

The Air Pilot's **Manual**

## **Volume 4**

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# **The Aeroplane – General Knowledge**

- Principles of Flight
- Aircraft General
- Flight Performance & Planning

*'Recommended reading'*  
*Civil Aviation Authority*  
*Singapore CAA Recommended Study Guide*

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## **Volume 4**

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## Preface to the Ninth Edition

Keeping up to date with legal changes is challenging, because the law is changing all the time. Please be aware that there are almost daily changes to some aspects of aviation law, so you must check the CAA (and EASA) websites frequently.

To highlight the difference between UK CAA material and ICAO or EASA material, we use a lighter typeface for the ICAO material.

**NOTE** Please check our websites for updates and links to references mentioned in the text. Please refer to [www.pooleysapp.com](http://www.pooleysapp.com) and to the Pooleys websites: [www.pooleys.com](http://www.pooleys.com).

On 1<sup>st</sup> January 2021, the EASA Regulations that had been in force in the UK transferred into UK law as ‘retained EU law’ and the EASA Basic Regulations became the UK Basic Regulation. This was to avoid large gaps in legislation that might otherwise existed when EU law ceased to apply. On 1<sup>st</sup> January 2024, any of this legislation that was still valid became known as ‘assimilated law’ and ended the supremacy of EU law within the UK legal system. The CAA and the Department of Transport are now the responsible departments.

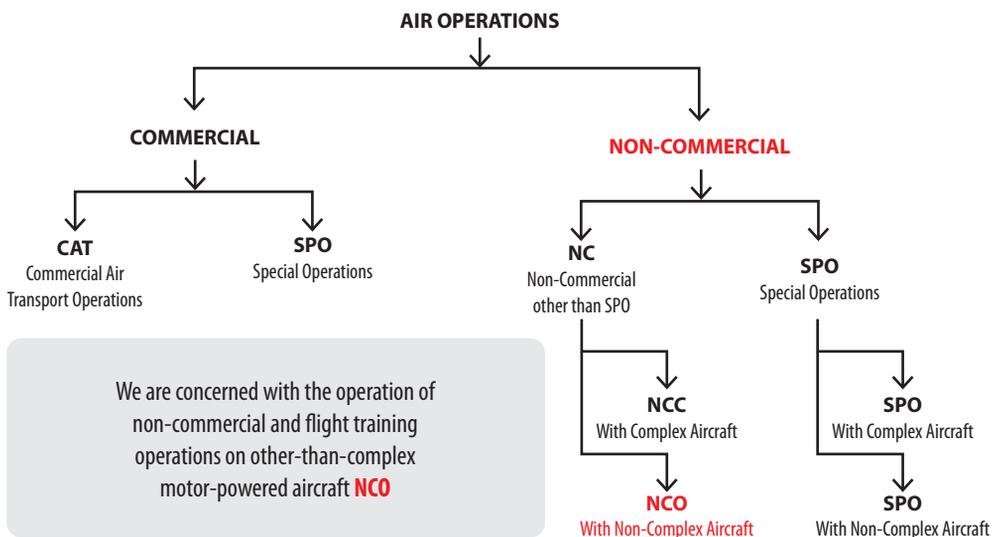
Until any further changes are made there is still a difference between what were classed as ‘EASA aircraft’ and ‘non-EASA aircraft’ but the terms now used are ‘Part-21 aircraft’ and ‘non-Part-21 aircraft’. Part-21 is the scheme for aircraft design and product certification under EASA, and non-Part-21 aircraft are regulated under the Air Navigation Order.

There will be changes to the assimilated law in the future that are not known at the time of writing and so it is vital that updates are monitored via Skywise and also [www.caa.co.uk/uk-regulations](http://www.caa.co.uk/uk-regulations).

### **Operation of Aircraft**

EASA classified civil aviation activities as:

- Commercial or non-commercial, based on the presence of remuneration;
- Air transport or specialised operation, based on the activity performed;
- Performed by complex motor-powered or other-than-complex motor-powered based on the aircraft used for the activity.



The definition of ‘complex’ in terms of air operations is:

- Maximum certificated take-off mass exceeding 5700 kg.
- Certificated for a maximum passenger seating configuration of more than 19.
- Certificated for operation with a minimum crew of at least two pilots.
- Equipped with at least one turbojet engine or more than one turboprop engine.

The assimilated EU law is structured in a way that the BASIC REGULATION branches off into different parts concerned with different aspects of aviation.

- The Part that deals with NCO operations is PART-NCO.
- The Part that deals with flight crew licensing is PART-FCL.
- The Regulation that deals with Rules of the Air is SERA (Standardised European Rules of the Air).

***So what documents do I need to refer to as a UK pilot flying a G registered aeroplane?***

### **AIR NAVIGATION ORDER (ANO) 2016**

Not changed. Enacted by parliament containing safety requirements for all aircraft in UK airspace and persons involved in aircraft operations.

Contains airworthiness, operational, and flight crew regulations for non-Part-21 aircraft.

## **THE STANDARDISED EUROPEAN RULES OF THE AIR (UK) AND UK RULES OF THE AIR REGULATIONS 2015**

All aircraft in UK airspace must adhere to these regulations.

### **PART-FCL**

This contains all licensing requirements for Part-21 aeroplanes.

### **PART-NCO**

This contains all operational regulations for Part-21 other-than-complex motor-powered aircraft.

### **ANO 2016 – PART 6 & SCHEDULE 8**

This contains all licensing requirements for non-Part-21 aeroplanes.

### **ANO 2016 – PART 5 & SCHEDULE 5**

This contains all operational regulations for non-Part-21 aircraft.

### **Part-21 or Non-Part-21?**

Most 'modern' factory built aircraft (*not including microlights or gyroplanes*) are classed as Part-21 whilst vintage, ex-military and amateur built aircraft, together with microlights and gyroplanes, are non-Part-21.

### **What has happened to my licence?**

Part-FCL licences for Part-21 aircraft are now issued in accordance with the UK (formerly EASA) Aircrew Regulation. UK issued EASA Part-FCL licences that were issued whilst the UK was still part of EASA remain valid on UK registered aircraft. A Part-FCL licence may also be used to fly a non-Part-21 aircraft of an equivalent category and class. However, to fly a non-Part-21 aircraft requiring a type rating you do need an endorsed UK licence issued in accordance with the ANO.

A recent change to the UK (EU) Aircrew Regulations means pilots with a licence issued under the Air Navigation Order and who hold a valid SEP, SLMG, SSEA or TMG Class Rating(s) can now fly UK (G) registered Part-21 aeroplanes.

Holders of an UK ANO licence with a SEP Class Rating are limited to similar privileges of the UK Part-FCL LAPL(A), when exercising the privileges of this rating while flying UK (G) registered Part-21 aeroplanes.



# Editorial Team

## **Dorothy Saul-Pooley** LLB(Hons) FRAeS FRIN

Dorothy held both an ATPL (A) and CPL (H) and was an instructor and examiner on aeroplanes and an instructor on helicopters for over 25 years. For 15 years she was Head of Training of a school dedicated to running Flight Instructor and examiner courses at Shoreham Airport. For 20 years Dorothy was also a CAA Flight Instructor Examiner (Senior Examiner).

Dorothy originally qualified as a solicitor in 1982 and acted for many years as a specialist dealing with aviation insurance liability issues and aircraft accident investigation work. She has lectured widely on aviation law and insurance matters. This highly unusual combination of qualifications and experience led to Dorothy's appointment as one of the Honorary Solicitors to the Guild of Air Pilots and Air Navigators (GAPAN). Dorothy is a Fellow of the Royal Aeronautical Society and of the Royal Institute of Navigation. She is the Past Chairman of the GAPAN Instructor Committee, of which she was a founding member and she was the prime instigator of the Guild's biennial joint Forum with the Central Flying School at RAF Cranwell for Senior Flight Instructors, both civil and military.

She is also Past Chairman of the Education and Training Committee. Dorothy was elected to the post of Master of the Honourable Company of Air Pilots (formerly GAPAN) for the year 2014–2015, the first woman to hold that post. Dorothy was the Founder, and for 8 years, the Chairman, of the Professional Flying Instructors Association and after 17 years at the helm she has just relinquished her role as the Governor of the British Section of the 99s, an international women pilots' organisation.

In 2003, Dorothy was awarded the Jean Lennox Bird Trophy for her contribution to aviation and support of Women in Aviation and the British Women Pilots Association (BWPA). In 2013, Dorothy was honoured to receive the prestigious award of a Master Air Pilot certificate from GAPAN. In 2015 she was awarded the Brabazon Cup by the BWPA for her outstanding achievements in aviation.

In 2019, Dorothy was awarded the Pike Trophy by the Honourable Company of Air Pilots for her outstanding contribution to the maintenance of civil flying instruction standards. As consulting editor for Air Pilot Manuals and for Pooleys Flight Equipment for over 25 years, Dorothy has written, edited and contributed to more than 30 training manuals and has published many articles in aviation magazines, legal journals and online publications. She continues to coach and mentor pilots and would-be pilots and is in demand as a public speaker on aviation topics.

## **Caroline Smith** BA (Hons) BSc (Hons)

Caroline holds a frozen ATPL(A) and has been an instructor since 1999 and examiner since 2001 teaching all levels of flight training from trial lessons, from ab initio PPL(A) courses, night and IMC ratings, to commercial, multi-engine and instrument rating training. Having previously been Chief Flying Instructor and then Head of Training at a busy flight school, she now specialises in running

Flight Instructor Courses at White Waltham airfield and is also a Flight Instructor Examiner which allows her to visit schools all over the south of England examining their instructors.

With degrees in Meteorology & Law and, more recently, in Psychology, she is a huge fan of continuing education for all and has expertise in the way in which people learn. She is currently trying desperately to learn British Sign Language! She has devised and presented groundschool presentations for a number of flight schools and a few UK universities and is the author of the webinar materials for the Pooleys Academy as well as being our Webinar Lead and the instructor on many of the webinar sessions.

Caroline is an Upper Freeman of the Honourable Company of Air Pilots and is the chairperson for the selection and interview panel for the Company's Flight Instructor scholarships.

### **Philip Baxter** BA(Hons) LLB (Hons)

Philip held a UK ATPL (A), is an Instructor and has been a PPL Examiner. He began his working life in the Civil Service, having joined from school, and stayed for more years than he now cares to remember! He worked in a wide variety of (mostly) very interesting jobs, within several Departments, which included one period as Private Secretary to a government Minister, another (reflecting his long-standing interest in aviation matters) dealing with aircraft noise and ICAO 'Annex 16' issues as well as pollution from aircraft engines; and another as a technical author. Much of the remainder of his Civil Service career was related to telecommunications, ranging from international Treaties to technical standardisation. This included representing his departmental interests on Standards Committees in particular, both internationally and domestically. Both his Degrees, the first in Science and Technology, the second in Law (providing an unusual combination) were awarded following part-time study with the Open University. Since 'retiring' early from a senior middle-management grade, Philip worked for six years as a fulltime Flight Instructor and Flight Examiner, accruing some three and a half thousand instructional hours. Phil has taught ground school subjects for the Flying Instructor course and has also been Vice Chairman of the Professional Flight Instructors' Association (PFIA).

### **Claire Hatton**

Claire became obsessed with flying at the age of 14, during a family summer holiday (although strangely, no-one in her family had any connection to flying)! A fact-finding visit to some local flying schools a few weeks later resulted in a Saturday job for Claire, helping on ops at Manchester School of Flying (MSF) at Manchester Airport – and having her first flying lesson! She worked at MSF throughout school, achieved her first solo flight on her 17th birthday (the earliest opportunity at the time) and gained her PPL four months later, during sixth form. Claire later flew Bulldogs with Bristol University Air Squadron, relishing solo aerobatics, then worked as cabin crew for Monarch Airlines to fund her ATPLs and Flight Instructor rating, assisted by the award of an Amy Johnson Memorial Scholarship.

Claire became the youngest female FI in the UK at the time, age 22, and immediately started instructing at Manchester School of Flying where her aviation journey had begun. She won the Jackie Moggridge Cup from the British Women Pilots' Association, awarded to a female pilot for achieving excellent qualifications in her chosen career. Later that year she added a Multi-Engine Instrument Rating, assisted by the award of an Air League bursary, and flew the 'Eye In The Sky' traffic watch flights for a local radio station, then worked at Caernarfon Airport as a pleasure flight pilot on a Piper Aztec.

Claire authored her flying instructor manual 'You Have Control! Being a Better Flying Instructor' and had regular instructional articles featured in the aviation press, both in the UK and other countries. She then added Multi-Engine Instructor privileges and focused on teaching the Multi-Engine CPL and Multi-Engine IR for Ravenair at Liverpool John Lennon Airport.

Having always had a keen interest in aviation safety, in 2015 Claire became Safety Manager for Air Traffic Control Services Ltd, the Air Navigation Services Provider (ANSP) for Liverpool John Lennon Airport, Doncaster Sheffield Airport and Teesside International Airport, continuing to fly and write in her spare time. She is a long-standing member of the British Women Pilots' Association and runs the BWPA North West Regional Group.

## **Martin Hatton**

Martin Hatton first learnt to fly with a Royal Air Force Sixth Form Scholarship and RAF Flying Scholarship in 1991 and after spending a few years in the military and working in civilian airfield operations, he became a Commercial Pilot Licence Holder in 1999 and Flying Instructor in 2000.

Since qualifying as an FI, Martin has kept progressing and adding to his instructor and examiner qualifications and in 2007 became Chief Flying Instructor and Flight Examiner at Ravenair, based at Liverpool John Lennon Airport. He was also a Training Captain for their AOC operation.

Martin was responsible for developing the Approved Training Organisation at Ravenair along with quality and standards. He also achieved compliance within the organisation in accordance with all the changes brought in with EASA.

Since leaving his full time position with Ravenair, Martin has worked for Eastern Airways flying the Jetstream 41 on a domestic flight network and flying charter operations for a variety of third party customers.

Over several years he, along with his wife and fellow instructor Claire, have written and produced a full set of groundschool courses for PPL students, and PPL holders, and have run many groundschool courses at flying schools and colleges.

Martin is an Upper Freeman and Liveryman of The Honourable Company of Air Pilots. He was an active member of the Instructor Working Group for 11 years, in which he was co-ordinator and editor for the Company's PPL Instructor Guide. He currently sits on the selection and interview panel for the Company's FI scholarships.

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## **A Condensed History of the Air Pilots Manuals**

For over 40 years the Air Pilot Manuals have led the academic training of pilots in the United Kingdom and in many countries around the world.

I first met Trevor Thom, a professional pilot and natural teacher, in Melbourne during a visit to Australia in January 1985. He already had his series of PPL Manuals for the Australian market and I asked him to produce a series for the New Zealand market where we had a small aviation business. Having completed this task, Trevor immediately began writing the first of the Air Pilot Manuals for the United Kingdom market and this project began in earnest on 5<sup>th</sup> December 1985.

Both Trevor Thom and Robert Johnson commenced the task in my office at Felden, Hertfordshire. By the end of the following year, all four volumes were completed and were published in February 1987. By the end of that year, we estimated that 95% of all the UK Flying Schools were using our manuals. Volumes 5, 6 and 7 followed, so completing the full series which also now includes the Question & Answer Exam Books Volumes 1-9 and the Air Presentations series of PowerPoint Teaching Aids.

Unfortunately, Trevor Thom had a serious accident at home which prevented him from continuing with the editing of the manuals. His rights were eventually sold to David Robson, another experienced pilot and natural teacher, who progressively improved the drawings and brought colour into the manuals for the first time.

Over the years there have been many assistant editors, in particular the late Peter Godwin, whose help I first asked for in the very early days with Trevor Thom. The rights in the Air Pilot Manuals are now vested with the Pooley family and they continue to be edited by Dorothy Saul-Pooley, with the assistance of Daljeet Gill who is responsible for the design and layout.

The Air Pilot Manuals have an outstanding reputation for accuracy and are continuously updated. The APM series of manuals are used in many countries around the world.

### ***Robert Pooley***

LVO MBE CStJ FRIN FRAeS