

Soaring Australian Thermals

The Collected Papers of
Garry Speight
from 1966 to 2015



From the Editor

This is an edited collection of papers published by Garry Speight mostly in Australian gliding journals from 1966 to 2015. As you can see, the topics are diverse, always treated thoroughly and are often very erudite. Most of the early papers are still relevant and very useful to both beginning and experienced pilots. The Lake Keepit Soaring Club decided to make this body of work available to its members and to the gliding community by gathering them together, encouraging Garry to edit and comment on his work and by placing it on the Club's website.

The whole collection can be downloaded as one PDF or individual papers can be downloaded separately.

The project was initiated and managed by Graham Holland and prepared for digital publication by Oliver Brighton (Fotolly Media, info@fotolly.com). We thank Garry for his support, continuing interest and valuable input in preparing the papers.

Every effort has been made to trace copyright owners.

Graham Holland, Editor.
July 2015.

Photo credits: Ian Barraclough, Geraldine Clark, John Clark, Dave Holbrook, Graham Holland, Garry Speight

This book is copyright. Apart from any use permitted under the Copyright Act 1968 and subsequent amendments, no part may be reproduced, stored in a retrieval system or transmitted by any means or process whatsoever without the prior permission of the publishers.

Published by
Lake Keepit Soaring Club
234 Keepit Dam Road
Lake Keepit, NSW, 2340
Copyright @Garry Speight
first edition 2015.

Design and typesetting: Oliver Brighton:
info@fotolly.com

National Library of Australia Cataloguing- in-
Publication entry

Author: Speight, Garry

Title: Soaring Australian Thermals, The Collected
Papers of Garry Speight from 1966 to 2015./
Garry Speight; Graham Holland, editor.

ISBN 978-0-646-94590-3 (paperback)

Subjects: Gliding and soaring-Australia
Gliding and soaring-Technique.
Gliders (Aeronautics)-Australia.
Thermals (Meteorology)-Australia.
Aerodynamics.

Dewey Number: 629.13333.

Contents

5	Introduction
8	212 Mile Record O & R
11	High Wind, Rough Country, And Airspace Limits
15	Canberra Control Zone Extension Reversed
17	Nihon No Guraidingu (Japanese Gliding)
23	Cheaper Cross Countries
28	The Thermal Interception Diagram
34	Rate Of Climb In Thermals
47	The Use Of Water Ballast
55	Thermal Density (Letter)
56	Water Ballast (Letter)
57	Sheep, Goats And Water Ballast (Letter)
59	Phasing Out Water-Ballast
62	Canopy Marks For Attitude Control
68	Visit By Mitsuru Marui
70	The Lak-12 Re-Visited
73	Thermals That Rotate, Part 1: Do Thermals Rotate?
76	Thermals That Rotate, Part 2: What They Are Like
81	Thermals That Rotate, Part 3: How The Glider Behaves
85	Thermals That Rotate, Part 4: How To Soar In Them
92	Thermals That Rotate (Letter)
92	Rotating Thermals (Letter, With Author's Reply)
94	Kingsley Just's Letter (Letter)
94	Rotating Thermals I (Letter)
95	Rotating Thermals II (Letter)
96	Rotating Thermals
98	Rotating Thermals
103	Probability In Cross-Country Flying
106	When To Circle: When To Leave
110	Climbing Faster
113	Optimal Flight Strategy (Letter)
114	How Glider Pilots Get There Faster (Letter)
115	Rules For Leaving Thermals
119	Let's Be Iconoclastic!
121	Best Use Of Thermals
125	Outlanding, Not Out-Crashing
128	My Brilliant Cross-Country Soaring Career

Preface

During Garry's involvement with aviation, his contribution to gliding in general and the Lake Keepit Soaring Club in particular, has been nothing short of outstanding.

As well as his personal flying, Garry has contributed enormously as a coach, mentor, instructor, tug pilot and author.

Whilst the club and its members celebrated Garry's 80th birthday at a very special function in August 2014, it was felt that a more lasting record of his work should be made available to a wider audience.

Hence this small collection of the wit and wisdom of Garry Speight.

I am extremely pleased to commend this publication to you and I trust it will provide many enjoyable hours of reading pleasure.

Ian Downes
President
Lake Keepit Soaring Club



Introduction

By Garry Speight

The Articles

These are my articles about gliding written over the last 50 years. They cover aspects of gliding that I thought important. I am glad of the chance to bring them back into the light.

There are a couple of articles on unusual flights, and on Japanese gliding, but most are on soaring in thermals. Although I have battled mountain thermals and waves in New Zealand, and I have jumped from thermal to wave in Australia, I have written mainly about how to use ordinary Australian flat-country fair-weather thermals.

My writing is technical and academic, rather than creative; I write as I did as a scientist. If you find some of my articles hard going, please don't give up.

With the series "Thermals That Rotate" I made my work easier to read. At first, that series was a single long article. I asked for comment from a large instructors' panel and, except for two or three, their response was so negative that I shelved the project. On later advice, I broke the topic into four parts, made it simpler, and put technical notes at the end. As you see, the articles then brought a good response.

I hope you enjoy reading all the articles, even the difficult ones, and those that seem quaintly antique!

How did I get into this?

My parents' life in aviation

My father, Ernest John Speight ("John"), born in 1900, started flying DH-60 Gipsy Moths in 1934, soon after I was born. That was at Nelson, New Zealand, and he trained as a member of the Marlborough Aero Club, based at Omaka, near Blenheim. John was a surveyor/engineer's assistant, on the construction of Nelson aerodrome. He and my mother Emma ("Jo") hatched a plan that he would make a career as a specialist aerodrome engineer, for which earning a (ruinously expensive) pilot's licence would help. The plan worked! John was appointed supervising engineer on Woodbourne RNZAF Station, building

it from green fields to completion from 1939 to 1941. Woodbourne was one of the Flying Schools that supplied thousands of pilots to the RAF for the war in Europe.

In late 1941, a week before the Pacific war began, John was sent to Fiji to supervise (as I believe) the construction of runways at Nadi ("Nandi") aerodrome so that four-engined aircraft could land there. The US Government agreed to pay seven million pounds as wartime "reverse lend lease". Within six months the New Zealanders had built two 7000-foot runways: "on budget, and ahead of time". That paid off: in March 1942 forty-eight Marauder high-speed bombers re-fueled at Nadi en route for Townsville and from there they attacked Rabaul. At Nadi Airport, these are the runways you see, but runway 02/20 was extended to 10,000 feet and concreted for jet aircraft twenty years later.

John's own flying career was cut short at 200 hours by a war-time ban on private flying. By then he had a commercial licence, and was flying the Miles Hawk and Miles Whitney Straight. He also flew some dual in RNZAF Oxfords and Harvards. When I took him up in a Kookaburra in 1974, I did not hand over to him until after the take-off, but he would have flown that perfectly too.

My mother, Jo, enjoyed flying. She passed a flight test for a flying scholarship, but there was no



At Omaka, 1937

Introduction

money to continue. When her sister Pat married Captain Maurice Buckley, they had a celebrated "flying honeymoon". Uncle Maurice became C/O of the famed No.75 (NZ) Bomber Squadron RAF in 1939, and later an Air Commodore.

My childhood flights

Thanks to my parents, I started flying at the age of two years and nine months. Over Easter 1937 John and Jo took me (illegally) in the Gipsy Moth ZK-AEM from Blenheim (South Island) to visit relatives in some North Island towns including Gisborne. It was a distance of 900 km, including crossing Cook Strait twice, and took 10 hours flight time. Later (30/1/1939) when I was four, I had a five-minute joy flight in a Moth with John. Then, from the age of five to the age of ten I lived at RNZAF Woodbourne within sight and ear-shot of aeroplanes every day: the die was cast.

My training in aeroplanes



In DH-82 at Omaka, 1951

Governments, then as now, ensured a supply of pilots to fight in foolish murderous wars by sponsoring free flying training in an Air Training Corps. I was game. Living in Blenheim at the time, I took up my ATC flying scholarship with the Marlborough Aero Club in my father's footsteps. I began flying DH-82 Tiger Moths on turning 17, and soloed on 22/9/1951. The scholarship was carried forward so that, by the end of 1953, I had 50 hours in Tiger Moths and Auster Aiglet J5F's. Then I was due for three months of Compulsory Military Training, which included another 12 hours in Tiger Moths. My bored instructor gave me an inverted spin exercise.

Being still game, I volunteered to train in a "university course" of the Territorial section of the RNZAF. The Territorial training was full-on. We did the RNZAF Pilots Brevet ("Wings") course with the regulars, but we did it (with pay!) mainly in two university long vacations. The course was at Wigram, Christchurch, and included 200 hours of training in the North American Harvard (T-6 Texan, SNJ, a Wirraway cousin). The first long vacation was "Initial", coming to grips with the big machine by circuits, aerobatics, forced landings and navigation. The second long vacation was "Advanced" including night flying, instrument flying, formation, gunnery, and bombing.

After gaining my "Wings" I did about ten flights per month in week-ends with No.3 (T) Squadron, based at Wigram. The squadron was equipped with Harvards only, as P-51 Mustangs had been retired due to maintenance cost and crashes. The RNZAF tried to give us fighter experience with one training camp at Ohakea where we flew Dual Vampires for six hours. My active commission in the Territorials ended in November 1956, when I had a total of 368 hours in aeroplanes, and the whole system was closed soon afterwards.

Flying for the RNZAF, I did not need a pilots licence. I qualified for that decades later, in 1989 (on holiday in New Zealand) and 1991 (in Australia). I had thought I should make myself more useful by



With Rupert Brown at Canberra, 1962

Introduction

towing at Lake Keepit. I found the tug aircraft more fun than Cessnas, but not much. I gave up in 2010, after 4740 yo-yo aero-tows and 1080 noisy hours in total.

Beginning gliding

In 1961 I was lured by an enormous salary to cross the Tasman to a research job with CSIRO in Canberra. I thought I might spend my wealth on an aviation hobby, but what? Cessnas did not appeal after Harvards. Sky diving seemed far too exciting and brief, and ballooning meant getting up early in the morning. At that date, I don't think practical hang-gliders, paragliders, trikes, ultralights or gyrocopters had yet been invented.

When Rupert Brown formed the Canberra Gliding Club I joined it. As Rupert was by far the best instructor I had ever had, he got me hooked!

My life in gliding

I have been very lucky to have flown gliders year



Operations check at Wagga, 1975

after year since 1962. Neither my scientific career nor my family commitments were such as to keep me away. My thanks to bosses and spouses!

For 27 years, I flew only week-ends and holidays,

doing 50 to 150 hours per year. I soon began instructing and competing, and later acting as an Assistant Regional Technical officer for Operations and as a coach at "Teams Challenge" events. These activities made me think about the theory and practice of cross-country soaring, which I have written about.

In 1989, I was made redundant at CSIRO. Fortunately, by then I had no family commitments, so I was able to go full-time instructing on a subsistence income. From then I flew gliders for more than 200 hours most years. In 1994, when I instructed for 420 hours, I recall thinking "I would fly better if I were more current!"

In the whole 52 years of gliding, I have flown 8850 hours in 15,800 flights. Of these, 1100 were cross-country flights, with a total distance of 234,000 kilometres - more than half-way to the moon. I competed in 60 Australian State and National Championships, but I seldom won.

Acknowledgment

I thank Graham Holland for the initiative for this collection, and I acknowledge the sponsorship of the Lake Keepit Soaring Club and technical assistance from Oliver Brighton.