

DELTA PAPA

A LIFE OF FLYING



Derek Piggott

Foreword by Sir Peter Scott C.B.E., D.S.C.

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—Why should a pilot choose to launch a glider in a thunderstorm?

—How were the aerial sequences filmed for *The Blue Max* or *Those Magnificent Men . . .* ?

—Can one fly from London to Paris on an open primary glider, the 'next best thing to a witch's broomstick'?

Derek Piggott answers these from first-hand knowledge in this compelling autobiography. Already well known throughout the flying world, and author of three instructional books about gliding and soaring, he now describes for the first time his own wide-ranging (and often unique) experiences.

He first flew at the age of four; as a schoolboy he helped sweep up after Sir Alan Cobham's Flying Circus and competed in model aircraft competitions.

Unorthodox wartime experience led to extensive involvement in RAF and civil gliding, and whilst chief instructor at one of Britain's largest clubs, he was invited to fly for films; he gives a vivid account of modern club gliding, and of the difficulties, dangers and rewards of filming.

Technical detail never obscures the lively narrative, but those who know about aircraft will appreciate its presence.

No pilot will read this book without learning from it; every reader, pilot or not, will share in the exhilarating but demanding business of flying.

£4.50 net

Delta Papa

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A LIFE OF FLYING

Derek Piggott

with line illustrations by the author

and a foreword by
Sir Peter Scott, CBE, DSC

To Wally,

Good Luck

Derek Piggott



Pelham Books · London

First published in Great Britain by

Pelham Books Ltd
52 Bedford Square
London WC1B 3EF
1977

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ISBN 0 7207 0979 2

Filmset in 10pt Baskerville by
D. P. Media, Hitchin
Printed and bound in Great Britain by
Billing & Sons Ltd, Guildford, London and Worcester

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Acknowledgements

The photographs appear by kind permission of

Steve Bicknell 34, 35
Charles E. Brown 1, 4, 6, 8, 10, 12, 16, 19
N. H. Ellison 22
R. E. Hale 24
Hugh Hilditch 20
Ron Moulton 30 (both)
Anthony Smith 17
C. E. Wardell, Andover 23
Anglia Television 26

Associated Newspapers/London Daily Mail 15
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Foreword

In July 1955 the International 14-foot dinghy class held its championship week at Seaview in the Isle of Wight. As usual the main event, the Prince of Wales's Cup, took place on the Thursday, and as a former holder of the Cup not sailing that year, I was invited to assist Cliff Michelmore in his BBC sound commentary on the race. At the start the wind was very light, but across the Solent great thunder clouds were building up over the mainland, and the dark sky made a menacing background to the white sails. When the squalls came down across the water the dinghies began to plane, and the race ended in sheets of spray and torrential rain. It was still raining much later as I listened to the six o'clock news, with extracts from our commentary. There was also a short account of the extraordinary adventure of a glider pilot who had climbed to more than 23,000 feet without oxygen in a thunder-cloud over Hampshire. I remember thinking as I listened 'Now there's something I'd like to try one of these days – gliding.'

That remarkable flight is vividly described in the opening pages of this book, but it was the brief BBC report of what took place inside the very thunderstorm we had been watching which caught my imagination and finally persuaded me that gliding was something I had to do. And that was the beginning of a whole new chapter of delight in my life, which I can trace back to the author of *Delta Papa*.

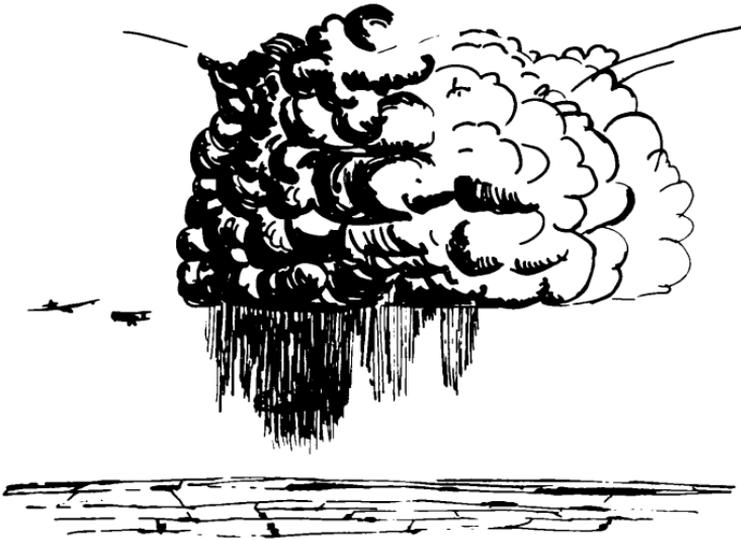
It must have been two summers later that I first met Derek Piggott when I landed in my own glider at Lasham, the place from which he had made the altitude flight. For many years thereafter we met frequently and competed against each other in national and regional gliding contests. He quickly earned my respect and admiration as a pilot, as an instructor and as a delightful human being. His text-books on the subject, *Gliding*, (now in its 4th Edition), *Beginning Gliding*, and *Understanding Gliding*, have, for many years, been basic reading for all glider pilots. And now we have his own personal story. It is the story of a pilot with more than four thousand hours of power flying and more than three thousand hours of gliding, largely made up of five-

minute training circuits. He has flown a hundred and fifty types of aircraft – from Dagling primary gliders and the Bristol Boxkite to four-engined bombers and jets. He has bridged the philosophical gaps between the instructor who always sets a good example and stresses safety, the display and film flier who is eager to cut margins to a minimum, and the test pilot whose job is to explore an aircraft to its structural limits.

To those of us who fly there is endless fascination in the experiences of others, especially when they are as varied as Derek Piggott's; to those who have no previous knowledge of flying I believe the story will be equally enjoyable for the directness of its authenticity and for its infectious enthusiasm.

I am particularly pleased to have had this opportunity of helping to launch *Delta Papa* and thus to repay some of my debt of gratitude to its author.

Peter Scott



Flight in a Thunderstorm

Isolated from the swishing hail and arctic cold by the thin plywood and glass fibre shell of my tiny sailplane cockpit, I could not even see out to the wingtips in the dark swirling cloud mass. Looking back on these moments I can now realise the full enormity of my position. The glider was heavily coated with ice, which jammed the controls so that every movement meant breaking the newly formed ice in the hinges and gaps in the control surfaces. Any moment a lightning strike could have fused every cable and control rod into a million molten globules or the violent gusts could have torn the glider into little pieces. One more puff of lift and I might have gone quietly to sleep forever, for man cannot live for long above twenty-five thousand feet without extra oxygen, and I had none. Nature had thrown out her challenge to ride the storm clouds and it was only natural that I should want to accept it.

So might a journalist have described my flight in a thunderstorm, which set a new British glider record. You may well wonder what this kind of flight is really like and what makes a glider pilot deliberately fly into a storm. The only concrete reason is to obtain a height of over 5000 metres (16,405 feet) for the Diamond Certificate, one of the highest awards universally recognised by the gliding world. Until recent years it was considered quite the normal thing for glider to fly

into storm clouds for any serious attempt for a Diamond height. Up to then the risks involved had always seemed to be acceptable providing that the pilot was competent to fly on instruments. However, since those days glider pilots have learned that there are much easier and safer ways of soaring to these heights.

For years airliners and other aircraft had disappeared mysteriously into the Pyrenees and other mountains with no rational explanation. Almost unwittingly, glider pilots soaring in amongst hills and mountains discovered that in some conditions the intense up and down draughts in these regions extend to incredible heights. Particularly in strong winds, the air is deflected into wave-like motions over and to the lee of the high ground, sometimes extending to more than twenty times the height of the hills. While these waves provided a glider with a rate of climb of more than a thousand feet per minute, the corresponding down-currents could force even an airliner down into the mountain tops, in spite of the pilot trying to climb with full power. The glider pilots also discovered an even more sinister threat, the areas of severe turbulence known as rotors. In a rotor the airflow is formed into a tumbling roller. The violent vertical currents, often only a few hundred yards apart, produce such intense up and down loads on any aircraft flying through them, that there is a very real risk of structural failure. This is particularly serious to the modern high-speed airliner, which is designed on the assumption that pilots will avoid such conditions. Few modern airliners are strong enough to withstand flying through rotor flow, and there have been numerous cases of aircraft being torn apart in the lee of mountain ranges.

A better understanding of these phenomena has made all flying far safer and has provided the glider pilot with a means of climbing to great heights without the risk involved in flying in storm clouds.

In 1955, however, few glider pilots had climbed to over 20,000 feet and wave flying was unpredictable and not fully understood. I had already made several cloud flights, including one with an ATC cadet to over 17,000 feet in an open cockpit T21b two-seater, and I was not the least perturbed at the thought of flying into large clouds.

July 14th was to be remembered in 1955 for the violent thunderstorms which broke out during the afternoon. However, it was just another training day at the Lasham Gliding Centre and we were busy teaching our course members on the two-seater gliders. During the morning, the clouds developed into large masses of cumulus and we could watch the mushroom shaped nodules of cloud growing visibly minute by minute. By two o'clock there was an occasional rumble of thunder and we heard from an RAF pilot that some of the clouds were

building up to 38,000 feet. Soon there would be heavy showers and almost certainly thunderstorms in our area, so we put away all the gliders which were not in use and made plans to return quickly to base if conditions became worse.

About three o'clock the sky began to darken and we were glad to fly the remaining gliders back to the safety of the hangar. It was obviously an opportunity to try for my Diamond height providing that I could get a launch before the storm broke. It would have been suicidal to launch the glider by winch like a kite since the steel wire standing up to 1000 feet would be a perfect lightning conductor; we had therefore to be launched by aerotow, and then I could be towed to the best lift even if it was some distance from the airfield.

While Derrick Goddard, my deputy, pushed out the Tiger Moth and started it, I hurriedly checked over the only readily available glider, a single-seater Skylark 2 belonging to the Imperial College Gliding Club. The Skylark is not a high-performance machine, but that is not critical when you are out for a height record; it had the bare minimum of instruments necessary for cloud flying, an airspeed indicator, altimeter, variometer (which shows rate of climb and descent), compass and a battery-operated turn and slip indicator. Besides checking the instruments carefully, I checked my parachute and recording barograph.

Parachutes are always worn for cloud flying, since in addition to the risks of icing, losing control, or structural failure because of the violent turbulence, there is always the possibility of collision with another glider. Remote though these hazards may seem, everyone wears a parachute just in case. However, special clothing is not necessary and on this occasion I had only a lightweight overall over my normal clothes.

It was a race against time. As we pushed the glider out of the hangar to a position from which it could be towed off by the Tiger Moth we could see the edge of the rain approaching the airfield from the north-east and see and hear the flashes of lightning and the thunder which were only a few miles away. If we were launched a few minutes too late, the strong lift ahead of the rain belt might well have already turned into heavy sink. Then all we could do would be to turn back and get down onto the airfield as quickly as possible before the heavy rain made the visibility so bad that landing became dangerous (try driving through heavy rain at sixty miles an hour without any windscreen wipers!).

As we took off, the line of rain had almost reached the boundary and we turned steeply to avoid it and climbed circling over the airfield, taking advantage of the area of rising air just ahead of the rain

front. I released the tow rope at about 1800 feet and knowing that I was already in rising air so that there would be little or no indication on the barograph chart of where I had released, I opened the air-brakes and dived down a few hundred feet to make an obvious dip and to record a low point before starting to gain height again.

The situation looked perfect for a quick climb. I needed just over 18,000 feet for a Diamond and my plan was to steer into wind after the climb, so that with luck I should come out of the cloud upwind of the airfield and be able to glide back and avoid a field landing and a road retrieve. I rechecked the instruments, switched on the turn and slip indicator and took a last farewell look at Lasham before being engulfed by the cloud at about 3000 feet. The cloud was dense but smooth, and within a few seconds I had settled down on the instruments, checking the airspeed and the position of the turn needle alternately to see that the glider was kept in a steady turn in order to stay in the lift. The psychological effect of going into cloud always amuses me; one moment you are flying a glider with wings standing out some thirty feet on either side, then suddenly you are sitting in a tiny cockpit all alone. You suddenly become aware of the purr of the gyro in the turn indicator, without which you would be unable to tell the attitude of the glider, and hence be unable to control it and prevent a dangerous spiral dive. It is a very, very tiny world – much like a space capsule I suppose. There is no sensation of turning, and only readings of the variometer and the altimeter give the indication that the glider is climbing rapidly.

Frequently, as on this occasion, the air is smooth and very few control corrections are needed to keep the turn steady.

Since there was so little to do I looked at my watch and timed the climb. From 4000 feet to 11,000 feet took only 5 minutes: an average rate of climb of 1400 feet per minute – I was duly impressed!

Suddenly at about 14,000 feet I ran into really violent turbulence. Usually turbulence tends to tip a glider laterally because of the large wing span, but this seemed like a violent shaking of the glider as a whole. I had no difficulty in controlling the glider but this turbulence was so bad that I seriously considered that there was a possibility of the wings becoming overstressed so that it might break up. By keeping the speed low I could prevent any real risk of overstressing the glider, but for what seemed like several minutes I was tossed about by the worst conditions I have ever encountered in a cloud. At the same time there was the sound of fine hail or ice crystals, and then equally suddenly, once again all was quiet and serene as the altimeter continued to wind on the height.

But now I began to get small shocks from the stick and the airbrake lever, and these became progressively worse and eventually really violent. Now the flashes were visible: one appeared as a blue spark across the rudder pedals and I felt a severe shock through my feet.

The first bad flash gave me a painful shock, rather like accidentally putting two fingers into the electricity power supply. Then came a second and a third one and I realised the real horror. It was as if I had my hands on the wires from the mains and I could not remove them. A little man was switching the power on every now and then and enjoying his fun. Waiting for the next shock was agonising, and somehow I knew he would do it again.

But the real worry was the realisation that if I became really scared, I might start to overbreathe. This, combined with the lack of oxygen at 15,000 feet, could result in losing consciousness in a few seconds.

I knew that this had been the cause of many losses in the war, and that I was in a precarious situation, particularly without oxygen equipment. The control of the breathing is regulated by the amount of carbon dioxide in the lungs and when you breathe very deeply, the sensitive balance is disturbed and the brain responds by stopping your breathing. Unconsciousness follows in a few seconds.

I opened the window in the canopy and scooped in fresh air, and willed myself into a calmer state, consciously keeping my breathing shallow.

The glider seemed to be struck four or five times near the cockpit in a few minutes. Usually the shocks were accompanied by a bright flash and a smell of ozone. Oddly enough I heard no thunder (and have seldom heard any when I have been in a glider). After the first few, the shocks became so bad that I shouted out in the cockpit, and decided to get out of the cloud immediately.

But that was not to be. By this time, I was at about 17,000 feet and I attempted to straighten up on a north-easterly heading as originally planned. It was a stupid decision as it would have been quicker and safer to have flown out from the side I had entered instead of trying to go right through the centre of the storm. Just for a moment I felt rather queer, and suspecting that lack of oxygen was affecting me I scooped more cold, fresh air into the cockpit.

Anoxia has very peculiar symptoms, and is particularly dangerous because you usually feel quite all right until the moment you become unconscious. It is rather like the effects of alcohol. You cease to be concerned or worried, often giggle or laugh out loud, and are unable to concentrate properly or perform any skilled task like flying accurately. Suddenly you become unconscious, and on recovery have no

recollection of what has happened or of passing out. Individuals have vastly different tolerances and these themselves vary from day to day. It is recognised nowadays that everyone deteriorates rapidly above about 10,000 feet, and that when flying above this height, oxygen equipment is essential for safety, and in many countries is mandatory. Of course if living permanently at ten or fifteen thousand feet, the body adapts itself to the lack of pressure and mountaineers can climb to over twenty thousand without special equipment.

A few moments later I was hit in the eye by a fragment of ice or hail. This added to my misery and was really very painful. I glanced out towards the wingtip and noticed, for the first time, that the leading edge of the wing was coated with a rough layer of ice and hoar frost about a quarter of an inch thick. The canopy was iced and frosted over, and on trying the controls I found that the ailerons had iced up and were immovable. This was a new experience to me and could have been very dangerous, but I was not too alarmed as it is just possible to keep reasonable control with the rudder and elevator alone. Anyway most of the ice would probably melt off during the descent so that the controls would be free again for the landing. I had not noticed the ailerons becoming jammed and so thought that the ice must be very thin. A rather brutal sideways movement on the stick broke them loose and as I was well above the level at which ice can form there was no further trouble. I checked the airbrakes and was relieved to find they were free, since if you lose control in cloud they will limit the speed and prevent high speeds which might cause a catastrophic structural failure.

I had some difficulty in straightening up to head out of the cloud, and for a few minutes suspected instrument trouble. Cross-checking showed that the instruments were all serviceable and I concluded that I must be suffering from lack of oxygen.

Some years later discussing anoxia I heard for the first time that one of the symptoms is tunnel vision. This is an effect where the eyes only see things immediately ahead or in a very narrow angle. I remember staring at the panel and seeing only the turn and slip and the airspeed indicator and being oblivious to everything else. Obviously I was being seriously affected at the time.

At 20,000 feet I decided that I should descend immediately. I stopped circling and opened the airbrakes fully to increase the rate of descent in a controlled dive. By concentrating on flying straight on a north-easterly heading, I hoped to leave the area of lift and fly out of the cloud. In fact after a short period of descent I ran into some even stronger lift, and in spite of the effect of the airbrakes, I was carried up

even higher. At the time I was concentrating on flying straight and getting onto the compass heading, a much more difficult task than circling steadily. I failed to notice that I was going up instead of coming down. It was only after the flight when I examined the barograph record that I realised that I had been up to well over 23,000 feet in spite of trying to descend. However, I was soon descending very rapidly again, but of course with the extra height the shortage of oxygen must have been beginning to become serious, and it made it difficult for me to concentrate on more than one thing at a time. After losing several thousands of feet, once again I flew into some very strong lift, and seeing the needle of the variometer zoom up to show a very high rate of climb again, in my happy-go-lucky anoxic state I could not resist the temptation, and closed the airbrakes. Fortunately good sense then prevailed, and I told myself to get down as quickly as possible before I passed out altogether.

The rest of the descent was so rapid that on looking at the barograph chart later I am aware that I must have been only semi-conscious most of the time. I have little or no recollection of the descent, except for a few moments at 16,000 feet when I giggled to myself over the look of the 10,000 feet hand of the altimeter and tried to work out whether I was at 6000 or 16,000 feet. For the average glider pilot in England, the tiny hand which indicates the tens of thousands of feet is seldom, if ever, seen to move and it was almost a novelty to me to find it actually worked.

My amusement convinced me that I was anoxic but at least I remained conscious and steered a more or less straight course. Left to its own devices, the glider would have wound itself into a high speed spiral dive, and this did not happen.

It was difficult to say exactly when I came out of cloud because it was raining or showering frozen rain from the anvil cloud above and it was difficult to see much through the frosted canopy. At about 10,000 feet the ground below became vaguely visible and I saw the town of Alton a mile or two to my south. Just as planned, I thought, but in the rain I could not spot Lasham airfield only three miles away and I could not make a clear decision which way to go to reach it. I set off and failed to locate Lasham and returned to Alton several times and finally more or less followed the road back. As I arrived the rain had just stopped and I was feeling very exhilarated and in my anoxic state put my glider into a steep dive and made several loops and other aerobatics before landing just one hour and fifteen minutes after take-off.

My friends at Lasham were very, very relieved to see me back safe

and sound, and we hurriedly pulled the glider into the hangar and checked the barograph. There was little doubt about my Diamond for height and that this would be a new British height record for single-seaters. Apparently it had been a terrific storm with torrential rain which flooded the airfield. They had been more than a little worried for my safety. We learned later that several people had been killed in the fields close to Lasham and that the storm had caused quite a lot of damage locally.

It was only after landing that I realised my stupidity. I had been through the teeth of the worst storm in our area for many years and had climbed to a height at which by normal standards I should have become unconscious.

Obviously, there was a likelihood that the lightning and hail would have caused damage, but in my anoxic state, it seems, I had been aerobating. When we looked around the glider on the ground, we found that it had suffered quite extensive damage. The solid spruce leading edge was badly dented by hail and had to be filled and completely refinished. The fabric of the elevator and rudder was tattered, either by hail or by the ice melting and flying back from the wings.

I had then remembered the lightning strikes, and begun to look for damage elsewhere. Where the sparks had entered and left across the nose, there were small pin holes and burn marks in the glass fibre. Around them the fabric and paint finish had been exploded off and peeled back for about an inch. There were also strike marks on the side of the cockpit by my shoulder and along the canopy, as well as at the tip of the rudder, where the plywood had exploded leaving a bad burn mark.

Considering the size of the storm, the damage was really very slight and did little to convince us that the risks involved in storm flying were unacceptable. I had been lucky to get my Diamond and the record of 22,800 feet and to live to tell the tale. This record was to stand for several years before being broken by similar climbs in storms to over 30,000 feet. By 1963 it had become clear that the risks of being struck by lightning and the glider being severely damaged were much greater than we had thought. About one in every five climbs to over 15,000 feet in storm clouds seemed to involve damage and the pilot of one glider in England was killed when it was struck by lightning. On this occasion the control cables were melted right away and large areas of the spar webs were burned away by the flash. Most pilots took the hint and began to turn their attention to soaring the mountain waves since it was much safer and easier as it did not rely on instrument flying.

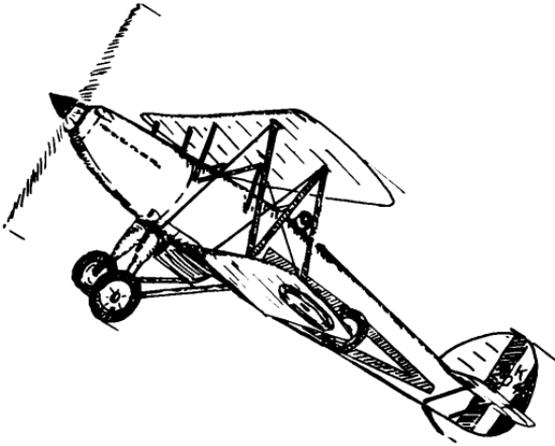
The World height record is for a height of 46,266 feet and this was achieved in California in a wave system triggered off by the mountains there. The flight had to be abandoned while the glider was still climbing rapidly because above that height a pressure suit or pressure cabin is essential. Without one the pilot cannot absorb enough oxygen to remain conscious, even when he is breathing pure oxygen. With a pressurised glider, if one becomes available, it may be possible to use these mountain waves to much greater heights, perhaps to 80,000 feet or more, but until that day both the British and World records are not likely to be broken by significant amounts, if at all.

This flight of mine to a mere 25,000 feet showed the dangers of being carried up by strong lift and the need for using oxygen equipment for any climb above about 10,000 feet. Even then the dangers of a failure of this equipment or even of the results of a loose fitting oxygen mask cannot be emphasised enough.

But the craving to achieve that Diamond award for a 5000 metre gain of height comes to most glider pilots at some time or other, and I only hope that no one else will try without making sure of his oxygen supply.

I still love cloud flying, but my attitude towards thunderstorms has never been quite the same. This one flight certainly taught me to choose my clouds with a little more discretion!

My life has not always been so exciting or so hazardous: I often think that but for the advent of Hitler and the War, my flying career might well have stopped at flying model planes. It is sad to think that it took a war to make piloting possible for someone like myself. For once we were all judged by our aptitude and not by our academic qualifications.



Fury

From Cradle to Cockpit

My first recollections of my early childhood are of a five-shilling joy ride in an Avro 504 somewhere on the cliffs near Eastbourne. I can still smell the pungent odour of castor oil and hear the clatter of the engine and the sudden silence as the engine cut out when we started our final glide down over the sea for landing. There were three of us squeezed into the rear cockpit. I sat on my mother's knee with my brother opposite us and I could just see over the cockpit edge. I was four years old. Five shillings was a lot of money in those days and the pilot must have been pleased to make fifteen bob for a five-minute circuit. I loved every moment of it and complained bitterly to the pilot that he hadn't gone high enough or fast enough. From that day, my life revolved round aeroplanes.

My father was a great aviation enthusiast. He had been an avid reader of Jules Verne and H. G. Wells. Like them he had the imagination to see the great future of flying. As a young man he had been to many of the early flying meetings to watch the pioneers. A. V. Roe, Rolls and Grahame-White were his heroes. He had always wanted to learn to fly himself but could never afford it. As a result he did all he could to encourage me as I grew older. Like other boys in the early

days of flying, he had pieced together wood and fabric in attempts to make his own flying machine, but perhaps the nearest he came to success (and to disaster) was attempting a parachute jump from an upstairs window, holding a large umbrella. He escaped with minor bruises and a scolding from his parents.

Every year when we went on holiday he would write to the nearest RAF Station and arrange for us to visit it so that I could get a closer look at real aircraft. He had an incorrigible cheek and no Station Commander had been known to refuse him. After all, he reasoned, the RAF was paid for from taxes, and he was a tax payer, so he had a right to see what he was paying for.

Soon I could identify the Siskins, Bulldogs, Furies and Virginias at a glance, and often five minutes before they came into view, by their distinctive engine notes. For several years we visited Tangmere, the home of two squadrons of Hawker Furies. The Fury was a neat little biplane and the pride and joy of the fighter squadrons. I can still remember the shining mirror-like aluminium engine cowlings and the huge wooden propellers. We were usually shown around by the orderly officer of the day and on one particular occasion by a very pleasant pilot officer who had just crashed and written off a Fury in some stupid accident. He was doing penance as permanent orderly officer for two weeks. I often wonder if many of these people became aces in the Battle of Britain, and whether they would remember patiently explaining the innermost workings of the interrupter gear (which prevents the machine gun from shooting off the propeller), to a tubbly little padre and his small son.

The nearest airfield to my home was Hornchurch, about four miles away. This was quite a long ride on my little fairy cycle and I can remember cycling there with my bosom school pal Stanley Elliott. Often we would arrive saddle-sore and weary, only to find all the hangars closed and no aircraft to be seen. On other occasions we were lucky, and would spend a thrilling afternoon watching the Bristol Bulldogs taking off and landing.

The early thirties were exciting times in the flying world. Records were being broken, and the newspapers were packed with sensational stories about these flights and the future of aviation. Gradually my mind became focused on aeroplanes and flying, to the exclusion of almost everything else.

About this time I began to make scale-model planes, mainly carved from solid balsa or hardwood. With a bare sixpence per week pocket money, it was only at Christmas that my funds allowed for buying a Skybird, the elite of the 1/72-scale kits. These were the equivalent of

the modern plastic scale models, but were put together with Secotine or Durofix and were shaped in hardwood. I soon had a fleet of these machines, including a few home-designed ones, and became expert at 'flying' two at a time in formation aerobatics and at producing a realistic 'raspberry' noise to simulate the engines. These seemingly childish activities stimulated my interest in real aircraft. I kept a diary of all the new types of aircraft which flew over my home town, and soon could identify most of them by sound alone. At school, most of my time was spent gazing out of the classroom windows at passing machines, or sketching aeroplanes in the back of my school books.

The next real landmark in my life was the decision to spend my Christmas present of five shillings on a kit for a flying model Puss Moth. I think I was about eleven or twelve years old, and although I had tried several times to make paper and card models from kits, none of them had flown at all. The major problem in those days was having the patience to stick them together correctly. Most of the glues took a day or so to dry, and I was always far too impatient to complete one of these models correctly. Also, the slightest contact with damp grass resulted in everything dropping to pieces: waterproof glues were almost unheard of in those days!

My sixteen-inch-wingspan Puss Moth was a stunning success. It was made of balsa and glued together with quick drying balsa cement, a revolutionary discovery. I found that it was simple to build, and it flew so well that I never doubted that I could build other models and that they would also fly well.

Next I built a very simple glider to my own design and tried unsuccessfully to launch it by catapult. This was followed by many more dismal failures and it was not until I met a few other modellers that I made more progress.

At this time I used to buy every American model magazine that I could lay my hands on, and copy their ideas. My first real competition model was a design from the *Flying Aces* magazine and I well remember fitting it with floats and taking it to Wimbledon Common for a seaplane competition. I made the best seaplane flight of the day, about 65 seconds, and came third or fourth. From then on my life was models, and school time became the time spent between eating, sleeping and the model I happened to be building at the time. My family learned to live on balsa shavings and the smell of cellulose dope, and I became expert at designing and building a new model every other week, whenever money allowed. By this time I had learned to scrounge extra pocket money on Saturday mornings, and this was inevitably spent on a few sheets of balsa and a threepenny

tube of cement. Improvisation was the watchword, and we never bought anything which we could make or scrounge. Almost all our models were to our own design, since kits were far too expensive for our limited pocket money. Even today when I build a model, it hurts to spend money on wheels or propellers – in those days we always made our own.

It was sometime in the thirties when I first went to Sir Alan Cobham's Air Display. Unlike the modern air displays, these flying circuses toured the country introducing the thrills of flying to anyone who could afford five or ten shillings for a flight. At this time the circus was touring round the towns of southern England, flying from any large field, and staying for two or three days before moving on to their next location. Usually I managed to persuade my family to take me on at least one of the days. Since it cost a shilling or two to enter the ground and we were perpetually broke, my friend Stanley and I would stand near the entrance gate to watch on the other days, hoping that someone would take pity on us and pay our entrance fee. One afternoon we were called over to the gate, given a sack and a wooden spike and invited in to help clear up the rubbish after the show was finished. This was like a dream come true, because we could go beyond the ropes and talk to the mechanics, and even the pilots themselves. We stayed long after the show had ended, drinking tea and talking aeroplanes with our benefactor. Of course we wanted to do it again and arranged to ask for him next time the show came our way. For several years his name was our passport into the displays and I have always remembered his kindness.

'Circus' is the best description of these displays, which had something of everything in the way of flying. At various times the fleet of machines included a twin-engine Handley Page airliner, two Airspeed Ferries, Avro 504s, Avro Cadets, Gipsy Moths, a Blackburn Lincock fighter, a Cierva Autogiro, a BAC Drone, a Flying Flea, a glider and various other machines. Each time there seemed to be something new to see. I will always remember the first sight of all the machines flying round the district in a wide straggling formation, announcing their arrival and showing the flag. Those were the days!

Apart from seeing Joan Meekin aerobating a glider at an Alan Cobham Display, my first introduction to real gliding was as a result of reading a newspaper article when the British two-seater duration record was raised to 22 hours. This drew my attention to the fact that the National Gliding Championships were in progress at Dunstable. My imagination was fired, and nothing could stop me from trying to get there to see the gliders at first hand. Somewhat reluctantly my

parents agreed to my playing truant from school for two days so that I could cycle to Dunstable to see the competition. It was a very long ride, and having ridden through London I arrived late in the evening, and pitched my tent at the side of the gliding site. Dunstable was a spectacle that I will never forget. Most of the gliders, Rhonsperbers, Buzzards and Kite 1s had varnished plywood skins and clear-doped white fabric covering. They looked beautiful. At height, every detail of the structure could be seen as the sun flashed on the polished surfaces. I was amazed at the near vertical climb on the winch launches, and at the long sideslipping approaches and gentle landings. I spent the days gazing spellbound at the beauty of the gliders as they circled lazily beneath the clouds before setting off across country. I was far too shy ever to speak to anyone, or to do more than touch the fabric when I could get near enough without being seen. Never once did I ask or find out anything about joining a club or the cost of gliding. It seems surprising to me now that I never even considered the possibility of learning to glide – somehow both gliding and power flying were a world apart from my life. These were a rich man's sports, or so I believed. It was not until I started to instruct on gliders that I realised that anyone who really was determined to learn to glide could manage it by saving on a few of the other luxuries of life.

My career at school was pretty disastrous, and by the time I left to start work, I had completely lost interest in almost all the subjects in which I had any real ability. Ironically, I glide today with my classmate Peter, who competed with me on several occasions for the bottom place in the class. He is now an assistant head teacher, and we often chuckle over the old school and why we were failures there. However, I realise now that had I done any work, life would have been much easier, and many more careers would have been open to me.

One master, Billy Wells, had been telling us all for years that we were 'wasting our fathers' money', and I finally came to the conclusion that he was right. I have never been sure whether or not my father was actually asked to take me away from Sutton County, or whether he just decided that I might be better learning something more practical than academic. I had worked my way steadily down from near the top of my class to the bottom in my five years at Sutton and it was time for me to move on to something else more profitable.

I left and went to a small precision engineering company to learn to be an instrument maker. This was thought to be a more promising line than aircraft, and the idea was that I could switch to aircraft instruments or something allied to aircraft at a later date.

The next few years were to have a great influence on my life.

It was a very small firm and the boss had built up a tradition of fear among his employees. We could scarcely speak a word to each other without either the foreman or the boss appearing on the scene with some cutting remark. New men came and disappeared with monotonous regularity, and this enforced the feeling that any moment one might be out of a job. This made a great impression on me at the time, because I somehow believed that if I were sacked it would be the end of any future hope in that industry.

Another worrying feature was that if we were even a few minutes late, the gate was locked and we had to knock at the office entrance to be let in. This meant facing the boss or his secretary, a veritable dragon who reported everything she saw or heard, apart from making up the pay packets each week. No excuses seemed good enough for being late and several times I can remember running all the way from the station to arrive a physical and nervous wreck on the door step. However, I must have been considered a good worker, because in spite of warnings and threats, I kept my job and stayed until I escaped into the RAF in 1942. I still feel a twinge of conscience if I start chatting while working on a job for someone or if I go into our workshop to borrow a tool and start a conversation with one of the workers.

I learned the art of being fully occupied while doing nothing when the foreman decided that it was not worth starting a fresh job before the knocking-off bell rang at five-thirty. But I also learned how to make up for lost time by saving seconds here and there and by thinking ahead about the next operation, something I try to apply to everything I do now because life seems so short.

Towards the end of my time, I specialised in machine engraving and in mounting and cleaning optical systems. In both jobs the constant anxiety and Gestapo-like conditions worked against doing the job well. Working fifty to sixty hours a week through the Battle of Britain period, I was very relieved when finally my papers arrived and I left for the RAF.

Looking back on my years as an instrument maker, it seems incredible to me that I had absolutely no idea that I could have changed my job, or that it was anything but normal and that the average worker was no longer under the threat of unemployment as had existed in the 1920s. I knew absolutely nothing about work relationships, and as a result lived those years in constant fear of dismissal – quite unnecessarily.

My entry in to the RAF was a welcome change. I enjoyed the preparatory work on the principles of flight, navigation, and

meteorology, and found that I could more than hold my own in all the technical subjects.

All the aircrew cadets, with the exception of a few who had re-mustered from other trades and who had learnt something about the ropes before they joined us, were terrified of the drill corporals and sergeants. Our squadron commander, a pilot officer, was the ultimate authority, and seemed to us to hold the power of life and death.

The mysteries of 'charges', and being confined to camp (or jankers as it was known), were never explained, and we lived in terror that some misdemeanour such as having dirty webbing equipment (our belts etc. were blanched pure white and showed every mark) would result in a blot on our record and relegation to the rear gun turret of a Wellington. However, on the whole the period spent at ITW (Initial Training Wing) at Scarborough was a very happy one and after a few weeks leave I was sent up to Carlisle for what was known as 'grading school'.

The grading scheme was a means of selecting the people who showed the most aptitude as a pilot, and at this stage of the war (1942) almost all potential aircrew went through grading. This did not mean that only the best became pilots, because the demand for pilots fluctuated so wildly from month to month according to the casualty rates and the vacancies in the various training schemes. At one time the top twenty per cent would be taken for pilot training and barely a week or so later only the top five per cent would be wanted.

The grading scheme gave each student about twelve hours of flying in a Tiger Moth, involving tests for progress and aptitude at about five hours, and at the end of the course. The result of these tests was recorded and graded. It was not supposed to influence the result if the student did not go solo, since that might be because of bad weather or other factors; however, going solo was a great morale-booster and must have resulted in more relaxed and therefore better flying for the final test.

I was most fortunate with my instructor and made very rapid progress during the first few hours. By about four hours I was ready to solo, but the weather was very windy. Next day we went up and did a few circuits and to my surprise he got out and sent me off on my own. All I can remember is my pleasure at being one of the first to solo, and the greatly improved take-off and climb without his weight in the front cockpit. Landings were quite a mystery to me. I seemed to have acquired the knack of doing them well, but how or why I don't think I really ever knew until I started to teach gliding almost ten years later.

After each flight we would discuss the lesson with a model and in

The Author

Derek Piggott was born in Essex. After school, he joined a firm of instrument makers, and then, in 1942, the RAF. Trained in Canada, he was posted to troop-carrying gliders, and spent most of his war years in India, at one stage flying Dakotas on the Burma front. Returning to England, he was posted to the Central Flying School, and then to the gliding instructors' school at Detling, as chief instructor.

Leaving the RAF in 1954, he has since been chief flying instructor at Lasham Gliding Centre, flying for films since 1964. He is an adviser to the BBC series *Wings*, and is now involved with test flying and developing gliders and light aircraft.

He has appeared many times on television and radio talking about film flying, and has made two *Clapperboard* programmes about stunt flying.

Front of jacket: Left. Flying under the bridge during the making of *The Blue Max*.

Right. The Avro triplane, one of the flying machines from *Those Magnificent Men . . .*

Back of jacket: Left. The author in the cockpit of the Bristol Boxkite, also used in *Those Magnificent Men . . .*

Right. Filming part of a crash sequence for *The Red Baron*.



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