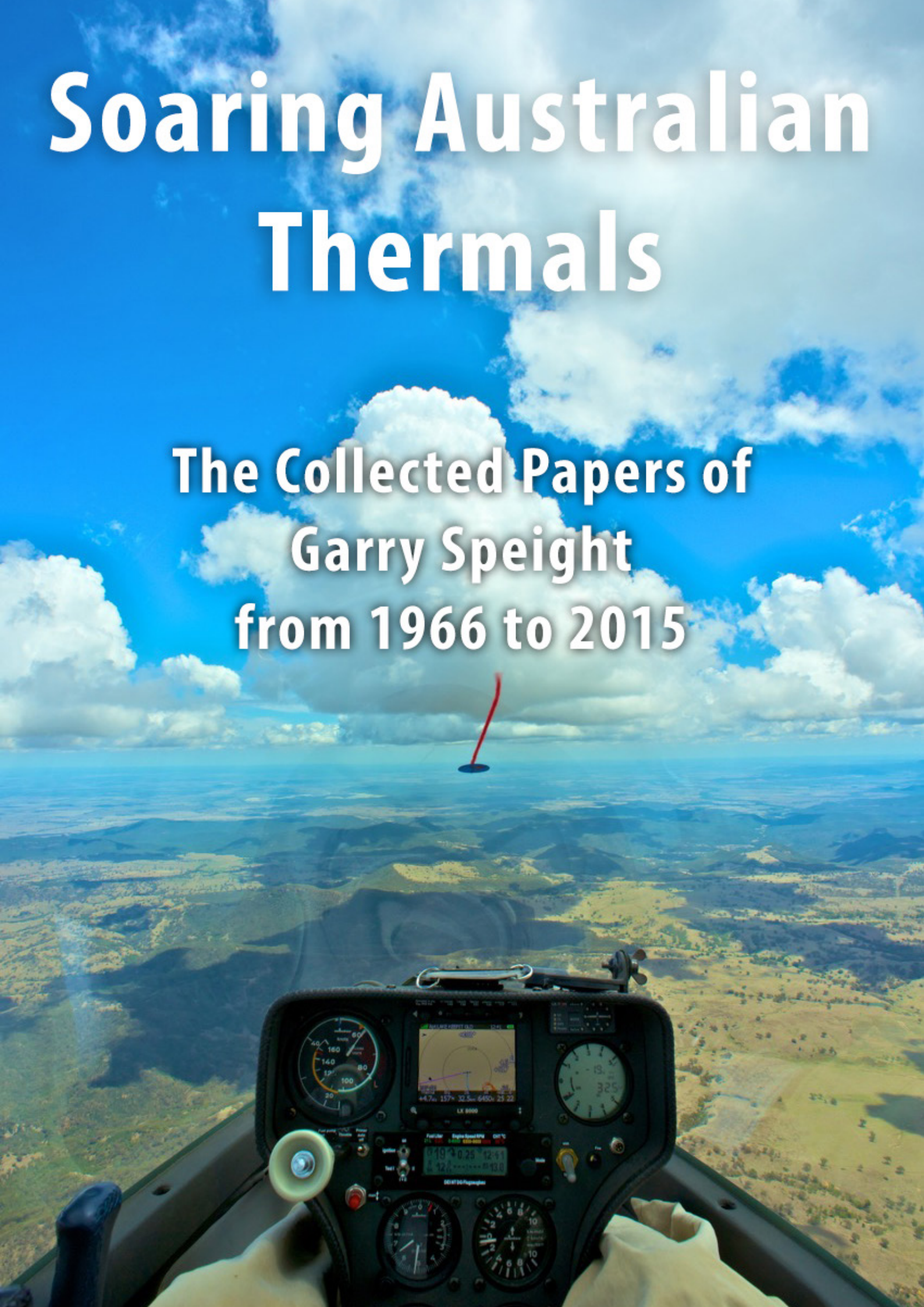
Soaring Australian Thermals

The Collected Papers of Garry Speight from 1966 to 2015



Outlanding, Not Out-Crashing

By Garry Speight

Teaching cross-country soaring technique is mainly coaching. That is, improving a pilot's performance. I have acted both as an instructor and as a coach. I wrote this recent article on outlandings when I became concerned that, while aiming to improve a pilot's performance, I was giving little weight to procedures that keep a pilot safe.

Disclaimer: I am talking about gliders that have no engines. Others are better qualified to talk about the other kind.

Originally published in Keep Soaring, January 2015

Also published in Gliding Australia, March 2015

On a cross-country soaring flight there is always a chance of outlanding. During a competition task, the chance is small, so long as the pilot is flying several thousand feet above the ground. I have suggested that a pilot, by sensible selection of thermals, can keep the chance of outlanding down to about one chance in two hundred (that is 0.5%). Very cautious pilots may keep the chance even lower, while very bold pilots may habitually accept a chance of around 5%.

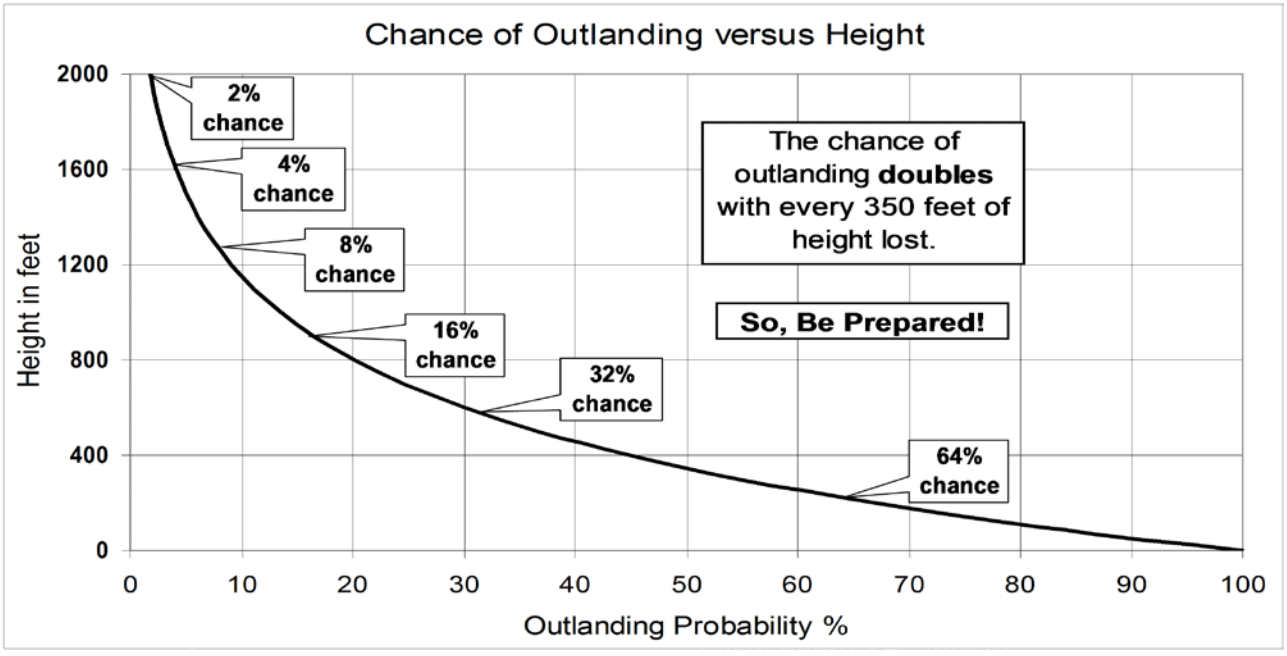
When any pilot flies down through 2000 feet above the ground, the odds are different. The chance of outlanding must increase, because there will be few thermals left within range, or perhaps none!

My first graph shows this increasing likelihood of outlanding. It has nothing to do with how the pilot should cope with the situation, which I come to later. At ground level, an outlanding is guaranteed (100%); at 2000 feet, I have plotted the chance as 2%.

The chance of outlanding increases very rapidly. According to this graph, the chance doubles with each 350 feet of height lost, and that happens every three minutes! Since landing is more hazardous than soaring, it is prudent to give serious attention to landing before the likelihood of outlanding gets much above 10%.

A pilot who has not already thoroughly planned how best to make a safe landing by this stage is in danger. Under the pressure of each new un-noticed hazard, the pilot's errors grow like an avalanche. Often, the result is a crash.

Competent pilots prepare for outlandings in good time; they act in a calm and methodical way that makes crashing very unlikely.



Making Outlandings Safe

Use Standard Procedures

One can imagine landing situations that have very different risks of a crash. At 2000 feet above an aerodrome such as Gunnedah in fine weather, the risk of crashing is very very small, perhaps 1 in 10,000. If that aerodrome became covered in fog, the risk of crashing could be close to 9,999 in 10,000.

Generally, however, a pilot who is soaring cross-country can keep the risk of crashing on outlanding very small (well below 1%) by following standard procedures that are in the GFA training syllabus. Each cross-country pilot will have been "checked out" as competent in these procedures. However, they must be practiced frequently and seriously to ensure that they will help when they are needed. That is really up to the pilot!

Procedures for safe outlandings

The Sequence

The second graph shows the sequence, height, and timing of the procedures that must be followed to ensure the safest possible outlanding:

(1) Select a safe field;
(2) Plan the circuit for landing;
(3) Fly a standard circuit.

Procedure (1): Select a safe field.

During a soaring cross-country flight, you must have a safe place to land at all times. So long as you are above 2000 feet above ground, it is safe enough to simply keep aerodromes, airstrips, and cropping country (not cotton) within range. When you are below 2000 feet above ground things get serious! You must not fail to notice when that happens. You must then identify at least one safe landing place before you get much lower.

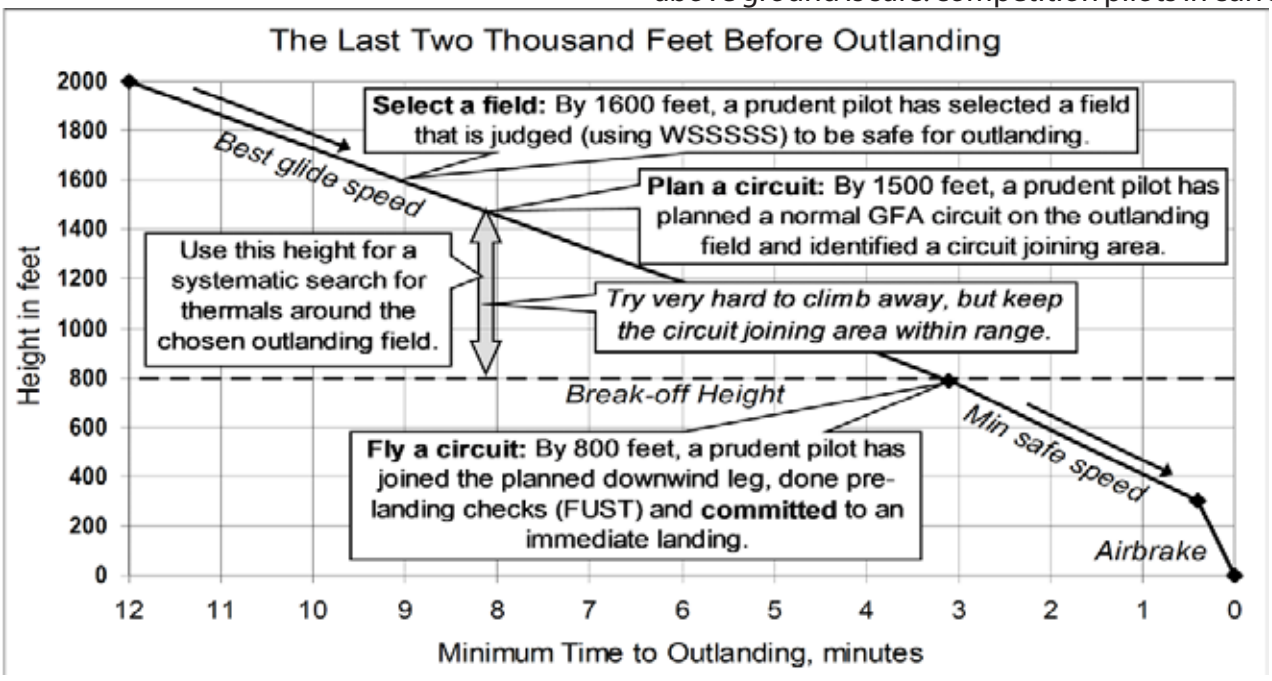
Scan fields that are one or two kilometres from you: near enough to see details, but not hidden under the glider. Given the choice, look at fields ahead on track, so as not to have wasted time if you can continue. A suitable field must meet all the safety requirements (WSSSSS): Wind, Size, Surface, Slope, Stock, and Surroundings. Get this procedure completed by 1500 or 1600 feet above ground if you can.

Procedure (2): Plan the circuit for landing.

As soon as you have decided on a safe landing place, plan the circuit that you will do, just as you would at your home airfield. If circuits to the left or to the right are equally suitable, you can leave that undecided. Identify, and keep in mind, the position of each circuit joining area. You may need them. Get this procedure over by 1500 feet above ground.

Procedure (3): Fly a standard circuit.

Arrive at the chosen circuit joining area at the height that you usually do. (A height of 800 feet above ground is safe: competition pilots in current



practice may be safe a little lower.) Prepare the glider for landing using the standard pre-landing check (FUST). Fly a normal GFA circuit, ignoring any signs of lift. Attempting to thermal away after joining the circuit is very unwise: thermals below circuit-joining height are treacherous.

Catching thermals below 2000 feet above ground.

The three procedures above are essential, and must be given top priority. That does not mean that you can't thermal. If, by chance, you meet strong, workable lift while doing Procedure (1) or Procedure (2), take it! It will soon lift you back above 2000 feet, and you can move on.

Once you have completed Procedure (1) and Procedure (2) by 1500 feet, thereby shedding a load of worry, you now have 700 feet left to look for a thermal before getting down to circuit height. Sinking at 140 feet per minute, you have five minutes to spare. At 50 knots, you can explore nearly eight kilometres (4.17 nautical miles).

Use your height wisely: plan a systematic search pattern through likely thermal sources. This pattern should end at a chosen circuit joining area.

Your thermal search can have four possible outcomes:

(1) No lift at all: you must enter the circuit for a landing;

(2) One or more very weak thermals, each drifting away: at some point you must give up while still able to enter the circuit;

(3) As in No.(2), but finally there is a good thermal: you climb away;

(4) A first thermal that is good: you climb away.

Mental Discipline

Discipline Is Vital

It takes mental discipline to learn, practice and adhere to these outlanding procedures. But, in any case, mental discipline is essential for success in cross-country soaring. Safe outlanding is just one of many skills to be perfected.

Circuit discipline

Instructors require students to show discipline in planning and flying circuits before letting them go solo. I believe that it is GFA dogma to treat each circuit as a practice for a cross-country outlanding. However, few instructors or students take this as seriously as they should. I find that some students do their pre-landing FUST check well before entering the circuit. When facing an outlanding, putting the wheel down when you still hope to thermal is almost bound to result in the wheel being down when it should be up, and vice versa.

I practice and teach that the pre-landing FUST check marks a decision point. It signals the end of soaring flight, and I will not soar after I have done the check. Because I have this rule, I never do the FUST check any earlier than is necessary for a safe circuit.

Circuit discipline remains vital as a pilot progesses. As a pilot advances to higher performance gliders, s/he should practice doing circuits at heights and angles that are appropriate to a glider of that performance, both at the home field and in outlandings.

Discipline in field selection

The main point is to be alert, and not miss things that indicate that you are less than 2000 feet above a landing place. As the first graph shows, you are at risk if you leave outlanding planning until you are lower.

Getting this low happens quite frequently during cross country flights. That gives priceless opportunities to practice the field selection procedure.

Practice it as a drill!

Usually, there is no-one watching you to see how prudent or careless you are. I realise that I have an advantage there. As I have so often had to demonstrate this procedure to trainees, I have had to keep current in my procedures. That is how it must be for others too.