



# HAWERA AERO CLUB NEWSLETTER

IT'S YOUR ATTITUDE THAT COUNTS

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<b>Secretary</b>	Doug Gray
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Ralph's been very busy and hasn't been able to write his usual note for the newsletter but he did attend some of the Flying New Zealand AGM so he will be able to share some of the wisdom that was discussed there. The weather hasn't been all that wonderful for flying but to appreciate the good I guess we need to experience the bad! The Avgas fuel price has increased a further 12cpl which makes a 35cpl increase since we last increased our flying costs. We haven't at this time increased our flying rates but if the fuel costs continue to rise we may have to pass this on. We have however increased our outside sales of avgas price, it is now \$3 per litre.

A reminder that we now have a social evening at the Aero Club every Friday night with everyone welcome, it's a BYO as the club doesn't have a licence. It's pretty casual event.

The our Aero Club's AGM is on the 21st August and all members are welcomed and encouraged to come along. It's your chance to put your input in to how you would like our club to progress into the future and if you would like to join the committee. The application forms will be placed in the club within the next month so you can have it all ready even if you are unable to make the AGM.

Our flying hours are continuing to be high with a 60% higher number of total hours this month compared to the same month last year, and most of those hours were in Hawera as New Plymouth did not hire our plane much recently. UNB also have a large increase on last year with a 55% increase. The Tecnam has the greatest increase with a 72% increase in the number of hours flown, keep up the good flying.

Julie Ingram

## MASTERTON FORMATION ARRIVING AT DANNEVIRKE DAWN RAID



# NEW MEMBERS

We have a number of new members this month. We at Hawera Aero Club would like to welcome and introduce —

**Jacob Northcott  
Mark Wentworth  
Chad Scrivens  
Graham O'Brien**



[www.flyingnz.co.nz](http://www.flyingnz.co.nz)

See our Newsletter online on FlyingNZ website.

## AIRCRAFT PROFILE

### PIPER J-3 CUB

The Piper J-3 Cub first flew in 1938 and was an updated version of the earlier J-2. With the outbreak of World War Two the J-3 played a major roll in the Civilian Pilot Training Program (CTPT) as the primary training aircraft with over 75 percent of all new pilots learning to fly in one.

Piper developed a military variant called the L-4 or "Grasshopper" and was extensively used for reconnaissance, transporting supplies and medical evacuations.

After the War the J-3 Cub continued teaching pilots to fly and to this day thousands are still registered to Flying Clubs and Private owners throughout the world.

Piper sold over 19,000 J-3's between 1938 and 1947 and are still very sort after for their simple flying qualities and low basic operating costs.

The J-3 Cub has a wing span of 35 feet (10.7m), an empty weight around 765lbs (345kg) and an Max Takeoff Weight 1,220lbs (550kg). Power comes from a

small Continental 55-65hp flat four air cooled engine that produces a cruise speed of 75mph (121kph) for a range of 220miles (354kms)

There are numerous companies in the US and abroad selling construction plans and kit components for the J-3 as well as other companies like Cub Crafters and American Legend Aircraft modernising and up rating engine sizes selling fully airworthy aircraft, these are proving very popular in today's Light Sport Aircraft licence in the US.

Over the years there have been 7 certified J-3 Cubs registered in New Zealand and 2 experimental Wag-Aero Cuby's plans built replica's, their future in New Zealand and around the world looks very positive.



**What's Coming up!****July 6****Tail draggers Day  
Hawkes Bay and Eastcoast Aero Club  
Bridge Pa****July 12****Marlborough Aero Club  
Aviation Ball****July 20****Scott's Trophy in Wanganui****August 1-3****Brass Monkey FlyIn  
Nelson Lakes (NZLE)****August 3****Breakfast Fly In  
Hastings****August 17****Manawatu Breakfast Fly In  
Feilding****August 24****Wairarapa & Ruahine Breakfast Fly In  
Hood Aerodrome Masterton****October 18-19****Tiger Moth Club annual Spring Fly-In  
Taurarunui****Labour Weekend****October 25-26****New Plymouth Aero Club 80th  
Anniversary Celebrations****November 1-2****Black Sands Fly In  
Raglan - No Beach Landing**

The event diary has filled up dramatically since the last newsletter, when we went to the Dannevirke Dawn raid last month they announced a further three breakfast Fly In's. Unfortunately the Hastings Fly In is on the same weekend as the Brass Monkey at Lake Station. We still have no confirmed date for the Foxpine Fly In and will likely be later than usual maybe September?!?

As mentioned the club flew to Dannevirke on Sunday June 15th for their annual Dawn Raid. I won't go into it to much as I am hoping to get someone to write an article on the trip, but I have not yet asked the person. I have never been to DV dawn raid before and it was a great day, besides a hitch with the Tecnam when I was about to leave. They are all very welcoming there and are waiting for us to host a Fly In, so one day....

We have had a number of regulars join us for the regular Friday night at the club. One night we had too much food with pizza and two scopes of chips. Some nights we watch flying videos others just sitting around the fire discussing upcoming trips or previous flights. Remember everyone is welcome, partners included.

The next Scott's trophy is July 20th in Wanganui, we'll planning to fly out of Hawera about 7.30am, so if you would like to be part of the team, get in touch with me or Amelia. Also if you would like to go as a spectator we should have room in the planes for that too.

Keep in mind the Scott's trophy after this one will be in Hawera and we will need volunteers to help with the marking grid and cooking breakfast, everyone that's available would be appreciated.

**BRASS MONKEY** Yay, I am getting excited about this trip, it was such a lot of fun last year, its such beautiful scenery down through the Wairau valley. I hope all the club members are hoping for good weather for our trip.

The regionals are in Tauranga this year so we need to put up a fighting spirit, in the next newsletter I will put in the list of competitions so that you can decide what you would like to do and start practicing.

If you would like to suggest a club trip or event let us know and we can arrange it, it doesn't matter if you are only a student, we can utilize the clubs PPLs or even instructor?!?

If you would like to contact me, you can email or ring me.

**Email** jaingram@gmail.com

**Cellphone** 021 150 2351

Julie



## Acro Sport II ZK-CAW

I am writing this the day after flying to Dannevirke in CAW to attend their annual Dawn Raid. After seventeen years of construction by our family, and a few different career



**ACRO BASIC WING STRUCTURE - CONSISTING OF SPRUCE AND PLYWOOD**



**FIRST ROLL OUT FROM THE WORKSHOP  
PAT AND LES ASSEMBLING CENTRE SECTION**

changes, rebuilding Aerosport Scamp LDD and having completed most of the test flight time, I had my first decent opportunity to enjoy the final process, which started with cutting, forming, steel, wood and aluminium into a real live flying machine.

I will not bore you with construction details or the nuts and bolts stuff that goes into “plans building” a biplane, but all this started with a dream when I was twenty years old and my family wanted to be part of it too. The plans and Builders Manual were purchased from Acrosport Inc of Wisconsin, USA in 1988. I had completed an electrical apprenticeship and was looking at finally building me a biplane. The Acro 2 was



**WITH THE WORKSHOP DOOR OPEN THE NEIGHBOURS ALWAYS HAVE SOMETHING TO TALK ABOUT**



**NEVILLE IS ALL SMILES AFTER HIS FIRST FLIGHT**

performance of this biplane far exceeds my expectations.

Shortly after starting the wing ribs, Bill Harris of Napier put this Acro project on the market. After discussions with the family we purchased a lot of steel, wood and a partially welded fuselage. I was optimistic, thinking this should take six-to-seven years to complete. Well, I was only wrong by a decade.

Some of the highlights of CAW construction were – finishing the first wing rib, which consisted of 46 individual parts, thinking there’s only 43 ribs to go. “that shouldn’t take too long!!” – rolling the fuselage outside for the first time on its wheels then making engine noises – finishing the fabric covering of the





Photo: Les Sword

airframe, hoping another year should see this baby looping and rolling amongst the clouds. I was always trying to think positive.

We only made a couple of changes to the original design. The first being the installation of a “Grove Aircraft” one piece aluminium undercarriage, which has worked out well, and secondly, the installation of a smoke system. That has been a lot of fun, blowing smoke rings in the sky!

The engine came out of a Cessna 172, and is 160hp, with a few changes to the accessories. The major change being the installation of a “Lightspeed Plasma II dual electronic ignition system” ie no mags. The engine runs very smoothly, with plenty of additional power.

I have logged all the hours spent building the Acro 2, also keep a note of the cost, and maybe one winters day I may go through the builders log to tally it all up, but somehow, I doubt it. I don't really need to know.

If you are thinking about building an aircraft, be it from plans or a kit, New Zealand is one of the best places in the world to do so – OK, the prices are increasing, but so is the price of a block of cheese! There is plenty of knowledge locally, also the CAA are there to help you achieve your dreams.

There are so many people who were involved with the construction of CAW, some of them not with us now. To all of those who helped shift, hold, weld, paint, inspect etc, a heart-felt thanks from our family. To those of you I kept hassling for help, advice and ideas, thanks for being so patient and we hope to share CAW with as many of you as possible.

The flight to Dannevirke was CAW's first ever cross country and it went great. Looking over our amazing countryside, then looking at those four wings you built yourself at home, life gets put in perspective, and its all good.

The last time CAW flew out of Dannevirke was in 1981. My Dad was flying it then – it was a Fieldair DC-3, now its on Acrosport 2 – it was a special moment.

Les Worsley



## Queens Birthday weekend 2008

Since I joined NZ Association of Women in Aviation (NZAWA) three years ago I have thought of attending their annual AGM and Fly In which can be anywhere in the country.

This year it was held in Blenheim or more to the point Omaka in the south Island. It



was a great venue, as it wasn't an commercial airport with regular airlines but it was also very close to Woodbourne which is a military base which is Blenheim National airport. I took my Father and Les Worsley along for the weekend. The weekend started on the Friday but we decided to travel down on the Saturday morning and what a great day, we were up early and left Hawera at about 7.30am. Once we were airborne we could see a fog layer extending from Stratford, North. But to the south the weather was gorgeous.

We flew from Hawera to Blenheim along the coast without any stops and arrived there at just before 9am, very good timing as the competitions hadn't started so we weren't invading! Blenheim has lots of things to do, but some of the things that are "Must do" are doing a wine trail of some of the 49 wineries in the area, the other is visit the Aviation Heritage Centre, We did both.

That night the NZAWA had organised a quiz night so after dads two dinners we joined in, I won't say where the team I was in came, but it was a lot of fun and well organised.

Sunday dawned, to average wx. We had planned on having a little trip to see the local area. So we set off at about 10.30



to head down the coast to Kaikoura, we stopped, paid our landing fees and decided to head into town to have some lunch. We checked out the local aero club (not as busy as our club), the local instructor informed us of some of the action on the field like "The Iron Cloud" which regularly comes in in the morning and the afternoon.

We got a taxi into town, \$20 each way and had a good lunch before returning to the airfield to make tracks inland towards Hammner Springs.



As we neared Hammner Springs airfield and entered the valley we had discussions about where the airfield was with Les looking a little too far a-field.

Looking at the field from above, it looks a bit interesting with the trees on either side but as we came into land the strip was not as narrow as it looked and the trees were not a problem. We had a look around, took some photos then paid our landing fees and were off again, we wanted to be heading off before the wx headed in. We had three options of departure, the way we arrived, following the Clarence river to the Wairau river or the route we took, along the Awatere river to travel along the Molesworth Station.

After tying the plane back down at Omaka and getting a ride back to the motel, we had to get ready for the main meal.



With guest speaker Tim Sullivan, who flies some of the biplanes and triplanes from the aviation heritage centre, a great speaker with some great photos.

Monday morning and we awoke to the unpleasant fact that the weather forecasts were right, the wx was miserable.

But after looking at the wx on [ifis.airways.co.nz](http://ifis.airways.co.nz) we decided now was a good time as any, we sent off. We were back in Hawera at 2pm. We had a great weekend and saw lots.

Julie Ingram

Last date to send in articles for  
next months newsletter is  
**Thursday 24th July**



## The evolution of aircraft engines - Part II

Guy Oakley

### The engines of today

The engines found in the aero club planes can trace their design back to the 1940's. The rather basic design of a relatively large displacement running at low revs, direct drive to the propeller with simple air cooling and lightweight construction.

What is new out there for those seeking a different powerplant?

Motor vehicle engines have been undergoing development over the last 50 years. At the end of the second world war most auto engines had pushrod operated side valves, cast iron blocks, carburetted and were unreliable. Currently most cars would have an all aluminium engine, double overhead camshafts, fuel injection are quite powerful and many manufacturers are offering 3 year warranties. Engine failures today are uncommon.

The slow revving air cooled VW engines have been used in aircraft for many years. The low revving nature of these engines means that no prop reduction gear is necessary in many of these engines for aero use. However larger displacement engines that are higher revving may need PSRU fitted. An intriguing development of the VW aero engine is the half VW concept. Here a two cylinder variant is used to power microlight aircraft

The 4 and 6 cylinder Subaru engines have been adapted for aircraft use. These all aluminium engines are in a flat configuration and one company, Eggenfellner, has made a successful aero engine from the six cylinder engine giving 200 hp in normally aspirated form or 220 hp with turbocharging.

Another car engine that is showing promise as an aircraft powerplant is the Mazda rotary engine as seen in Mike Jones's aircraft. This engine has a number of desirable characteristics. The main one is its favourable power to weight ratio ( about half the weight of a conventional engine for the same power). These engines seem to possess all the desirable characteristics mentioned earlier in this article. They are light, powerful, simple, and have a small frontal area. Some of the articles I have read have maintained that because the steel rotor expands less than the aluminium housing, seizures are unlikely. I guess we will have to wait and see how these go in testing.

Generally car engines adapted for aircraft use have a number of disadvantages.

They require some form of reduction gear to



**Delta Hawk Engine**  
2 stroke with 160HP in non turbocharged & 200HP in Turbo

slow the prop to useful revs.

They are usually liquid cooled which adds another level of complexity.

Most car engines run at less than half their rated horsepower. The demands of flight would mean that they would be running at close to their maximum power.

### Diesel engines

Diesel engines were first used in aircraft by the Germans during the second world war.

Because of their reliability and long intervals between services they are again being looked at for aircraft use. Turbocharging and better fuel injection techniques have meant that diesels are producing equivalent power to their petrol powered cousins. Currently Delta Hawk, Thielert and others are offering engines for aircraft use.

Diesels require no spark so there is no magneto and there is no danger of interference with the electronic ignition due to external influences.

The general direction diesels are taking is that they should be able to run on jet fuel. There are a number of reasons for this

Jet fuel is widely available as opposed to AVGAS. Many diesels are not particularly fussy about their fuel and will run on kerosene or diesel

It is cheaper.

No lead.

A given volume will offer a greater endurance than AVGAS

Two strokes.

These engines used to be dismissed as being too unreliable and too thirsty for aircraft use.

However marine development of two strokes

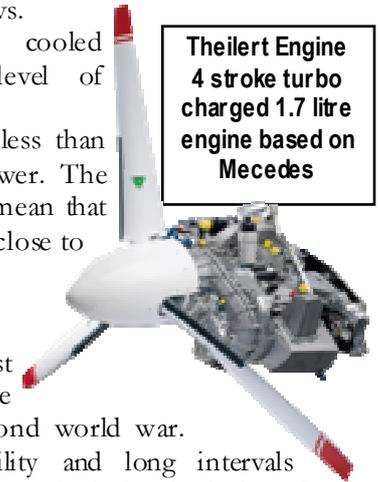
have resulted in very reliable engines which coupled with direct oil injection and fuel injection have made significant progress. Two strokes have the advantage of fewer moving parts, more horsepower for a given displacement than a four stroke, consequently they are lighter.

Manufacturers such as Rotax and Hirth offer two stroke engines for aircraft use. One emerging development is diesel two strokes for aero engines.

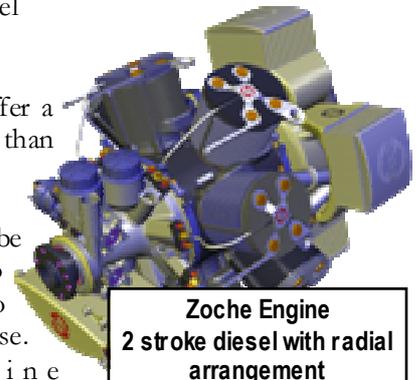
### Summary

It would appear that post war there was some stagnation in the development of small engines for aircraft application. However the rapid development of car engines and the revival of GA flying has seen considerable activity recently to produce new powerplants for light aircraft.

**Thielert Engine**  
4 stroke turbo charged 1.7 litre engine based on Mercedes



**Zoche Engine**  
2 stroke diesel with radial arrangement



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