



# 2026 FAR//AIM

FEDERAL AVIATION REGULATIONS /  
AERONAUTICAL INFORMATION MANUAL



**RULES AND PROCEDURES FOR AVIATORS**  
U.S. Department of Transportation  
From Titles 14 and 49 of the Code of Federal Regulations

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NEWCASTLE, WASHINGTON

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First edition published 1945. 2026 edition published 2025.

This publication contains current regulations as of May 5, 2025.  
The *Aeronautical Information Manual* is current through February 20, 2025.

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Front cover photo: iStock.com/Dushlik.

**ASA-26-FR-AM-BK**  
ISBN 978-1-64425-498-1

**Additional formats available:**  
eBook EPUB ISBN 978-1-64425-499-8  
eBook PDF ISBN 978-1-64425-500-1

Printed in the United States of America

2026 2025 9 8 7 6 5 4 3 2 1

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- Suggested study list of FAR sections and AIM paragraphs pertinent to specific pilot certificates and ratings
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# Introduction

## ASA 2026 FAR/AIM Series

### FAR/AIM • FAR for Flight Crew • FAR for AMT

ASA has been supplying the standard reference of the industry, the FAR/AIM series, for over 80 years. The 2026 series continues to provide the Federal Aviation Regulations and the *Aeronautical Information Manual* along with these important features:

- All changes since the last edition are clearly identified.
- Access to online suggested study list of FAR sections and *AIM* paragraphs pertinent to specific pilot certificates and ratings (see [asa2fly.com/faraim-book](http://asa2fly.com/faraim-book)).
- Index includes both FAR and *AIM* terms to provide an alphabetized listing of subject matter for quick look-up.
- *AIM* produced with full-color graphics.

Each regulation Part is preceded by a table of contents. Changes since last year's printing are identified on page vii and in the table of contents for each regulation Part (in bold and marked with an asterisk), as well as within the text for quick reference (changed text is indicated with a bold line in the margin). In the *AIM*, changes are explained in a list at the beginning and with bold lines in the margins. It is recommended that you familiarize yourself with all the changes to identify those that affect your aviation activities.

Changes affecting the regulations can take place daily; the *AIM* changes every 6 months. ASA tracks all changes and offers you two options for free **Updates** at [asa2fly.com/farupdate](http://asa2fly.com/farupdate):

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Visit the Federal Aviation Administration (FAA) website at [www.faa.gov](http://www.faa.gov) to review Advisory Circulars (AC), Notices of Proposed Rulemaking (NPRM), current regulations, FSDO contact details, and FAA Orders and publications. Pilots operating internationally should be familiar with Customs and Border Protection regulations, which can be found at [cbp.gov](http://cbp.gov).

Although ASA is not a government agency, and we do not write the regulations or the *AIM*, we do work closely with the FAA. Questions or concerns can be forwarded to our attention, and we will in turn pass the comments on to the responsible office within the agency. The FAA is interested in user feedback and your comments could foster improvements in the regulations that affect the entire industry.

#### FAR/AIM Comments

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# Identifying Regulation Changes Since Last Year

Changes since last year’s printing of the book are noted in the table of contents of each Part with an asterisk and bold title:

Example:

**\*61.5 Certificates and ratings issued under this part.**

The updated text within the context of the regulation is indicated by a bold line in the margin:

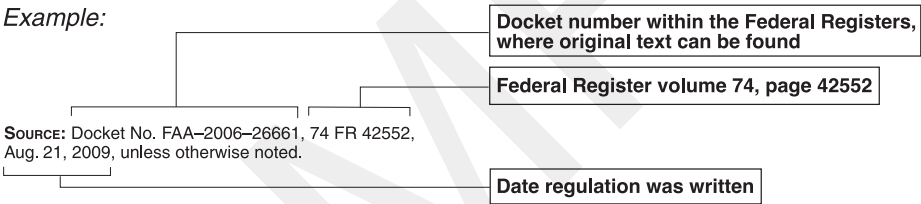
(a) The following certificates are issued under this part to an applicant who satisfactorily accomplishes the training and certification requirements for the certificate sought:

- (1) Pilot certificates—
  - (i) Student pilot.
  - (ii) Sport pilot.
  - (iii) Recreational pilot.
  - (iv) Private pilot.
  - (v) Commercial pilot.
  - (vi) Airline transport pilot.
- (2) Flight instructor certificates.
- (3) Ground instructor certificates.

## How to Identify the Currency of the Regulations

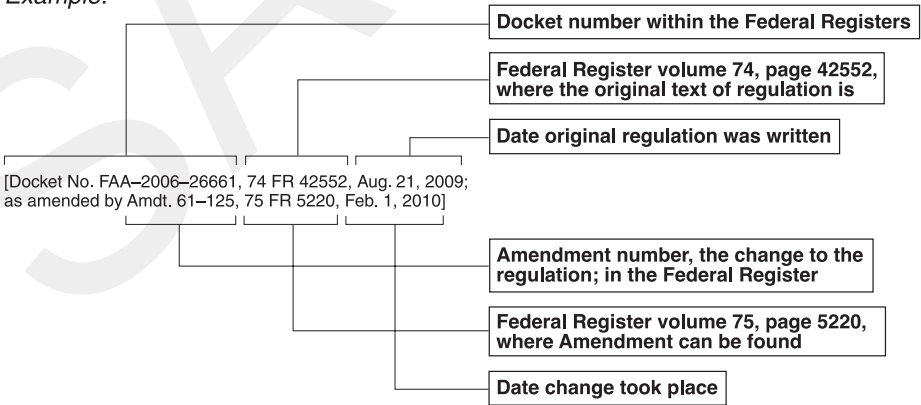
In each Part following the Table of Contents is a Source, with the date of origin for that regulation.

Example:



If a change has taken place since the original Regulation was written, it is noted at the end of the regulation.

Example:





# Summary of Major FAR Changes Since 2025 Book Was Published

All changes are identified in the table of contents of each Part with bold Section titles and asterisks and in the regulation text with bold lines in the margins.

These regulation changes from the *Federal Register* affect this book as follows:

## 14 CFR

### Parts 1, 43, 61, 91, 97, 136, 141, 142

- Adopts permanent amendments and a Special Federal Aviation Regulation (SFAR) for a period of ten years to facilitate the certification of powered-lift pilots, clarify operating rules applicable to operations involving a powered-lift, and finalize other amendments which are necessary to integrate powered-lift into the National Airspace System (NAS). (*Part 194 containing SFAR No. 120—Powered-Lift: Pilot Certification and Training; Operations Requirements—is accessible online at [ecfr.gov](http://ecfr.gov) and in ASA's FAR/AIM app.*)

### Parts 1, 61, 91

- Allows pilots conducting public aircraft operations to credit their flight time toward FAA civil regulatory requirements; amends the operating rules for experimental aircraft to permit certain flight training, testing, and checking in these aircraft without a letter of deviation authority and extends the same relief for limited category, primary category, and experimental light sport aircraft; and revises miscellaneous amendments related to recent flight experience, flight instructor privileges, and flight training in certain aircraft holding special airworthiness certificates.

### Parts 1, 91, 136

- Prohibits civil aircraft operations conducted with supplemental restraint systems (SRS) unless operators meet certain requirements for ensuring passenger and crewmember safety during all phases of the operation.

### Part 61

- Revises the Special Federal Aviation Regulation No. 73—Robinson R 22/R-44 Special Training and Experience Requirements to provide consistency with other FAA regulatory requirements, training, and Airman Certification Standards and Practical Test Standards.
- Removes duplicative requirements to correct regulatory text previously set forth incorporating by reference the FAA Airman Certification Standards into the certification requirements for pilots.
- Relocates and codifies Special Federal Aviation Regulation (SFAR) No. 100–2, *Relief for U.S. Military and Civilian Personnel who are Assigned Outside the United States in Support of U.S. Armed Forces Operations*, into parts 61, 63, and 65, respectively.

### Parts 61, 68, 91

- Amends BasicMed regulations to align aircraft conditions and limitations with the term “covered aircraft” to increase the number of allowable passengers from 5 to 6, increase the number of occupants from 6 to 7, and increase the maximum takeoff weight from 6,000 pounds to 12,500 pounds, while excluding certain transport category rotorcraft.

(continued)



## Parts 61, 141

- Removes the expiration date on flight instructor certificates to align with other airman certificates; changes the flight instructor certificate renewal requirements to recent experience requirements; adds two new methods for flight instructors to qualify to train initial applicants; and other provisions.

## Part 71

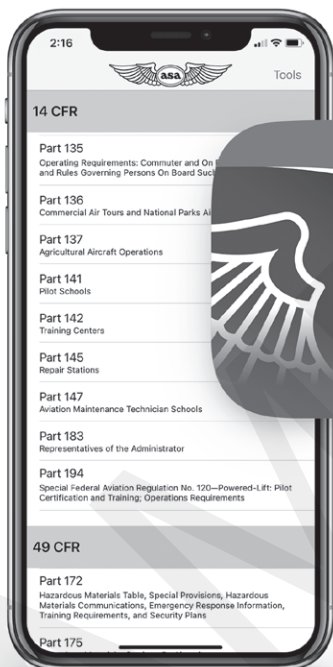
- Amends regulations relating to airspace designations to reflect the incorporation by reference of FAA Order JO 7400.11J, Airspace Designations and Reporting Points.

## Part 91

- Replaces the pilot safety background check required by this section with compliance with 14 CFR Part 111.
- Finalizes the substantive relief proposed in the notice of proposed rulemaking entitled Removal of Check Pilot Medical Certificate Requirement, amending certain medical certificate requirements to remove inconsistencies applicable to the qualification requirements for check pilots and flight instructors.
- Amends regulations to allow aircraft to operate either with “No Smoking” signs continuously illuminated or with “No Smoking” signs a crewmember can turn on and off.
- Modifies some flight operations in the Kabul Flight Information Region (FIR) (OAKX).
- Extends the prohibition against certain flight operations in the Tehran Flight Information Region (FIR) (OIIX) for an additional three years, from October 31, 2024, to October 31, 2027.
- Extends the prohibition against certain flight operations in the Baghdad Flight Information Region (FIR) (ORBB) for an additional three years, from October 26, 2024, to October 26, 2027.
- Extends the prohibition against certain flight operations in specified areas of the Sanaa Flight Information Region (FIR) (OYSC) for an additional three years, from January 7, 2025, until January 7, 2028.
- Extends the prohibition against certain flight operations in the territory and airspace of Libya for an additional three years, from March 20, 2025, to March 20, 2028.

The ***Aeronautical Information Manual*** printed in this book is current through February 20, 2025. The major changes are summarized in the *AIM* introductory text.

**Note:** Changes affecting the regulations can take place daily. ASA tracks all changes and posts them on the ASA website so you always have the most current information. To view the rules currently in effect and to have Update notices automatically emailed to you, visit [asa2fly.com/farupdate](https://asa2fly.com/farupdate).



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# PART 61

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**Authority:** 49 U.S.C. 106(f), 40113, 44701–44703, 44707, 44709–44711, 44729, 44903, 45102–45103, 45301–45302; Sec. 2307, Pub. L. 114–190, 130 Stat. 615 (49 U.S.C. 44703 note); sec. 318, Pub. L. 115–254, 132 Stat. 3186 (49 U.S.C. 44703 note); sec. 820, Pub. L. 118–63, 138 Stat. 1330 (49 U.S.C. 44939 note); secs. 815 and 828, Pub. L. 118–63, 138 Stat. 1328, 1336 (49 U.S.C. 44703 note).

**Source:** Docket No. 25910, 62 FR 16298, April 4, 1997, unless otherwise noted.

**SPECIAL FEDERAL AVIATION REGULATIONS****SFAR No. 73**

**ROBINSON HELICOPTER COMPANY,  
ROBINSON R-22/R-44 SPECIAL TRAINING  
AND EXPERIENCE REQUIREMENTS**

**Sections**

1. Applicability.
2. Required training, aeronautical experience, endorsements, and flight review.
3. Expiration date.

**1. Applicability.** Under the procedures prescribed in this section, this Special Federal Aviation Regulation (SFAR) applies to all persons who seek to manipulate the controls, act as pilot in command, provide ground training or flight training, or conduct a flight review in a Robinson model R-22 or R-44 helicopter. The requirements stated in this SFAR are in addition to the current requirements of this part.

**2. Required training, aeronautical experience, endorsements, and flight review.**

**(a) Ground Training.**

(1) Except as provided in paragraph 2(a)(2) of this SFAR, no person may manipulate the controls of a Robinson model R-22 or R-44 helicopter for the purpose of flight unless the ground training specified in paragraph 2(a)(3) of this SFAR is completed and the person's logbook has been endorsed by a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR.

(2) A person who holds a rotorcraft category and helicopter class rating on that person's pilot certificate and meets the experience requirements of paragraph 2(b)(1) or paragraph 2(b)(2) of this SFAR may not manipulate the controls of a Robinson model R-22 or R-44 helicopter for the purpose of flight unless the ground training specified in paragraph 2(a)(3) of this SFAR is completed and the person's logbook has been endorsed by a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR.

(3) Ground training must be conducted by a flight instructor who has been authorized under paragraph 2(b)(5)(iv) of this SFAR and consists of the following general subject areas:

- (i) Energy management;
- (ii) Mast bumping;
- (iii) Low rotor revolutions per minute (RPM) and rotor stall;
- (iv) Low G conditions, effects, and proper recovery procedures; and
- (v) Rotor RPM decay.

(4) The general subject areas identified in paragraph 2(a)(3) of this SFAR are intended to cover both Robinson model R-22 and R-44 helicopters.

(5) A person who can show satisfactory completion of the manufacturer's safety course may obtain an endorsement from an FAA aviation safety inspector in lieu of completing the ground training required by paragraphs 2(a)(1) and (2) of this SFAR.

**(b) Aeronautical Experience.**

(1) No person may act as pilot in command of a Robinson model R-22 unless that person:

- (i) Has logged at least 200 flight hours in helicopters, at least 50 flight hours of which were in the Robinson model R-22 helicopter; or
- (ii) Has logged at least 10 hours of flight training in the Robinson model R-22 helicopter and has received an endorsement from a flight instructor

authorized under paragraph 2(b)(5)(iv) of this SFAR that the individual has been given the training required by this paragraph 2(b)(1)(ii) and is proficient to act as pilot in command of an R-22. The flight training must include at least the following abnormal and emergency procedures:

(A) Training in autorotation procedures and energy management, including utilizing a combination of flight control inputs and maneuvering to prevent overshooting or undershooting the selected landing area from an entry altitude that permits safe recovery;

(B) Autorotations at an entry altitude that permits safe maneuvering and recovery utilizing maximum glide configuration;

(C) Engine rotor RPM control without the use of the governor; and

(D) Low rotor RPM recognition and recovery.

(iii) Pilots who do not meet the experience requirement of paragraph 2(b)(1)(i) of this SFAR may not act as pilot in command of a Robinson model R-22 helicopter beginning 12 calendar months after the date of the endorsement identified in paragraph 2(b)(1)(ii) of this SFAR until those pilots have:

(A) Completed a flight review of the ground training subject areas identified by paragraph 2(a)(3) of this SFAR and the flight training identified in paragraph 2(b)(1)(ii) of this SFAR in an R-22; and

(B) Obtained an endorsement for that flight review from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR.

(2) No person may act as pilot in command of a Robinson model R-44 helicopter unless that person—

(i) Has logged at least 200 flight hours in helicopters, at least 50 flight hours of which were in the Robinson model R-44 helicopter. The pilot in command may credit up to 25 flight hours in the Robinson model R-22 helicopter toward the 50-hour requirement in the Robinson model R-44 helicopter; or

(ii) Has logged at least 10 hours of flight training in a Robinson helicopter, at least 5 hours of which must have been accomplished in the Robinson model R-44 helicopter, and has received an endorsement from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR that the individual has been given the training required by this paragraph 2(b)(2)(ii) and is proficient to act as pilot in command of an R-44. The flight training must include at least the following abnormal and emergency procedures—

(A) Training in autorotation procedures and energy management, including utilizing a combination of flight control inputs and maneuvering to prevent overshooting or undershooting the selected landing area from an entry altitude that permits safe recovery;



(B) Autorotations at an entry altitude that permits safe maneuvering and recovery utilizing minimum rate of descent configuration and maximum glide configuration;

(C) Engine rotor RPM control without the use of the governor; and

(D) Low rotor RPM recognition and recovery.

(iii) Pilots who do not meet the experience requirement of paragraph 2(b)(2)(i) of this SFAR may not act as pilot in command of a Robinson model R-44 helicopter beginning 12 calendar months after the date of the endorsement identified in paragraph 2(b)(2)(ii) of this SFAR until those pilots have:

(A) Completed a flight review of the ground training subject areas identified by paragraph 2(a)(3) and the flight training identified in paragraph 2(b)(2)(ii) of this SFAR in an R-44; and

(B) Obtained an endorsement for that flight review from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR.

(3) A person who does not hold a rotorcraft category and helicopter class rating must have logged at least 20 hours of flight training in a Robinson model R-22 helicopter from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR prior to operating it in solo flight. In addition, the person must obtain an endorsement from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR that training has been given in those maneuvers and procedures, and the instructor has found the applicant proficient to solo a Robinson model R-22 helicopter. This endorsement is valid for a period of 90 days. The flight training must include at least the following abnormal and emergency procedures:

(i) Training in autorotation procedures and energy management, including utilizing a combination of flight control inputs and maneuvering to prevent overshooting or undershooting the selected landing area from an entry altitude that permits safe recovery;

(ii) Autorotations at an entry altitude that permits safe maneuvering and recovery utilizing maximum glide configuration;

(iii) Engine rotor RPM control without the use of the governor; and

(iv) Low rotor RPM recognition and recovery.

(4) A person who does not hold a rotorcraft category and helicopter class rating must have logged at least 20 hours of flight training in a Robinson model R-44 helicopter from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR prior to operating it in solo flight. In addition, the person must obtain an endorsement from a flight instructor authorized under paragraph 2(b)(5)(iv) of this SFAR that training has been given in those maneuvers and procedures and the instructor has found the applicant proficient to solo

a Robinson model R-44 helicopter. This endorsement is valid for a period of 90 days. The flight training must include at least the following abnormal and emergency procedures:

(i) Training in autorotation procedures and energy management, including utilizing a combination of flight control inputs and maneuvering to prevent overshooting or undershooting the selected landing area from an entry altitude that permits safe recovery;

(ii) Autorotations at an entry altitude that permits safe maneuvering and recovery utilizing minimum rate of descent configuration and maximum glide configuration;

(iii) Engine rotor RPM control without the use of the governor; and

(iv) Low rotor RPM recognition and recovery.

(5) No flight instructor may provide training or conduct a flight review in a Robinson R-22 or R-44 unless that instructor—

(i) Completes the ground training in paragraph 2(a) of this SFAR.

(ii) For the Robinson model R-22 helicopter, has logged at least 200 flight hours in helicopters, at least 50 flight hours of which were in the Robinson model R-22 helicopter, or for the Robinson model R-44 helicopter, logged at least 200 flight hours in helicopters, 50 flight hours of which were in Robinson helicopters. Up to 25 flight hours of Robinson model R-22 helicopter flight time may be credited toward the 50-hour requirement.

(iii) Has completed flight training in a Robinson model R-22 or R-44 helicopter, or both, on the following abnormal and emergency procedures—

(A) Training in autorotation procedures and energy management, including utilizing a combination of flight control inputs and maneuvering to prevent overshooting or undershooting the selected landing area from an entry altitude that permits safe recovery;

(B) For the Robinson model R-22 helicopter, autorotations at an entry altitude that permits safe maneuvering and recovery utilizing maximum glide configuration. For the Robinson model R-44 helicopter, autorotations at an entry altitude that permits safe maneuvering and recovery utilizing maximum glide configuration and minimum rate of descent configuration;

(C) Engine rotor RPM control without the use of the governor; and

(D) Low rotor RPM recognition and recovery.

(iv) Has been authorized by endorsement from an FAA aviation safety inspector or authorized designated examiner that the instructor has completed the appropriate training, meets the experience requirements, and has satisfactorily demonstrated an ability to provide training on the general subject areas of paragraph 2(a)(3) of this SFAR, and the flight training identified in paragraph 2(b)(5)(iii) of this SFAR.

(c) *Flight Review.*

(1) No flight review completed to satisfy §61.56 by an individual after becoming eligible to function as pilot in command in a Robinson model R-22 helicopter shall be valid for the operation of an R-22 unless that flight review was taken in an R-22.

(2) No flight review completed to satisfy §61.56 by an individual after becoming eligible to function as pilot in command in a Robinson model R-44 helicopter shall be valid for the operation of an R-44 unless that flight review was taken in the R-44.

(3) The flight review will include a review of the ground training subject areas of paragraph 2(a)(3) of this SFAR and flight training in abnormal and emergency procedures in the Robinson model R-22 or R-44 helicopter, as appropriate, identified in paragraph 2(b) of this SFAR.

(d) *Currency Requirements.* No person may act as pilot in command of a Robinson model R-22 or R-44 helicopter carrying passengers unless the pilot in command has met the recency of flight experience requirements of §61.57 in an R-22 or R-44, as appropriate.

**3. Expiration date.** This SFAR expires August 22, 2029, unless sooner revised or rescinded.

[Docket No. 25910, 62 FR 16298, April 4, 1997, as amended by SFAR 73–1, 63 FR 666, Jan. 7, 1998; 68 FR 43, Jan. 2, 2003; Amdt. 61–120, 73 FR 17246, April 1, 2008; Amdt. SFAR 73–2, 74 FR 25650, May 29, 2009; Amdt. 61–154, 89 FR 59608, July 23, 2024]

## Subpart A—General

### §61.1 Applicability and definitions.

(a) Except as provided in parts 107 and 194 of this chapter, this part prescribes:

(1) The requirements for issuing pilot, flight instructor, and ground instructor certificates and ratings; the conditions under which those certificates and ratings are necessary; and the privileges and limitations of those certificates and ratings.

(2) The requirements for issuing pilot, flight instructor, and ground instructor authorizations; the conditions under which those authorizations are necessary; and the privileges and limitations of those authorizations.

(3) The requirements for issuing pilot, flight instructor, and ground instructor certificates and ratings for persons who have taken courses approved by the Administrator under other parts of this chapter.

(b) For the purpose of this part:

*Accredited* has the same meaning as defined by the Department of Education in 34 CFR 600.2.

*Aeronautical experience* means pilot time obtained in an aircraft, flight simulator, or flight training device for meeting the appropriate training

and flight time requirements for an airman certificate, rating, flight review, or recency of flight experience requirements of this part.

*Authorized instructor* means—

(i) A person who holds a ground instructor certificate issued under part 61 of this chapter and is in compliance with §61.217, when conducting ground training in accordance with the privileges and limitations of his or her ground instructor certificate;

(ii) A person who holds a flight instructor certificate issued under part 61 of this chapter and is in compliance with §61.197, when conducting ground training or flight training in accordance with the privileges and limitations of his or her flight instructor certificate; or

(iii) A person authorized by the Administrator to provide ground training or flight training under part 61, 121, 135, or 142 of this chapter when conducting ground training or flight training in accordance with that authority.

*Aviation training device* means a training device, other than a full flight simulator or flight training device, that has been evaluated, qualified, and approved by the Administrator.

*Complex airplane* means an airplane that has a retractable landing gear, flaps, and a controllable pitch propeller, including airplanes equipped with an engine control system consisting of a digital computer and associated accessories for controlling the engine and propeller, such as a full authority digital engine control; or, in the case of a seaplane, flaps and a controllable pitch propeller, including seaplanes equipped with an engine control system consisting of a digital computer and associated accessories for controlling the engine and propeller, such as a full authority digital engine control.

*Cross-country time* means—

(i) Except as provided in paragraphs (ii) through (vii) of this definition, time acquired during flight—

(A) Conducted by a person who holds a pilot certificate;

(B) Conducted in an aircraft;

(C) That includes a landing at a point other than the point of departure; and

(D) That involves the use of dead reckoning, pilotage, electronic navigation aids, radio aids, or other navigation systems to navigate to the landing point.

(ii) For the purpose of meeting the aeronautical experience requirements (except for a rotorcraft category rating), for a private pilot certificate (except for a powered parachute category rating), a commercial pilot certificate, or an instrument rating, or for the purpose of exercising recreational pilot privileges (except in a rotorcraft) under §61.101(c), time acquired during a flight—

(A) Conducted in an appropriate aircraft;

(B) That includes a point of landing that was at least a straight-line distance of more than 50 nautical miles from the original point of departure; and

(C) That involves the use of dead reckoning, pilotage, electronic navigation aids, radio aids, or other navigation systems to navigate to the landing point.

(iii) For the purpose of meeting the aeronautical experience requirements for a sport pilot certificate (except for powered parachute privileges), time acquired during a flight conducted in an appropriate aircraft that—

(A) Includes a point of landing at least a straight line distance of more than 25 nautical miles from the original point of departure; and

(B) Involves, as applicable, the use of dead reckoning; pilotage; electronic navigation aids; radio aids; or other navigation systems to navigate to the landing point.

(iv) For the purpose of meeting the aeronautical experience requirements for a sport pilot certificate with powered parachute privileges or a private pilot certificate with a powered parachute category rating, time acquired during a flight conducted in an appropriate aircraft that—

(A) Includes a point of landing at least a straight line distance of more than 15 nautical miles from the original point of departure; and

(B) Involves, as applicable, the use of dead reckoning; pilotage; electronic navigation aids; radio aids; or other navigation systems to navigate to the landing point.

(v) For the purpose of meeting the aeronautical experience requirements for any pilot certificate with a rotorcraft category rating or an instrument-helicopter rating, or for the purpose of exercising recreational pilot privileges, in a rotorcraft, under §61.101(c), time acquired during a flight—

(A) Conducted in an appropriate aircraft;

(B) That includes a point of landing that was at least a straight-line distance of more than 25 nautical miles from the original point of departure; and

(C) That involves the use of dead reckoning, pilotage, electronic navigation aids, radio aids, or other navigation systems to navigate to the landing point.

(vi) For the purpose of meeting the aeronautical experience requirements for an airline transport pilot certificate (except with a rotorcraft category rating), time acquired during a flight—

(A) Conducted in an appropriate aircraft;

(B) That is at least a straight-line distance of more than 50 nautical miles from the original point of departure; and

(C) That involves the use of dead reckoning, pilotage, electronic navigation aids, radio aids, or other navigation systems.

(vii) For a military pilot who qualifies for a commercial pilot certificate (except with a rotorcraft category rating) under §61.73 of this part, time acquired during a flight—

(A) Conducted in an appropriate aircraft;

(B) That is at least a straight-line distance of more than 50 nautical miles from the original point of departure; and

(C) That involves the use of dead reckoning, pilotage, electronic navigation aids, radio aids, or other navigation systems.

*Examiner* means any person who is authorized by the Administrator to conduct a pilot proficiency test or a practical test for an airman certificate or rating issued under this part, or a person who is authorized to conduct a knowledge test under this part.

*Flight training* means that training, other than ground training, received from an authorized instructor in flight in an aircraft.

*Ground training* means that training, other than flight training, received from an authorized instructor.

*Institution of higher education* has the same meaning as defined by the Department of Education in 34 CFR 600.4.

*Instrument approach* means an approach procedure defined in part 97 of this chapter.

*Instrument training* means that time in which instrument training is received from an authorized instructor under actual or simulated instrument conditions.

*Knowledge test* means a test on the aeronautical knowledge areas required for an airman certificate or rating that can be administered in written form or by a computer.

*Nationally recognized accrediting agency* has the same meaning as defined by the Department of Education in 34 CFR 600.2.

*Night vision goggles* means an appliance worn by a pilot that enhances the pilot's ability to maintain visual surface reference at night.

*Night vision goggle operation* means the portion of a flight that occurs during the time period from 1 hour after sunset to 1 hour before sunrise where the pilot maintains visual surface reference using night vision goggles in an aircraft that is approved for such an operation.

*Passenger* means any person on board an aircraft other than a crewmember, FAA personnel, manufacturer personnel required for type certification, or a person receiving or providing flight training, checking, or testing as authorized by this part.

*Pilot time* means that time in which a person—

(i) Serves as a required pilot flight crewmember;

(ii) Receives training from an authorized instructor in an aircraft, full flight simulator, flight training device, or aviation training device;

(iii) Gives training as an authorized instructor in an aircraft, full flight simulator, flight training device, or aviation training device; or

(iv) Serves as second in command in operations conducted in accordance with §135.99(c) of

this chapter when a second pilot is not required under the type certification of the aircraft or the regulations under which the flight is being conducted, provided the requirements in §61.159(c) are satisfied.

**Practical test** means a test on the areas of operations for an airman certificate, rating, or authorization that is conducted by having the applicant respond to questions and demonstrate maneuvers in flight, in a flight simulator, or in a flight training device.

**Set of aircraft** means aircraft that share similar performance characteristics, such as similar airspeed and altitude operating envelopes, similar handling characteristics, and the same number and type of propulsion systems.

**Student pilot seeking a sport pilot certificate** means a person who has received an endorsement—

(i) To exercise student pilot privileges from a certificated flight instructor with a sport pilot rating; or

(ii) That includes a limitation for the operation of a light-sport aircraft specified in §61.89(c) issued by a certificated flight instructor with other than a sport pilot rating.

**Technically advanced airplane (TAA)** means an airplane equipped with an electronically advanced avionics system.

**Training time** means training received—

(i) In flight from an authorized instructor;

(ii) On the ground from an authorized instructor; or

(iii) In a flight simulator or flight training device from an authorized instructor.

[Docket No. 25910, 62 FR 16298, April 4, 1997; Amdt. 61–103, 62 FR 40893, July 30, 1997 as amended by Amdt. 61–110, 69 FR 44864, July 27, 2004; Amdt. 61–124, 74 FR 42546, Aug. 21, 2009; Amdt. 61–128, 76 FR 54105, Aug. 31, 2011; Amdt. 61–130, 78 FR 42372, July 15, 2013; Amdt. 61–137, 81 FR 42208, June 28, 2016; Amdt. 61–142, 83 FR 30276, June 27, 2018; Amdt. 61–156, 89 FR 80339, Oct. 2, 2024; Amdt. 61–157, 89 FR 92483, Nov. 21, 2024]

## §61.2 Exercise of Privilege.

(a) **Validity.** No person may:

(1) Exercise privileges of a certificate, rating, endorsement, or authorization issued under this part if the certificate, rating or authorization is surrendered, suspended, revoked or expired.

(2) Exercise privileges of a flight instructor certificate if that flight instructor certificate is surrendered, suspended, revoked or expired.

(3) Exercise privileges of a foreign pilot certificate to operate an aircraft of foreign registry under §61.3(b) if the certificate is surrendered, suspended, revoked or expired.

(4) Exercise privileges of a pilot certificate issued under §61.75, or an authorization issued

under §61.77, if the foreign pilot certificate relied upon for the issuance of the U.S. pilot certificate or authorization is surrendered, suspended, revoked or expired.

(5) Exercise privileges of a medical certificate issued under part 67 to meet any requirements of part 61 if the medical certificate is surrendered, suspended, revoked or expired according to the duration standards set forth in §61.23(d).

(6) Use an official government issued driver's license to meet any requirements of part 61 related to holding that driver's license, if the driver's license is surrendered, suspended, revoked or expired.

(b) **Currency.** No person may:

(1) Exercise privileges of an airman certificate, rating, endorsement, or authorization issued under this part unless that person meets the appropriate airman recent experience and medical requirements of this part, specific to the operation or activity.

(2) Exercise privileges of a foreign pilot license within the United States to conduct an operation described in §61.3(b), unless that person meets the appropriate airman recent experience and medical requirements of the country that issued the license, specific to the operation.

[Docket No. FAA–2006–26661, 74 FR 42546, Aug. 21, 2009; Amdt. 61–155, 89 FR 80049, Oct. 1, 2024]

## §61.3 Requirement for certificates, ratings, and authorizations.

(a) **Required pilot certificate for operating a civil aircraft of the United States.** No person may serve as a required pilot flight crewmember of a civil aircraft of the United States, unless that person:

(1) Has in the person's physical possession or readily accessible in the aircraft when exercising the privileges of that pilot certificate or authorization—

(i) A pilot certificate issued under this part and in accordance with §61.19;

(ii) A special purpose pilot authorization issued under §61.77;

(iii) A temporary certificate issued under §61.17;

(iv) A document conveying temporary authority to exercise certificate privileges issued by the Airmen Certification Branch under §61.29(e);

(v) When engaged in a flight operation within the United States for a part 119 certificate holder authorized to conduct operations under part 121 or 135 of this chapter, a temporary document provided by that certificate holder under an approved certificate verification plan;

(vi) When engaged in a flight operation within the United States for a fractional ownership program manager authorized to conduct operations under part 91, subpart K, of this chapter, a

# AIM Contents

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Official Guide to Basic Flight Information and ATC Procedures  
U.S. Department of Transportation • Federal Aviation Administration

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## Federal Aviation Administration (FAA)

The Federal Aviation Administration is responsible for ensuring the safe, efficient, and secure use of the Nation's airspace, by military as well as civil aviation, for promoting safety in air commerce, for encouraging and developing civil aeronautics, including new aviation technology, and for supporting the requirements of national defense.

The activities required to carry out these responsibilities include: safety regulations; airspace management and the establishment, operation, and maintenance of a civil-military common system of air traffic control (ATC) and navigation facilities; research and development in support of the fostering of a national system of airports, promulgation of standards and specifications for civil airports, and administration of Federal grants-in-aid for developing public airports; various joint and cooperative activities with the Department of Defense; and technical assistance (under State Department auspices) to other countries.

## Aeronautical Information Manual (AIM)

### Basic Flight Information and ATC Procedures

This manual is designed to provide the aviation community with basic flight information and ATC procedures for use in the National Airspace System (NAS) of the United States. An international version called the Aeronautical Information Publication contains parallel information, as well as specific information on the international airports for use by the international community.

This manual contains the fundamentals required in order to fly in the United States NAS. It also contains items of interest to pilots concerning health and medical facts, factors affecting flight safety, a pilot/controller glossary of terms used in the ATC System, and information on safety, accident, and hazard reporting.

This manual is complemented by other operational publications which are available via separate subscriptions. These publications are:

The Chart Supplement U.S., the Chart Supplement Alaska, and the Chart Supplement Pacific—These publications contain information on airports, communications, navigation aids, instrument landing systems, VOR receiver check points, preferred routes, Flight Service Station/Weather Service telephone numbers, Air Route Traffic Control Center (ARTCC) frequencies, part-time surface areas, and various other pertinent special notices essential to air navigation. These publications are available through a network of FAA approved print providers. A listing of products, dates of latest editions, and print providers

is available on the Aeronautical Information Services (AIS) website at: [http://www.faa.gov/air\\_traffic/flight\\_info/aeronav/print\\_providers/](http://www.faa.gov/air_traffic/flight_info/aeronav/print_providers/).

Publication Schedule		
Basic or Change	Cutoff Date for Completion	Effective Date of Publication
Basic Manual	9/5/24	2/20/25
Change 1	2/20/25	8/7/25
Change 2	8/7/25	1/22/26
Change 3	1/22/26	7/9/26
Basic Manual	7/9/26	12/24/26
Change 1	12/24/26	6/10/27
Change 2	6/10/27	11/25/27
Change 3	11/25/27	5/11/28

## Flight Information Publication Policy

The following is in essence, the statement issued by the FAA Administrator and published in the December 10, 1964, issue of the Federal Register, concerning the FAA policy as pertaining to the type of information that will be published as NOTAMs and in the *Aeronautical Information Manual*.

a. It is a pilot's inherent responsibility to be alert at all times for and in anticipation of all circumstances, situations, and conditions affecting the safe operation of the aircraft. For example, a pilot should expect to find air traffic at any time or place. At or near both civil and military airports and in the vicinity of known training areas, a pilot should expect concentrated air traffic and realize concentrations of air traffic are not limited to these places.

b. It is the general practice of the agency to advertise by NOTAM or other flight information publications such information it may deem appropriate; information which the agency may from time to time make available to pilots is solely for the purpose of assisting them in executing their regulatory responsibilities. Such information serves the aviation community as a whole and not pilots individually.

c. The fact that the agency under one particular situation or another may or may not furnish information does not serve as a precedent of the agency's responsibility to the aviation community; neither does it give assurance that other information of the same or similar nature will be advertised, nor, does it guarantee that any and all information known to the agency will be advertised.

d. This publication, while not regulatory, provides information which reflects examples of operating techniques and procedures which may be requirements in other federal publications or regulations. It is made available solely to assist pilots in executing their responsibilities required by other publications.

Consistent with the foregoing, it is the policy of the Federal Aviation Administration to furnish information only when, in the opinion of the agency, a unique situation should be advertised and not to furnish routine information such as concentrations of air traffic, either civil or military. The *Aeronautical Information Manual* will not contain informative items concerning everyday circumstances that pilots should, either by good practices or regulation, expect to encounter or avoid.

## **Aeronautical Information Manual (AIM)**

### **Code of Federal Regulations and Advisory Circulars**

**Code of Federal Regulations**—The FAA publishes the Code of Federal Regulations (CFRs) to make readily available to the aviation community the regulatory requirements placed upon them. These regulations are sold as individual parts by the Superintendent of Documents.

The more frequently amended parts are sold on subscription service with subscribers receiving changes automatically as issued. Less active parts are sold on a single-sale basis. Changes to

single-sale parts will be sold separately as issued. Information concerning these changes will be furnished by the FAA through its Status of Federal Aviation Regulations, AC 00-44.

**Advisory Circulars**—The FAA issues Advisory Circulars (ACs) to inform the aviation public in a systematic way of nonregulatory material. Unless incorporated into a regulation by reference, the contents of an advisory circular are not binding on the public. Advisory Circulars are issued in a numbered subject system corresponding to the subject areas of the Code of Federal Regulations (CFRs) (Title 14, Chapter 1, FAA).

**Note:** *Current AC information can be found at: [https://www.faa.gov/regulations\\_policies/advisory\\_circulars/](https://www.faa.gov/regulations_policies/advisory_circulars/).*

**External References**—All references to Advisory Circulars and other FAA publications in the *Aeronautical Information Manual* include the FAA Advisory Circular or Order identification numbers (when available). However, due to varied publication dates, the basic publication letter is not included.

**Example**

*FAA Order JO 7110.65X, Air Traffic Control, is referenced as FAA Order JO 7110.65.*



## Comments/Corrections

The office of primary responsibility (OPR) for this manual is:

FAA Headquarters, Mission Support Services  
Policy Directorate (AJV-P)  
600 Independence Avenue SW  
Washington, DC 20597

Proposed changes must be submitted electronically, using the following format, to the Policy Directorate Correspondence Mailbox at 9-AJV-P-HQ-Correspondence@faa.gov.

### Notice to Editor

The following comments/corrections are submitted concerning the information contained in:

Paragraph number \_\_\_\_\_

Title \_\_\_\_\_

Page \_\_\_\_\_

Dated \_\_\_\_\_

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

## Subscription Information

This manual is available by its effective date on the FAA's Air Traffic Plans and Publications website at [https://www.faa.gov/air\\_traffic/publications/](https://www.faa.gov/air_traffic/publications/).

This manual is distributed electronically to all who subscribe to receive email notifications through the FAA's website. All organizations are responsible for viewing, downloading, and subscribing to receive email notifications when changes occur to this manual. Subscriptions to air traffic directives can be made through the Air Traffic Plans and Publications website at [https://www.faa.gov/air\\_traffic/publications/](https://www.faa.gov/air_traffic/publications/) or directly via the following link: [https://public.govdelivery.com/accounts/USAFAA/subscriber/new?topic\\_id=USAFAA\\_39](https://public.govdelivery.com/accounts/USAFAA/subscriber/new?topic_id=USAFAA_39).

## Explanation of Major Changes

*Change 3 effective September 5, 2024 (to Basic Manual effective April 20, 2023) and Basic Manual effective February 20, 2025.*

### **1–2–4. Recognizing, Mitigating, and Adapting to GPS Interference (Jamming or Spoofing)**

This change provides additional guidance and recommendations for jamming and/or spoofing of Global Positioning System (GPS) and reiterates the need for pilots' reporting of events.

### **3–5–2. Military Training Routes**

This change adds explanatory material on Special Military Advisory Routes (SMARs).

### **3–5–5. Published VFR Routes**

#### **9–1–4. General Description of Each Chart Series**

This change updates the names to three visual flight rules (VFR) charted products published by Aeronautical Information Services via the Terminal Area Chart (TAC) and VFR Flyway Planning Chart. These charts contain the VFR Flyway and VFR Transition Routes developed where applicable due to traffic volume and airspace complexity. The descriptions for each route are updated to better describe the products and the compliance requirements for each. A new section covering the Helicopter Route Chart is added to include a description and example of this charted VFR product.

### **4–4–12. Speed Adjustments**

#### **5–4–1. Standard Terminal Arrival Procedures**

This change adds language to clarify that any published speed, including a chart note speed, is canceled when aircraft are vectored or deviate off of a procedure.

### **4–4–12. Speed Adjustments**

This change is being made to align ICAO language with NAS orders and procedures by removing "turbojet" as the only aircraft that can be assigned a Mach number speed.

### **4–5–2. Air Traffic Control Radar Beacon System (ATCRBS)**

#### **Appendix 3. Abbreviations/Acronyms**

This change removes the note in subparagraph 4-5-2c; Figure 4-5-3 and Figure 4-5-4 that illustrate the old systems; and references to Automated Radar Terminal System in Appendix 3, Abbreviations/Acronyms.

### **4–7–1. Introduction and General Policies**

This change removes subparagraph f that previously instructed pilots to use Strategic Lateral Offset Procedures (SLOP) when flying in airspace over the Gulf of Mexico. We have revised the general guidance on SLOP in the U.S. AIP, ENR 7.1, accordingly.

### **5–1–3. Notice to Airmen (NOTAM) System**

This change removes mention of Chart Update Bulletin and replaces it with a description and link to the AJV-A website containing Safety Alerts, Charting Notices and Digital Product Notices.

### **5–2–5. Line Up and Wait (LUAW)**

This change moves the cautionary statement "Line Up and Wait (LUAW) is not an authorization to takeoff" to the first paragraph for emphasis. This change also adds a note advising readers of the increased number of instances where pilots correctly read back LUAW instructions yet depart without a takeoff clearance. It reminds pilots of the need for vigilance during LUAW operations. This change emphasizes situational awareness and vigilance to subparagraphs respectively.

### **5–4–5. Instrument Approach Procedures (IAP) Charts**

This change corrects the inconsistency between documents and charting to reflect the current method of procedure titling.

### **5–4–5. Instrument Approach Procedure (IAP) Charts**

This change clarifies the "Fly Visual" guidance by adding the recommendation that the visual segment should be flown with flight instrumentation when advisory lateral and vertical guidance is provided.

### **5–4–7. Instrument Approach Procedures**

This change clarifies when the phraseology "cleared approach" is issued without specifying which instrument approach to fly, pilots are not authorized to fly a visual or contact approach. The change also clarifies guidance instructing pilots what is expected when controllers clear IFR aircraft for a specific instrument approach.

### **Editorial Changes**

An editorial change to subparagraph 5-1-1d corrects the time frame for updating Section Charts from 6 months to 56 days. Changes also include correcting an airport name change from Pensacola "Regional" to "International" in Table 3-2-1, another change updates the hyperlink to the Graphical Forecasts for Aviation (GFA) static images website in paragraph 7-1-4, and updates the graphics used in Figure 7-1-2 and Figure 7-1-3. The term "Notice(s) to Air Missions" is changed to "Notice(s) to Airmen" throughout. Finally, the CFR "part" and "section" references are lower-cased throughout, to make consistent with usage across publications.

### **Entire Publication**

Additional editorial/format changes were made where necessary. Revision bars were not used because of the insignificant nature of these changes.

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# Chapter 2

## Aeronautical Lighting and Other Airport Visual Aids

### Section 1. Airport Lighting Aids

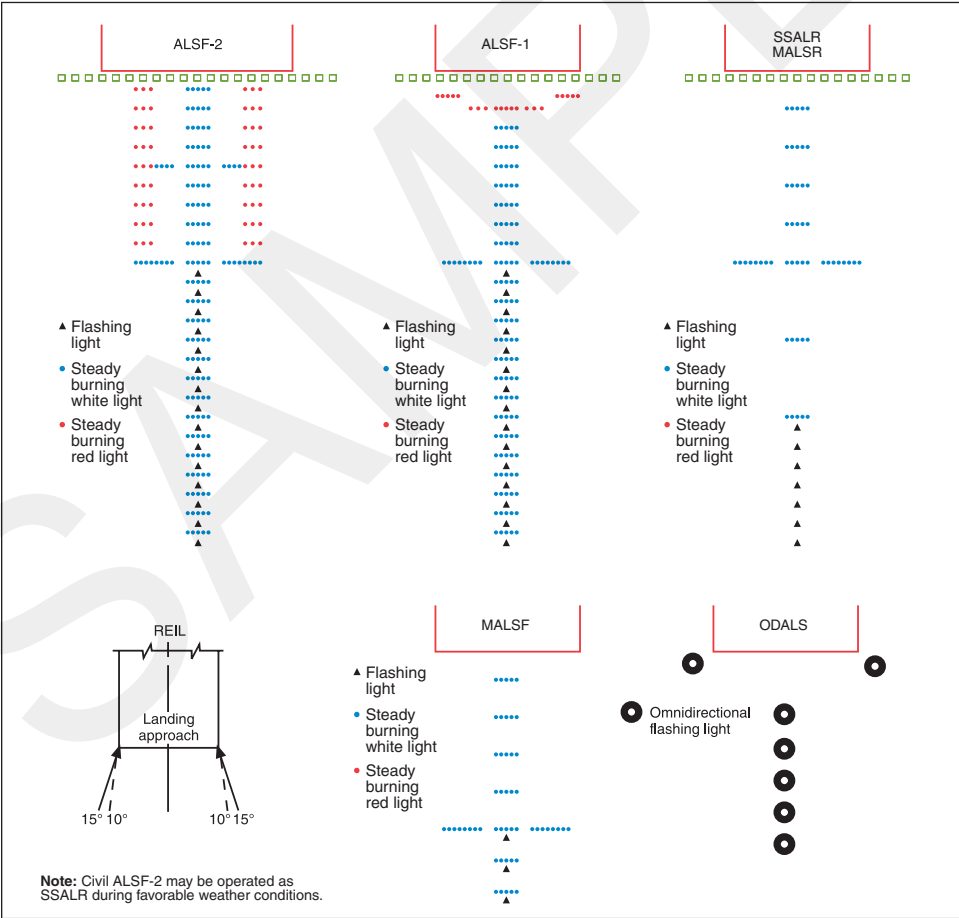
#### 2-1-1 Approach Light Systems (ALS)

a. ALS provide the basic means to transition from instrument flight to visual flight for landing. Operational requirements dictate the sophistication and configuration of the approach light system for a particular runway.

b. ALS are a configuration of signal lights starting at the landing threshold and extending into the approach area a distance of 2,400–3,000 feet for precision instrument runways and 1,400–1,500 feet for nonprecision instrument runways. Some systems include sequenced flashing lights which appear to the pilot as a ball of light traveling towards the runway at high speed (twice a second). (See Figure 2-1-1.)

Ch 2

FIGURE 2-1-1  
Precision and Nonprecision Configurations



## 2-1-2 Visual Glideslope Indicators

### a. Visual Approach Slope Indicator (VASI)

1. VASI installations may consist of either 2, 4, 6, 12, or 16 light units arranged in bars referred to as near, middle, and far bars. Most VASI installations consist of 2 bars, near and far, and may consist of 2, 4, or 12 light units. Some VASIs consist of three bars, near, middle, and far, which provide an additional visual glide path to accommodate high cockpit aircraft. This installation may consist of either 6 or 16 light units. VASI installations consisting of 2, 4, or 6 light units are located on one side of the runway, usually the left. Where the installation consists of 12 or 16 light units, the units are located on both sides of the runway.

2. Two-bar VASI installations provide one visual glide path which is normally set at 3 degrees. Three-bar VASI installations provide two visual glide paths. The lower glide path is provided by the near and middle bars and is normally set at 3 degrees while the upper glide path, provided by the middle and far bars, is normally 1/4 degree higher. This higher glide path is intended for use only by high cockpit aircraft to provide a sufficient threshold crossing height. Although normal glide path angles are three degrees, angles at some locations may be as high as 4.5 degrees to give proper obstacle clearance. Pilots of high performance aircraft are cautioned that use of VASI angles in excess of 3.5 degrees may cause an increase in runway length required for landing and rollout.

3. The basic principle of the VASI is that of color differentiation between red and white. Each light unit projects a beam of light having a white segment in the upper part of the beam and red segment in the lower part of the beam. The light units are arranged so that the pilot using the VASIs during an approach will see the combination of lights shown below.

4. The VASI is a system of lights so arranged to provide visual descent guidance information during the approach to a runway. These lights are visible from 3–5 miles during the day and up to 20 miles or more at night. The visual glide path of the VASI provides safe obstruction clearance within plus or minus 10 degrees of the extended runway centerline and to 4 NM from the runway threshold. Descent, using the VASI, should not be initiated until the aircraft is visually aligned with the runway. Lateral course guidance is provided by the runway or runway lights. In certain circumstances, the safe obstruction clearance area may be reduced by narrowing the beam width or shortening the usable distance due to local limitations, or the VASI may be offset from the extended runway centerline. This will be noted in the Chart Supplement and/or applicable Notices to Airmen (NOTAMs).

5. For 2-bar VASI (4 light units) see Figure 2-1-2.

6. For 3-bar VASI (6 light units) see Figure 2-1-3.

7. For other VASI configurations see Figure 2-1-4.

### b. Precision Approach Path Indicator (PAPI).

The precision approach path indicator (PAPI) uses light units similar to the VASI but are installed in a single row of either two or four light units. These lights are visible from about 5 miles during the day and up to 20 miles at night. The visual glide path of the PAPI typically provides safe obstruction clearance within plus or minus 10 degrees of the extended runway centerline and to 3.4 NM from the runway threshold. Descent, using the PAPI, should not be initiated until the aircraft is visually aligned with the runway. The row of light units is normally installed on the left side of the runway and the glide path indications are as depicted. Lateral course guidance is provided by the runway or runway lights. In certain circumstances, the safe obstruction clearance area may be reduced by narrowing the beam width or shortening the usable distance due to local limitations, or the PAPI may be offset from the extended runway centerline. This will be noted in the Chart Supplement and/or applicable NOTAMs. (See Figure 2-1-5.)

c. **Tri-color Systems.** Tri-color visual approach slope indicators normally consist of a single light unit projecting a three-color visual approach path into the final approach area of the runway upon which the indicator is installed. The below glide path indication is red, the above glide path indication is amber, and the on glide path indication is green. These types of indicators have a useful range of approximately one-half to one mile during the day and up to five miles at night depending upon the visibility conditions. (See Figure 2-1-6.)

d. **Pulsating Systems.** Pulsating visual approach slope indicators normally consist of a single light unit projecting a two-color visual approach path into the final approach area of the runway upon which the indicator is installed. The on glide path indication may be a steady white light or alternating RED and WHITE light. The slightly below glide path indication is a steady red light. If the aircraft descends further below the glide path, the red light starts to pulsate. The above glide path indication is a pulsating white light. The pulsating rate increases as the aircraft gets further above or below the desired glide slope. The useful range of the system is about four miles during the day and up to ten miles at night. (See Figure 2-1-7.)

e. **Alignment of Elements Systems.** Alignment of elements systems are installed on some small general aviation airports and are a low-cost system consisting of painted plywood panels, normally black and white or fluorescent orange. Some



of these systems are lighted for night use. The useful range of these systems is approximately three-quarter miles. To use the system the pilot positions the aircraft so the elements are in alignment. The glide path indications are shown in Figure 2-1-8.

FIGURE 2-1-2  
2-Bar VASI

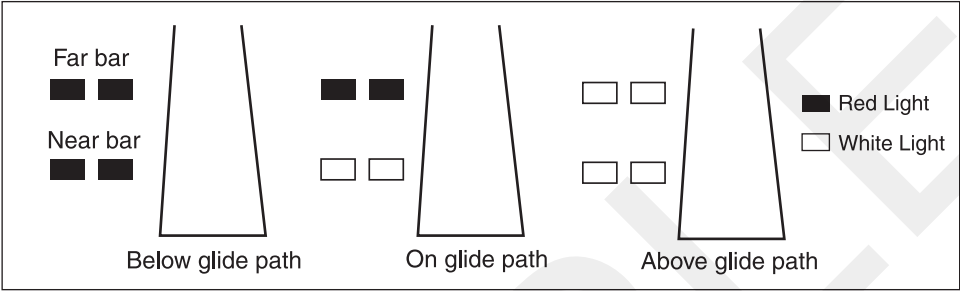


FIGURE 2-1-3  
3-Bar VASI

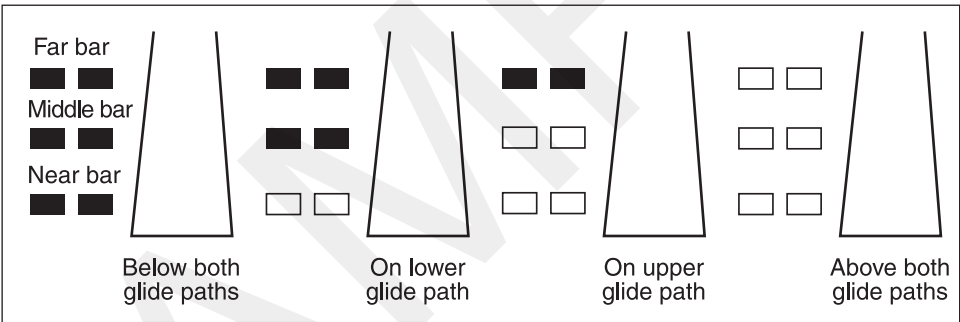
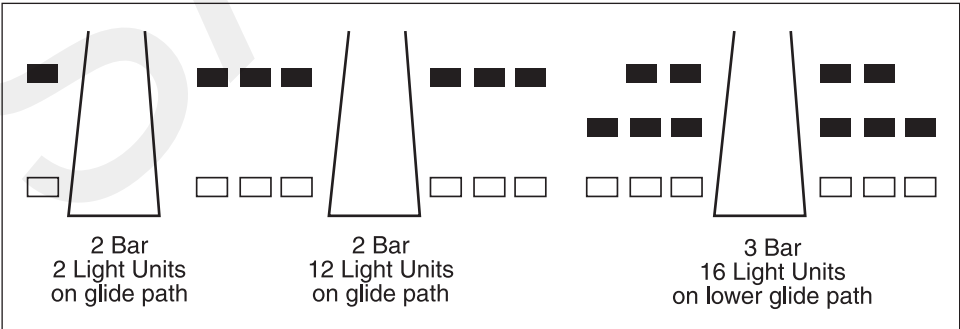
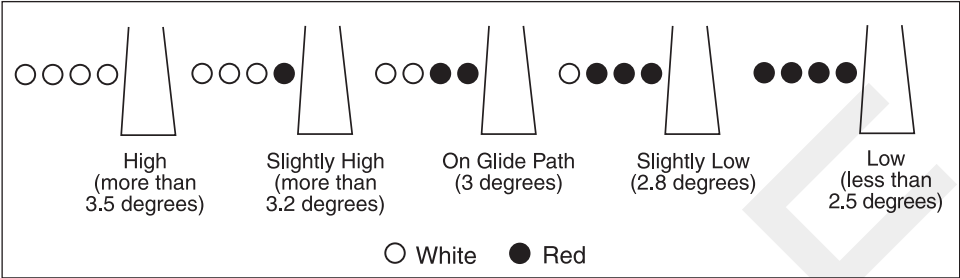


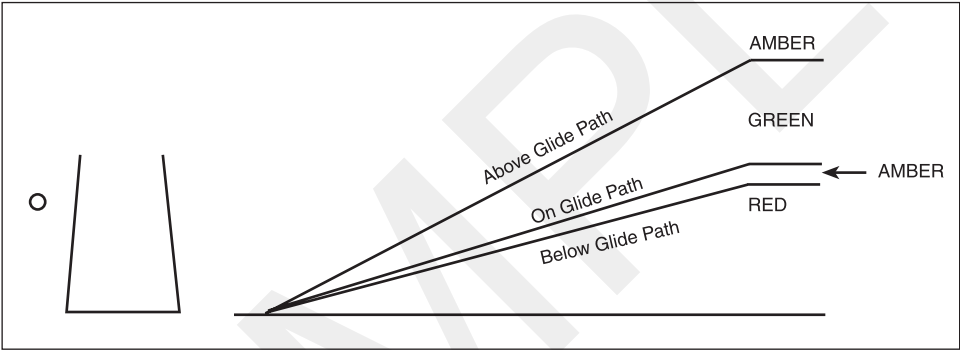
FIGURE 2-1-4  
VASI Variations



**FIGURE 2-1-5**  
**Precision Approach Path Indicator (PAPI)**



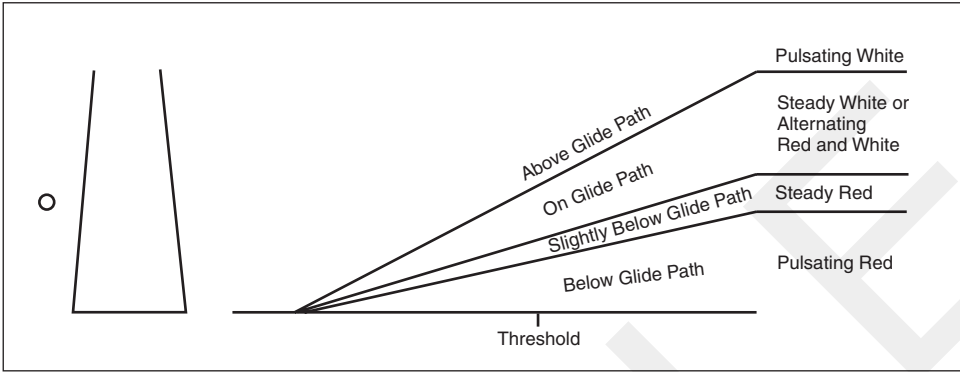
**FIGURE 2-1-6**  
**Tri-Color Visual Approach Slope Indicator**



**Notes:**

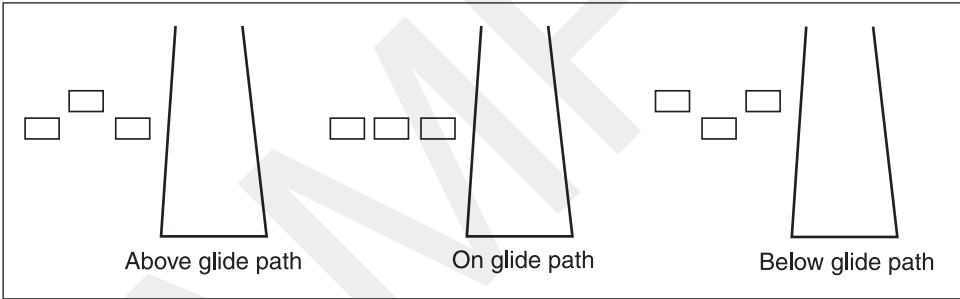
1. Since the tri-color VASI consists of a single light source which could possibly be confused with other light sources, pilots should exercise care to properly locate and identify the light signal.
2. When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.

FIGURE 2-1-7  
Pulsating Visual Approach Slope Indicator



**Note:** Since the PVASI consists of a single light source which could possibly be confused with other light sources, pilots should exercise care to properly locate and identify the light signal.

FIGURE 2-1-8  
Alignment of Elements



### 2-1-3 Runway End Identifier Lights (REIL)

REILs are installed at many airfields to provide rapid and positive identification of the approach end of a particular runway. The system consists of a pair of synchronized flashing lights located laterally on each side of the runway threshold. REILs may be either omnidirectional or unidirectional facing the approach area. They are effective for:

- a. Identification of a runway surrounded by a preponderance of other lighting.
- b. Identification of a runway which lacks contrast with surrounding terrain.
- c. Identification of a runway during reduced visibility.

### 2-1-4 Runway Edge Light Systems

a. Runway edge lights are used to outline the edges of runways during periods of darkness or restricted visibility conditions. These light systems are classified according to the intensity or brightness they are capable of producing: they are the High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL), and the Low Intensity Runway Lights (LIRL). The HIRL and MIRL systems have variable intensity controls, whereas the LIRLs normally have one intensity setting.

b. The runway edge lights are white, except on instrument runways yellow replaces white on the last 2,000 feet or half the runway length, whichever is less, to form a caution zone for landings.

c. The lights marking the ends of the runway emit red light toward the runway to indicate the end of runway to a departing aircraft and emit green outward from the runway end to indicate the threshold to landing aircraft.

## 2-1-5 In-Runway Lighting

**a. Runway Centerline Lighting System (RCLS).** Runway centerline lights are installed on some precision approach runways to facilitate landing under adverse visibility conditions. They are located along the runway centerline and are spaced at 50-foot intervals. When viewed from the landing threshold, the runway centerline lights are white until the last 3,000 feet of the runway. The white lights begin to alternate with red for the next 2,000 feet, and for the last 1,000 feet of the runway, all centerline lights are red.

**b. Touchdown Zone Lights (TDZL).** Touchdown zone lights are installed on some precision approach runways to indicate the touchdown zone when landing under adverse visibility conditions. They consist of two rows of transverse light bars disposed symmetrically about the runway centerline. The system consists of steady-burning white lights which start 100 feet beyond the landing threshold and extend to 3,000 feet beyond the landing threshold or to the midpoint of the runway, whichever is less.

**c. Taxiway Centerline Lead-Off Lights.** Taxiway centerline lead-off lights provide visual guidance to persons exiting the runway. They are color-coded to warn pilots and vehicle drivers that they are within the runway environment or instrument landing system (ILS) critical area, whichever is more restrictive. Alternate green and yellow lights are installed, beginning with green, from the runway centerline to one centerline light position beyond the runway holding position or ILS critical area holding position.

**d. Taxiway Centerline Lead-On Lights.** Taxiway centerline lead-on lights provide visual guidance to persons entering the runway. These "lead-on" lights are also color-coded with the same color pattern as lead-off lights to warn pilots and vehicle drivers that they are within the runway environment or instrument landing system (ILS) critical area, whichever is more conservative. The fixtures used for lead-on lights are bidirectional, i.e., one side emits light for the lead-on function while the other side emits light for the lead-off function. Any fixture that emits yellow light for the lead-off function must also emit yellow light for the lead-on function. (See Figure 2-1-12.)

**e. Land and Hold Short Lights.** Land and hold short lights are used to indicate the hold short point on certain runways which are approved for Land and Hold Short Operations (LAHSO). Land and hold short lights consist of a row of pulsing white lights installed across the runway at the hold short point. Where installed, the lights will be on anytime LAHSO is in effect. These lights will be off when LAHSO is not in effect.

**Reference:** AIM, ¶4-3-11, *Pilot Responsibilities When Conducting Land and Hold Short Operations (LAHSO).*

## 2-1-6 Runway Status Light (RWSL) System

### a. Introduction.

RWSL is a fully automated system that provides runway status information to pilots and surface vehicle operators to clearly indicate when it is unsafe to enter, cross, takeoff from, or land on a runway. The RWSL system processes information from surveillance systems and activates Runway Entrance Lights (REL) and Takeoff Hold Lights (THL), in accordance with the position and velocity of the detected surface traffic and approach traffic. REL and THL are in-pavement light fixtures that are directly visible to pilots and surface vehicle operators. RWSL is an independent safety enhancement that does not substitute for or convey an ATC clearance. Clearance to enter, cross, takeoff from, land on, or operate on a runway must still be received from ATC. Although ATC has limited control over the system, personnel do not directly use and may not be able to view light fixture activations and deactivations during the conduct of daily ATC operations.

**b. Runway Entrance Lights (REL):** The REL system is composed of flush mounted, in-pavement, unidirectional light fixtures that are parallel to and focused along the taxiway centerline and directed toward the pilot at the hold line. An array of REL lights include the first light at the hold line followed by a series of evenly spaced lights to the runway edge; one additional light at the runway centerline is in line with the last two lights before the runway edge (see Figure 2-1-9 and Figure 2-1-10). When activated, the red lights indicate that there is high speed traffic on the runway or there is an aircraft on final approach within the activation area.

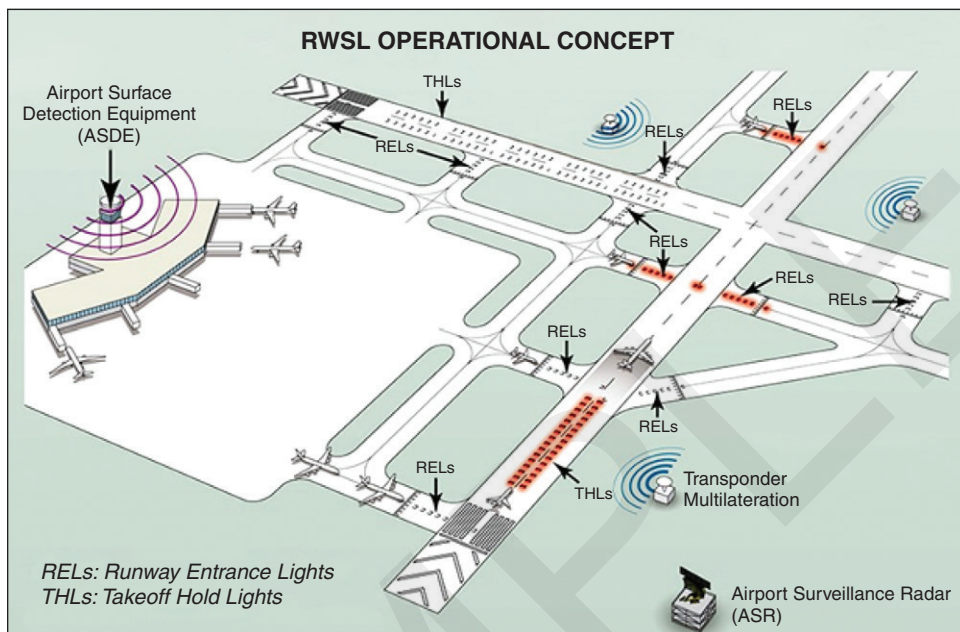
### 1. REL Operating Characteristics—Departing Aircraft:

When a departing aircraft reaches a site adaptable speed of approximately 30 knots, all taxiway intersections with REL arrays along the runway ahead of the aircraft will illuminate (see Figure 2-1-9). As the aircraft approaches an REL equipped taxiway intersection, the lights at that intersection extinguish approximately 3 to 4 seconds before the aircraft reaches it. This allows controllers to apply "anticipated separation" to permit ATC to move traffic more expeditiously without compromising safety. After the aircraft is declared "airborne" by the system, all REL lights associated with this runway will extinguish.

### 2. REL Operating Characteristics—Arriving Aircraft:

When an aircraft on final approach is approximately 1 mile from the runway threshold, all sets of taxiway REL light arrays that intersect the runway illuminate. The distance is adjustable and can be configured for specific operations at particular

**FIGURE 2-1-9**  
Runway Status Light System



airports. Lights extinguish at each equipped taxiway intersection approximately 3 to 4 seconds before the aircraft reaches it to apply anticipated separation until the aircraft has slowed to approximately 80 knots (site adjustable parameter). Below 80 knots, all arrays that are not within 30 seconds of the aircraft's forward path are extinguished. Once the arriving aircraft slows to approximately 34 knots (site adjustable parameter), it is declared to be in a taxi state, and all lights extinguish.

3. What a pilot would observe: A pilot at or approaching the hold line to a runway will observe RELs illuminate and extinguish in reaction to an aircraft or vehicle operating on the runway, or an arriving aircraft operating less than 1 mile from the runway threshold.

4. When a pilot observes the red lights of the REL, that pilot will stop at the hold line or remain stopped. The pilot will then contact ATC for resolution if the clearance is in conflict with the lights. Should pilots note illuminated lights under circumstances when remaining clear of the runway is impractical for safety reasons (for example, aircraft is already on the runway), the crew should proceed according to their best judgment while understanding the illuminated lights indicate the runway is unsafe to enter or cross. Contact ATC at the earliest possible opportunity.

**c. Takeoff Hold Lights (THL):** The THL system is composed of flush mounted, in-pavement, unidirectional light fixtures in a double longitudinal row aligned either side of the runway centerline lighting. Fixtures are focused toward the arrival end of the runway at the "line up and wait" point. THLs extend for 1,500 feet in front of the holding aircraft starting at a point 375 feet from the departure threshold (see Figure 2-1-11). Illuminated red lights provide a signal, to an aircraft in position for takeoff or rolling, that it is unsafe to takeoff because the runway is occupied or about to be occupied by another aircraft or ground vehicle. Two aircraft, or a surface vehicle and an aircraft, are required for the lights to illuminate. The departing aircraft must be in position for takeoff or beginning takeoff roll. Another aircraft or a surface vehicle must be on or about to cross the runway.

1. THL Operating Characteristics—Departing Aircraft:

THLs will illuminate for an aircraft in position for departure or departing when there is another aircraft or vehicle on the runway or about to enter the runway (see Figure 2-1-9). Once that aircraft or vehicle exits the runway, the THLs extinguish. A pilot may notice lights extinguish prior to the downfield aircraft or vehicle being completely clear of the runway but still moving. Like RELs, THLs have an "anticipated separation" feature.

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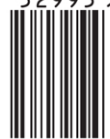
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