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Rebecca Richards is the winner of the Heathcote Cup for 2008.
HSL President Jack Murphy awards the trophy while Secretary
Fred Lodden assists.

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The History of Airfoil Development

Part 2 of 3.

In the last last edition we saw that early aviators performed experiments on fullsize sections of wings on rotating merry-go-rounds to test sections which were copies of bird wing profiles. Research into the effects of wind on various structures had been conducted by engineers including M Eiffel following disasters where structures had been blown over.(ie the bridge over the Firth of Forth) Models were used in wind tunnels to test wing sections also and as we shall see in this article it was difficult compare the test results.

Attempts at Rationalisation.

In 1915 the National Advisory Committee on Aeronautics (NACA) was founded in USA and shortly thereafter research laboratories including a wind tunnel were established. In 1920 a series of profiles was developed using the prefix NACA ie NACA 1, NACA 2, 3... 70,71 etc. By that time information on airfoil test was becoming available from all over the world in various languages, using different methods and reporting results in different ways. Results were not plotted in any standard way and there was no consistency in the units of measurement.

The many different wind tunnels with their various different test methods, flow speeds, model sizes, etc. did not agree well with one another! To investigate this, a pattern makers model with an RAF 15 wing section was made and tested in England and then sent to NACA for testing. The results were seriously different. It was nearly impossible for an aircraft designer to search in any rational way for a suitable airfoil.

The NACA decided to collect all the published reports and bring them to a common standard to make them generally more useful. More than 850 different profiles with test results in standard form were included in reports published in 1928. The forces in the wind tunnels tests were reduced to coefficients of lift and drag plotted against angle of attack. The angles were measured from the same reference line used for the profile coordinates. Practical designers had good reason to hesitate to use these profiles. The test wings sections were produced by skilled patternmakers from laminated timber to accuracies of a few thousandths of an inch, smooth and highly polished. Real airplanes mostly had wings with fabric covering which sagged between the ribs; there were lumps and bumps caused by spars, rib tapes, struts and wires. Gaps at control hinges were common. Even metal and plywood skinned aircraft had lumps and bumps, oil-canning panels and rivet heads, screw heads and the like. These were easily enough to cast serious doubt on the applicability of the wind tunnel test results.

Furthermore, the various wind tunnels differed greatly in the quality of the airstream they produced and there was always some turbulence in the airflow. And then there was Scale Effect. How this situation affected the results was not realised for years, even by wind tunnel engineers.

Scale Effect.

Designers in the aircraft industry instantly recognised that flow airspeeds and model sizes were much too small for their needs. A large wing flying fast did not behave the same way as a small wing flying slowly. A typical wing in the early NACA test facility would have a chord of 5 inches and an air velocity of 70 ft/sec (117 mm and 77 km/hour) Some 45 years earlier, (yes, forty five years!!!) Osborne Reynolds had shown that to take into account the size of the model and apply the results to the full size the viscosity and density of the air had to be taken into account along with the size of the model.

Reynolds Number.

The factor that is called the Reynolds number was discovered by Osborne Reynolds of the University of Manchester in 1883 at about the same time Lilienthal was developing his first family of wing sections. This parameter is important in wind tunnel experiments since it relates to the aerodynamic properties of lifting surfaces (like airfoils) when extrapolating from small wind tunnel test models to full-size wings. Reynolds discovered that, if the same atmospheric pressure were used for experiments with wind tunnel models as a full-size aircraft would encounter under actual conditions, the experimental results would be invalid.

For results obtained with a scale model in wind tunnel experiments to be valid, the air density inside the tunnel had to be increased by the same proportion as the model is smaller than the full-size aircraft. In practical terms, if a model is 1/10 the size of a full-size aircraft, then the air density (the number of atmospheres) inside the tunnel must be increased by a factor of 10 to get wind tunnel results that are valid in regular atmospheric conditions with a full-size aircraft. Another author describes Reynolds number as follows:

“Reynolds number is air density x true airspeed x wing chord divided by the air's viscosity. (Viscosity is a measure of the "stickiness" of a fluid. Alcohol has a lower viscosity than honey.) More to the point, the Reynolds number is a measure of how "fine grained" the turbulence of the airflow is. At very low speeds, fluid flow is laminar,

that is, it flows in smooth layers. At higher speeds (i.e., higher Reynolds numbers) the flow becomes increasingly turbulent at increasingly smaller dimensions.”

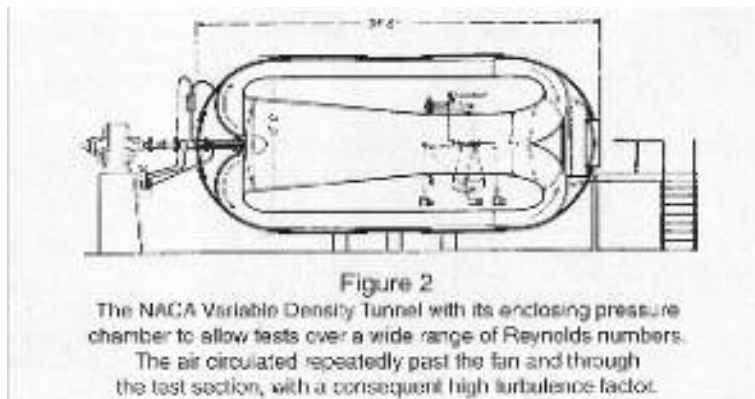
The early NACA tests were done at Reynolds numbers of 186,000. The Massachusetts Institute of Technology (MIT) tunnel worked at $Re = 93,000$ and the Gottingen tunnel even lower at 76,000. A full scale wing of that period operated at $Re = 1$ million to 6 million!!!

The Variable Density Wind Tunnel.

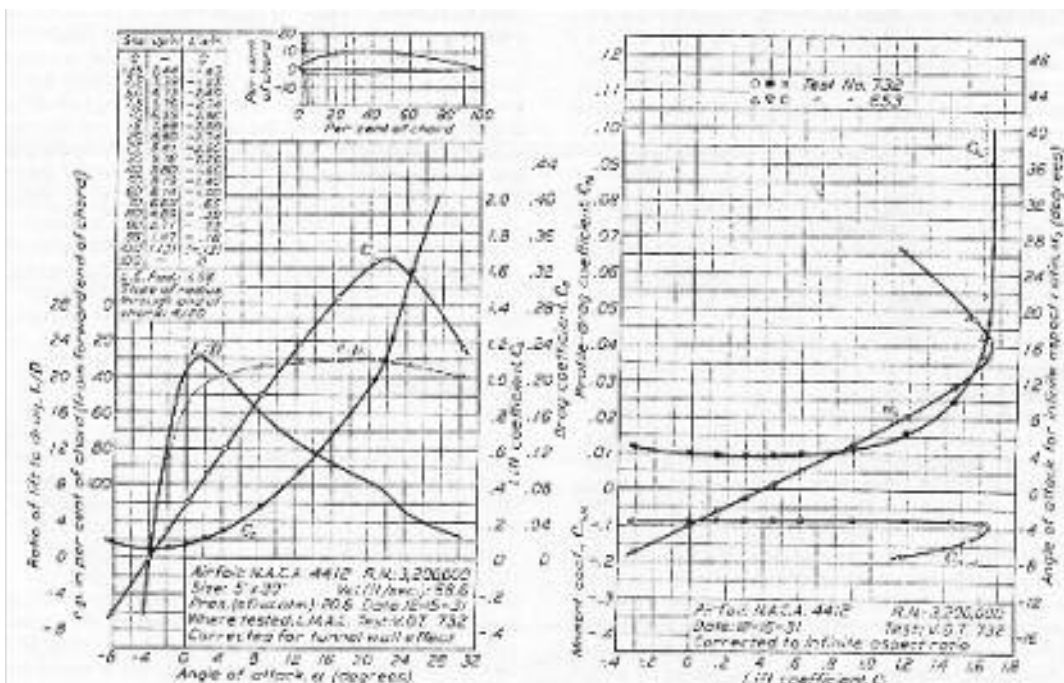
To achieve Reynolds numbers comparable to full size airfoils NACA constructed a new wind tunnel which could be pumped up to 20 atmospheres of pressure. (about 300 psi) To appreciate how much scale effect had on the test results compare the results in the graph for a Clark Y section tested at MIT in 1924 with the same test done in the NACA tunnel. At $Re = 3$ million the lift coefficient is much higher, the stalling angle is greater and the minimum drag coefficient is halved.

Aspect Ratio Corrections.

The early scientists were still not producing directly comparable results. The test wings were of different



lengths and chord often with different shapes and styles of wing tips. The Gottingen tunnel always used wings of length/chord (aspect ratio) of 5 while NACA was using an aspect ratio of 6. It was realised then that mathematical correction was necessary to be able to use the new high density tunnel results for wings of different aspect ratio. Test results were then corrected to simulate wings of infinite aspect ratio and soon after test models were made to span the entire width of the wind tunnel, wall to wall, the airflow being free to flow vertically but constrained on each side by the walls. The NACA four digit airfoils were used very widely after 1933, even by some German designers. They were safe, efficient, and predictable, used on airliners fighters, bombers, light aircraft and gliders. A designer could find airfoils of a certain thickness and camber very quickly, examine the test result charts and make a choice quickly and pass on to the detail design work.



Airfoils in Modelling.

Among model flyers in the English speaking world the NACA charts of 1923 were of great influence, but many years after they were originally published and many years after better results from variable density tunnels with aspect ratio correction had become widely available. The 1923 test charts and ordinates were copied and reprinted in countless model magazines and books and plans. Several of them appeared in the Model Aeronautics Yearbook of 1935-6. Soon afterwards the author Frank Zaic pointed out that more modern results were available however up to 30 years after the original

1923 publication, modellers were still relying on this data for model design.

Modellers nowadays have excellent resources on the internet and current modern reliable data is freely available.

We'll have a look at test results for two wing sections next newsletter and draw some general conclusions which will help you to make better decisions about the models you buy or build and fly.

Steve Mutch.



Nothing to do with soaring, but I thought readers might like to see this beautifully restored Lockheed Hudson which was photographed at Albion Park Airport in 2007. In the background is an equally rare Gloster Meteor jet fighter.

World Record Cross Country Flight.

By Joe Wurts.

Editor's Note:

This article appeared in the HSL Newsletter way back in 1998. I read it again recently and found it just as interesting as it had been the first time. HSL has had many new members in the past decade, and they would not have seen this article before, which is my excuse for publishing it again. And a very good excuse it is.

Introduction.

Since about the middle of 1987 I had been considering an attempt on the cross-country distance record. There were several factors feeding this desire. I have been quite successful in cross-country competition through the years, winning at:

Thousand Oaks Soaring Societies' Western Great Race in '83, '84, '85, '86, '87, and '88.

Santa Maria Soaring Societies' Cross Country in '84, '85, '86, '87, and '88, and all other cross country events that I have entered in that period of time.

I am still undefeated in cross-country, almost ten years after this article was first written. I've also had a very low incidence of land outs in cross-country flying during the period leading to my attempt on the world record. At the TOSS cross-country, I had not landed out except once in 1987, and at the SMSS cross-country, I had never landed out. This is with usually doing the course 2 to 4 times a day trying to better my times. Usually we would do a conservative course early in the day when the lift was light, then progressively push harder to better our previous best flight time, even if nobody else had finished at all (we were there to fly!). In fact, in 1988 the SMSS cross-country had its first finisher other than me, while we typically did the course at least twice on Saturday and once on Sunday. This added up to as much as 70-80 miles flown in a single day, and upwards of 1000 miles flown without an out-landing through the years.

Anyhow, with all of the above, I was fairly confident of extending the record set by Jack Hiner. I met and talked with Mr. Hiner at the 1987 MARCS symposium and he was quite supportive of my attempting to better his record. I am indebted to him for his spurring me to action by sending me copies of his dossier, which, frankly, I plagiarized for my dossier.

Preparations.

It turned out that the hardest thing about establishing a record is not the actual flying, but doing the necessary preparation beforehand, and then doing the documentation afterwards. Jan and I spent several evenings looking over maps of Southern California

finding potential courses that were relatively straight, and would theoretically be in a downwind direction. Although one would think that in the deserts of Southern California it would be easy to find many courses, it turns out that after you eliminate unfavourable terrain, well-travelled roads, and restrict it to roads following the prevailing winds, the choices narrow down considerably. I found a potential course and talked a friend, Brian Quayle, who has a Piper Warrior, into over-flying the course to check its validity.

It brought home the magnitude of the task when it took upwards of 1-1/2 hours to fly the course at 100 mph. We even found a way to circumnavigate Barstow, a big worry that I had. More on this later.

Then I had to get a world record sanction from AMA. A good friend, and constant cross-country teammate, Don Vickers (LSF level V holder) volunteered to be the Contest Director for the attempt and took care of the necessary paperwork for this. As I had a couple of cross country planes already, all that remained was to wait for good conditions, assemble a team and make the attempt.

The Flying.

As of May 14, Don had not gotten his CD papers back from AMA (filed early April), we recruited Gary Ittner to participate, as he was an AMA CD, to oversee an attempt on the world record. If we were unsuccessful, we would establish a new world record, but no national records as we hadn't contest sanctions from AMA yet, but we decided to give it a try anyhow. As in all the cross-country flights we make, the driver was my wife, Jan.

As we made the necessary preparations at the launch site conditions seemed promising. With the first launch we found lift and started on our journey at about 10:45 AM. The flying was uneventful until about 20 miles into the course, where we ran into a patch of dead air and got down to about 300 feet until finding a thermal. As the wind was primarily out of the north, I stayed on the upwind side of the road. We crested a 3800 foot pass before descending into the Helendale area, which is due north of the Cajon Pass. As we descended, the

airplane seemed to start flying funny, crabbing and drifting north. We soon realized that we were flying into a different air mass that was coming from the Cajon Pass going due north. The more we progressed, the worse it got until the majority of the flying was just to keep the plane near the road. At one point I just about lost the plane just by thermalling downwind for a minute. We ended up giving up at Helendale and having lunch, after going 41 miles.

There were many lessons learned from this flight. Pay more attention to the air, get the earliest start possible, and we had to beat the normal daily shear line spilling into the desert from El Cajon.

Attempt on May 28.

For this attempt Don Vickers had received his paperwork back from AMA and was the official Contest Director. We were a bit better prepared and had Jack and Joyce Patzold along as official observers, following along in their VW Rabbit. On the drive out to the launch site, we noticed a stiff breeze out of the southwest, a good sign. As we reached the pass to Palmdale, a gust of wind pulled one of the beanbags that we use for pilot and spotter comfort, out of our pick-up and deposited it on the side of the freeway. When we stopped to retrieve it, we measured the wind at 25 mph, with gusts over 35 mph, a good sign of tail winds if we could beat the shear line that was sure to be blow in from Cajon Pass.

We made it to the launch site at 10 AM greeted by 5-10 mph breezes out of the west and the perennial Lancaster fliers, Howard Short, and Bud xxxx. They had a winch set up for our use. As we wanted to start as soon as possible, we quickly assembled the plane, got the truck and crew ready, and launched.

We quickly got into what Howard calls the Mojave Wave, which in reality was a giant smooth thermal, and climbed to about 2000 feet, not nearly cross-country contest starting altitude, but enough to get us on our way at 10: 16 AM. The start of the flight was kind of weak in that the lift was soft, but we wished to get moving as soon as possible. I had to work hard to find any identifiable lift initially, as the air was stable and we were passing irrigated farmland (nothing grows there unless it is constantly watered). We were helped by a nice tailwind, but 10 miles into the course was my first real challenge. We started to climb out of the Antelope Valley gradually, but could not find any good lift. So, as we went forward, the ground came up and the glider came down. Finally, at about 100 feet, at the side of the road, I hit some light air, about zero sink. I had to try and work it, as my only other option was to land. I ended up shifting cores three times as we drifted downwind, each time losing some precious

altitude, before I finally connected with some air that I could climb on. By this point, I had gotten down to the height of the telephone poles bordering the road. As I thermalled, we drifted straight down the course at about 15 mph, a sign of a very helpful tailwind. The thermals were still topping out quite low, especially noticeable as we were gaining altitude.

During the next 15 miles, we concentrated on gaining and keeping altitude, rather than making good time down the road. We were still going rather well in ground speed, as the tailwind was adding 15 mph to our average airspeed. By the end of our first hour aloft, we had covered 30 miles, a respectable speed in the weak air we had encountered so far.

As we descended into the next valley and approached the crossing of highway 395, the lift started showing improvement in strength and altitude. By the time that we reached Helendale, the thermals were numerous, very strong, and also showed no signs of topping out up to the limits of visibility. We flew well to the south of the course after our last experience with the winds from the El Cajon Pass, but this time there were no signs of a southerly wind. The lift continued to get better as we left Helendale heading towards Barstow, which was quite good as the 27 miles between the two was a well-travelled stretch of road (National Trails Highway). We did notice that the tailwind was decreasing, but the lift was so good that our ground speed average still was at or above 30 mph (translating to 45-50 mph between thermals). In the stretch between Helendale and Barstow, we ended up making only 3 to 4 complete stops for thermals because the air overall was so good that I just cruised in good lift.

At one stop, Jan noticed that I was turning a good shade of pink, and asked if I had used any sunscreen. In the rush to get started I had forgotten to use any. I'm fair skinned and burn quite easily. She applied some spray on sunscreen to my legs, but I declined any for my face as Moby (my glider) was at the limits of vision and I did not wish to risk getting any in my eyes. This turned out later to have serious consequences.

By the time we got to Barstow, our tailwind had just about disappeared but the lift was still quite good, although the normal desert sinkholes were beginning to appear. We hadn't driven this section of the course before, but I had flown over it. I had some kind of wimpy directions written down, like "turn right at the Fosters Freeze, turn left at the water tower", etc., as from the air, one cannot read road signs. Jan did very well following these directions until the last turn on the Barstow bypass.

About a mile down one road, I figured out that something was wrong, as the course was supposed to

be going east, and we were heading south. We turned around to get back to the turnoff, and I took my eyes off Moby to get some bearings as to where we were, as I was the only one that knew the right course. I lost track of where the plane was. Don couldn't spot it either, so I put the stick into the corner and looked for flashes. In about 30 seconds, Don spotted the plane and helped me find it. Meanwhile, we still had to find the right turnoff. It took about 3 cycles of losing the plane and navigating, until we found the right road to take and started back on course.

The road that we got onto was really not a standard road, but only a pipeline access road. It looked like a graded gravel road from the air, but we quickly found out that the "gravel" was actually 2 inch to 8 inch rocks, very difficult going & Jan was going at the upper limits for our pick-up (25-30) mph, in order to keep up with Moby, which left Jack and Joyce well behind in their little VW Rabbit. Jan followed the road religiously, through some very steep hills. She told me later that she had to just trust that the road didn't stop or turn as she crested some hills and went back down, as all she could see was the hood. After about a mile of this we reached the spot where it connected to the highway frontage road, and waited for Jack and Joyce. They showed up in a couple of minutes with a tale of woe. A rock had punctured their fuel tank and now they had a steady, albeit slow, leak.

After Barstow, the wind gradually grew into a headwind, which was making progress slow, especially as we knew that we were not yet at the halfway point. We were still doing okay, as the lift was quite good, although the sink was getting stronger. We pulled into a gas station so that Jan could take a well-deserved rest, and so that the Rabbit could take on a full load of fuel, which was being slowly distributed along the road. I did get down to about 400-500 feet once, and was treated to listening to truckers on the 27 MHz sniffer frequency discussing that "plane circling over the highway".

One of the interesting things was driving under freeway overpasses. We would drive under at speed, and hope that we could reacquire the plane on the other side. It was amazing how long it seemed to take to see sky again. We passed Ludlow, and the headwind had been gradually increasing, making the flying a very difficult chore. Every time I stopped to thermal, I would lose ground as the plane drifted back. On some of the thermals, I would have Jan back-up down the course to have better visibility of the plane, which was difficult to accept.

We did have one amusing moment during this segment. About a half-hour earlier, a California Highway Patrol had passed us, and looked over our vehicle very carefully, as Don and I were sprawled in the back of the pick-up looking up for who knows

what reason. Then a CHP patrol plane came overhead when I was stopped and thermalling. He was actually quite a bit lower than the glider and most likely had no idea of what was actually going on, all he saw was two vehicles on the side of the road in a deserted area when it was about 95 degrees. He used his loudspeaker to ask us to wave if we needed help. Of course, I was listening to the sniffer with headphones and had no clue. Then, he asked as to wave if we did not need help. I finally left the thermal so as demonstrate that we were capable of travel.

I had set up my transmitter with two external batteries in anticipation of needing a lot of time. But I had expected to finish in only about 5-6 hours. The headwind really ate into our rate of travel, as we lost a lot of time in every thermal, drifting backwards. At about 50 miles to go, I started using the last Tx battery. The sun was doing its job on my face, and I was really feeling sunburnt and tired. With all this, and the slow progress, I was having doubts about finishing the task.

We got to Amboy by trading altitude for distance. We were helped somewhat in that it was downhill to Amboy. Don was doing an excellent job in trying to keep my morale up, and reading any signs of air upwind, but we were struggling. My last Tx battery was in the red, and in the last hour, I had only done 11 miles. It was not looking good. I was pushing hard, and taking some chances.

We traded the last battery pack for the first one, thinking that NiCad batteries have some "spring back", and it worked. I got another 15 miles on the starting pack. Leaving Amboy I got really low with only six miles to go. I mentally was resigned to finishing just short of the goal and set up to land on the road. On final, with only about 30 feet of altitude, I found a small thermal and rolled into it. We backed up about a 1/4 mile as I worked it up. I ended up using several thermals in the same area to get to about 3000 feet, also switching battery packs on the Tx, as each pack would yield less and less time. We finally set off for the finish, found lift for almost the entire six miles, and finished with about 2500 feet of altitude!

We drove into the town of Chambliss (really just an intersection between National Trails Highway and Cadiz Rd with a few houses), with horns honking, lights flashing, and a lot of whooping and hollering. I spent a few minutes using up the altitude doing aerobatics, and settled into a landing pattern. We were parked on the intersection of the two roads (my designated goal), and I tried to land there. What a joke. Evidently I was a bit whipped from the flight, especially the last few hours, and ended up landing about 90 meters away, with a ground loop when I hit a bush.

I got out of the truck for the first time in eight hours, and almost fell over. All of us did a bit of celebrating, and then looked around. The town of Chambliss is a place that time forgot. Not much there, and it looked like it hadn't been changed since 1950. After taking the plane apart, we started heading back. It took us 2-1/2 hours of driving just to get back to the starting point. We finally made it home by 11 PM.

I'd like to give my heartfelt thanks to Don Vickers for his constant encouragement during all phases of this attempt. Without his pushing, I would have never set this record. Also, I'd like to say thanks to Jack and Joyce Patzold for their support for their witnessing this attempt, and for their calm acceptance of the tank puncture! Finally, thanks to my wife Jan, who puts up

with it all, and for driving.

The record was 140.67 miles, declared distance to a goal. That is, you must declare before launching where you will land. The mileage is measured via great circle distance. We actually drove about 163 miles.

The sunburn that I alluded to earlier was really quite serious. I never before really understood why there was "burn" in sunburn. By the time we got home, my entire face was blistering, and the next day it started caking up. I ate through a straw for a few days, and did not talk. My legs fared better, as Jan had sprayed them, but they came out striped!

Joe Wurts.



Bill Bland's gigant scale Fox at the Maddens Plains scale day last November.

Excuses Excuses.

Those who have been involved in RC soaring for a while may remember the Weston Aerodesign Company (WACO) of the USA and its very advanced competition sailplanes such as the famous and very successful Magic. WACO's proprietor, Frank Weston, was a pioneer of glass-on-foam construction using vacuum-bagging. Unlike any other manufacturer I am aware of WACO not only produced sailplanes in various stages of completion but also sold plans and instructions to allow customers to build these same designs from scratch.

WACO also published the WACO Technical Newsletter, which contained both a wealth of useful information, and some humorous pieces. Among these was a list of "Official Excuses" and a competition for imaginative stories making use of the list of excuses.

WACO has been out of business for years now and I have no idea how to contact Frank Weston. I am reproducing the following material, that appeared in the WACO Technical Newsletter of January 1994, in the firm belief that Frank would approve.

The Official WACO Excuse Table.

- | | |
|--|--|
| 1. The battery must not have been fully charged. | 21. It just popped off. |
| 2. I landed at the wrong end of the tape. | 22. The tow hook was too (short, long, loose, tight). |
| 3. It tip stalled. | 23. The tow ring was too (big, small, weak). |
| 4. I used the wrong transmitter set-up. | 24. I had too much (up, down, left, right) trim dialed in. |
| 5. The battery pack fell out. | 25. Space aliens controlled my mind. |
| 6. There was this big gust of wind. | 26. It was a downwind launch. |
| 7. There was sink everywhere. | 27. It was a crosswind launch. |
| 8. I was just sucked up into the cloud. | 28. The watch just stopped for no reason. |
| 9. Water got in the transmitter. | 29. It was a down cycle. |
| 10. I thought I was past the (parking lot, tower, tree line, fence, lake, rhino enclosure). | 30. I didn't have time to get it fully trimmed out. |
| 11. It didn't look like it was going that fast. | 31. There must have been a short somewhere. |
| 12. I was hit. | 32. I couldn't see the (plane, spot, winch line) because of the (sun, haze, shadows, alcohol, rain). |
| 13. Only one flap came down. | 33. They wouldn't give me a relaunch. |
| 14. The servo just died. | 34. They made me take a relaunch. |
| 15. The winch was too (strong, weak) for a good launch. | 35. The winch pedal stuck (on, off). |
| 16. The winch line is too (short, long, weak, heavy, full of knots) | 36. The winch drum was too (large, small). |
| 17. The winch battery is too (weak, heavy, expensive). | 37. The (fuselage, wing, wing rod, tail boom, elevator, rudder) was too weak. |
| 18. I had the servo reverse wrong. | 38. It didn't have enough control throw. |
| 19. The wing rod was the wrong size. | 39. The CG was too far (forward, aft). |
| 20. The landing area was too close to the (parking lot, tower, trees, fence, lake, rhino enclosure). | 40. The plane was too (heavy, light, ugly, deep in the ground). |

It Wasn't My Fault (Honestly)

By Bill Miller

If I had not crashed my number one Magic I cudda been somebody this year. That was the best plane I ever owned and the events that led up to the crash are burned into my mind like it just happened yesterday.

On that fateful day I decided to do a hand launch before taking her up on the winch because of some program adjustments I had made the night before on the radio. I chucked the plane and, to my horror, it went straight in nose first. Upon close examination I discovered that (excuse 4) someone had changed my transmitter setup

during the night. I've been chuckin' airplanes for umpteen years and there was no way it was my fault. The impact had caused the nose cone to split open a little bit, and it was loose on the fuselage, but not enough to fret about.

Right about this time the wind picked up and it began to drizzle. Not to worry. I corrected the setup and stepped up to the winch. She looked real good coming off a moderate zoom even though (excuse 26) it was a downwind launch and (excuse 9) I was having trouble

seeing it because of the rain. Suddenly without warning my plane pitched over into a dive and before I could respond it proceeded to do an outside loop. It was like (excuse 25) space aliens were controlling my ship.

At the top of the loop, going mach 1, I threw out the flaps in a panic and Magic stopped dead in her tracks. The nose cone went flying off and at the same time I shut the flaps. Into another outside loop! This time I pulled out at the bottom of the loop inverted whereupon (excuse 5) the battery pack fell out to be left dangling eight inches below the fuse like a high wire artist on a trapeze. I'm thinking this must be an elevator servo problem, or maybe (excuse 9) the rain is messing up my radio, but still the plane keeps flying out over by the far tree line inverted with the battery pack swinging below to and fro.

By now (excuse 32) I couldn't see the plane because of the rain but somehow I slowly force it into a shallow turn. Suddenly (excuse 6) there was this big gust of wind, or maybe it was wind shear, but to my dismay I found I was knife edge. It must have been the swinging battery pack acting like a keel that bought Ol' Nell back

to level flight because I couldn't see well enough to make that manoeuvre.

I was praying for some lift to give me time to think but (excuse 7) there was sink everywhere and Magic was losing altitude fast. I tried one final turn back towards me with the hopes of landing on the soft sod. Ever so slowly she responded. I thought (excuse 10) I was past the tress, but NO! The battery pack caught on an outstretched branch, disconnected itself from the switch harness, and was digested by a tree. Magic's heart stopped beating at the edge of the tree line inverted at 40 MPH. It still might have landed safely if there hadn't been a cross wind. Instead the plane gave one final shudder as (excuse 3) it tip stalled, rolled over on its side like a frolicking whale, and cart-wheeled itself into a ball of fibreglass and foam.

It wasn't pilot error or lack of skills. It certainly wasn't inferior equipment. It was simply that the Thermal Gods gave me the finger that day.

Hey, IT WASN'T MY FAULT.

Bill Miller won second place in the "World Wide Soaring Excuses Competition" for this contribution. Frank Weston declined to award him first place on the grounds that:

- 1). Bill crashed a Magic, and;
 - 2). He had seen Bill fly and considered that this story bore too much resemblance to his typical flying style.
-



A scale Wilga tug at Maddens Plains aero-tow day in December 2006.



HSL pilots Klaus Metzger, Guy Brand, and Brian Lindsay in action at Armidale (Fred Lodden photo).

Contest Reports.

Millennium Cup - Round 1. Werrington - 13 January, 2008.

Twenty six pilots competed in the first round of the 2008 Millennium Cup at Werrington.

As forecast the day was very hot with light winds. It was physically arduous with the temperature in the high thirties and the heat and sun were energy sapping. Despite the temperatures, in the morning the thermals were relatively weak and narrow. In the first few rounds there were some nasty sink patches and it wasn't until around midday that anyone was able to hook a strong thermal and get away to great height. Immediately after lunch stronger thermals were consistently present.

Unfortunately we had a few pilots bust up planes on launch (went off the air for no apparent reason - tow line wrapped around the wing) or got out of control/out of range, at distance.

We decided to try for 7 rounds but about half way through the final round the forecast afternoon storms

came over with strong gusty winds and a wind direction reversal. I was flying at the time and had decided to search for lift to the North of the field, but with the wind change I couldn't get back to the field and 'arrived' high up in a large tree. By then the CD had decided to call it a day as we would at least have needed to reverse the line direction to continue and conditions were now unpleasant. The wind must have dislodged my aircraft from the tree because by the time I went to locate it I couldn't see it any tree and I found it inverted on the ground in the grass, amazingly with no damage. I was lucky.

The presentation was held in rain and strong wind with thunder booming all around.

When the scores for the six completed rounds were tallied, the winner for the day was Colin Woodward. Congratulations Colin. In second place was Fred Lodden and in third place was Jack Murphy.

1st	Colin Woodward	2003
2nd	Fred Lodden	1930
3rd	Jack Murphy	1881

4th	Owen Pearcey	1868
6th	Peter Sikora	1765
8th	Ian Roach	1671
9th	Rebecca Richards	1602
10th	Brian Lindsay	1568
11th	Don Farrar	1550
12th	Ken Woodward	1483
14th	Klaus Metzger	1428
20th	Steve Zivkov	1088
23rd	Max Stone	1051

Fred Lodden.

Armidale Sailplane Expo.
Armidale - 26/28 January, 2008.

This year's Expo featured superb weather, a large entry, and close competition. We also had the good fortune to meet and compete against Joe Wurts, probably the best known and most accomplished glider pilot in the World. Joe has represented the USA in about a dozen World Championships, never finishing below sixth and winning both the F3B and F3J Championships, the only person to do so. He has also been extremely successful in thermal duration, hand launch, cross-country, and slope racing events. Joe has recently settled in New Zealand, so hopefully we will see more of him over the next few years.

The Expo covered a range of events. The biggest was, as usual, the Australian Thermal Glider event, which attracted 49 entries, not many fewer than we get at Jerilderie each June. There were also events for electric gliders and hand launched gliders. Electric glider was divided into two divisions, an open class with no limitations on the power system, and a limited class with restrictions on the type of batteries that could be used.

The rules for both thermal glider and electric glider required a ten minute flight in a twelve minute working time, with group scoring. This allowed electric and winch launched gliders to be flown together in the same groups. They were of course scored separately. As far as I know this has never been done before, but it worked very smoothly. A typical heat would consist of five or six thermal gliders and three or four electrics. There were eight groups in each round. The eighth group in each round had no electric gliders, which eliminated the possibility of an electric competitor having to fly two consecutive rounds and having no time to recharge his batteries. You could enter both electric and thermal glider and somehow the organisers managed to avoid any individual having to fly both classes in the same heat.

In the thermal glider event competition was extremely close. To illustrate this I can cite my own scores. At the end of the second day I had 4950 points out of a possible 5000, but was only in 13th place, not even in the top 25% of the field.

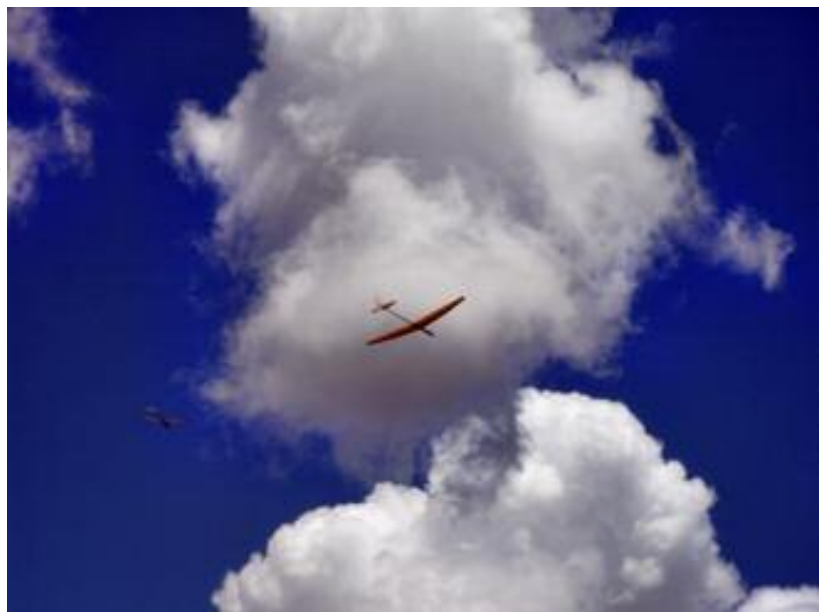
The thermal glider results were:

1st	Theo ARVANTITAKUS	7999	
2nd	Joe WURTS	7991	
3rd	Carl STRAUTINS	7979	
4th	Matthew LOWE	7969	
8th	Alan LOWE	7904	
9th	Jack MURPHY	7894	
13th	Bjorn RUDGLEY	7608	
14th	Ian ROACH	7491	
15th	Matthew PARTLETT	7405	
21st	Fred LODDEN	7178	
22nd	Rebecca RICHARDS	7157	
24th	Brian LINDSAY	7111	
26th	Guy BRAND	7070	
29th	Klaus METZGER	6969	
30th	Paul GIBSON	6410	1st RES
32nd	Don FARRAR	6269	
36th	Owen PEARCEY	5861	

Allan Mayhew took out the Open Electric Glider event with Shane Spoor top in the Limited Electric class. Joe Wurts won the Hand Launch event.

On the Saturday evening Joe presented a very interesting seminar in which he described his techniques for finding thermals and how he sets up his gliders. A number of competitors were out early next morning trying out some of his ideas.

Ian Roach.



A hand launched glider soaring in perfect conditions at Armidale.

Millennium Cup - Round 2. Berkeley - 10 February, 2008.

Although the weather on the day was not too bad heavy rain in the preceding days had flooded the field and made it unusable. The event has been rescheduled for June 15.

Heathcote Cup - Day 1. Maddens Plains - 24 February, 2008.

A very strong Westerly wind made launching difficult, and at times dangerous, during the morning. As a result only 11 competitors chose to compete. Several others attended but chose not to fly because of the conditions, while others did not fly in every round.

During the lunch break the wind moderated in strength and backed rather suddenly to the South East, providing much more manageable conditions and tighter competition. On the whole it was not an easy day and those who scored well deserve our praise and applause.

1st	Rebecca Richards	5836
2nd	Colin Woodward	5494
3rd	Alan Lowe	5481
4th	Jack Murphy	5480
5th	Fred Lodden	5079
6th	Drew Parkes	5019
7th	Ian Roach	4359
8th	Klaus Metzger	4263
9th	Ken Woodward	2875
10th	Brian Lindsay	2640
11th	Owen Pearcey	924

Ian Roach

Hunter Valley Championships. Muswellbrook - 1 March, 2008.

For more than a decade now open class competition has been dominated by relatively expensive hollow moulded sailplanes. For whatever reason this type of model has not achieved the popularity in the Hunter Valley that it has enjoyed elsewhere. Partly as a result of this the Hunter Valley Championships has, in recent years, not been well supported by the locals, and participation has been falling.

In an attempt to address this the organisers introduced a handicap system this year. The event was run to the usual Australian Thermal Glider rules with group scoring. However the target duration was six minutes for two metre span models, eight minutes for rudder/elevator/spoiler (RES) models, and the usual ten minutes for the rest. Flight scores were then multiplied by a

factor so that the pilot of a two metre model who achieved exactly six minutes, or of an RES model that achieved exactly eight minutes, would receive the same score as would an open model that flew for ten minutes.

This scheme appears to have been a success as, although there were only sixteen entries, this is an improvement on the past few years and more than half the competitors flew two metre or RES models.

The weather for the event was absolutely superb, with plenty of sunshine, very light winds, and excellent thermals.

In the end the moulded models still dominated. Moulded models flown by the five HSL members who attended took out five of the top six places, but a well flown two metre glider was able to place fifth.

1st	Rebecca Richards	4928
2nd	Jack Murphy	4821
3rd	Brian Lindsay	4784
4th	Klaus Metzger	4616
6th	Ian Roach	4364

Ian Roach.

Australian F3B Open International. Milang SA - 7/9 March, 2008.

Twenty three pilots from Australia, Germany, Indonesia, and Dubai competed in the fifth Australian Open F3B International, an event that also doubled as the Australian team selection trials for the 2009 World Championships. No HSL members competed.

1st	Tim Kullack	14707.46
2	Nick Chabrel	14690.42
3	Steve Keep	14601.64

Some outstanding times were achieved in Task C, the speed task, with five runs below 16 seconds and twenty below 17 seconds. The fastest time was scored by Steve Keep at 15.1 seconds.

Heathcote Cup - Day 2. Maddens Plains - 8 March, 2008.

For day two of the Heathcote Cup the weather was superb, with sunny skies, mild temperatures and light winds. The winds swung from ESE to ENE with thermal activity. Despite the good conditions only 12 pilots competed.

Unfortunately we had a few busted planes on launch due to reversed elevators, caught out by the crosswind or just inexplicably went off the air.

The gap between 1st and 2nd place today was just 5 points out of more than 5800. It was very close.

Congratulations to Colin Woodward who took out first place. In second place was Rebecca Richards and in third was Fred Lodden. Max Stone took out 1st place in the 2m class.

1st	Colin Woodward	5840
2nd	Rebecca Richards	5835
3rd	Fred Lodden	5831
4th	Alan Lowe	5756
5th	Ian Roach	5637
6th	Jack Murphy	5634
7th	Brian Lindsay	5318
8th	Klaus Metzger	4414
9th	Peter Sikora	4052
10th	Drew Parkes	2928
11th	Max Stone	2580
12th	Les Morris	2471

Fred Lodden

Heathcote Cup - Overall Results.

The Heathcote Cup is awarded to the pilot who achieves the highest combined score over the two days. Each day's scores are normalised before being combined, so the maximum possible combined score is 2000.

1st	Rebecca Richards	1999
2nd	Colin Woodward	1941
3rd	Alan Lowe	1925
4th	Jack Murphy	1887
5th	Fred Lodden	1867
6th	Ian Roach	1712
7th	Klaus Metzger	1486
8th	Brian Lindsay	1363
9th	Drew Parks	1361
10th	Peter Sikora	694
11th	Ken Woodward	493
12th	Max Stone	442
13th	Les Morris	423
14th	Owen Pearcey	924

HSL Club Competition - Round 1. Maddens Plains - 6 April, 2008.

A South East wind produced long periods of low cloud when safe winch launching was not possible. When there were breaks in the cloud the soaring conditions were surprisingly good, and many excellent flights were made. Even during these good periods all soaring had to be done downwind of the field to stay in clear air.

In the end the low cloud cost us too much time and the competition could not be completed.

Millennium Cup - Round 3. Queanbeyan - 13 April, 2008.

We had a great days flying at Queanbeyan this year.

Upon arrival at the field at 8am it was very dark and gloomy with heavy cloud and with steady rain falling. Things looked quite socked in and it didn't look good for running a gliding competition. However by 9am the sky to the West showed some blue patches and indeed the cloud in the vicinity of the field was beginning to thin.

We set up the equipment, assembled aircraft and had a pilots briefing at 10:15 and got underway shortly after with 18 pilots entered. At this time the sky was almost cloudless. The top surface of the field dried up quickly and the wind was very light and variable mostly from the SW. The weather was great for most of the rest of the day.

We skipped lunch and finished flying the 6th round at around 1pm as another band of nasty weather was approaching from the SW. This weather duly came over the field and it was raining as the presentations were happening.

The round was won by Paul Gibson. Congratulations Paul. In second place was Brian Lindsay and Klaus Metzger took third.

1st	Paul Gibson	1954
2nd	Brian Lindsay	1941
3rd	Klaus Metzger	1876
4th	Jack Murphy	1854
8th	Les Morris	1671
9th	Ian Roach	1668
11th	Fred Lodden	1439
14th	Max Stone	1368

Fred Lodden.

HSL Club Competition - Round 2. Maddens Plains - 20 April, 2008.

This event was cancelled due to rain.

HSL Club Competition - Round 3. Maddens Plains - 18 May, 2008.

The weather forecast looked so bad that it was decided to call off this event the day before. In fact the weather was not as bad as expected, though it was very far from perfect.

I cannot give a rational explanation of why it should be so but, during my nearly 20 years as an HSL member, the Club Competitions have been affected by poor weather to a much greater extent than any other event in the calendar. This year is no exception with, so far, all three scheduled rounds being cancelled.

Millennium Cup - Round 4. Salt Ash - 25 May, 2008.

Twenty seven pilots had a great day of two metre glider competition at the NACA field at Salt Ash, just North of



Fred Lodden put together this composite panoramic view of the action at Salt Ash.

Newcastle. It was the first time a Millennium Cup round had been flown at this field, and it proved to be very suitable.

The weather was superb, sunny at first, clouding over a little towards midday and clearing after lunch. There was a very light wind from the SW (perhaps only a couple of knots) and most of the time the tell-tales were hanging almost vertically.

It was great to see some of the local fliers from NACA having their first experience of Millennium Cup flying.

Despite the number of entrants, we were able to comfortably complete six rounds of flying by 2pm, even with a break for lunch. The retriever was doing a great job of returning the parachute quickly. Most of the time there was a queue for launching and many times we had

between four and six aircraft in the air at one time, so things were ticking over sweetly.

The winner on the day was Brian Lindsay. Congratulations Brian. In second place was Rebecca Richards and in third place was Fred Lodden.

1st	Brian Lindsay	1972
2nd	Rebecca Richards	1894
3rd	Fred Lodden	1852
5th	Jack Murphy	1798
8th	Ian Roach	1741
10th	Klaus Metzger	1693
11th	Les Morris	1682
14th	Don Farrar	1541
25th	Max Stone	1290

Fred Lodden.



A group of pilots wait for their turn to fly at Salt Ash.

Dates To Remember			
June	7-9	LSF Tournament	Jerilderie
June	15	Rescheduled Millennium Cup - Round 2	Berkeley
August	24	HSL Club Competition Round 4	Maddens Plains
September	21	Limited Electric Glider	Berkeley
September	27-28	2m Glider Millennium Cup Round 5	Cowra
October	19	2m Glider Millennium Cup Round 6	Maddens Plains
November	2	HSL Club Competition Round 5	Maddens Plains
November	9	Shoalhaven Shield, 2m Glider Millennium Cup Rd 7	Bomaderry
November	16	HSL Club Competition Round 6	Maddens Plains
November	23	Scale Aero-tow Gliders	Maddens Plains
December	7	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.



Joe Wurts used this Supra (the moulded version) to take out second place in the open glider event at the Armidale Sailplane Expo.

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