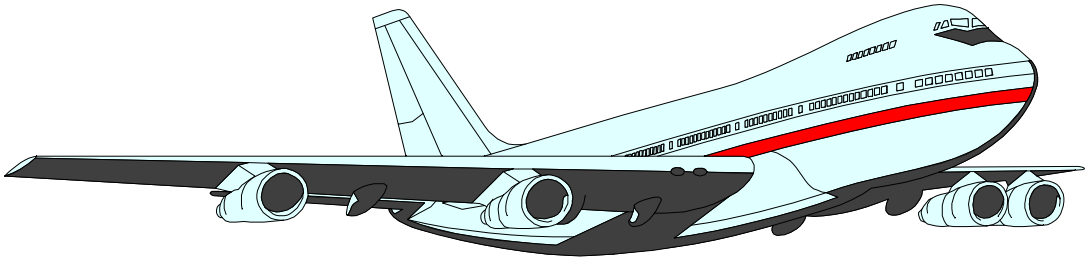
AC 63-1

FLIGHT ENGINEER KNOWLEDGE TEST GUIDE



U.S. Department of Transportation
Federal Aviation Administration

FLIGHT ENGINEER
KNOWLEDGE TEST GUIDE

1995

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

PREFACE

The Flight Standards Service of the Federal Aviation Administration (FAA) has developed this guide to help applicants meet the knowledge requirements for the computer administered tests for flight engineer turbojet, turboprop, and reciprocating class certification.

This guide contains information about the knowledge test eligibility requirements, test descriptions, testing and retesting procedures, and sample test questions with answers. As a convenience to the applicant, the eligibility requirements for the oral and flight tests are included. Appendix 1 provides a list of reference materials and subject matter knowledge codes, and computer testing designees. Changes to the subject matter knowledge code list will be published as a separate advisory circular.

The sample questions and answers in this guide are predicated on Federal Aviation Regulations (FAR's) and references that were current at the time of publication. Questions and answers in the computer administered knowledge tests are updated when changes are made to these reference materials.

The flight engineer test question bank and subject matter knowledge code list for all airmen certificates and ratings, with changes, may be obtained by computer access from FedWorld at (703) 321-3339. This bulletin board service is provided by the U.S. Department of Commerce, 24 hours a day, 7 days per week. For technical assistance regarding computer requirements for this service, contact the FedWorld help desk at (703) 487-4608 from 7:30 a.m. to 5 p.m. EST, Monday through Friday.

This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325 or from U.S. Government Printing Office bookstores located in major cities throughout the United States.

Comments regarding this guide should be sent to:

Federal Aviation Administration
Operations Support Branch, AFS-630
ATTN: Flight Engineer Certification Manager
P. O. Box 25082
Oklahoma City, OK 73125

ACKNOWLEDGMENTS

The FAA wishes to express appreciation to the following organizations for their generosity in providing publications for reference materials in the preparation of the flight engineer knowledge tests:

Glencoe/McGraw Hill, Inc.
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Marietta, GA

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Longueuil, PQ, Canada

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FLIGHT ENGINEER
KNOWLEDGE TEST GUIDE

INTRODUCTION

At one time, the flight engineer functioned as an inflight maintenance person. Today, the flight engineer is a technical expert, who must be thoroughly familiar with the operation and function of various airplane components. The principal function of the flight engineer is to assist the pilots in the operation of the airplane. Specific duties vary with different airplanes and operators.

The questions and answers on the flight engineer knowledge tests pertain only to airplanes that require a flight engineer. Because the questions and answers cover a wide scope of airplanes, powerplants, and systems, some questions are general in nature. The information contained in the questions and answers should never take precedence over specific information furnished by a manufacturer in the operation of an airplane.

ELIGIBILITY REQUIREMENTS FOR THE KNOWLEDGE TEST

The minimum age for taking the knowledge test is 19.

A medical certificate is not required.

Flight training in the duties of a flight engineer is not required.

Applicants must be able to read, speak, and understand the English language.

The applicant must hold:

1. an unrestricted commercial pilot certificate with an instrument rating; or

2. an airline transport pilot certificate issued by the FAA or another International Civil Aviation Organization member nation; or

3. an AC Form 8080-2, Airman Written Test Report, or Airman Computer Test Report for a flight engineer original class rating, or a flight engineer certificate, when applying to take an additional class rating test; or

4. an FAA Form 8060-7, Airman's Authorization for Written Test. This form is issued by an FAA inspector upon the applicant’s presenting satisfactory evidence of meeting one of the following practical experience requirements specified by FAR 63.37:

   a. FAR 63.37(b)(1). The applicant must have at least 3 years of diversified practical experience in aircraft and engine maintenance. At least 1 year of this experience must have been on multiengine aircraft with engines that each have at least 800 horsepower, or the turbine engine equivalent.

   b. FAR 63.37(b)(2). The applicant must have graduated from a 2-year aircraft and engine maintenance course, of which at least 6 months was devoted to the maintenance of aircraft, with engines that each have at least 800 horsepower, or the turbine engine equivalent.

c. FAR 63.37(b)(3). The applicant must hold a degree in aeronautical, electrical, or mechanical engineering and 6 months of practical experience in the maintenance of multiengine aircraft, with engines that each have at least 800 horsepower, or the turbine engine equivalent.

d. FAR 63.37(b)(5). The applicant must have accumulated 200 hours of flight time as pilot in command, or second in command performing the functions of pilot in command, under the supervision of a pilot in command in an airplane certified in the transport category or a military airplane of equivalent weight and power, with at least two engines.

e. FAR 63.37(b)(6). The applicant must have accumulated 200 hours of flight time as a flight engineer in an airplane requiring a flight engineer, or an airplane with at least three engines that each have at least 800 horsepower, or the turbine engine equivalent.

f. FAR 63.37(b)(7). Within the previous 90 days, the applicant must have completed the ground portion of an approved Part 63, appendix C, flight engineer training course, for the class rating for which the application has been made.

ELIGIBILITY REQUIREMENTS FOR THE ORAL AND FLIGHT TESTS

The minimum age for the oral and flight tests is 19. However, to obtain a flight engineer certificate, the minimum age is 21. An applicant who is less than 21 years of age and successfully completes the oral and flight tests will be issued a letter of aeronautical competency. The letter will state that the applicant has met all the requirements for a flight engineer certificate except for age. When an applicant presents proof of reaching age 21, and a second-class medical certificate or better, the letter of aeronautical competency may be exchanged for a temporary airman certificate at any Flight Standards District Office (FSDO).

A current second-class medical certificate or better is required for taking the oral and flight tests.

Applicants must present a current or validated AC Form 8080-2, Airman Written Test Report, or Airman Computer Test Report.

Note: The flight engineer turboprop and basic 300 (FET-300) series tests administered in 1989 and 1990 did not include the flight engineer basic (FEB) test. To be valid, FET-300 series test results must be accompanied by an FEB test result for an original flight engineer certificate. Administration of the flight engineer basic test (FEB) by itself was eliminated in 1991. This change was made to ensure specificity for testing over regulations, theory of flight and aerodynamics, meteorology with respect to engine operations, and center-of-gravity computations. Applicants requiring the basic test to accompany a class test for original certification may do so by taking the appropriate flight engineer combined test.

The flight training must be completed in the airplane type which will be used for the tests. The minimum amount of flight training time is 5 hours for applicants qualifying under the provisions of FAR 63.37(b) subparagraphs (1), (2), (3), (4) and (7). Applicants who qualify under the provisions of FAR 63.37(b) subparagraph (7) and hold a commercial pilot certificate or higher with an instrument rating may complete all their flight training in a simulator. There is not a minimum amount of flight training time specified for applicants qualifying under the provisions of FAR 63.37(b) subparagraphs (5) and (6).

The applicant must present an authorized instructor's recommendation and verification of the instructor’s eligibility to provide the endorsement, if retesting within 30 days after failing the oral or flight test.

For an additional class rating, the applicant must present his or her flight engineer certificate.

FAR 63.35 REQUIREMENTS FOR THE KNOWLEDGE TEST

Applicants must pass a knowledge test on the areas specified by FAR 63.35. These areas are arranged in the following order on the computer administered knowledge tests:

FAR's that apply to flight engineer duties.

Theory of flight and aerodynamics.

Meteorology with respect to engine operations.

Operating procedures.

1. Preflight.
2. Normal.
3. Emergency.

Airplane equipment.

Airplane systems.

Limitations.

1. Airplane procedures.
2. Engine operations.

Math computations.

1. Engine operations.
2. Fuel consumption.
3. Center of gravity.
4. Airplane loading.

DESCRIPTION OF THE KNOWLEDGE TEST

All test questions are multiple-choice with three choices of answers. Each question can be answered by the selection of a single response, is independent of other questions, and has equal value. The minimum passing score is 70 percent.

Applicants must successfully complete a knowledge test appropriate to the desired rating. The following tests are for original class ratings and each contains 80 questions. Three hours is allowed to take each test.

Turbojet and Basic.....(FEX)
Turboprop and Basic.....(FET)
Reciprocating and Basic.....(FEN)

Applicants desiring to add a class rating to their flight engineer certificate must successfully complete a knowledge test appropriate to the desired class rating. The following tests are for additional class ratings and each contains 50 questions. Two hours is allowed to take each test.

Turbojet.....(FEJ)
Turboprop.....(FEP)
Reciprocating.....(FER)

Applicants, who hold a flight engineer basic test and require a class rating test, can take an appropriate combined test for an original class rating (FEX, FET, or FEN), or the appropriate class rating test (FEJ, FEP, or FER).

Applicants, who hold a flight engineer class rating test and require the basic test, must take the appropriate combined test for an original class rating (FEX, FET, or FEN).

USE OF AIDS, REFERENCE, AND TEST MATERIALS

Aids, reference, and test materials within the following guidelines may be used if actual test questions or answers are not revealed. All models of computers, regardless of manufacture, may be used, including hand-held computers designed expressly for aviation use, and also small electronic calculators that perform only arithmetic functions (add, subtract, multiply, and divide). Simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory are permissible. Also, simple functions such as square root or percent keys are permissible. The following guidelines apply:

1. The test administrator will furnish a flight engineer test supplement to answer the questions which reference figures, and two sheets of scratch paper. At the close of the test, the supplement and scratch paper must be returned to the test administrator. In addition, scales, straight edges, protractors, plotters, and electronic or mechanical calculators that are directly related to the test may be used.

2. Permanently inscribed manufacturer's instructions on the front and back of such aids, e.g., formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, weight and balance formulas, and air traffic control procedures are permissible.

3. The use of electronic calculators is subject to the following limitations:

a. Prior to, and upon completion of the test, you must actuate the ON/OFF switch and perform any other function that ensures erasure of any data stored in memory circuits.

b. The use of electronic calculators incorporating permanent or continuous-type memory circuits without erasure capability is prohibited. The test administrator may refuse the use of your calculator if the test administrator is unable to determine its use of permanent or continuous-type memory circuits without erasure capability.

c. Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.

d. The use of magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which prewritten programs or information related to the test can be stored and retrieved, is prohibited.

e. The use of any operations booklet or manual of operations containing instructions related to the operation of the calculator, during the test, is not permitted.

TAKING A KNOWLEDGE TEST BY COMPUTER

The FAA has computer testing centers available nationwide and in other countries. To determine the most convenient testing site, contact the computer testing designees listed in appendix 1. They will provide the hours of operation, costs, and schedule your test date and time. You may cancel your appointment 2 business days before the day the test is scheduled without financial penalty.

When applying for the test, you must provide positive proof of identification, a permanent mailing address, and documentary evidence of age. The identification must include a current photograph, signature, and actual residential address, if different from your mailing address. This information may be presented in more than one form of identification. Acceptable forms of identification include, but are not limited to, drivers' licenses, government identification cards, passports, alien residency (green) cards, and military identification cards. Other forms of identification that meet the requirements of this paragraph are acceptable. If you are under 21 years of age, your parent or guardian may accompany you and present an identification of themselves as described previously and attest to your identity.

Normally, a test may not be started if the full allotted time is not available before the closing time of the testing center. An exception can be made by signing an agreement statement waiving the right to the full allotted time

When taking the test, keep the following points in mind:

1. Unless you are experienced with taking tests by computer and are familiar with the features, take the sample test. The practice exercises do not count against test time.

2. Read each question carefully before looking at the possible answers. You should clearly understand the question or problem before attempting to solve it.

3. If you are unsure of the answer, mark it for RECALL, and then return to it after answering the other questions on the test. Use caution in selecting an answer different than your first selection.

4. Answer all of the questions. Credit is not given for questions which are not answered. The computer is programmed to alert to any unanswered questions.

5. Do not spend too much time on any one question.

Upon completing the test, an airman computer test report is issued with the score and the subject matter codes for any questions which were answered incorrectly. These codes identify the reference materials used in the preparation of the flight engineer test. Review the reference materials to improve your understanding of the subject matter. The total number of test questions missed may differ from the number of subject matter codes shown on the test report, since more than one question for that subject matter may have been missed.

RETESTING

An applicant who holds an airman computer test report with a passing score may take another knowledge test for that same class rating 30 days after the last test was taken but not before. Eligibility to retake the test is established by presenting the test administrator with the last airman computer test report. The test administrator will retain these test results. The score of the last test taken is the official score.

An applicant for a flight engineer certificate who fails a knowledge test may apply for retesting:

1. 30 days after the date the test was failed; or

2. after receiving additional instruction that is necessary, in the opinion of the FAA Administrator or the applicant's instructor (if the FAA Administrator has authorized the instructor to determine the additional instruction necessary) to prepare the applicant for retesting.

The following persons are authorized to provide the endorsement for a flight engineer applicant to retake the knowledge test within 30 days following failure:

1. An FAA certificated flight engineer with an appropriate class rating.

2. A U.S. Armed Forces flight engineer instructor, standardization or evaluation flight engineer for that airplane class.

3. An instructor employed by a training facility approved under FAR 63.43.

Before retaking a knowledge test, a flight engineer applicant must present to the test administrator the following documentation of the endorser's eligibility:

1. A U.S. Armed Forces flight engineer instructor, standardization, or evaluation flight engineer, for the airplane class being retested, must provide the applicant with copies of flight logs, military qualification forms, or a statement documenting eligibility from his or her military supervisor.

2. An instructor, employed by a training facility approved under FAR 63.43, must provide the applicant with a statement from that facility. The statement must include certification of the endorser's position as an instructor at that facility.

The statement on the test report shall be completed by:

1. An FAA certificated flight engineer entering his or her last name and first initial, flight engineer certificate number, class rating, and signature. An example of this would be: Winter, L., FE 2069084, Reciprocating.

2. A U.S. Armed Forces flight engineer instructor, standardization or evaluation flight engineer entering his or her last name and first initial, branch of service, type of designation (instead of an FAA certificate number), and signature. An example of this would be: Winter, K., USN, FE Instructor C-130 (L-382).

3. An instructor, employed by a training facility approved under FAR 63.43, entering his or her last name and first initial, facility name, position, and signature. An example of this would be: Winter, B., AAL, FE Instructor Turbojet.

VALIDITY PERIOD FOR KNOWLEDGE TESTS

The flight engineer knowledge test report is valid for 24 calendar months. The validity period may be extended when application is made to take the oral and flight tests, if the following requirements are met:

1. Air Carrier Employees. The following criteria apply to flight crewmembers and mechanics employed by an FAR 121 or FAR 135 air carrier. Employment by an FAR 135 on-demand operator does not qualify an applicant for an extension:

a. Applicants who are flight crewmembers must have completed initial new-hire training, initial equipment training, or transition training.

b. Applicants who are flight crewmembers must be participating in a training program which includes a recurrent training curriculum in accordance with FAR 121 or FAR 135.

c. Applicants who are mechanics must meet the currency requirements of FAR 65.

d. Applicants must be currently employed by an FAR 121 or an FAR 135 air carrier. However, applicants do not need to have been continuously employed by a qualified air carrier between the time they passed the knowledge test and the time they apply to take the oral and flight tests.

2. Military Applicants. The following criteria apply to military applicants who apply for extensions on the basis of participation in a training program of a scheduled military transport service:

a. Applicants must have participated in a flight engineer or maintenance training program at the time of passing the knowledge test or begun a flight engineer or maintenance training program within 24 calendar months after passing the knowledge test.

b. Applicants must be currently participating in a military flight engineer or maintenance training program.

3. Continued Eligibility Documentation.

Inspectors and examiners will not accept, for the oral test, an expired AC Form 8080-2, Airman Written Test Report, or Airman Computer Test Report, unless the applicant provides written evidence of continued eligibility. When satisfactory evidence is presented, the inspector or examiner will enter, date, and sign the following statement on the test report: "The period of validity of this form has been extended in accordance with the provisions of FAR 63.35(d)."

CHEATING OR OTHER UNAUTHORIZED CONDUCT

Except as authorized by the FAA, no person may -

1. Copy, or intentionally remove test materials;

2. Give to another, or receive from another, any part or copy of that test;

3. Give help on that test to, or receive help on that test from, any person during the period that test is being given;

4. Take any part of that test in behalf of another person;

5. Use any material or aid during the period that test is being given; or

6. Intentionally cause, assist, or participate in any act prohibited by this paragraph.

Any person who commits an act prohibited by this paragraph is not eligible for any airman or ground instructor certificate or rating for a period of 1 year after the date of that act. In addition, the commission of that act is a basis for suspending or revoking any airman or ground instructor certificate or rating held by that person.

REPLACING LOST OR DESTROYED TEST REPORTS

If an AC Form 8080-2, Airman Written Test Report, or Airman Computer Test Report is lost or destroyed, a duplicate report may by obtained by sending a request to:

Federal Aviation Administration
Airmen Certification Branch
P.O. Box 25082
Oklahoma City, OK 73125

The request should include your full name, date of birth, social security number, test title, date or approximate date the test was taken, whether it was a written or computer test (if computer test, name of computer testing designee and address), a brief explanation of why the duplicate is being requested, $1 (amount subject to change) money order or check payable to the FAA, return address, daytime telephone number, and signature. If expedited handling is required, it costs approximately $20 more and may be coordinated with the Airman Certification Branch written test department by calling (405) 954-3235.

SAMPLE TEST QUESTIONS AND ANSWERS

1. What is the air carrier requirement for preflighting the flight engineer's oxygen equipment?

A—The preflight shall be completed by the flight engineer before each flight.
B—The preflight may be completed by any flight crewmember before each flight.
C—The preflight must be completed by the flight engineer for the first flight of the day only.

Answer A—Subject Matter Code: D11. FAR 121.337 - Before each flight, each item of protective breathing equipment at flight crewmember duty stations must be checked by the flight crewmember who will use the equipment.

2. The point on an airfoil through which lift acts is the

A—CG.
B—center of pressure.
C—midpoint of the chord.

Answer B—Subject Matter Code: T33. The center of pressure is the point at which the chord of an airfoil section intersects the line of action of the resultant aerodynamic forces of lift and drag about which the pressures balance.

3. Which factor has the effect of increasing V_1 speed?

A—Dry cold air.
B—High takeoff gross weight.
C—Slush or standing water on the runway.

Answer B—Subject Matter Code: W12. Takeoff performance is affected by gross weight, thrust on the airplane, temperature, pressure altitude, wind direction and velocity, runway slope, and runway surface.

Adjustments to V_1 are made for temperature, gross weight, pressure altitude, and flap setting. Some airplane performance tables make a small correction for strong winds. High gross weight, pressure altitude, or temperature will all increase V_1 speed. Slush or water on the runway reduces the stopping performance of the airplane and an aborted takeoff must be started at a lower speed.

4. What does declaring minimum fuel to ATC imply?

A—Traffic priority is needed to the destination airport.
B—Emergency handling is required to the nearest usable airport.
C—An emergency situation is possible should an undue delay occur.

Answer C—Subject Matter Code: J19. Declaring minimum fuel to ATC indicates that upon reaching the destination that an emergency situation is possible should any undue delay occur. The airplane will not receive traffic priority unless an emergency is declared. If the remaining usable fuel supply is such that no delay can be taken, ATC should be notified immediately by declaring an emergency due to low fuel and stating the minutes of fuel remaining.

5. Which position should be selected on the diluter-demand oxygen regulator if there is smoke in the cockpit?

A—Normal.
B—Emergency.
C—100 percent.

Answer C— Subject Matter Code: S69. Setting the oxygen selector lever to 100 percent closes the outside air passage to the regulator. The outside air passage dilutes the oxygen supplied to the mask with air from the cabin and is open at low altitudes. When the airplane climbs, the passage begins to close until it is completely closed at approximately 34,000 feet.

6. What is residual voltage?

A—Voltage produced that is not in phase with the current.
B—Voltage stored in the generator exciter output windings.
C—Voltage produced by permanent magnets which starts the ac generator output.

Answer C— Subject Matter Code: S66. Residual voltage is the voltage of a generator with no field current flowing, and is produced by the residual magnetism of the generator. If the voltmeter indicates residual voltage, the generator is turning. If there is no voltage, the generator has been disconnected, or it has lost its residual magnetism.

7. The purpose of an aileron balance panel is to

A—assist in moving the ailerons.
B—aerodynamically prevent control surface flutter.
C—provide a balance between the forces in front of the hinge line with moments aft of the hinge line.

Answer A—Subject Matter Code: S55. Pressure changes created by the aileron deflect a hinged panel in a compartment ahead of the aileron. Movement of the hinged panel then moves the control surface. The greater the deflection, the greater the pressure changes, and the more assistance will be provided by the hinged panel.

8. Moisture in a pneumatic system may cause

A—corrosion.
B—a variety of sounds including banging, squealing, and chattering.
C—return lines to freeze when the pressure of the air drops during actuation.

Answer A—Subject Matter Code: T46. Moisture in a pneumatic system can cause freezing of operating units; interfere with the normal operation of valves, pumps, etc.; and cause corrosion. After the compressed air serves its purpose, it is dumped overboard.

9. Why should turbine engines normally be operated at idle for a period of time before shutdown?

A—The turbine case cools faster and may shrink down and seize the turbine blades.
B—Rapid cooling of the compressor section may cause cracking of compressor blades.
C—Temperature reduction and stabilization prevents a hot combustion chamber from igniting residual fuel.

Answer A—Subject Matter Code: T04. The turbine case and the turbine wheels operate at approximately the same temperature when the engine is running. After shutdown, the turbine case will cool faster than the turbine wheels and may shrink down on the still-rotating turbine wheels if the engine is too hot. Under extreme conditions, the turbine blades may seize. This can be avoided if the engine is cooled at idle speed after prolonged high thrust.

10. Which flight conditions will result in the largest propeller blade angle?

A—Initial climb-out.
B—Approach to landing.
C—High-speed, high-altitude cruise flight.

Answer C—Subject Matter Code: S18. A constant-speed propeller will attain the largest blade angle when the airplane is at high speed and high altitude. The air is less dense and the propeller requires a larger blade angle for the same amount of torque.

11. If the nosegear retracts forward on an airplane with a datum located forward of the nose, the total moments will

A—increase.
B—decrease.
C—remain the same.

Answer B—Subject Matter Code: H14. When the landing gear swings forward, the total moments will decrease in proportion to the distance the weight is moved.

12. A cargo airplane is loaded to a maximum takeoff gross weight of 150,000 pounds. How many 150-pound boxes must be moved from Station 1200.0 to Station 700.0 to move the CG forward 3 inches?

A—3 boxes.
B—6 boxes.
C—22 boxes.

Answer B—Subject Matter Code: H14.

Total weight ..... 150,000 lb
CG change..... 3"
Distance weight is shifted.....1200" - 700" = 500"
Weight shifted ..... 150,000 x 3" 500" = 900 lb
Number of boxes ..... 900 lb 150 lb = 6 boxes

APPENDIX 1

LIST OF REFERENCE MATERIALS
AND SUBJECT MATTER KNOWLEDGE CODES

The publications listed in the following pages contain study material that may be used in preparing for the flight engineer computer administered knowledge tests. These publications may be purchased through U.S. Government bookstores, or commercial aviation book and supply companies. The latest revision of the references should be requested.

The knowledge standards and subject matter knowledge codes for the flight engineer tests are derived from the following reference materials. When reviewing the results of the knowledge test, compare the subject matter knowledge code(s) on the airman test report to these references.

FAR 1 Definitions and Abbreviations

A01 General Definitions
A02 Abbreviations and Symbols

FAR 25 Airworthiness Standards: Transport Category Airplanes

A03 General
A04 Flight
A05 Structure
A06 Design and Construction
A07 Powerplant
A08 Equipment
A09 Operating Limitations and Information

FAR 61 Certification: Pilots and Flight Instructors

A20 General

FAR 63 Certification: Flight Crewmembers Other Than Pilots

A30 General
A31 Flight Engineers

FAR 91 General Operating Rules

B07 General
B14 Large and Turbine-Powered Multiengine Airplanes
B15 Additional Equipment and Operating Requirements for Large and Transport Category Aircraft

FAR 121 Certification and Operations: Domestic, Flag and Supplemental Air Carriers and Commercial Operators of Large Aircraft

D01 General
D07 Manual Requirements
D08 Aircraft Requirements
D09 Airplane Performance Operating Limitations
D10 Special Airworthiness Requirements
D11 Instrument and Equipment Requirements

D12 Maintenance, Preventive Maintenance, and Alterations
D13 Airman and Crewmember Requirements
D14 Training Program
D15 Crewmember Qualifications
D17 Flight Time Limitations and Rest Requirements: Domestic Air Carriers
D18 Flight Time Limitations: Flag Air Carriers
D19 Flight Time Limitations: Supplemental Air Carriers and Commercial Operators
D20 Flight Operations
D21 Dispatching and Flight Release Rules
D22 Records and Reports
D23 Crewmember Certificate: International

FAR 125 Certification and Operations: Airplanes Having a Seating Capacity of 20 or More Passengers or a Maximum Payload Capacity of 6,000 Pounds or More

D30 General
D31 Certification Rules and Miscellaneous Requirements
D32 Manual Requirements
D33 Airplane Requirements
D34 Special Airworthiness Requirements
D35 Instrument and Equipment Requirements
D36 Maintenance
D37 Airman and Crewmember Requirements
D38 Flight Crewmember Requirements
D39 Flight Operations
D40 Flight Release Rules
D41 Records and Reports

US HMR 175 Materials Transportation Bureau Hazardous Materials Regulations (HMR)

G01 General Information and Regulations
G02 Loading, Unloading, and Handling
G03 Specific Regulation Applicable According to Classification of Material

AC 91-23 Pilot's Weight and Balance Handbook

H10 Weight and Balance Control
H11 Terms and Definitions
H12 Empty Weight Center of Gravity
H13 Index and Graphic Limits
H14 Change of Weight
H16 Control of Loading— Large Aircraft

AC 00-6 Aviation Weather

I20 The Earth's Atmosphere
I21 Temperature
I22 Atmospheric Pressure and Altimetry
I23 Wind
I24 Moisture, Cloud Formation, and Precipitation
I25 Stable and Unstable Air

I26 Clouds
I27 Air Masses and Fronts
I28 Turbulence
I29 Icing
I30 Thunderstorms
I31 Common IFR Producers
I32 High Altitude Weather
I33 Arctic Weather
I34 Tropical Weather
I36 Glossary of Weather Terms

AIM Airman's Information Manual

J03 Airport Lighting Aids
J04 Air Navigation and Obstruction Lighting
J05 Airport Marking Aids and Signs
J11 Service Available to Pilots
J13 Airport Operations
J15 Preflight
J23 Distress and Urgency Procedures
J25 Meteorology
J26 Altimeter Setting Procedures
J27 Wake Turbulence
J29 Potential Flight Hazards
J30 Safety, Accident, and Hazard Reports
J31 Fitness for Flight

AC 67-2 Medical Handbook for Pilots

J52 Hypoxia
J53 Hyperventilation
J55 The Ears
J56 Alcohol
J57 Drugs and Flying
J58 Carbon Monoxide
J59 Vision
J60 Night Flight
J61 Cockpit Lighting
J62 Disorientation (Vertigo)
J63 Motion Sickness
J64 Fatigue
J65 Noise
J66 Age
J67 Some Psychological Aspects of Flying
J68 The Flying Passenger

ADDITIONAL ADVISORY CIRCULARS

K01 AC 00-24, Thunderstorms
K02 AC 00-30, Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence
K03 AC 00-34, Aircraft Ground Handling and Servicing

K04 AC 00-54, Pilot Wind Shear Guide
K11 AC 20-34, Prevention of Retractable Landing Gear Failure
K12 AC 20-32, Carbon Monoxide (CO) Contamination in Aircraft Detection and Prevention
K13 AC 20-43, Aircraft Fuel Control
K20 AC 20-103, Aircraft Engine Crankshaft Failure
K40 AC 25-4, Inertial Navigation System (INS)
L05 AC 60-22, Aeronautical Decision Making
L15 AC 61-107, Operations of Aircraft at Altitudes Above 25,000 Feet MSL and/or MACH numbers (Mmo) Greater Than .75
L34 AC 90-48, Pilots' Role in Collision Avoidance
L50 AC 91-6, Water, Slush, and Snow on the Runway
L52 AC 91-13, Cold Weather Operation of Aircraft
L53 AC 91-14, Altimeter Setting Sources
L57 AC 91-43, Unreliable Airspeed Indications
L59 AC 91-46, Gyroscopic Instruments – Good Operating Practices
L61 AC 91-50, Importance of Transponder Operation and Altitude Reporting
L62 AC 91-51, Airplane Deice and Anti-Ice Systems
L80 AC 103-4, Hazard Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft
M01 AC 120-12, Private Carriage Versus Common Carriage of Persons or Property
M02 AC 120-27, Aircraft Weight and Balance Control
M08 AC 120-58, Large Aircraft Ground Deicing
M13 AC 121-195-1, Operational Landing Distances for Wet Runways; Transport Category Airplanes
M51 AC 20-117, Hazards Following Ground Deicing and Ground Operations in Conditions Conducive to Aircraft Icing
M52 AC 00-2, Advisory Circular Checklist

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S80 Ignition Systems
S81 Engine Instrument Systems
S82 Fire/Overheat Detection and Extinguishing Systems for Turbine Engines
S83 Engine Operation

The Aircraft Gas Turbine Engine and Its Operation— United Technologies Corporation, Pratt & Whitney, 1988

T01 Gas Turbine Engine Fundamentals
T02 Gas Turbine Engine Terms
T03 Gas Turbine Engine Components
T04 Gas Turbine Engine Operation
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W09 Prop Aircraft Applied Performance
W11 Hazards of Low Speed Flight
W12 Takeoff Performance
W13 Landing Performance
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W17 High Speed Flight

Fly the Wing,— Iowa State University Press/Ames, Second Edition

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X02 High-Speed Aerodynamics
X03 High-Altitude Machs
X07 Takeoffs
X08 Rejected Takeoffs
X09 Climb, Cruise, and Descent
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Aircraft Gas Turbine Engine Technology, Glencoe/McGraw-Hill, Second Edition

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Y04 Maintenance and Testing
Y05 Representative Engines
Y06 Appendixes

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U.S. Department of Transportation
General Services Section, M-45.3
Washington, DC 20590

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The following is a list of the computer testing designees authorized to give FAA knowledge tests. This list should be helpful in choosing where to register for a test or for requesting additional information.

Aviation Business Services
1-800-947-4228
outside U.S. (415) 259-8550

Drake Prometric
1-800-359-3278
outside U.S. (612) 896-7702

Sylvan Learning Systems, Inc.
1-800-967-1100
outside U.S. (410) 880-0880, Extension 8890

The latest listing of computer testing center locations may be obtained through FedWorld, (703) 321-3339, in the FAA library file named TST_SITE. For technical assistance, contact the FedWorld help desk at (703) 487-4608.