

# AGC Weekly News

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## The Dimona GCB

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Ian Williams

With the apparent shortage of interesting stories for the weekly newsletter, I thought the

background about this motor glider would be of interest to some readers.



GCB at Omarama

Actually, this story is in two parts. The first part relates to GCB (which I will try and keep short but probably won't) and the second part is the acquisition of the current rebuild from Australia, which is really quite entertaining. That will have to wait for the next edition, provided the editor doesn't bin it.

So, to the Dimona GCB

I first heard about this aircraft when doing a Class 2 NZG engineers' course at Hororata with Roger Harris, quite a few years ago. Roger talked about it as he had previously carried out some superficial fiberglass work on it. It was in Greymouth, owned by a bloke called Dave, an Engineer there. At the time I was in the Grob 109 syndicate (GOC) and had recently completed quite a significant refurbish on it, so the whole motorglider concept really appealed to my personal kind of aviation passion.

Around that time, I had a client in Karamea to visit, so I figured that a slight detour to Greymouth was possible, really just to take a look. Having previously flown a Dimona in Australia (VH-GIX), my interest had already kicked off.

Swinging by Greymouth airport, sure enough, in the back of a hangar was this forlorn looking Dimona - in bits. It had been parked there for around 20 years and looked like it. However, a close inspection did not reveal any significant structural issues. There were quite a few superficial dings and the engine smelt like a 100-

year-old Model A Ford – that is, a mixture of old grease and oil, combined with a smell of mouse turds and dust.

To give you some background; this Dimona (S/N0 3537; Thai no 537) was one of 10 purchased by the Royal Thai Air Force in 1982, for initial cadet training. They had been in service for approximately 10 years. However, GCB had an apparent engine failure and landed in a paddy-field, damaging the undercarriage. This was a year prior to the others being taken out of service. We didn't know it at the time but the Limbach L2000 engine had been sent back to the factory in Germany and had been overhauled.

On disposal, nine of the 10 were purchased by an Aussie and relocated to a warehouse in Brisbane. The 10<sup>th</sup> remained in Thailand as a museum display. Of those nine, one went back to Germany, one to the USA, and of course GCB to New Zealand. The rest remained in Australia. Interestingly, the two Dimona's I brought back from Aussie were also ex Thai Air Force (VH-GNW and VH-WVW).

So, to cut a long story short, I offered to restore it for the owner for a set sum, less materials, as I really wanted more fiberglass work experience, which he accepted.

After a year or so the owner developed some significant health issues and asked me if I would like to buy it. So that is when Tony Noble, Conal

Edwards, Jonathan Cross and I became ¼-shareholders.

Back to the story – a few weeks after my first visit, and sweet-talking the Club into borrowing the PW-6 trailer, I saddled up my trusty Toyota Hilux and proceeded to Greymouth. Loaded all the bits - engine and prop in the back of the truck, wings flat on the trailer, fuse on two brackets bolted to the trailer (yep, I was responsible for those four holes!) and the tailplane on the roof rack, we set off back to Auckland. Interestingly, driving through the night to Blenheim, taking the back route via Tophouse and St Arnaud, and just passing the gate of the Nelson Gliding Club in the middle of the night, the trusty Hilux clicked over exactly 500,000 Km!

The restoration took about four and a half years of essentially part time work, during which I really learnt a lot. There was a lot of support and help from various people. Two that stand out are Ron Simmons (with painting and finishing) and Allen Trump, who redesigned the engine cooling baffles. Allen's work resulted in the engine running much cooler than the original design. Their input was highly valued.

Sailplane Services also carried out some fiberglass repair work as well as the replacement of all 10 sets of the linear aileron push rod bearings - not a five-minute job. To expand that somewhat, GCB was an early production Dimona where the "up" aileron control put the aileron push rod in tension. At cruise speed, both aileron's combined "up" load is surprisingly high, resulting in the aileron push rods being subjected to an increasing compressive load. To overcome this, five linear bearings are used in each wing to try and keep the rods straight under this compressive load. Later aircraft were changed so this load is in tension, so only three linear bearings are required per wing.

As a further complication, each aileron bearing set in GCB consists of three ball bearings in a housing around the push rod. These bearings are contained in an entire outer bearing ring made from nylon. Maybe OK initially, but nylon absorbs moisture and over its time in the Thailand heat and humidity, all 10 of those bearing sets had expanded and seized. Fortunately, a complete replacement set was obtained from Diamond Aircraft and installed by Sailplane Services.

Corrosion was also an issue I had to address, as the aircraft had spent many years operating close to the sea. This was mostly surface corrosion on

metal fittings requiring them all to receive the full treatment.

The engine has an interesting story. When I picked it up, it really looked disgusting externally. However, after taking a few bits off, the inside looked new and unused. With the help of the Thai restaurant owners in Papakura, translation of the military documentation confirmed that indeed, the engine had been overhauled in Germany. This was later confirmed by Limbach. All this included a major introduction to the delights of Thai food as well!

The Hoffmann three- position prop was well past its calendar six-year life, though still in its packing crate. This therefore had to be sent to the Australian service dealer for re-life - not a cheap event, but eventually all done and attached.

One interesting engineering issue became obvious - any type-certified aircraft has to comply with its Type Certificate. However, if said aircraft is supplied to a military organisation, said military have no requirement to ensure type certificate compliance. So, putting said aircraft back into civilian life, it's a real mission to ensure compliance because generally there is no detailed documentation of various mods carried out while in military service. This means EVERYTHING has to be checked for compliance. Not only applicable AD's and Service Bulletins but the whole aircraft structure and fittings. GCB was no exception, however, there will be more about that in the next Aussie epistle, which will probably raise some eyebrows.

Finally, the great day came where David Gill from the CAA inspected it, signed it off and a successful test flight ensued.

Since that time it has completed just over 500 hours and flown from North Cape to Omarama. There have been many trips to the South Island and a few to Napier, Bridge Pa and Hastings.

It is an interesting little rocket. A real plus is its low-speed stability, so in gliding mode it flies and feels just like any glider. A gentle stall at under 40Kts is really a non-event. No tendency to drop a wing violently, just an increased rate of descent, so thermalling at 45Kts works well. Best LD of 27:1 is at 51Ks. Visibility is excellent and the seating position is very comfortable. For cross country flying it will thunder along at 90Kts, burning around 13 L of 95 octane Mogas. It holds 80L so theoretically giving a six hour duration with engine running. I have flown from Drury to Ashburton non-stop, but the red light was starting



to flash before touch down. With the adjustable glide angle control in the full forward position, it will move along at 100Kts, but use a bit more fuel.

It has been on and off the Douglas Road strip a few times, ridge soaring the west coast with engine off and prop feathered, quite a number of times. On one trip from Rangiora to Nelson, I inadvertently pinged the upper airspace at 10,500

feet around St Arnaud - Airways were very understanding though .

All four of us in the syndicate have had some really interesting cross country flights, any one of which can be a story in itself.

Still on my wish list is to fly it from Drury to Matamata using less than 10 minutes of engine time.

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## ***Flying Early in the Day***

*By Roy Bourgeois, courtesy Wings & Wheels*

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*This article, submitted by Russell Thorne, contains interesting suggestions which could be useful in getting away from Drury before there are*

*visible indications of lift. There are also links into the explanation of RASP information of which we have few experts.*



*Interested in setting distance records, doing very long OLC flights, or getting the maximum mileage out of a day predicted to end early? Then it will help to learn to take the earliest starts possible*

### **Part 1**

#### **Getting an Early Start**

I got a lot of positive feedback on the articles about flying in special circumstances (under an

overcast and flying in the blue), so I thought some XC pilot readers might appreciate a few ideas on other XC circumstances that don't get a lot of articles or written discussion. So, what follows is a two-part article with the first part on soaring early in the day and the second part on flying late in the day.

If all you are interested in is competition, where we usually fly a three-hour speed scored event in

the meat of the day, you probably don't need to learn how to plan a flight with a launch very early in the day. But if you are interested in setting distance records, doing very long OLC flights, or getting the maximum milage out of a day predicted to end early, then it will help to learn to take the earliest starts possible. So, let's talk about starting tasks very early in the day.

### What kind of morning is it?

The first step in an early start is figuring out what kind of soaring morning it is going to be. For our purposes, we can generalize into two types of conditions in the morning of a predicted good day - and our strategy is different depending on which type of day it will be.

### Deep Morning Inversion

The first type of day is one with a deep early morning inversion layer above the ground (determinable by the presence of an obvious low-level haze or dust layer, or by a tow pilot report that the morning air is "dead" or by a knee shaped reverse angle in the Skew-T chart temperature line just above ground altitude). [Most of the modern online soaring prediction products have localized Skew-T charts available and if you need help learning to read one and determining the trigger temperature, try this source: [http://flsc.org/portals/12/PDF/Read\\_Skew\\_T.pdf](http://flsc.org/portals/12/PDF/Read_Skew_T.pdf) ] These mornings require the surface temperature to heat the air to a trigger temperature where the surface air as builds up a buoyancy pressure that finally gets strong enough to overcome the inversion. Such days start a little later and have characteristic thermals that begin strong and go fairly high once they start. Not much useful happens before they start. Our strategy on these days is to be airborne and ready to climb when the trigger temperature is met, so that we catch the first thermals. Monitoring the surface temperature before launch (and launching when - or just before - that temperature is reached) is helpful here, as is watching for haze domes, variable surface breezes, and initial cumulus formation. We want to be in the air when those things start happening. These are the mornings that you might consider adding a little ballast if you would normally fly with it - because the initial thermals are pretty good. More on ballast later.

### Little to No Surface Inversion

The second type of morning we can encounter is one where there is little to no surface inversion so that the sun warming the surface causes buoyant thermals to rise early with no inversion to retard them. These days start clear without haze or dust and have characteristic thermals that start early, cycle fast, and progressively grow in height, duration and strength as the morning progresses. Each thermal will be better than the last one. These days also have the advantage of substantial "thermal density" - meaning that although the thermals are low there will be more thermals in a given flying area and so we don't need to glide very far to reach the next thermal. Our strategy on these days is to launch as soon as we think we can sustain soaring flight (our clues are trigger temperature, light/variable breezes on the ground, low level soaring birds, haze domes, and initial cumulus formation), and we fly "low and local" until the thermals bring us to an altitude where we are comfortable starting the task - weighing our personal margins, the land out options, the increased thermal density, cumulus clouds on course and the task layout technique discussed below. Because we all weigh those factors differently, determining exactly when to decide to start the task will be different for each of us. But we have put ourselves in a position to start as early as we are comfortable doing it.

What topic do you want to see in an upcoming newsletter? Email us [sales@wingsandsheels.com](mailto:sales@wingsandsheels.com)



Roy Bourgeois is a well-known US and South African glider pilot who serves as the Chief Pilot for the Greater Boston Soaring Club. He has held several US national records, competed in many US and Canadian Nationals, and has flown over a quarter million XC kilometers in his 4200 hours of gliding. He can be reached at [royb@bw.legal](mailto:royb@bw.legal)

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## Please Help!

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Adam Cumberlege is searching for the clubhouse/caravan portable phone and docking station (not a "mobile"). This is the phone with a

long antenna. If you have inadvertently picked this up, please let Adam know ASAP [acumberlege@gmail.com](mailto:acumberlege@gmail.com)

## Gerard Robertson's Latest YouTube Picks



<https://www.youtube.com/watch?v=EEY668NKmdo>



<https://www.youtube.com/watch?v=28QZPF0KKM0>



<https://www.youtube.com/watch?v=4WRI0qA-tOg>






<https://www.youtube.com/watch?v=2STYKloEjic>

## Weekend Weather

Gerard Robertson

Hunua

9 September 2021

<p><b>Friday</b></p> <p>10 SEP</p>		<p>A few showers. Rain developing in the evening, heavy with possible squally thunderstorms. Northwesterlies becoming strong late morning.</p>	<p>▲ 18°C</p> <p>▼ 9°C</p>
<p><b>Saturday</b></p> <p>11 SEP</p>		<p>Morning showers, clearing to partly cloudy weather. Southwesterlies, strong in exposed places, easing by afternoon.</p>	<p>▲ 16°C</p> <p>▼ 6°C</p>
<p><b>Sunday</b></p> <p>12 SEP</p>		<p>Partly cloudy. Winds turning northwest.</p>	<p>▲ 17°C</p> <p>▼ 8°C</p>

Special thanks to Ian Williams for taking the trouble to pen an article on the Dimona.

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