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ROTORUA MODEL AIRCRAFT CLUB (INC)

December 2021 NEWSLETTER

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Covid Restrictions

Please be aware the Club has adopted a policy of No Entry to the field if you cannot show proof of vaccination or valid proof of exemption.

Welcome to the December 2021 newsletter

Last month we asked if there is someone willing to take over the treasurer's role so far no result. Don't miss out on this great opportunity to be involved in the Clubs affairs. Contact any committee member.

We have had some excellent flying conditions lately with plenty of activity. Bryan W and Andy H are both going well having mastered landings and take offs. Great to see Brian H again after the Waikato area was released from lockdown glider guiders have been taking advantage of the thermal activity as have the vintage fliers. Remember the sunscreen and a hat if you don't want to be fried. And talking of frying things a timely reminder to our electric fliers. Models must be tied down in the pits when the battery is connected and keep well away from the prop. Don't rely on the throttle stop switch to stop a motor bursting into life. While an excellent thing to have set up for an added layer of safety no radio system is guaranteed 100% perfect.

Charge Lipo batteries as per the manufacturers' instructions and always set the capacity and time limits on the charger and charge outside. These batteries do explode if not handled correctly. If not convinced talk to our two members who set fire to their houses one did several thousand dollars' worth of damage. And finally, if they start to puff up get rid of them quick as they are a time bomb.

A good bible on Lipos is A Guide to Understanding LiPo Batteries — Roger's Hobby Center (rogershobbycenter.com). Recommended reading for anyone using Lipos.

Dave Bailey has completed his Antonov An2 and had a successful test flight a couple of weeks ago and was very happy with the way it preformed.

Sadly we heard of the passing of Alan Smith. Alan was an ex member of the club. He had been a hard worker and always the first to help when a model

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disapeared inton the jungle. The Club extends its sympathy to Alan's wife and family. We have been asked to sell Alan's modelling gear see the details later.

The AN2 under construction

The completed flying machine

Welcome to new member Graham Christmas. Graham is getting back into flying with a couple of beautifully built gliders.

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Unfortunately, our Christmas BBQ has been postponed until the new year. Finally have a very merry Christmas and a happy new year.

Another Arduino Project

It's well known that our Nicad and NiMh batteries lose their capacity as they age. With our modern radios we can set up alarms in the transmitter to alert us when the Tx or Rx battery has discharged to a pre-set limit and display the Tx and Rx voltage on the Tx screen.

Nicad and NiMh batteries do not have a linear discharge so a voltage reading while being within safe limits gives us no indication of the remaining battery capacity. Lipos are another story. I won't go into them here.

I was interested to see what a typical discharge curve looked like. You can find plenty of examples on the internet but what are my batteries like. It's not too difficult to log the voltage of a battery at regular intervals while it is being discharged and plot a graph of voltage against time.

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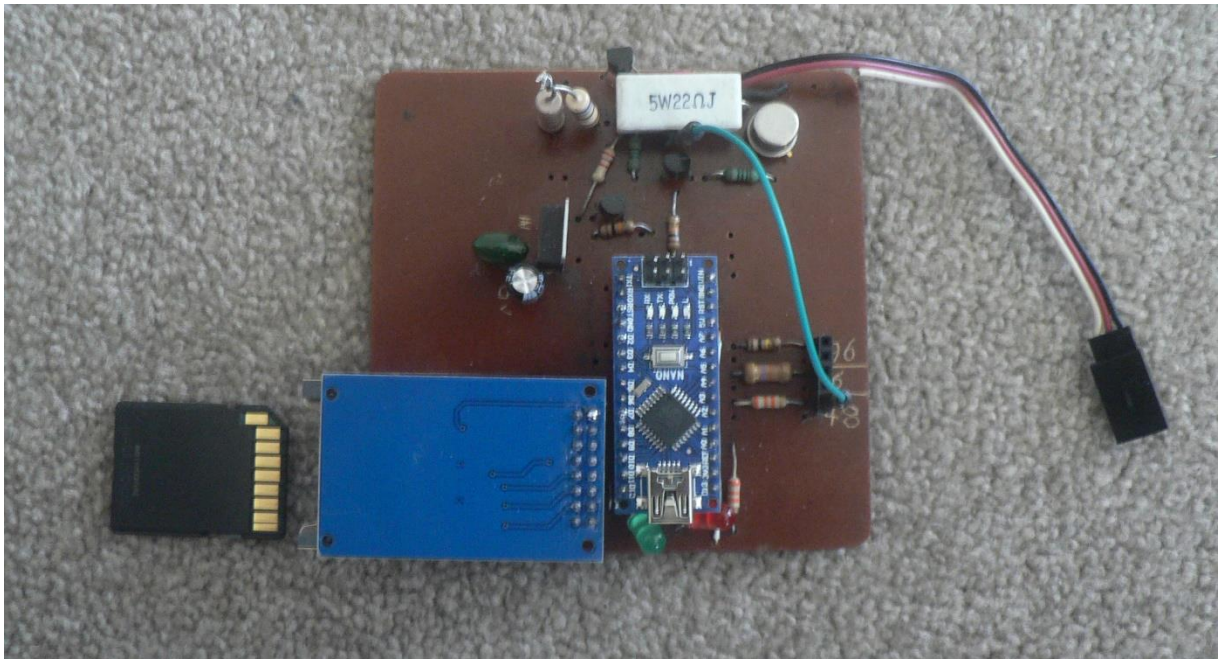
An Arduino datalogger that writes to an SD card can be purchased for just over $10 and an Arduino Nano programmable processor for not much over $20 or even cheaper from Bangood. These are the two main components used.

Having figured out how to write a program to discharge the batteries to 1.1v per cell. (This is the safe minimun voltage to discharge a Nicad or NiMh to before permanent damage can occur) I figured why not have the discharge voltage logged every 5mins then have the batteries charge for 15 hrs. This took me into a new learning curve as I could get each individual action working but when everything was combined nothing worked. After a few internet searches things started to work and finally the whole lot was built on a printed circuit board. The components to charge and discharge were found found in the spare parts bin as was a voltage regulator.

The complete affair was built up on a PC board which required a few design revisions but still required a couple of hard wired links between a couple of the tracks.



The Completed Discharger / Charger and Datalogger

- The black item on the left is a SD card the data is written to
- The blue item next to the SD card is the SD card writer
- The blue item in the middle is the Arduino Nano processor
- The items at the top control the discharge and charge rates

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Well, what do we do with the logged information?
It's a simple matter to import the csv data from the SD card into Excel and plot a graph an example is shown below.

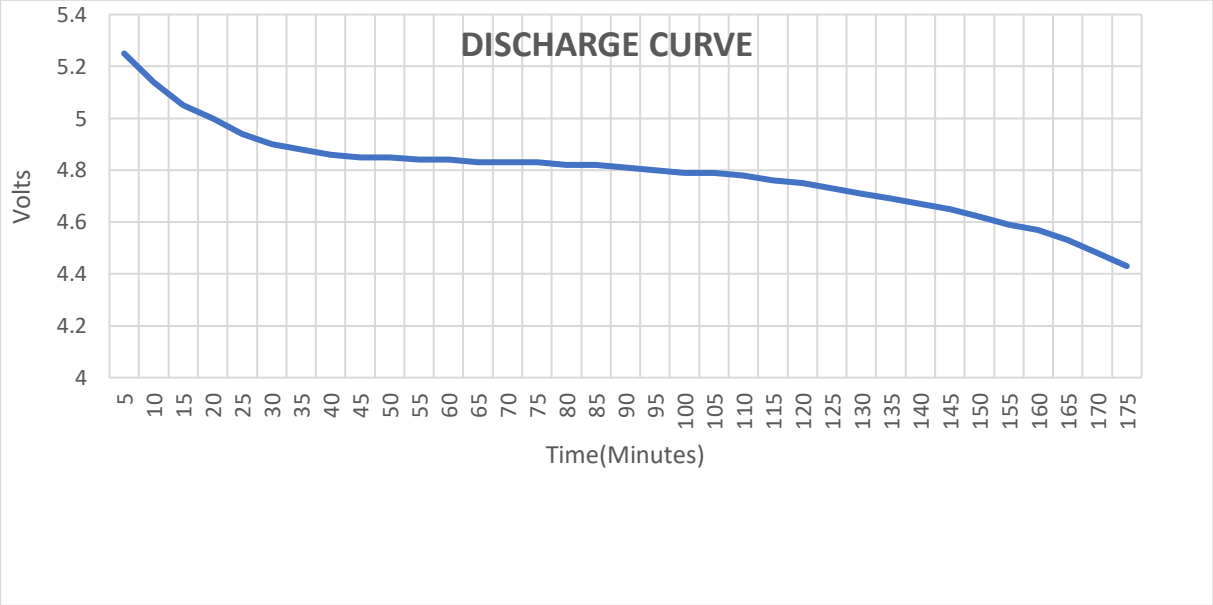
The pack was an old 4.8v 700mah hr AAA NiMh

The discharge ratre was 220ma down to 4.4v (1.1v per cell)

What does this tell us about the battery pack.

The capacity at this rate of discharge was (175/60) x 220 = 642mha

Th initial voltage drop is quite rapid then stable at round 4.8v



After 4.6v the curve steepens and at 4.4v is getting steeper. From here on the discharge become very steep . This is why it is very important to set the correct alarm voltages in your Tx and land immediately when an alarm is triggered.

By plotting future discharges on to this graph we can see if the discharge time is becoming shorter indicating reduced capacity and time to send the pack into retirement.

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What are the Three Wise? Men Up To?

FISHING?

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For This?
Unfortunately, no bites

Aerobatics…. The Stall Turn (Hammerhead, Fieseler)

By.. Ray Philpot

As we all know aerobatics can be a demanding mistress for most of us.
No more so than when we attempt the dreaded stall turn.
This is a manoeuvre that seems to strike fear into both full size and RC drivers alike when first starting.
Often this concern relates to having the aircraft pointing straight up and what might happen if it “falls out” at the top.
Another concern is the, so called, dreaded tail slide.
Neither of these are really a worry if you have height on your side. Like any new manoeuvre you should always start high when it comes to aerobatics, at least until you get your head sorted out about the figure.

Now, when it comes to aerobatics there are, it seems, a hundred different ways to assess a figure.
So, we cannot go through all the criteria for the different disciplines such as FAI, Pattern, IMAC, scale, etc, etc
This is the same in full size competition.
They can all have subtle differences in the finer judging criteria so we are talking about a generic vanilla stall turn here.

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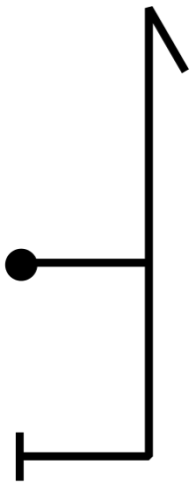
First up let's sort this name thing… it is misleading to call the manoeuvre a stall turn as there is no stall.
Americans call it the hammerhead stall. Or just the hammerhead. It is also known as a Fieseler after a German WW1 ace.
In NZ we call it a Stall Turn so I guess we are stuck with it.
Why no stall?
There is no stall (unless you mess it up) as it is flown on the Zero lift axis.
At the top there is zero G and zero wing load you cannot stall under these conditions.
You can however, trust me, come to a complete stop. (and fall or slide out maybe !!)

I remember well my first stall turn in a full size Airtourer … my finger imprints are probably still on the dash panel.

That said, it is one of the most pleasing manoeuvres whether in full size or a model once you start to get it right.
That is easier said than done. It has a K factor of 17 in the FAI catalogue which is relatively high because, although considered a basic figure, it is NOT easy to do well EVERY time.
Don't believe me, watch me stuff it up time after time.. ☺

Talking about the FAI catalogue which shows figures as ARESTI symbols.
Here is the symbol for a vanilla stock standard stall turn.



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A stall turn can be positive in, positive out or any other combination.
Like negative in, positive out, negative in, negative out and so on.
Of course “negative” here means upside down (inverted).

Let’s break it down.. this is for the vanilla figure……positive in and positive out.
We are ignoring wind correction here as that comes later after you have the basics down pat and your entering competition.

Step one..
Fly with wings absolutely level and I really mean level. When you start learning this figure don’t even start the figure unless your wings are level… so important.
Think about it, if your wings are not level at the start by the time you reach vertical the aircraft is busy shooting off at an angle left or right.. makes for a very hard fix.
This is the first important step…. **WINGS LEVEL before you pull up.**
How much throttle is a choice issue based on how much up line you want and your aircraft.
I suggest that you keep your up line to a modest length to start with.

Step two..
Now carry out a **one quarter loop…** it’s that easy. I suggest a nice easy quarter loop up as if you pull it tight and hard you risk a stall. Also you have more gyroscopic effects, propwash and P factor. (not the damp spot on the grass in front of you)
So if all has gone well you should release the back pressure on the elevator stick close to neutral just as you arrive at the vertical.

Step three..
The vertical up line.. now this seems to be easy but not as easy as you may think.
You can’t simply do nothing as the airspeed is slowing down. Things are changing, so be prepared to make minor adjustments on the way up.
You may find you have to use a slight amount of right rudder and a tad of forward elevator.
This depends on how well you set it up and also of course on your aircraft, engine, rigging, etc.

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Now this is where most people go wrong.. just **wait !!**
DON'T rush it..
If you decide to hit the up line with full throttle and high speed you may have a long wait and some issues staying straight. It is perfectly ok to do a short up line on reduced throttle.
Nearly all early stall turns, particularly when learning, are really wingovers and would actually score low in competition. Every discipline has strict guidelines on this part but we will use the FAI guide lines as most are similar.

Step four..
The turn around….
We need to do the "turn around" within one wing span.
If you do this part too soon you simply fly it across. (called a bridge)
So, we need to be at almost zero airspeed at the top.. just **about** a dead stop.
Its this part that I have seen panics some fliers… the "dreaded" tail slide, the "fall over" etc.
If you have height these issues are no big deal… if you get confused simply close the throttle and centre the sticks. Most aircraft will sort themselves out if you do this however, **wait** until it start to get some airspeed before GENTLY pulling out… not a hard pull…. that stall is waiting for you if you get harsh.
Golden rule for aerobatics is….. **Let it fly !! …..** Gently does it.

You will need to arrive at the top with virtually no speed and a reasonable amount of throttle as it's the prop wash that is going help turn you around with the airflow over the rudder.
You will also find that most aircraft tend to like going one way better than the other. However, if contemplating competition then you need to master both ways in due course.

So your at the top with nothing on the speedo but the makers name… what now ??

At the magic moment (your choice) smoothly and positively apply FULL rudder, lets say left.
If all is going well the aircraft will start to yaw around at the top.
Here is where it gets a bit tricky. If you just rely on the rudder only the aircraft may roll and tuck under.., why is this ?

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Well, as we are going to the left with full rudder applied the right wing is speeding up and thus starts to produce some lift and rolling the aircraft to the left during the turn around (yaw).
So you will need to apply a small amount of right aileron (called outboard aileron)and a small amount of forward elevator during the yaw turnaround while gently closing the throttle all at the same time.
This is why piano players are good at this multi tasking stuff (so are woman but we don't have many of those flying in our club)

Step five..

The vertical downline..

If you got through the turnaround this bit is easy except for a few pointers..
It has to be vertical down.
You may have to quickly dab a little opposite rudder (right in this case) very quickly to stop a swing through past vertical as you hit the turn around part…its just a small quick jab.
Don't rush to get out of the dive as the aircraft initially has very little airspeed..
As the speed builds you may need to tweak elevator and rudder very slightly.
keep it straight down.
Be patient, when it has a reasonable speed you will need to decide if you need to add some throttle and at what point, that depends on your model and your height.

Step six..

Quarter loop out..

So now you have building airspeed in the vertical downline.
Just before or just as you start the quarter loop you will need to increase throttle to "drive out".
This part is really just the last quarter of a loop..

Back to level flight and it's all over... bar the shaking.

This is a manoeuvre that needs lots and lots of practise. Did I say lots ? I mean heaps !!
Its actually an easy one to practise as you can keep doing one after another.

An important point don't even think about trying to get it right if your aircraft isn't "straight".

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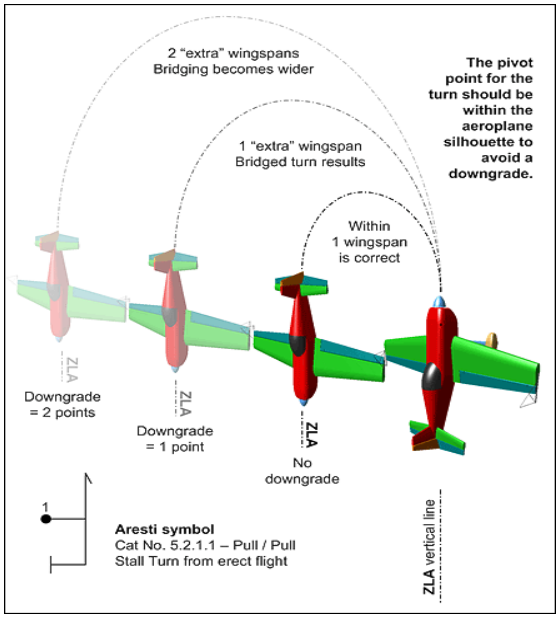
If you have rigging issues they need to be fixed before getting into aerobatics or you will just get fed up.
Can a trainer do a good stall turn?…. Many can, if its straight and true.



ZLA in the above picture is ….. Zero Lift Axis

Just to finish… if you are going to get into aerobatics then it is essential to start to learn to actively use the throttle. Its as important as any other control.
I see so many at the field screaming through a figure on full throttle and then "panic" to get out.

Rule of thumb !! If its going uphill increase power… if its going downhill reduce power.. use it.

FROM THE PRES

During November I was saddened to learn of the death of former RMAC member Alan Smith. Alan was an active member of the club right up until a few years ago and learnt to fly with us. He was always willing to assist people and served on the committee helping the club, particularly where a practical solution was needed to field maintenance. Over the last five years he has mixed fuel for those who needed it and provide a range of mixes to meet members requirements. A small profit on the ingredients was regularly paid by Alan to club funds. He had a great personality and was a very practical and meticulous engineer. Every minute of engine running time was noted and after 20hours all his engines were stripped

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down and bearings replaced. I knew him for twelve years, and during that time I can recall only 3 models, a Stryker electric that he flew so much that the motor bearings wore out, a larger nitro fuelled model and a little stick. He was not a terribly gifted pilot, some of his crashes I witnessed were really spectacular, and he was regularly in the bush searching out his own models as well as other peoples. One particular Alan moment was when the batteries fell out of his transmitter whilst he was flying, leaving them swinging in mid-air, the ensuing rush to try and get them back in place before the plug connector pulled off the circuit board was a sight to behold.

Unfortunately, four years ago he was so unhappy with the way the club finances were being run, particularly the subscriptions, he decided to leave and fly at Hunts farm with another member. As the president, I never gave up trying to persuade him to come back but he was unwavering in sticking to his principles. Although he had left, he still helped the club with its members fuel supply.

I will miss Alan, not only for the skilled jobs he did for me on his Myford lathe but also for his interesting and friendly personality.

October had very unstable weather conditions and on a particularly windy day I had my trainer out, using it to re-introduce Alan Dennis, a returning RC flyer to the joys??? of RC flying at RMAC. The wind was a south westerly, so it was blowing over the ranges and swirling onto the field. The plan was to buddy with Alan and let him get some confidence in flying again. We went through the usual pre-flight check and checked the LED battery indicator which shows perfect, since I had fully charged it up the night before. We got into the air, and it was immediately obvious that really, we should have stayed on the ground. The model was all over the sky in the gusts that were swirling over the hills. Alan did a great job in fighting the turbulent conditions but it was a constant struggle to keep it under control. We persisted for about five minutes and suddenly Alan cried out that he was losing it, I took over but could not control it either, and crashed at the end of the runway. Of course, we both blamed the wind and agreed that we had simply been blown into the ground. The fuselage was in three pieces and the port wing broken at 1/3 span

The model has a history with me and that I did not want to lose, and since the fuselage breaks were very clean, I decided to repair it. After a couple of weeks of work I was replacing the pushrods and needed to check and set up the servos. I attached the battery and nothing worked.

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The battery had been fully charged before flight, so it shouldn't have gone flat in just two weeks after only five minutes flying. The measured voltage was only 3.8v so clearly it was totally flat. To cut a long story short I re-charged the battery but it only accepted 370mah before the charger turned off saying it was full. The capacity of the battery was 1100mah, so something was wrong if it only accepted 370mah after being totally flat. I then did a charger charge and discharge cycle and was dismayed to see that the usable capacity was only 165mah before the battery was flat. It then became apparent why the model had crashed. With 165mah capacity and the way that we were using the servos to keep the model flying, it had run simply run out of battery power and the model went in.

The moral of this story is to regularly cycle flight batteries and note the available capacity to ensure you have enough for flying. The rule that I have read somewhere is that a loss of 25% means that the battery should be replaced. With modern NiMh flight batteries the capacity is normally 2000mah so a 25% loss leaves1500mah. This is three times what we used to have years ago in the days of NiCad batteries. Still, if the battery is losing capacity, it shows degeneration is happening and a wise course would be to replace before it gives up suddenly like mine did. I have a number of models all ready to fly with batteries (most of unknown vintage!) in them. My new year resolution will be to charge and cycle them all before flying

Another battery issue that came up during the month was with another member who had bought a nice new LiPo but it had the wrong connector for the battery. No problem, just whip the unsuitable one off and solder on the correct type. Out with the side-cutters and away we go……. except don't cut through both wires at once which shorts out the battery and burns out the internal cell connection! Oh dear, another expensive lesson learnt. When changing plugs on LiPo batteries the wires MUST be kept apart, best to insulate both ends and then carefully solder them individually to the new plug. Also a powerful soldering iron is needed to make the joint quickly before the surrounding plastic gets overheated.

During windy October I was desperately been trying to find suitable conditions to try out, and then practice with my new control line stunters for a new intermediate aerobatic class. The models were built during the winter lockdown and also fitted with special fuel tanks as detailed in my September notes.

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Since I generally fly CL on my own, I use a model release method called a stooge, that has a ground line that pulls out a pin that is holding the tailplane down on the ground. I go to the centre, pick up the handle and then pull the line. The model is released and away I go.

The first time I tried the new lock down one out, my stooge release line got tangled with the control lines on take-off. The release line was then being wrapped around my legs as I rotated, and the model was getting closer and closer, and my legs were slowly getting bound together. After about three laps the string release line snapped and the model rocketed outwards to the extent of the control lines, as they snapped tight the handle was snatched from my grasp with the wrist strap just restraining the handle. I grabbed the handle back and found that one control line had also snapped, yet the model was still flying level! It went on for a couple of more laps but then started a series of slow climbs and dives, eventually ploughing into the soft earth. When I got to the model, the elevator was loose with the pushrod clevis disconnected. Presumably it had come adrift in the line snap. I still can't fathom how the model was so well balanced that it could fly without an elevator. Presumably the centre of lift was just on the CG position with hardly a margin for stability. (There should be about 5% of the chord)

Fortunately, the soft earth limited damage to a bent monowheel UC.

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After fixing the damage and making up new control lines I tried again a few days later. This time the engine was difficult to start and would not respond to the needle valve it just ran flat out all the time. I needed to stop it, so I reached under the model and tried to pinch the feed line. You can guess what happened, my finger caught the side of the propeller. There were about 15 cuts side by side right down the side of my index finger with blood everywhere. However, with the model nose up, the engine stopped. After I got home ,finger bandaged up and in a better frame of mind I realised that the clunk in my new super duper clunk/uniflow tinplate tank was probably jammed forward from the first crash.

This was in fact the case and after jerking the model back, it could then be heard swinging freely. The kink in the flexible clunk line allowed just enough fuel through for the engine to run at full speed with the needle valve having no effect. Learnings here: a) keep your hands away from propellors!! and b) if your model has a sudden arrival with the ground, check that you can hear the clunk swinging in the tank after you have sorted everything out. This very same thing happened to another member in November.

If you are interested in quadcopter (drones) flying we have a “Whirlybird” group when we go to the field to exclusively (nearly) fly drones or helicopters. Let me know if you want to be on the group.

A Radio from the 1960s

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FOR SALE

From the Alan Smith Estate

- Futaba FF7 Tx
- Futaba SkySport Tx
- Tower Hobbies 6Ch Tx
- Super Tiger 51
- OS 60 FSR
- OS AX 25 bits
- OS AX 46 liner stuffed
- OS LA 25
- Magnum 25
- Magnum 70 4stroke
- OS 40 FP
- Babe Bee
- Covering iron
- 40 mhz receivers
- Servos (some new)
- Various Electric Motors and ECS
- Balsa
- T28 Foam Electric model
- Props
- Models
- Odds and ends

Contact me on 020 4118 5597 for details

COMING EVENTS

February	12 Scale at Matamata
	26 - 27 Airsail MAC Vintage
March	19 - 20 Awatoto (TBC) Vintage
April	9 - 10 Thames Black feet Vintage
	21 Scale at Matamata
May	21 - 22 Tuakau MAC Vintage

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