OUTLANDING

The Taupo Gliding Club's Newsletter

Inside this Issue....

July - August 2023

Welcome everyone to another edition of Outlanding. Spring is here! Which means summer is knocking on the door. We have seen some good early soaring flights in the last few weeks indicating that we should be in for a good summer, so come out and play.

There will be a mandatory pre-season briefing on the 23rd of September for all flying members' starting at 1200. After flying for the day there will be a Potluck dinner so celebrate the start of the soaring season and welcoming daylight savings. Mark this on your calendar.

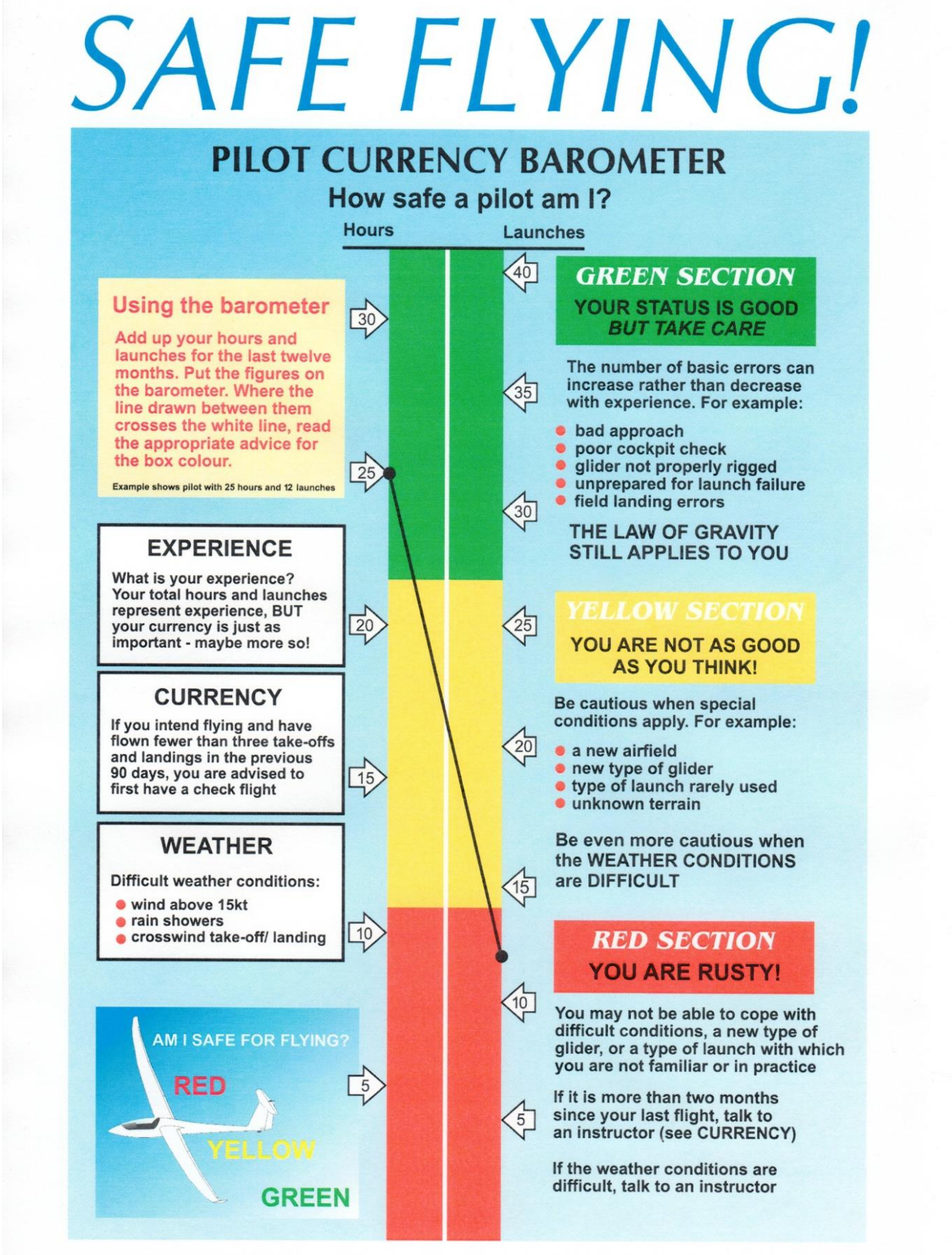
If anyone has an article or notification to be included into the next newsletter, please have it to Trace by 20 September 2023.

Fly well and have fun!

Cheers, Trace

CFI Report *by CFI Colin McGrath*

We are fast approaching the soaring season and for a lot of us, there has not been a lot of flying over the last few months. This barometer is a good indication as to where your flying ability will be. Remember, if you are a post Solo pilot but do not hold a Cross Country rating you will need a check flight if you haven't flown within the last 28 days. If you are a cross country pilot and you have not flown within the last 90 days, you will need a check flight.



Learning to Fly for the THIRD Time *by Rob Lyon*

The first time I learned to Fly was in 1994 at the Auckland Gliding Club. I got the "flying bug" pretty hard and managed to get my QGP within about a year.

The second time I learned to fly started in 1998 when I joined the Rotorua Aero Club and started to fly Power Planes. But it really didn't grab me and I took a little longer to get my powered PPL. I took quite a long break in fact. But I finally got back to power flying in around 2018 so it took me well over 20 years to learn to fly the second time around.

But this is the story of learning to fly THIRD time round ….

Many club members will know that I spend far too much of my time travelling around the word for work. Usually this leaves far too little time for flying. And it shows up pretty clearly in my Log Book with some quite long gaps in flying. I am embarrassed to admit that my log book contains one single solitary flight in my Libelle for almost an entire year. And even that flight was curtailed by a broken Air Speed Indicator. I guess I can feel fortunate that I was still pretty current flying airplanes of some description and a circuit with no ASI really was no significant problem at all.

My latest trip has taken me outside of New Zealand and off to the US for a minimum of 3 months and more likely to be well over 6 months in total. At this point I really didn't want to sit around not flying for months on end. I'm on a mission to get my tow rating…. And that means I need to fly a LOT more. So there's only one thing for it – I need to learn to Fly in the USA. I mean how hard can it be??

Step 1. Convince the Federal Aviation Administration that I am a pilot! Apparently this used to be really simple. But now we live in a post 9/11 world so those days are long gone. The FAA has moved to a new modern computerised system. And that of course means that everything happens at a lighting fast pace - for a US Government Agency. The process is best described as "somewhat complicated". To start, I need a letter from the NZ CAA to be sent to the FAA. It took New Zealand about 4 hours from receiving my email to issuing the Letter. So far so good.

It then took the FAA 2 weeks to read the letter. Then it took a week for them to tell me it wasn't the right letter. Then it took a week for them to agree that yes it was the right letter. And then it took 2 weeks for them to arrange for me to visit an FAA office to fill in the forms required to get my license. No the FAA does NOT have offices in New Zealand. You have to come to the US to do that!

Finally after 6 weeks and an entire day off work to visit the FAA, I have a Temporary Airman's Certificate that lets me fly in the US. But my trip to the US is over and it's time to get back to NZ without having even come close to an airplane. However 3 weeks later I'm on my way back to the US for my next trip.

Step 2. Find a plane to Fly! This is America, home of Cessna and the biggest General Aviation Community in the world. Surely this can't be hard? Wrong! Nobody would return my emails, nobody would answer the phone. Any flight schools in the state where I'm working are either huge Part 141 commercial schools or private syndicates who are not interested in talking to strangers.

Finally, I track down a tiny "mom and pop" flying school that returns my calls. But they're based at the local international airport mixed in with all the commercial traffic and executive jets. This isn't going to be cheap. The airport makes Auckland seem small by comparison. Oh well. I bite the bullet and go talk to them anyway.

And finally at last, I've actually landed on my feet at the right place. And I'm starting to understand just how DIFFERENT flying in the US really is!

So what's really different about it???

Well the biggest difference is that all GA flying is mixed in with commercial flying. And that means you are operating out of big commercial airports with concrete runways and very very large jets all trying to use the same airspace and ATC services. Just to get a clearance at my new local airport requires five different frequencies to four different control services …. "ATIS (Weather)", "Clearance", "Ground", "Tower" and "Departure". To come back to the Airport is the same procedure in reverse. Four different controllers, five different frequencies, four different clearances. US Controllers speak REALLY fast and if you don't know what to expect then you will miss the details and sound like a country yokel from the wrong side of the pond. Which I do. A lot.

The next difference seems really insignificant, but my instructor was totally confused at my first circuit and landing. In NZ, we hold height in the downwind all the way to the turn on to base. In the US, you begin descent on downwind like a glider. This moves the position of downwind and base legs quite a lot. So my instructor had no clue what the hell I was doing and why I seemed to be in completely the wrong place at the wrong height. We sorted it out after a couple of circuits. And several go arounds. And quite a lot of frustration.

Good grief. Gas is Cheap. Slightly over US$1 per litre. Yes you read that correctly. US$ 5 per gallon for aviation 100LL.

Did I mention that it's flat here? I mean really flat. These are the fly-over states. There are NO hills, and every town is the same as every other town. It's like flying in Australia with less land marks. Also visibility is horrible because there are wild fires in Canada and you can't see the horizon if you are above 4500 and below the inversion layer. Claimed 6 mile visibility is a total lie. Also my iPad doesn't have Cell phone connection so I have no GPS. Neither does the plane. You're going to get lost in this. And I did. Twice.

But there are good things here as well…..

There are almost no landing fees. So flying out of a large airport mixed in with commercial traffic and all those Control Services doesn't cost ANYTHING. It's free. Did I mention that the gas is cheap?

Almost every airport and small airfield has an FBO - "Fixed Base Operator". In a small country town this might just be a shed like the Aero Club at Taumarunui. There's a coffee machine in the corner and a set of car keys on the wall. Just help yourself and fill up the gas tank. With a bigger FBO there's a café or restaurant, a courtesy car, an airplane fuelling service and coffee and burgers.

Once you get your head around using the ATC services, they're incredibly helpful. You just need to speak 'murican and sound like you've done this before. Weather forecasts, flight planning, flight following, etc all works really well.

So in the last few weeks, I've learned to navigate around the US using ATC services. Got familiar with using congested international airports and restricted airspace. "Busted the Bravo" airspace (legally) at Kansas City International. Learned how not to get lost by navigating using the VOR direction beacons. Practiced my instrument flying more than expected. Dodged thunderstorms and lightning. Made my first legal night landing. Completed my BFR. And got a type rating on a brand new aircraft. My instructor turned

out to be pretty good in the end. He's quite new and I reckon we've both taught each other quite a lot. He's promised to check out the local soaring club as well.

All in all, I feel a hell of a lot more comfortable flying here in the US now. I've learned far more than expected and I'll definitely come back to NZ with a lot more confidence in Cross Country flying.

Who knows? I might even manage to get a tow rating soon!

World Record Flight

On the 4th of February 1959, the two pilots succeeded and achieved to fly 64 days, 22 hours, 19 minutes and five seconds without landing in a Cessna 172 aircraft, named Hacienda. See Google for more information.

Matamata Flying

A small group of club members' decided to take a road trip to Matamata to do some ridge flying while there were some good Westerly breezes.

Everyone arrived on the Friday and set up for the weekend. John and Trace did a gridding exercise on the Friday as the day was full of passing showers and in the end decided to wait until the following day.

With a low cloud base and a good Westerly, everyone got into the air on the Saturday. Geoff had the flight of the day and was extremely happy. We all had good flights even though visibility was difficult late in the afternoon with the sun low and hazy conditions.

A couple of the guys departed early on the Sunday and the rest of us had an hour or so on the ridge to make the most of the weekend before derigging and heading home. I'm sure we will take the opportunity to do another visit before the official soaring season begins.

TGC Booking System

We have a booking system on the website for member's wishing to fly at certain times of the day. Unfortunately, the system isn't being utilised properly. The main reasons for this have been; pilots launching without a booking and the glider has not been ready early enough.

Therefore, if you wish to fly, please use the system to select a launch time for a training flight or a solo flight, either club aircraft or private aircraft. If you have a booking for a club glider, ensure you are at the club early enough to ensure the aircraft is prepared and ready to fly before the first launch time.

An Idiot's Guide to Tephigrams: Part 2 – *by David Hirst*

Warning: The following article contains more graphs. If you handled the last lot OK and are looking forward to this lot, then you need help. Remember, the first step to a cure is admitting you have a problem.

In the last article, you saw how a tephigram can be used to predict the likely height of thermal activity and whether they would form at all. In all that discussion, the parcels of rising (and falling) air were deemed to be "dry". In other words, I ignored moisture completely. In this article I'll talk about how the presence of water can really confuse things but also allow you to predict

- whether the day will be "blue" or not
- the height of cloudbase
- whether the clouds will produce rain

First, I have a confession: I lied. In the last article, I described the movement of "dry" air in the atmosphere when in fact it wasn't dry at all, just un-saturated.

To explain. All air contains some water vapour. This is not the same as the visible steam you'd get out of a boiling kettle; it's water in invisible gaseous form. The amount of water vapour dissolved in the air can be expressed as mg/m3 (mg of water vapour per cubic metre of air) or, more usefully %RH (Relative Humidity expressed as a percentage). At a particular temperature and pressure, a volume of air can only hold a certain amount of water vapour. If none is present, the humidity is 0%RH; if the air is full of mist, the humidity is 100%RH. Note that I said "a particular temperature and pressure". Hot air can hold more water than cold air if the air pressure is constant. At constant temperature, low pressure air can hold slightly more water than high pressure air.

Those “dry adiabats” I talked about last time were not in fact dry, just un-saturated. Once a parcel of air with a certain amount of water goes from being un-saturated to saturated, Things Happen. Firstly, a small quantity of water will condense out to form mist (or dew if it condenses on a surface), leaving the remaining air holding as much water vapour as it can. Most of the time we see this effect when air cools down, so the temperature at which moisture or dew begins to form is called the Dewpoint. Surprise!

Figure 3 shows a thick green line that meanders its way next to the red one. This is a plot of the dewpoint against pressure (i.e. against height). For example, the dewpoint at ground level is about 15°C. If the temperature line and the dewpoint line are very close to each other (or even touching), it means that there’s cloud at that height – if they follow each other very closely all the way up it means that it’s raining. A lot. You could have just looked out the window.

Any rising (and cooling) parcel of air doesn’t dump all of its water when it reaches the dewpoint – just enough to maintain an equilibrium. If the air continues to rise and cool, it will continue to dump more and more water until eventually there’s none left to dump. This is why Cumulus clouds have fairly flat bottoms and a finite height – either the air stops rising or they run out of water.

The other thing that happens is that when water condenses, it gives up its Latent Heat of Condensation. It takes just over 2kJ to turn 1cc of water into vapour and that same amount of energy is re-released when it re-condenses – the reason why steam burns are so painful. So once condensation begins, the rising parcel of air warms up a bit, which makes it rise faster. Remember how the dry adiabatic lapse rate was -3°C per 1000’? Well once the air’s saturated, the lapse rate halves. This “saturated adiabatic lapse rate” is only -1.5°C per 1000’.

What does this mean for your average tephigram? Now, if you’re pretending to be a rising windbag, instead of just tracing some imaginary line parallel to the dry adiabats until you reach the surrounding air temperature, you have to trace two (actually three but we’ll get to that – patience, young Jedi). You follow the dry adiabats until you saturate, then you follow a whole other set of lines. **Figure 3** shows a typical tephigram (same as the one last time) which includes these lines – the “saturated adiabats”. See how much steeper they are! Once you’re shedding water, you don’t cool down as quickly.

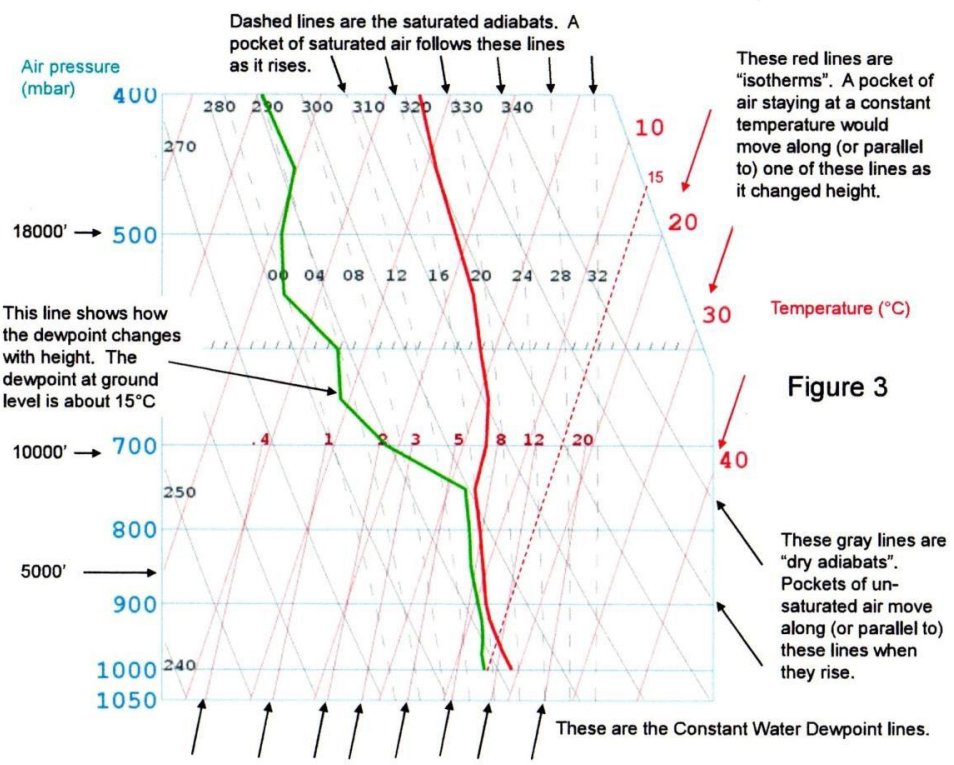


Figure 3

All well and good, but how do you know when you're saturated? This is where the third set of lines comes in (remember I said it'd get confusing). These show the dewpoint for a given moisture content and height. I'll call these the "constant water dewpoint" lines for lack of a better description; there probably is a better description but nobody's told me. This is how you use them.

Have a look at another figure which I've called, imaginatively enough, **Figure 4**. Start where the green dewpoint line starts at ground level. Note which Constant Water Dewpoint line it's nearest to. It's between the lines marked "5" (5mg/m3) and "8" (8mg/m3), so we can say that at

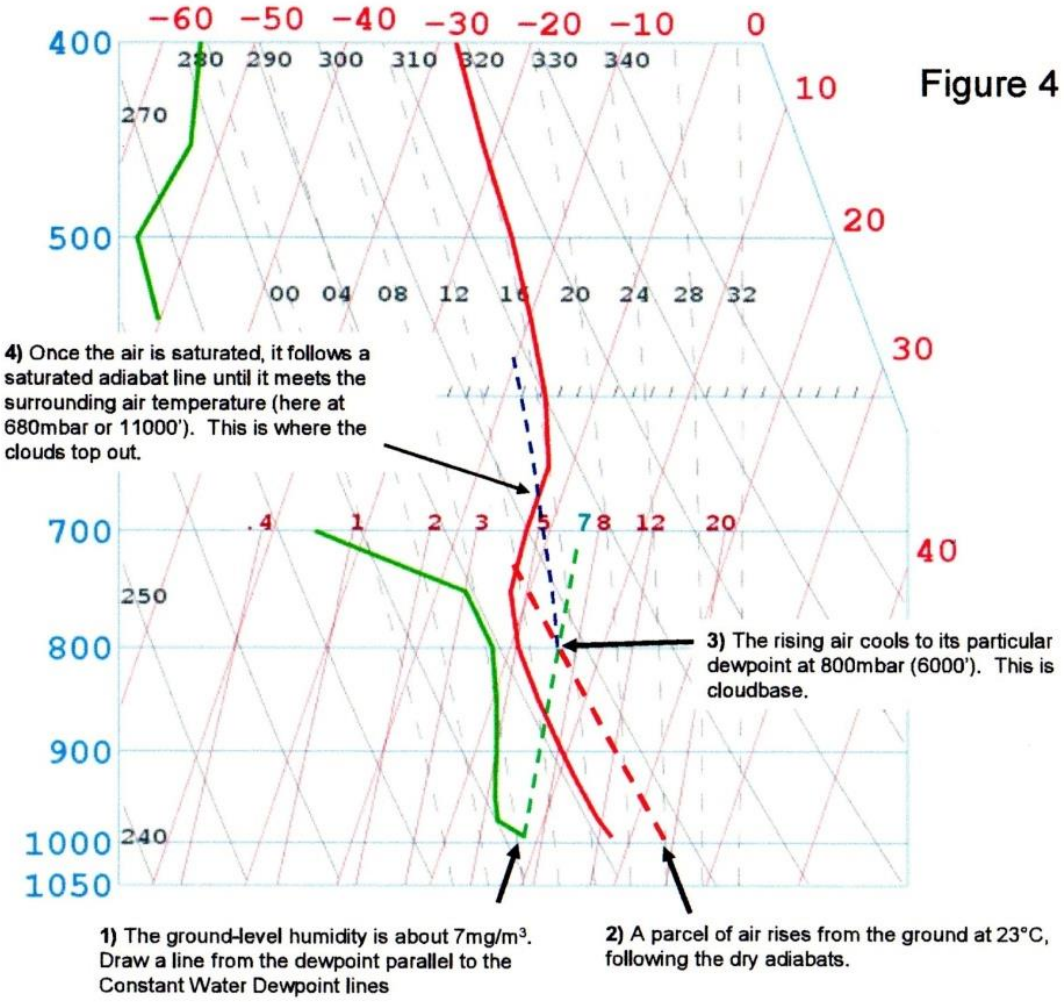


Figure 4

ground level, the water content of the air would be 7mg/m3. Now draw an imaginary line up, parallel to the "8" line. Why? Because we're going to consider what happens to parcels of air rising from the ground, and if they rise from the ground on this particular day, their water content will be about 7mg for every cubic metre of their initial volume.

Now imagine a parcel of air on the ground at 23°C. That parcel of air contains 7mg/m3 of water vapour (as we read from the dewpoint line at ground level). As it rises, its temperature drops but is water content doesn't[1]. At some point (which is indicated on Figure 2), the dry adiabat line of the air parcel will meet the Constant Water Dewpoint line and that is where the water vapour will start to condense, in this case at about 800mbar (6000'). Our rising windbag has met its own dewpoint. Congratulations, you've now found cloudbase.

[1] The volume of the air parcel will increase, so the water vapour density will drop, but the total amount of water in it won't.

To find cloudbase on any day, draw one dry adiabat line up from where the ground temperature is, and another constant water dewpoint line up from the ground-level dewpoint. The height where these two lines meet is where you'll find cloudbase. Simple, really. Have a look at Figure 6, and you can see here that cloudbase wasn't very high at all (Go on, try it. Start at 22°C and you'll reach 900mbar before your water will condense. How unfortunate.)

On days that are "blue", the dry adiabat line for the thermals will hit an inversion or just reach the surrounding air temperature before it encounters the relevant constant water dewpoint line. **Figure 5** shows an example. Actually on this day, there was just the odd wisp of cloud at 3000'. An inversion stopped the thermals just before a normal cloudbase would have formed, and momentum carried a bit of the air past the condensation height. Marginal days like this can be quite hard to judge and it really comes down to three options: definitely cloud; definitely blue; a bit iffy - plan for blue and hope for the best.

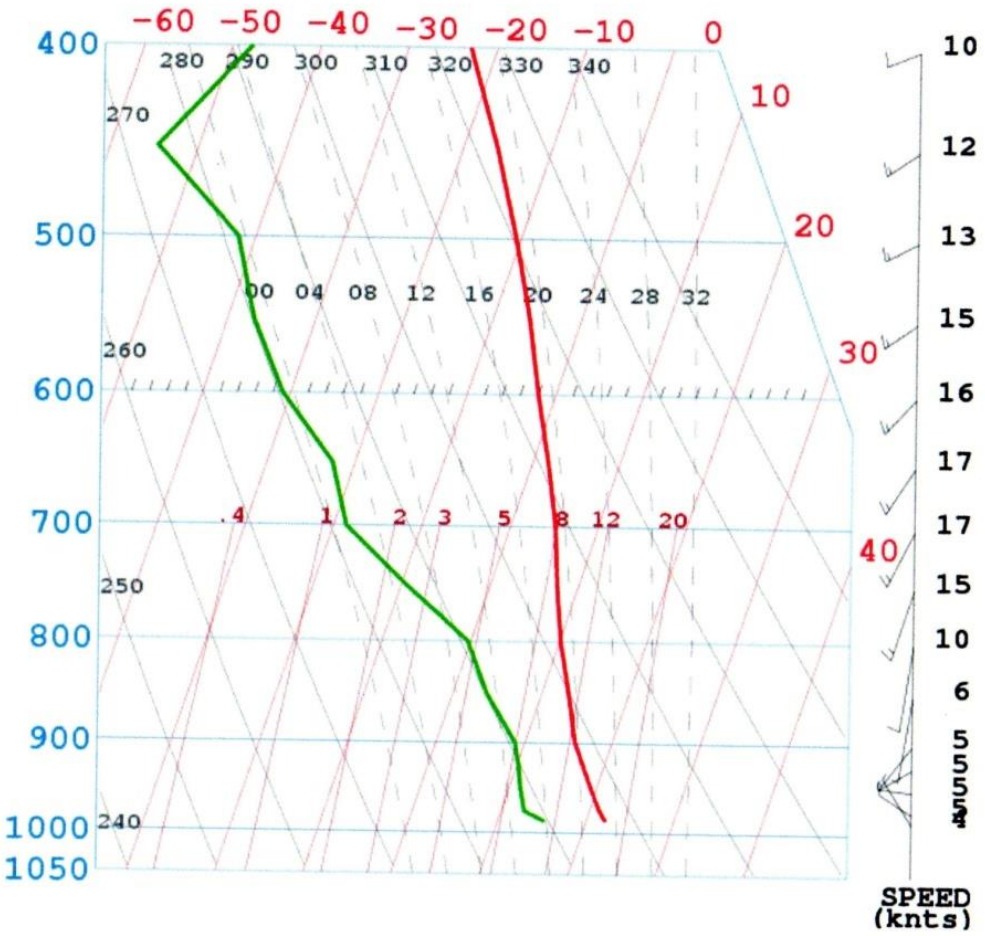


Figure 5

OK, so now we've established that there is or isn't cloud forming. If there is cloud, how high will it rise? This is where the saturated adiabats come in. Once you've established cloudbase from the intersection of those two lines, draw another line up from this – one which parallels the nearest saturated adiabat. See **Figure 6**. Wherever this new line hits the atmospheric temperature (red) line is where the cloud will stop rising, in this case at about 680mbar.

If your saturated adiabat hits the red line at well below freezing, ice will have formed and will be growing from all the new water rising up towards it, so you'll get showers of some sort. Conversely, in **Figure 6**, you can see that, even though cloudbase was about 3000', the clouds topped off at 700mbar, where the temperature was still about 4°C. Result? No rain.

What if your saturated adiabat never hits the red line, but just keeps on going up? In that case you can be pretty sure that there will be heavy showers or thunderstorms. Beyond that, it's anyone's guess really. This is how met people keep their jobs and why everyone else moans at them.

As you can also see from figures 2 and 4, you can end up with an awful lot of lines on your tephigram. Just take it step by step and you can't go too wrong, though people will still shout at you if you get it wrong.

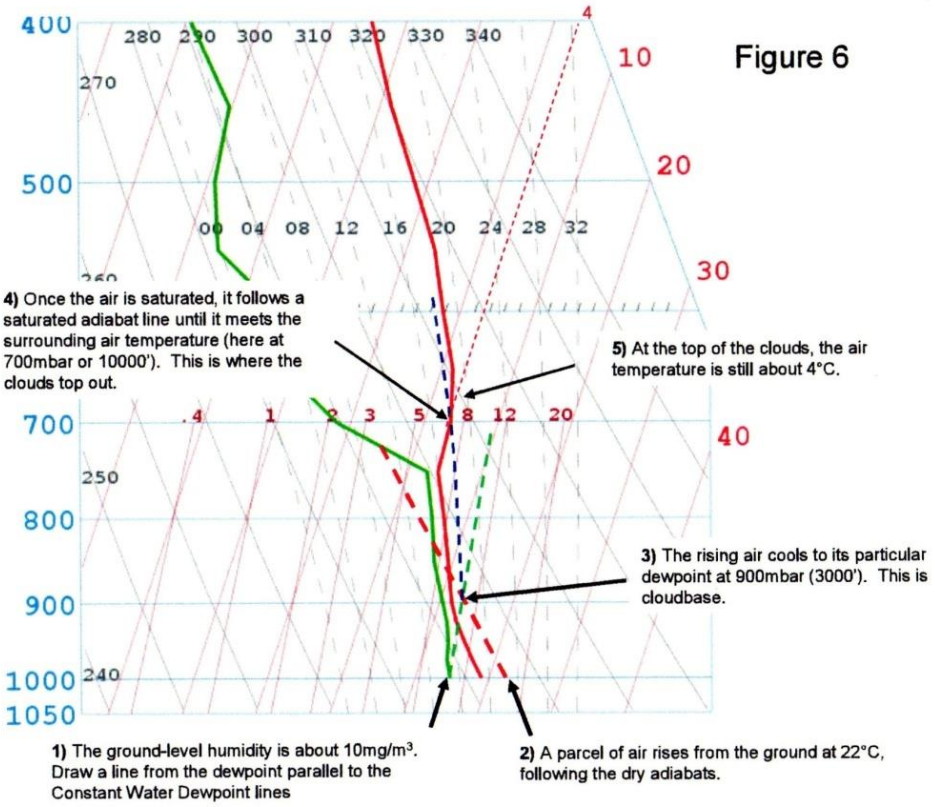


Figure 6

OK, that's it. You now know as much as I know about tephigrams, right and wrong. Remember, they're a guide only; use them with as large a grain of salt as you can get away with. They're predictions of what's likely to happen. A more accurate method is an actual sounding, taken on the day itself and compared with the prediction. An even more accurate method is often just to look out the window and go flying.

See you up there.

Hobby Expo

The 28th Hobby Expo was held at the AC Baths between the 8th and 9th of July. Of the 28 years of displays, the Taupo gliding Club has been in attendance for 27 of them. That is a remarkable effort from past and present club members'. A huge thank you goes out to all of you that helped make it a successful event.

Around the Club

There has been a lot happening around the club with winter maintenance from tree trimming, major clubroom renovations and general maintenance. A huge THANK YOU to those of you for helping out. And a special EXTRA thank you to Martin.

Upcoming Events

Just a quick reminder about the following events.

- SUMMER is Coming
- MANDATORY briefing – 23rd September at 1200
- Training nights will be announced in the near future.
- Central Plateau Soaring Competition – 4th to 12th November.

Humour

This is a very clever optical illusion! If you look long enough you'll see two clowns looking at each other.