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**Best Wishes to all our members
and readers for Christmas and
the New Year.**

Huge Resort Planned for Maddens Plains.

According to the Illawarra Mercury a Development Application for a \$250 million golf resort has been lodged with Wollongong City Council.

The resort will be built on the 55 ha site currently occupied by the Illawarra Golf Club, immediately to the North of HSL's flying field.

The project, to be called "Illawarra Ridge Golf Resort", will include a clubhouse, driving range, tennis courts, swimming pool, gymnasium, health spa, 200 residential villas, a 100 room hotel, function centre, and 100 serviced apartments. The existing 18-hole golf course will be redeveloped into a nine-hole course.

The developer is Melbourne Company Links Living, which has already completed a similar development in Victoria.

As you can see from the above description this is a huge undertaking. If it goes ahead it will certainly have some impact on our Club, and may even result in the present field being no longer viable.

The HSL Committee will be monitoring the progress of this project closely.

Ian Roach.

Beginners Guide to R.C. Soaring, and Associated Costs.

When I am flying at our local slope, I often get people come over and take a strong interest in what I am doing with my model aircraft. These people are invariably fascinated by the gliders, and are amazed at how they can keep flying for hours on end, and that they can then be landed back at the pilot's feet. This short article is aimed at those who browse our website, and have entertained the thought of getting into some form of Radio Control gliding.

After the usual questions about how they can fly without a motor, comes the one about how much they cost. Most are pleasantly surprised, when informed how much it will cost them for equipment. (not so pleasant is when they hear how much it will cost for insurance and Club fees). Even so, when the associated costs are looked at in a different way, then they come around to accepting just how cheap the sport is. An example I love to give, is, if the insurance and associated cost is \$215 per year, (as in HSL fees) then yes, I agree it sounds like a hefty sum. Now, if you consider that you can potentially fly 365 days a year, at a well maintained field, the cost works out to be a paltry 60 cents a day. A bag of chips or a soft drink, costs more!!!

On the other hand, I hear many R.C.

pilots speak of R.C. flying as an "expensive" hobby. Well, if you compared it to basic stamp collecting, it may well be, but compared to most other hobbies or sports, R.C. flying, and especially soaring, is quite reasonable if not down-right cheap.

There are start up costs associated with any sport or hobby. If you play golf you need to buy a set of clubs. They are not cheap. If you ski you need skis or a snowboard. They are not cheap. If you surf you need a board. They are not cheap. Target shooting or hunting. Not cheap. If you go fishing, the gear is not cheap, etc. etc.

There are also recurring costs, the ones you pay to play your sport or hobby. You have greens fees, lift tickets, bait, line, board wax, bullets, etc. The only recurring cost you have in R.C. is fuel, if you fly power models. Gliders don't really have any recurring costs.

There are also voluntary upgrade costs with most hobbies or sports. These are the cost you pay when you want the newest stuff or just want to upgrade. R.C. is no different to other sports in this regard. These costs are entirely up to the individual, as these are not required costs, but rather a decision on the

part of the individual. These are the costs that make hobbies expensive and can get out of control if you're not careful.

With R.C. gliders, the initial costs would be the radio set, charger, and launching equipment. Model planes, servos, batteries etc, can be regarded as our recurring costs.

So if you buy a basic 2 channel radio (\$90), a high start (\$140) and a good quick charger (\$100) you have spent about \$330. Not too bad considering that a reasonable quality golf club set will cost around \$800 - \$1200, with a good set running to far more. Now lets throw in a plane or two, something like a decent ARF First or Spirit 2m (\$240) and a foamie slope soarer such as a Vector Combat wing (\$100). You now have a basic setup which will enable you to fly the flat field and/or the slope. One could conceivably fly the whole year or longer with just those two models, at a total cost of \$670. Of course, if you decide on getting a better radio, you can another \$200 to the total, for a 6 channel computer radio. Once you have a few planes R/C soaring is very inexpensive unless you start breaking things.

It's roughly \$20 - \$100+ to play a round of golf on a decent course on a weekend. Once you factor in lunch,

drinks, balls, etc, then it makes our sport very cheap indeed. Skiing is another \$100 day on average. Slope soaring costs nothing once you have the planes and radio.

The upgrade costs are where R.C. pilots can invest a small fortune. The additional costs are totally up to the individual of course, but I have seen many pilots who just have to have the newest piece of equipment as soon as it hits the market. It's nice to have the latest and greatest shiny fibreglass/carbon moulded model, but you must also have the bankroll to pay for it.

Decide how much money per year (or break it down to per day) you are willing to set aside for your hobbies. Give yourself a yearly total, and plan what you are going to spend on your sport. You should know ahead of time whether a moulded glider, turbine jet or giant scale power model is within your budget. If it is not and you still want it, then sell some of your other toys, but try to

stay within your allotted budget.

If you do fly in Australia, then make sure that you have the required insurance. Do this by joining a local R.C. Club. You will then be able to fly in contests and at a Club field or location, and have the added benefit of socialising with people of a like mind.

All model aircraft can be potentially dangerous, but learning to fly them skilfully, will minimise any danger. Gliders can be very fast, and at the time of writing, the world record for slope soaring speed, is 301 mph or a whopping 484 km/h.

If you haven't tried slope soaring, then do have a go. Likewise, if you haven't tried thermal duration from the flat field, give it a go.

Klaus Weiss.

LSF Australia Postal 2005/2006

I forgot to include this information in the previous Newsletter. Fortunately, because of the format of this years event, there is still plenty of time to compete.

All flights may be completed at any time and in any order before the end of May 2006. This is to give time to collate the results prior to Jerilderie 06. The best two of four count and they will need to be normalised. A modeller who completes LSF Level 1, will get 1000 points.

Event 1 is intended to be an Australian Open Thermal style launch and landing practice event. It could also be a vehicle to introduce a newberry to LSF.

Event 2 is based on a task from the UK gliding achievement system but with a change to add some interest. A quality landing together with a minimum flying time of 10 minutes is required to qualify the flight. If either flight is less than 10 minutes then simply start the one-hour clock again. This can be harder than it looks. Being in great lift and pulling stumps can be heart breaking.

Event 3 is an insight to LSF tasks. Flights under 10 minutes do not count. That means a 10 minute flight qualifies for the 20-minute flight, which starts at release of the model. Over 20 minutes the usual penalty applies. Land inside 20m of the launch point to consummate the flight, but no landing points.

Event 4 is for new LSF aspirants. One must start and finish LSF Level 1 between now and May 2006.

Some comment on your activities to assist the editor with material for the newsletter and web page would be interesting to other modellers. Maybe even some graphs from loggers.

I hope you all find the format a change and interesting.

Event 1) 5 Consecutive flights of 3 minutes duration with normal open thermal landing points and overtime penalty.

Event 2) Two flights of 20 minutes in one hour. Perfect flight is 1200, minimum 600.

Event 3) Two open ended long flights. Land within 200m just like an LSF task.

Event 4) Start and Finish LSF L1

Good Flying. Please send your results to:

John Quigley
PO Box 498
Bathurst 2795

Contest Reports

NSW Thermal Glider Championships. Muswellbrook - 8/9 October, 2005.

Despite this being one of the State's most prestigious thermal soaring events only 16 competitors returned a score. This may seem a little disappointing but, when you take account of both the weather forecast and the actual conditions we experienced, you could conclude that this was 16 more than it might have been.

Saturday began with overcast skies, steady rain, and a near calm. As predicted the rain stopped by mid-morning, only to be replaced by a very strong, gusty wind. As the day went on it only got stronger, and gustier. Some of those who lived locally elected not to fly. I can't say I blame them. But those of us who had come a long way, and a handful of locals, pressed on. Even amongst those who did fly there were some who sat out some rounds when the wind happened to be particularly bad at the time they were required to fly.

On Sunday the sky was blue, but the wind was even stronger.

I have to admit that I have happily flown in winds as strong, or even stronger, than this in the past, for example at Jerilderie. But at Jerilderie there are no hills for several hundred kilometres in every direction and, even when it is windy, there is only mild turbulence. At Muswellbrook there is a row of hills

immediately to the west of the field and these produced severe turbulence at heights below about 100m. If you could launch high, and find lift before your glider sank back into the turbulent layer, you had a good chance of making the ten minute target. In the turbulent layer almost anything could happen. I saw models gain 20 metres in just a second or two, only to lose 30 just as quickly a few seconds later.

Given these difficulties I thought that the most meritorious flight of the two days was one by Ross Ginder towards the end of the event. Ross lost height rapidly and found himself, not very long after launching, about two trees high at the Eastern end of the field. I, and I think all others watching, thought he would soon be on the ground with a poor score, but he did not give in so easily. Despite the wind and turbulence he thermalled away in tight circles, adding several minutes to his flight time and then, when forced to return to the field, he proved it was no fluke by doing the whole thing over again. Eventually he landed on the spot for a near perfect score.

Despite the conditions I don't recall any model being severely damaged, but slight or moderate damage was very common.

At least four models hit trees due either to their pilots misjudging a landing approach in the difficult conditions, or to failing to get back to the field after following lift downwind.



Many were damaged on landing, often by being blown over.

Guy Brand's Escape had a hole knocked in its wing while it was sitting on a tarpaulin between flights. A strong gust of wind picked up a corner of the tarpaulin and tipped a heavy toolbox onto the model.

The tail of Colin Woodward's Eraser was damaged when it fluttered during the winch launch in round 1. Probably it had never flown that fast before. He completed the event with his two metre First, winning a heat along the way, and the prize for the

Scratch building is not dead. Ross Ginder came from Queensland with his scratch built hollow moulded Europhia to win the NSW Thermal Glider Championship.

top RES model

Six rounds were flown each day, and each pilot's best ten were used to determine the overall scores. The results were:

1st	Ross Ginder	9987	Europhia
2nd	Thomas Cooke	9867	Icon
3rd	Jack Murphy	9822	Pike Superior
4th	Guy Brand	9601	Escape
5th	Fred Lodden	9162	Starlight 3000
6th	Peter Sikora	9094	Starlight 3000
7th	Ian Roach	7557	Infinity Pro
8th	Klaus Metzger	7055	Starlight 3000
9th	Colin Woodward	6892	First
11th	Matthew Partlett	5719	Pike Superior
16th	Carl Strautins	850	Icon

Jack Murphy had a perfect score at the end of the first day, but the eventual winner was not far behind and made up the difference on day two.

Ross came all the way from Queensland to compete, and is hoping to convince some more Queenslanders to come south with him next year. His Europhia is a scratch built, hollow moulded, F3B design by Gernany's Martin Weberschock. I understand his club, the Morton Region Soaring Society, has a full set of moulds for this model, and that they are available for hire to its members.

Ian Roach.

Millennium Cup - Round 6. Maddens Plains - 23 October, 2005.

Flying got under way, more or less on time, in perfect conditions. The sky was blue and a gentle breeze was blowing from the North West.

Twenty three pilots competed, seventeen of them HSL members. I don't think the high proportion of HSL members indicates a lack of wider interest in the event. The numbers competing are about the same as they were ten years ago. What has changed in that time is that the hobby has become more specialised, and modellers tend to join the club that best covers their particular interests, rather than the club nearest their home. Most people who live in and around Sydney, and are interested in competition gliding, now belong to HSL. Consequently HSL members make up a high proportion of the entrants at any soaring event within a couple of hundred kilometres of Sydney.

Soaring conditions in the first three rounds were very good and a high proportion of flights achieved the six minute target. The wind, however, was moving gradually around to the North East and, eventually, a sea breeze became well established. After a short lunch break flying resumed and, from that time on, not a

single six minute flight was achieved. In fact three minutes was not a bad time, and flights of more than four minutes were rare. I have little doubt that soaring conditions remained good just a few kilometres inland.

Another effect of the wind direction, which was near enough to ninety degrees to the launch direction, was that it increased the time taken to retrieve the parachute. Despite this we completed six rounds comfortably, though it might have been eight if the original wind direction had lasted all day.

The results were:

1st	Carl Stautins	1672	Spirit
2nd*	Tony Naughton	1529	First
3rd	Don Farrar	1508	First
4th	Jack Murphy	1487	First
5th	Peter Sikora	1420	Own Design
6th	Matthew Partlett	1389	First
7th	Fred Lodden	1334	First
8th	Ian Roach	1286	First
9th	Doug McDonald	1266	First
10th*	Troy Zivkov	1246	Sagitta
11th	Klaus Weiss	1232	First
12th	Steve Zivkov	1191	Sagitta/Spirit
13th	Colin Woodward	1157	First
14th	Tom Illyes	1115	Sophisticated Lady
15th	Matthew Brand	1062	First
16th	Jim Henwood	1051	First
17th	Max Stone	1045	SoarMax
18th	Laurie Bestel	1001	Spirit
19th	Owen Piercy	963	Own Design
20th	Klaus Metzger	926	First
21st	Ken Woodward	893	Sagitta
21st	Harold Stevenson	893	Sagitta
23rd	Peter McGregor	599	First

* Junior

It was pleasing to see good results from the juniors. It would be even more pleasing to see more of them.

Carl's win took him to the top of the Millennium Cup table for the first time. But it is not over yet. He can still be beaten, which will make the final round, the Shoalhaven Shield, even more interesting than usual.

For the HSL members this event was also a round of the Club Championship, and counted for both the Open and Two Metre Divisions.

Ian Roach.

Club Competition - Round 7. Maddens Plains - 6 November, 2005.

There had been a lot of rain in the previous week, and the forecast for Sunday was not very encouraging, so twelve entries, including one visitor, was probably quite

a good turn out for the last round of the Club Championships for 2005.

The task for the day was to make flights of 4, 6, 8, 10, and 10 minutes, in any order, with an FAI spot landing in each flight. Just to make the in-flight decision making a little more complex, it was decreed that a flight that exceeded the target by more than thirty seconds would score no landing points.

Before the competition commenced conditions were heavily overcast and a very light South East wind was blowing. There was plenty of lift around, but it was very light.

By the time competition began the wind had strengthened, but the lift had not. Consequently you could not stay with a thermal for more than two or three minutes before having to head back to the field. As a result, although a few good times were made early in the day, many of us had to settle for making our four and six minute flights during this period.

Then, just in the nick of time, the skies cleared, the thermals strengthened, and longer flights became much more achievable.

By the time the competition concluded at 2PM the weather was very nice indeed, and many members continued flying for fun and/or practice.

The results were:

1st	Mat Lowe	2624	Pike Superior
2nd	Bruce Robbins	2584	Starlight 2000
3rd	Ian Roach	2491	Ellipse 4
4th*	Fred Lodden	2434	First
5th*	Owen Piercy	2396	Own Design
6th	Matthew Partlett	2222	Graphit
7th	Klaus Metzger	1972	Starlight 3000
8th	Peter Sikora	1921	Starlight 3000
9th*	Colin Woodward	1915	First
10th*	Steve Zivkov	1708	Sagitta
11th*	Don Farrar	1248	First
12th*	Max Stone	736	MaxSoar

* Two Metre

Particularly notable is Fred's fourth place flying a two metre First. He was only a handful of points away from a top three placing, and not all that far behind the winner.

Purely for fun an "all up - last down" style event was organised after main business of the day was complete. About half a dozen pilots entered. To avoid collisions they launched at about five second intervals, with the objective of simply staying up for as long as possible.

The CD for the day, Bruce Robbins, was trying to

organise this unfamiliar event, as well as fly in it. In the confusion he forgot to put his frequency key in the board. A couple of minutes into the flight another member, whose key was in the board, switched on his radio, as he had every right to do. Bruce's Starlight immediately began to behave erratically and, before any of us had worked out what had gone wrong, it crashed heavily in the scrub to the west of the field. Remarkably it was virtually undamaged. It could just as easily have been written-off.

Apart from the obvious lesson, always use the keyboard correctly, I think there is something else to be learned from this incident. Preparing for a flight requires concentration. If a pilot has to perform another task simultaneously the chance of an error rises dramatically. One of us should have stepped in and taken over the organising task to allow Bruce to concentrate on his flying.

Matthew Partlett won this informal event by a comfortable margin. I don't have the scores.

Ian Roach.

2005 HSL Club Championship.

In the past we have generally scheduled about six Club competitions each year. The Club Champion has been the member who amassed the most points over all these events. Consequently it was impossible to win the Championship if you missed even one of these events. Generally only two or three members managed to fly in every round, so the Championship depended more on attendance than performance.

In 2005 it was decided to address this issue by increasing the number of rounds, and by having only each members best four results count.

Six Club events were originally scheduled, another was added during the year, each day of the Heathcote Cup, and the Maddens Plains round of the Millennium Cup also counted towards the Club Championship. That made ten events in all, two of which were lost due to bad weather.

Of course, the more rounds you fly, the better chance you have of winning, which is as it should be, but you no longer have to fly in every round to have a chance.

The situation, coming into the final round in the first week of November, was that four members could still win the Championship, while three were still in contention for the Two Metre Division. And these were not merely mathematical possibilities, but real chances that did not require a miracle to make them come true.

The results were:

1st	Ian Roach	3865
2nd	Colin Woodward	3821
3rd	Mat Lowe	3771
4th	Alan Lowe	3753
5th	Matthew Partlett	3678
6th	Jack Murphy	3571
7th	Peter Sikora	3561
8th	Bruce Robbins	3355
9th*	Fred Lodden	3221
10th*	Don Farrar	3096
11th	Klaus Metzger	2974
12th*	Tony Naughton	2724
13th	David Johnson	2542
14th*	Steve Zivkov	2067
15th	Tom Illyes	2060
16th*	Troy Zivkov	1969
17th	Thomas Cooke	1780
18th	Klaus Weiss	1757
19th	Max Stone	1465
20th	Bill Bland	1086
21st	Harold Stevenson	1005
22nd	Carl Stautins	1000
23rd	Bjorn Rudgley	995
24th*	Peter McGregor	828
25th	Nick Cohen	785
26th	Rebecca Richards	259
27th*	Richard Solomon	242

* Two Metre

Only those who flew either all their rounds, or at least four rounds, with a two metre, two channel, model have been classified as two metre pilots in the above table. Many members flew a two metre model in one round, and several flew one in two or three rounds. They may well have scored more two metre points than some of those classified as two metre pilots above.

Colin Woodard was the leader with one round to go. Unfortunately he damaged his Eraser at the State Championships and was forced to fly his two metre model in the final round. This gave him very little chance of improving his score, and allowed me to sneak past him by a narrow margin.

Don Farrar lead the Two Metre Division for most of the year, though Fred Lodden was never far behind. In the final round Fred turned in a sensational score, for a two metre up against the open gliders, and finished as

the new Two Metre Club Champion.

Only two juniors competed, with Tony Naughton the best in a commendable 12th place, and third in Two Metre.

Sixteen members flew at least the four rounds needed to be competitive. You needed 92% of the winner's score to place better than eighth. My view is that the new format for the Championship worked out quite well.

Ian Roach.

Shoalhaven Shield. Bomaderry - 13 November, 2005.

This was the twenty third running of the Shoalhaven Shield. I have competed in the eleven of them, not even half the total. In those eleven years we have experienced all types of weather, from near perfect to terrible, yet not one of them had to be cancelled. This year the weather was very kind. There were thermals around all day and the wind, though it strengthened in the afternoon, was never strong enough to trouble competitors.

Once again the Shoalhaven Shield, with 31 competitors returning a score, proved to be the most popular two metre event of the year.

Round one proceeded very slowly. The breeze was light, but its direction caused the parachute to fall in difficult locations, slowing down retrieval, and consequently the launching rate. However, after round one, the wind blew in a little more firmly from the North East, and the



A group of competitors waiting for their turn to fly in the Shoalhaven Shield.

launching direction was reversed. Things then began to move along very smoothly, helped by the Shoalhaven Club's unique motorcycle parachute retrieval system.

Few good scores were made in round two but, for the rest of the day, although the conditions varied, long flights were common and many very high climbs were made. Of the 50 flights made by the top ten pilots only 12 scored fewer than 350 points.

Despite the slow start and large entry five rounds were completed.

The results were:

1st	Carl Strautins	1963	First
2nd	Colin Woodward	1928	First
3rd	Tom Prosser	1837	Own Design
5th	Don Farrar	1774	First
5th	Peter Sikora	1774	Own Design
7th	Fred Lodden	1762	First
8th	Max Stone	1751	SoarMax
9th	Klaus Metzger	1750	First
10th	Matthew Partlett	1731	First
11th	Jack Murphy	1604	First
15th*	Dave Symons	1514	First
16th	Ian Avery	1494	
17th	Ian Roach	1480	First
20th*	Troy Zivkov	1454	Sagitta
21st*	Tony Naughton	1426	First
25th	Klaus Weiss	1294	First
26th	Steve Zivkov	1277	Sagitta
29th	Les Morris	1160	First

* Junior

The top Junior, in 15th place overall, was Dave Symons, who came all the way from Cowra to compete.

The Shoalhaven Shield was also the last of the seven rounds of the Millennium Cup for 2005.

It was a very enjoyable day, even for those who, like me, lost sight of the leaders during round two and finished well down the order.

Ian Roach.

Millennium Cup 2005.

Final Rankings.

Seven rounds, at Werrington, Berkeley, Queanbeyan, Muswellbrook, Cowra, Maddens Plains and Bomaderry, were held again this year. All were well supported. A total of 44 pilots competed in at least one round, while no fewer than 23 flew at least the four rounds needed to have any chance of a high placing.

After six years the series has established itself as one of



Carl Strautins appears to be quite pleased with his win in the 2005 Millennium Cup series.

the most popular soaring events in the country.

Standards have risen dramatically. For example, almost everybody now launches harder and higher than all but the best three or four were achieving five years ago.

The final standings for 2005 are:

1st	Carl Strautins	3998
2nd	Peter Sikora	3926
3rd	Colin Woodward	3919
4th	Jack Murphy	3824
5th	Fred Lodden	3794
7th	Ian Roach	3695
9th	Don Farrar	3539
10th	Klaus Metzger	3523
11th*	Dave Symons	3453
12th	Steve Zivkov	3405
13th*	Tony Naughton	3344
16th	Max Stone	3246
18th	Klaus Weiss	3094
21st*	Troy Zivkov	2828
24th	Matthew Partlett	2541
28th	Les Morris	1236
31st	Guy Brand	810
33rd	Ian Avery	761
37th	Tom Illyes	667
41st	Harold Stevenson	534
42nd	Peter McGregor	358

* Junior

The winner, Carl Stautins, was flying his first year of Millennium Cup competition, but his win surprised nobody. Carl has represented Australia at several World Championships, both F3J and F3B. He has reached the fly-off at the F3J World Championship twice, and is recognised as one of the world's best thermal pilots. But two metre competition is very different from F3J or the Australian Thermal Glider events. Carl finished well down in the first event of the year, but he soon worked out what was needed to succeed in two metre competition and won three of the next six rounds. Carl flew an ARF Spirit most of the year, upgrading to a First for the final round.

Dave Symons was the best junior. His skill has developed enormously in the past couple of years. There

were only three regular junior competitors and all flew well. None of them needs to be given a start to be able to compete successfully against the seniors. It is a pity there are not more of them as the Millennium Cup is ideal for developing juniors or, for that matter, any inexperienced soaring pilot. You only need simple and inexpensive equipment, but you get to fly with, and learn from, some of the best pilots in the world.

Next year's Millennium Cup programme will be very similar to this year's. You can find the dates in the "Dates to Remember" table on the back page of this newsletter.

Ian Roach.



Bill Bland's scale Cessna C195 glider tug nearing completion

Experiences and Observations with the First Glider

The purpose of this article is to pass on some of the collective experiences and observations acquired while flying the First glider in competition for a couple of seasons now.

The First is a two metre, two channel polyhedral glider. It is manufactured by Blejzyk in Poland.



minimum amount of material in the wing saddle so that the maximum strength is retained. The cut-out really only needs to be large enough to allow access to the tow hook nut, insert the receiver and clamp the wing hold down nuts when gluing them in. Keep the corners of the cut-out

The wing construction is a foam core with black poplar sheeting. The wing joiner is a steel blade that is fixed in epoxy in one wing and slides into a mating rectangular brass tube fixed in by epoxy in the opposite wing. The fuselage is made from fibreglass with a slip on nose cone. The cruciform tail is made from solid balsa.

rounded so as to minimise stress concentration in the corners.

The aircraft uses the SD7037 wing section and penetrates noticeably better than the traditional built up two metre, two channel aircraft like the Gentle Lady, Spirit or Sagitta. The wing thickness on the First remains about the same as these other built up aircraft at approximately 22 mm. It is not possible to build the First down to the weights that a Spirit or Sagitta can be built to and I believe that the dead air sink rate on a First is slightly greater than a Spirit or Sagitta. However this disadvantage is more than offset by the ability to launch higher, penetrate better and cover more sky in search of that elusive lift, particularly at the windier coastal fields around Sydney.

Later models of the First have been significantly reinforced in the saddle area with some additional Kevlar cloth along the fuselage sides and carbon tow under the edge of the saddle.

The points listed below are oriented towards competition flying where the pilot wants the plane to repeatedly and reliably launch hard with no nasty vices and still have pleasant flight characteristics. Knowing that your plane is sorted out and will provide a good launch lets you focus on what the air is doing and on hunting down the lift.

Fuselage Reinforcing

After seeing a couple of pilots get fuselage cracking in the area behind the trailing edge of the wing on cartwheel landings, I resolved to strengthen my own aircraft during construction by laying in four lengths of carbon tow, each 150 mm long in this area. Just lightly wet them with epoxy and drop them in and press them against the fuselage before you epoxy in the inner nose cone. The four were positioned 90 degrees apart to provide resistance to bending from all angles in that region. So far so good, the fuselage remains intact despite two full seasons of Millennium Cup competition and two seasons of club competition - and there were some ugly landings in there.

Wing Dihedral

Build the wing with the recommended dihedral specified in the build instructions. Some models have been assembled with less than recommended dihedral, or no dihedral, and this results in the aircraft noticeably oscillating in yaw when turning or when flying through turbulent air.

Servos

The fuselage is quite roomy and standard size servos can be mounted in a tandem layout. Clearance towards the front under the nose cone gets tight and you need to ensure that the servo arm and its clevis don't foul the nose cone. Smaller servos avoid the clearance issue and micro servos can even be mounted side by side at the very front but this layout brings up the clearance issue again.

Wing Saddle Area

The wing saddle area has been prone to cracking and splitting, particularly after rough landings. Remove the

Wing Coatings

Many pilots have coated their aircraft wings with a natural clear varnish/polyurethane finish which is as per the build instructions. This looks attractive too - if you like wood grain. Others have used two pack epoxy paints (a heavy solution), automotive touch up spray paint and

Monokote/Profilm covering (great colour range). The paints result in a heavier wing and there can be some remnant wood grain texture in the surface depending on the number of coats applied. The Monokote/Profilm approach provides a very smooth surface but bubbles under the film can be a perennial issue requiring ongoing attention. I don't know if the film has difficulty sticking to the wood sheeting or if the foam is continuously gassing. Bubbles can also appear when travelling to higher altitude fields such as Queanbeyan. This happened to me but the bubbles had disappeared when I got the wing out to re-iron it after returning home.

Wing Bolts

The 4 mm nylon bolts provided with the kit are more than adequate in strength to handle any launch loads. However these bolts are hollow in the centre and shear quite easily with rough landings. 4 mm nylon bolts are also difficult to procure from hobby shops and are usually available only in small quantities and high prices, if you can find them. If you are a beginner, the air is turbulent in the landing area or you don't have the aircraft flying the way you want it you may need several sets of these wing bolts in a flying session. I purchased a bag of 50 over the net for US\$3.50 from www.microfasteners.com but beware the shipping charges more than double the cost. There are other suppliers of small parts that you can find on the web.

The wing hold down nuts mounted in plastic collars that are supplied in the kit have been known to cause some issues over time. The plastic collar cracks and the nut then spins freely or falls out completely. Once the aircraft is fully built getting back in there to install a replacement or fit something else is difficult. My solution to this has been to use metal 10-32 blind nuts and 10-32 nylon bolts. These are a slightly greater diameter than 4mm bolts but the additional strength is not the requirement as 4mm is more than strong enough. The 10-32 nylon bolts are easier to obtain locally too. Unfortunately I can also vouch for the fact that the 10-32 nylon bolts will still shear through with a big impact. The shearing of the nylon bolts goes some way to minimising the risk of wing damage and saves the wing saddle area from high impact forces.

Some pilots are using metal bolts to hold the wings down. This removes any issues with wing bolt failure or having to find replacements but the prospect of damage to either the wing or fuselage arising from hard landings is increased.

Elevator and Rudder Hinges

The tail pieces come with pre-hinged stabiliser/elevator and fin/rudder items. This is a nice touch - but a real trap. Inevitably these hinges work their way loose and major control issues can arise in flight usually

immediately after the zoom or after high speed flight. I would not trust these hinges at all and strongly recommend taping over the hinge joint with hinge tape as a standard build practice. After taping the hinge line there are no further problems in this area.

Wing Decalage/Incidence

When the aircraft is built with the wing flat on the wing saddle and the stabiliser flat on the tail mounting, the aircraft will want to fly very quickly and requires considerable up elevator trim to slow it down. Almost all pilots have modified the decalage by either packing up the leading edge of the wing or installing a balsa wedge under the tail.

Using the wedge under the tail method requires a wedge that is around 2mm thick at the rear. This wedge results in a trim setting where the elevator is in line with the stabiliser at normal flying speeds.

Using the wedge under the tail approach results in a tail down fuselage attitude in normal flight which some find unattractive, so packing up the leading edge of the wing could be a more aesthetic alternative.

Overall Weight

With full size servos (44 g each), 600 mAh battery pack and a Monokote/Profilm covered wing a 1000 g aircraft results. Painting the wings adds around a further 40 grams and two part paint adds 200g for a 'pre-ballasted' aircraft. Smaller mini or micro servos or a smaller battery can save weight but this saving will be offset somewhat by increased lead weight in the nose to maintain the CoG position. I think that flight loads are not very high and the smaller servos provide good service barring any landing 'arrivals' or cartwheels. A number of aircraft have been built with their all up weight in the 950g range.

The newer kits that have the reinforced fuselage in the wing saddle area are a little heavier than earlier kits. The added strength is worth the weight penalty though.

Elevator Sensitivity

The aircraft is quite sensitive in pitch. The control rod clevis should be affixed to the hole furthest out on the elevator horn, or dual rates and/or travel throw adjustments used to limit the elevator throw. Ensure that full up elevator doesn't foul the rudder.

Centre of Gravity

The recommended CG position, at 85 mm from the leading edge, is conservative. I find that a CG position a further to 10 mm rearward, at 95 mm from the leading edge, still provides a controllable aircraft that it is more 'lively' and responsive. Even with this more aft CG

position the aircraft pitch stability remains slightly positive when evaluated using the 'dive test'.

Tow Hook Position

While the plans do not specifically state the tow hook position, scaling the dimensions from the drawing leads me to a figure of 90mm from the leading edge. This tow hook position is acceptable. With the tow hook further forward of this position the rotation is leisurely and the climb relatively flat. A tow hook positioned at 90-92 mm provides a much better rotation upon release and the aircraft climbs steeply while still being very stable. Tow hook positions further back at 100 mm have been tested but the aircraft is extremely unstable leading to the likelihood of pop offs. This setting makes the launch very exciting but not the vice free and repeatable launch I seek.

Also see the section below regarding additional up elevator preset when launching.

Tow Hook Angle

The standard tow hook provided with the kit is a very sturdy and attractive unit. However it appears that the angle of the hook is not tight (acute) enough and the aircraft is very prone to popping off a tow line when launched aggressively. Perhaps the floor of the fuselage is distorting under load and the tow hook is rotating forward presenting the back of the tow hook and allowing the tow ring to slip off. Anyway the simplest way to correct this is to place the tow hook in a vice and give it a few gentle taps with a hammer to make the angle of the tow hook more acute i.e. less than 90 degrees. It doesn't need much. This modification keeps the aircraft on the tow line even on the hardest launches. No-one who has used this tow hook modification has had any difficulty releasing the aircraft from the line when the time comes to get off.

Rudder Throw

The manual indicates a rudder throw of 9 mm left and 9mm right. This is so ridiculously low it just has to be a typographical error. Try to get around 40-50 mm in each direction. At low airspeeds the aircraft is quite insensitive to rudder inputs and having decent rudder throws will help in the landing pattern. If you are heavy on the sticks or you find too much rudder sensitivity in normal flight, try some exponential to soften the response around the centre position while still retaining full throw for the low speed flight regime.

Launch Preset

Many pilots have programmed in a small amount of up elevator for the launch phase. This helps the launch rotation and keeps the aircraft pulling up and maintaining line tension all the way up on launch. Some

experimentation is required to ascertain the appropriate setting to prevent over rotation and popping off or instability in the climb. What I have done is to have flaps permanently lowered in the radio (I know the aircraft really has no flaps) and then mix 10% to 20% flaps to elevator through a switch as a launch mode. I am sure there are many different ways to implement this. The actual value of the mix will depend primarily on your elevator throws and tow hook position.

If you have the unthinkable happen and you do pop off you can quickly remove this launch preset for an absolutely pop off free subsequent launch. Our competition rules only allow one pop off so the second launch must be good, even if it isn't optimal.

The use of the launch elevator preset will require implementation of the tow hook position, tow hook angle and elevator throw adjustments mentioned above. These things are all inter-related for an optimal launch.

As an aside, I have similarly implemented a 'speed' mode with my radio. This is the reverse of the launch mode as it mixes a small amount of flap (remember the flaps are always deployed in the radio) to down elevator. This causes the aircraft to fly at a faster natural speed for greater penetration. You don't have to hold the elevator stick forward nor do you need to remember how many clicks of down trim you put in. If you choose to use the programmed 'speed' function, experimentation will be required to arrive at the appropriate mix value for your aircraft.

Alternate Wing Profiles

A couple of pilots have used the First fuselage mated to a MH32 profile foam core wing with spars and either fibreglass or balsa covered. These aircraft also fly very well and the MH32 profile may offer a further gain in penetration performance in windier weather. It is a very interesting experiment.

Conclusion

The First has proven to be a very popular glider for our two metre, two channel competition. The purchase price of the kit is a premium on built up kits but it still represents good value. The First is quite tough and to my knowledge none have folded wings on launch, no matter how vigorous the reflex or electric winch launch has been. Its flight performance is a step up from the built up models and the ability to launch with impunity and readily achieve high launches also proves to be an advantage in competition. Its success as a design can be measured to some degree by the fact that of the first 20 pilots in the 2005 Millennium Cup for two metre, two channel gliders, 15 pilots were flying the First.

Fred Lodden

Some Thoughts on Pulley Hand Towing.

Hand towing is the simplest, and in some ways the most satisfactory, method of launching a thermal glider from a flat field. Its main disadvantage is that, if there is little wind, it can require more running speed from the tow man than many of us can readily achieve.

The pulley hand tow helps solves this problem. Use of a single pulley halves the speed required of the tow man. This means that most people can act as tow man quite successfully, providing there is just a little wind.

When there is no wind, or a slight downwind, two pulleys, with two tow men running in opposite directions, halves the running speed again, and allows good launches to be achieved by tow men who are not at all athletic.

In Millennium Cup competition, where pulley hand towing is the standard method, the two pulley, two man, tow is becoming more popular, even when there is a good breeze. The reason is simply that using this method makes things easier for the tow men. With a good breeze a one man tow will launch the glider just as high.

Occasionally you will see a pilot decline a two pulley tow because he is afraid his wings may fail during the launch. I don't think this really is a problem. In a two pulley launch each tow man feels exactly the same load that he would experience in an equivalent one man, one pulley launch, so the risk of accidental overloading is not much different. Besides, it is the pilot who controls the tension, using his left thumb on the elevator stick.

Though I don't claim to be the leading authority on the subject, I have a few suggestions to make that might prove useful.

I believe it is best to maintain high tension throughout the launch. If you can get a lot of tension on the line early, and maintain it throughout the launch, the tow man, or men, will neither need to, nor be able to, run very far, thus reducing the amount of line that is pulled in, and wasted, during the launch.

If you float the model up to the top of the line with little tension, you may use up a little less line initially, but at the top of the launch you will have low line tension and the zoom will be disappointing.

Calling on the tow man for an extra effort when the model is near the top of the launch will not help much, if at all. Have a look at the geometry of the launch and you will soon come to the conclusion that if the tow man runs fast as the glider approaches the top of the launch he is simply pulling the glider down towards the turn around. This reduces the release height, but does little, if anything, to increase the line tension. Higher tension just

prior to the dive produces a higher zoom.

On the other hand, if the tension is already high, the tow man will probably not be able to run faster anyway, so why ask him to?

It is the energy stored in the line by tensioning it that provides the speed needed for a good zoom. Having the tow man run a little faster will not achieve the same effect, but it will reduce the effective length of the line.

The dive to release the stored energy only needs to be short. Diving deeply wastes height and produces no extra speed to offset the loss. If you see the model fly off the line while still diving you have gone too far, and you also risk the model flying into the line and becoming entangled in it.

Most of us, I believe, stay on the line too long. The view from the pilot's position is very deceptive, but if you observe from near the turn around you will see that many models are released directly above it, or even upwind of it. Under these conditions the tow man, if he is still running, is simply pulling the model downwards. And he probably will be running, because he will feel the line tension reducing as the line angle approaches vertical. Better to get off when the line is about 70 degrees to the ground, maybe even earlier.

So what does the perfect launch look like?

Unless the wind is very strong the line is highly tensioned before the glider leaves the hand of the pilot, or his assistant.

Tension is maintained all the way up the launch, using some up elevator if necessary. Even with a two metre model, if there is a reasonable breeze, the tow man will be struggling to make progress against the line tension.

When the line is about 70 degrees to the ground the glider dives very briefly directly towards the turn around, then pulls up into a steep climb. I don't know what the best climb angle is, but it is certainly greater than 60 degrees.

When the glider's speed is only just sufficient to provide elevator authority, down elevator is applied and the glider is returned to level flight at its normal gliding speed.

This is easier to write than to do but, if you can get it right, the model will be very high and, whether you are flying in competition or just for fun, a high launch is a very valuable thing.

Ian Roach.

Dates to Remember

November	6	HSL Club Championship - Round 7	Maddens Plains
November	13	Shoalhaven Shield (two metre glider)	Bomaderry
		Millennium Cup Round 7	
November	18 - 20	Old Timers	Muswellbrook
November	27	Scale Glider/Glider Fun Day	Maddens Plains
December	4	Ted Swan Cup (Open Glider)	Goulburn
December	11	7-Cell Electric Glider	Maddens Plains
January 2006	15	Two Metre Glider - Millennium Cup Rnd 1	Werrington
January 2006	26 - 28	Glider Expo	Armidale
February 2006	4 - 5	Old Timers	Orange
February 2006	12	Two Metre Glider - Millennium Cup Rnd 2	Berkeley
February 2006	26	Heathcote Cup - Day 1	Maddens Plains
March 2006	4 - 5	Hunter Valley Championships	Muswellbrook
March 2006	19	Heathcote Cup - Day 2	Maddens Plains
April 2006	2	HSL Club Competition Round 1	Maddens Plains
April 2006	9	Two Metre Glider - Millennium Cup Rnd 3	Queanbeyan
April 2006	14 - 17	Electric Glider Rally	Cootamundra
April 2006	14 - 17	Scale Glider	Jerilderie
April 2006	18 - 25	Nationals	Milang (SA)
May 2006	7	NSW F3J Championship	Maddens Plains
May 2006	21	Two Metre Glider - Millennium Cup Rnd 4	Muswellbrook
June 2006	4	HSL Club Competition Round 2	Maddens Plains
June 2006	10 - 12	LSF Tournament	Jerilderie
June 2006	25	HSL Club Competition Round 3	Maddens Plains
July 2006	2	F3J Club Comp and Team Practice	Maddens Plains
August 2006	27	HSL Club Competition Round 4	Maddens Plains
September 2006	9 - 10	Two Metre Glider - Millennium Cup Rnd 5	Cowra
September 2006	17	7 Cell Electric Glider	Berkeley
October 2006	14 - 15	NSW Thermal Glider Championships	Muswellbrook
October 2006	22	Two Metre Glider - Millennium Cup Rnd 6	Maddens Plains
October 2006	28 - 29	Old Timers	Lithgow
October 2006	29	7-Cell Electric Glider	Maddens Plains
November 2006	5	HSL Club Competition Round 5	Maddens Plains
November 2006	12	Shoalhaven Shield (Two Metre Glider)	Bomaderry
		Millennium Cup - Round 7	
November 2006	19	HSL Club Competition Round 6	Maddens Plains
November 2006	26	Scale Aerotow Gliders	Maddens Plains
December 2006	3	Ted Swan Cup	Goulburn

The information above is the best we can get at the time of publication, but I can guarantee you there will be many additions and changes as time goes on. Please be sure always to use the latest version and, if in doubt check with the organisers of the event.

HSL

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