

The Air Pilot's **Manual**

Volume 5

Instrument Flying

Radio Navigation Aids

Instrument Procedures

Night Flying

IR(R) Rating

Night Rating

Recommended CVRUX

Civil Aviation Authority CAP 804



POOLEYS
Air Pilot Publishing

*Nothing in this manual supersedes any 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 © 2018 Pooleys-Air Pilot Publishing Limited

ISBN 978-1-84336-235-7

First edition published 1989

Reprinted with revisions 1990, 1991, 1992 and 1994

Second revised edition 1997

Reprinted 1998

Third edition 1999

Fourth revised edition 2001

Reprinted with revisions 2002

Fifth revised edition 2004

Reprinted with revisions and colour illustrations 2007

Sixth revised edition 2008

Seventh edition 2012

Eighth edition Feb. 2016

Ninth edition Nov. 2018

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.

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

Volume 5

Contents

Introduction *i*

Section One

Instrument Flying Techniques

1. Instrument Scanning 3
2. The Instruments 15
3. Straight and Level Flight 51
4. The Straight Climb and Descent 77
5. Turning 95
6. Unusual Attitudes 115
7. Instrument Flight on a Limited Panel 133

Section Two

Radio Navigation Aids

8. Introduction to Radio Navigation Aids 157
9. Radar 159
10. DME 187
11. The NDB and the ADF 199
12. The Relative Bearing Indicator (RBI) 225
13. The Radio Magnetic Indicator (RMI) 259
14. The VOR 277
15. The Instrument Landing System (ILS) 317
16. VHF Direction Finding (VDF) 343
17. Introduction to RNAV 359

Section Three – Instrument Procedures

18. Preparation for Flight 389
19. Instrument Departures 397
20. Instrument Arrivals 405
21. Holding and Manoeuvring 411

22. Instrument Approaches	423
23. Instrument Minima	463
24. Visual Manoeuvring	481

Section Four – Night Flying

25. Aerodrome Lighting	497
26. Night Flying at an Aerodrome	503
27. Night Navigation	521

Appendix 1

The IR(R)/IMC Rating	525
----------------------------	-----

Appendix 2

Night Rating (Part-FCL)	527
-------------------------------	-----

Appendix 3

Radio Failure Procedures	529
--------------------------------	-----

Appendix 4

Part FCL Modular, Competency Based and En Route Instrument Ratings (Aeroplanes)	531
---	-----

Questions & Answers

Preparation for the IR(R) Theoretical Knowledge Exam	537
--	-----

Abbreviations	547
----------------------------	-----

Index	551
--------------------	-----

Editorial Team

Dorothy Saul-Pooley LLB (Hons) FRAeS

Dorothy holds an ATPL (A) and a CPL (H), and is both an instructor and examiner on aeroplanes and an instructor on helicopters. She is Head of Training for a school dedicated to running Flight Instructor courses at Shoreham. She is also a CAA Flight Instructor Examiner. In addition, having qualified as a solicitor in 1982, Dorothy acted for many years as a consultant specialising in aviation and insurance liability issues, and has lectured widely on air law and insurance issues. This highly unusual combination of qualifications led to her appointment as Honorary Solicitor to the Guild of Air Pilots and Navigators (GAPAN). Dorothy is a Fellow of the Royal Aeronautical Society, first Chairman of the GAPAN Instructor Committee, and past Chairman of the Education & Training Committee. She has just completed her term of office as the Master for the year 2014-15 of the Honourable Company of Air Pilots (formerly GAPAN). She is also Chairman of the Professional Flying Instructors Association. In 2003 she was awarded the Jean Lennox Bird Trophy for her contribution to aviation and support of Women in Aviation and the BWPA (British Women Pilots Association). In 2013 Dorothy was awarded the prestigious Master Air Pilots Certificate by GAPAN. A regular contributor to seminars, conferences and aviation publications. Dorothy is the author and editor of a number of flying training books and has published articles in legal and insurance journals.

Jonathan Shooter

Jonathan had his first trial lesson on his twelfth birthday eventually gaining his PPL with the help of an RAF flying scholarship. He went onto flying with the University Air Squadron before gaining airline sponsorship in conjunction with one of Europe's largest flying schools. He taught the PPL and associated ratings at Elstree aerodrome before gaining an internal promotion to teach the CPL and Instrument rating at the commercial college at Cranfield aerodrome. After two years he joined his sponsoring airline and flew the Dash 8 Q400 throughout Europe. In 2005 he joined Europe's largest tour operator and flew the Boeing 757 and 767 both on short and long haul operations. He currently flies the A320/A321 and has over 6000 hrs with 1500 hrs instructional experience on commercial courses. He holds European, Canadian and American airline transport licences and is an authorised PPL examiner for both single and multi-engine aeroplanes. He is also the author for a Guide to the EASA CPL Flight Test.

Acknowledgements

The Civil Aviation Authority, Thales Avionics Aerad, Jeppesen & Co. GmbH, Allied Signal (Bendix/King Radio Corp.), Narco Avionics, Pooleys Flight Equipment Limited, Bill Bennett, Brian Bristow, John Fenton, Robyn Hind, Rick James, David Langford, Robert Lawson, Daljeet Kaur Gill, Robert and Dorothy Pooley, and the many other instructors and students whose comments have helped to improve this manual.

A Condensed History of the Air Pilot Manuals

For over 30 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 Feldon. By the end of the following year, all four volumes were complete and were published in February 1987. At that time, 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.

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 and published from our offices and the school at Shoreham Airport.

The Air Pilot Manuals have an outstanding reputation for accuracy and are continuously updated. They are recommended CAA reading material and are referred to extensively in the CAA examination answer booklet.

Robert Pooley
CSJ FRIN FRAeS