cheap glow motors since production started about half way through the last century.

Added to this if you have not run across a small unit called "Ruby" check their website - [www.uthere.com](http://www.uthere.com) - (it's probably best not to just Google ruby if your kids or wife are about) and have a look at the unit. A small turbine + ruby + a foam model and we have just produced a model with capabilities far beyond anything we could have envisaged a couple of years ago. Even FPV models are almost redundant. Round the pylon races? Nah - we could run a race round Mt Wellington, Tasman Isl and back to Kelly field and have the model land itself when it gets here.

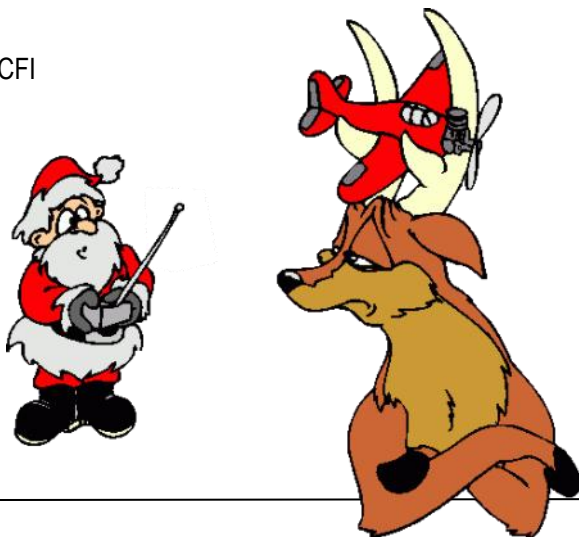
**Congratulations** to our honoured President - Tony Gray - Tony completed the flight check for Gold Wings recently. Mind you, considering his MAAA membership number is in the 2000s somewhere, and the new numbers being issued are up around 66000 it's taken him long enough to get around to it.



Makes me wonder who holds the clubs lowest number?

Safe flying to all

Nils  
Acting CFI

**EVENTS FOR 2012**

<b>EVENT CALENDAR - 2011/12</b>		
Date	HMAC	LMAC
Sat 21/01/2012		Scale Day
Sun 4/02/2012	Low key Aerobatics	
Sat 3/03/2012	Control-line	
Sat 17/03/2012		Tomboy/OT
Sun 14/04/2012	Tomboys / ladies day	
Sat 21/04/2012		Scale Day
Sun 5/05/2012	Stand-off Scale	

**BENCH TORQUE****Tomboys – Old and New!****Chris Rowe****Tomboys - Old!**

The recent growth of enthusiasm evident amongst members of HMAAC, for the building and flying Tomboys and similar R/C assisted vintage free flight models, has prompted me to ponder just what it was about these little models that has ensured their continuing popularity for more than sixty years? For those of us who, like myself, were around in 1950 when Vic Smeed designed the model, the answer is easy - the sight and sound of a Tomboy, or indeed any similar vintage diesel powered model, climbing gently into a blue sky, instantly evokes memories of times long past and our very earliest associations with aeromodelling.



Of particular significance for me, are my clear recollections of a sunny Sunday morning in England in 1948 when, as an eight year old, I was driving to Loughborough with my father. About a mile from our home in Castle Donington, the road passed the end of a recently de-commissioned wartime airfield, from which I had previously watched Wellington bombers taking off for Germany. On this morning however, the airfield was completely deserted except for a teenage boy, who was busily engaged in preparing for flight the largest and most beautiful model aeroplane that I had ever seen. My father stopped the car and I watched, fascinated, as the engine was started and the red and white model, subsequently identified as a Frog 45 with a Frog 100 engine, taxied across the tarmac and took to the air. It turned out that the owner, Brian Hoyes was in fact a close neighbour, and shortly thereafter it was my new friend Brian who supervised the construction of my own very first model. It was a Keil Kraft Polaris chuck glider, and it was built on the kitchen table. It was only tiny, and it didn't have an engine like that much coveted Frog 45, but it certainly flew beautifully, and I was hooked!

Two years, and a number of gliders and Jetex 50 powered models later, I was on my way across the world to live in Tasmania, with my last English Christmas present, a brand new ED Bee engine, carefully wrapped in an oily rag and stashed in my cabin luggage! I was extraordinarily lucky. Shortly after arriving in Scottsdale I met Ken de Bomford, the then manager of the Lyric Theatre, who immediately took me under his wing and shortly thereafter supervised the construction of my very first I/C powered model. Yes it was a Tomboy, with my new ED Bee up front, built from a plan scaled up for me by Ken from a recent edition of the

*Aero modeller.*



With Ken's encouragement, advice and assistance, numerous Tomboys of varying sizes were successfully built and flown at Scottsdale in the early 50's by our little group of enthusiastic young aeromodellers. The most prolific were referred to as Extra Tomboys; so called because they were scaled up to about 45" span to accommodate the Frog 150 which was the most popular engine of choice at the time.

Gerard Strickland took a different tack when he decided to build a slightly larger version for his new ED 2.46 Racer, resulting in a model with distinctly un-Tomboy like performance! I recall that on full power this particular model would rocket skywards in an almost vertical climb then, as inevitably it approached the inverted position, it would roll upright and accelerate into a repeat

**BENCH TORQUE** CONT..

performance of the manoeuvre, rapidly reaching an extraordinary height in a hair-raising series of half loops and roll outs! The model was subsequently flown quite successfully, in the Power Duration event at the State Championships, held near Burnie in about 1954.

The largest Tomboy of all built at Scottsdale at this time was however a 72" span monster. Double the size of the original and powered, somewhat more sedately than Gerard's model, by a Frog 250, this one was appropriately referred to as the Super Tomboy! The old photographs are from Ken's albums, and record the flight of three different sized Tomboys, including Gerard Strickland's model which had a fully sheeted, white painted fuselage with red and black trim. Very smart!

So why, you might ask, was the Tomboy such a popular design at Scottsdale in the early 50's?

- By comparison with many other models of the time, the Tomboy actually looked, at least superficially, something like a real aeroplane!
- The model was designed to be as easy as possible to build. Gone were the complex elliptical shapes that so frequently complicated the construction of many models of that era. In their place were parallel chord wings; square tips and a simple slab sided fuselage. With a little bit of effort they could in fact be successfully built by anyone; even 10 year olds like me!

Finally, and perhaps most importantly, with some experienced assistance in trimming, even the roughest of Tomboys could be almost guaranteed to fly successfully. In truth the problem was not whether they would fly; the real question was whether you were going to get your model back after it had, yet again, been borne upwards in a strong thermal to finally disappear from view into the clouds!



### Tomboys – New!



After watching the fun being experienced by an ever increasing band of HMA enthusiasts at the last Tomboy competition day, it became glaringly obvious that it was high time that I built myself another Tomboy and joined in! Someone, I can't remember exactly who, recently suggested to me that if one were pushed, a Tomboy could be built in as little as 24 hours. It seemed a bit unlikely but, as a matter of interest, I decided on this occasion to record the time that it would actually take me to build the new Tomboy from scratch.

For anyone who may be contemplating building, as distinct from buying, a new Tomboy, the results of this exercise may be of some interest. Without having made any special effort to speed up the process, it took me a total of 22 working hours to complete the basic wooden structure. Somewhat to my surprise however, it also took me a further 12 hours to cover the model with Lite

Span, paint the engine bay and trim, and install the radio gear and associated bits and pieces. Looking back, I can see how it might be possible to speed up the process, and perhaps even complete such a model in 24 hours, but unless you are a super efficient builder, I wouldn't count on it! Instead, I suggest that you take your time and enjoy the challenge of building a really

**BENCH TORQUE** CONT..

simple model, really well. Believe me, the ultimate satisfaction of watching your own scratch built Tomboy take its first flight at the end of the process, will be well worth the effort, and the wait!

Finally, a few words about the cost of scratch building. Over the last few years it has frequently been suggested to me that scratch building is simply a waste of time, when you can now buy an equivalent ARTF kit for the same, or perhaps even less, cost. Well, if you want a genuine Tomboy there is no ARTF option, and the only way to get one is either to build one yourself, or pay someone else to do it for you! I don't know how much the outsourced solution is likely to set you back, but if you choose to scratch build, the balsa, glue, wire, wheels and Lite Span covering, should cost no more than about \$50; that is if you don't already have most of the above already sitting around in your workshop like I did! If you already have a 2.4 GHz system, a further \$50 should cover the cost of a micro receiver, battery and two servos; to which of course you will need to add the cost of an engine, if you don't already have an ancient Mills .75 hidden away like me.

So, if you are careful with your purchases and exclude the cost of the engine, a nice new Tomboy 3 can currently be built for about \$100; most of which will be in the cost of the micro R/C gear and the light weight covering. If you really want to cut costs even further, you could even cover your model with tissue or even brown paper, because I am sure it would still fly! So come on guys. They cost peanuts, and they really are easy to build. So why not give it a go and scratch build your way into the growing HMAc Tomboy squadron!



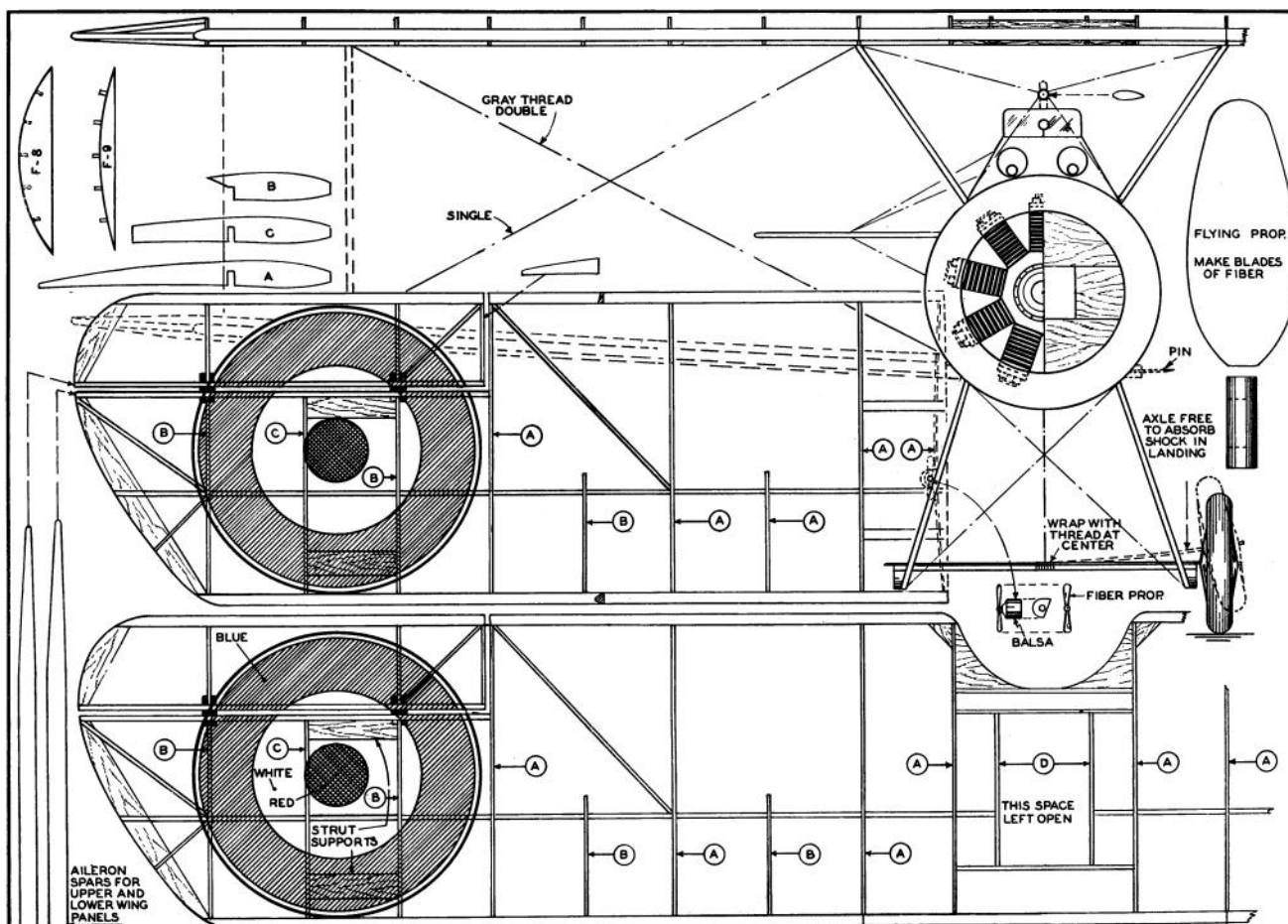
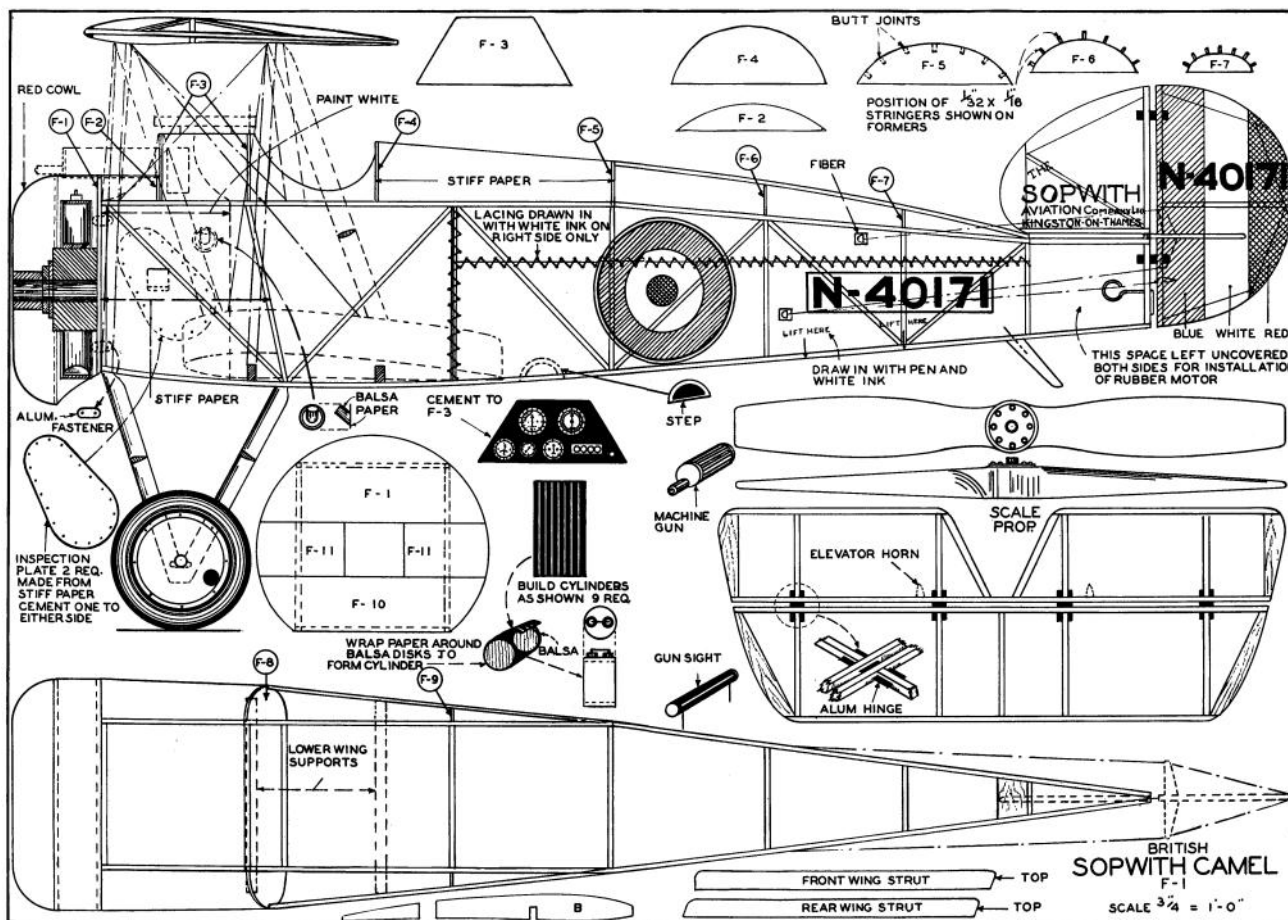
Chris Rowe

**QUICK QUIZ TORQUE****FIELD TORQUE****MOWING**

A notice was sent to all club members by email, asking for members to assist with keeping the strips and other areas mown. We had two members respond, Tim McCulloch who lives at Richmond and Frank Henderson from Main Road Lindisfarne. We must thank them for volunteering, not forgetting the members that have been cutting it over the years and still do. If you as a member arrive at the field and find the grass is not suitable to fly from, you may have to cut it your self. If you are at the field and need to know how to operate the mower for future use, ask a committee member or some of the fliers. The mower has been modified to cut lower, number 2 setting seems to be the best all round for the strips, number 5 for any thick grass. Ear and eye protection should be worn, these are in the fuel cupboard. After use the grass needs removing from the top of the mower deck, it gets in around the belt.

- Q1 What is the area of Kelly Field
- Q2 How many tiger Moths were based at Western Junction (Launceston) during ww2 (to the nearest 50)
- Q3 the tiger moth had a 145 hp engine, how many litres capacity?
- Q4 What seat is the tiger flown from, front or rear, and why?
- Q5 Name the three ingredients used in Tomboy fuel?
- Q6 What metal is used in good quality glow plug element?
- Q7 On the fourth day of xmas my true love sent to me?
- Q8 On a brushless motor what does K/V mean?
- Q9 When is our fun fly aerobatic event being held?
- Q10 In 2003 Maynard Hill flew a model from Newfoundland to Ireland, 1182 miles, 38 hours 52 minutes, How were the batteries charged?

# PLAN TORQUE



**AREOBATIC TORQUE** CONT...**RC Model Airplane Aerobatics Part I****The Basics**

<http://www.rctoys.com/pr/2008/07/02/rc-model-airplane-aerobatics-part-1/>

After you finish learning the basics of model airplane flight, you will probably want to progress to more advanced flying. Aerobatics are manoeuvres which are performed outside the normal performance envelope of an aircraft. This means that the aircraft is subject to stress, speeds, and attitudes not encountered in straight and level flight. There are several relatively easy to perform manoeuvres for a beginner to try. This article will show you the basic manoeuvres such as loops and rolls, and later articles will detail more advanced manoeuvres.

**The Stall**

Although the stall isn't exactly an aerobatic manoeuvre, you will need to know how to avoid and survive them before you try the basic aerobatic manoeuvres which can sometimes cause stalls.

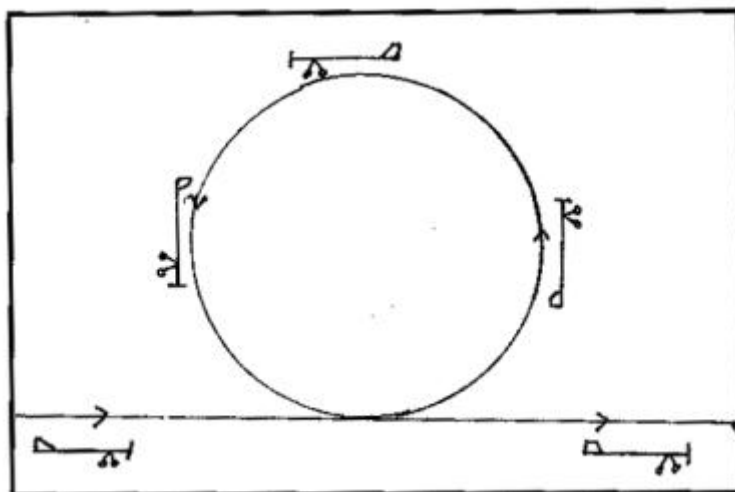
In order to produce lift and keep the RC model airplane flying, air must constantly move over the wings. If the angle of attack (how high the nose is pointed) is increased, then the aircraft will climb and slow down. A stall is a condition of flight where little to no lift is produced by the wings, causing the aircraft to free fall. All aircraft wings have a critical angle of attack, beyond which they cannot effectively generate lift. If this limit is exceeded, then the RC model aircraft will enter a stall.

After entering the stall, the RC model airplane's nose will drop. Most beginning pilot's first instinct is to pull back on the elevator and attempt to slow the descent. This is actually the opposite of what should be done to recover from a stall. Remember, the lift produced by the wings is proportional to the amount of air moving over them. The only way to increase this airflow over the wings and thus end the stall is to increase the RC model airplane's speed through the air. This is accomplished by letting the nose drop, and then gently pulling back after sufficient airspeed has been gained.

You can safely practice stall recovery by letting the RC model airplane climb to a safe altitude, reducing throttle, and pulling back on the elevator. After inducing a stall, just let the nose drop, increase throttle, and then gradually pull back on the elevator. Once you are comfortable with stall recovery, you can start learning about the fun stuff – aerobatics!

**The Loop**

The loop is one of the easiest (and most fun) aerobatic manoeuvres to perform. Begin by flying the RC model airplane to a safe altitude (about 50 feet should be enough) and into the wind. Increase throttle to full, and gently pull back on the elevator to start climbing. Continue to use the elevator, and let the aircraft enter inverted flight. After the RC model aircraft's nose starts to point downwards, gradually decrease the amount of up elevator until the RC model aircraft is level again. Take a look at this sketch, which shows what a loop looks like.

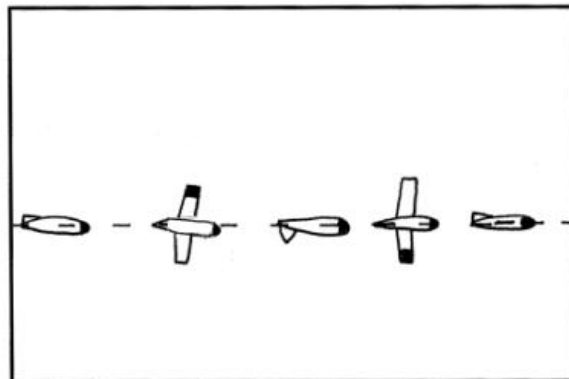
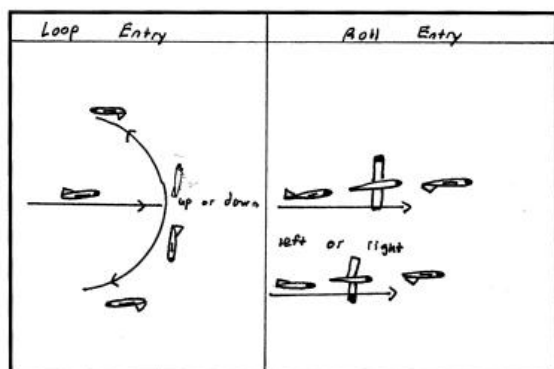


**AREOBATIC TORQUE**

The loop described here is an inside loop, performed with the RC model airplanes bottom facing outwards. An outside loop is a much more challenging manoeuvre, and will be discussed in a later part of this article.

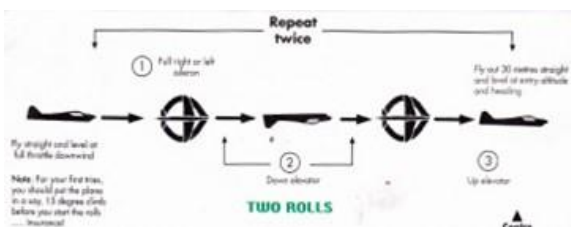
**The Roll**

The roll is another easy to perform manoeuvre, consisting of rolling the airplane on its side 360 degrees. We recommend having a RC aircraft with ailerons to perform this manoeuvre, but some three channel aircraft are able to roll without problems. This sketch shows what a roll looks like. We have coloured in one wingtip of the aircraft in the picture, so that you can see the start the roll with the RC model airplane facing into the wind. Then apply a small amount of up elevator (to compensate for the loss of lift from the wing) and apply full aileron in the direction that you want to roll. Don't centre the ailerons until the RC model airplane is level again. As the model become inverted apply some down elevator (don't hold down elevator too long rather flip it down).

**Inverted Flight**

Flying the RC model aircraft inverted is a fun and impressive aerobatic manoeuvre. You already have some experience with inverted flight after performing loops and rolls, the two major ways to enter inverted flight.

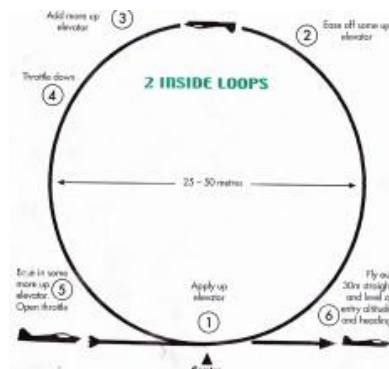
The loop is the simplest way to enter inverted flight. Enter the loop like before, but at the top, don't use up elevator. Instead apply a slight amount of down elevator. Because the RC model airplane is inverted, every control input will be opposite to what it is when the plane is flying normally. For example: use up elevator to fly downwards, and down elevator to fly upwards. You can exit inverted flight by completing the loop, using up elevator, or rolling 180 degrees. This sketch illustrates the two main ways to enter inverted flight.

**Aerobatic manoeuvres—HMAC**

Scheduled for the 4th February 2012 is our low key aerobatics. Each competitor will take off and they will nominate the manoeuvre they are going to do. You don't have to carry out a manoeuvre on each pass, only when you are ready do you call, example, "two loops" or

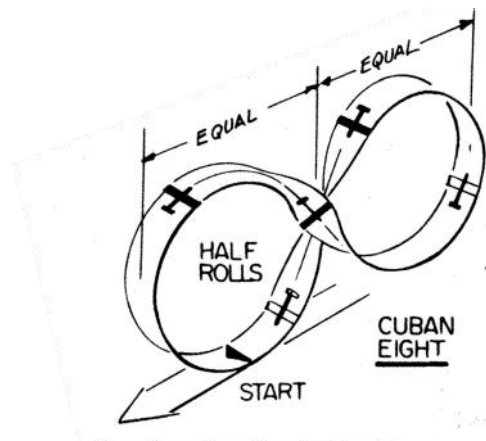
"landing". The schedule will be in any order. Take off ---two loops ---Cuban eight---two rolls ---inverted ---land. The first and last are mandatory. Competitors will be judged on the quality and positioning of the manoeuvre. If you have to abort your landing approach it will not be scored against you, you do it again, this is a fun fly event. Low powered and trainer type models will get bonus points. A flyer will be sent out prior to the event with more information.

Tony Gray (HMAC aerobatics day)



**AREOBATIC TORQUE**

**Cuban 8.** another maneuverer for utilising both the roll and loop is the Cuban eight. This stunt looks good but requires practice. Makes for a real challenge in testing you're new found R/C piloting skills. Start the Cuban eight from cruising speed. Pull the model up into an inside loop, continue over the loop inverted and starting down the loops back side. At the 45o point (on the back side) half roll the aircraft back to the right side up position. Continue flying the model into another inside loop, over the top inverted again at the 45o spot make a half roll the plane to the right way up. Strive to make your rolls at the intersection of the two inside loops making a horizontal figure eight as you do so. At first you're manoeuvre will most likely take a lot of air space and your loops will be rather egg shaped. As you become more proficient, the stunt will look a figure eight laying on it's side. Try a consistent loop size and exact intersection point. Before long you have it right.

**WORD TORQUE**

Editor is aware of spelling mistakes in word torque.

Torque Teaser

Ailarons	Airframe	Antenna
Balsa	Biplane	Brushless Motor
Chord	Club House	Cockpit
COG	Control surfaces	Covering
Crash	Decal	Dope
Elevator	Engine	ESC
Filter	Flaps	Flight
Flying	FPV	Fuel
<b>Secret word</b>	Landing Gear	Leading Edge
LiPo	Motor	Mower
Nicad	Nose	Patching
Pitts	Plywood	Propeller
Range test	Rerciever	Root
Rudder	Servo	Signal
Strip	tail	Telemetry
Throttle	Tiger Moth	Tips
Tissue	Trailing Edge	Trainer
Transmitter	Wheels	Wing

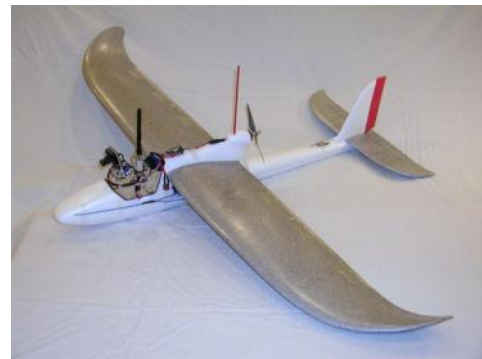
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L S E N W H E E L S T T I P E N M I P
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**TECH TORQUE****FPV** (First Person Video)by:- [fpvpilot.com/GettingStarted.aspx](http://fpvpilot.com/GettingStarted.aspx)**What it takes to get Started in FPV Piloting:**

If you are new to wireless video the first thing is to purchase a wireless video system that will fit your needs from a good FPV vendor like PCVA.com, ReadymadeRC.com, etc.... First you must consider what type of FPV piloting you will be doing, long range (2 miles or more) or short range (less than 1 mile). Long range will require more equipment and a powerful wireless transmitter 500-1000mw (milliwatts) where shorter range requires less power like anywhere from 10mw to 300mw. More watts = further distance. For FPV pilots a 500mw system is the most popular since it can have as much as 2-3 miles of range without drawing lots of power like a 1000mw system. It's recommended to have more wireless video range than RC radio range so if you happen to lose the RC link at least you will be able to see the aircraft's view and OSD info. Helpful if the aircraft should go down making retrieving much easier.



We will assume that you already have an RC Plane, Helicopter, Car, Boat, HAM lic. and are familiar with the radio controlled hobby.

If not we suggest you start with a Radio Controlled Aircraft/Vehicle and become good at controlling it before you ever try FPV piloting. Even though some hobbyist may think it's easier to control a RC aircraft/vehicle through the use of FPV it might not be for you. Take your time getting into this hobby as it can be addicting:).

**What you will need to get :**

1. Small light weight security type colour cameras like the KX-131(5 volts), SN555 (12 volts) WD600N (Hi-Res 12v) CCD imager is preferred. Available from site like: (ReadyMadeRC.com) ( DPCAV.com) ([www.nghobbies.com](http://www.nghobbies.com)) ([www.futurehobbies.com](http://www.futurehobbies.com)) and now (HobbyKing.com)
2. There are 2 types of camera imaging sensors used, CMOS and CCD. Both have positives and negatives for FPV. Most CMOS will adjust to brightness and contrast for each pixel giving a better picture than CCD, along with using slightly less power. The CMOS camera draw back is it scans each image line by line which can cause waves or ripples in the video if there are vibrations from the aircraft. Also sudden turns or movements can look less natural.

CCD cameras are more popular with FPV pilots because they capture the image frame by frame which allows for better picture when there's vibrations and quick movements. They handle low light conditions better than CMOS and have more pixels for the size (more pixels the better the resolution/clearer picture). The draw back is they consume more power along with blurring when going from dark to bright objects like ground to sky (CCD cameras like the WD600N don't have this issue). 5 volts and 12 volts systems are common. Some prefer 5 volts because of the other electronics they are powering use the same voltage like servos and such so they might share the power source (not recommended). Also most 12volt cameras are really stepped down to 5 volts with a built in regulator.



**TECH TORQUE**

12 volt cameras are popular because a separate power source like a 3cell 11.1 volt lipo battery easily powers the system along with the video transmitters which now are mostly 12 volts. 12 volt systems are becoming the most popular and are recommended.

2. Wireless video Transmitter and a matching Receiver (ReadyMadeRC.com) (DPCAV.com) (www.nghobbies.com) (www.futurehobbies.com) (hobbyking.com)

There are a few frequency bands to choose from when it comes to purchasing a wireless video system, 900MHz, 1.3ghz, 2.4GHz and the newer 5.8GHz.

Most popular video transmitter as of now is the 900MHz with 500 milliwatts due to the fact it has more range at the same power draw as the other bands. Gets around obstacles better than the other frequencies like trees and buildings. Works with all RC radios and the newer 2.4GHz radios like Spektrum/Futaba/JR without causing interference. The draw back is some countries do not allow 900MHz for public use so 1.3GHz or 5.8GHz is recommended. Milliwatts are important for range so if your going to fly at a far distance then 500mw is going to allow for 1-3 miles/2 km Line-of-Sight, where 10mw will give you much less like 200-300 yards. Some countries do not allow more than 10mw so check your local laws. Wireless video sellers will also have a matching receiver to go along with the frequency you choose.



3. A monitor 7" display or larger. The larger the monitor the better. Or video goggles with a minimum resolution of 640x480 if you plan on using an OSD and want to be able to read the text clearly. Most popular are "Fat Shark" and "Head-Play" brands. If using a monitor you will need to block out the sun light from hitting the screen. Most FPV pilots build an enclosure like a shoe box around the display and then cut an opening for viewing. (note: Fat Sharks are 2.4ghz wireless goggles so there not recommended when using 2.4ghz radios.)

4. A separate battery to run the video equipment inside the aircraft is highly recommended. Using the aircraft's battery can make for poor video and if the battery runs out you will lose your video feed (Video Drop Out) making it impossible to see where the aircraft might land/crash. Try to keep all your wireless video equipment using the same voltage like all 5volts or all 12volts, most companies have both. 12 volt systems make the most sense because a 3s 11.1 volt liPo can power these systems without having to use a voltage regulator like 5 volt systems need. It's not recommended to power 5 volt wireless gear with the radio RX power source even though they have the same voltage. Doing this may cause glitching and/or shorter radio range.



Not all wireless systems are "Plug N Play" so some soldering skills maybe needed depending on what you purchase. Some systems come with bulky RCA/BNC stereo/TV connectors which most serious FPV pilots like to replace with smaller, lighter servo type connectors especially if space and weight are a issue. Most FPV plug n play systems use servo connectors that match what most OSD's and data loggers use.

A good platform for FPV is a well built RC Aircraft/Vehicle keeping in mind that you will be adding more weight for a Video Transmitter (about 2oz), Camera (1.5oz) and a separate power source (battery 2oz) and that's just the basics.

Another thing to consider is the type of aircraft. Electric RC has come a long way in the past few years with the newer Brushless Motors and Lipo batteries that allow for more power and longer flights. They're recommend for FPV over gas (nitro fuel) and don't have the mess associated with fuel.

**TECH TORQUE**

Trainer aircraft can make a good platform and some modifying of the equipment location may be necessary to keep the centre of gravity (CG) correct along with a more powerful motor, larger prop, etc...

A RC car or truck is also a good way to get into FPV even if piloting aircraft is your goal. Vehicles are easy to control and are a great way to get use to the 2D view. They will allow you to test the wireless systems and other gear without the risk of a crash not to mention they are a blast. Some popular planes for getting started in FPV are the Multiplex (MPX) Easy Star and Skywalker which are made from a durable EPP/EPO foam. There's also the electric Easy Glider, HobbyKings FPV-UAV-168, GWS Slow Stick, Flying Wings, EPP-FPV, etc... Even though you might be an expert flier we suggest starting with something like an Easy Star when first learning FPV piloting.



It's also a good idea to have a plane/heli dedicated just for FPV as changing back and forth will cause you some headaches. Once you have the aircraft chosen you will need to install your wireless camera gear. It's a good idea to keep the wireless video TX 6" to 10" or more away from the planes RX and antenna (your results may vary..always Range Test 1st). If using GPS try to keep the GPS antenna far away as possible from the video TX. When ever possible keep servo wires separated from video wiring. Also use twisted or braided servo wires. This will help keep any interference down to a minimum or none. Some of the best FPV camera placement is usually in the cockpit area for planes and between the skids for heli's. Some FPV pilots prefer to see part of the aircraft's nose and some don't want anything but the view so final camera placement will be up to you.

Another great way to practice FPV is to use a simulator like Great Planes "Real Flight" G3/G4/G5 RC Flight Sims which allow you to fly from the cockpit view (not able on photo fields sims like the Phoenix). Using the simulator for FPV helicopter practice helps tremendously, not to mention cutting down on repairs from crashes and saving money while learning.

Most popular recommended set-up for basic First Person View, FPV piloting:

**\*\*Multiplex Easy Star with a brushless motor (2400kv-3000kv, 6x5apc prop) and matching ESC (25-35 amp) Hi-Tec HS-81 servos\*\***

Futaba , 9C,10C (10channel), 12Z, 14MZ if you plan on using a Plug n Play head-tracker (Head-Trackers not recommended for beginners)

SN-555 / WD600 (12v) camera (mounted on Pan & Tilt servos if using Head-Tracker)

100mw to 500mw 900MHz wireless audio/video transmitter with whip antenna.

Matching wireless receiver with a patch antenna (standard whip is fine for short range flights under 2000')

3 cell (for 12v) 1000mAh or higher Lipo battery for powering wireless video gear

Video goggles or monitor with good resolution (640x480 min. if planning on using a OSD.)

Note: If using a 2.4ghz radio like Spektrum/JR/Futaba it will be necessary to use a 900MHz(.9GHz) or 1.2GHz, 1.3 GHz (UK), 5.8 GHz wireless video system and not a 2.4GHz system due to interference with 2.4GHz radios.

## TECH TORQUE

Notice: Video Transmitters can get HOT and need cooling like good airflow or a heatsink or fan. Never power a wireless video transmitter for more than a couple of minutes without proper cooling as doing so may ruin the range of the transmitter causing it to be much shorter....but it will still work so always range test if there is a chance it has been overheated.

### **Your First FPV Piloted Flights**

Once you have done a range test you should fly your new FPV plane in normal view until you get the hang of how your new plane flies and get all the trims set to your liking. Record your flight and review it so you'll be familiar with the surroundings and you'll also be aware of any video drops/static before flying FPV. When you feel comfortable to move on to FPV it is recommended that you don't use Head-Tracking (HT) with a pan and tilt set-up for your first few FPV flights and that you use your camera in a fixed position Pointing Straight Ahead (don't point camera down). This will help with visual flight (VFR) in allowing you to put the horizon in the centre of the screen during level flight. You will be better able to tell whether you're climbing, descending or banking a lot easier.

This will also help you become oriented with your aircraft and what to expect while flying FPV.

Another good idea and can't be said enough is "Have a Spotter" to watch your aircraft. Having a spotter is a important FPV tool and if possible have your spotter hooked to your radio with a buddy box/trainer cord. If you become disoriented or lose video feed you'll be able to select your trainer switch allowing the spotter to take over your aircraft until you can regain it. Don't fly over 400' altitude (in US) keeping in mind that your spotter must be able to see your plane and it's orientation. Try to keep level flight and refrain from doing loops, rolls, hammer heads, etc.. until you become a good FPV pilot.

Piloting by FPV takes a lot of concentration and might seem hard at first so if your thumbs (fingers) are shaking that's normal for most newbie's but should go away after a couple flights.

**Don't fly too far!!! A lot of first time FPV pilots fly out of radio range on there first flights and it's easy to do so Stay Close by and expect shorter flights since most new FPV pilots also tend to use more power draining the battery faster.**

*Practice flying slow at a safe altitude (100'+) and Close by (400'-).*

At this time some RC clubs may not allow you to fly FPV so check with your local club if you intend to fly there. Most FPV pilots fly in unpopulated areas in the middle of nowhere which is highly recommended for FPV pilots.... just make sure you know the area and landmarks. It's a good idea to do a regular view flight first when flying at a new location while recording it. Review the video to get a better understanding of your location from the sky view.

Landing could be done without FPV piloting until you become comfortable with flying in this mode. Just like when you first started to fly it will take some practice and will be rewarding when your able to do it.

Taking it to the Next Level once you get the hang of FPV piloting you might want to add a GPS along with a On-Screen Display (OSD) like the Eagle Tree "OSD pro" can give you more info on your aircraft. This can be a good tool and the information can be recorded to your laptop, DVR, etc... Also recording the GPS information can help recover a lost aircraft if it should go down. Just review the recording and get the location of last position and using another GPS to guide you to the location of your downed aircraft.

One problem with GPS on an RC plane is the lag time. This causes the information on the OSD to be behind on location, speed and heading. 10hz GPS modules or faster can give faster info updates and highly recommended.

**TECH TORQUE**

The lag is usually only about 1/2 to 1 second and if you keep your manoeuvres slow it shouldn't be an issue. Another thing to keep in mind is the GPS gives you ground speed and not airspeed. So if you're climbing, lets say vertical, your ground speed may only be a couple of mph/knots where airspeed could be 25 mph.

You also may want to get a set of video goggles (if your not already using them), then maybe adding a Head-Tracker and camera mounted to Pan & Tilt servos. This allows the FPV pilot to look around while flying. If you chose to do this first start with the pan only until you get use to it, and then add the tilt. Good luck, Have Fun and BE SAFE!!!

Note: Not all radios are compatible with using a Head-Tracker Gyro (HT) set-up. Check manufacturer for compatibility with your RC radio.

Thanks to the people of **FPVpilot.com** for allowing me to use their website content. Ed.

**Interesting links**

[fpvpilot.com/default.aspx](http://fpvpilot.com/default.aspx)

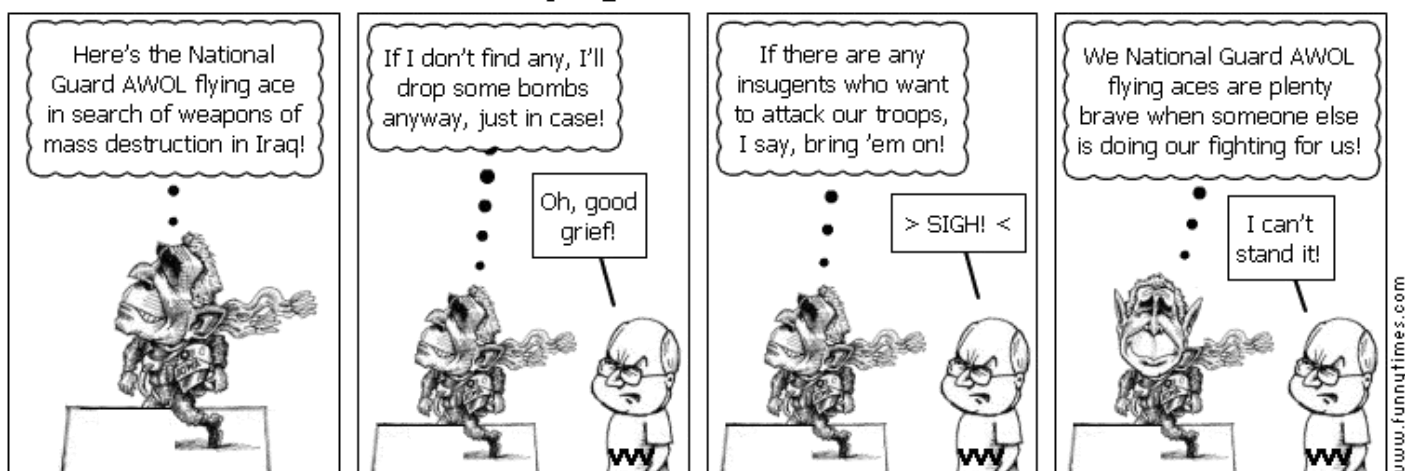
[www.youtube.com/watch?v=dmbAVp5q3Y0](http://www.youtube.com/watch?v=dmbAVp5q3Y0)

[www.youtube.com/watch?v=cHlyLClyfek&feature=related](http://www.youtube.com/watch?v=cHlyLClyfek&feature=related)

(interesting and different view)

[www.youtube.com/watch?v=qGnIJVRlekY&feature=related](http://www.youtube.com/watch?v=qGnIJVRlekY&feature=related)

There is many more videos and websites out there to have a look at. Just do a search for FPV model aircraft (Ed)

**SNOOPY TORQUES****The National Guard AWOL Flying Ace** by Eric Perlin

**FOR SALE & WANTED**
**For Sale**
**HK Pylon Racer**

Not built, airframe only  
930mm wingspan

Details on [HobbyKing](http://HobbyKing) website\$80

Contact: Greg 0457 103 150  
gdh240 (at) hotmail.com


**1/5 Scale Fokker DVII**

OS 60 engine, Hitec radio gear  
All reasonable offers considered.

Contact: Bryce 0417 127 945  
bryce\_atkinson(at)netspace.net.au


**Zagi wing**

OS25, Hitec radio gear.

Goes like stink!

All reasonable offers considered.

Contact: Bryce 0417 127 945  
bryce\_atkinson(at)netspace.net.au


**Sanwa VG-6000**

36MHz transmitter, near new,  
comes with 240v charger, one  
receiver, no servo's. Stores 4  
models.

\$220.

Contact: Danny 0427 685 085


**JR Receivers - NER-549X**

9 channel, 36MHz, 2 of, \$45 each

Contact: Stuart 6247 7423

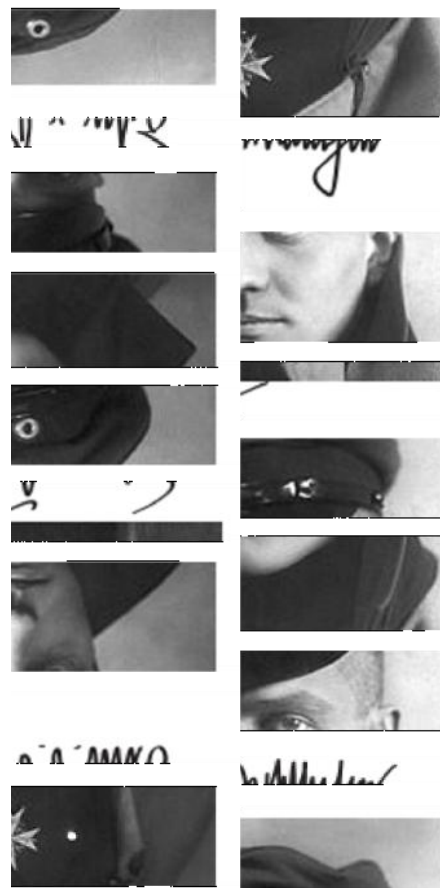

**Wanted to Buy**

Wanted to buy

**Lost and Found**

**Found** on Wednesday 1 LiPo battery (blue in colour) at K.  
F. Appears to have been in crash. Contact Tony Gray on  
0409881 112..

**Found** inflatable dupro tire approx. 150mm 6" Contact Tony  
Gray on 0409881 112


**PUZZLING TORQUE**


Who is this person and why were they infamous or famous ?

The first person to email me with the correct answer will have their Published in the next edition and I will ask Greg to publish the answer on the website in a month.

**Quiz answers** 1- 16.3 hrs. 2- 425. 3- 145 hp, 6.14 litre  
4- Passenger sits under the wing close CG. 5- Ether, kerosene  
and oil (preferably castor oil) 6- Platinum. 7- Four calling bird  
8- number of rpm per volt (eg 12000rpm = 12v) 9- Fourth of  
Feb 10- the OS 60 drove an alternator coupled to the rear of  
the engine. Battery only had a capacity of a few minutes.