

Pilot's Handbook of Aeronautical Knowledge

2023

U.S. Department of Transportation FEDERAL AVIATION ADMINISTRATION

Flight Standards Service

Preface

This handbook provides the basic knowledge that is essential for pilots. It introduces pilots to the broad spectrum of knowledge that will be needed as they progress in their pilot training. Except for the Code of Federal Regulations pertinent to civil aviation, most of the knowledge areas applicable to pilot certification are presented. This handbook is useful to beginning pilots, as well as those pursuing more advanced pilot certificates.

Occasionally the word "must" or similar language is used where the desired action is deemed critical. The use of such language is not intended to add to, interpret, or relieve a duty imposed by Title 14 of the Code of Federal Regulations (14 CFR).

It is essential for persons using this handbook to become familiar with and apply the pertinent parts of 14 CFR and the Aeronautical Information Manual (AIM). The AIM is available online at www.faa.gov. The current Flight Standards Service airman training and testing material and learning statements for all airman certificates and ratings can be obtained from www.faa.gov.

This handbook supersedes FAA-H-8083-25B, Pilot's Handbook of Aeronautical Knowledge, dated 2016; the Pilot's Handbook of Aeronautical Knowledge Addendum A, dated February 2021; the Pilot's Handbook of Aeronautical Knowledge Addendum B, dated January 2022; and the Pilot's Handbook of Aeronautical Knowledge Addendum C, dated March 2023.

This handbook is available for download, in PDF format, from www.faa.gov.

This handbook is published by the United States Department of Transportation, Federal Aviation Administration, Airman Testing Standards Branch, AFS-630, P.O. Box 25082, Oklahoma City, OK 73125.

Comments regarding this publication should be emailed to AFS630comments@faa.gov.

Major Enhancements

This revision of the handbook has only been updated to include the following:

- Pilot's Handbook of Aeronautical Knowledge Addendum A, dated February 2021
- Pilot's Handbook of Aeronautical Knowledge Addendum B, dated January 2022
- Pilot's Handbook of Aeronautical Knowledge Addendum C, dated March 2023
- Included language to answer National Transportation Safety Board (NTSB) Safety Recommendation (SR) A-21-020

This revision is considered a minor revision. A major revision is underway and is planned for release June 2024.

Acknowledgments

The Pilot's Handbook of Aeronautical Knowledge was produced by the Federal Aviation Administration (FAA) with the assistance of Safety Research Corporation of America. The FAA wishes to acknowledge the following contributors:

Mrs. Nancy A. Wright for providing imagery of a de Haviland DH-4 inaugural air mail flight (Chapter 1)

The Raab Collection, Philadelphia, Pennsylvania, for images of the first pilot license (Chapter 1)

Sandy Kenyon and Rod Magner (magicair.com) for photo of 1929 TravelAir 4000 (Chapter 1)

Dr. Pat Veillette for information used on decision-making (Chapter 2)

Adventure Seaplanes for photos of a ski and float training plane (Chapter 3)

Jack Davis, Stearman Restorers Asociation, for photo of a 1941 PT-17 Army Air Corps trainer (Chapter 3)

Michael J. Hoke, Abaris Training Resources, Inc., for images and information about composite aircraft (Chapter 3)

Colin Cutler, Boldmethod, for images and content on the topic of ground effect (Chapter 5)

Mark R. Korin, Alpha Systems, for images of AOA disaplys (Chapter 5)

M. van Leeuwen (www.zap16.com) for image of Piaggio P-180 (Chapter 6)

Greg Richter, Blue Mountain Avionics, for autopilot information and imagery (Chapter 6)

Mountain High E&S Company for various images provided regarding oxygen systems (Chapter 7)

Jeff Callahan, Aerox, for image of MSK-AS Silicone Mask without Microphone (Chapter 7)

Nonin Medical, Inc. for image of Onyx pulse oximeter (Chapter 7)

Pilotfriend.com for photo of a TKS Weeping Wing (Chapter 7)

Chelton Flight Systems for image of FlightLogic (Chapter 8)

Avidyne Corporation for image of the Entegra (Chapter 8)

Teledyne Controls for image of an air data computer (Chapter 8)

Watson Industries, Inc. (www.watson-gyro.com) for image of Attitude and Heading Reference system (Chapter 8)

Engineering Arresting Systems Corporation (www.esco.zodiacaerospace.com) for EMAS imagery and EMASMAX technical digrams (Chapter 14)

Caasey Rose and Jose Roggeveen (burningholesinthesky wordpress.com) for flight checklist image (Chapter 14)

Tim Murnahan for images of EMAS at Yeager Airport, Charleston, West Virginia, and EMAS arrested aircraft (Chapter 14)

Cessna Aircraft Company, Columbia Aircraft Manufacturing Corporation, Eclipse Aviation Corporation, Garmin Ltd., The Boeing Company for images provided and used throughout the Handbook.

Additional appreciation is extended to the Aircraft Owners and Pilots Association (AOPA), the AOPA Air Safety Foundation, the General Aviation Manufacturers Association (GAMA), and the National Business Aviation Association (NBAA) for their technical support and input.

Disclaimer: Information in Chapter 14 pertaining to Runway Incursion Avoidance was created using FAA orders, documents, and Advisory Circulars that were current at the date of publication. Users should not assume that all references are current and should check often for reference updates.