PROP TORQUE

Gerry de Groot's well presented Piper Cub. A Great Planes kit. Didn't get a start at the recent scale contest but I'm sure we'll see it in the air soon as it flies very nicely.

Official Newsletter of the...

LAUNCESTON MODEL AERO CLUB Inc.

VOLUME 12

OCTOBER

2002

Super Winter Specials

NEW FROM ZN LINE - HYDEAWAY & ENIGMA

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Call Brian Simpson on: (08) 9328 8986 Fax: (08) 9328 8932 Email: perthrc@perthrc.com.au
Web: www.perthrc.com.au Perth RC Models and Hobbies 454 Newcastle Street, West Perth, WA 6005

CAPTAIN'S REPORT

Peter Kidson (03) 6394 4380
p.kidson@microtech.com.au

Hello to you all once again.

As you will all know by now the MAAA have imposed the member to member levy. If at the 31st of October you have **NOT** paid your ten dollar levy, you will **NOT** have any insurance and will not be able to fly at our field. As we informed you in the last newsletter LMAC does not have the funds to foot the bill again so, it's in your best interest to see that a committee member gets your ten dollar's.

The MAAA have advised us that they will be issuing pink stickers to those who have paid. This should be placed on the back of your FAI license, particularly if you intend to fly at other clubs. Your license may be asked for and remember, no pink sticker, no flying.

The weather has not been very kind to us and the last competition was cancelled. Geoff will have more to say on that.

George & Kerry are still doing a great stand-in job with the canteen, but please remember the club house belongs to all of us and therefore it is essential that we all take a part in looking after it.

Geoff still needs some help with Railex so if you can lend a hand let him know, even if it's to put a model in. It will be of benefit to the club.

In last months newsletter there seemed to be quite a few things for sale and at this last committee meeting we discussed the idea of holding a bring and buy sale probably at the club house, what are your thoughts?.

Once again if you have any articles for the newsletter it would be appreciated and also help out those that are constantly giving articles to George.

(Continued on page 4)

(Continued from page 3)

Most of you may know by now that OZ E-Flight has once again changed hands, I'm not sure who to but I suspect that Gerry will let us know.

That's about it from me for this month,,,

See you at the field...Pete...

SECRETARY'S REPORT
Gerry de Groot
Ph: 0417 536 200 (BH) or 6369 5284 AH
gdegroot@vision.net.au

Hello All.

The October committee meeting was not held on 14th October as scheduled and was held on 21st of October instead. Here are some points from the meeting:

- No more insurance rises since the last meeting! (I'm being facetious.) By the close of the meeting 19 members have paid their $10 levy - this means we are waiting payments on from another 14 members. *Remember the closing date is 31st October*.
- Some time early in November members who have paid the levy will receive a sticker that will go on their FAI license card. You must have a sticker on your card to show that you are fully insured and therefore eligible to fly.
- It appears some social members are under the impression they

(Continued on page 5)

(Continued from page 4)

also have to pay the $10. This is not correct - *social members do not pay the levy*.

- Geoff Hays reports that preparations for Railex are well under way. Any member may assist if they wish. Let a member of the Committee know if you can help.
- LMAC would like to welcome new member **Cliff Walters** from Westbury. When you see Cliff at the field, introduce yourself to him and make him feel welcome. (This really goes for anyone at the field that you do not recognise - it's not being nosey, but does make it clear that you are interested in others, as well as what goes on at the field.)
- Anyone who is interested in becoming an instructor should let a committee member know. If there is enough interest, a theory course may be run in November. There are no special pre-requisites for participating (eg., you do not need to hold a Gold Wing to do the theory course.)
- The annual LMAC **Christmas Party** will be held on 7th December at George & Kerry's after the Club Day. Put it in your diary!

That's all for now. Until next time, happy flying.

Gerry de Groot

From the Editors

George & Kerry Carnie
"Glenhaven" 50-62 Fairtlough St Perth 7300
e-mail: gcarnie@tassie.net.au
6398 2141 or 0418 134 672

Hello to all.

As editors, it seems as though only yesterday we finished the last magazine and another one comes around and the research is on for more articles to fill the magazine. This task is eased somewhat by our regular contributors writing voluminous words. If however they run out of things to say or their own commitments sees a hastily put together "short report" we are again looking for more to fill the pages and keep you, the members, interested. To this end our thanks go to those that provide regular articles.

Having said that, there are many of you that often have suggestions at the field about building techniques, flying skills etc. so why not submit them in an article or just a brief diagram to explain a skill or technique that you can share with your fellow members. It can be very simple, like the diagram Andrew McEntyre gave me at the last meeting and shown elsewhere in the magazine, that we as editors can complete to place it in the magazine. A photograph also makes interesting reading so if you have one; send it in. Thanks to Max Wiggins for a photograph of him flying a trike over Bright in the Victorian Alps.

The Committee has decided to hold the Christmas Party again this year. It will be held at our home and details are shown on page 17. We'll think of some more fun games. For those that participated in the Chuck Glider contest, why not build your own this year and bring it along and see if your winning design can take the prizes. We'll have prizes for adults and children. Last year Richard and Stevie Cooper just about scooped the pool, and then generously

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(Continued from page 6)
shared their spoils with the other party goers.

Those that attended last year had a great time and said they'd be back. For those that didn't attend, come along and enjoy yourselves and share in the Christmas spirit.

Don't forget, the food, entertainment, laughter and above all, friendship is free. Just bring along whatever refreshments you require for you and your family. A super Christmas hamper valued at over $100 will be offered and tickets will be $1.00 each or 3 for $2.00. Buying is already brisk so give Kerry or I a call if you want a book of tickets or just a few. It is a great prize so don't forget to include family and friends when you are selling tickets.

A thank you also to our advertisers including Perth R/C Models who continue to support us despite being at the other end of the continent. Don't let that deter you from ordering the specialised equipment and kits they offer. Dave Jacobs was surprised when some electric equipment he ordered was very competitively priced and arrived here the next business day.

Until next month..
Put a spark in your life—Fly Electric
George & Kerry

Don't Forget—Badges are available for sale. Price $10.00 (incl. 2 stickers).
Contact Kerry, George or any Committee member if you require some.
Show your support and buy one.

Contest Directors Report

Geoff Hays
6344 1920 / 0408 559 806

The Novelty Fly In on September 21st was one of those days where anything could happen and it did. By complete contrast to the big 3 contests in August, the day started very ordinary. At 7 am the weather was as bleak a day as you could imagine with wind and rain most of the night.

But at 8 am the sky was blue and the wind fresh but not strong. I decided that the journey to the field was probably the right choice to make.

By the time I arrived, the McEntyre's were just pulling up at the clubhouse and not long after me, John Lovell arrived. That was it for quite a while but things were to change when Pete, Kevin and Dave Jacobs came. So we made a start with proceedings with 5 contestants and two flag marshals; John Madden and Clarrie Murray.

We flew 4 events on the day which were a Power Differential to see who could get the biggest differential between a fast flight timed through a distance and then a timed slow run. A Modified Pylon race, a "Guess the Time" and Landing event , followed by the popular Bomb Drop.

All went fairly well up until during Andrew's Pylon race turn when he was about half way through the course, his biplane said "I am tired of doing all these fast turns, so I will go it alone in a straight line"… and it did. It kept heading South, flat out, slowly descending and Whack! straight into one of the pines at the southern end of the field.

Peter, Andrew and Kevin went in the car to retrieve the model, parts of which were still high up in the tree. Apparently the motor and cowling were wedged up on a branch and one wing was up there too. The rest was scattered.

(Continued on page 9)

I believe Kevin retrieved the motor and Peter went up to get the wing but as he climbed he seemed to be getting further away from it, then realised he was up the wrong tree and had to start again! Meanwhile Andrew philosophically surveyed the remains of his once pretty little model.

A strange thing happened in the Bomb Drop event. John Lovell could not seem to carry his water bomb aloft. After three tries it just seemed to pop out of the container at the wrong time. So we gave him a flour bomb to try, he got this one up okay and did all the necessary jiggles and wriggles to dislodge it but we all remarked "Where is it?", nobody saw it come out of the container when suddenly, bang, right in front of us, not more than five metres from the target landed the flour bomb "SPLAT!"

Well after a shaky start to the day, all turned out okay except for Andrew's bipe and it did fly very well. Bad luck Andrew.

The scores for this event are as follows.

Contest Scores 2002-2003

Novelty Fly In Contest
21 September 2002

	Contestant	Score	Points	Division
Equal 1st	Kevin Hay	125	110.00	A
Equal 1st	John Lovell	125	110.00	B
2nd	Peter Kidson	120	106.00	A
3rd	Andrew McEntyre	74	65.20	B
4th	Dave Jacobs	56	54.80	B

By the time you receive this report, the next event, Thermal Glider, on October 19, will be run and won. Details next month. *(This event has now been rescheduled to November 3 Ed.)*

(Continued on page 10)

(Continued from page 9)

I would remind you all that Railex is to be held on the 9th and 10th of November and if you were thinking of supporting our club display, then I will need to hear from you as soon as you read this. Give me a ring on the telephone numbers at the start of this article.

Well that's it from me for now.

Happy Landings all.

Geoff CD

Contest Scores 2002-2003

POINTS TOTALS After 8 Contests

Division A			Division B		
Contestant	Contests Entered	Points	Contestant	Contests Entered	Points
P. Kidson	5	494.22	A. McEntyre	5	493.19
K. Hay	5	483.67	G. Carnie	3	271.67
G.Robertson	3	330.00	D. Jacobs	3	264.41
			J. de Groot	1	110.00
			J. Lovell	1	110.00
			P. Haworth	1	103.43
			G. de Groot	1	95.44
			K. Gray	1	88.90
			D. de Groot	1	87.10
			B. Nye	1	45.66
			R. Cooper	1	29.74

Electrasite

To BEC or not to BEC

Firstly what is BEC? BEC is an acronym for Battery Eliminator Circuit, this would suggest that some electronic circuit searches for, finds and promptly chucks the battery out of your model. Not quite so, during the dark ages some bright spark realized the advantage of replacing the standard receiver battery by a wonder of technology called a Voltage Regulator. That device was originally created to simplify the 5-Volt requirements on computer logic boards when the architecture migrated from discrete components to ECL and TTL logic.

All a regulator required was a bit of line-noise filtering (a couple of cheap capacitors) and an input supply that was at least around 2.5 Volt higher than the output. So the idea was; why not use the motor drive battery as a Voltage input source for a 5-Volt regulator then use the 5 Volt to operate the receiver and servos. However, the regulator was designed with some built-in protection circuits, not only did it supply a smooth 5 Volts but also protected the chips and itself from over-current (greater than 1 Amp) by reducing the output voltage and/or protect itself from over-heating by simply shutting down. Great on computer boards, not so great in a model plane.

The only advantage BEC has is that you replace a 50 gram plus receiver battery by a 3-5 gram regulation circuit, ideal in the early days when most people used 6 or maybe 7 cells and the BEC's only duty was to drive a couple of wimpy servos. It must be realized that all components used in speed controllers are uniquely designed for industrial purposes, since no controller manufacture could possibly afford to have custom made components for the small production runs involved. Therefore power handling components such as voltage regulators and FETs are designed for an environment where size, weight and cooling with heat sinks is not considered a

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problem. If we followed those rules and attached large heat sinks to everything, we would negate the earlier weight saving advantage, this forces us to carefully consider the loads placed on the BEC if the model is to survive.

The standard TO-220 package can only dissipate approx. 2 Watt without an attached heatsink, since the regulator has to shed any Voltage above 5 Volt it pays to limit the input Voltage, 10 cells seems to be a generally imposed upper limit. Another factor is the current through the regulator; we should limit ourselves to 2-4 servos (the higher the cell count, the less servos) and only use servos with a low current drain. The reason here being that the simultaneous operation of two or more high drain servos can easily exceed the current handling capacity of the regulator, which will dip the output Voltage from its regular 5 Volt to whatever it can safely supply and lo and behold, receivers get upset.

This fluctuating Voltage problem can be fatal if the receiver and/ or servos are using computer chips in their design. If the chips do not provide a software or hardware recovery from brownout conditions, they could temporarily lockout until a proper switch-off/switch-on is implemented (hard to do when the model is 500 feet up).

This problem is somewhat alleviated by the use of 1.5A or even 3A regulators and sometimes even by placing a couple of regulators in parallel, however this does not mean that you can use additional servos since the thermal handling capacity of the regulator stays the same, the higher Amperage capacity of the regulator(s) is only there to protect against instantaneous current surges occurring at servo-motor startup/reversing. Another problem is that the output is not pure DC but DC with superimposed regulator ripple and motor brush noise; this can seriously reduce the range and effectiveness of the receiver.

(Continued on page 13)

(Continued from page 12)

Yet another problem, yes there is more, is that since we use the motor battery as input to our regulator we cannot afford to run the battery flat. Most speed controllers now incorporate a sensing circuit which shuts the motor down whenever the battery Voltage drops below around 5.5Volt, this thus hopefully leaves enough in the battery to operate the receiver and servos and allows you time to bring the model back. But then, what if the battery was nearly flat, the motor is already stopped and the servos drain the battery flat? Well then you just buy another model, simple isn't it!

Seriously, this low-Voltage cut-off is a feature that should not be relied upon without intensive bench testing. Like I said, most controllers have a fixed trip point of around 5.5 Volt, regardless of how many cells there are, what size batteries you use and how heavy the power demand is. It can be seen that a 6-cell pack with a high drain motor will virtually trip 5 seconds after take-off and still be 80% full, but a 10-cell pack with a low drain motor will be absolutely flat even before the sensing circuit trips.

You really need to experiment with the pack/motor/servos configuration to find-out how long you can run the motor at full power, then run all the servos constantly until they fail to operate. Another way is to discharge the battery at full motor until the controller trips then use a battery discharger set at 200mA to complete the discharge process. That discharge time becomes your absolute maximum airtime after the motor has cut. The whole thing is really very imprecise and explains the multitude of bad experiences with BEC.

To recap, BEC has its place in situations where you have a limited motor run and motor-off airtime like with 7-cell competition gliders, for any other configuration do yourself a favor and use a receiver battery, if you are really desperate for that couple of ounces you can save with BEC, use a hybrid system composed of BEC and a small 270mA backup Nicad, this gives you a minimum 1 hour airtime. Personally, I have been a confirmed

(Continued on page 14)

(Continued from page 13)
advocate of BEC for the last 6-7 years; now I am backpedaling at a great rate of knots and treat all my models incorporating pure BEC with the utmost suspicion. Amazing what a couple of unexplained crashes can do to your peace of mind.

Jacques Wakae jlwakae@bigpond.com

CG Location
by Dr. Mark Drela

CG Location Contrary to popular myth, airfoils do not have "ideal" CG locations -- airplanes do. The CG location should mainly depend on the wing planform, the tail arm, and the tail size. The wing airfoil is secondary.

Another myth is that the glider's performance (L/D, sink rate, penetration, whatever) is strongly affected by CG position. It just ain't so. You might see the L/D change by only a few percent after a drastic CG change, assuming the elevator trim and/or decalage are readjusted correctly. The big effect is on handling and pitch behavior, which is far more important than a few percent in sink rate when flying in active air.

Where you want the CG to be should depend on personal preference and flying style. Some people fly with the CG well forward. Others seem to fly with the CG as far back as is tolerable.

To decide what's best for you, a good approach is to first identify the aftmost neutrally-stable CG location by dive test or whatever.

Then move the CG ahead of that point by gradual amounts, until the glider behaves as you like.

So what to watch for? As a guide, here are some behavior pros and cons at the two extremes of the CG range. The idea is to strike a nice balance. (*refer to the diagram at the end of the article)*

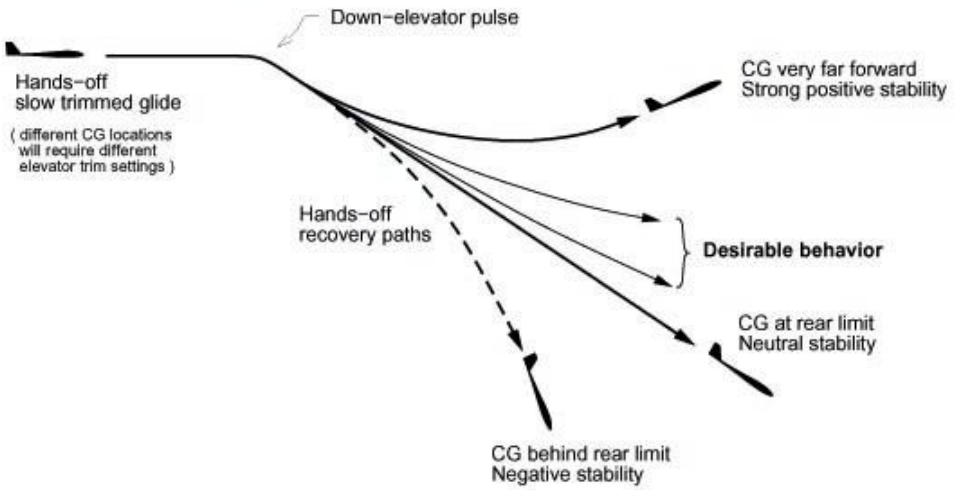
1) CG at the aft limit... glider continues in a straight line or tucks in very slightly when put into a dive from a slow glide.

> **Pro**: Glider will strongly pitch up and slow down, or "balloon", when flying directly into the slightest lift, and dive down and speed up when flying directly out of lift. Obviously this behavior is a nice weak lift indicator, especially when very far away or directly overhead where you can't easily tell if the glider is going up or down. This type of "lift ahead" or "lift behind" indication via pitch change and airspeed is a good addition to the usual "lift to the side" indication via banking.
>
> **Con:** Glider will not hold pitch trim, but will tend to stall or dive at the slightest disturbance. Lots of work is needed to constantly twiddle with the elevator. In turbulent thermals you have to fly faster than ideal to avoid occasional stalls.

2) CG well forward of aft CG limit... glider pulls out very quickly when put into a dive.

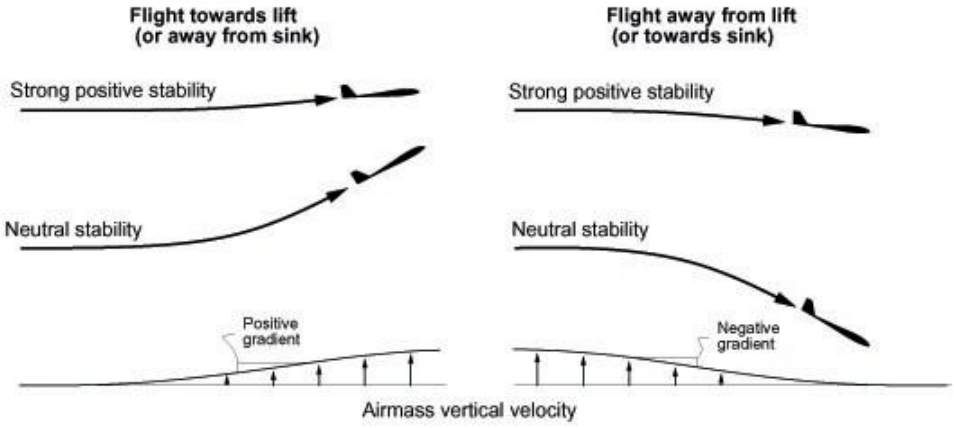
> **Pro:** Glider will solidly hold pitch trim and airspeed, even in turbulence. When in a thermal, this allows flying nice and slow at minimum sink, with little risk of stalling from an upset.
>
> **Con:** Glider has little tendency to pitch up and slow down when flying straight into lift, but just plows steadily along. It will still directly rise in lift while staying level, but again this is not as obvious as a pitch change when directly overhead or very high up. The "lift to the side" indication via banking is unaffected, and should not enter into the CG position decision.

CG–position diagnosis via Dive Test



Resulting pitch response to weak longitudinal lift gradients

Sketches show pitch response only. Vertical translation of glider not shown.

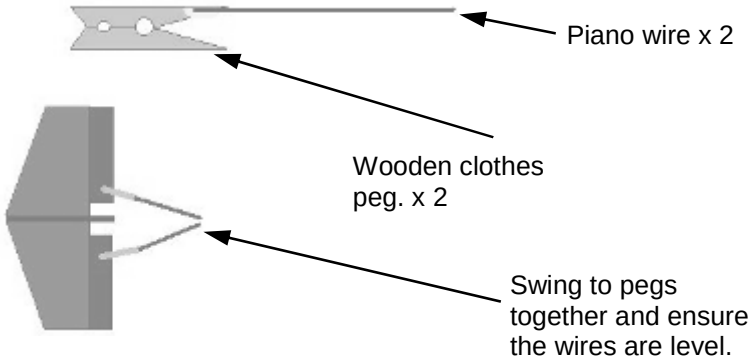


Note: Banking response to lateral lift gradients is not significantly affected by CG location

MD 24 May 02

Tips 'n Tricks

Split Elevator Differential Gauge



If you have split elevators a very simple way to test for elevator differential is to get two standard clothes pegs and epoxy in two straight pieces of piano wire (as in the diagram). Clip the clothes pegs to your elevator's at an angle so the ends of the wire are almost crossed, then move your elevator up and down. If the wires stay the same vertical distance throughout the movement, you have perfect elevator movement! but if the wires change their distance apart you need to (if you have a computer radio) mix in some opposite aileron to counteract the elevator differential.

Submitted by Andrew McEntyre
Courtesy of website "Ed Hartley's R/C Pattern Page"
www.rcpattern.nxs.net

Directions to George & Kerry's for the LMAC CHRISTMAS PARTY

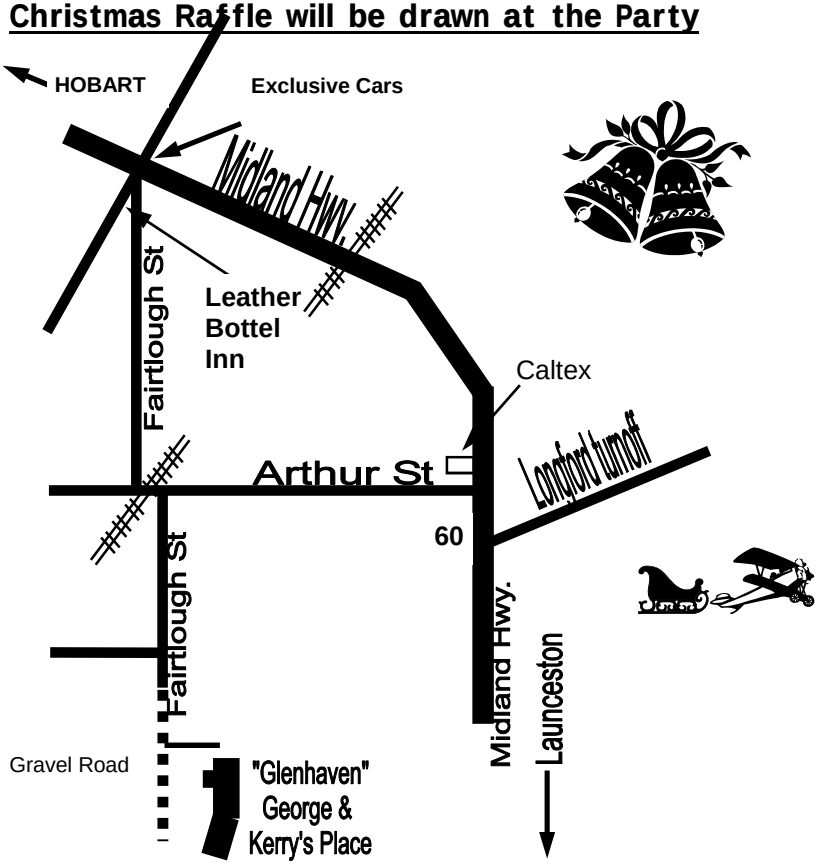
Plenty of Room to meet people & Enjoy Yourselves

When: SATURDAY, December 7 at 4 pm

Where: "Glenhaven" 50-62 Fairtlough St Perth

RSVP: 6398 2141 by Friday, November 29

Christmas Raffle will be drawn at the Party



Coming Events

DATE	EVENT	DETAILS	TIME
Nov 2	**Club Day**	**LMAC**	
Nov 3	**Thermal Glider Day**	**LMAC**	**9:30am**
Nov 9	Scale Day 2	NWAM	9:30am
Nov 11	**Committee Meeting**	**LMAC**	**6:00pm**
Nov 16	**7 Cell Electric Glider (2)**	**LMAC**	**9:30am**
Nov 24	Pattern Comp	NWAM	9:30am
Dec 7	**Club Day**	**LMAC**	
Dec 7	**Christmas Barbecue**	**Perth**	**4:00pm**

"BOLD" text denotes LMAC events

Contests to be on the day specified. If weather is not suitable, then the next day, Sunday. If that too is not suitable then the event is cancelled and we move to the next contest scheduled.

"Club Day" is the first Saturday in each month.
"Cafe Symmons" will operate each Contest Day and Club Day.
(Please come along to both these events. These are important fund raising events for your club . Ed.)

Candid Camera

"MAD MAX" is at it again. Our adventurous member Max Wiggins is seen here flying a trike over Bright with the Victorian Alps in the background. I hope those bolts are strong holding the airframe to the wing Max!

Is there anything Max won't try his hand at?