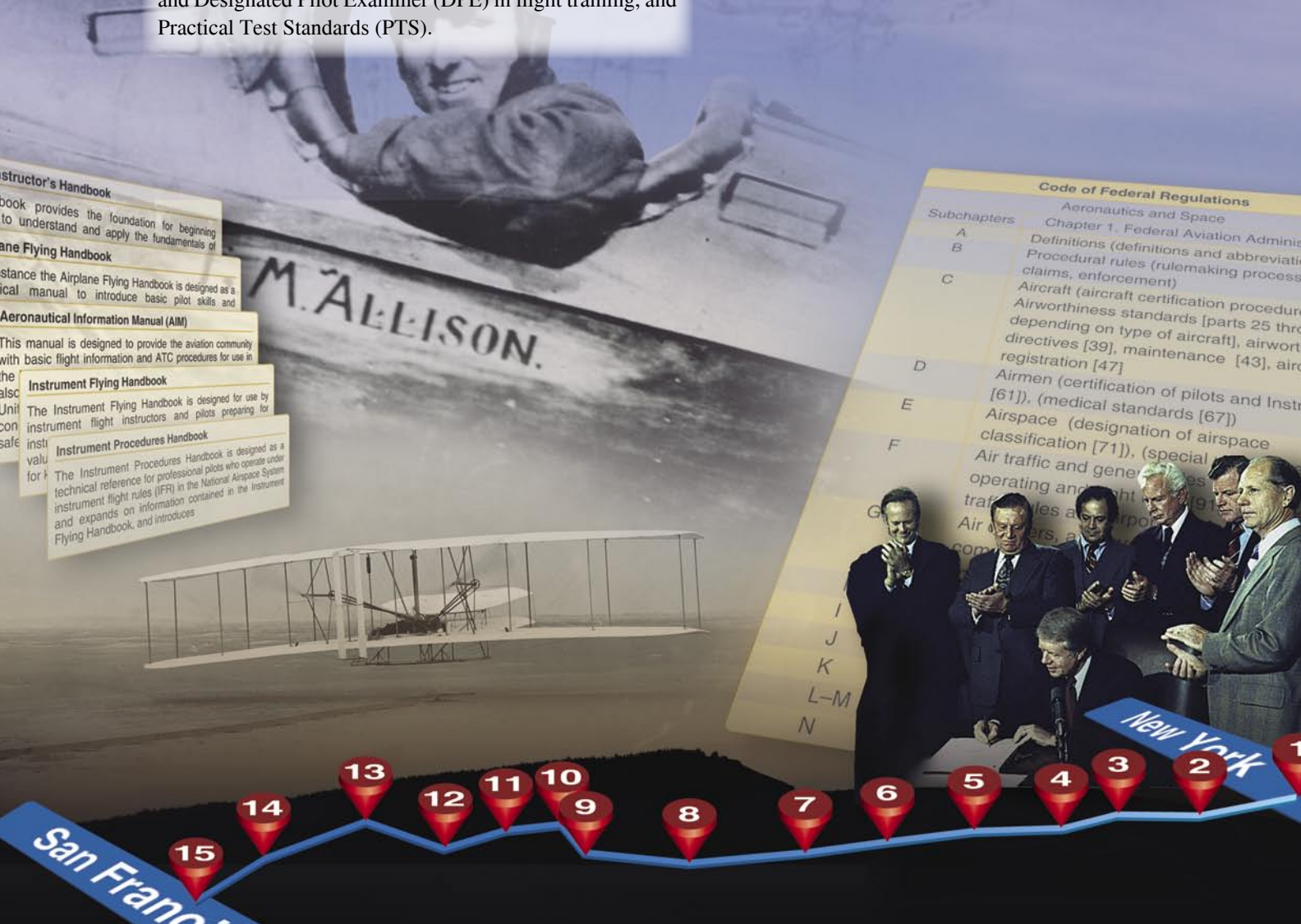
Chapter 1

Introduction To Flying

Introduction

The Pilot's Handbook of Aeronautical Knowledge provides basic knowledge for the student pilot learning to fly, as well as pilots seeking advanced pilot certification. For detailed information on a variety of specialized flight topics, see specific Federal Aviation Administration (FAA) handbooks and Advisory Circulars (ACs).

This chapter offers a brief history of flight, introduces the history and role of the FAA in civil aviation, FAA regulations and standards, government references and publications, eligibility for pilot certificates, available routes to flight instruction, the role of the Certificated Flight Instructor (CFI) and Designated Pilot Examiner (DPE) in flight training, and Practical Test Standards (PTS).



History of Flight

From prehistoric times, humans have watched the flight of birds, longed to imitate them, but lacked the power to do so. Logic dictated that if the small muscles of birds can lift them into the air and sustain them, then the larger muscles of humans should be able to duplicate the feat. No one knew about the intricate mesh of muscles, sinew, heart, breathing system, and devices not unlike wing flaps, variable-camber and spoilers of the modern airplane that enabled a bird to fly. Still, thousands of years and countless lives were lost in attempts to fly like birds.

The identity of the first "bird-men" who fitted themselves with wings and leapt off a cliff in an effort to fly are lost in time, but each failure gave those who wished to fly questions that needed answering. Where had the wing flappers gone wrong? Philosophers, scientists, and inventors offered solutions, but no one could add wings to the human body and soar like a bird. During the 1500s, Leonardo da Vinci filled pages of his notebooks with sketches of proposed flying machines, but most of his ideas were flawed because he clung to the idea of birdlike wings. *[Figure 1-1]* By 1655, mathematician, physicist, and inventor Robert Hooke concluded the human body does not possess the strength to power artificial wings. He believed human flight would require some form of artificial propulsion.

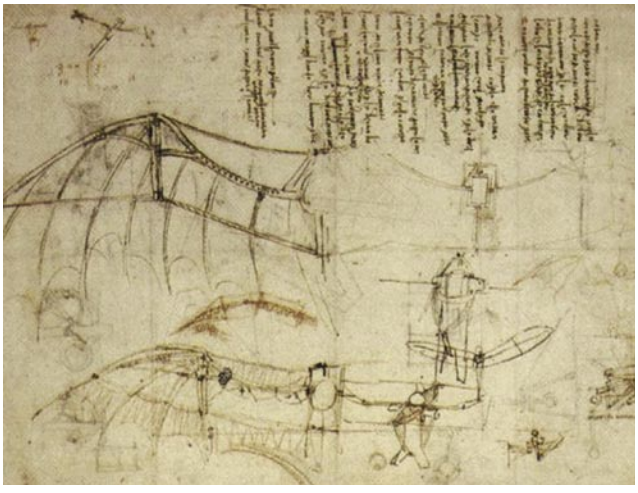


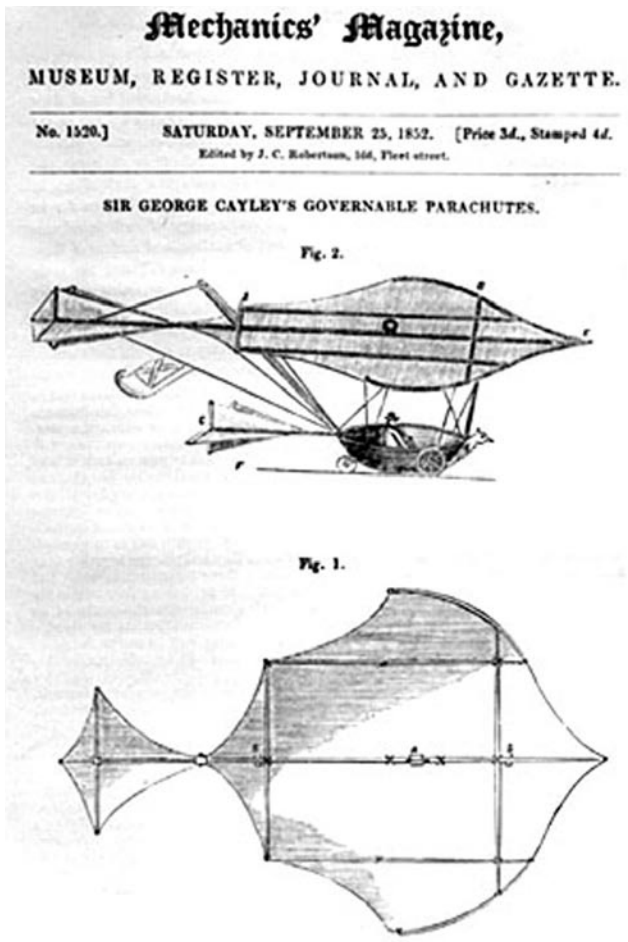
Figure 1-1. *Leonardo da Vinci's ornithopter wings.*

The quest for human flight led some practitioners in another direction. In 1783, the first manned hot air balloon, crafted by Joseph and Etienne Montgolfier, flew for 23 minutes. Ten days later, Professor Jacques Charles flew the first gas balloon. A madness for balloon flight captivated the public's imagination and for a time flying enthusiasts turned their expertise to the promise of lighter-than-air flight. But for all its majesty in the air, the balloon was little more than a billowing heap of cloth capable of no more than a one-way, downwind journey.

Balloons solved the problem of lift, but that was only one of the problems of human flight. The ability to control speed and direction eluded balloonists. The solution to that problem lay in a child's toy familiar to the East for 2,000 years, but not introduced to the West until the 13th century. The kite, used by the Chinese manned for aerial observation and to test winds for sailing, and unmanned as a signaling device and as a toy, held many of the answers to lifting a heavier-than-air device into the air.

One of the men who believed the study of kites unlocked the secrets of winged flight was Sir George Cayley. Born in England 10 years before the Mongolfier balloon flight, Cayley spent his 84 years seeking to develop a heavier-than-air vehicle supported by kite-shaped wings. *[Figure 1-2]* The "Father of Aerial Navigation," Cayley discovered the basic principles on which the modern science of aeronautics is founded, built what is recognized as the first successful flying model, and tested the first full-size man-carrying airplane.

For the half-century after Cayley's death, countless scientists, flying enthusiasts, and inventors worked toward building


Mechanics' Magazine,

MUSEUM, REGISTER, JOURNAL, AND GAZETTE.

No. 1520.] SATURDAY, SEPTEMBER 25, 1852. [Price 3d., Stamped 4d.

Edited by J. C. Robertson, 166, Fleet street.

SIR GEORGE CAYLEY'S GOVERNABLE PARACHUTES.

Fig. 2.

Fig. 1.

Figure 1-2. *Glider from 1852 by Sir George Cayley, British aviator (1773–1857).*

a powered flying machine. Men, such as William Samuel Henson, who designed a huge monoplane that was propelled by a steam engine housed inside the fuselage, and Otto Lilienthal, who proved human flight in aircraft heavier than air was practical, worked toward the dream of powered flight. A dream turned into reality by Wilbur and Orville Wright at Kitty Hawk, North Carolina, on December 17, 1903.

The bicycle-building Wright brothers of Dayton, Ohio, had experimented for 4 years with kites, their own homemade wind tunnel, and different engines to power their biplane. One of their great achievements was proving the value of the scientific, rather than build-it-and-see approach to flight. Their biplane, The Flyer, combined inspired design and engineering with superior craftsmanship. *[Figure 1-3]* By the afternoon of December 17th, the Wright brothers had flown a total of 98 seconds on four flights. The age of flight had arrived.

Figure 1-3. *First flight by the Wright brothers.*

History of the Federal Aviation Administration (FAA)

During the early years of manned flight, aviation was a free for all because no government body was in place to establish policies or regulate and enforce safety standards. Individuals were free to conduct flights and operate aircraft with no government oversight. Most of the early flights were conducted for sport. Aviation was expensive and became the playground of the wealthy. Since these early airplanes were small, many people doubted their commercial value. One group of individuals believed otherwise and they became the genesis for modern airline travel.

P. E. Fansler, a Florida businessman living in St. Petersburg approached Tom Benoist of the Benoist Aircraft Company in St. Louis, Missouri, about starting a flight route from St. Petersburg across the waterway to Tampa. Benoist suggested using his "Safety First" airboat and the two men signed an agreement for what would become the first scheduled airline in the United States. The first aircraft was delivered to St. Petersburg and made the first test flight on December 31, 1913. *[Figure 1-4]*

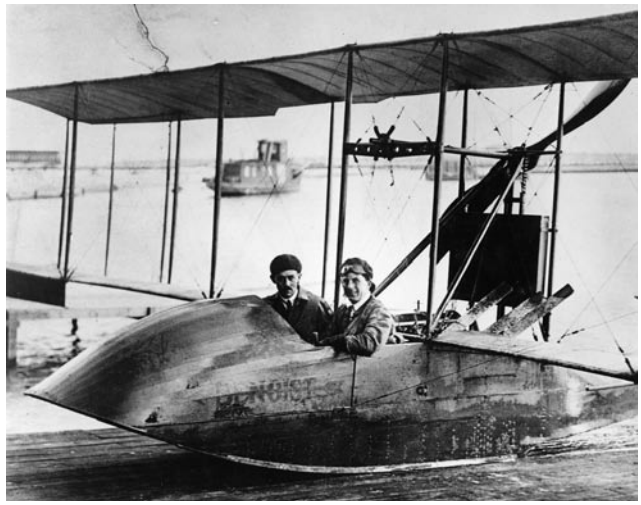


Figure 1-4. *Benoist airboat.*

A public auction decided who would win the honor of becoming the first paying airline customer. The former mayor of St. Petersburg, A. C. Pheil made the winning bid of $400.00 which secured his place in history as the first paying airline passenger.

On January 1, 1914, the first scheduled airline flight was conducted. The flight length was 21 miles and lasted 23 minutes due to a headwind. The return trip took 20 minutes. The line, which was subsidized by Florida businessmen, continued for 4 months and offered regular passage for $5.00 per person or $5.00 per 100 pounds of cargo. Shortly after the opening of the line, Benoist added a new airboat that afforded more protection from spray during takeoff and landing. The routes were also extended to Manatee, Bradenton, and Sarasota giving further credence to the idea of a profitable commercial airline.

The St. Petersburg-Tampa Airboat Line continued throughout the winter months with flights finally being suspended when the winter tourist industry began to dry up. The airline operated only for 4 months, but 1,205 passengers were carried without injury. This experiment proved commercial passenger airline travel was viable.

The advent of World War I offered the airplane a chance to demonstrate its varied capabilities. It began the war as a reconnaissance platform, but by 1918, airplanes were being mass produced to serve as fighters, bombers, trainers, as well as reconnaissance platforms.

Aviation advocates continued to look for ways to use airplanes. Airmail service was a popular idea, but the war prevented the Postal Service from having access to airplanes. The War Department and Postal Service reached an agreement in 1918. The Army would use the mail service to train its pilots in cross-country flying. The first airmail flight was conducted on May 15, 1918, between New York and Washington, DC. The flight was not considered spectacular; the pilot became lost and landed at the wrong airfield. In August of 1918, the United States Postal Service took control of the airmail routes and brought the existing Army airmail pilots and their planes into the program as postal employees.

Transcontinental Air Mail Route

Airmail routes continued to expand until the Transcontinental Mail Route was inaugurated. *[Figure 1-5]* This route spanned from San Francisco to New York for a total distance of 2,612 miles with 13 intermediate stops along the way. *[Figure 1-6]*

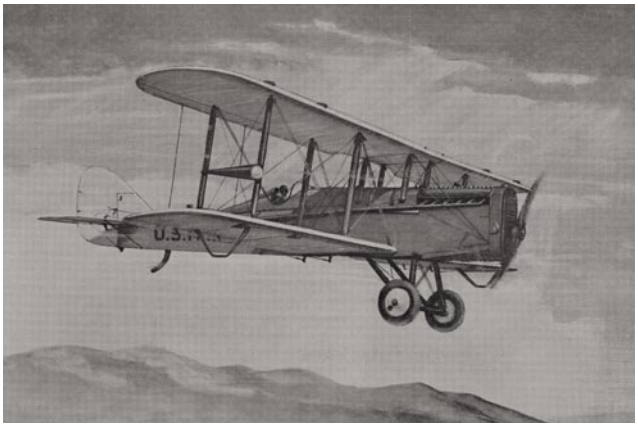


Figure 1-5. *The de Haviland DH-4 on the New York to San Francisco inaugural route in 1921.*

On May 20, 1926, Congress passed the Air Commerce Act, which served as the cornerstone for aviation within the United States. This legislation was supported by leaders in the aviation industry who felt that the airplane could not reach its full potential without assistance from the Federal Government in improving safety.

The Air Commerce Act charged the Secretary of Commerce with fostering air commerce, issuing and enforcing air traffic rules, licensing pilots, certificating aircraft, establishing airways, and operating and maintaining aids to air navigation. The Department of Commerce created a new Aeronautics Branch whose primary mission was to provide oversight for the aviation industry. In addition, the Aeronautics Branch took over the construction and operation of the nation's system of lighted airways. The Postal Service, as part of the

Figure 1-6. *The transcontinental airmail route ran from New York to San Francisco. Intermediate stops were: 2) Bellefonte, 3) Cleveland, 4) Bryan, 5) Chicago, 6) Iowa City, 7) Omaha, 8) North Platte, 9) Cheyenne, 10) Rawlins, 11) Rock Springs, 12) Salt Lake City, 13) Elko, and 14) Reno.*

Transcontinental Air Mail Route system, had initiated this system. The Department of Commerce made great advances in aviation communications, as well as introducing radio beacons as an effective means of navigation.

Built at intervals of approximately 10 miles, the standard beacon tower was 51 feet high, topped with a powerful rotating light. Below the rotating light, two course lights pointed forward and back along the airway. The course lights flashed a code to identify the beacon's number. The tower usually stood in the center of a concrete arrow 70 feet long. A generator shed, where required, stood at the "feather" end of the arrow. *[Figure 1-7]*

Federal Certification of Pilots and Mechanics

The Aeronautics Branch of the Department of Commerce began pilot certification with the first license issued on April 6, 1927. The recipient was the chief of the Aeronautics Branch, William P. MacCracken, Jr. *[Figure 1-8]* (Orville Wright, who was no longer an active flier, had declined the honor.) MacCracken's license was the first issued to a pilot by a civilian agency of the Federal Government. Some 3 months later, the Aeronautics Branch issued the first Federal aircraft mechanic license.

Equally important for safety was the establishment of a system of certification for aircraft. On March 29, 1927, the Aeronautics Branch issued the first airworthiness type certificate to the Buhl Airster CA-3, a three-place open biplane.

In 1934, to recognize the tremendous strides made in aviation and to display the enhanced status within the department,

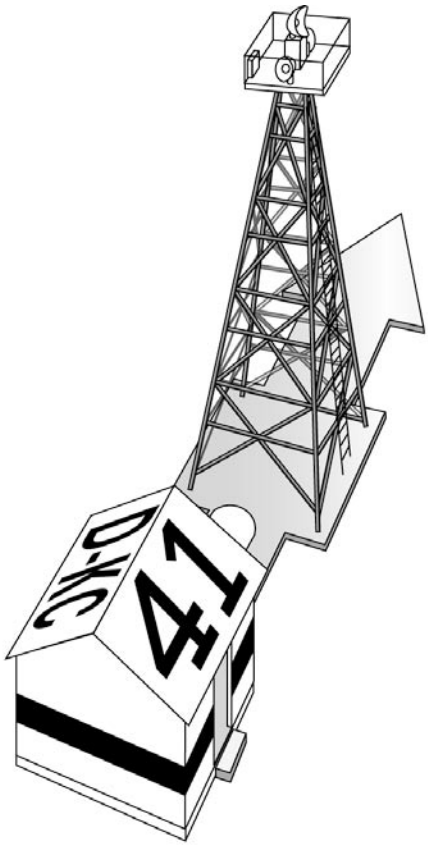


Figure 1-7. *A standard airway beacon tower.*


UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
AERONAUTICS BRANCH
FORM R-18C

OFFICIAL NO. 1

This Certifies, That
WILLIAM P. MacCRACKEN, Jr.
whose photograph and signature accompany this license, is a
PRIVATE PILOT
of civil aircraft of the United States. The holder is not authorized to transport persons or property for hire or reward.
This license expires April 6th, 1928
Herbert Hoover
Secretary of Commerce

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
AERONAUTICS BRANCH

PILOT'S IDENTIFICATION CARD

This Identification Card, issued on the 6th day of April, 1927, accompanies Pilot's License No. 1
Age 38
Weight 200 Color hair Brown
Height 6' 1½" Color eyes Blue
W. P. MacCracken Jr.
Pilot's Signature.
FORM R-19
GOVERNMENT PRINTING OFFICE

Figure 1-8. *The first pilot license was issued to William P. MacCracken, Jr.*

the Aeronautics Branch was renamed the Bureau of Air Commerce. *[Figure 1-9]* Within this time frame, the Bureau of Air Commerce brought together a group of airlines and encouraged them to form the first three Air Traffic Control (ATC) facilities along the established air routes. Then in 1936, the Bureau of Air Commerce took over the responsibilities of operating the centers and continued to advance the ATC facilities. ATC has come a long way from the early controllers using maps, chalkboards, and performing mental math calculations in order to separate aircraft along flight routes.

Figure 1-9. *The third head of the Aeronautics Branch, Eugene L. Vidal, is flanked by President Franklin D. Roosevelt (left) and Secretary of Agriculture Henry A. Wallace (right). The photograph was taken in 1933. During Vidal's tenure, the Aeronautics Branch was renamed the Bureau of Air Commerce on July 1, 1934. The new name more accurately reflected the status of the organization within the Department of Commerce.*

The Civil Aeronautics Act of 1938

In 1938, the Civil Aeronautics Act transferred the civil aviation responsibilities to a newly created, independent body, named the Civil Aeronautics Authority (CAA). This Act empowered the CAA to regulate airfares and establish new routes for the airlines to service.

President Franklin Roosevelt split the CAA into two agencies, the Civil Aeronautics Administration (CAA) and the Civil Aeronautics Board (CAB). Both agencies were still part of the Department of Commerce but the CAB functioned independently of the Secretary of Commerce. The role of the CAA was to facilitate ATC, certification of airmen and aircraft, rule enforcement, and the development of new airways. The CAB was charged with rule making to enhance safety, accident investigation, and the economic regulation of the airlines. Then in 1946, Congress gave the

CAA the responsibility of administering the Federal Aid Airport Program. This program was designed to promote the establishment of civil airports throughout the country.

The Federal Aviation Act of 1958

By mid-century, air traffic had increased and jet aircraft had been introduced into the civil aviation arena. A series of mid-air collisions underlined the need for more regulation of the aviation industry. Aircraft were not only increasing in numbers, but were now streaking across the skies at much higher speeds. The Federal Aviation Act of 1958 established a new independent body that assumed the roles of the CAA and transferred the rule making authority of the CAB to the newly created Federal Aviation Agency (FAA). In addition, the FAA was given complete control of the common civil-military system of air navigation and ATC. The man who was given the honor of being the first administrator of the FAA was former Air Force General Elwood Richard "Pete" Quesada. He served as the administrator from 1959–1961. *[Figure 1-10]*

Figure 1-10. *First Administrator of the FAA was General Elwood Richard "Pete" Quesada, 1959–1961.*

Department of Transportation (DOT)

On October 15, 1966, Congress established the Department of Transportation (DOT), which was given oversight of the transportation industry within the United States. The result was a combination of both air and surface transportation. Its mission was and is to serve the United States by ensuring a fast, safe, efficient, accessible, and convenient transportation system meeting vital national interests and enhancing the quality of life of the American people, then, now, and into the future. At this same time, the Federal Aviation Agency was renamed to the Federal Aviation Administration (FAA). The DOT began operation on April 1, 1967.

The role of the CAB was assumed by the newly created National Transportation Safety Board (NTSB), which was charged with the investigation of all transportation accidents within the United States.

As aviation continued to grow, the FAA took on additional duties and responsibilities. With the highjacking epidemic of the 1960s, the FAA was responsible for increasing the security duties of aviation both on the ground and in the air. After September 11, 2001, the duties were transferred to a newly created body called the Department of Homeland Security (DHS).

With numerous aircraft flying in and out of larger cities, the FAA began to concentrate on the environmental aspect of aviation by establishing and regulating the noise standards of aircraft. Additionally in the 1960s and 1970s, the FAA began to regulate high altitude (over 500 feet) kite and balloon flying. 1970 brought more duties to the FAA by adding the management of a new federal airport aid program and increased responsibility for airport safety.

Air Traffic Control (ATC) Automation

By the mid-1970s, the FAA had achieved a semi-automated ATC system based on a marriage of radar and computer technology. By automating certain routine tasks, the system allowed controllers to concentrate more efficiently on the vital task of providing aircraft separation. Data appearing directly on the controllers' scopes provided the identity, altitude, and groundspeed of aircraft carrying radar beacons. Despite its effectiveness, this system required enhancement to keep pace with the increased air traffic of the late 1970s. The increase was due in part to the competitive environment created by the Airline Deregulation Act of 1978. This law phased out CAB's economic regulation of the airlines, and CAB ceased to exist at the end of 1984.

To meet the challenge of traffic growth, the FAA unveiled the National Airspace System (NAS) Plan in January 1982. The new plan called for more advanced systems for en route and terminal ATC, modernized flight service stations, and improvements in ground-to-air surveillance and communication.

The Professional Air Traffic Controllers Organization (PATCO) Strike

While preparing the NAS Plan, the FAA faced a strike by key members of its workforce. An earlier period of discord between management and the Professional Air Traffic Controllers Organization (PATCO) culminated in a 1970 "sickout" by 3,000 controllers. Although controllers subsequently gained additional wage and retirement benefits, another period of tension led to an illegal strike in August 1981. The government dismissed over 11,000 strike participants and decertified PATCO. By the spring of 1984, the FAA ended the last of the special restrictions imposed to keep the airspace system operating safely during the strike.

The Airline Deregulation Act of 1978

Until 1978, the CAB regulated many areas of commercial aviation such as fares, routes, and schedules. The Airline Deregulation Act of 1978, however, removed many of these controls, thus changing the face of civil aviation in the United States. After deregulation, unfettered free competition ushered in a new era in passenger air travel.

The CAB had three main functions: to award routes to airlines, to limit the entry of air carriers into new markets, and to regulate fares for passengers. Much of the established practices of commercial passenger travel within the United States went back to the policies of Walter Folger Brown, the United States Postmaster General during the administration of President Herbert Hoover. Brown had changed the mail payments system to encourage the manufacture of passenger aircraft instead of mail-carrying aircraft. His influence was crucial in awarding contracts and helped create four major domestic airlines: United, American, Eastern, and Transcontinental and Western Air (TWA). Similarly, Brown had also helped give Pan American a monopoly on international routes.

The push to deregulate, or at least to reform the existing laws governing passenger carriers, was accelerated by President Jimmy Carter, who appointed economist and former professor Alfred Kahn, a vocal supporter of deregulation, to head the CAB. A second force to deregulate emerged from abroad. In 1977, Freddie Laker, a British entrepreneur who owned Laker Airways, created the Skytrain service, which offered extraordinarily cheap fares for transatlantic flights. Laker's offerings coincided with a boom in low-cost domestic flights as the CAB eased some limitations on charter flights, i.e., flights offered by companies that do not actually own planes but leased them from the major airlines. The big air carriers responded by proposing their own lower fares. For example, American Airlines, the country's second largest airline, obtained CAB approval for "SuperSaver" tickets.

All of these events proved to be favorable for large-scale deregulation. In November 1977, Congress formally deregulated air cargo. In late 1978, Congress passed the Airline Deregulation Act of 1978, legislation that had been principally authored by Senators Edward Kennedy and Howard Cannon. *[Figure 1-11]* There was stiff opposition to the bill—from the major airlines who feared free competition, from labor unions who feared nonunion employees, and from safety advocates who feared that safety would be sacrificed. Public support was, however, strong enough to pass the act. The act appeased the major airlines by offering generous subsidies and it pleased workers by offering high unemployment benefits if they lost their jobs as a result. The most important effect of the act, whose laws were slowly phased in, was on the passenger market. For the first time in 40 years, airlines could enter the market or (from 1981) expand their routes as they saw fit. Airlines (from 1982) also had full freedom to set their fares. In 1984, the CAB was finally abolished since its primary duty of regulating the airline industry was no longer necessary.

Figure 1-11. *President Jimmy Carter signs the Airline Deregulation Act in late 1978.*

The Role of the Federal Aviation Administration (FAA)

The Code of Federal Regulations (CFR)

The FAA is empowered by regulations to promote aviation safety and establish safety standards for civil aviation. The FAA achieves these objectives under the Code of Federal Regulations (CFR), which is the codification of the general and permanent rules published by the executive departments and agencies of the United States Government. The regulations are divided into 50 different codes, called Titles, that represent broad areas subject to Federal regulation. FAA regulations are listed under Title 14, Aeronautics and Space, which encompasses all aspects of civil aviation from how to earn a pilot's certificate to maintenance of an aircraft.

Title 14 CFR Chapter 1, Federal Aviation Administration, is broken down into subchapters A through N as illustrated in *Figure 1-12.*

Code of Federal Regulations	
Aeronautics and Space	
Subchapters	Chapter 1. Federal Aviation Administration
A	Definitions (definitions and abbreviations)
B	Procedural rules (rulemaking processes, claims, enforcement)
C	Aircraft (Aircraft certification procedures [21], Airworthiness standards [parts 25 through 33 depending on type of aircraft], airworthiness directives [39], maintenance [43], aircraft registration [47])
D	Airmen (certification of pilots and Instructors [61], (Medical standards [67])
E	Airspace (designation of airspace classification [71], special use airspace [73]
F	Air traffic and general rules (general operating and flight rules [91], special air traffic rules and airport traffic patterns [93])
G	Air carriers, air travel clubs. and operators for compensation or hire: certification and operations
H	Schools and other certified agencies
I	Airports
J	Navigational facilities
K	Administrative regulations
L–M	Reserved
N	War risk insurance

Figure 1-12. *Overview of 14 CFR, available online free from the FAA, and for purchase through commercial sources.*

For the pilot, certain parts of 14 CFR are more relevant than others. During flight training, it is helpful for the pilot to become familiar with the parts and subparts that relate to flight training and pilot certification. For instance, 14 CFR part 61 pertains to the certification of pilots, flight instructors, and ground instructors. It also defines the eligibility, aeronautical knowledge, flight proficiency, as well as training and testing requirements for each type of pilot certificate issued. 14 CFR part 91 provides guidance in the areas of general flight rules, visual flight rules (VFR), and instrument flight rules (IFR), while 14 CFR part 43 covers aircraft maintenance, preventive maintenance, rebuilding, and alterations.

Primary Locations of the FAA

The FAA headquarters are in Washington, D.C., and there are nine regional offices strategically located across the United States. The agency's two largest field facilities are the Mike Monroney Aeronautical Center (MMAC) in Oklahoma City, Oklahoma, and the William J. Hughes Technical Center (WJHTC) in Atlantic City, New Jersey. Home to FAA training and logistics services, the MMAC provides a number of aviation safety-related and business support services. The WJHTC is the premier aviation research and development and test and evaluation facility in the country. The center's programs include testing and evaluation in ATC, communication, navigation, airports, aircraft safety, and security. Furthermore, the WJHTC is active in long-range development of innovative aviation systems and concepts, development of new ATC equipment and software, and modification of existing systems and procedures.

Field Offices

Flight Standards Service

Within the FAA, the Flight Standards Service promotes safe air transportation by setting the standards for certification and oversight of airmen, air operators, air agencies, and designees. It also promotes safety of flight of civil aircraft and air commerce by:

- Accomplishing certification, inspection, surveillance, investigation, and enforcement.
- Setting regulations and standards.
- Managing the system for registration of civil aircraft and all airmen records.

The focus of interaction between Flight Standards Service and the aviation community/general public is the Flight Standards District Office (FSDO).

Flight Standards District Office (FSDO)

The FAA has approximately 130 FSDOs. *[Figure 1-13]* These offices provide information and services for the aviation community. FSDO phone numbers are listed in the telephone directory under Government Offices, DOT, FAA. Another convenient method of finding a local office is to use the FSDO locator available at: www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs600.

Figure 1-13. *Atlanta Flight Standards District Office (FSDO).*

In addition to accident investigation and the enforcement of aviation regulations, the FSDO is also responsible for the certification and surveillance of air carriers, air operators, flight schools/training centers, and airmen including pilots and flight instructors. Each FSDO is staffed by Aviation Safety Inspectors (ASIs) who play a key role in making the nation's aviation system safe.

Aviation Safety Inspector (ASI)

The Aviation Safety Inspectors (ASIs) administer and enforce safety regulations and standards for the production, operation, maintenance, and/or modification of aircraft used in civil aviation. They also specialize in conducting inspections of various aspects of the aviation system, such as aircraft and parts manufacturing, aircraft operation, aircraft airworthiness, and cabin safety. ASIs must complete a training program at the FAA Academy in Oklahoma City, Oklahoma, which includes airman evaluation, and pilot testing techniques and procedures. ASIs also receive extensive on-the-job training and recurrent training on a regular basis. The FAA has approximately 3,700 inspectors located in its FSDO offices. All questions concerning pilot certification (and/or requests for other aviation information or services) should be directed to the local FSDO.

FAA Safety Team (FAASTeam)

The FAA is dedicated to improving the safety of United States civilian aviation by conveying safety principles and practices through training, outreach, and education. The FAA Safety Team (FAASTeam) exemplifies this commitment. The FAASTeam has replaced the Aviation Safety Program (ASP), whose education of airmen on all types of safety subjects successfully reduced accidents. Its success led to its demise because the easy-to-fix accident causes have been addressed. To take aviation safety one step further, Flight Standards Service created the FAASTeam, which is devoted to reducing aircraft accidents by using a coordinated effort to focus resources on elusive accident causes.

Each of the FAA's nine regions has a Regional FAASTeam Office dedicated to this new safety program and managed by the Regional FAASTeam Manager (RFM). The FAASTeam is "teaming" up with individuals and the aviation industry to create a unified effort against accidents and "tip" the safety culture in the right direction. To learn more about this effort to improve aviation safety, to take a course at their online learning center, or to join the FAASTeam, visit their web site at www.faasafety.gov/default.aspx.

Obtaining Assistance from the FAA

Information can be obtained from the FAA by phone, Internet/e-mail, or mail. To talk to the FAA toll-free 24 hours a day, call 1-866-TELL-FAA (1-866-835-5322). To visit the FAA's web site, go to www.faa.gov. Individuals can also e-mail an FAA representative at a local FSDO office by accessing the staff e-mail address available via the "Contact FAA" link at the bottom of the FAA home page. Letters can be sent to:

Federal Aviation Administration
800 Independence Ave, SW
Washington, DC 20591

FAA Reference Material

The FAA provides a variety of important reference material for the student, as well as the advanced civil aviation pilot. In addition to the regulations provided online by the FAA, several other publications are available to the user. Almost all reference material is available online at www.faa.gov in downloadable format. Commercial aviation publishers also provide published and online reference material to further aid the aviation pilot.

Aeronautical Information Manual (AIM)

The Aeronautical Information Manual (AIM) is the official guide to basic flight information and ATC procedures for the aviation community flying in the NAS of the United States. *[Figure 1-14]* An international version, containing parallel information, as well as specific information on international airports, is also available. The AIM also contains information of interest to pilots, such as health and medical facts, flight safety, a pilot/controller glossary of terms used in the system, and information on safety, accidents, and reporting of hazards.

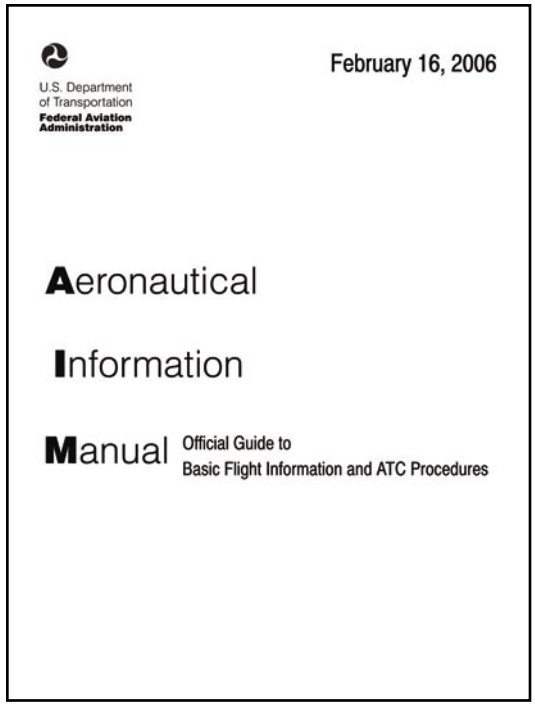


Figure 1-14. *Aeronautical Information Manual.*

This manual is offered for sale on a subscription basis or is available online at: http://bookstore.gpo.gov.

Order forms are provided at the beginning of the manual or online and should be sent to the Superintendent of Documents, United States Government Printing Office (GPO). The AIM is complemented by other operational publications, which are available via separate subscriptions or online.

Handbooks

Handbooks are developed to provide specific information about a particular topic that enhances training or understanding. The FAA publishes a variety of handbooks that generally fall into three categories: Aircraft, Aviation, and Examiners and Inspectors. *[Figure 1-15]* These handbooks can be purchased from the Superintendent of Documents or downloaded (www.faa.gov/regulations_policies). Aviation handbooks are also published by various commercial aviation companies. Aircraft flight manuals commonly called Pilot Operating Handbooks (POH) are documents developed by the airplane manufacturer, approved by the FAA, and are specific to a particular make and model aircraft by serial number. This subject is covered in greater detail in Chapter 8, Flight Manuals and Other Documents, of this handbook. *[Figure 1-16]*

Advisory Circulars (ACs)

Advisory circulars (ACs) provide a single, uniform, agency-wide system that the FAA uses to deliver advisory material to FAA customers, industry, the aviation community, and the public. An AC may be needed to:

- Provide an acceptable, clearly understood method for complying with a regulation.
- Standardize implementation of the regulation or harmonize implementation for the international aviation community.
- Resolve a general misunderstanding of a regulation.
- Respond to a request from some government entity, such as General Accounting Office, NTSB, or the Office of the Inspector General.
- Help the industry and FAA effectively implement a regulation.
- Explain requirements and limits of an FAA grant program.
- Expand on standards needed to promote aviation safety, including the safe operation of airports.

There are three parts to an AC number, as in 25-42C. The first part of the number identifies the subject matter area of the AC and corresponds to the appropriate 14 CFR part. For example, an AC on certification: Pilots and Flight and

Aeronautical Information Manual (AIM)

The Aeronautical Information Manual is designed to provide the aviation community with basic flight information and ATC procedures for use in the NAS of the United States. It also contains the fundamentals required in order to fly in the United States NAS, including items of interest to pilots concerning health/medical facts, factors affecting flight safety, etc.

Airplane Flying Handbook

The Airplane Flying Handbook is designed as a technical manual to introduce basic pilot skills and knowledge that are essential for piloting airplanes. It provides information on transition to other airplanes and the operation of various airplane systems.

Aviation Instructor's Handbook

The Aviation Instructor's Handbook provides the foundation for beginning instructors to understand and apply the fundamentals of instructing. This handbook also provides aviation instructors with up-to-date information on learning and teaching, and how to relate this information to the task of conveying aeronautical knowledge and skills to students. Experienced aviation instructors also find the new and updated information useful for improving their effectiveness in training activities.

Instrument Flying Handbook

The Instrument Flying Handbook is designed for use by instrument flight instructors and pilots preparing for instrument rating tests. Instructors find this handbook a valuable training aid as it includes basic reference material for knowledge testing and instrument flight training.

Instrument Procedures Handbook

The Instrument Procedures Handbook is designed as a technical reference for professional pilots who operate under IFR in the NAS and expands on information contained in the Instrument Flying Handbook.

Figure 1-15. *A few samples of the handbooks available to the public. Most are free of charge or can be downloaded from the FAA website.*

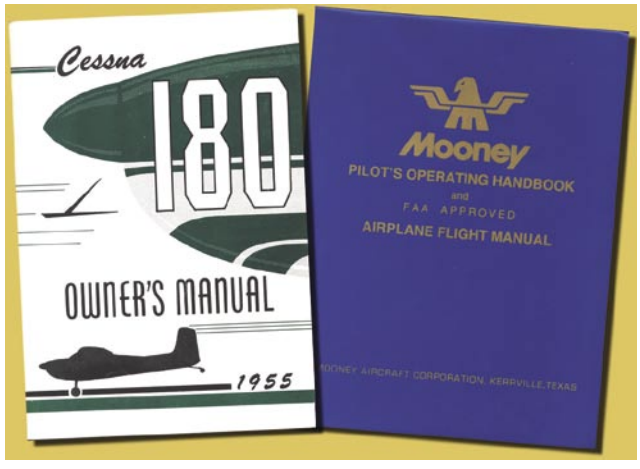
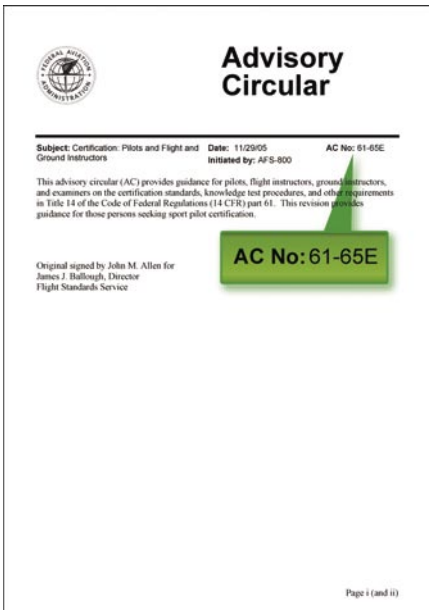


Figure 1-16. *Pilot Operating Handbooks from manufacturers.*

Ground Instructors is numbered as AC 61-65E. Since ACs are numbered sequentially within each subject area, the second part of the number beginning with the dash identifies this sequence. The third part of the number is a letter assigned by the originating office and shows the revision sequence if an AC is revised. The first version of an AC does not have a revision letter. In *Figure 1-17*, this is the fifth revision, as designated by the "E."


Advisory Circular

Subject: Certification: Pilots and Flight and Ground Instructors
Date: 11/29/05
Initiated by: AFS-800
AC No: 61-65E

This advisory circular (AC) provides guidance for pilots, flight instructors, ground instructors, and examiners on the certification standards, knowledge test procedures, and other requirements in Title 14 of the Code of Federal Regulations (14 CFR) part 61. This revision provides guidance for those persons seeking sport pilot certification.

AC No: 61-65E

Original signed by John M. Allen for
James J. Ballough, Director
Flight Standards Service

Page i (and ii)

Figure 1-17. *Example of an Advisory Circular.*

Flight Publications

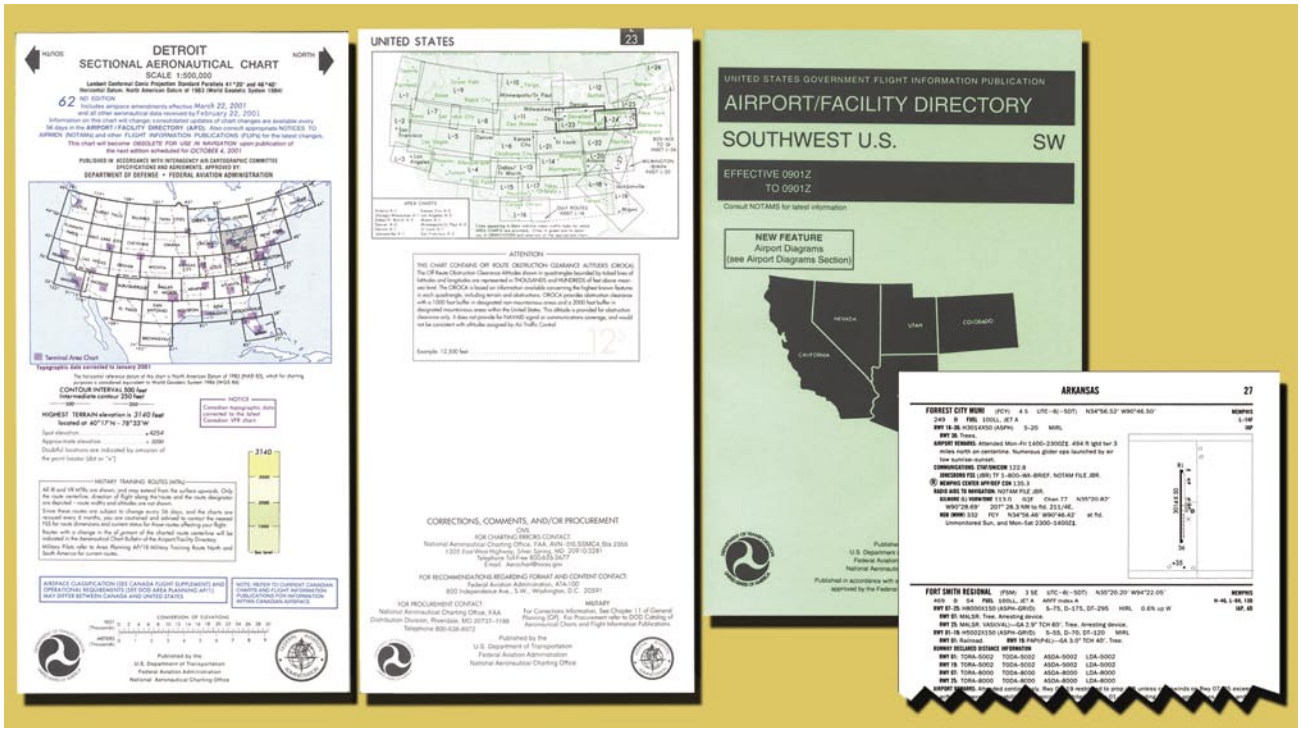
The FAA, in concert with other government agencies, orchestrates the publication and changes to publications that are key to safe flight. *Figure 1-18* illustrates some publications a pilot uses.

Pilot and Aeronautical Information

Notices to Airmen (NOTAMs)

Time-critical aeronautical information, which is of either a temporary nature or not sufficiently known in advance to permit publication on aeronautical charts or in other operational publications, receives immediate dissemination via the National Notice to Airmen (NOTAM) System. NOTAMs contain current notices to airmen, which are considered essential to the safety of flight, as well as supplemental data affecting other operational publications. NOTAM information is classified into two categories: NOTAM (D) or distant and Flight Data Center (FDC) NOTAMs.

NOTAM (D) information is disseminated for all navigational facilities that are part of the NAS, all public use airports, seaplane bases, and heliports listed in the Airport/Facility Directory (A/FD). NOTAM (D) information now includes such data as taxiway closures, personnel and equipment near or crossing runways, and airport lighting aids that do not affect instrument approach criteria, such as visual approach slope indicator (VASI).


DETROIT
SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000

UNITED STATES

UNITED STATES GOVERNMENT FLIGHT INFORMATION PUBLICATION
AIRPORT/FACILITY DIRECTORY
SOUTHWEST U.S.
SW
EFFECTIVE 0901Z
TO 0901Z

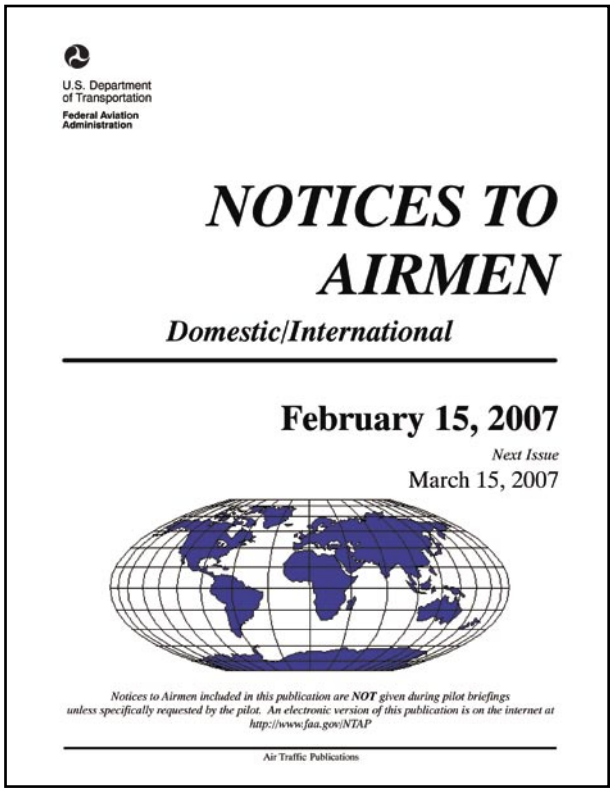
NEW FEATURE
Airport Diagrams
(see Airport Diagrams Section)

ARKANSAS

Figure 1-18. *From left to right, a sectional VFR chart, IFR chart, and A/FD with a sample of a page from that directory.*

FDC NOTAMs contain such things as amendments to published Instrument Approach Procedures (IAPs) and other current aeronautical charts. They are also used to advertise temporary flight restrictions caused by such things as natural disasters or large-scale public events that may generate a congestion of air traffic over a site.

NOTAMs are available in printed form through subscription from the Superintendent of Documents, from an FSS, or online at The Pilot Web Site (http://pilotweb.nas.faa.gov/distribution/atcscc.html), which provides access to current NOTAM information. *[Figure 1-19]*


U.S. Department of Transportation
Federal Aviation Administration

NOTICES TO AIRMEN

Domestic/International

February 15, 2007

Next Issue
March 15, 2007

Notices to Airmen included in this publication are **NOT** given during pilot briefings unless specifically requested by the pilot. An electronic version of this publication is on the internet at http://www.faa.gov/NTAP

Air Traffic Publications

Figure 1-19. *A sample of NOTAM information available to the public. Most are free of charge or can be downloaded from the FAA website.*

Safety Program Airmen Notification System (SPANS)

The FAA recently launched the Safety Program Airmen Notification System (SPANS), an online event notification system that provides timely and easy-to-assess seminar and event information notification for airmen. The SPANS system is taking the place of the current paper based mail system. This transition will provide better service to airmen while reducing costs for the FAA. Anyone can search the SPANS system and register for events. To read more about SPANS, visit www.faasafety.gov/SPANS/default.aspx.

Aircraft Types and Categories

Ultralight Vehicles

An ultralight aircraft *[Figure 1-20]* is referred to as a vehicle because the FAA does not govern it if it:

- Is used or intended to be used by a single occupant.
- Is used for recreation or sport purposes.
- Does not have an airworthiness certificate.
- If unpowered, weighs less than 155 pounds.
- If powered, weighs less than 254 pounds empty weight, excluding floats and safety devices that are intended for deployment in a potentially catastrophic situation.
- Has a fuel capacity not exceeding 5 gallons.
- Is not capable of more than 55 knots calibrated airspeed at full power in level flight.
- Has a power-off stall speed, which does not exceed 24 knots calibrated airspeed.

Figure 1-20. *A typical ultralight vehicle, which weighs less than 254 pounds.*

Ultralight vehicles do not require any form of pilot license or certification if they are flown within 14 CFR 103 operating rules which generally limit the ultralight vehicle to uncontrolled airpsace and no flight over populated areas. Every person flying an ultralight should be familiar to the rules specified in 14 CFR 103.

Light Sport Aircraft (LSA) Category

In 2004, the FAA approved a new pilot certificate and aircraft category program to allow individuals to join the aviation community by reducing training requirements that affect the overall cost of learning to fly. The Sport Pilot Certificate was created for pilots flying light-weight, simple aircraft and offers limited privileges. The category of aircraft called the

Light Sport Aircraft (LSA) includes Airplane (Land/Sea), Gyroplane, Airship, Balloon, Weight-Shift Control (Land/Sea), Glider, and Powered Parachute. *[Figure 1-21]*

In order for an aircraft to fall in the Light Sport Category, it must meet the following criteria:

- The maximum gross takeoff weight may not exceed 1,320 pounds, or 1,430 pounds for seaplanes. Lighter-than-air maximum gross weight may not be more than 660 pounds.
- The maximum stall speed may not exceed 45 knots, and the inflight maximum speed in level flight with maximum continuous power is no greater than 120 knots.
- Seating is restricted to single or two-seat configuration only.
- The powerplant may be only a single, reciprocating engine (if powered), but may include rotary or diesel engines.
- The landing gear must be fixed, except gliders or those aircraft intended for operation on water.
- The aircraft can be manufactured and sold ready-to-fly under a new special LSA category, and certification must meet industry consensus standards. The aircraft may be used for sport, recreation, flight training, and aircraft rental.
- The aircraft will have an FAA registration N-number and may be operated at night if the aircraft is properly equipped and the pilot holds at least a private pilot certificate with a minimum of a third-class medical.

Figure 1-21. *Some examples of LSA (from top to bottom: gyroplane, weight-shift control, and a powered parachute).*

Pilot Certifications

The type of intended flying will influence what type of pilot's certificate is required. Eligibility, training, experience, and testing requirements differ depending on the type of certificates sought. *[Figure 1-22]*

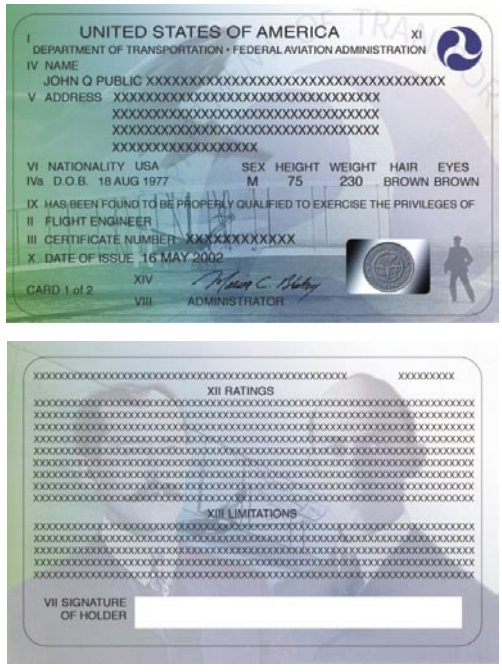


Figure 1-22. *Front side (top) and back side (bottom) of an airman certificate issued by the FAA.*

Sport Pilot

To become a sport pilot, the student pilot is required to have the following hours depending upon the aircraft:

- Airplane: 20 hours
- Powered Parachute: 12 hours
- Weight-Shift Control (Trikes): 20 hours
- Glider: 10 hours
- Rotorcraft (gyroplane only): 20 hours
- Lighter-Than-Air: 20 hours (airship) or 7 hours (balloon)

To earn a Sport Pilot Certificate, one must:

- Be at least 16 to become a student sport pilot (14 for glider).
- Be at least 17 to test for a sport pilot certificate (16 for gliders).
- Be able to read, write, and understand English.
- Hold a current and valid driver's license as evidence of medical eligibility.

Recreational Pilot

To become a recreational pilot, one must:

- Be at least 17 years old (16 to be a private glider pilot or be rated for free flight in a balloon.)
- Be able to read, write, speak and understand the English language
- Pass the required knowledge test
- Meet the aeronautical experience requirements
- A logbook endorsement from an instructor
- Pass the required practical test
- Third-class medical certificate issued under part 14 CFR part 67, except for gliders and balloons—medical eligibility not required

As a recreational pilot, cross-country flight is limited to a 50 NM range from departure airport but is permitted with additional training per 14 CFR section 61.101(c). Additional limitations include flight during the day, and no flying in airspace where communications with air traffic control are required.

The aeronautical experience requirements for a recreational pilot license

- 30 hours of flight time including at least:
- 15 hours of dual instruction
- 2 hours of enroute training
- 3 hours in preparation for the practical test
- 3 hours of solo flight

Private Pilot

A private pilot is one who flies for pleasure or personal business without accepting compensation for flying except in some very limited, specific circumstances. The Private Pilot Certificate is the certificate held by the majority of active pilots. It allows command of any aircraft (subject to appropriate ratings) for any noncommercial purpose, and gives almost unlimited authority to fly under VFR. Passengers may be carried, and flight in furtherance of a business is permitted; however, a private pilot may not be compensated in any way for services as a pilot, although passengers can pay a pro rata share of flight expenses, such as fuel or rental costs. If training under 14 CFR part 61, experience requirements include at least 40 hours of piloting time, including 20 hours of flight with an instructor and 10 hours of solo flight. *[Figure 1-23]*

Figure 1-23. *A typical aircraft a private pilot might fly.*

Commercial Pilot

A commercial pilot may be compensated for flying. Training for the certificate focuses on a better understanding of aircraft systems and a higher standard of airmanship. The Commercial Certificate itself does not allow a pilot to fly in instrument meteorological conditions (IMC), and commercial pilots without an instrument rating are restricted to daytime flight within 50 nautical miles (NM) when flying for hire.

A commercial airplane pilot must be able to operate a complex airplane, as a specific number of hours of complex (or turbine-powered) aircraft time are among the prerequisites, and at least a portion of the practical examination is performed in a complex aircraft. A complex aircraft must have retractable landing gear, movable flaps, and a controllable pitch propeller. See 14 CFR part 61, section 61.31(c) for additional information. *[Figure 1-24]*

Figure 1-24. *A complex aircraft.*

Airline Transport Pilot

The airline transport pilot (ATP) is tested to the highest level of piloting ability. The ATP Certificate is a prerequisite for acting as a pilot in command (PIC) of scheduled airline operations. The minimum pilot experience is 1,500 hours of flight time. In addition, the pilot must be at least 23 years of age, be able to read, write, speak, and understand the English language, and be "of good moral standing." *[Figure 1-25]*

Figure 1-25. *Type of aircraft flown by an airline transport pilot.*

Selecting a Flight School

Selection of a flight school is an important consideration in the flight training process. FAA-approved flight schools, noncertificated flying schools, and independent flight instructors conduct flight training in the United States. All flight training is conducted under the auspices of the FAA following the regulations outlined in either 14 CFR part 141 or 61. 14 CFR part 141 flight schools are certificated by the FAA. Application for certification is voluntary and the school must meet stringent requirements for personnel, equipment, maintenance, facilities, and teach an established curriculum, which includes a training course outline (TCO) approved by the FAA. The certificated schools may qualify for a ground school rating and a flight school rating. In addition, the school may be authorized to give its graduates practical (flight) tests and knowledge (computer administered written) tests. AC 140-2, as amended, FAA Certificated Pilot Schools Directory, lists certificated ground and flight schools and the pilot training courses each school offers. AC 140-2, as amended, can be found online at the FAA's Regulations and Guidance Library located on the FAA's web site at www.faa.gov.

Enrollment in a 14 CFR part 141 flight school ensures quality and continuity, and offers a structured approach to flight training because these facilities must document the training curriculum and have their flight courses approved by the FAA. These strictures allow 14 CFR part 141 schools to complete certificates and ratings in fewer flight hours, which can mean a savings on the cost of flight training for the student pilot. For example, the minimum requirement for a Private Pilot Certificate is 35 hours in a part 141-certificated school and 40 hours in part 61 schools. (This difference may be insignificant for a Private Pilot Certificate because the national average indicates most pilots require 60 to 75 hours of flight training.)

Many excellent flight schools find it impractical to qualify for the FAA part 141 certificates and are referred to as part 61 schools. 14 CFR part 61 outlines certificate and rating requirements for pilot certification through noncertificated schools and individual flight instructors. It also states what knowledge-based training must be covered and how much flight experience is required for each certificate and rating. Flight schools and flight instructors who train must adhere to the statutory requirements and train pilots to the standards found in 14 CFR part 61.

One advantage of flight training under 14 CFR part 61 is its flexibility. Flight lessons can be tailored to the individual student, because 14 CFR part 61 dictates the required minimum flight experience and knowledge-based training necessary to gain a specific pilot's license, but it does not stipulate how the training is to be organized. This flexibility can also be a disadvantage because a flight instructor who fails to organize the flight training can cost a student pilot time and expense through repetitious training. One way for a student pilot to avoid this problem is to insure the flight instructor has a well-documented training syllabus.

How To Find a Reputable Flight Program

To obtain information about pilot training, contact the local FSDO, which maintains a current file on all schools within its district. The choice of a flight school depends on what type of certificate is sought, whether an individual wishes to fly as a sport pilot or wishes to pursue a career as a professional pilot. Another consideration is the amount of time that can be devoted to training. Ground and flight training should be obtained as regularly and frequently as possible because this assures maximum retention of instruction and the achievement of requisite proficiency.

Do not make the determination based on financial concerns alone, because the quality of training is very important. Prior to making a final decision, visit the schools under consideration and talk with management, instructors, and students.

Be inquisitive and proactive when searching for a flight school, do some homework, and develop a checklist of questions by talking to pilots and reading articles in flight magazines. The checklist should include questions about aircraft reliability and maintenance practices, questions for current students such as whether or not there is a safe, clean aircraft available when they are scheduled to fly.

Questions for the training facility should be aimed at determining if the instruction fits available personal time. What are the school's operating hours? Does the facility have dedicated classrooms available for ground training required by the FAA? Is there an area available for preflight briefings, postflight debriefings, and critiques? Are these rooms private in nature in order to provide a nonthreatening environment in which the instructor can explain the content and outcome of the flight without making the student feel self-conscious?

Examine the facility before committing to any flight training. Evaluate the answers on the checklist, and then take time to think things over before making a decision. This proactive approach to choosing a flight school will ensure a student pilot contracts with a flight school or flight instructor best suited to individual needs.

How To Choose a Certificated Flight Instructor (CFI)

Whether an individual chooses to train under 14 CFR part 141 or part 61, the key to an effective flight program is the quality of the ground and flight training received from the CFI. The flight instructor assumes total responsibility for training an individual to meet the standards required for certification within an ever-changing operating environment.

A CFI should possess an understanding of the learning process, knowledge of the fundamentals of teaching, and the ability to communicate effectively with the student pilot. During the certification process, a flight instructor applicant is tested on the practical application of these skills in specific teaching situations. The flight instructor is crucial to the scenario-based training program endorsed by the FAA. He or she is trained to function in the learning environment as an advisor and guide for the learner. The duties, responsibilities, and authority of the CFI include the following:

- Orient the student to the scenario-based training system.
- Help the student become a confident planner and inflight manager of each flight and a critical evaluator of their own performance.
- Help the student understand the knowledge requirements present in real world applications.
- Diagnose learning difficulties and helping the student overcome them.
- Evaluate student progress and maintain appropriate records.
- Provide continuous review of student learning.

Should a student pilot find the selected CFI is not training in a manner conducive for learning, or the student and CFI do not have compatible schedules, the student pilot should find another CFI. Choosing the right CFI is important because the quality of instruction and the knowledge and skills acquired from this flight instructor affect a student pilot's entire flying career.

The Student Pilot

The first step in becoming a pilot is to select a type of aircraft. FAA rules for getting a pilot's certificate differ depending on the type of aircraft flown. Individuals can choose among airplanes, gyroplanes, weight-shift, helicopters, powered parachutes, gliders, balloons, or airships. A pilot does not need a certificate to fly ultralight vehicles.

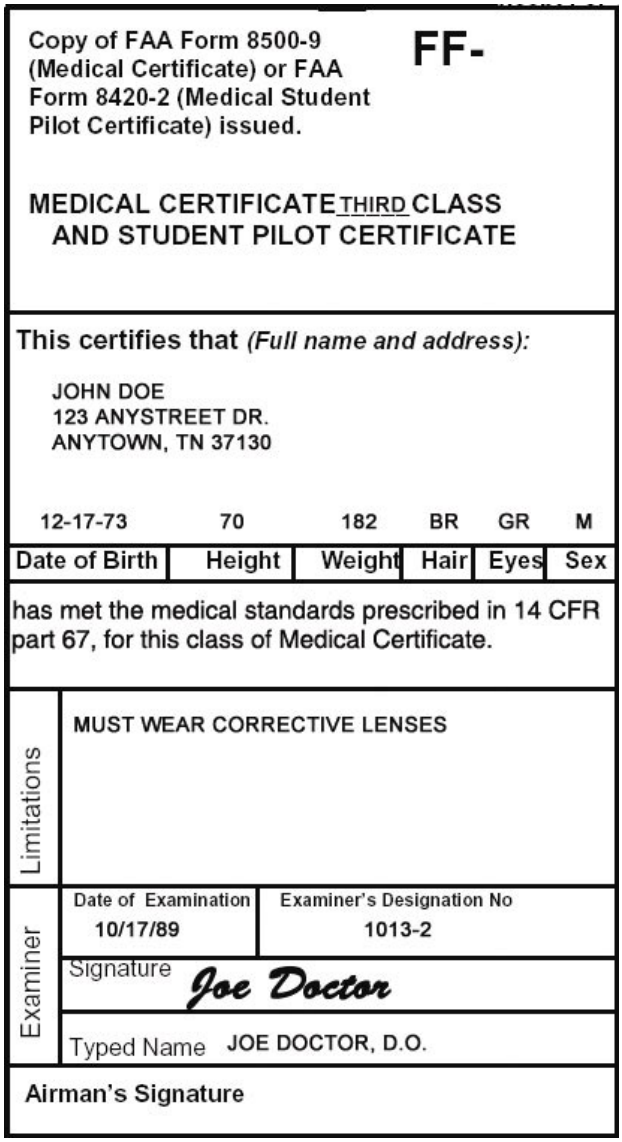
Basic Requirements

A student pilot is one who is being trained by an instructor pilot for his or her first full certificate, and is permitted to fly alone (solo) under specific, limited circumstances. Upon request, an FAA-authorized aviation medical examiner (AME) will issue a combined medical certificate and Student Pilot Certificate after completion of a physical examination. Student Pilot Certificates may be issued by an FAA inspector or an FAA-designated pilot examiner. To be eligible for a Student Pilot's Certificate, an individual must be:

- Be 16 years old (14 years old to pilot a glider or balloon).
- Be able to read, write, speak, and understand English.
- Hold a current Third-Class Medical Certificate (or for glider or balloon, certify no medical defect exists that would prevent piloting a balloon or glider).

Medical Certification Requirements

The second step in becoming a pilot is to obtain a medical certificate and Student Pilot's Certificate if the choice of aircraft is an airplane, helicopter, gyroplane, or airship. *[Figure 1-26]* (The FAA suggests the individual get a medical certificate before beginning flight training to avoid the expense of flight training that cannot be continued due to a medical condition.) Balloon or glider pilots do not need a medical certificate, but do need to write a statement certifying that no medical defect exists that would prevent them from piloting a balloon or glider. The new sport pilot category does not require a medical examination; a driver's license can be used as proof of medical competence. Applicants who fail to meet certain requirements or who have physical disabilities which might limit, but not prevent, their acting as pilots, should contact the nearest FAA office.


Copy of FAA Form 8500-9 (Medical Certificate) or FAA Form 8420-2 (Medical Student Pilot Certificate) issued.

FF-

MEDICAL CERTIFICATE THIRD CLASS
AND STUDENT PILOT CERTIFICATE

This certifies that *(Full name and address):*

JOHN DOE
123 ANYSTREET DR.
ANYTOWN, TN 37130

Date of Birth	Height	Weight	Hair	Eyes	Sex
12-17-73	70	182	BR	GR	M

has met the medical standards prescribed in 14 CFR part 67, for this class of Medical Certificate.

Limitations: MUST WEAR CORRECTIVE LENSES

Examiner:
Date of Examination: 10/17/89
Examiner's Designation No: 1013-2
Signature: Joe Doctor
Typed Name: JOE DOCTOR, D.O.

Airman's Signature

Figure 1-26. *A Third-Class Medical Certificate/Student Pilot Certificate.*

A medical certificate is obtained by passing a physical examination administered by a doctor who is an FAA-authorized AME. There are approximately 6,000 FAA-authorized AMEs in the nation. Medical certificates are designated as first class, second class, or third class. Generally, first class is designed for the airline transport pilot; second class for the commercial pilot; and third class for the student, recreational, and private pilot. A Student Pilot Certificate is issued by an AME at the time of the student's first medical examination. This certificate allows an individual who is being trained by a flight instructor to fly alone (solo) under specific, limited circumstances and must be carried with the student pilot while exercising solo flight privileges. The student pilot certificate is only required when exercising solo flight privileges. The student certificate is valid until the last day of the month, 24 months after it was issued.

Student Pilot Solo Requirements

Once a student has accrued sufficient training and experience, a CFI can endorse the student's certificate to authorize limited solo flight in a specific type (make and model) of aircraft. A student pilot may not carry passengers, fly in furtherance of a business, or operate an aircraft outside of the various endorsements provided by the flight instructor. There is no minimum aeronautical knowledge or experience requirement for the issuance of a student pilot certificate other than the medical requirements for the class of medical certificate the student certificate is based upon. There are, however, minimum aeronautical knowledge and experience requirements for student pilots to solo.

Becoming a Pilot

The course of instruction a student pilot follows depends on the type of certificate sought. It should include the ground and flight training necessary to acquire the knowledge and skills required to safely and efficiently function as a certificated pilot in the selected category and class of aircraft. The specific knowledge and skill areas for each category and class of aircraft are outlined in 14 CFR part 61. Eligibility, aeronautical knowledge, proficiency, and aeronautical requirements can be found in 14 CFR part 61, Certification: Pilots, Flight Instructors, and Ground Instructors.

- Recreational Pilot, see subpart D
- Private Pilot, see subpart E
- Sport Pilot, see subpart J

The knowledge-based portion of training is obtained through FAA handbooks such as this one, textbooks, and other sources of training and testing materials which are available in print form from the Superintendent of Documents, GPO, and online

at the Regulatory Support Division: www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs600.

The CFI may also use commercial publications as a source of study materials, especially for aircraft categories where government materials are limited. A student pilot should follow the flight instructor's advice on what and when to study. Planning a definite study program and following it as closely as possible will help in scoring well on the knowledge test. Haphazard or disorganized study habits usually result in an unsatisfactory score.

In addition to learning aeronautical knowledge, such as the principles of flight, a student pilot is also required to gain skill in flight maneuvers. The selected category and class of aircraft determines the type of flight skills and number of flight hours to be obtained. There are four steps involved in learning a flight maneuver:

- The CFI introduces and demonstrates flight maneuver to the student.
- The CFI talks student pilot through the maneuver.
- The student pilot practices the maneuver under CFI supervision.
- The CFI authorizes the student pilot to practice the maneuver solo.

Once the student pilot has shown proficiency in the required knowledge areas, flight maneuvers, and accrued the required amount of flight hours, the CFI endorses the student pilot logbook, which allows the student pilot to take the written and practical exams for pilot certification.

Knowledge and Skill Examinations

Knowledge Examination

The knowledge test is the computer portion of the exams taken to obtain pilot certification. The test contains questions of the objective, multiple-choice type. This testing method conserves the applicant's time, eliminates any element of individual judgment in determining grades, and saves time in scoring.

If pursuing a recreational pilot or private pilot certificate, it is important to become familiar with 14 CFR part 61, section 61.23, Medical Certificates: Requirements and Duration; 14 CFR section 61.35, Knowledge Test: Prerequisites and Passing Grades; and 14 CFR section 61.83, Eligibility Requirements for Student Pilot, for detailed information pertaining to prerequisites and eligibility.

If pursuing a recreational pilot certificate, it is important to review 14 CFR section 61.96, Applicability and Eligibility Requirements: General, for additional detailed information pertaining to eligibility; and if pursuing a private pilot certificate, 14 CFR section 61.103, Eligibility Requirements: General, contains additional detailed information pertaining to eligibility. Sample test questions can be downloaded from Airmen Knowledge Test Questions: www.faa.gov/education_research/testing/airmen/test_questions/.

Each applicant must register to take the test, and provide proper identification and authorization proving eligibility to take a particular FAA test. The option to take an untimed sample test will be offered. The actual test is time limited, but most applicants have sufficient time to complete and review the test. Upon completion of the knowledge test, the applicant receives an Airman Knowledge Test Report that reflects the score and is embossed with the testing center's seal. To pass, a minimum score of 70 must be attained.

When To Take the Examination

The knowledge test is more meaningful to the applicant and more likely to result in a satisfactory grade if it is taken after beginning the flight portion of the training. Therefore, the FAA recommends the knowledge test be taken after the student pilot has completed a solo cross-country flight. The operational knowledge gained by this experience can be used to the student's advantage in the knowledge test. The student pilot's CFI is the best person to determine when the applicant is ready to take the knowledge exam.

Where To Take the Examination

The FAA has hundreds of designated computer testing centers worldwide that administer FAA knowledge tests. These testing centers offer the full range of airman knowledge tests. Applicants will be charged a fee for the administration of FAA knowledge tests. A complete list of test centers, their locations and phone numbers can be downloaded at "Airmen Certification Frequently Asked Questions" located at www.faa.gov/education_research/testing/airmen/test_questions/ or www.faa.gov/licenses_certificates/airmen_certification/airmen_FAQ/.

An applicant can also contact the local FSDO to obtain this information. If the student pilot chooses a 14 CFR part 141 flight school with test examining authority, the school will administer the knowledge test during the curriculum.

Practical Examination

The FAA has developed PTSs for FAA pilot certificates and associated ratings. *[Figure 1-27]* These practical tests are administered by FAA ASIs and DPEs. 14 CFR part 61 specifies the areas of operation in which knowledge and skill must be demonstrated by the applicant. Since the

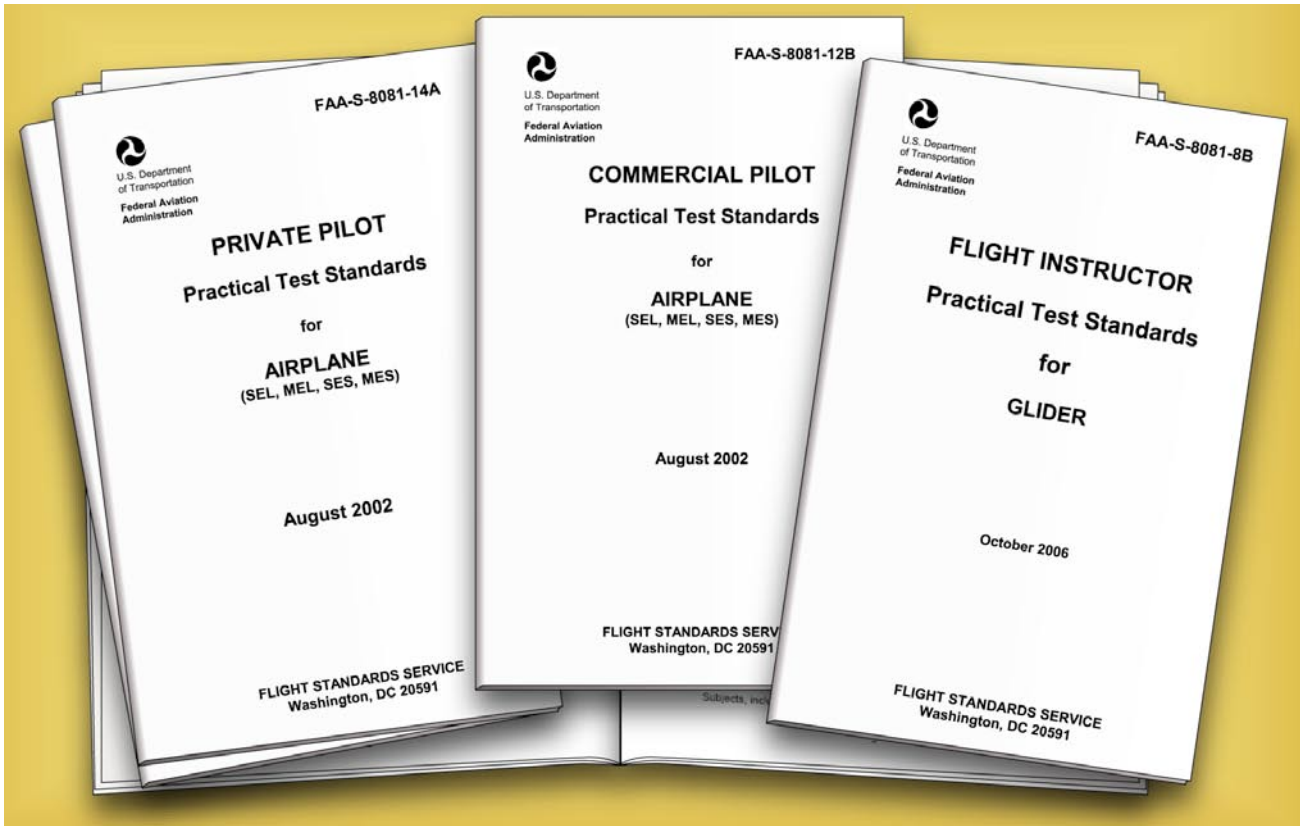


Figure 1-27. *Examples of Practical Test Standards.*

FAA requires all practical tests be conducted in accordance with the appropriate PTS, and the policies set forth in the Introduction section of the PTS book, the pilot applicant should become familiar with this book during training.

The PTS book is a testing document and not intended to be a training syllabus. An appropriately rated flight instructor is responsible for training the pilot applicant to acceptable standards in all subject matter areas, procedures, and maneuvers. Descriptions of tasks and information on how to perform maneuvers and procedures are contained in reference and teaching documents such as this handbook. A list of reference documents is contained in the Introduction section of each PTS book. Copies may obtained by:

- Downloading from the FAA website: www.faa.gov.
- Purchase of print copies from the GPO, Pittsburgh, Pennsylvania, or via their official online bookstore at www.access.gpo.gov.

The flight proficiency maneuvers listed in 14 CFR part 61 are the standard skill requirements for certification. They are outlined in the PTS as "areas of operation." These are phases of the practical test arranged in a logical sequence within the standard. They begin with preflight preparation and end with postflight procedures. Each area of operation contains "tasks," which are comprised of knowledge areas, flight procedures, and/or flight maneuvers appropriate to the area of operation. The candidate is required to demonstrate knowledge and proficiency in all tasks for the original issuance of all pilot certificates.

When To Take the Practical Exam

14 CFR part 61 establishes the ground school and flight experience requirements for the type of certification and aircraft selected. However, the CFI best determines when an applicant is qualified for the practical test. A practice practical test is an important step in the flight training process.

The applicant will be asked to present the following documentation:

- FAA Form 8710-1 (8710.11 for sport pilot applicants), Application for an Airman Certificate and/or Rating, with the flight instructor's recommendation.
- An Airman Knowledge Test Report with a satisfactory grade.
- A medical certificate (not required for glider or balloon), and a student pilot certificate endorsed by a flight instructor for solo, solo cross-country (airplane and rotorcraft), and for the make and model aircraft

to be used for the practical test (driver's license or medical certificate for sport pilot applicants).

- The pilot log book records.
- A graduation certificate from an FAA-approved school (if applicable).

The applicant must provide an airworthy aircraft with equipment relevant to the areas of operation required for the practical test. He or she will also be asked to produce and explain the:

- Aircraft's registration certificate
- Aircraft's airworthiness certificate
- Aircraft's operating limitations or FAA-approved aircraft flight manual (if required)
- Aircraft equipment list
- Required weight and balance data
- Maintenance records
- Applicable airworthiness directives (ADs)

For a detailed explanation of the required pilot maneuvers and performance standards, refer to the PTSs pertaining to the type of certification and aircraft selected. These standards may be downloaded free of charge from the FAA: www.faa.gov. They can also be purchased from the Superintendent of Documents or GPO bookstores. Most airport fixed-base operators and flight schools carry a variety of government publications and charts, as well as commercially published materials.

Who Administers the FAA Practical Examination?

Due to the varied responsibilities of the FSDOs, practical tests are usually given by DPEs. An applicant should schedule the practical test by appointment to avoid conflicts and wasted time. A list of examiner names can be obtained from the local FSDO. Since a DPE serves without pay from the government for conducting practical tests and processing the necessary reports, the examiner is allowed to charge a reasonable fee. There is no charge for the practical test when conducted by an FAA inspector.

Role of the Certificated Flight Instructor

To become a CFI, a pilot must meet the provisions of 14 CFR part 61. The FAA places full responsibility for student flight training on the shoulders of the CFI, who is the cornerstone of aviation safety. It is the job of the flight instructor to train the student pilot in all the knowledge areas and teach the skills necessary for the student pilot to operate safely and competently as a certificated pilot in the NAS. The training will include airmanship skills, pilot judgment and decision-making, and good operating practices.

A pilot training program depends on the quality of the ground and flight instruction the student pilot receives. The flight instructor must possess a thorough understanding of the learning process, knowledge of the fundamentals of teaching, and the ability to communicate effectively with the student pilot. He or she uses a syllabus and teaching style that embodies the "building block" method of instruction. In this method, the student progresses from the known to the unknown via a course of instruction laid out in such a way that each new maneuver embodies the principles involved in the performance of maneuvers previously learned. Thus, with the introduction of each new subject, the student not only learns a new principle or technique, but also broadens his or her application of those principles or techniques previously learned.

Insistence on correct techniques and procedures from the beginning of training by the flight instructor ensures that the student pilot develops proper flying habit patterns. Any deficiencies in the maneuvers or techniques must immediately be emphasized and corrected. A flight instructor serves as a role model for the student pilot who observes the flying habits of his or her flight instructor during flight instruction, as well as when the instructor conducts other pilot operations. Thus, the flight instructor becomes a model of flying proficiency for the student who, consciously or unconsciously, attempts to imitate the instructor. For this reason, a flight instructor should observe recognized safety practices, as well as regulations during all flight operations.

The student pilot who enrolls in a pilot training program commits considerable time, effort, and expense to achieve a pilot certificate. Students often judge the effectiveness of the flight instructor and the success of the pilot training program based on their ability to pass the requisite FAA practical test. A competent flight instructor stresses to the student that practical tests are a sampling of pilot ability compressed into a short period of time. The goal of a flight instructor is to train the "total" pilot.

Role of the Designated Pilot Examiner

The DPE plays an important role in the FAA's mission of promoting aviation safety by administering FAA practical tests for pilot and Flight Instructor Certificates and associated ratings. Although administering these tests is a responsibility of the ASI, the FAA's highest priority is making air travel safer by inspecting aircraft that fly in the United States. To satisfy the need for pilot testing and certification services, the FAA delegates certain of these responsibilities to private individuals who are not FAA employees.

Appointed in accordance with 14 CFR section 183.23, a DPE is an individual who meets the qualification requirements of the Pilot Examiner's Handbook, FAA Order 8710.3, and who:

- Is technically qualified.
- Holds all pertinent category, class, and type ratings for each aircraft related to their designation.
- Meets requirements of 14 CFR part 61, sections 61.56, 61.57, and 61.58, as appropriate.
- Is current and qualified to act as PIC of each aircraft for which he or she is authorized.
- Maintains at least a Third-Class Medical Certificate, if required.
- Maintains a current Flight Instructor Certificate, if required.

Designated to perform specific pilot certification tasks on behalf of the FAA, a DPE may charge a reasonable fee. Generally, a DPE's authority is limited to accepting applications and conducting practical tests leading to the issuance of specific pilot certificates and/or ratings. The majority of FAA practical tests at the private and commercial pilot levels are administered by DPEs.

DPE candidates must have good industry reputations for professionalism, integrity, a demonstrated willingness to serve the public, and adhere to FAA policies and procedures in certification matters. The FAA expects the DPE to administer practical tests with the same degree of professionalism, using the same methods, procedures, and standards as an FAA ASI.

Chapter Summary

The FAA has entered the second century of civil aviation as a robust government organization and is taking full advantage of technology, such as Global Positioning System (GPS) satellite technology to enhance the safety of civil aviation. The Internet has also become an important tool in promoting aviation safety and providing around-the-clock resources for the aviation community. Handbooks, regulations, standards, references, and online courses are now available at the FAA website.

In keeping with the FAA's belief that safety is a learned behavior, the FAA offers many courses and seminars to enhance air safety. The FAA puts the burden of instilling safe flying habits on the flight instructor, who should follow basic flight safety practices and procedures in every flight operation he or she undertakes with a student pilot. Operational safety practices include, but are not limited to, collision avoidance procedures consisting of proper scanning techniques, use of checklists, runway incursion avoidance, positive transfer of controls, and workload management. These safety practices will be discussed more fully within this handbook. Safe flight also depends on Scenario-Based Training (SBT) that teaches the student pilot how to respond in different flight situations. The FAA has incorporated these techniques along with decision-making methods, such as Aeronautical Decision-Making (ADM), risk management, and Crew Resource Management (CRM), which are covered more completely in Chapter 17, Aeronautical Decision-Making.

Chapter 8

Flight Manuals and Other Documents

Introduction

Each aircraft comes with documentation and a set of manuals with which a pilot must be familiar in order to fly that aircraft. This chapter covers airplane flight manuals (AFM), the pilot's operating handbook (POH), and aircraft documents pertaining to ownership, airworthiness, maintenance, and operations with inoperative equipment. Knowledge of these required documents and manuals is essential for a pilot to conduct a safe flight.

Airplane Flight Manuals (AFM)

Flight manuals and operating handbooks are concise reference books that provide specific information about a particular aircraft or subject. They contain basic facts, information, and/or instructions for the pilot about the operation of an aircraft, flying techniques, etc., and are intended to be kept at hand for ready reference.

The aircraft owner/information manual is a document developed by the manufacturer and contains general information about the make and model of aircraft. The manual is not pproved by the Federal Aviation Administration (FAA) and is not specific to an individual aircraft. The manual provides general information about the operation of an aircraft, is not kept current, and cannot be substituted for the AFM/POH.

An AFM is a document developed by the manufacturer and approved by the FAA. This book contains the information and instructions required to operate an aircraft safely. A pilot must comply with this information which is specific to a particular make and model aircraft, usually by serial number. An AFM contains the operating procedures and limitations of that aircraft. Title 14 of the Code of Federal Regulations (14 CFR) part 91 requires that pilots comply with the operating limitations specified in the approved flight manuals, markings, and placards.

Originally, flight manuals followed whatever format and content the manufacturer felt was appropriate, but this changed with the acceptance of Specification No. 1 prepared by the General Aviation Manufacturers Association (GAMA). Specification No. 1 established a standardized format for all general aviation airplane and helicopter flight manuals.

The POH is a document developed by the aircraft manufacturer and contains FAA approved AFM information. If "POH" is used in the main title, a statement must be included on the title page indicating that sections of the document are FAA approved as the AFM.

The POH for most light aircraft built after 1975 is also designated as the FAA-approved flight manual. The typical AFM/POH contains the following nine sections: General; Limitations; Emergency Procedures; Normal Procedures; Performance; Weight and Balance/Equipment List; Systems Description; Handling, Service, and Maintenance; and Supplements. Manufacturers also have the option of including additional sections, such as one on Safety and Operational Tips or an alphabetical index at the end of the POH.

Preliminary Pages

While the AFM/POH may appear similar for the same make and model of aircraft, each manual is unique and contains specific information about a particular aircraft, such as the equipment installed and weight and balance information. Manufacturers are required to include the serial number and registration on the title page to identify the aircraft to which the manual belongs. If a manual does not indicate a specific aircraft registration and serial number, it is limited to general study purposes only.

Most manufacturers include a table of contents, which identifies the order of the entire manual by section number and title. Usually, each section also contains a table of contents for that section. Page numbers reflect the section and page within that section (1-1, 1-2, 2-1, 3-1, etc.). If the manual is published in loose-leaf form, each section is usually marked with a divider tab indicating the section number or title, or both. The Emergency Procedures section may have a red tab for quick identification and reference.

General (Section 1)

The General section provides the basic descriptive information on the airframe and powerplant(s). Some manuals include a three-dimensional drawing of the aircraft that provides dimensions of various components. Included are such items as wingspan, maximum height, overall length, wheelbase length, main landing gear track width, diameter of the rotor system, maximum propeller diameter, propeller ground clearance, minimum turning radius, and wing area. This section serves as a quick reference and helps a pilot become familiar with the aircraft.

The last segment of the General section contains definitions, abbreviations, explanations of symbology, and some of the terminology used in the POH. At the option of the manufacturer, metric and other conversion tables may also be included.

Limitations (Section 2)

The Limitations section contains only those limitations required by regulation or that are necessary for the safe operation of the aircraft, powerplant, systems, and equipment. It includes operating limitations, instrument markings, color-coding, and basic placards. Some of the limitation areas are: airspeed, powerplant, weight and loading distribution, and flight.

Airspeed

Airspeed limitations are shown on the airspeed indicator (ASI) by color coding and on placards or graphs in the aircraft. *[Figure 8-1]* A red line on the ASI shows the airspeed limit beyond which structural damage could occur. This is called the never-exceed speed (V_{NE}). A yellow arc indicates the speed range between maximum structural cruising speed (V_{NO}) and V_{NE}. Operation of an airplane in the yellow airspeed arc is for smooth air only, and then only with caution. A green arc depicts the normal operating speed range, with the upper end at V_{NO}, and the lower end at stalling speed at maximum weight with the landing gear and flaps retracted (V_{S1}). For airplanes the flap operating range is depicted by the white arc, with the upper end at the maximum flap extended speed (V_{FE}), and the lower end at the stalling speed with the landing gear and flaps in the landing configuration (V_{SO}).

Figure 8-1. *Single-engine airpseed indicator.*

In addition to the markings listed above, small multi-engine airplanes will have a red radial line to indicate single-engine minimum controllable airspeed (VMC). A blue radial line is used to indicate single-engine best rate of climb speed at maximum weight at sea level (V_{YSE}). *[Figure 8-2]*

Figure 8-2. *Multi-engine airpseed indicator.*

Powerplant

The Powerplant Limitations portion describes operating limitations on an aircraft's reciprocating or turbine engine(s). These include limitations for takeoff power, maximum continuous power, and maximum normal operating power, which is the maximum power the engine can produce without any restrictions and is depicted by a green arc. Other items that can be included in this area are the minimum and maximum oil and fuel pressures, oil and fuel grades, and propeller operating limits. *[Figure 8-3]*

All reciprocating-engine powered aircraft must have a revolutions per minute (rpm) indicator for each engine. Aircraft equipped with a constant-speed propeller or rotor system use a manifold pressure gauge to monitor power output and a tachometer to monitor propeller or rotor speed. Both instruments depict the maximum operating limit with a red radial line and the normal operating range with a green arc. *[Figure 8-4]* Some instruments may have a yellow arc to indicate a caution area.

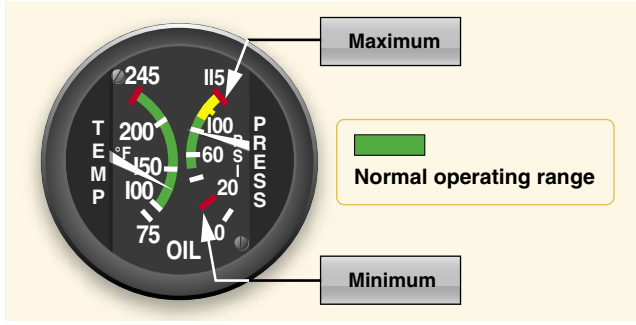


Figure 8-3. *Minimum, maximum, and normal operating range markings on oil gauge.*

Weight and Loading Distribution

Weight and Loading Distribution contains the maximum certificated weights, as well as the center of gravity (CG) range. The location of the reference datum used in balance computations is included in this section. Weight and balance computations are not provided in this area, but rather in the weight and balance section of the AFM/POH.

Figure 8-4. *Manifold pressure gauge (top) and tachometer (bottom).*

Flight Limits

Flight Limits list authorized maneuvers with appropriate entry speeds, flight load factor limits, and kinds of operation limits. It also indicates those maneuvers that are prohibited, such as spins or acrobatic flight, as well as operational limitations such as flight into known icing conditions.

Placards

Most aircraft display one or more placards that contain information having a direct bearing on the safe operation of the aircraft. These placards are located in conspicuous places and are reproduced in the Limitations section or as directed by an Airworthiness Directive (AD). *[Figure 8-5]*

Figure 8-5. *Placards are used to depict aircraft limitations.*

Emergency Procedures (Section 3)

Checklists describing the recommended procedures and airspeeds for coping with various types of emergencies or critical situations are located in the Emergency Procedures section. Some of the emergencies covered include: engine failure, fire, and system failure. The procedures for inflight engine restarting and ditching may also be included. Manufacturers may first show an emergency checklist in an abbreviated form, with the order of items reflecting the sequence of action. Amplified checklists that provide additional information on the procedures follow the abbreviated checklist. To be prepared for emergency situations, memorize the immediate action items and, after completion, refer to the appropriate checklist.

Manufacturers may include an optional subsection titled "Abnormal Procedures." This subsection describes recommended procedures for handling malfunctions that are not considered emergencies.

Normal Procedures (Section 4)

This section begins with a list of the airspeeds for normal operations. The next area consists of several checklists that may include preflight inspection, before starting procedures, starting engine, before taxiing, taxiing, before takeoff, climb, cruise, descent, before landing, balked landing, after landing, and post flight procedures. An Amplified Procedures area follows the checklists to provide more detailed information about the various previously mentioned procedures.

To avoid missing important steps, always use the appropriate checklists when available. Consistent adherence to approved checklists is a sign of a disciplined and competent pilot.

Performance (Section 5)

The Performance section contains all the information required by the aircraft certification regulations, and any additional performance information the manufacturer deems important to pilot ability to safely operate the aircraft. Performance charts, tables, and graphs vary in style, but all contain the same basic information. Examples of the performance information found in most flight manuals include a graph or table for converting calibrated airspeed to true airspeed; stall speeds in various configurations; and data for determining takeoff and climb performance, cruise performance, and landing performance. *Figure 8-6* is an example of a typical performance graph. For more information on use of the charts, graphs, and tables, refer to Chapter 10, Aircraft Performance.

Weight and Balance/Equipment List (Section 6)

The Weight and Balance/Equipment List section contains all the information required by the FAA to calculate the weight and balance of an aircraft. Manufacturers include sample weight and balance problems. Weight and balance is discussed in greater detail in Chapter 9, Weight and Balance.

Systems Description (Section 7)

This section describes the aircraft systems in a manner appropriate to the pilot most likely to operate the aircraft. For example, a manufacturer might assume an experienced pilot will be reading the information for an advanced aircraft. For more information on aircraft systems, refer to Chapter 6, Aircraft Systems.

Handling, Service, and Maintenance (Section 8)

The Handling, Service, and Maintenance section describes the maintenance and inspections recommended by the manufacturer (and the regulations). Additional maintenance or inspections may be required by the issuance of AD applicable to the airframe, engine, propeller, or components.

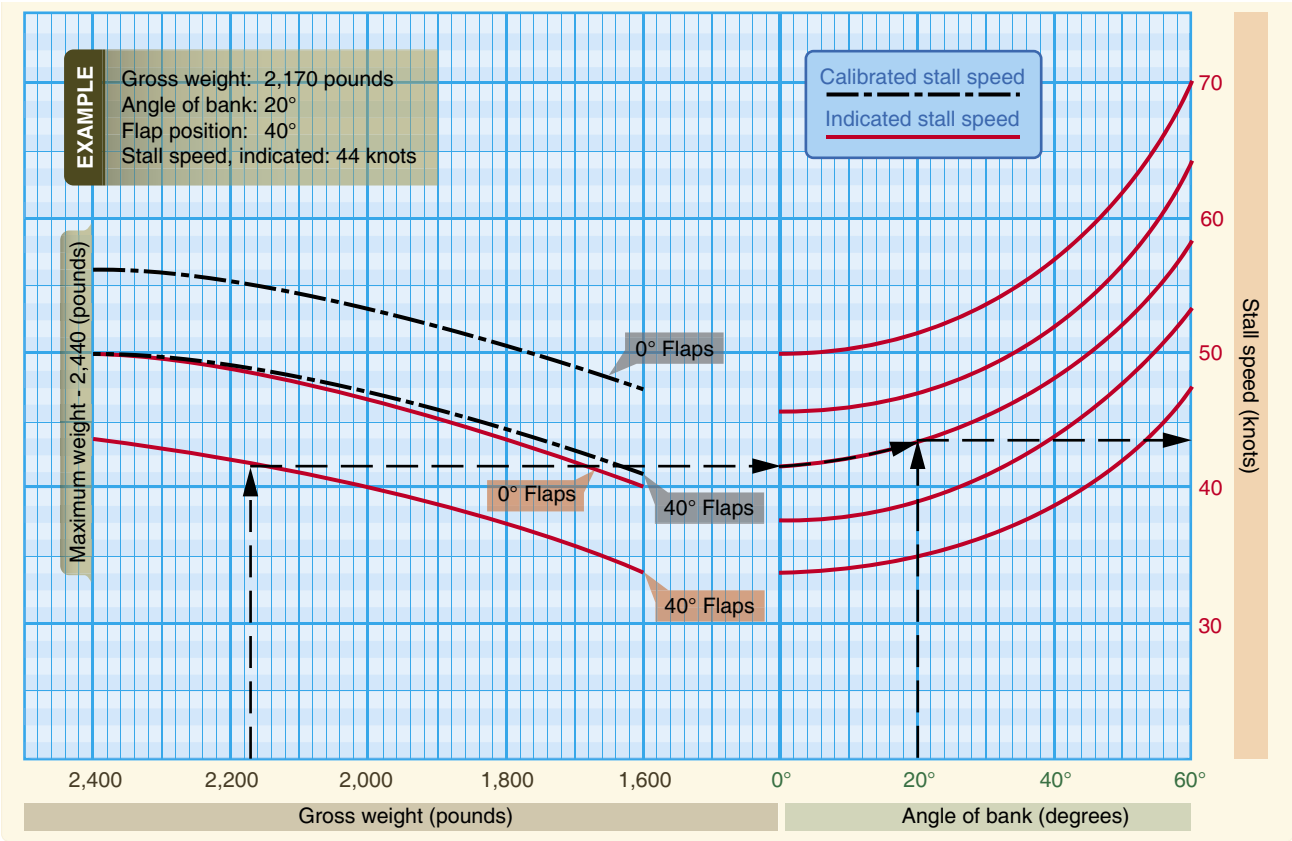


Figure 8-6. *Stall speed chart.*

This section also describes preventive maintenance that may be accomplished by certificated pilots, as well as the manufacturer's recommended ground handling procedures. It includes considerations for hangaring, tie-down, and general storage procedures for the aircraft.

Supplements (Section 9)

The Supplements section contains information necessary to safely and efficiently operate the aircraft when equipped with optional systems and equipment (not provided with the standard aircraft). Some of this information may be supplied by the aircraft manufacturer or by the manufacturer of the optional equipment. The appropriate information is inserted into the flight manual at the time the equipment is installed. Autopilots, navigation systems, and air-conditioning systems are examples of equipment described in this section. *[Figure 8-7]*

Figure 8-7. *Supplements provide information on optional equipment.*

Safety Tips (Section 10)

The Safety Tips section is an optional section containing a review of information that enhances the safe operation of the aircraft. For example, physiological factors, general weather information, fuel conservation procedures, high altitude operations, or cold weather operations might be discussed.

Aircraft Documents

Certificate of Aircraft Registration

Before an aircraft can be flown legally, it must be registered with the FAA Aircraft Registry. The Certificate of Aircraft Registration, which is issued to the owner as evidence of the registration, must be carried in the aircraft at all times. *[Figure 8-8]*

The Certificate of Aircraft Registration cannot be used for operations when:

- The aircraft is registered under the laws of a foreign country.
- The aircraft's registration is canceled upon written request of the certificate holder.
- The aircraft is totally destroyed or scrapped.
- The ownership of the aircraft is transferred.
- The certificate holder loses United States citizenship.

For additional information, see 14 CFR section 47.41. When one of the events listed in 14 CFR section 47.41 occurs, the previous owner must notify the FAA by filling in the back of the Certificate of Aircraft Registration, and mailing it to:

FAA Aircraft Registration Branch, AFS-750
P.O. Box 25504
Oklahoma City, OK 73125-0504

A dealer's aircraft registration certificate is another form of registration certificate, but is valid only for required flight tests by the manufacturer or in flights that are necessary for the sale of the aircraft by the manufacturer or a dealer. The dealer must remove the certificate when the aircraft is sold.

Upon complying with 14 CFR section 47.31, the pink copy of the application for an Aircraft Registration Application, Aeronautical Center (AC) Form 8050-1, provides authorization to operate an unregistered aircraft for a period not to exceed 90 days. Since the aircraft is

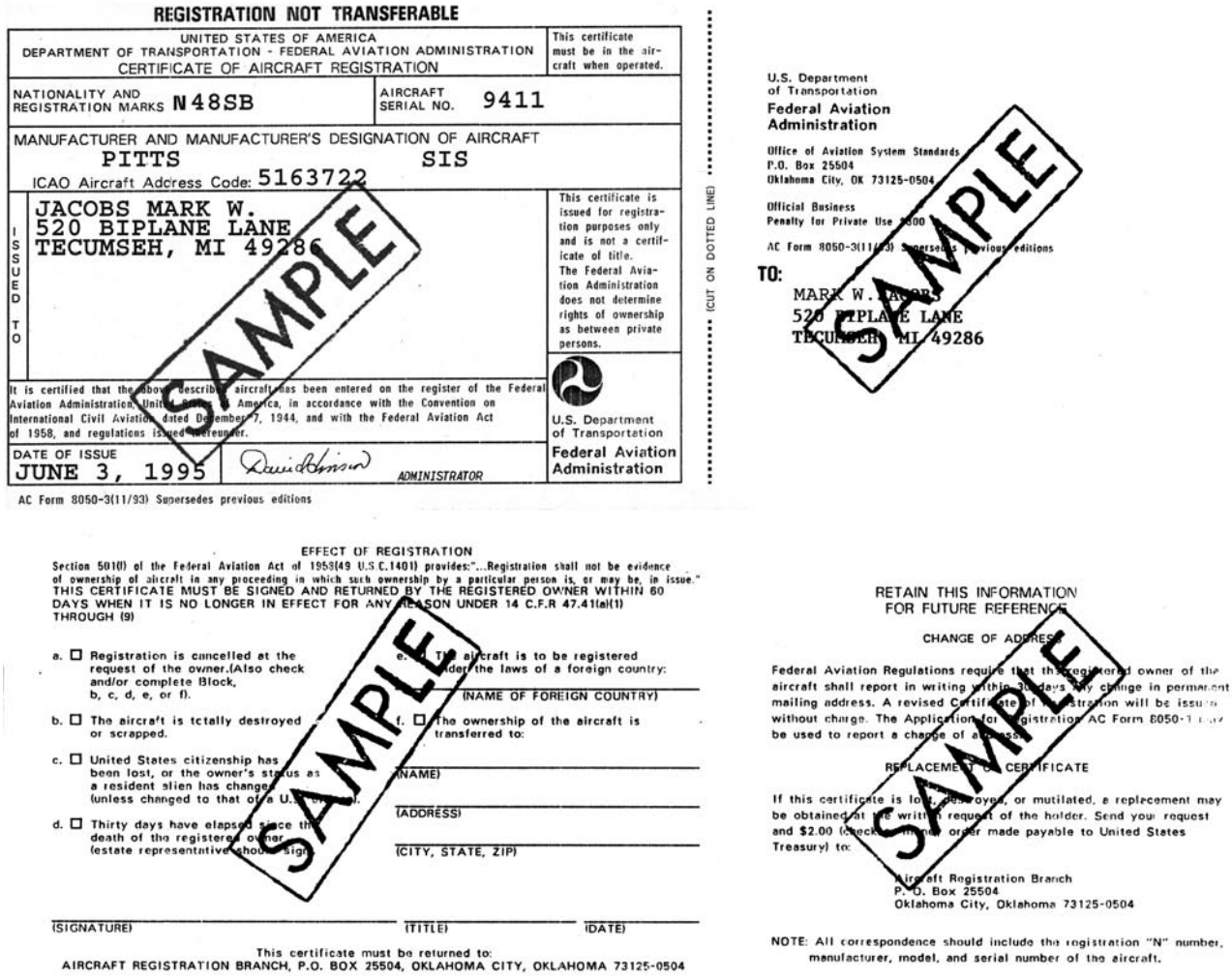


Figure 8-8. *AC Form 8050-3, Certificate of Aircraft Registration.*

unregistered, it cannot be operated outside of the United States until a permanent Certificate of Aircraft Registration is received and placed in the aircraft.

The FAA does not issue any certificate of ownership or endorse any information with respect to ownership on a Certificate of Aircraft Registration.

NOTE: For additional information concerning the Aircraft Registration Application or the Aircraft Bill of Sale, contact the nearest FAA Flight Standards District Office (FSDO).

Light Sport Aircraft (LSA)

The FAA recently added a new category called Light Sport Aircraft (LSA). Requirements for registration of these aircraft differ from those of other aircraft. The following guidelines are provided for LSA registration, but a more detailed explanation can be found on the FAA website at http//www.faa.gov.

An existing LSA that has not been issued a United States or foreign airworthiness certificate, and does not meet the provisions of 14 CFR section 103.1, must meet specific criteria in order to be certificated as an experimental LSA under 14 CFR section 21.191 (i)(l) before January 31, 2008. The following items must be provided: evidence of ownership of the parts or the manufacturer's kit, Aircraft Registration Application (AC Form 8050-1), and a $5.00 registration fee. If evidence of ownership can not be supplied, an affidavit stating why it is not available must be submitted on the AC Form 8050-88A.

If an owner wants to register a newly manufactured LSA that will be certificated as an experimental light sport aircraft under 14 CFR section 21.191(i)(2), the following items must be provided: AC Form 8050-88A or its equivalent (completed by the LSA manufacturer, unless previously submitted to the Registry by the manufacturer), evidence from the manufacturer of ownership of an aircraft (kit-built or fly-away), AC Form 8050-1, and a $5.00 registration fee.

Airworthiness Certificate

An Airworthiness Certificate is issued by a representative of the FAA after the aircraft has been inspected, is found to meet the requirements of 14 CFR part 21, and is in condition for safe operation. The Airworthiness Certificate must be displayed in the aircraft so it is legible to the passengers and crew whenever it is operated. The Airworthiness Certificate is transferred with the aircraft except when it is sold to a foreign purchaser.

A Standard Airworthiness Certificate is issued for aircraft type certificated in the normal, utility, acrobatic, commuter, transport categories, and manned free balloons. *Figure 8-9* illustrates a Standard Airworthiness Certificate, and an explanation of each item in the certificate follows.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION—FEDERAL AVIATION ADMINISTRATION

STANDARD AIRWORTHINESS CERTIFICATE

1 NATIONALITY AND REGISTRATION MARKS	2 MANUFACTURER AND MODEL	3 AIRCRAFT SERIAL NUMBER	4 CATEGORY
N2631A	PIPER PA-22-135	22-903	NORMAL

5. AUTHORITY AND BASIS FOR ISSUANCE

This airworthiness certificate is issued pursuant to the Federal Aviation Act of 1958 and certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to conform to the type certificate therefor, to be in condition for safe operation, and has been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.
Exceptions:

NONE

6 TERMS AND CONDITIONS

Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, this airworthiness certificate is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

DATE OF ISSUANCE	FAA REPRESENTATIVE	DESIGNATION NUMBER
08-10-95	Marion W. Williams MARION W. WILLIAMS	SW-FSDO-OKC

Any alteration, reproduction, or misuse of this certificate may be punishable by a fine not exceeding $1,000, or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA Form 8100-2 (8-82) GPO 892-804

Figure 8-9. *FAA Form 8100-2, Standard Airworthiness Certificate.*

1. Nationality and Registration Marks. The "N" indicates the aircraft is registered in the United States. Registration marks consist of a series of up to five numbers or numbers and letters. In this case, N2631A is the registration number assigned to this airplane.
2. Manufacturer and Model. Indicates the manufacturer, make, and model of the aircraft.
3. Aircraft Serial Number. Indicates the manufacturer's serial number assigned to the aircraft, as noted on the aircraft data plate.
4. Category. Indicates the category in which the aircraft must be operated. In this case, it must be operated in accordance with the limitations specified for the "NORMAL" category.
5. Authority and Basis for Issuance. Indicates the aircraft conforms to its type certificate and is considered in condition for safe operation at the time of inspection and issuance of the certificate. Any exemptions from the applicable airworthiness standards are briefly noted here and the exemption number given. The word "NONE" is entered if no exemption exists.
6. Terms and Conditions. Indicates the Airworthiness Certificate is in effect indefinitely if the aircraft is maintained in accordance with 14 CFR parts 21, 43, and 91, and the aircraft is registered in the United States.

Also included are the date the certificate was issued and the signature and office identification of the FAA representative.

A Standard Airworthiness Certificate remains in effect if the aircraft receives the required maintenance and is properly registered in the United States. Flight safety relies in part on the condition of the aircraft, which is determined by inspections performed by mechanics, approved repair stations, or manufacturers that meet specific requirements of 14 CFR part 43.

A Special Airworthiness Certificate is issued for all aircraft certificated in other than the Standard classifications, such as Experimental, Restricted, Limited, Provisional, and LSA. LSA receive a pink special airworthiness certificate. There are exceptions. For example, the Piper Cub is in the new LSA category, but it was certificated as a normal aircraft during its manufacture. When purchasing an aircraft classified as other than Standard, it is recommended that the local FSDO be contacted for an explanation of the pertinent airworthiness requirements and the limitations of such a certificate.

Aircraft Maintenance

Maintenance is defined as the preservation, inspection, overhaul, and repair of an aircraft, including the replacement of parts. Regular and proper maintenance ensures that an aircraft meets an acceptable standard of airworthiness throughout its operational life.

Although maintenance requirements vary for different types of aircraft, experience shows that aircraft need some type of preventive maintenance every 25 hours of flying time or less, and minor maintenance at least every 100 hours. This is influenced by the kind of operation, climatic conditions, storage facilities, age, and construction of the aircraft. Manufacturers supply maintenance manuals, parts catalogs, and other service information that should be used in maintaining the aircraft.

Aircraft Inspections

14 CFR part 91 places primary responsibility on the owner or operator for maintaining an aircraft in an airworthy condition. Certain inspections must be performed on the aircraft, and the owner must maintain the airworthiness of the aircraft during the time between required inspections by having any defects corrected.

14 CFR part 91, subpart E, requires the inspection of all civil aircraft at specific intervals to determine the overall condition. The interval depends upon the type of operations in which the aircraft is engaged. All aircraft need to be inspected at least once each 12 calendar months, while inspection is required for others after each 100 hours of operation. Some aircraft are inspected in accordance with an inspection system set up to provide for total inspection of the aircraft on the basis of calendar time, time in service, number of system operations, or any combination of these.

All inspections should follow the current manufacturer's maintenance manual, including the Instructions for Continued Airworthiness concerning inspections intervals, parts replacement, and life-limited items as applicable to the aircraft.

Annual Inspection

Any reciprocating engine or single-engine turbojet/turbopropeller-powered small aircraft (12,500 pounds and under) flown for business or pleasure and not flown for compensation or hire is required to be inspected at least annually. The inspection shall be performed by a certificated airframe and powerplant (A&P) mechanic who holds an inspection authorization (IA) by the manufacturer of the

aircraft or by a certificated and appropriately rated repair station. The aircraft may not be operated unless the annual inspection has been performed within the preceding 12 calendar months. A period of 12 calendar months extends from any day of a month to the last day of the same month the following year. An aircraft overdue for an annual inspection may be operated under a Special Flight Permit issued by the FAA for the purpose of flying the aircraft to a location where the annual inspection can be performed. However, all applicable ADs that are due must be complied with before the flight.

100-Hour Inspection

All aircraft under 12,500 pounds (except turbojet/turbopropeller-powered multi-engine airplanes and turbine powered rotorcraft), used to carry passengers for hire, must have received a 100-hour inspection within the preceding 100 hours of time in service and have been approved for return to service. Additionally, an aircraft used for flight instruction for hire, when provided by the person giving the flight instruction, must also have received a 100-hour inspection. This inspection must be performed by an FAA-certificated A&P mechanic, an appropriately rated FAA-certificated repair station, or by the aircraft manufacturer. An annual inspection, or an inspection for the issuance of an Airworthiness Certificate may be substituted for a required 100-hour inspection. The 100-hour limitation may be exceeded by not more than 10 hours while en route to reach a place where the inspection can be done. The excess time used to reach a place where the inspection can be done must be included in computing the next 100 hours of time in service.

Other Inspection Programs

The annual and 100-hour inspection requirements do not apply to large (over 12,500 pounds) airplanes, turbojets, or turbopropeller-powered multi-engine airplanes or to aircraft for which the owner complies with a progressive inspection program. Details of these requirements may be determined by reference to 14 CFR section 43.11 and 14 CFR part 91, subpart E, and by inquiring at a local FSDO.

Altimeter System Inspection

14 CFR section 91.411 requires that the altimeter, encoding altimeter, and related system be tested and inspected in the preceding 24 months before operated in controlled airspace under instrument flight rules (IFR).

Transponder Inspection

14 CFR section 91.413 requires that before a transponder can be used under 14 CFR section 91.215(a), it shall be tested and inspected within the preceding 24 months.

Emergency Locator Transmitter

An emergency locator transmitter (ELT) is required by 14 CFR section 91.207 and must be inspected within 12 calendar months after the last inspection for the following:

- Proper installation
- Battery corrosion
- Operation of the controls and crash sensor
- The presence of a sufficient signal radiated from its antenna

The ELT must be attached to the airplane in such a manner that the probablity of damage to the transmitter in the event of crash impact is minimized. Fixed and deployable automatic type transmitters must be attached to the airplane as far aft as practicable. Batteries used in the ELTs must be replaced (or recharged, if the batteries are rechargeable):

- When the transmitter has been in use for more than 1 cumulative hour.
- When 50 percent of the battery useful life (or, for rechargeable batteries, 50 percent of useful life of the charge) has expired.

An expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter and entered in the aircraft maintenance record. This does not apply to batteries that are essentially unaffected during storage intervals, such as water-activated batteries.

Preflight Inspections

The preflight inspection is a thorough and systematic means by which a pilot determines if the aircraft is airworthy and in condition for safe operation. POHs and owner/information manuals contain a section devoted to a systematic method of performing a preflight inspection.

Minimum Equipment Lists (MEL) and Operations With Inoperative Equipment

14 CFR requires that all aircraft instruments and installed equipment be operative prior to each departure. When the FAA adopted the minimum equipment list (MEL) concept for 14 CFR part 91 operations, this allowed operations with inoperative equipment determined to be nonessential for safe flight. At the same time, it allowed part 91 operators, without an MEL, to defer repairs on nonessential equipment within the guidelines of part 91.

The FAA has two acceptable methods of deferring maintenance on small rotorcraft, non-turbine powered airplanes, gliders, or lighter-than-air aircraft operated under part 91. They are the deferral provision of 14 CFR section 91.213(d) and an FAA-approved MEL.

The deferral provision of 14 CFR section 91.213(d) is widely used by most pilot/operators. Its popularity is due to simplicity and minimal paperwork. When inoperative equipment is found during preflight or prior to departure, the decision should be to cancel the flight, obtain maintenance prior to flight, or to defer the item or equipment.

Maintenance deferrals are not used for inflight discrepancies. The manufacturer's AFM/POH procedures are to be used in those situations. The discussion that follows assumes that the pilot wishes to defer maintenance that would ordinarily be required prior to flight.

Using the deferral provision of 14 CFR section 91.213(d), the pilot determines whether the inoperative equipment is required by type design, 14 CFR, or ADs. If the inoperative item is not required, and the aircraft can be safely operated without it, the deferral may be made. The inoperative item shall be deactivated or removed and an INOPERATIVE placard placed near the appropriate switch, control, or indicator. If deactivation or removal involves maintenance (removal always will), it must be accomplished by certificated maintenance personnel and recorded in accordance with 14 CFR part 43.

For example, if the position lights (installed equipment) were discovered to be inoperative prior to a daytime flight, the pilot would follow the requirements of 14 CFR section 91.213(d).

The deactivation may be a process as simple as the pilot positioning a circuit breaker to the OFF position, or as complex as rendering instruments or equipment totally inoperable. Complex maintenance tasks require a certificated and appropriately rated maintenance person to perform the deactivation. In all cases, the item or equipment must be placarded INOPERATIVE.

All small rotorcraft, non-turbine powered airplanes, gliders, or lighter-than-air aircraft operated under 14 CFR part 91 are eligible to use the maintenance deferral provisions of 14 CFR section 91.213(d). However, once an operator requests an MEL, and a Letter of Authorization (LOA) is issued by the FAA, then the use of the MEL becomes mandatory for that aircraft. All maintenance deferrals must be accomplished in accordance with the terms and conditions of the MEL and the operator-generated procedures document.

The use of an MEL for an aircraft operated under 14 CFR part 91 also allows for the deferral of inoperative items or equipment. The primary guidance becomes the FAA-approved MEL issued to that specific operator and N-numbered aircraft.

The FAA has developed master minimum equipment lists (MMELs) for aircraft in current use. Upon written request by an operator, the local FSDO may issue the appropriate make and model MMEL, along with an LOA, and the preamble. The operator then develops operations and maintenance (O&M) procedures from the MMEL. This MMEL with O&M procedures now becomes the operator's MEL. The MEL, LOA, preamble, and procedures document developed by the operator must be on board the aircraft when it is operated. The FAA considers an approved MEL to be a supplemental type certificate (STC) issued to an aircraft by serial number and registration number. It, therefore, becomes the authority to operate that aircraft in a condition other than originally type certificated.

With an approved MEL, if the position lights were discovered inoperative prior to a daytime flight, the pilot would make an entry in the maintenance record or discrepancy record provided for that purpose. The item is then either repaired or deferred in accordance with the MEL. Upon confirming that daytime flight with inoperative position lights is acceptable in accordance with the provisions of the MEL, the pilot would leave the position lights switch OFF, open the circuit breaker (or whatever action is called for in the procedures document), and placard the position light switch as INOPERATIVE.

There are exceptions to the use of the MEL for deferral. For example, should a component fail that is not listed in the MEL as deferrable (the tachometer, flaps, or stall warning device, for example), then repairs are required to be performed prior to departure. If maintenance or parts are not readily available at that location, a special flight permit can be obtained from the nearest FSDO. This permit allows the aircraft to be flown to another location for maintenance. This allows an aircraft that may not currently meet applicable airworthiness requirements, but is capable of safe flight, to be operated under the restrictive special terms and conditions attached to the special flight permit.

Deferral of maintenance is not to be taken lightly, and due consideration should be given to the effect an inoperative component may have on the operation of an aircraft, particularly if other items are inoperative. Further information regarding MELs and operations with inoperative equipment can be found in AC 91-67, Minimum Equipment Requirements for General Aviation Operations Under CFR Part 91.

Preventive Maintenance

Preventive maintenance is considered to be simple or minor preservation operations and the replacement of small standard parts, not involving complex assembly operations. Allowed items of preventative maintenance are listed and limited to the items of 14 CFR part 43, appendix A(c).

Maintenance Entries

All pilots who maintain or perform preventive maintenance must make an entry in the maintenance record of the aircraft. The entry must include:

1. A description of the work, such as "changed oil (Shell Aero-50) at 2,345 hours."
2. The date of completion of the work performed.
3. The entry of the pilot's name, signature, certificate number, and type of certificate held.

Examples of Preventive Maintenance

The following examples of preventive maintenance are taken from 14 CFR Part 43, Maintenance, Preventive Maintenance, Rebuilding, and Alternation, which should be consulted for a more in-depth look at preventive maintenance a pilot can perform on an aircraft. Remember, preventive maintenance is limited to work that does not involve complex assembly operations and includes:

- Removal, installation, and repair of landing gear tires and shock cords; servicing landing gear shock struts by adding oil, air, or both; servicing gear wheel bearings; replacing defective safety wiring or cotter keys; lubrication not requiring disassembly other than removal of nonstructural items such as cover plates, cowlings, and fairings; making simple fabric patches not requiring rib stitching or the removal of structural parts or control surfaces. In the case of balloons, the making of small fabric repairs to envelopes (as defined in, and in accordance with, the balloon manufacturer's instructions) not requiring load tape repair or replacement.
- Replenishing hydraulic fluid in the hydraulic reservoir; refinishing decorative coating of fuselage, balloon baskets, wings, tail group surfaces (excluding balanced control surfaces), fairings, cowlings, landing gear, cabin, or flight deck interior when removal or disassembly of any primary structure or operating system is not required; applying preservative or protective material to components where no disassembly of any primary structure or operating system is involved and where such coating is not prohibited or is not contrary to good practices; repairing upholstery and decorative furnishings of the cabin, flight deck, or balloon basket interior when the repair does not require disassembly of any primary structure or operating system or interfere with an operating system or affect the primary structure of the aircraft; making small, simple repairs to fairings, nonstructural cover plates, cowlings, and small patches and reinforcements not changing the contour to interfere with proper air flow; replacing side windows where that work does not interfere with the structure or any operating system such as controls, electrical equipment, etc.
- Replacing safety belts, seats or seat parts with replacement parts approved for the aircraft, not involving disassembly of any primary structure or operating system, bulbs, reflectors, and lenses of position and landing lights.
- Replacing wheels and skis where no weight-and-balance computation is involved; replacing any cowling not requiring removal of the propeller or disconnection of flight controls; replacing or cleaning spark plugs and setting of spark plug gap clearance; replacing any hose connection, except hydraulic connections; however, prefabricated fuel lines may be replaced.
- Cleaning or replacing fuel and oil strainers or filter elements; servicing batteries, cleaning of balloon burner pilot and main nozzles in accordance with the balloon manufacturer's instructions.
- The interchange of balloon baskets and burners on envelopes when the basket or burner is designated as interchangeable in the balloon type certificate data and the baskets and burners are specifically designed for quick removal and installation; adjustment of nonstructural standard fasteners incidental to operations.
- The installations of anti-misfueling devices to reduce the diameter of fuel tank filler openings only if the specific device has been made a part of the aircraft type certificate data by the aircraft manufacturer, the aircraft manufacturer has provided FAA-approved instructions for installation of the specific device, and installation does not involve the disassembly of the existing tank filler opening; troubleshooting and repairing broken circuits in landing light wiring circuits.
- Removing and replacing self-contained, front instrument panel-mounted navigation and communication devices employing tray-mounted connectors that connect the unit when the unit is installed into the instrument panel; excluding automatic flight control systems, transponders, and microwave frequency distance measuring equipment (DME). The approved unit must be designed to be readily and repeatedly removed and replaced, and pertinent instructions must be provided.

Prior to the unit's intended use, an operational check must be performed in accordance with the applicable sections of 14 CFR part 91 on checking, removing, and replacing magnetic chip detectors.

- Inspection and maintenance tasks prescribed and specifically identified as preventive maintenance in a primary category aircraft type certificate or supplemental type certificate holder's approved special inspection and preventive maintenance program when accomplished on a primary category aircraft.
- Updating self-contained, front instrument panel-mounted air traffic control (ATC) navigational software databases (excluding those of automatic flight control systems, transponders, and microwave frequency DME) only if no disassembly of the unit is required and pertinent instructions are provided; prior to the unit's intended use, an operational check must be performed in accordance with applicable sections of 14 CFR part 91.

Certificated pilots, excluding student pilots, sport pilots, and recreational pilots, may perform preventive maintenance on any aircraft that is owned or operated by them provided that aircraft is not used in air carrier service or 14 CFR part 121, 129, or 135. A pilot holding a sport pilot certificate may perform preventive maintenance on an aircraft owned or operated by that pilot if that aircraft is issued a special airworthiness certificate in the LSA category. (Sport pilots operating LSA should refer to 14 CFR part 65 for maintenance privileges.) 14 CFR part 43, appendix A, contains a list of the operations that are considered to be preventive maintenance.

Repairs and Alterations

Repairs and alterations are classified as either major or minor. 14 CFR part 43, appendix A, describes the alterations and repairs considered major. Major repairs or alterations shall be approved for return to service on FAA Form 337, Major Repair and Alteration, by an appropriately rated certificated repair station, an FAA-certificated A&P mechanic holding an IA, or a representative of the Administrator. Minor repairs and minor alterations may be approved for return to service with a proper entry in the maintenance records by an FAA-certificated A&P mechanic or an appropriately certificated repair station.

For modifications of experimental aircraft, refer to the operating limitations issued to that aircraft. Modifications in accordance with FAA Order 8130.2, Airworthiness Certification of Aircraft and Related Products, may require the notification of the issuing authority.

Special Flight Permits

A special flight permit is a Special Airworthiness Certificate authorizing operation of an aircraft that does not currently meet applicable airworthiness requirements but is safe for a specific flight. Before the permit is issued, an FAA inspector may personally inspect the aircraft, or require it to be inspected by an FAA-certificated A&P mechanic or an appropriately certificated repair station to determine its safety for the intended flight. The inspection shall be recorded in the aircraft records.

The special flight permit is issued to allow the aircraft to be flown to a base where repairs, alterations, or maintenance can be performed; for delivering or exporting the aircraft; or for evacuating an aircraft from an area of impending danger. A special flight permit may be issued to allow the operation of an overweight aircraft for flight beyond its normal range over water or land areas where adequate landing facilities or fuel is not available.

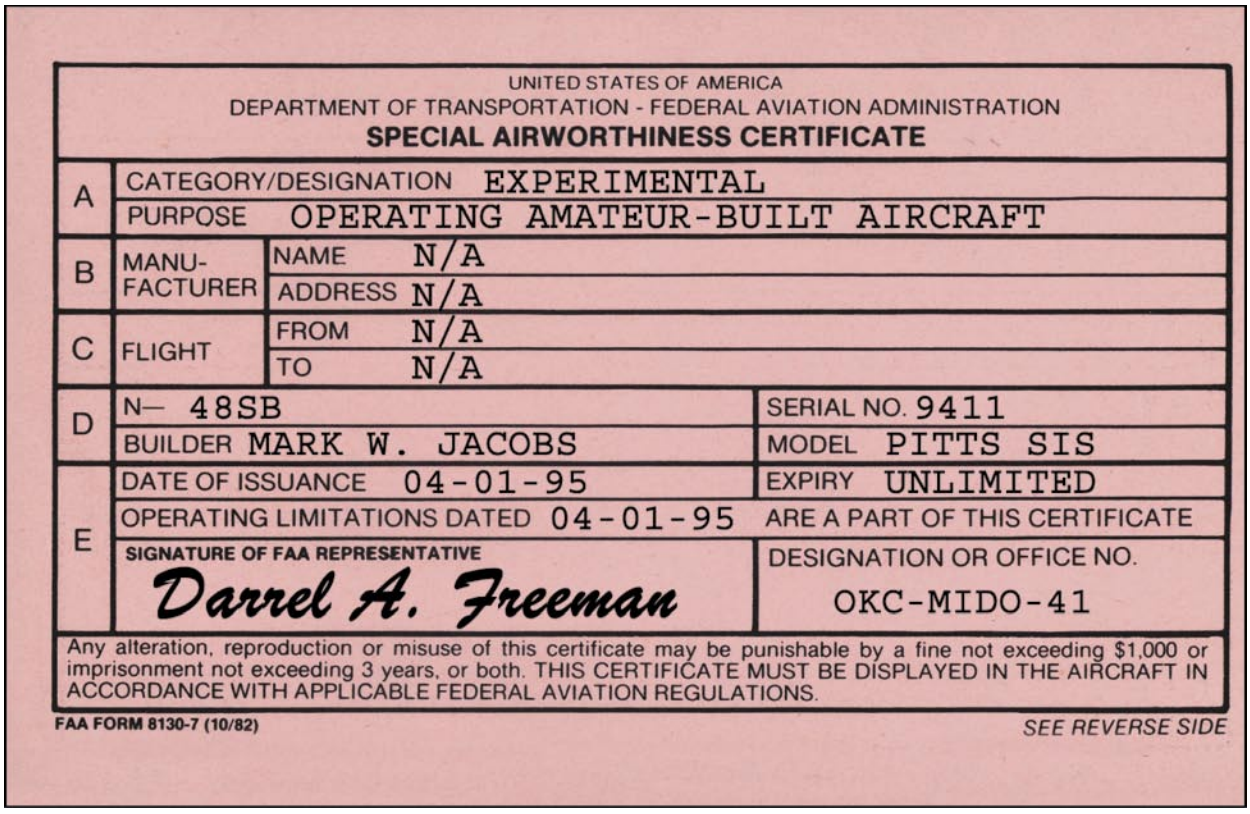
If a special flight permit is needed, assistance and the necessary forms may be obtained from the local FSDO or Designated Airworthiness Representative (DAR). *[Figure 8-10]*

Airworthiness Directives (ADs)

A primary safety function of the FAA is to require correction of unsafe conditions found in an aircraft, aircraft engine, propeller, or appliance when such conditions exist and are likely to exist or develop in other products of the same design. The unsafe condition may exist because of a design defect, maintenance, or other causes. 14 CFR part 39 and Airworthiness Directives (ADs) define the authority and responsibility of the Administrator for requiring the necessary corrective action. ADs are used to notify aircraft owners and other interested persons of unsafe conditions and to specify the conditions under which the product may continue to be operated. ADs are divided into two categories:

1. Those of an emergency nature requiring immediate compliance prior to further flight
2. Those of a less urgent nature requiring compliance within a specified period of time

ADs are regulatory and shall be complied with unless a specific exemption is granted. It is the responsibility of the aircraft owner or operator to ensure compliance with all pertinent ADs, including those ADs that require recurrent or continuing action. For example, an AD may require a repetitive inspection each 50 hours of operation, meaning the particular inspection shall be accomplished and recorded



UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION
SPECIAL AIRWORTHINESS CERTIFICATE

A	CATEGORY/DESIGNATION	EXPERIMENTAL	
	PURPOSE	OPERATING AMATEUR-BUILT AIRCRAFT	
B	MANU-FACTURER	NAME N/A	
		ADDRESS N/A	
C	FLIGHT	FROM N/A	
		TO N/A	
D	N— 48SB		SERIAL NO. 9411
	BUILDER MARK W. JACOBS		MODEL PITTS SIS
E	DATE OF ISSUANCE 04-01-95		EXPIRY UNLIMITED
	OPERATING LIMITATIONS DATED 04-01-95		ARE A PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE Darrel A. Freeman		DESIGNATION OR OFFICE NO. OKC-MIDO-41

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding $1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA FORM 8130-7 (10/82) SEE REVERSE SIDE

Figure 8-10. *FAA Form 8130-7, Special Airworthiness Certificate.*

every 50 hours of time in service. Owners/operators are reminded there is no provision to overfly the maximum hour requirement of an AD unless it is specifically written into the AD. To help determine if an AD applies to an amateur-built aircraft, contact the local FSDO.

14 CFR section 91.417 requires a record to be maintained that shows the current status of applicable ADs, including the method of compliance; the AD number and revision date, if recurring; next due date and time; the signature; kind of certificate; and certificate number of the repair station or mechanic who performed the work. For ready reference, many aircraft owners have a chronological listing of the pertinent ADs in the back of their aircraft, engine, and propeller maintenance records.

All ADs and the AD Biweekly are free on the Internet at http://rgl.faa.gov. In July of 2007, the FAA made ADs available through e-mail. Individuals can enroll for the e-mail service at the link above. Mailing paper copies of ADs will be discontinued when the e-mail system is proven to be effective.

Paper copies of the Summary of Airworthiness Directives and the AD Biweekly may be purchased from the Superintendent of Documents. The Summary contains all the valid ADs previously published and is divided into two areas. The small aircraft and helicopter books contain all ADs applicable to small aircraft (12,500 pounds or less maximum certificated takeoff weight) and ADs applicable to all helicopters. The large aircraft books contain all ADs applicable to large aircraft.

For current information on how to order paper copies of AD books and the AD Biweekly visit the FAA online regulatory and guidance library at: http://rgl.faa.gov.

Aircraft Owner/Operator Responsibilities

The registered owner/operator of an aircraft is responsible for:

- Having a current Airworthiness Certificate and a Certificate of Aircraft Registration in the aircraft.
- Maintaining the aircraft in an airworthy condition, including compliance with all applicable ADs, and assuring that maintenance is properly recorded.
- Keeping abreast of current regulations concerning the operation and maintenance of the aircraft.
- Notifying the FAA Aircraft Registry immediately of any change of permanent mailing address, or of the sale or export of the aircraft, or of the loss of the eligibility to register an aircraft. (Refer to 14 CFR section 47.41.)

- Having a current Federal Communications Commission (FCC) radio station license if equipped with radios, including emergency locator transmitter (ELT), if operated outside of the United States.

Chapter Summary

Knowledge of an aircraft's AFM/POH and documents such as ADs help a pilot to have ready access to pertinent information needed to safely fly a particular aircraft. By understanding the operations, limitations, and performance characteristics of the aircraft, the pilot can make good flight decisions. By learning what preventive maintenance is allowed on the aircraft, a pilot can maintain his or her aircraft in an airworthy condition. The goal of every pilot is a safe flight; flight manuals and aircraft documentation are essential tools used to reach that goal.