



PRACTICAL

**AVIATION &
AEROSPACE**

LAW

J. Scott Hamilton and Sarah Nilsson
EIGHTH EDITION



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Practical Aviation & Aerospace Law

Eighth Edition

J. Scott Hamilton, Sarah Nilsson

Aviation Supplies & Academics, Inc.

7005 132nd Place SE

Newcastle, Washington 98059

asa@asa2fly.com | 425-235-1500 | asa2fly.com

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PREFACE

Practical Aviation and Aerospace Law is designed to be used in conjunction with the *Practical Aviation and Aerospace Law Workbook* as a university text for aviation and aerospace law courses and, standing alone, as a reference guide for aviation and aerospace business managers, pilots, mechanics, aircraft owners, and others involved in aviation by vocation or avocation.

Originally titled simply *Practical Aviation Law*, beginning with the first edition in 1991 and continuing through the sixth edition in 2015, the book has continuously grown in response to industry developments and instructor feedback. In much of the world, aviation is generally considered to be included in the term “aerospace industry,” but in the United States, a distinction has persisted, with the term “aviation industry” generally encompassing operations, repair and maintenance, while “aerospace industry” is used to refer to aircraft, spacecraft, and component design and manufacturing, and now also spaceflight, as well as uncrewed aircraft operations.

With the recent expansion of the number of companies engaged in commercial spacecraft design and manufacturing, and most of these companies engaging in or preparing to engage in operation of those spacecraft (beyond the flight test phase) for commercial purposes, it appeared timely to add a new chapter covering the law of commercial spaceflight operations in the sixth edition, and UAS operations in the seventh edition. The addition of “*and Aerospace*” to the title signified the book’s expanded scope for the sixth and subsequent editions. To that end, Dr. Sarah Nilsson, Professor at Embry-Riddle Aeronautical University, became the first contributing author since the book’s inception and provided the new spaceflight law chapter in the sixth edition; an uncrewed aircraft systems law chapter in the seventh; which now in the eighth edition also includes advanced air mobility (AAM) law.

Except for certain treaties having worldwide or at least multinational effect, the scope of previous editions of the book has been limited to the law of the United States and may have had little relevance to the domestic laws of other nations. In keeping with the truly global nature of the aviation and aerospace industries and in recognition of the

worldwide employment opportunities that offers, the new editions began what is likely to be a long-term effort to continually expand the global perspective. The book does not attempt to explore the entire seamless web of the law—only those areas particularly applicable to aviation and aerospace. The authors recommend that students considering a career in aviation and aerospace, whether in operations, maintenance, engineering, manufacturing or business management, also take courses in business law and aviation labor relations. While there is some overlap between the content of those courses and this text, those give much broader and deeper coverage of some of the legal concepts and principles studied here.

As the title suggests, this book takes a practical viewpoint. It aims to provide the reader with basic legal knowledge and perspectives along with an understanding of how the legal system works in relation to aviation and aerospace activities. It aims to provide that in a form that can be applied to help you recognize and avoid common legal pitfalls, and to recognize when the moment has come to stop what you are doing and consult your lawyer. If this book had a subtitle, it would be *How to Avoid Aviation Lawyers and When to Call One*.

No book can hope to advise you what to do in every conceivable situation. In advising our clients, lawyers must take into consideration not only the law but also the facts and circumstances. In over thirty-five years of practicing law—in private practice, as government and later corporate counsel—co-author Hamilton represented clients in well over three thousand aviation matters involving every subject in this book, and never saw two identical cases. While similar facts give rise to similar considerations, slight differences in the facts and circumstances often lead to major differences in the best approach to solving the problem. Examples in this book and its accompanying workbook are drawn largely from cases encountered in both authors' practices.

The law itself is also in a constant state of change. Even as we write, the Congress of the United States, fifty state legislatures, and a vast number of administrative agencies are daily making changes to statutes and regulations, while hundreds of federal and state courts are writing and publishing case decisions on the interpretation, application, and constitutionality of those laws and regulations, along with decisions that modify, clarify, or sometimes confuse the common law. Simultaneously, U.S. diplomats are negotiating with their foreign counterparts new or

amended treaties to be ratified by their governments. Such changes as have occurred since the seventh edition of this book was published are one reason for this expanded and updated eighth edition.

While this process of continual change keeps the lawyer's work from becoming routine to the point of boredom, it also means that what was good advice yesterday (or the day this book went to press) may no longer be good advice today. While the fundamental legal principles discussed in this book are less susceptible to sudden obsolescence than, say, a text on the Internal Revenue Code and IRS Regulations, *you are cautioned not to attempt to solve actual individual legal problems on the basis of information contained in this book.* Finding yourself faced with an actual legal problem, you should recognize that the time has come to consult your lawyer.

ACKNOWLEDGMENTS

FROM J. SCOTT HAMILTON

I would like to thank the following people for their encouragement, advice, and support, without which I would not have undertaken and persevered with the writing of this text, the related workbook and teacher's manual, and subsequent updated editions of each. These acknowledgments should not be construed to imply an endorsement of this teaching system by any of the persons or organizations mentioned.

Dr. Stacy Weislogel, chair, Department of Aviation, The Ohio State University, one of the first to urge me to write this book.

Professor Gary Kiteley of Auburn University, who retired in 2001 as executive director of the University Aviation Association, an organization that consistently provides a wonderful forum and source of information to those of us who teach aviation-related courses in colleges and universities. He was a source of encouragement not only in the drafting of the original manuscript for the first edition, but also in the continuously expanded international law coverage of each subsequent edition.

Dr. Rex A. Hammarback, director, University of North Dakota Aviation Foundation and formerly a professor in UND's renowned aviation program, who after I had explained my concept for the book said simply and directly: "If you write it, I'll use it."

Hon. John E. Faulk, NTSB administrative law judge (retired), a practicing attorney with the Trachtman law firm in Melbourne, Florida, and an adjunct professor in the School of Aeronautics at the Florida Institute of Technology. Many of his recommendations based on his classroom experience using this teaching system have been incorporated as improvements to each successive edition.

Professor Terri Haynes, Chadron State College, Chadron, Nebraska. She deserves particular credit for strongly encouraging me to avoid "legalese" jargon wherever possible in favor of plain English to make

the book as clear and understandable as possible to students and other readers having no previous training in the law.

Jonathan Stern, Esq., partner in the Washington, D.C. office of the world-renowned Schnader, Harrison, Segal & Lewis law firm and editor of the American Bar Association's *Aviation Litigation Quarterly*. Jon has been especially helpful in providing materials, insights, and updates on the continuing evolution of international law governing airline liability.

Bill Behan, CEO, AssuredPartners Aerospace, Golden, Colorado. Bill has been a reliable source of information on developments in the ever changing field of aviation insurance.

John and Kathleen Yodice, a father-and-daughter team in the Yodice & Associates law firm in Bethesda, Maryland, who do yeoman service for general aviation as legal counsel for the Aircraft Owners & Pilots Association and other clients and have proved themselves reliable sources of insights into recent developments in FAA enforcement, aviation medical, and airport and airspace access issues.

Professors Robert Kaps of Southern Illinois University (Carbondale) and Timm Bliss of Oklahoma State University, co-authors with me of the *Labor Relations in Aviation and Aerospace* textbook and study guide with supplemental readings, published by Southern Illinois University Press, and Professor Jack Panosian of Embry-Riddle Aeronautical University's Prescott, Arizona, campus, who strongly encouraged that effort. All of them also use this *Practical Aviation & Aerospace Law* text and motivated me to expand the coverage of Chapter 17 to provide students a broader introduction to that topic.

Dr. Sarah Nilsson, Professor, Embry-Riddle Aeronautical University, friend, admired colleague, practicing attorney, and coauthor of this text.

Dr. Harry W. Lawrence, transportation lawyer, adjunct professor and author of *Aviation & the Role of Government* for engaging in a long-running colloquy that has led to many improvements in this text over the years.

The Lawyer-Pilots Bar Association, Southern Methodist University's *Journal of Air Law and Commerce*; DePaul University College of Law's International Aviation Law Institute (IALI) and its journal, *Issues in Aviation Law and Policy*; and the University of Denver's *Transportation Law Journal*, each of which consistently provides wonderful forums

and opportunities for attorneys and others interested in aviation and aerospace law to share knowledge and ideas in print and face-to-face in an atmosphere of professional collegiality. They continue to contribute greatly to the advancement of the legal profession and the quality of legal service to aviation and aerospace clients.

Colleagues teaching aviation and aerospace law courses at numerous colleges and universities who provide feedback and suggestions that contribute to the continuous improvement of each successive edition of this teaching system.

Our students, past and present, who continue to relentlessly question, challenge, and demand clear explanations and sound reasoning, rightly refusing to settle for less.

Not unlike the airline and aerospace industries, the publishing industry is in dynamic change as publishing companies merge, are acquired, go out of business, or adjust their scope and market focus, particularly in response to technological advancements in alternative means of dissemination of knowledge. Through all this change, successive editors at Iowa State University Press, Blackwell Publishing Professional, and now Aviation Supplies & Academics have recognized the need for this teaching system and its periodic updates, turning my vision into the solid reality you are now holding in your hand or viewing on your electronic device.

My family, who encouraged me in this project and more-or-less cheerfully tolerated the many hours I spent sequestered writing and updating this work (often after a full day of practicing aviation law, running a corporation or teaching), and especially my late wife Charlotte, who did most of the work of preparing the original and several subsequent manuscripts.

The credit is theirs; the errors are mine.

FROM SARAH NILSSON

I would like to thank the following people for their encouragement, advice, and support. First and foremost, Dr. Hamilton for being my long-time mentor and friend, not to mention the reason so many opportunities in my aviation law profession came my way. From the start, he has been my biggest supporter. He had absolute faith in me when he offered me the task of writing the commercial space law chapter of the sixth edition of this text. That task gave me the courage I needed to author my own textbook, *Drones Across America*, with the American Bar Association in 2017; and the eBook *Drones Across the World* (eaglepubs.erau.edu/dronesacrosstheworld), with Embry-Riddle Aeronautical University in 2023.

As an intern in law school, I owe a debt of gratitude to my first aviation attorney boss, Michael Pearson, for giving me a chance to learn from one of Arizona's best.

As a budding aviation attorney in 2015, I would also like to acknowledge John and Kathleen Yodice for their inspiration and training starting with their weekend seminar, *Representing Airmen and Air Agencies in FAA Enforcement Matters*, in Salinas, California, and continuing throughout her last five years in private practice when Kathy was kind enough to continue her mentorship.

My students, past and present, for being the reason I continue to work on improving my teaching and learning. My clients, for never allowing a dull moment and continuing to challenge me to mold my practice to industry demands.

Lastly, to my soulmate, Bill Lange, for his support in all things, as I wrote eighth edition revisions way into the wee hours of the night. From the very first day we met, he has been my staff of strength, source of wit and humor, and cup of abundant love.

Thank you all. I am eternally grateful for your support and I remain your humble advocate for improving what parts of this industry as are within my purview.

NOTES ON THE TEXT

Unless otherwise noted, all opinions expressed herein are entirely our own and do not necessarily reflect the views of our employers, past or present.

All photos and illustrations are by the authors, unless otherwise credited.

The use of proper language and phraseology is of crucial importance in the law. The primary use of *italics* in the text is to alert you to the introduction of a law, legal word or phrase you need to understand to grasp the concepts under discussion, though italics are also occasionally used to give special emphasis to a point. The authors strive to maintain an informal, conversational tone wherever possible. To that end, wherever stories from our personal professional experiences are used to illustrate our points we simply refer to ourselves as Scott or Sarah.

The law is constantly evolving to keep abreast of challenges presented by the evolution of society and technology. The aviation and aerospace industries are among the most dynamic of all enterprises, and thus the locus of some of the most continual legal change. The reader can watch for changes that may occur after this book is in print by consulting the ASA website at asa2fly.com/prlaw.

ABOUT THE AUTHORS

J. SCOTT HAMILTON is an adjunct professor and course developer at Embry-Riddle Aeronautical University, formerly assistant professor and faculty chair. He previously served as general counsel for the Civil Air Patrol, then as the national organization's chief operating officer. Prior to that, he served as senior assistant attorney general for the State of Wyoming. While practicing aviation law in Colorado, he also was a faculty member at the University of Denver College of Law, as well as Metropolitan State College of Denver. He is an experienced pilot and skydiver who served as a HALO instructor in the Green Berets. Hamilton is widely published on aviation law and has received many honors, including induction into the Colorado and Arkansas Aviation Halls of Fame and the International Skydiving Hall of Fame.

SARAH NILSSON is a tenured professor at Embry-Riddle Aeronautical University and a practicing attorney in Arizona, where her practice focuses on aviation/aerospace and business law. Sarah gained extensive aviation operating experience working as a cargo pilot and flight instructor. She maintains her crewed pilot certificates and ratings and still flies her personal aircraft, a Cherokee 235. She has also obtained remote pilot certificates in the US, Canada, and the UK. She volunteers as a safety representative and DronePro on the FAA Safety Team. Her research interests include aviation, space, uncrewed aircraft, and advanced air mobility law.

Her other textbook that remains current, as she updates it regularly, is an eBook, *Drones Across the World*, (eaglepubs.erau.edu/dronesacrosstheworld) published with Embry-Riddle Aeronautical University in 2023.

PART I

ADMINISTRATIVE LAW

1

REGULATORY AGENCIES AND INTERNATIONAL ORGANIZATIONS

If you are involved in aviation, you will deal with administrative agency regulations far more frequently than any other area of the law. Indeed, you will probably be confronted with making decisions based on the Federal Aviation Regulations (FARs) on a daily basis. Those regulations also establish standards of legal behavior by which a judge or jury may later decide whether you and your employer are legally liable for negligence in the event of an aircraft accident. Hardly any aspect of aviation today is unaffected by these regulations. That is why we begin with an examination of administrative law, with particular focus on the role of the Federal Aviation Administration (FAA) in administering the federal program of air safety regulation.

Since the 1920s, Congress has created a plethora of regulatory agencies to administer the many federal programs it has initiated. Indeed, federal agencies continue to grow and multiply, under Democratic and Republican administrations alike. We start here with an overview of the numerous U.S. administrative agencies most directly involved with some aspect of aviation, distinguishing them from each other according to the specific role played by each in regulating aviation. Although this chapter focuses on the U.S. model, virtually all nations have their own counterparts of these agencies, engaged in similar aviation regulatory activities. For example, at least 193 nations have their own domestic counterpart of the FAA, such as the European Union's European Aviation Safety Agency, the Civil Aviation Authority of Singapore, the National Civil

Aviation Agency of Brazil, the United Arab Emirates' General Civil Aviation Authority, and the Civil Aviation Administration of China.

The ease with which civil aircraft cross national borders, air transportation's key role in the global economy, and horrific and effective use of civil airliners as weapons of terror have made the regulation and development of civil aviation a continuing subject of not only national but also international concern.

This chapter also introduces the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA), organizations that, although not technically regulatory agencies, play an important role in harmonizing technical standards for civil aviation worldwide.

FEDERAL ADMINISTRATIVE AGENCIES

The terrorist attacks of September 11, 2001, shook the United States to the core. Few industries—indeed, few aspects of American life—were untouched, though some were more deeply affected than others. Civil aviation, having been so infamously and effectively abused in these attacks as a weapon of terror, has borne the brunt of these changes.

One of the results of the attacks was the most sweeping reorganization of the federal government in over a half-century.

Transportation Security Administration (TSA) (tsa.gov)

Barely two months after the attacks and for the express purpose of improving security in all modes of transportation, including civil aviation, Congress enacted the *Aviation and Transportation Security Act of 2001*, creating the Transportation Security Administration (TSA). The TSA was originally established as an operating agency of the Department of Transportation (DOT), but moved into the Department of Homeland Security (DHS) when that agency was created.

Previously, operators of airports served by commercial airlines had been responsible for airport security, relying primarily on contractors, with some FAA oversight. The new law brought the responsibility for day-to-day screening of airline passengers, baggage and cargo into the federal arena, under the TSA, which immediately set about hiring and

training security personnel. Most of the new federal screeners were the same individuals previously employed by those contractors that had been performing the function prior to its federalization. With a change of uniform and some additional training, they returned to the same work. However, in late 2004, the Screening Partnership Program (SPP) enabled airports to obtain TSA approval to replace those federal screeners with qualified, TSA-approved private sector vendors. At this writing, some twenty-two airports have taken advantage of the SPP and now utilize private sector contractors to provide passenger and baggage screening services.

The TSA also took over from the FAA the responsibility for inspecting and testing security measures at airports, with the added responsibility for the same at other transportation facilities, including foreign aircraft repair stations. Congress also empowered the TSA to receive, assess, and distribute intelligence information related to transportation security. The new agency was directed to develop plans, policies, and strategies for dealing with threats to transportation security and to coordinate countermeasures with other federal agencies. Congress also ordered that the Federal Air Marshal program be beefed up and that steps be taken to increase the availability and use of explosive detection systems at air carrier airports.

Under the Secure Flight Program, the TSA is now responsible for maintaining the Terrorist Watchlist and related No Fly and Selectee lists. The “watch list” of known and suspected terrorists is a uniform list used to identify persons who should be prevented from boarding (the No Fly List) or who should undergo additional security scrutiny (the Selectee List). The TSA began taking over the responsibility for the pre-boarding matching of airline passengers’ names against these lists from the airlines in early 2009.

Transportation Security Oversight Board (TSOB)

Congress’ initial investigation into the terrorist attacks of September 11, 2001, revealed that various federal law enforcement agencies had clues that, if assembled together and investigated coherently, might have revealed the plot and enabled prevention, but that these agencies tended to hoard, rather than share, potentially crucial intelligence information.

In an effort to address that shortcoming, the *Aviation and Transportation Security Act* also created the Transportation Security Oversight Board (TSOB), an extremely high-level panel composed of the Secretaries of Homeland Security, Transportation, Defense, and Treasury; the Attorney General, and the Director of National Intelligence (or designees of any of the foregoing), along with a presidential appointee representing the National Security Council (NSC). The TSOB was made responsible for assuring the coordination and sharing of intelligence relating to threats against transportation.

Department of Homeland Security (DHS) (dhs.gov)

Next, Congress and President George W. Bush created the new Department of Homeland Security (DHS), now the largest federal department. Paralleling President Truman's epic 1947 merger of all branches of the U.S. armed forces into a new Department of Defense (DoD) to better coordinate the nation's defense against military threats, 24 federal agencies were brought under the new DHS to protect the nation against further terrorist attacks and respond to natural disasters. Agencies brought into the DHS include the following (*italics* indicate the agency's former home in the federal bureaucracy):

Secret Service

Coast Guard (*Department of Transportation*)

U.S. Customs Service (*Department of the Treasury*)

Immigration and Naturalization Service (INS), since 2002, U.S.

Citizenship and Immigration Services (USCIS) (part, from *Department of Justice*)

Transportation Security Administration (TSA) (*Department of Transportation*)

Federal Protective Service (*General Services Administration*)

Federal Law Enforcement Training Center (*Department of the Treasury*)

Animal & Plant Health Inspection Service (part, from *Department of Agriculture*)

Office for Domestic Preparedness (*Department of Justice*)

Federal Emergency Management Agency (*FEMA*)

Strategic National Stockpile & Disaster Medical System
(*Department of Health and Human Services*)
Nuclear Incident Response Team (*Department of Energy*)
Domestic Emergency Response Teams (*Department of Justice*)
National Domestic Preparedness Office (*FBI*)
CBN Countermeasures Program (*Department of Energy*)
Environmental Measures Laboratory (*Department of Energy*)
National Biological Warfare Defense Analysis Center (*Department of Defense*)
Plum Island Animal Disease Center (*Department of Agriculture*)
Critical Infrastructure Assurance Office (*Department of Commerce*)
Federal Computer Incident Response Center (*General Services Administration*)
National Communications System (*Department of Defense*)
National Infrastructure Protection Center (*FBI*)
Energy Security and Assurance Program (*Department of Energy*)

The *Aviation and Transportation Security Act* originally assigned the attorney general responsibility for screening all aliens applying for training at U.S. flight schools for security risks. Due to comparatively low fuel costs, prevalent VFR weather, and abundant suitable airspace, the United States (and particularly Florida and the desert southwest) was a popular destination for large numbers of foreigners wishing to learn to fly (and land). This new requirement hit U.S. flight schools—many of which were heavily reliant on foreign students—hard and hundreds closed their doors. This screening duty was later transferred to the new DHS and limited to students desiring to learn to fly aircraft with a maximum certificated gross takeoff weight of more than 12,500 pounds. As required by Congress, DHS now gives quick service to these foreign students, acting on them within five days.

Aviation security law is discussed in much greater detail in Chapter 15.

Department of Transportation (DOT) (dot.gov)

The U.S. Department of Transportation houses a variety of federal agencies dealing with policy and regulation of various means of transportation of people and goods. DOT agencies having jurisdiction over various aspects of transportation include the Federal Aviation Administration

(FAA), Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), Maritime Administration (MARAD), National Highway Traffic Safety Administration (NHTSA), Pipeline and Hazardous Materials Safety Administration (PHMSA), Research and Innovative Technology Administration (RITA), St. Lawrence Seaway Development Corporation (SLSDC), and Surface Transportation Board (STB). The head of the agency is the Secretary of Transportation.

In civil aviation, the DOT amasses and publishes a wealth of detailed operational and financial data and statistics on airlines and airports, available online at bts.gov/topics/airlines-and-airports-0.

The DOT also issues certificates of economic authority to U.S. carriers for interstate or foreign passengers and/or cargo and mail authority, a certificate for interstate or foreign all-cargo authority, or authorization as a commuter air carrier, as well as foreign air carrier permits to foreign airlines designated by their nations to provide service to the United States pursuant to treaty. The DOT consults with the State Department in the foreign air carrier approval process. Permit issuance requires presidential approval. The president may disapprove a specific foreign carrier only for foreign relations or national security reasons. Such permits have occasionally been denied or withdrawn in the application of U.S. foreign policy, as when Aeroflot's permit was suspended following the Soviet Union's invasion of Afghanistan.

The DOT also regulates deceptive and anticompetitive practices by airlines and airports to protect consumers and foster competition in the airline industry.

Federal Aviation Administration (FAA) ([faa.gov](https://www.faa.gov))

In the *Federal Aviation Act of 1958*, Congress made the FAA primarily responsible for the safe and efficient use of the nation's airspace. The agency's influence on the entire aviation industry is pervasive.

The FAA Administrator is the head of the agency, and likely the single most influential person in U.S. civil aviation.

For many years, the FAA (and its predecessor, the Civil Aeronautics Authority, or CAA) enjoyed independent agency status within the

federal bureaucracy, an arrangement that afforded the administrator direct access to the president. But now that the FAA is but one of those many divisions of the DOT, the Secretary of Transportation is the sole voice for all of these subordinate agencies in the president's cabinet. Some aviation interests still feel that the development of sound aviation policy has suffered as a result of this organizational structure. A parade of proposals to liberate the FAA from the DOT has come before Congress, but none has passed and as the years go by, it appears even less likely that one will.

For several decades, the position of FAA Administrator was one of the plums of political patronage. The administrator served at the pleasure of the president, and turnover in the position was frequent, averaging about every two years—hardly sufficient time to accomplish anything in so ponderous a bureaucracy. Now, however, the individual appointed to the position is assured a five-year term in office.

The FAA's activities cover a wide range, and include:

1. Regulation

The FAA regulates aviation safety, airspace use, and, to a certain extent, aircraft noise. The primary laws promulgated and enforced by the FAA are the Federal Aviation Regulations (FARs), found in Title 14 of the Code of Federal Regulations (14 CFR). This pervasive body of regulations addresses every conceivable aspect of aviation safety. Additionally, through those regulations prescribing airworthiness standards for the certification of new aircraft, the FAA has established aircraft noise limits. These regulations, developed in consultation with the Environmental Protection Agency (EPA), deserve credit as the primary incentive for development of the quieter high bypass ratio fanjet engines that came into use on the second generation of airline transport jets—the Boeing 747, Lockheed L-1011, and McDonnell Douglas DC-10. In comparison, the straight turbojet engines used on the first generation of jet transports, such as the Boeing 707, Douglas DC-8, and Convair 880, were positively thunderous. Indeed, as we'll see in Chapter 13, that first generation of airline jets (whose noise was not regulated by the FAA) appears largely responsible for creating the widespread enmity that persists today between airports and their noise-sensitive neighbors. Although these noisy "Stage 1" jets are now banned from flying in the United States

unless retrofitted with quieter new-technology engines or “hush kits,” the legacy of public hostility toward airports engendered decades ago by their noise remains an effective obstacle to the development of new and the expansion of existing airports in this country.

The FAA also recently imposed noise limits on propeller-driven light and commuter aircraft receiving FAA type certification in 2006 and later, based on criteria developed by the International Civil Aviation Organization (ICAO, discussed later in this chapter).

Congress has also given the FAA sole regulatory authority over suborbital spacecraft, in the *Commercial Space Launch Amendments Act of 2004*, intended to encourage private enterprise investment and participation by avoiding overregulation of this developing area of commercial activity, recognizing that spaceflight is inherently more risky than flight in the atmosphere. That authority is now exercised by the FAA’s Office of Commercial Space Transportation, which licenses the launch and re-entry of commercially operated spacecraft. (NASA, however, retains the authority to set safety standards for any spacecraft that carry NASA astronauts or visit NASA destinations, such as the International Space Station.)

In addition to the FARs, the FAA from time to time issues other mandatory orders having the force and effect of law on the subject of aviation safety. The primary examples are Airworthiness Directives (ADs), which are FAA orders requiring some inspection or modification of previously certified aircraft. An AD is usually issued when operating and maintenance experience reveals the need to change some element of the design or fabrication of a particular type of aircraft or component to improve flight safety. The need for such an improvement may be revealed by an accident (or series of accidents), or by reports of difficulties experienced or observed by aircraft operators, inspectors, and mechanics in the field.

In 2022 in its *Advanced Air Mobility and Leadership Act*, Congress gave the FAA another task: to plan for and coordinate efforts to integrate advanced air mobility aircraft into the national airspace system (discussed in greater detail in chapter 19).

2. Certification

It is virtually impossible for a person or business to participate in any aspect of civil aviation in the United States without first obtaining one or more certificates from the FAA. The FAA certifies not only flight crew members—including pilots (student, sport, recreational, private, commercial, and airline transport), flight engineers, flight instructors, flight navigators, and ground instructors—but also airmen other than flight crew members, including air traffic control tower operators, aircraft dispatchers, mechanics, repairmen, parachute riggers and remote pilot certificates for small unmanned aircraft systems. The FAA also issues a great variety of skill-specific ratings to accompany these certificates, as well as aviation medical certificates required of pilots and air traffic controllers (discussed in greater detail in Chapter 3).

The agency also certifies air carriers and commercial operators, including domestic, flag, and supplemental air carriers; foreign air carriers operating in the United States, commuter and on-demand operators, rotorcraft external load operators, agricultural aircraft operators, and airports serving certificated air carriers; pilot schools and aviation training centers, aircraft and component repair stations, and aviation maintenance technician schools. The agency, using safety agreements with other nations, such as Canada, the European community, and Singapore, also enters into partnerships for the conduct of aircraft maintenance and airworthiness approvals.

Additionally, each civil aircraft of U.S. manufacture is the product of three separate FAA inspection and certification processes. An aircraft manufacturer intending to introduce a new aircraft design into the marketplace must first produce prototype aircraft that are subjected to an intense program of both flight and static testing to prove the design's conformity to the certification standards contained in the FARs. Once this test program is completed to the satisfaction of the FAA, an FAA *Type Certificate* is issued, approving the design. Next, the manufacturer's production facilities and quality assurance program are submitted to FAA scrutiny. The agency must be convinced that the manufacturer's production and inspection methods are adequate to ensure that each aircraft produced will precisely replicate the design for which the type certificate was issued. Once this is accomplished, the FAA issues a *Production Type Certificate* and manufacturing can proceed. Next, each



Figure 1-1. If it has an “N-number,” a title search through the FAA Aircraft Registry and the International Registry can reveal who owns it and who has recorded liens against it.

aircraft produced is inspected and tested for conformity with the original design and receives an FAA *Airworthiness Certificate* before being delivered to the customer. Subsequent modifications and improvements to the design require additional FAA certification, through amendments to the Type Certificate, by issuance of a *Supplemental Type Certificate*, or by a one-time field approval for modification of an individual aircraft under an FAA Form 337.

3. Registration

The FAA also operates a single centralized registry for all civil aircraft in the United States and for certain powerful aircraft engines and propellers. The FAA Aircraft Registry in the FAA Aeronautical Center in Oklahoma City maintains files on every aircraft that has ever been issued an “N-number” signifying U.S. registry (*see* Figure 1-1). The files include the entire history of the sequence of owners of the aircraft and other legal interests in the aircraft, such as liens and encumbrances. The utility and importance of this registry is explored in greater detail in Chapter 11, along with its connection to the new International Registry applicable to certain aircraft. The agency also has a separate registry for UAS.

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Dr. J. Scott Hamilton is an adjunct professor and course developer at Embry-Riddle Aeronautical University. He has practiced aviation law, taught at several colleges, and is an experienced pilot and skydiver.



Dr. Sarah Nilsson, also with Embry-Riddle, is a professor and a practicing attorney in Arizona, who specializes in aviation/aerospace and business law. An experienced cargo pilot and flight instructor, she also holds remote pilot certificates in the US, Canada, and the UK.



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