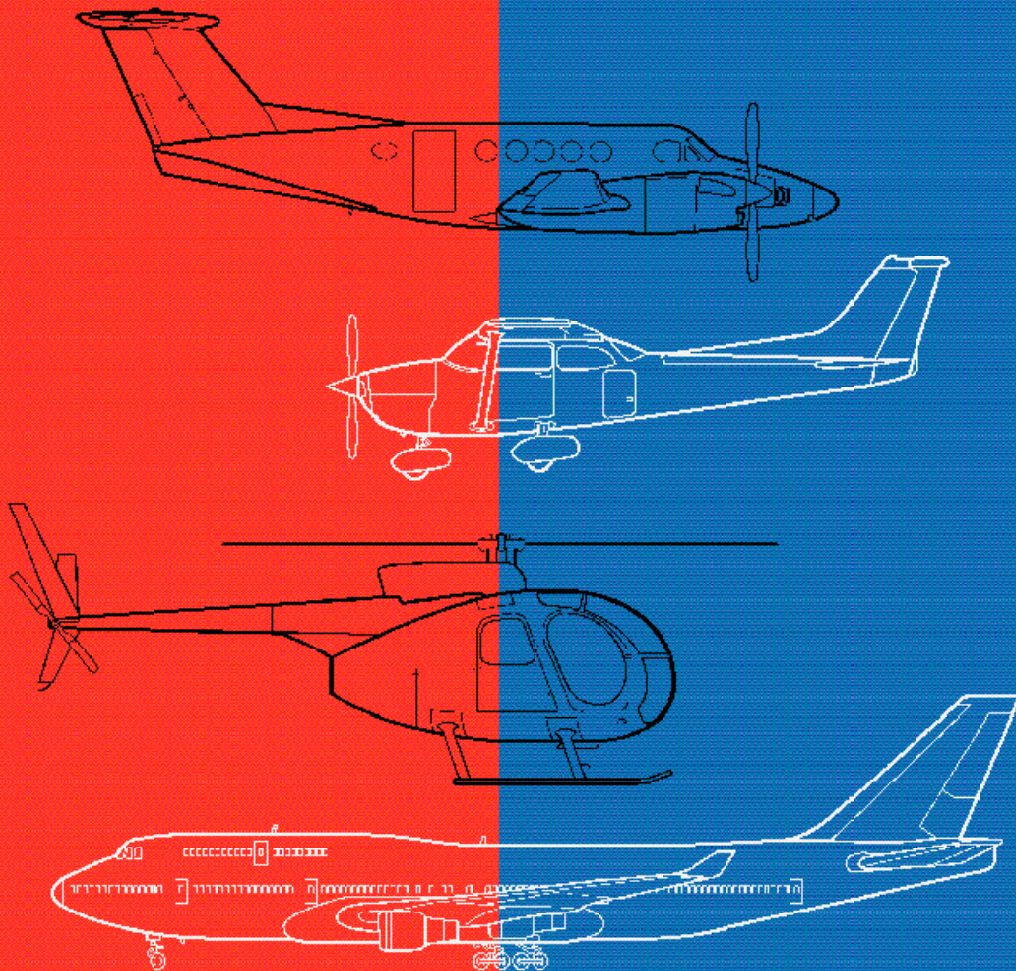




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Aircraft Weight and Balance Handbook



Aircraft Weight and Balance Handbook

1999

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Flight Standards Service

Preface

FAA-H-8083-1, *Aircraft Weight and Balance Handbook*, has been prepared in recognition of the importance of weight and balance technology in conducting safe and efficient flight. The objective of this handbook is twofold: to provide the Aviation Maintenance Technician (AMT) with the method of determining the empty weight and empty-weight center of gravity (EWCG) of an aircraft, and to furnish the flight crew with information on loading and operating the aircraft to ensure its weight is within the allowable limit and the center of gravity (CG) is within the allowable range.

Any time there is a conflict between the information in this handbook and specific information issued by an aircraft manufacturer, the manufacturer's data takes precedence over information in this handbook. 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).

This handbook supersedes Advisory Circular (AC) 91-23A, *Pilot's Weight and Balance Handbook*, revised in 1977.

Comments regarding this handbook should be sent to U.S. Department of Transportation, Federal Aviation Administration, Airman Testing Standards Branch, AFS-630, P.O. Box 25082, Oklahoma City, OK 73125.

This publication may be purchased from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954, or from the U.S. Government Printing Office bookstores located in major cities throughout the United States.

AC 00-2, *Advisory Circular Checklist*, transmits the current status of Federal Aviation Administration (FAA) advisory circulars and other flight information publications. This checklist is free of charge and may be obtained by sending a request to U.S. Department of Transportation, Subsequent Distribution Office, SVC-121.23, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785. The checklist is also available on the Internet at <http://www.faa.gov/abc/ac-chklst/actoc.htm>.

Acknowledgments

This book was produced as a combined FAA and industry effort.

Introduction

This handbook begins with the basic principle of aircraft weight and balance control, emphasizing its importance and including examples of documentation furnished by the aircraft manufacturer and by the FAA to ensure the aircraft weight and balance records contain the proper data.

Procedures for the preparation and the actual weighing of an aircraft are described, as are the methods of determining the location of the empty-weight center of gravity (EWCG) relative to both the datum and the mean aerodynamic chord (MAC).

Loading computations for general aviation aircraft are discussed, using both loading graphs and tables of weight and moment indexes.

Information is included that allows an Aviation Maintenance Technician (AMT) to determine the weight and center of gravity (CG) changes caused by repairs and alterations. This includes instructions for conducting adverse-loaded CG checks, also explaining the way to determine the amount and location of ballast needed to bring the CG within allowable limits.

Weight and balance control for large aircraft is discussed, including cargo management, takeoff and landing conditions, and the determination of fuel dump time for emergency conditions. Examples are also given for weight and balance control of commuter category airplanes in both the passenger and cargo configuration.

The unique requirements for helicopter weight and balance control are discussed, including the determination of lateral CG and the way both lateral and longitudinal CG change as fuel is consumed.

A chapter is included giving the methods and examples of solving weight and balance problems, using hand-held electronic calculators, E6-B flight computers, and a dedicated electronic flight computer.

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