PROP TORQUE

Official Newsletter of Launceston Model Aero Club Inc. PO Box 1204 Launceston TAS 7250

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From the President

Hello All

Well, there seems to be little point in criticising the weather, as that is all we hear about at the moment. In fact, you could probably count the number of flyable days on the fingers of a butcher's left hand! Even the FF/OT day held earlier this month was not immune; the wind was strong enough to put a stop to any significant flying all day. In spite of the weather, there was a good roll-up, and it was nice to see our stalwarts from the south visit us yet again. There was much hangar flying!

I haven't much to report this month; I seem to have been spending a lot of time working (on 'work') in the evenings rather than building. Projects that I have been working on for some time seem to have stalled (bad pun). The only significant milestone reached has been to finish the "Apogee Sport" DLG. However any thoughts of test flying will have to wait for calmer weather.

There has been some discussion of late regarding NiMH batteries, especially the characteristic called "self discharge", by which is meant the loss of charge within the battery even when not connected to anything. The reason for this lies with the chemistry and the construction of the NiMH cell. It is my opinion (and I admit this is a generalisation) that as rated discharge currents have increased, allowing us to run more powerful motors, so self discharge has increased. In other words, the battery tends to lose its charge quicker in between flying sessions. This demands a more disciplined approach to battery Management. Also, it does make it harder to spot a dodgy battery when even good ones run themselves down.

One interesting development has been the "Eneloop" battery by Sanyo. This is a recent development designed to overcome the problem of high self discharge. And it has been very successful. Even after many months in storage, a pack left in a state of full charge is still nearly fully charged. I have now replaced all my flight packs with Eneloops. However there are some restrictions. The present series of Eneloop cells (including the 800mAh AAA and 2000mAh AA cells) are not meant for high discharge operation. In fact, the optimum current for a 2000mAh cell is about 1C or 2 amps, otherwise the cell voltage will quickly drop below 1.2 volts. For a receiver pack with analogue ("normal") servos connected this is not a problem. However, in an application using digital servos, even if they are of small size, the current drawn when all are being operated can reach many amps. So I would not use Eneloops in a model with a number of digital servos.

Well, that's it from me for this month. I've read the cat's entrails and now I'm off to make another offering to the weather gods....

.....***Gerry.***

INSIDE THIS ISSUE

From the Secretary's Desk

Hi all,
Well we have been having some rain lately and this is the first time for many years that we have had our pit area with water lying on it, particularly just at the pit side of the entrance bridge. I think that the last time we saw that was about 2003; anyhow it will grow the grass when the temperature starts to climb.

Not a lot to report on this month from me from our last committee meeting, mainly the major topic was working out the dates of the two main contests for the year, as most of the others are low key fun types of event.
These are the Pattern and Electric Glider contests: we have decided on two pattern schedules, Novice and Sportsman,- more details on these will follow in due course.

As far as Electric Glider is concerned we will be using the new LEG or limited Electric Glider rules which will enable Pilots to use different combinations of batteries.

George has developed a system on his laptop computer for scoring competitions, designed to be used for all the contests, which will make this job a lot easier and quicker.

There seems to be a fair bit of interest in the setting up of the little Tomboy free flight aircraft, with the added assistance of two-channel radio control. This will be a big help in retrieving the models rather than having them pure free flight. Years ago when we were surrounded by grazing paddocks, chasing wayward models was not an issue, but now the situation has changed, with water logged cropping paddocks all around the flying strip are, and certainly at the moment are quite water logged.

The membership for this year has generally all renewed except for two unknown and two who have indicated that they do not wish to renew, it is no doubt that before year's end they will be picked up by new members.
Our birthdays for this month are: Gerry DeGroot, Robyn McEntyre, Jamie Sheehan, and Tim Sydes. We do wish them all a happy birthday and a great New Year ahead with many happy landings.

Speaking of happy landings that just about wraps it up for me for now: - but I leave this with you to ponder on: - *so what's the difference between a pigeon and a stock trader?*
The pigeon can still make a deposit on a BMW.
Well that's it, so keep on flying and as usual,
Happy Landings!

Geoff.

Contest Director's Report

Hi all, well what can I say, once again Mother Nature is dampening our pleasures. (Pun intended). We had one of our best turn ups for any event for some time, but alas it was not to be, with the wind rather fresh & not at all conducive to free flight as was the case with the old timer event. Not only was the wind rather strong, it was also quite turbulent: it's not often that you see Terry pack up after just one short flight because it's too rough!
Now I know a lot of work had been going on in the weeks leading up to this event, because all aircraft that had been damaged in the previous event had been repaired, and I had been enthused and finished off my Lanzo Bomber. All to no avail:…it still hasn't been flown despite three trips out to the field.
Reading the register I see that at least a few of our lucky retired members are able

to take advantage of mid week fine weather to get some good air time happening. Perhaps we workers could lobby the government into allowing workers to only work on wet or windy days and have fine sunny days off. In Our dreams!!
At a recent committee meeting, to which I was invited to attend, we discussed some of the events coming up. One was the aerobatic pattern event in November. We have settled on a schedule of manoeuvres that would be within the realms of the average pilot, with a well performing trainer type aircraft. It also allows for the pilot to drop 1 or 2 manoeuvres if they fail. For the more advanced pilots we have another set that incorporates turnaround manoeuvres as well, all this is rather basic stuff , so don't be put off,- we would like to see as many as possible take part. Taking into account that this type of flying greatly improves your skill in general, I'm sure that if anybody would like some help to learn these maneuvers , Terry , Merv , Greg , Kevin , Andrew & myself would be only too glad to help. "SO GIVE IT A GO IT CAN ONLY HELP IMPROVE YOU FLYING"

Chris...

From the Editor's Desk

Model plane flying away from clubs

You may remember the fright at Perth Airport a few months ago when a Park Flyer flew his model plane towards a Virgin Airlines passenger aircraft, The clubs have received a copy of a letter from CASA to all retailers which I reproduce below, together with a pamphlet about model aircraft flying, released by them. This is a text summary of the pamphlet.

6 July 2009

MODEL AIRCRAFT/ROCKET SAFETY INFORMATION FOR CONSUMERS

TO WHOM IT MAY CONCERN

As a retailer or wholesaler of model aircraft/rockets, we would like to inform you of a recent incident where a model aircraft was deliberately flown at a 160-seat B737 aircraft as it came into land at Perth airport. Fortunately, the aircraft landed safely. However, this incident highlighted the need to remind the purchasers of model aircraft/rockets of the associated safety regulations.

CASA, as the aviation regulator, has policies and regulations in place to maximise the safety of our travelling public. By various means, including communicating with model aircraft/rocket clubs and associations, we are currently reminding enthusiasts of their obligations and responsibilities. As not all purchasers of model craft are association members, we hope to enlist your help in getting this message out to those purchasing model craft or kits.

We would request that the enclosed brochure be made available to purchasers of model aircraft or rockets. It educates on the rules, and also lists where help and support is available to contribute to safe model flying practices.

If you require further information or more brochures, please contact safetypromotion@casa.gov.au with the quantity you feel appropriate to your needs.

As a socially responsible organisation, we hope you will join us in this project and we would appreciate your commitment to distribute this information with purchases.

Yours sincerely

John McCormick
Director of Aviation Safety

Text Version of CASA pamphlet

Did you know?
Buying or building your radio controlled model aircraft and enjoying time out flying can be a relaxing and fun way to spend the day....but did you know that there are Australian Government rules that determine where and how you fly?

The basic rules

1) Keep your model aircraft away from populated areas and the immediate vicinity of others (i.e. > 30 metres).
2) Do not operate within 3 nautical miles (nm) or 4.5 Km of an aerodrome without approval.
3) Do not operate in controlled airspace above 400ft without approval
4) Do not operate in military

prohibited or restricted areas without approval.
5)Consider the benefits of approved flying areas.
6) Do not fly in poor visibility, clouds or at night.

6) For more specific details visit casa.gov.au or your local club or association, then consider speaking with an experienced flier before you fly.
7) Consider our environment and the people around you.

Further information:
Model Aeronautical Assoc. of Australia.
www.maaa.asn.au
Civil Aviation Safety Authority
–
Civil Aviation Safety Regulations 1998 Part 101 sub parts A, B, C and G
–
CASA Advisory Circular AC101-3(0)
Phone 131 757
www.casa.gov.au

Your local model aircraft club

For free advice, instruction, information on flying sites and public liability insurance contact the Secretary of the Model Aeronautical Association at:

secretary@maaa.asn.au

The original pamphlet is well designed. Hopefully it will go a long way to preventing accidents in the future,

Digital servos and speed controllers
I have included another highly informative article on digital servos below. Once more Jacques found this on the internet. It is from a manufacturer of ESCs (Electronic Speed Controllers) who is obviously concerned with their misuse and the lack of understanding of problems that occur, Much of the knowledge has been published in this newsletter before, but not I think summarized as well as this. There is also a very nice account of how servos work.
As we keep saying, safety and reduction of risk of losing expensive aircraft must always be a concern: Lucien Miller has done well to explain a serious problem with electric flight control in higher performance craft. Much of this also may be applied to other forms of flight which rely on multiple digital servos in one aircraft particularly when mixing will result in several servos responding to one input. i.e. heavy duty switching and adequate flight batteries.

Telemaster flies again soon.
As a Telemaster fan and owner, I was interested to receive an article from Fred Willis on his latest building project, of a Telemaster Senior, which is published in this issue. It will be very good to see it fly.

Richard.

Digital Servos: more information.

By Lucien Miller:
of Innov8tive Designs: posting address:

www.rcgroups.com/forums/showpost.php?p=124477848postcount=4963

Edited by Richard Cooper
This is an extremely important post, and I urge everyone to read it. It is quite long, but it contains VITAL information concerning motors, speed controllers and servos.

We have been having an above average rate of failures of Electronic Sped Controllers (ESCs) lately, and as a result, I have taken a great deal of time investigating this issue to discover the root cause. From what I have been reading in other posts in other threads and on other sites, this is not an isolated incident, and is affecting all brands of speed controllers.

The conclusion that I have come up with is that the true cause of the ESC failures is the servos that are being used in models these days. With the advent of the newer Digital Servos, high availability and reasonable prices, just about everyone has switched to them.
To proceed with this discussion, a bit of education is necessary so here it is. I will attempt to keep it as simple as I can, but there are some electronics terms that have to be used, so try to follow along as best you can.

For those of you that do not know how a servo actually works, here is a crash course. A servo consists of a motor, a set of gears that reduce the speed and increase the torque of the motor output, a feedback potentiometer, a feedback amplifier circuit and a drive circuit.

A servo receives a pulse from the radio receiver that tells the servo what position it should move to. In a typical radio system, the pulse has a width that varies from 1.0 millisecond at one extreme to 2.0 milliseconds at the other extreme, with 1.5 milliseconds considered to be the centre point.

The feedback potentiometer in the servo provides a variable resistance that is converted to a varying pulse signal inside the feedback amplifier. The feedback amplifier then compares the width of this signal to the one that is coming in from the radio receiver. If the widths of the two pulses are the same, then the servo sits still at that position.

If you move the control stick a bit, the width of the pulse coming from the radio receiver will change and the feedback amplifier will now sense a difference between the two signals. The feedback amplifier will then send out a signal to the servo's drive circuit, and this causes the motor to spin in the proper direction to match the new signal input. As the motor turns, it spins the gears in the servo. These gears eventually attach to the output arm of the servo and to the feedback potentiometer. As the output arm turns the potentiometer, the resistance value changes until a point is reached where it matches the position of the control stick and the servo stops at the new position.

This process repeats itself over and over again, hundreds of times per minute as we fly our models around, constantly matching the servo out position to match the control inputs that we give at the transmitter. Now that we know how the system works, we can take a look at the difference between the older analogue servos versus the newer digital servos.

In analogue servos, the transistors used in the driver circuit were normally traditional NPN and PNP bi-polar transistors. When these servos are set up in an amplifier circuit, there is a small range of operation on either side of neutral where the servos operate in a linear mode. What this means is that if you move your stick a tiny bit, the servo would react slowly at a lower power level. This would pull less current that normal, and the servo would move a little slower than normal. However, if you made a large stick movement, the servo would quickly ramp up to full power and full speed and move to the new position.

Since we are talking about current, I want to clarify a few things here about the different types of servo current. There are basically 3 different current levels you need to worry about. First is the Idle Current. This is how much current the servo pulls when it is sitting still doing no work. In most cases, this value is very small, somewhere in the 5mA to 20mA range, which is very negligible.

The second current is the Working Current. This is how much current the servo pulls when it is in the process of moving from one position to another, with normal flight loads applied to the output arm. Depending on the size of the servo, and the applied load, this value can range from around 200mA up to 1 amp or more.

The last current is the Stall Current. This is how much current the servo draws if you hold the output arm from moving and apply a command to make the servo move. It is called Stall Current because the motor is stalled and cannot move. In this condition, the motor acts almost like a dead short, and pulls a lot of current. Again, depending on the size of the servo, and primarily the size and quality of the motor in the servo, this value can be anywhere from 500mA to 2 amps or more.

Another current value that has become very important is the Start Current of the servos. When a servo is sitting still at a fixed position, it only pulls the Idle Current. However, whenever a control signal is given, the motor has to go from a dead stop and accelerate to full speed. At the instant that the control signal is given, the motor is not spinning, so for a very brief period of time, the motor draws the stall current, and then as the motor starts turning, this current level drops down to the Working Current value of the motor.

With the earlier analogue type servos, this start-up was softened somewhat because of the slight linear region of the transistors, so it never really got up to the short circuit current. However, with the newer Digital Servos, this is not the case.

The new digital servos use FET type

transistors in the drive circuit, and these have almost no linear range around neutral. They also sent command signals to the motor much more quickly that the analogue servos do, so the respond much more quickly. If you move the stick the smallest amount, the servo instantly reacts with full power to provide the desired control input.

The bad news is that this speed and responsiveness does not come without a very high cost. Unfortunately, very few pilots are aware of this, and it is this fact that has been the root cause of speed controller failures all over the world. (I am sure you were all wondering when I was going to get back to the speed controllers.)

Because of the insanely fast response of the new Digital Servos, and the fact that they instantly go to full power every time you move the stick, they pull HUGE amounts of current every time they move. The new digital servos basically pull the full stall current of the servo every single time you make any control movement on the sticks.

Any time you are using two or more servos you have to remember that As I have said earlier, these new digital often pull 2 amps of current or more in a stall, so when you multiply that by the number of servos involved in a complex manoeuvre , with any added mixing, you are pulling current spikes that are 6 amps or more every time the control stick is moved. When you start adding all of this up, you can quickly see how the Battery Eliminator Circuit (BEC) is getting constantly hammered with HUGE current surges.

Most of the on-board BEC circuits are rated for around 3 amps with a 4 amp surge. This is usually sufficient, even with the smaller digital servos. However, when you start getting into larger machines, the current levels from the servos can quickly out-strip the ability of the BEC circuit to provide the required current without over-heating.

When the BEC circuit gets overloaded, they either go into an over-current or over temperature protection mode and shut down for a while, or just burn out all together. If you lose the BEC voltage, the microprocessor in the ESC can no longer function, and whatever phase was turned on in the ESC when the power goes out usually stays stuck on. This pulls full short circuit from the battery, through the ESC and into the motor. This current can be several hundred amps for a brief period of time, depending on the Rm value of the motor. Normally, the windings of the motor take several seconds to heat up and start to burn in this condition, but the FET transistors in the speed controller cannot handle that much current, so within about 2 seconds they start blowing out.

If you are lucky, the ESC burns open quickly and removes the load from the battery and motor and they survive the incident. In some cases though, the ESC welds shut from the current and takes out the motor and sometimes the battery as well.

The really sad thing is that the ESC itself is not at fault in this kind of failure. The complete fault for the incident lies in the current draw of the servos that exceeds the design specifications of the BEC. The worst part about it is that virtually none of the servo manufacturers out there give the full current specs for their servos, and some of them give absolutely no current specs at all. This places the blame for a huge number of speed controller failures squarely in the laps of the servo manufacturers.

The main problem with the whole situation is that the servos cause the problem, but they hardly ever see any damage as a result of it. I went to several websites to pull the exact text from the specifications on several commonly used digital servos to see what they said. Here is what I found.
From the Futaba Website.
For the 9650 servo
SPECS: Dimensions: 1.4 x 0.6 x 1.1" (36 x 15 x 29mm)
Weight: .92oz (26g)
SPEED: 0.14 sec/60° @ 4.8V
0.11 sec/60° @ 6.0V
TORQUE: 50 oz-in (3.6 kg/cm) @ 4.8V
63 oz-in (4.5 kg/cm) @ 6.0V
How much current does it pull? 
For the 9250 servo
SPECS: Speed: .11 sec/60° @ 4.8V
Torque: 76 oz-in (5.5 kg-cm) @ 4.8V
Weight: 1.9oz (54g)
Power Supply: 4.8V (Futaba does not recommend using 6V)

Length: 1.6 x 0.8 x 1.5" (41 x 20 x 38mm)
Current specs?
Ok, let us take a look over at the JR heli servos and see what they say.
From the www.jrradios.com website
DS9411 Digital Mid MG Servo
Specs
Size Category: Minis and Micros
Type: Digital
Torque: 82 oz/in @ 4.8V, 95 oz/in @ 6V
Speed: .15 sec/60° @ 4.8V, .12 sec/60° @ 6V
Dimensions (WxLxH): 0.71 x 1.41 x 1.03 in
Weight: 1.36 oz
Bushing Or Bearing: Bearing
Bearing: Dual
Motor Type: coreless
Gear Type: Metal
Gear Material: Metal
Um….How much current does this one draw? Idle current, Stall current, Working Current? Inquiring minds want to know.
Let's try another
DS8231 Digital Ultra Precision Servo
Specs
Size Category: Standard
Type: Digital
Torque: 88 oz/in @ 4.8V, 113 oz/in @ 6V
Speed: .22 sec/60 @ 4.8V, .19 sec/60° @ 6V
Dimensions (WxLxH): 0.75" x 1.54" x 1.36"
Weight: 1.73 oz
Bushing Or Bearing: Bearing
Bearing: Dual
Motor Type: Coreless
Gear Type: Nylon
Application: precision pattern and jet airplanes, collective and rudder on helicopters
I looked further and found more information on this one.
Key Features
Outstanding holding torque that's 2-5 times greater than a conventional servo
Current draw is only 8% greater than a conventional servo
Ultra precise 5,900 step resolution for unmatched precision.
New wide-spaced output shaft dual ball bearings for minimal output shaft play
250MHz pulse rate for increased precision
OK, it pulls 8% more than a standard servo, how much is that?
Well it seems we have struck out with Futaba and JR, let's try Hitec and see what they say.
Info from the www.hitecrcd.com site
HS-6975HB
Detailed Specifications
Motor Type: Coreless
Bearing Type: Dual Ball Bearing
Speed: 0.13 / 0.10 sec @ 60 deg.
English Metric
Torque: 119.42 / 144.42 oz.in (4.8v/6v) 8.6 / 10.4 kg.cm
Size: 1.57" x 0.78" x 1.45" 40.00 x 20.00 x 37.00mm
Weight: 1.83oz 52.00g
Again, no current specs on the site. I did notice that they had a downloadable PDF available with complete servo specs, so I downloaded that and finally got a current specification.
On this sheet I got the following information:
Idle Current - 3mA when stopped
Running Current - 200mA at 4.8 volts, 240mA at 6.0 volts (No load applied)
Stall Current - 2400mA at 4.8 volts, 3000ma at 6.0 volts

Finally! A real current spec for a servo. My hats off to Hitec! My only recommendation to them would be to add this data to the basic specs found on the front page of the site. This is EXTREMELY important information, and needs to be put in the standard servo specs.

I would strongly urge Futaba and JR, as well as every other servo manufacturer out there, to follow Hitec's lead here and publish your current specs for the servos you manufacture. I would also urge every single modeler out there to contact the servo manufacturers and obtain a copy of the current specifications for the servos. If they are not available, we all need to pressure the servo manufacturers to test their products and provide this critical information to us.

As you can see, this completely confirms what I was saying earlier about the current draw of these newer digital servos. The Scorpion Switching BEC circuits in the 6-cell ESCs are rated for 3 amps with a 4 amp surge, and put out 5.7 volts. Based on the above numbers for the Hitec 6975HB servo, I would estimate that they would pull about 2800mA of stall current at 5.7 volts. If you have 3 of these servos acting together, the total stall current is 8.4 amps!! Are you starting to get scared now? I sure hope so, because this is what you are subjecting your BEC circuit to every time you move the control stick for that mix.

Now granted, the 8.4 amp current surge is short lived, but when you consider the flying

style of many of today's pilots and the manoeuvres that they perform, the rapid pulsing of these currents really puts a beating on the BEC circuit. It probably will not fail right away, but I can guarantee that some time in the future, maybe 10 flights, 15 flights or 20 flights, suddenly, out of nowhere, the BEC will fail and your 'plane will be coming down.

When you get there you find that the ESC is smoked and get on the phone, all upset, to the ESC manufacturer to ask for a warranty replacement. Well, I can safely say that the ESC is not at fault here, it is the excessively high current draw of the servos that are the root cause of the problem.

It is for this reason that in any high performance aircraft, I HIGHLY recommend the use of a separate power source for the receiver and servos in your machine, and disable the on-board BEC circuit. This power source can be a separate 4 or 5 cell Ni-Cad or Ni-MH battery pack, or a separate Higher current switching BEC circuit rated for 5-8 amps running from the motor battery, or a dedicated separate 2-cell Li-Po battery with an appropriate linear or switching BEC. Failure to do this WILL lead to the eventual failure of your ESC.

I would urge everyone who has taken the time to read this to copy this text and paste it on every other site or forum that you go to. This is a serious educational issue that needs to be spread around to every model aircraft pilot flying high performance machines in the world. This is one of the most important things that I have ever written, and I hope that everyone takes it to heart and makes the necessary modifications to their planes in order to provide the power needed to properly feed these very current hungry digital servos.

This is not "Someone crying Wolf" or running around saying that "The Sky is Falling", this is probably one of the most serious issues to come up in this hobby in many years, and needs to be addressed.

So getting back to Scorpion products, this is a huge issue for us. We have been getting a large number of ESCs back lately with people expecting us to cover them under warranty. We have always had one of the most generous return policies in the industry, and stand behind the product if there are any manufacturing defects.

In the future, we will be closely looking at the ESCs that do come back, and if the BEC circuits are blown out in them due to pulling too much current, we will not be covering this under warranty. The 50% crash warranty will be in effect for this type of failure, because it is the end users responsibility to ensure that the parameters of the ESC are not exceeded. This includes both the ESC current AND the BEC current.

The purpose of this post is to shed some light on a very serious issue that is currently causing a huge amount problems for modelers out there. I hope that everyone out there takes this information to heart, and takes the necessary actions to ensure the life of their ESC and aircraft.

Senior Telemaster

By Fred Willis

The Senior Telemaster was designed by Alexander Engel. I was attracted to the model when I first heard about it helping to lay electricity lines across a wide gorge. Apparently the Telemaster towed a light cord (or string) across which was then attached to a heavier rope and this, in turn, was attached to an even heavier rope and so on until the last rope pulled the cables across. (Makes sense...I hope so!!)

Kits were made in Germany but none (that I know of) reached our shores. RCM magazine featured a review in the April, 1973 issue so you can imagine my joy when, in October, 1975, the plane was featured in RCM together with building instructions and an opportunity to purchase the plan from America.

My plan arrived within three weeks and I soon discovered that it would take more than a balsa tree to build this monster. Ribs would use 8 sheets of 1/8x4x36..Ailerons 2 sheets of 3/16x4x48..Plus.more than 6 sheets of 1/4x4x48 plus sheets of 1/2 and 1 inch and so on. The plans were twice the size of our kitchen table and took some juggling to copy ribs, fuse etc. Nevertheless I managed to build it within a month. Wing span is 95 inches with a chord of 14 inches. Wing loading was just over 9 Oz/Sq.

Ft. Covering was the next issue. I think I used 6 metres of orange Coverall then doped and finished the model with a coat of clear. It looked great with the OS 60 two stroke up front. The motor looked like a pimple on a pumpkin.

First flight was at the club field at Moriarty (near Devonport). I had many enjoyable flights without incidents until I attempted a very sharp and snappy loop.....wing folded up!!! A gentle spiral into the ground revealed a repairable model so back to the repair room. I used better ply wing braces this time and then inlayed a piano wire brace into the leading edge. No more problems! My trusty OS 60 was an ideal power unit. Later I tried an OS60 Four Stroke but not for long as it just sacrificed performance.

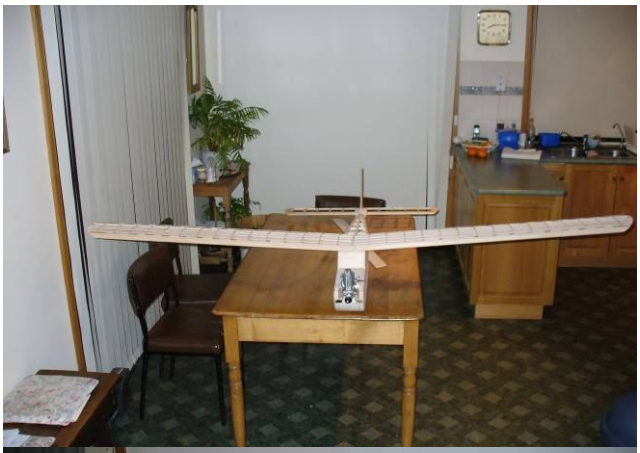
Later on I built another for one friend and sold my original to another friend, the late Rocky Chambers, who literally flew the pants off it until one day (several years later) when he released the model without switching on the receiver. The wing survived in tact but that was all.

That now brings me to the present where I have again been building another Senior Telemaster. This one will be powered by a Magnum 91 FS. I should have finished it by now but I have been procrastinating about the covering. Finally I have decided to Use Solartex instead of Coverall. Then the model will be painted in a simple colour scheme.

Two photos show the monster sitting on the kitchen table. I was going to include a photo of the great pile of shavings just from shaping the ailerons but thought better of it. I hope that I may be able to have her airborne before I go to Melbourne for a couple of weeks mid September but the windy weather has been a *downer*.

Finally, I would like to thank my very patient (and understanding) wife for allowing me to monopolize the kitchen table these past weeks. My excuse.....too cold in the shed!!!)

Telemaster Senior in progress…..



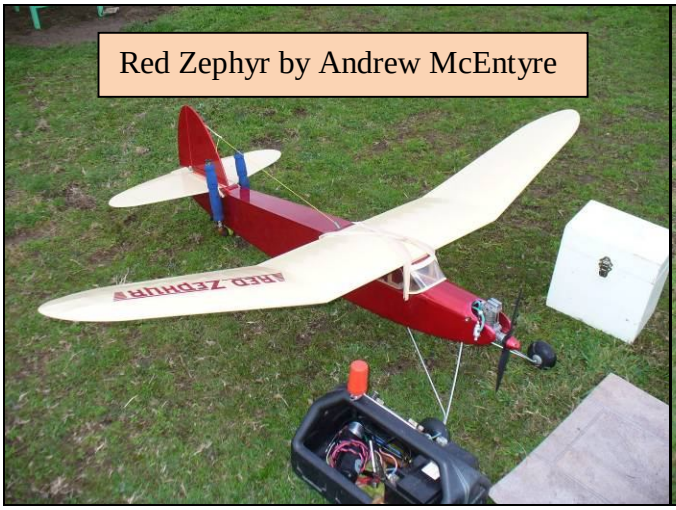
Interested in joining the Tomboy brigade but too busy to build one?

Greg Robertson will build a Tomboy and cover it for $150. You specify whether IC or electric. You only have to fit out your model with motor, radio gear etc.

Interested?
Give Greg a call on 6343 1753

Candid Camera

Photos by Fred Willis:
July 2009. Old Timers:



CONTACTS

President	Gerry de Groot	6369 5284 / 0429 196 560	degroots@activ8.net.au
V.President	Kevin Hay	6326 2990 / 0417 011 839	zzkevin@iprimus.com.au
Secretary	Geoff Hays	6326 7967 / 0408 559 806	ghays7@bigpond.com
Treasurer/Webmaster	George Carnie	6398 2141 / 0418 134 672	george@thecarnies.ws
Committee	Greg A Robertson	63431753	
	Merv Cameron	6344 5614	mervcameron@internode.on.net
	Terry Pearson	0438 053 255	tnt13@bigpond.net.au
Editor	Richard Cooper	63695142	richardlc@activ8.net.au
Contest Director	Chris Klimeck	0458 448 674	cklimeck@bigpond.net.au
Web Site	www.lmacrc.com		

EVENTS CALENDAR

Date	Events
July 4TH	Club day
18th	**F / F and Old Timer**
August 1st	Club Day
15th	**F / F and Old Timer**
Sept 5th	Club Day incorporating Fun Fly
19th	Electric Glider
Oct 3rd	**Club Day**
17th	**Thermal Glider**
Nov 7th	Club Day
21st	**Club Pattern**
Dec 5th	Club Day
19th	**All Models Family Fun Fly and B.B.Q.**
2010	
Jan 2nd	Club Day
16th	**Club Pattern Contest - Practice**
Feb 6th	Club Day
20th	**(State) or Club Pattern Champs**
Mar 6th	Club Day- AM Gen flying –- PM Electric Glider
20th	**State Electric Glider Champs**
Apr 3rd	Club Day
17th	**Fun Fly Novelty events**
May 1st	Club Day
15th	**Proposed scale fly in**
June 5th	Club Day
19th	**To be advised--Possibly special Old Timer event**

Note: Starting times: - F/Flight--------- 9 AM
Old Timer------11 AM
All Other events except where noted----- 10 AM

This Calendar is subject to change that will be notified as required

Club AGM will be held Thursday June 10th 2010 venue TBA