

Soaring Australian Thermals

The Collected Papers of
Garry Speight
from 1966 to 2015



My Brilliant Cross-Country Soaring Career

By Garry Speight

Originally published in *Gliding Australia*, May 2013

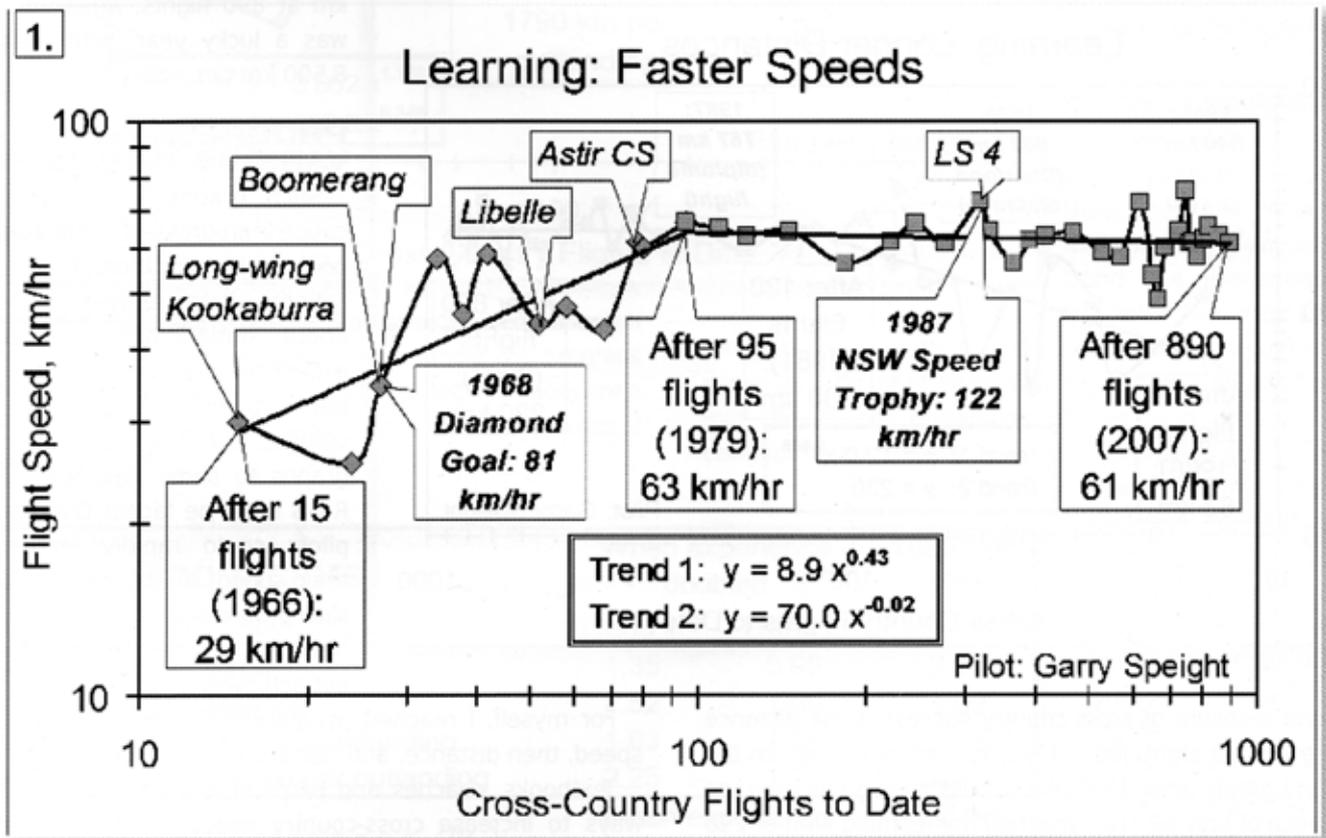
A Long Time Soaring

Begun 48 years ago, my career in cross-country soaring is very long. It has been a success at State level, but I won a National Championship class only once (1997). My logbooks show how I learned to be better at it with more practice. While other pilots must have learned faster, or better, they have not told us about it yet. I hope these

cross-country gliding: hours flown, distance flown, number of flights, and number of outlandings. Although my logbooks have details of each cross-country flight, I have not used those details here.

How To Measure Success

I have plotted my progress in cross-country soaring using four ways to measure success: speed, distance, flights per outlanding, and distance per outlanding.



graphs and numbers let you see your own soaring flights from another point of view. I am surprised myself at how things worked out.

Where Do The Numbers Come From?

Numbers come from my logbooks: from the summaries that I make on the first of April each year. I make up totals to date, and totals for the year since the last summary. As well as my gliding hours for dual, solo and instructing in various gliders and launch methods, I summarise my

My numbers include all cross-country flights in each year, not just the best. For example, the average distance achieved is the total of all distances divided by the number of flights. My average cross-country speed for a year is the total distance divided by the total flight time. The result is much slower than for a race from a start to a finish. On the other hand, unlike a race scorer, I count speeds to outlandings.

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Axes Of The Graphs

Along the bottom of each graph (the x-axis) I do not plot time in years, because in some years I got much less practice than in others. Life events intruded. I needed something that would show my level of experience. I chose the number of cross country flights I had made at the start of each year.

I have used logarithmic scales on the axes of the graphs. This is because learning is not a matter of adding equal amounts of knowledge at each lesson. Knowledge accumulates like compound interest: more and more, exponentially.

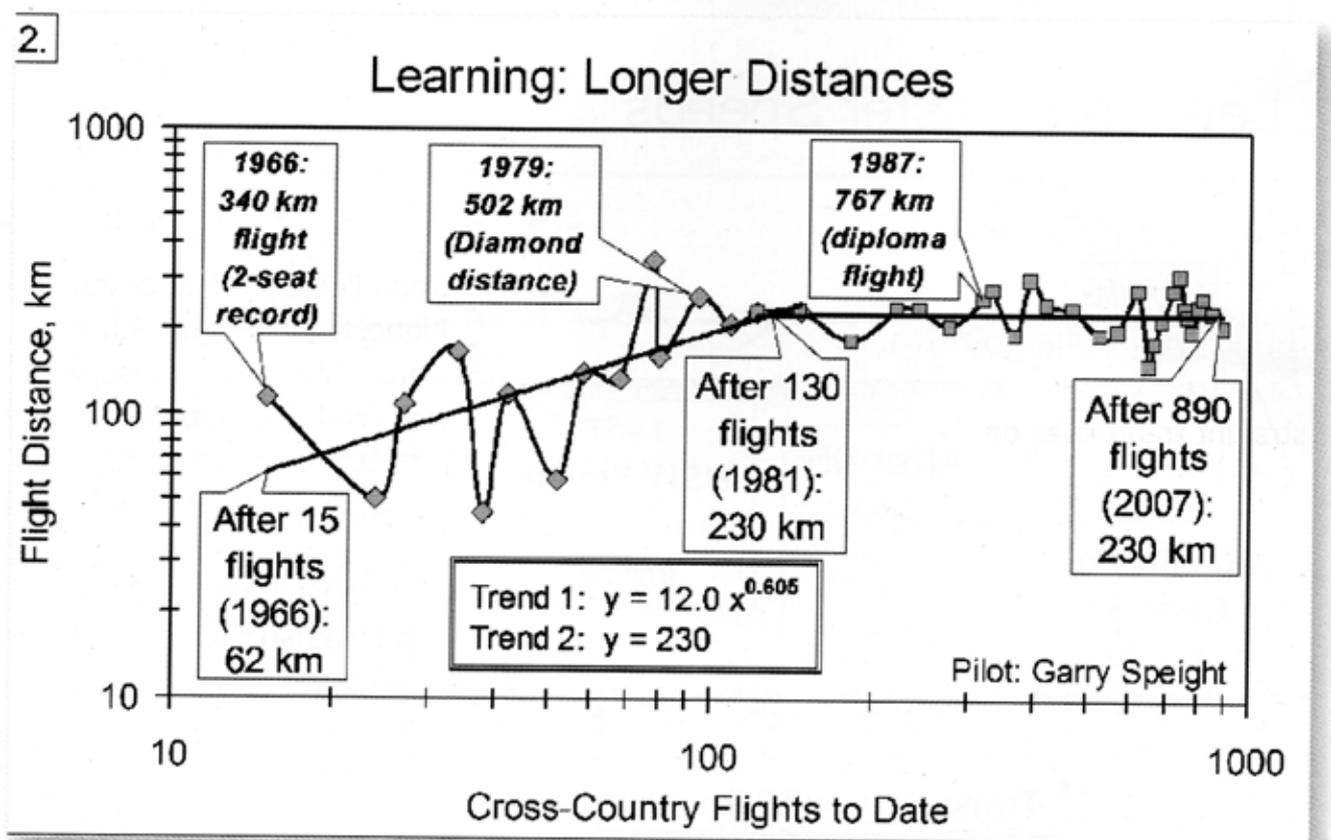
Flying Faster

The first graph shows my progress in learning to fly faster. At first, when I had made 15 cross-country flights, I could only manage an average speed of 29 km/hr. By the time I had made 95 flights, my speed had more than doubled, to 63 km/hr. Increasing the number of flights to 890 did not improve on this speed. In fact, it fell slightly, to 61 km/hr.

The term 'learning curve' is often used carelessly. I think the two straight lines on the graph, taken together, are a learning curve: my learning continued steadily to a point where, quite suddenly, little or nothing more was achieved. Few care to admit that this has happened.

A speed of 63 km/hr seems slow, but I am no slug! From time to time I have flown fast. As noted on the graph, I achieved 81 km/hr on a flight as early as 1968, and I won a speed trophy for 122 km/hr in 1987 and in 1989.

At first, I flew cross-countries in the Canberra Gliding Club's ES52B Long-wing (15 m) Kookaburra, with a glide ratio of 22:1. Club machines I flew later were a Briegleb BG12, ES59 Arrow, E560 Boomerang, and Standard Libelle. Eventually, I flew my own Astir CS and finally LS4a, with good Standard Class performance (38:1). I have marked some changes of glider type on the graph. I can see no effect of glider performance on the speed I achieved. Even if I had been able to fly an LS4a from the start, the curve might have looked much the same.



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Flying Further

A second measure of cross-country success is the distance achieved in a flight. Judged by the learning curves on the second graph, after 15 flights I could manage an average distance of only 62 km. I reached my learning limit of 230 km distance after 130 flights, and maintained this level to 890 flights.

Again, my best flights were very much longer. At the beginning (1966), John White and I flew the Kookaburra from near Canberra to Temora and back for a 340-km distance, doubling the 2-seater record. Later, I flew a 502-km Diamond Distance in 1979 and a 767-km Diploma Distance in 1987.

More Flights Per Outlanding

When I had completed 15 cross-country flights, the nine flights in the next year included seven outlandings: only 1.2 flights per outlanding! Outlandings may happen at any time, but learning to avoid them saves a lot of trouble. After 230 flights, the ratio was up to 8.6 flights per outlanding. Improvement then slowed, but I reached 13 flights per outlanding after 890 flights. In 1993 I was lucky to achieve 44 flights for each outlanding.

More Distance Per Outlanding

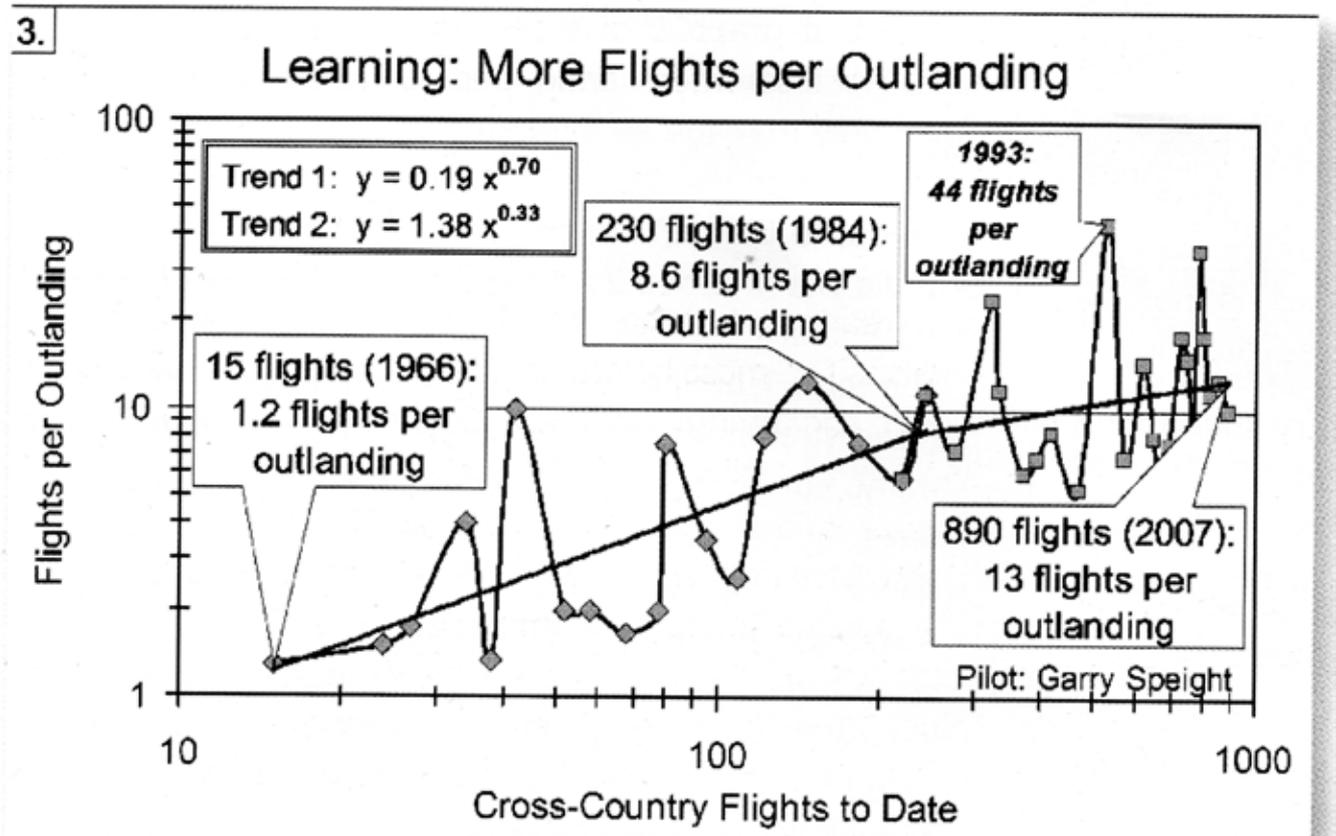
The average distance I achieved before an outlanding increased from 87km at first, to 1,790 km when I had done 200 flights, and to 2,900 km at 890 flights. Again, 1993 was a lucky year, with nearly 8,500 km per outlanding,

Progress By Various Measures

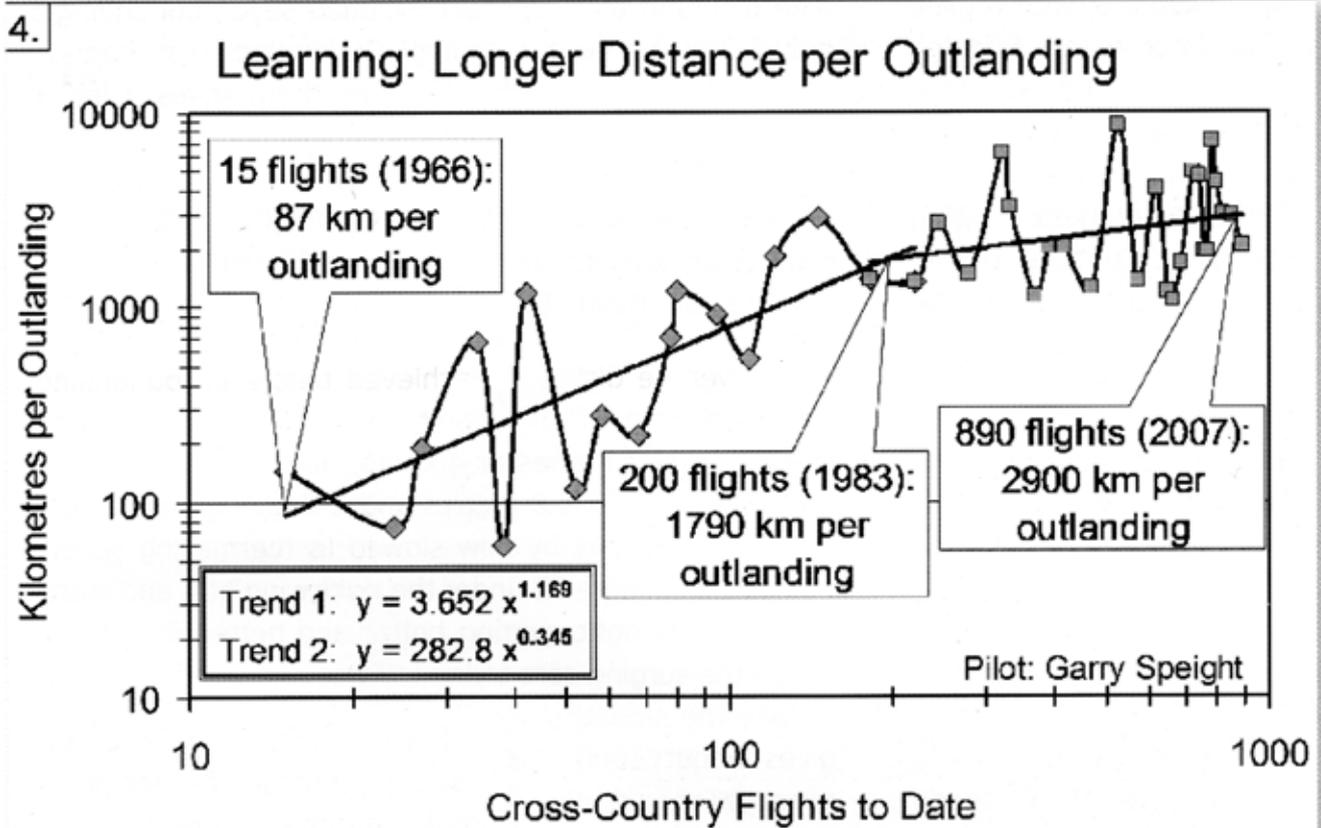
Such graphs of the cross-country progress of other pilots could be rather different. Some pilots are over-cautious about out landings. I would expect the graph of their flights per outlanding to have high values, but the other three graphs to show slow learning. Risks must be faced! Over-bold pilots could rapidly increase their speed, at the expense of slow progress on the other three measures because they so often outland early in a flight.

For myself, I reached my potential in this order: first speed, then distance, and last avoiding outlanding.

Textbooks, coaches and pilots give a lot of weight to ways to increase cross-country speed. Yet, my graphs show that I learned to fly up to my



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speed potential quite early: after only 95 flights. To achieve my potential for long flight distance took 35% more flights than for speed. Distance flying needs much more planning, discipline and practice than speed flying. My speed and distance graphs suggest that, after early progress, I learnt little more in the last three decades. The third and fourth graphs are different. First, my time of rapid learning to avoid outlanding continued for much longer, right through to 230 flights. Second, I kept on learning after that, up to the last point of the graphs in 2007. Old dogs do learn new tricks!

Performance And Learning

These graphs show clearly the difference between performance and learning. There is a good textbook on the subject: 'Motor Learning and Performance' by Schmidt and Ginsberg.

My performance is shown by the wavy line through the data points. It goes up and down as I had good or bad luck, problems with gliders and instruments, not paying attention, etc. Learning is when the lessons stick and cannot easily be forgotten. It tends to lead to a steady, permanent improvement in performance. The straight trend lines on the graphs are 'learning curves' that

model the progress of my learning. The fact that I did not regress more than slightly in recent years suggests that, within my limits, I had learned well.

Learning Rates

On each graph, I have given the equations of the trend lines that describe my learning progress. If others do the same, they can compare notes on how well they are learning.

The equations may seem daunting because they are power functions, not arithmetic. One simple way to use them is to mark where the level of experience (x-axis) is doubled and find whether the learning (y-axis) is more or less than doubled. If you prefer percentages, doubling is the same as increasing by 100%.

From the graphs, I have prepared two tables, both showing the same data. The second table "My learning increases %" is easier.

Most of my learning is in Trend 1, early in my career. At that time, for each 100% increase in my experience, my speed went up by 35%, my distance by 52%, my flights per outlanding by 63% and my distance per outlanding by 125%.

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My learning factors in cross-country soaring	When experience doubled		Total from 1966
	Trend 1.	Trend 2.	
Learning faster speed	1.35	0.99	2.14
Learning longer distance	1.52	1.00	3.69
Learning more flights per outlanding	1.63	1.26	10.26
Learning more distance per outlanding	2.25	1.27	34.01

My learning increases (%) in cross-country soaring	When experience increased by 100%		Total from 1966
	Trend 1.	Trend 2.	
Learning faster speed	35%	-1%	114%
Learning longer distance	52%	0%	269%
Learning more flights per outlanding	63%	26%	926%
Learning more distance per outlanding	125%	27%	3301%

Eventually, this rate of learning fell from Trend 1 to Trend 2. For speed and distance, my learning ceased, but I held close to the level I had reached. For outlanding avoidance, I continued to learn, but more slowly. Still, my later rate of learning (26% and 27% for 100%) was almost as good as my early rate of learning to fly faster (35% for 100%).

Total Learning

If we start at the beginning of the first trend lines and end at the highest point on either trend line, we measure my total learning. Using the right-side numbers in the first table, I improved my speed by a factor of about two, my distance by a factor of four, flights per outlanding by ten, and distance per outlanding by thirty-four. I am surprised that I have learned so much about avoiding outlandings, which still happen. My improvement in kilometres per outlanding is 16 times greater than my improvement in cross-country speed!

The chosen starting point for the graphs in 1966 is not a true beginning. To clarify, I should say that my first cross-country soaring flight (10 km) was flown with Rupert Brown on 2/2/64. By then I had done 111 dual glider flights, beginning on the first flying day of the new Canberra Gliding Club:

26/12/62. I had come to gliding after 370 hours of RNZAF training in Tiger Moths and Harvards from 1951 to 1956. Perhaps that helped me to learn cross-country soaring, perhaps not.

Coaching

I have seldom been coached in advanced soaring - just one day with Maurie Bradney, and five with Ingo Renner. I have read most of the books about it that are published in English. The most helpful is 'New Soaring Pilot' by Welch, Welch and Irving, Another, 'Soaring Cross Country' by Byars and Holbrook, has the vital advice "NEVER FLY THROUGH THE SAME BAD AIR TWICE".

The GFA now has a National Coaching Panel, tasked with helping pilots to learn advanced skills. I think that pilots should be encouraged to keep records such as mine. Then their rate of learning, relative to each other, and relative to the coaching received, could be judged.

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Ready to fly the Twin Astir IKX, 2015



At Garry's 80th Birthday Party, 2014

