

The Air Pilot's **Manual**

Volume 6

Human Performance and Operational Procedures

'Recommended reading'

Civil Aviation Authority



POOLEY'S
Air Pilot Publishing

*Nothing in this manual supersedes any UK and EU legislation or European Aviation Safety Agency (EASA) Regulations or procedures; or any operational documents issued by any United Kingdom Government Department, the Civil Aviation Authority, National Aviation Authorities, the manufacturers of aircraft, engines and systems, or by the operators of aircraft throughout the world. As maps and chart are changed regularly, any extracts reproduced in this book **must not** be used for flight planning or flight operations.*

Copyright © 2021 Pooleys-Air Pilot Publishing Limited

ISBN 978-1-84336-234-0

First Edition published 1994

Reprinted 1995

Reprinted 1997

Second Edition 1997

Reprinted 1998, 1999

Reprinted with revisions 2001

Reprinted 2002

Reprinted with revisions 2003

Third Edition 2004

Reprinted with revisions and colour illustrations 2006

Reprinted with revisions 2009

Fourth Edition 2011

Fifth Edition 2013

New Combined Edition 2015

Second Combined Edition 2017

Third Combined Edition June 2018

Fourth Combined Edition June 2020

Fifth Combined Edition June 2021

All rights reserved. No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical including photocopying, recording or by any information storage and retrieval system, without permission from the publisher in writing.

Origination by Pooleys-Air Pilot Publishing Limited.

Published by Pooleys-Air Pilot Publishing Ltd

Elstree Aerodrome, Elstree, Hertfordshire, WD6 3AW. UK.

Tel: +44(0)208 207 3749

Web: www.pooleys.com

Email: sales@pooleys.com

The Air Pilot's **Manual**

Volume 6 Combined Edition

Contents

Human Performance

Introduction	ix
---------------------------	----

Section One – Human Performance

1. Human Physiology and High Altitudes	3
2. Eyesight and Visual Illusions	23
3. Hearing and Balance	49
4. Am I Fit to Fly?	65
5. Stress Management, Fatigue and Sleep	73
6. Human Information Processing	105
7. Judgement and Decision-Making	129
8. Airmanship and Threat and Error Management	145
9. The Flight Deck	159

Section Two – Safety, First Aid and Survival

10. Safety and Care of Passengers	203
11. First Aid	217
12. Survival	225

Index	251
--------------------	-----

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 currently holds the post of Chairman of the Professional Flying Instructors Association and is 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, Dorothy has written, edited and contributed to more than 30 training manuals and has published many articles in aviation magazines, legal journals and on-line publications.

Claire Louise 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 CPL 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' having by now been a flying instructor for five years, and had regular instructional articles featured in the aviation press. 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 a volunteer providing school visits and talks for The Aviatrix Project, an organisation which uses flying and being a pilot as an engaging way to bring STEM subjects into schools.

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 (recently invited to take the Livery) 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.

Gary Hutchinson

Gary caught the aviation 'bug' at an early age, since plane-spotting at London Gatwick as a boy. He has since held a variety of aviation roles, from airport check-in desks and passenger profiling to operational roles in air cargo involving Health and Safety improvements. He has also travelled extensively worldwide using his airline staff travel privileges.

After gaining a CPL (A) Multi IR, and operating local charters and calibration flights, he won a GAPAN Flight Instructor Scholarship and now instructs at Shoreham.

He studied Psychology at London University, including Ergonomics and Cockpit Resource Management (CRM). As a member of the British Psychological Society, GAPAN and the Air League, he has been published in Psychological journals and

since then has sought to combine these interests into a career as a 'Human Factors in Aviation' specialist. His aim is to increase safety, quality and efficiency in aviation, primarily through reducing human error and improving decision making.

He loves flying and would ultimately like to be an airline training captain/Human Factors Psychologist.

On a lighter note, he dreams of one day flying a P 51 Mustang, but at 6'10" fears his height may preclude this!

Jenny Dodman

Jenny inherited her passion for aviation from her father and spent many happy hours as a child either at the airfield or sitting in a light aircraft. She then went on to learn to fly with the help of scholarship awards from the Swire Charitable Trust and British Women Pilots Association. On graduating from medical school and completing junior medical training, Jenny undertook specialist training in Occupational Medicine through an NHS and National Institute for Health Research funded joint clinical and academic role within the NHS and at The University of Manchester, where her research focused on safety critical occupations and assessing medical fitness. Jenny completed specialist training and training in aviation medicine and now works as a Consultant Occupational Physician and Aeromedical Examiner for British Airways, as well as an independent Aeromedical Examiner and Honorary Lecturer within the Centre for Occupational and Environmental Medicine at The University of Manchester. Her spare time is spent with family, friends and dogs; usually still centred around the airfield!

Acknowledgements

The Civil Aviation Authority, British Aerospace, Boeing and McDonnell Douglas; Graeme Dennerstein, Daryl Guest, Frank Horwill, Michael Leahy and Peter Loughnan for medical comments; Robert Seaman, Captain R. W. K. Snell, Ian Swan, Thomas Syburra, Simon Ferrari, Joe Harper, Assen Assenov, Fabio Tozzi, Daljeet Gill and Robert Pooley.

A Condensed History of the Air Pilot Manuals

For over 35 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 5th 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 Peter Godwin, whose help I first asked for in the very early days with Trevor Thom and which continued until quite recently. 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, and are published from our offices at Shoreham Airport.

The APM series of manuals are used in many countries around the world.

Robert Pooley

MBE CStJ FRIN FRAeS