ASA's 2023 FAR/AIM Update

Changes to the Federal Aviation Regulations occur via the *Federal Register*, which is published daily. The *Aeronautical Information Manual* is updated every 180 days, and Advisory Circulars are revised as the FAA deems necessary. ASA tracks all relevant changes to keep you current and informed: the ASA FAR/AIM Series is published annually, and all Updates are available at **asa2fly.com/farupdate** and through a free email subscription service that notifies you of changes affecting the information printed in your books.

ASA's 2023 *FAR/AIM* book is current through August 2, 2022. With this Update, information is current through **July 27, 2023**.

The *AIM* changes (*AIM Change 3* effective November 3, 2022 and *AIM Basic* effective April 20, 2023) begin on page 14.

TITLE 14: AERONAUTICS AND SPACE

PART 61
CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND GROUND INSTRUCTORS

➧ ***Change Date:*** *November 22, 2022*
➧ ***Effective Date:*** *December 22, 2022*
➧ ***Source:*** *Amdt. 61–152, 87 FR 71236*

The authority citation for Part 61 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701–44703, 44707, 44709–44711, 44729, 44903, 45102–45103, 45301–45302.

Amend §61.3 by revising paragraphs (c)(2)(xiii) and (c)(2)(xiv), and adding paragraph (c)(2)(xv) to read as follows:

§61.3 Requirement for certificates, ratings, and authorizations.

* * * * *

(c) * * *

(2) * * *

(xiii) Is exercising the privileges of a student, recreational or private pilot certificate for operations conducted under the conditions and limitations set forth in §61.113(i) and holds a U.S. driver's license;

(xiv) Is exercising the privileges of a flight instructor certificate and acting as pilot in command or a required flightcrew member for operations conducted under the conditions and limitations set forth in §61.113(i) and holds a U.S. driver's license; or

(xv) Is exercising the privileges of a student pilot certificate or higher while acting as pilot in command on a special medical flight test authorized under part 67 of this chapter.

* * * * *

➧ ***Change Date:*** *November 22, 2022*
➧ ***Effective Date:*** *May 22, 2023*
➧ ***Source:*** *Amdt. 61–152, 87 FR 71236*

Effective May 22, 2023, amend §61.3 by revising paragraph (c)(2)(vi) to read as follows:

§61.3 Requirement for certificates, ratings, and authorizations.

* * * * *

(c) * * *

(2) * * *

(vi) Is holding a pilot certificate with a balloon class rating and that person—

(A) Is exercising the privileges of a private pilot certificate in a balloon; or

(B) Is providing flight training in a balloon in accordance with §61.133(a)(2)(ii);

* * * * *

➧ ***Change Date:*** *November 22, 2022*
➧ ***Effective Date:*** *December 22, 2022*
➧ ***Source:*** *Amdt. 61–152, 87 FR 71236*

Amend §61.23 by:

a. Revising paragraphs (b)(8) and (b)(9)(ii);

b. Adding paragraph (b)(10); and

c. Revising paragraphs (c)(3)(i)(C), (c)(3)(i)(D), and (c)(3)(i)(E).

The revisions and additions read as follows:

§61.23 Medical certificates: Requirement and duration.

* * * * *

(b) * * *

(8) When taking a practical test or a proficiency check for a certificate, rating, authorization or operating privilege conducted in a glider, balloon, flight simulator, or flight training device;

(9) * * *

(ii) The flight conducted is a domestic flight operation within U.S. airspace; or

(10) When exercising the privileges of a student pilot certificate or higher while acting as pilot in command on a special medical flight test authorized under part 67 of this chapter.

(c) * * *

(3) * * *

(i) * * *

(C) Complete the medical education course set forth in §68.3 of this chapter during the 24 calendar months before acting as pilot in command or serving as a required flightcrew member in an operation conducted under §61.113(i) and retain a certification of course completion in accordance with §68.3(b)(1) of this chapter;

(D) Receive a comprehensive medical examination from a State-licensed physician during the 48 months before acting as pilot in command or serving as a required flightcrew member of an operation conducted under §61.113(i) and that medical examination is conducted in accordance with the requirements in part 68 of this chapter; and

(E) If the individual has been diagnosed with any medical condition that may impact the ability of the individual to fly, be under the care and treatment of a State-licensed physician when acting as pilot in command or serving as a required flightcrew member of an operation conducted under §61.113(i).

* * * * *

➨ ***Change Date:*** *November 22, 2022*
➨ ***Effective Date:*** *May 22, 2023*
➨ ***Source:*** *Amdt. 61–152, 87 FR 71237*

Effective May 22, 2023, amend §61.23 by:

a. Revising paragraphs (a)(2)(i) and (a)(2)(ii);

b. Adding paragraph (a)(2)(iii);

c. Revising paragraph (b)(3);

d. Redesignating paragraphs (b)(4) through (b)(10) as paragraphs (b)(6) through (b)(12); and

e. Adding new paragraphs (b)(4) and (b)(5);

f. Revising paragraphs (d)(1)(iii) and (d)(2)(i).

The revisions and additions read as follows:

§61.23 Medical certificates: Requirement and duration.

(a) * * *

(2) * * *

(i) Second-in-command privileges of an airline transport pilot certificate in part 121 of this chapter (other than operations specified in paragraph (a)(1)(ii) of this section);

(ii) Privileges of a commercial pilot certificate in an aircraft other than a balloon or glider; or

(iii) Except as provided in paragraph (b)(5) of this section, privileges of a commercial pilot certificate with a balloon class rating for compensation or hire; or

(b) * * *

(3) When exercising the privileges of a pilot certificate with a glider category rating in a glider;

(4) When exercising the privileges of a private pilot certificate with a balloon class rating in a balloon;

(5) When exercising the privileges of a commercial pilot certificate with a balloon class rating in a balloon if the person is providing flight training in accordance with §61.133(a)(2)(ii);

* * * * *

(d) * * *

Medical Certificates: Requirement and Duration			
If you hold	**And on the date of examination for your most recent medical certificate you were**	**And you are conducting an operation requiring**	**Then your medical certificate expires, for that operation, at the end of the last day of the**
(1) A first-class medical certificate	(i) Under age 40	an airline transport pilot certificate for pilot-in-command privileges, or for second-in-command privileges in a flag or supplemental operation in part 121 requiring three or more pilots	12th month after the month of the date of examination shown on the medical certificate.
	(ii) Age 40 or older	an airline transport pilot certificate for pilot-in-command privileges, for second-in-command privileges in a flag or supplemental operation in part 121 requiring three or more pilots, or for a pilot flightcrew member in part 121 operations who has reached his or her 60th birthday.	6th month after the month of the date of examination shown on the medical certificate.
	(iii) Any age	a commercial pilot certificate (other than a commercial pilot certificate with a balloon rating when conducting flight training), a flight engineer certificate, or an air traffic control tower operator certificate.	12th month after the month of the date of examination shown on the medical certificate.
	(iv) Under age 40	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification)	60th month after the month of the date of examination shown on the medical certificate
	(v) Age 40 or older	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification)	24th month after the month of the date of examination shown on the medical certificate

(continued...)

Medical Certificates: Requirement and Duration			
If you hold	**And on the date of examination for your most recent medical certificate you were**	**And you are conducting an operation requiring**	**Then your medical certificate expires, for that operation, at the end of the last day of the**
(2) A second-class medical certificate	(i) Any age	an airline transport pilot certificate for second-in-command privileges (other than the operations specified in paragraph (d)(1) of this section), a commercial pilot certificate (other than a commercial pilot certificate with a balloon rating when conducting flight training), a flight engineer certificate, or an air traffic control tower operator certificate.	12th month after the month of the date of examination shown on the medical certificate.
	(ii) Under age 40	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification)	60th month after the month of the date of examination shown on the medical certificate
	(iii) Age 40 or older	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification)	24th month after the month of the date of examination shown on the medical certificate
(3) A third-class medical certificate	(i) Under age 40	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification)	60th month after the month of the date of examination shown on the medical certificate
	(ii) Age 40 or older	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification)	24th month after the month of the date of examination shown on the medical certificate

➨ ***Change Date:*** *December 9, 2022*
➨ ***Effective Date:*** *December 9, 2022*
➨ ***Source:*** *Amdt. 61–151, 87 FR 75845*

Amend §61.58 by removing paragraphs (j) and (k).

➨ ***Change Date:*** *November 22, 2022*
➨ ***Effective Date:*** *December 22, 2022*
➨ ***Source:*** *Amdt. 61–152, 87 FR 71237*

Amend §61.113 by revising the introductory text of paragraph (i) to read as follows:

§61.113 Private pilot privileges and limitations: Pilot in command.

* * * * *

(i) A private pilot may act as pilot in command or serve as a required flightcrew member of an aircraft without holding a medical certificate issued under part 67 of this chapter provided the pilot holds a valid U.S. driver's license, meets the requirements of §61.23(c)(3), and complies with this section and all of the following conditions and limitations:

* * * * *

➨ ***Change Date:*** *September 21, 2022*
➨ ***Effective Date:*** *October 21, 2022*
➨ ***Source:*** *Amdt. 61–150, 87 FR 57590*

Amend §61.159 by revising paragraph (a)(5) to read as follows:

§61.159 Aeronautical experience: Airplane category rating.

(a) * * *

(5) 250 hours of flight time in an airplane as a pilot in command, or as second in command performing the duties of pilot in command while under the supervision of a pilot in command, or any combination thereof, subject to the following:

(i) The flight time requirement must include at least—

(A) 100 hours of cross-country flight time; and

(B) 25 hours of night flight time.

(ii) Except for a person who has been removed from flying status for lack of proficiency or because of a disciplinary action involving aircraft operations, a U.S. military pilot or former U.S. military pilot who meets the requirements of §61.73(b)(1), or a military pilot in the Armed Forces of a foreign contracting State to the Convention on International Civil Aviation who meets the requirements of §61.73(c)(1), may credit flight time in a powered-lift aircraft operated in horizontal flight toward the flight time requirement.

* * * * *

➨ ***Change Date:*** *December 9, 2022*
➨ ***Effective Date:*** *December 9, 2022*
➨ ***Source:*** *Amdt. 61–151, 87 FR 75845*

Amend §61.313 in paragraph (h)(1) by removing the word "light" and adding in its place the word "flight".

PART 67
MEDICAL STANDARDS AND CERTIFICATION

➧ ***Change Date:*** *December 9, 2022*
➧ ***Effective Date:*** *December 9, 2022*
➧ ***Source:*** *Amdt. 67–22, 87 FR 75845*

Amend §67.4 in paragraph (b) by removing the numbers "26200" and adding in their place the numbers "25082". The amended text reads as follows:

§67.4 Application.

* * * * *

(b) Be examined by an aviation medical examiner designated in accordance with part 183 of this chapter. An applicant may obtain a list of aviation medical examiners from the FAA Office of Aerospace Medicine homepage on the FAA Web site, from any FAA Regional Flight Surgeon, or by contacting the Manager of the Aerospace Medical Education Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

* * * * *

Amend §67.409 in paragraph (a) by removing the phrase "and in duplicate" and by removing the numbers "26080" and adding in their place the numbers "25082". The amended text reads as follows:

§67.409 Denial of medical certificate.

(a) Any person who is denied a medical certificate by an aviation medical examiner may, within 30 days after the date of the denial, apply in writing to the Federal Air Surgeon, Attention: Manager, Aeromedical Certification Division, AAM-300, Federal Aviation Administration, P.O. Box 25082, Oklahoma City, Oklahoma 73126, for reconsideration of that denial. If the person does not ask for reconsideration during the 30-day period after the date of the denial, he or she is considered to have withdrawn the application for a medical certificate.

* * * * *

PART 68
REQUIREMENTS FOR OPERATING CERTAIN SMALL AIRCRAFT WITHOUT A MEDICAL CERTIFICATE

➧ ***Change Date:*** *November 22, 2022*
➧ ***Effective Date:*** *December 22, 2022*
➧ ***Source:*** *Amdt. 68–2, 87 FR 71238*

Amend §68.3 by revising the introductory text of paragraph (a) and the introductory text of paragraph (b) to read as follows:

§68.3 Medical education course requirements.

(a) The medical education course required to act as pilot in command or serve as a required flightcrew member in an operation under §61.113(i) of this chapter must—

* * * * *

(b) Upon successful completion of the medical education course, the following items must be electronically provided to the individual seeking to act as pilot in command or serve as a required flightcrew member under the conditions and limitations of §61.113(i) of this chapter and transmitted to the FAA—

* * * * *

Amend §68.9 by revising the introductory text of paragraph (a) to read as follows:

§68.9 Special Issuance process.

(a) ***General.*** An individual who has met the qualifications to operate an aircraft under §61.113(i) of this chapter and is seeking to act as a pilot in command or serve as a required flightcrew member under that section must have completed the process for obtaining an Authorization for Special Issuance of a Medical Certificate for each of the following:

* * * * *

PART 71
DESIGNATION OF CLASS A, B, C, D, AND E AIRSPACE AREAS; AIR TRAFFIC SERVICE ROUTES; AND REPORTING POINTS

➧ ***Change Date:*** *September 8, 2022*
➧ ***Effective Date:*** *September 15, 2022, through September 15, 2023*
➧ ***Source:*** *Amdt. 71–54, 87 FR 54878*

§71.1 is revised to read as follows:

§ 71.1 Applicability.

A listing for Class A, B, C, D, and E airspace areas; air traffic service routes; and reporting points can be found in FAA Order JO 7400.11G, Airspace Designations and Reporting Points, dated August 19, 2022. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552 (a) and 1 CFR part 51. The approval to incorporate by reference FAA Order JO 7400.11G is effective September 15, 2022, through September 15, 2023. During the incorporation by reference period, proposed changes to the listings of Class A, B, C, D, and E airspace areas; air traffic service routes; and reporting points will be published in full text as proposed rule documents in the **Federal Register**, unless there is good cause to forego notice and comment. Amendments to the listings of Class A, B, C, D, and E airspace areas; air traffic service routes; and reporting points will be published in full text as final rules in the **Federal Register**. Periodically, the final rule amendments will be integrated into a revised edition of FAA Order JO 7400.11 and submitted to the Director of the Federal Register for approval for incorporation by reference in this section. Copies of FAA Order JO 7400.11G may be obtained from Rules and Regulations Group, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591, (202) 267-8783. An electronic version of FAA Order JO 7400.11G is available on the FAA website at *www.faa.gov/air_traffic/publications*. Copies of FAA Order JO 7400.11G may be inspected in Docket No. FAA–2022–1022; Amendment No. 71–54, on *www.regulations.gov*. A copy of FAA Order JO 7400.11G may be inspected at the National Archives and Records Administration (NARA). For information on the availability of FAA Order JO 7400.11G at NARA, email: *fr.inspection@nara.gov* or go to *www.archives.gov/federal-register/cfr/ibr-locations.html*.

§§71.5; 71.15; 71.31; 71.33(c); 71.41; 71.51; 71.61; 71.71(b), (c), (d), (e), and (f); and 71.901(a) are amended by removing the words "FAA Order 7400.11F" and adding, in their place, the words "FAA Order JO 7400.11G."

PART 73
SPECIAL USE AIRSPACE

➧ ***Change Date:*** *December 9, 2022; January 18, 2023*
➧ ***Effective Date:*** *December 9, 2022*
➧ ***Source:*** *Amdt. 73–1, 87 FR 75845; Amdt. 73–9, 88 FR 2813*

Amend §73.19 by revising paragraphs (a), (b) introductory text, and (c) to read as follows:

§73.19 Reports by using agency.

(a) Each using agency must prepare a report on the use of each restricted area assigned thereto during any part of the preceding 12-month period ended September 30, and transmit it by the following January 31 of each year to the Manager, Operations Support Group in the ATO Service Center office of the Federal Aviation Administration having jurisdiction over the area in which the restricted area is located, with a copy to the Manager, Airspace Policy Group, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591.

(b) In the report under this section the using agency must:

* * * * *

(c) If it is determined that the information submitted under paragraph (b) of this section is not sufficient to evaluate the nature and extent of the use of a restricted area, the FAA may request the using agency to submit supplementary reports. Within 60 days after receiving a request for additional information, the using agency must submit such information as the FAA Service Center Operations Support Group Manager considers appropriate. Supplementary reports must be sent to the FAA officials designated in paragraph (a) of this section.

PART 91
GENERAL OPERATING AND FLIGHT RULES

➧ ***Change Date:*** *July 26, 2023*
➧ ***Effective Date:*** *July 26, 2023*
➧ ***Source:*** *Amdt. 91–370, 88 FR 48087*

Amend §91.146 by revising paragraphs (b) introductory text and (b)(2), (3), (5), and (7) to read as follows:

§91.146 Passenger-carrying flights for the benefit of a charitable, nonprofit, or community event.

* * * * *

(b) Passenger-carrying flights in airplanes, powered-lift, or rotorcraft for the benefit of a charitable, nonprofit, or community event identified in paragraph (c) of this section are not subject to the certification requirements of part 119 of this chapter or the drug and alcohol testing requirements in part 120 of this chapter, provided the following conditions are satisfied and the limitations in paragraphs (c) and (d) of this section are not exceeded:

* * * * *

(2) The flight is conducted from a public airport that is adequate for the aircraft used, or from another location the FAA approves for the operation;

(3) The aircraft has a maximum of 30 seats, excluding each crewmember seat, and a maximum payload capacity of 7,500 pounds;

* * * * *

(5) Each aircraft holds a standard airworthiness certificate, is airworthy, and is operated in compliance with the applicable requirements of subpart E of this part;

* * * * *

(7) Reimbursement of the operator of the aircraft is limited to that portion of the passenger payment for the flight that does not exceed the pro rata cost of owning, operating, and maintaining the aircraft for that flight, which may include fuel, oil, airport expenditures, and rental fees;

* * * * *

Amend §91.147 by revising paragraph (a) to read as follows:

§91.147 Passenger-carrying flights for compensation or hire.

* * * * *

(a) For the purposes of this section and for drug and alcohol testing, *Operator* means any person conducting nonstop passenger-carrying flights in an airplane, powered-lift, or rotorcraft for compensation or hire in accordance with §119.1(e)(2), §135.1(a)(5), or §121.1(d) of this chapter that begin and end at the same airport and are conducted within a 25-statute mile radius of that airport.

* * * * *

➧ ***Change Date:*** *December 9, 2022*
➧ ***Effective Date:*** *December 9, 2022*
➧ ***Source:*** *Amdt. 91–366, 87 FR 75846*

Amend §91.9 in paragraph (c) by removing the phrase “part 45” and adding in its place the phrase “part 45 or 48”.

Amend §91.157 in paragraph (b)(4) introductory text by adding the word “less” after the phrase “6 degrees or” and by removing the word “more” before the phrase “below the horizon”. The amended text reads as follows:

§91.157 Special VFR weather minimums.

* * * * *

(b) * * *

(4) Except for helicopters, between sunrise and sunset (or in Alaska, when the sun is 6 degrees or less below the horizon) unless—

* * * * *

Amend §91.203 in paragraph (a)(1) by removing the phrase “part 47” and adding in its place the phrase “part 47 or 48”.

Amend §91.511 in paragraph (a) introductory text by adding the words “operating under this subpart” after the word “person” in the first sentence. The amended text reads as follows:

§91.511 Communication equipment for overwater operations.

(a) Except as provided in paragraphs (c), (d), and (f) of this section, no person operating under this subpart may take off an airplane for a flight over water more than 30 minutes flying time or 100 nautical miles from the nearest shore unless it has at least the following operable equipment:

* * * * *

Amend §91.609 in paragraph (g) by adding the words “49 CFR” before both instances of the words “part 830”.

Amend §91.1001 in paragraph (b)(9) by removing “(b)(1)(v)” and adding in its place “(b)(5)(vi)”.

➨ ***Change Date:*** *July 26, 2023*
➨ ***Effective Date:*** *July 26, 2023*
➨ ***Source:*** *Amdt. 91–370, 88 FR 48087*

Amend §91.1015 by revising paragraph (a)(9) to read as follows:

§91.1015 Management specifications.

(a) * * *

(9) Any authorized deviation and exemption that applies to the person conducting operations under this subpart; and

* * * * *

➨ ***Change Date:*** *May 30, 2023*
➨ ***Effective Date:*** *June 29, 2023*
➨ ***Source:*** *Amdt. 91–368, 88 FR 34443*

Amend §91.1023 by:

a. Revising paragraphs (f) and (g);

b. Removing paragraph (h); and

c. Redesignating paragraph (i) as paragraph (h).

The revisions read as follows:

§91.1023 Program operating manual requirements.

* * * * *

(f) The program manager must ensure the appropriate parts of the manual are accessible to flight, ground, and maintenance personnel at all times when such personnel are performing their assigned duties.

(g) The information and instructions contained in the manual must be displayed clearly and be retrievable in the English language.

(h) Program managers that are also certificated to operate under part 121 or 135 of this chapter may be authorized to use the operating manual required by those parts to meet the manual requirements of subpart K, provided:

* * * * *

Amend §91.1025 by revising the introductory text to read as follows:

§91.1025 Program operating manual contents.

Each program operating manual accessed in paper format must display the date of last revision on each page. Each program operating manual accessed in electronic format must display the date of last revision in a manner in which a person can immediately ascertain it. Unless otherwise authorized by the Administrator, the manual must include the following:

* * * * *

➨ ***Change Date:*** *March 21, 2023*
➨ ***Effective Date:*** *March 17, 2023*
➨ ***Source:*** *Amdt. 91–321F, 88 FR 16878*

Amend §91.1603 by revising the section heading and paragraphs (b), (c), and (e) to read as follows:

§91.1603 Special Federal Aviation Regulation No. 112—Prohibition Against Certain Flights in the Territory and Airspace of Libya.

* * * * *

(b) ***Flight prohibition.*** Except as provided in paragraphs (c) and (d) of this section, no person described in paragraph (a) of this section may conduct flight operations in the territory and airspace of Libya.

(c) ***Permitted operations.*** This section does not prohibit persons described in paragraph (a) of this section from conducting flight operations in the territory and airspace of Libya, provided that such flight operations occur under a contract, grant, or cooperative agreement with a department, agency, or instrumentality of the U.S. Government (or under a subcontract between the prime contractor of the department, agency, or instrumentality and the person described in paragraph (a) of this section), with the approval of the FAA, or under an exemption issued by the FAA. The FAA will consider requests for approval or exemption in a timely manner, with the order of preference being: First, for those operations in support of U.S. Government-sponsored activities; second, for those operations in support of government-sponsored activities of a foreign country with the support of a U.S. Government department, agency, or instrumentality; and third, for all other operations.

* * * * *

(e) ***Expiration.*** This SFAR will remain in effect until March 20, 2025. The FAA may amend, rescind, or extend this SFAR, as necessary.

➨ ***Change Date:*** *September 20, 2022*
➨ ***Effective Date:*** *September 20, 2022*
➨ ***Source:*** *Amdt. 91–353B, 87 FR 57390*

Amend §91.1605 by revising paragraph (e) to read as follows:

§91.1605 Special Federal Aviation Regulation No. 77—Prohibition Against Certain Flights in the Baghdad Flight Information Region (FIR) (ORBB).

* * * * *

(e) ***Expiration.*** This SFAR will remain in effect until October 26, 2024. The FAA may amend, rescind, or extend this SFAR, as necessary.

➨ ***Change Date:*** *December 27, 2022*
➨ ***Effective Date:*** *December 27, 2022*
➨ ***Source:*** *Amdt. 91–339C, 87 FR 79245*

Amend §91.1613 by revising paragraphs (c) and (e) to read as follows:

§91.1613 Special Federal Aviation Regulation No. 107—Prohibition Against Certain Flights in the Territory and Airspace of Somalia.

* * * * *

(c) ***Permitted operations.*** This section does not prohibit persons described in paragraph (a) of this section from conducting flight operations in the territory and airspace of Somalia under the following circumstances:

(1) Overflights of Somalia may be conducted at altitudes at or above FL260 subject to the approval of, and in accordance with the conditions established by, the appropriate authorities of Somalia.

(2) Aircraft departing from Djibouti Ambouli International Airport (International Civil Aviation Organization (ICAO) code: HDAM) may operate overwater in the territory and airspace of Somalia at altitudes below FL260 only to the extent necessary to permit a climb during takeoff if the operator of that aircraft:

(i) Receives any necessary approval from the appropriate authorities of Djibouti;

(ii) Conducts operations that comply with applicable conditions established by the appropriate authorities of Djibouti and air traffic control instructions; and

(iii) Is either on a published instrument procedure or under the direction of air traffic control.

(3) Aircraft descending into Djibouti Ambouli International Airport (HDAM) may operate overwater at altitudes below FL260 in the territory and airspace of Somalia only to the extent necessary to permit descent for landing at Djibouti Ambouli International Airport (HDAM), if the operator of that aircraft:

(i) Receives any necessary approval from the appropriate authorities of Djibouti;

(ii) Conducts operations that comply with applicable conditions established by the appropriate authorities of Djibouti and air traffic control instructions; and

(iii) Is either on a published instrument procedure or under the direction of air traffic control.

(4) Flight operations may be conducted in the territory and airspace of Somalia at altitudes below FL260 if such flight operations are conducted under a contract, grant, or cooperative agreement with a department, agency, or instrumentality of the U.S. Government (or under a subcontract between the prime contractor of the U.S. Government department, agency, or instrumentality and the person described in paragraph (a) of this section) with the approval of the FAA or under an exemption issued by the FAA. The FAA will consider requests for approval or exemption in a timely manner, with the order of preference being: First, for those operations in support of U.S. Government-sponsored activities; second, for those operations in support of government-sponsored activities of a foreign country with the support of a U.S. Government department, agency, or instrumentality; and third, for all other operations.

* * * * *

(e) ***Expiration.*** This SFAR will remain in effect until January 7, 2027. The FAA may amend, rescind, or extend this SFAR, as necessary.

Issued in Washington, DC, under the authority of 49 U.S.C. 106(f) and (g), 40101(d)(1), 40105(b)(1)(A), and 44701(a)(5).

➨ ***Change Date:*** *September 20, 2022*
➨ ***Effective Date:*** *September 20, 2022*
➨ ***Source:*** *Amdt. 91–359A, 87 FR 57384*

Amend §91.1617 by revising paragraph (e) to read as follows:

§91.1617 Special Federal Aviation Regulation No. 117—Prohibition Against Certain Flights in the Tehran Flight Information Region (FIR) (OIIX).

* * * * *

(e) ***Expiration.*** This SFAR will remain in effect until October 31, 2024. The FAA may amend, rescind, or extend this SFAR, as necessary.

➨ ***Change Date:*** *July 25, 2023*
➨ ***Effective Date:*** *July 25, 2023*
➨ ***Source:*** *Amdt. 91–369, 88 FR 47771*

Add §91.1619 to read as follows:

§91.1619 Special Federal Aviation Regulation No. 119—Prohibition Against Certain Flights in the Kabul Flight Information Region (FIR) (OAKX).

(a) ***Applicability.*** This Special Federal Aviation Regulation (SFAR) applies to the following persons:

(1) All U.S. air carriers and U.S. commercial operators;

(2) All persons exercising the privileges of an airman certificate issued by the FAA, except when such persons are operating U.S.-registered aircraft for a foreign air carrier; and

(3) All operators of U.S.-registered civil aircraft, except when the operator of such aircraft is a foreign air carrier.

(b) ***Flight prohibition.*** Except as provided in paragraphs (c) and (d) of this section, no person described in paragraph (a) of this section may conduct flight operations in the Kabul Flight Information Region (FIR) (OAKX).

(c) ***Permitted operations.*** This section does not prohibit persons described in paragraph (a) of this section from conducting flight operations in the Kabul Flight Information Region (FIR) (OAKX) under the following circumstances:

(1) Overflights of the Kabul Flight Information Region (FIR) (OAKX) may be conducted at altitudes at and above Flight Level (FL) 320, subject to the approval of, and in accordance with the conditions established by, the appropriate authorities of Afghanistan.

(2) Flight operations may be conducted in the Kabul Flight Information Region (FIR) (OAKX) at altitudes below FL320, provided that such flight operations occur under a contract, grant, or cooperative agreement with a department, agency, or instrumentality of the U.S. Government (or under a subcontract between the prime contractor of the U.S. Government department, agency, or instrumentality and the person described in paragraph (a) of this section) with the approval of the FAA or under an exemption issued by the FAA. The FAA will consider requests for approval or exemption in a timely manner, with the order of preference being: first, for those operations in support of U.S. Government-sponsored activities; second, for those operations in support of government-sponsored activities of a foreign country with the support of a U.S. Government department, agency, or instrumentality; and third, for all other operations.

(d) ***Emergency situations.*** In an emergency that requires immediate decision and action for the safety of the flight, the pilot in command of an aircraft may deviate from this section to the extent required by that emergency. Except for U.S. air carriers and commercial operators that are subject to the requirements of 14 CFR part 119, 121, 125, or 135, each person who deviates from this section must, within 10 days of the deviation, excluding Saturdays, Sundays, and Federal holidays, submit to the responsible Flight Standards Office a complete report of the operations of the aircraft involved in the deviation, including a description of the deviation and the reasons for it.

(e) ***Expiration.*** This SFAR will remain in effect until July 25, 2025. The FAA may amend, rescind, or extend this SFAR as necessary.

PART 97
STANDARD INSTRUMENT PROCEDURES

➧ ***Change Date:*** *December 9, 2022*
➧ ***Effective Date:*** *December 9, 2022*
➧ ***Source:*** *Amdt. 97–1339, 87 FR 75846*

Amend §97.20 in paragraph (b) by:

a. Removing the phrase "FAA's Rules Docket (AGC–200) and at the National Flight Data Center, 800 Independence Avenue SW., Washington, DC 20590" and adding in its place the phrase "U.S. Department of Transportation, Docket Operations, 1200 New Jersey Avenue SE, West Building Ground Floor, Room W12–140, Washington, DC 20590, and at Aeronautical Information Services, 1305 East-West Highway, Silver Spring, MD 20910"; and

b. Removing the phrase "call 202-741-6030" and adding in its place the words phrase "email: *fedreg.legal@nara.gov*".

The amended text reads as follows:

§97.20 General.

* * * * *

(b) Standard instrument approach procedures and associated supporting data adopted by the FAA are documented on FAA Forms 8260-3, 8260-4, 8260-5. Takeoff minimums and obstacle departure procedures (ODPs) are documented on FAA Form 8260-15A. These forms are incorporated by reference. The Director of the Federal Register approved this incorporation by reference pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. The standard instrument approach procedures and takeoff minimums and obstacle departure procedures (ODPs) are available for examination at the U.S. Department of Transportation, Docket Operations, 1200 New Jersey Avenue SE, West Building Ground Floor, Room W12–140, Washington, DC 20590, and at Aeronautical Information Services, 1305 East-West Highway, Silver Spring, MD 20910, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: *fedreg.legal@nara.gov*, or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.

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PART 107
SMALL UNMANNED AIRCRAFT SYSTEMS

➧ ***Change Date:*** *December 9, 2022*
➧ ***Effective Date:*** *December 9, 2022*
➧ ***Source:*** *Amdt. 107–10, 87 FR 75846*

Revise the heading for §107.9 to read as follows:

§107.9 Safety event reporting.

* * * * *

PART 110
GENERAL REQUIREMENTS

➧ ***Change Date:*** *July 26, 2023*
➧ ***Effective Date:*** *July 26, 2023*
➧ ***Source:*** *Amdt. 110–3, 88 FR 48087*

The authority citation for Part 110 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40101, 40102, 40103, 40113, 44105, 44106, 44111, 44701–44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105.

Amend §110.2 by revising the introductory text of the definition of "Commercial air tour" and by revising the definitions of "Commuter operation", "Domestic operation", "Flag operation", "On-demand operation", and "Supplemental operation" to read as follows:

§110.2 Definitions.

* * * * *

Commercial air tour means a flight conducted for compensation or hire in an airplane, powered-lift, or rotorcraft where a purpose of the flight is sightseeing. The FAA may consider the following factors in determining whether a flight is a commercial air tour:

* * * * *

Commuter operation means any scheduled operation conducted by any person operating one of the following types of aircraft with a frequency of operations of at least five round trips per week on at least one route between two or more points according to the published flight schedules:

(1) Rotorcraft; or

(2) Airplanes or powered-lift that:

(i) Are not turbojet-powered;

(ii) Have a maximum passenger-seat configuration of 9 seats or less, excluding each crewmember seat; and

(iii) Have a maximum payload capacity of 7,500 pounds or less.

* * * * *

Domestic operation means any scheduled operation conducted by any person operating any aircraft described in paragraph (1) of this definition at locations described in paragraph (2) of this definition:

(1) Airplanes or powered-lift that:

(i) Are turbojet-powered;

(ii) Have a passenger-seat configuration of more than 9 passenger seats, excluding each crewmember seat; or

(iii) Have a payload capacity of more than 7,500 pounds.

(2) Locations:

(i) Between any points within the 48 contiguous States of the United States or the District of Columbia; or

(ii) Operations solely within the 48 contiguous States of the United States or the District of Columbia; or

(iii) Operations entirely within any State, territory, or possession of the United States; or

(iv) When specifically authorized by the Administrator, operations between any point within the 48 contiguous States of the United States or the District of Columbia and any specifically authorized point located outside the 48 contiguous States of the United States or the District of Columbia.

* * * * *

Flag operation means any scheduled operation conducted by any person operating any aircraft described in paragraph (1) of this definition at locations described in paragraph (2) of this definition:

(1) Airplanes or powered-lift that:

(i) Are turbojet-powered;

(ii) Have a passenger-seat configuration of more than 9 passenger seats, excluding each crewmember seat; or

(iii) Have a payload capacity of more than 7,500 pounds.

(2) Locations:

(i) Between any point within the State of Alaska or the State of Hawaii or any territory or possession of the United States and any point outside the State of Alaska or the State of Hawaii or any territory or possession of the United States, respectively; or

(ii) Between any point within the 48 contiguous States of the United States or the District of Columbia and any point outside the 48 contiguous States of the United States and the District of Columbia; or

(iii) Between any point outside the U.S. and another point outside the U.S.

* * * * *

On-demand operation means any operation for compensation or hire that is one of the following:

(1) Passenger-carrying operations conducted as a public charter under part 380 of this chapter or any operations in which the departure time, departure location, and arrival location are specifically negotiated with the customer or the customer's representative that are any of the following types of operations:

(i) Common carriage operations conducted with airplanes or powered-lift, including any that are turbojet-powered, having a passenger-seat configuration of 30 seats or fewer, excluding each crewmember seat, and a payload capacity of 7,500 pounds or less. The operations described in this paragraph do not include operations using a specific airplane or powered-lift that is also used in domestic or flag operations and that is so listed in the operations specifications as required by §119.49(a)(4) of this chapter for those operations are considered supplemental operations;

(ii) Noncommon or private carriage operations conducted with airplanes or powered-lift having a passenger-seat configuration of less than 20 seats, excluding each crewmember seat, and a payload capacity of less than 6,000 pounds; or

(iii) Any rotorcraft operation.

(2) Scheduled passenger-carrying operations conducted with one of the following types of aircraft, other than turbojet-powered aircraft, with a frequency of operations of less than five round trips per week on at least one route between two or more points according to the published flight schedules:

(i) Airplanes or powered-lift having a maximum passenger-seat configuration of 9 seats or less, excluding each crewmember seat, and a maximum payload capacity of 7,500 pounds or less; or

(ii) Rotorcraft.

(3) All-cargo operations conducted with airplanes or powered-lift having a payload capacity of 7,500 pounds or less, or with rotorcraft.

* * * * *

Supplemental operation means any common carriage operation for compensation or hire conducted with any aircraft described in paragraph (1) of this definition that is a type of operation described in paragraph (2) of this definition:

(1) Airplanes or powered-lift that:

(i) Have a passenger-seat configuration of more than 30 seats, excluding each crewmember seat.

(ii) Have a payload capacity of more than 7,500 pounds.

(iii) Are propeller-powered and:

(A) Have a passenger-seat configuration of more than 9 seats and less than 31 seats, excluding each crewmember seat; and

(B) Are used in domestic or flag operations but are so listed in the operations specifications as required by §119.49(a)(4) of this chapter for such operations.

(iv) Are turbojet-powered and:

(A) Have a passenger seat configuration of 1 or more but less than 31 seats, excluding each crewmember seat; and

(B) Are used in domestic or flag operations and are so listed in the operations specifications as required by §119.49(a)(4) of this chapter for such operations.

(2) Types of operation:

(i) Operations for which the departure time, departure location, and arrival location are specifically negotiated with the customer or the customer's representative.

(ii) All-cargo operations.

(iii) Passenger-carrying public charter operations conducted under part 380 of this chapter.

* * * * *

PART 119
CERTIFICATION: AIR CARRIERS AND COMMERCIAL OPERATORS

➧ ***Change Date:*** *July 26, 2023*
➧ ***Effective Date:*** *July 26, 2023*
➧ ***Source:*** *Amdt. 119–20, 88 FR 48088*

The authority citation for Part 119 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40101, 40102, 40103, 40113, 44105, 44106, 44111, 44701–44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105; sec. 215, Pub. L. 111–216, 124 Stat. 2348.

Amend §119.1 by:

a. Revising paragraph (a)(2);

b. Adding paragraph (a)(3); and

c. Revising paragraphs (e) introductory text, (e)(2), (e)(4)(v), (e)(5), (e)(7) introductory text, and (e)(7)(i), (iii), and (vii).

The revisions and addition read as follows:

§119.1 Applicability.

(a) * * *

(2) When common carriage is not involved, in operations of any U.S.-registered civil airplane or powered-lift with a seat configuration of 20 or more passengers, or a maximum payload capacity of 6,000 pounds or more; or

(3) When noncommon carriage is involved, except as provided in §91.501(b) of this chapter, or in private carriage for compensation or hire, in operations of any U.S.-registered civil airplane or powered-lift with a passenger-seat configuration of less than 20 seats and a payload capacity of less than 6,000 pounds.

* * * * *

(e) Except for operations when common carriage is not involved conducted with any airplane or powered-lift having a passenger-seat configuration of 20 seats or more, excluding any required crewmember seat, or a payload capacity of 6,000 pounds or more, this part does not apply to—

* * * * *

(2) Nonstop Commercial Air Tours that occur in an airplane, powered-lift, or rotorcraft having a standard airworthiness certificate and passenger-seat configuration of 30 seats or fewer and a

maximum payload capacity of 7,500 pounds or less that begin and end at the same airport, and are conducted within a 25-statute mile radius of that airport, in compliance with the Letter of Authorization issued under §91.147 of this chapter. For nonstop Commercial Air Tours conducted in accordance with part 136, subpart B, of this chapter, National Parks Air Tour Management, the requirements of this part apply unless excepted in §136.37(g)(2). For Nonstop Commercial Air Tours conducted in the vicinity of the Grand Canyon National Park, Arizona, the requirements of SFAR 50-2, part 93, subpart U, of the chapter and this part, as applicable, apply.
* * * * *

(4) * * *

(v) Powered-lift or rotorcraft operations in construction or repair work (but part 119 of this chapter does apply to transportation to and from the site of operations); and
* * * * *

(5) Sightseeing flights conducted in hot air balloons or gliders;
* * * * *

(7) Powered-lift or rotorcraft flights conducted within a 25 statute mile radius of the airport of takeoff if—

(i) Not more than two passengers are carried in the aircraft in addition to the required flightcrew;
* * * * *

(iii) The aircraft used is certificated in the standard category and complies with the 100-hour inspection requirements of part 91 of this chapter;
* * * * *

(vii) Cargo is not carried in or on the aircraft;
* * * * *

Amend §119.5 by revising paragraphs (b) and (c) to read as follows:

§119.5 Certifications, authorizations, and prohibitions.
* * * * *

(b) A person not authorized to conduct direct air carrier operations, but authorized by the Administrator to conduct operations as a U.S. commercial operator, will be issued an Operating Certificate.

(c) A person not authorized to conduct direct air carrier operations, but authorized by the Administrator to conduct operations when common carriage is not involved as an operator of any U.S.-registered civil airplane or powered-lift with a seat configuration of 20 or more passengers, or a maximum payload capacity of 6,000 pounds or more, will be issued an Operating Certificate.
* * * * *

Amend §119.21 by revising paragraph (a) introductory text to read as follows:

§119.21 Commercial operators engaged in intrastate common carriage and direct air carriers.

(a) Each person who conducts airplane or powered-lift operations as a commercial operator engaged in intrastate common carriage of persons or property for compensation or hire in air commerce, or as a direct air carrier, shall comply with the certification and operations specifications requirements in subpart C of this part, and shall conduct its:
* * * * *

Amend §119.23 by revising the section heading, paragraphs (a) introductory text, (a)(2), and (b) introductory text to read as follows:

§119.23 Operators engaged in passenger-carrying operations, cargo operations, or both with airplanes or powered-lift when common carriage is not involved.

(a) Each person who conducts operations when common carriage is not involved with any airplane or powered-lift having a passenger-seat configuration of 20 seats or more, excluding each crewmember seat, or a payload capacity of 6,000 pounds or more, must, unless deviation authority is issued—
* * * * *

(2) Conduct its operations in accordance with the requirements of part 125 of this chapter; and
* * * * *

(b) Each person who conducts noncommon carriage (except as provided in §91.501(b) of this chapter) or private carriage operations for compensation or hire with any airplane or powered-lift having a passenger-seat configuration of less than 20 seats, excluding each crewmember seat, and a payload capacity of less than 6,000 pounds, must—
* * * * *

Amend §119.49 by revising paragraphs (a)(12), (b)(12), and (c)(11) to read as follows:

§119.49 Contents of operations specifications.

(a) * * *

(12) Any authorized deviation or exemption from any requirement of this chapter that applies to the certificate holder.
* * * * *

(b) * * *

(12) Any authorized deviation or exemption from any requirement of this chapter that applies to the certificate holder.
* * * * *

(c) * * *

(11) Any authorized deviation or exemption from any requirement of this chapter that applies to the certificate holder.
* * * * *

Amend §119.65 by revising paragraphs (a)(3) and (b)(2) to read as follows:

§119.65 Management personnel required for operations conducted under part 121 of this chapter.

(a) * * *

(3) Chief Pilot for each category of aircraft the certificate holder uses, as listed in §61.5(b)(1) of this chapter.
* * * * *

(b) * * *

(2) The number and type of aircraft used; and
* * * * *

Revise §119.67 to read as follows:

§119.67 Management personnel: Qualifications for operations conducted under part 121 of this chapter.

(a) ***Director of Operations.*** To serve as Director of Operations under §119.65(a), a person must hold an airline transport pilot certificate and—

(1) If the certificate holder uses large aircraft, at least 3 years of supervisory or managerial experience within the last 6 years in large aircraft, in a position that exercised operational control over any operations conducted under part 121 or 135 of this chapter.

(2) If the certificate holder uses large aircraft, at least 3 years of experience as pilot in command under part 121 or 135 of this chapter in large aircraft in at least one of the categories of aircraft the certificate holder uses, as listed in §61.5(b)(1) of this chapter. In the case of a person becoming Director of Operations for the first time, he or she must have accumulated this experience as pilot in command within the past 6 years.

(3) If the certificate holder uses only small aircraft in its operations, the experience required in paragraphs (a)(1) and (2) of this section may be obtained in either large or small aircraft.

(b) ***Chief Pilot.*** To serve as Chief Pilot under §119.65(a), a person must:

(1) Hold an airline transport pilot certificate with appropriate ratings in the category of aircraft that the certificate holder uses in its operations under part 121 of this chapter and over which the Chief Pilot exercises responsibility; and

(2) Have at least 3 years of experience as pilot in command in the same category of aircraft that the certificate holder uses, as listed in §61.5(b) of this chapter. The experience as pilot in command described in this paragraph (b)(2) must:

(i) Have occurred within the past 6 years, in the case of a person becoming a Chief Pilot for the first time.

(ii) Have occurred in large aircraft operated under part 121 or 135 of this chapter. If the certificate holder uses only small aircraft in its operation, this experience may be obtained in either large or small aircraft.

(iii) Be in the same category of aircraft over which the Chief Pilot exercises responsibility.

(c) ***Director of Maintenance.*** To serve as Director of Maintenance under §119.65(a), a person must:

(1) Hold a mechanic certificate with airframe and powerplant ratings;

(2) Have 1 year of experience in a position responsible for returning aircraft to service;

(3) Have at least 1 year of experience in a supervisory capacity under either paragraph (c)(4)(i) or (ii) of this section maintaining the same category and class of aircraft as the certificate holder uses; and

(4) Have 3 years of experience within the past 6 years in one or a combination of the following—

(i) Maintaining large aircraft with 10 or more passenger seats, including, at the time of appointment as Director of Maintenance, experience in maintaining the same category and class of aircraft as the certificate holder uses; or

(ii) Repairing aircraft in a certificated airframe repair station that is rated to maintain aircraft in the same category and class of aircraft as the certificate holder uses.

(d) ***Chief Inspector.*** To serve as Chief Inspector under §119.65(a), a person must:

(1) Hold a mechanic certificate with both airframe and powerplant ratings, and have held these ratings for at least 3 years;

(2) Have at least 3 years of maintenance experience on different types of large aircraft with 10 or more passenger seats with an air carrier or certificated repair station, 1 year of which must have been as maintenance inspector; and

(3) Have at least 1 year of experience in a supervisory capacity maintaining the same category and class of aircraft as the certificate holder uses.

(e) ***Deviation.*** A certificate holder may request a deviation to employ a person who does not meet the appropriate airman experience, managerial experience, or supervisory experience requirements of this section if the Manager of the Air Transportation Division or the Manager of the Aircraft Maintenance Division, as appropriate, finds that the person has comparable experience and can effectively perform the functions associated with the position in accordance with the requirements of this chapter and the procedures outlined in the certificate holder's manual. Deviations under this paragraph (e) may be issued after consideration of the size and scope of the operation and the qualifications of the intended personnel. The Administrator may, at any time, terminate any grant of deviation authority issued under this paragraph (e).

PART 136
COMMERCIAL AIR TOURS AND NATIONAL PARKS AIR TOUR MANAGEMENT

➨ ***Change Date:*** *July 26, 2023*
➨ ***Effective Date:*** *July 26, 2023*
➨ ***Source:*** *Amdt. 136–2, 88 FR 48091*

The authority citation for part 136 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901, 44903–44904, 44912, 46105.

Amend §136.1:

a. By revising paragraphs (a), (b) introductory text, and (c); and

b. In paragraph (d):

i. In the definition of "Commercial Air Tour":

A. By removing "Commercial Air Tour" and adding "Commercial air tour" in its place;

B. By revising the introductory text; and

C. By redesignating paragraphs (1) through (8) as paragraphs (i) through (viii);

ii. By removing the definition of "Suitable landing area for helicopters"; and

iii. By adding a definition for "Suitable landing area for rotorcraft" in alphabetical order.

The revisions and addition read as follows:

§136.1 Applicability and definitions.

(a) This subpart applies to each person operating or intending to operate a commercial air tour in an airplane, powered-lift, or rotorcraft and, when applicable, to all occupants of those aircraft engaged in a commercial air tour. When any requirement of this subpart is more stringent than any other requirement of this chapter, the person operating the commercial air tour must comply with the requirement in this subpart.

(b) This subpart applies to:

* * * * *

(c) This subpart does not apply to operations conducted in balloons, gliders (powered and un-powered), parachutes (powered and un-powered), gyroplanes, or airships.

(d) * * *

Commercial air tour means a flight conducted for compensation or hire in an airplane, powered-lift, or rotorcraft where a purpose of the flight is sightseeing. The FAA may consider the following factors in determining whether a flight is a commercial air tour for purposes of this subpart:

* * * * *

Suitable landing area for rotorcraft means an area that provides the operator reasonable capability to land in an emergency without causing serious injury to persons. These suitable landing areas must be site specific, designated by the operator, and accepted by the FAA.

* * * * *

Revise §136.3 to read as follows:

§136.3 Letters of Authorization.

Operators subject to this subpart who have Letters of Authorization may use the procedures described in §119.51 of this chapter to amend or have the FAA reconsider those Letters of Authorization.

Revise §136.5 to read as follows:

§136.5 Additional requirements for Hawaii.

Any operator subject to this subpart who meets the criteria of §136.71 must comply with the additional requirements and restrictions in subpart D of this part.

Amend §136.9 by revising the section heading and paragraphs (b)(1) through (3) to read as follows:

§136.9 Life preservers for operations over water.

* * * * *

(b) * * *

(1) The aircraft is equipped with floats;

(2) The airplane is within power-off gliding distance to the shoreline for the duration of the time that the flight is over water; or

(3) The aircraft is a multiengine that can be operated with the critical engine inoperative at a weight that will allow it to climb, at least 50 feet a minute, at an altitude of 1,000 feet above the surface, as provided in the approved aircraft flight manual for that aircraft.

* * * * *

Revise §136.11 to read as follows:

§136.11 Rotorcraft floats for over water.

(a) A rotorcraft used in commercial air tours over water beyond the shoreline must be equipped with fixed floats or an inflatable flotation system adequate to accomplish a safe emergency ditching, if—

(1) It is a single-engine rotorcraft; or

(2) It is a multi-engine rotorcraft that cannot be operated with the critical engine inoperative at a weight that will allow it to climb, at least 50 feet a minute, at an altitude of 1,000 feet above the surface, as provided in the approved aircraft flight manual for that aircraft.

(b) Each rotorcraft that is required to be equipped with an inflatable flotation system under this section must have:

(1) The activation switch for the flotation system on one of the primary flight controls; and

(2) The flotation system armed when the rotorcraft is over water beyond the shoreline and is flying at a speed that does not exceed the maximum speed prescribed in the approved aircraft flight manual for flying with the flotation system armed.

(c) Neither fixed floats nor an inflatable flotation system is required for a rotorcraft under this section when that rotorcraft is:

(1) Over water only during the takeoff or landing portion of the flight; or

(2) Operated within power-off gliding distance to the shoreline for the duration of the flight and each occupant is wearing a life preserver from before takeoff until the aircraft is no longer over water.

Revise §136.13 to read as follows:

§136.13 Performance plan.

(a) Each operator that uses a rotorcraft must complete a performance plan before each commercial air tour or flight operated under §91.146 or §91.147 of this chapter. The pilot in command must review for accuracy and comply with the performance plan on the day the flight occurs. The performance plan must be based on information in the approved aircraft flight manual for that aircraft taking into consideration the maximum density altitude for which the operation is planned, in order to determine:

(1) Maximum gross weight and center of gravity (CG) limitations for hovering in ground effect;

(2) Maximum gross weight and CG limitations for hovering out of ground effect; and

(3) Maximum combination of weight, altitude, and temperature for which height/velocity information in the approved aircraft flight manual is valid.

(b) Except for the approach to and transition from a hover for the purpose of takeoff and landing, or during takeoff and landing, the pilot in command must make a reasonable plan to operate the rotorcraft outside of the caution/warning/avoid area of the limiting height/velocity diagram.

(c) Except for the approach to and transition from a hover for the purpose of takeoff and landing, during takeoff and landing, or when necessary for safety of flight, the pilot in command must operate the rotorcraft in compliance with the plan described in paragraph (b) of this section.

Remove appendix A to part 136.

APPENDIX A TO PART 136—[REMOVED]

Add subpart D to part 136 to read as follows:

Subpart D—Special Operating Rules for Air Tour Operators in the State of Hawaii

Sec.

Subpart D—Special Operating Rules for Air Tour Operators in the State of Hawaii

§136.71 Applicability.

(a) Except as provided in paragraph (b) of this section, this subpart prescribes operating rules for air tour flights conducted in airplanes, powered-lift, or rotorcraft under visual flight rules in the State of Hawaii pursuant to parts 91, 121, and 135 of this chapter.

(b) This subpart does not apply to:

(1) Operations conducted under part 121 of this chapter in airplanes with a passenger seating configuration of more than 30 seats or a payload capacity of more than 7,500 pounds.

(2) Flights conducted in gliders or hot air balloons.

§136.73 Definitions.

For the purposes of this subpart:

Air tour means any sightseeing flight conducted under visual flight rules in an airplane, powered-lift, or rotorcraft for compensation or hire.

Air tour operator means any person who conducts an air tour.

§136.75 Equipment and requirements.

(a) ***Flotation equipment.*** No person may conduct an air tour in Hawaii in a rotorcraft beyond the shore of any island, regardless of whether the rotorcraft is within gliding distance of the shore, unless:

(1) The rotorcraft is amphibious or is equipped with floats adequate to accomplish a safe emergency ditching and approved flotation gear is easily accessible for each occupant; or

(2) Each person on board the rotorcraft is wearing approved flotation gear.

(b) ***Performance plan.*** Each operator must complete a performance plan that meets the requirements of this paragraph (b) before each air tour flight conducted in a rotorcraft.

(1) The performance plan must be based on information from the current approved aircraft flight manual for that aircraft, considering the maximum density altitude for which the operation is planned to determine the following:

(i) Maximum gross weight and center of gravity (CG) limitations for hovering in ground effect;

(ii) Maximum gross weight and CG limitations for hovering out of ground effect; and

(iii) Maximum combination of weight, altitude, and temperature for which height-velocity information from the performance data is valid.

(2) The pilot in command (PIC) must comply with the performance plan.

(c) ***Operating limitations.*** Except for approach to and transition from a hover, and except for the purpose of takeoff and landing, the PIC of a rotorcraft may only operate such aircraft at a combination of height and forward speed (including hover) that would permit a safe landing in event of engine power loss, in accordance with the height-speed envelope for that rotorcraft under current weight and aircraft altitude.

(d) ***Minimum flight altitudes.*** Except when necessary for takeoff and landing, or operating in compliance with an air traffic control clearance, or as otherwise authorized by the Administrator, no person may conduct an air tour in Hawaii:

(1) Below an altitude of 1,500 feet above the surface over all areas of the State of Hawaii;

(2) Closer than 1,500 feet to any person or property; or

(3) Below any altitude prescribed by Federal statute or regulation.

(e) ***Passenger briefing.*** Before takeoff, each PIC of an air tour flight of Hawaii with a flight segment beyond the ocean shore of any island shall ensure that each passenger has been briefed on the following, in addition to requirements set forth in §91.107, §121.571, or §135.117 of this chapter:

(1) Water ditching procedures;

(2) Use of required flotation equipment; and

(3) Emergency egress from the aircraft in event of a water landing.

Issued in Washington, DC, under the authority of 49 U.S.C. 106(f) and (g), 40101(d)(1), 40105(b)(1)(A), and 44701(a)(5).

PART 141

COMMERCIAL AIR TOURS AND NATIONAL PARKS AIR TOUR MANAGEMENT

➨ ***Change Date:*** *December 9, 2022*
➨ ***Effective Date:*** *December 9, 2022*
➨ ***Source:*** *Amdt. 141–24, 87 FR 75848*

Amend appendix I to part 141 by revising paragraph 4.(a)(3)(ii) and adding paragraphs 4.(i)(2)(i) and (ii) to read as follows:

APPENDIX I TO PART 141

ADDITIONAL AIRCRAFT CATEGORY AND/OR CLASS RATING COURSE

* * * * *

4. ***Flight Training***

(a) * * *

(3) * * *

(ii) Ten hours of training in a complex airplane, a turbine-powered airplane, or a technically advanced airplane that meets the requirements of §61.129(j), or any combination thereof. The airplane must be appropriate to land or sea for the rating sought;

* * * * *

(i) * * *

(2) * * *

(i) Five training flights in a glider with a certificated flight instructor on the launch/ tow procedures approved for the course and on the appropriate approved areas of operation listed in appendix D of part 141, paragraph 4.(d)(6); and

(ii) Three training flights in a glider with a certificated flight instructor in preparation for the practical test within 2 calendar months preceding the date of the test.

* * * * *

TITLE 49: TRANSPORTATION

PART 830

NOTIFICATION AND REPORTING OF AIRCRAFT ACCIDENTS OR INCIDENTS AND OVERDUE AIRCRAFT, AND PRESERVATION OF AIRCRAFT WRECKAGE, MAIL, CARGO, AND RECORDS

➨ ***Change Date:*** *July 14, 2022*
➨ ***Effective Date:*** *August 15, 2022*
➨ ***Source:*** *Doc. No. NTSB-2021-0004, 87 FR 42104*

Amend §830.2 in paragraph (2) of the definition of "Unmanned aircraft accident" to read as follows:

§830.2 Definitions.

* * * * *

Unmanned aircraft accident * * *

(2) The aircraft holds an airworthiness certificate and sustains substantial damage.

Aeronautical Information Manual
Explanation of Major Changes

Change 3 effective November 3, 2022 (to Basic Manual effective June 17, 2021) and Basic Manual effective April 20, 2023.

General Information—Aeronautical Information Manual (AIM) Code of Federal Regulations and Advisory Circulars

This change removes the reference to the canceled Advisory Circular (AC) 00–2 in the Aeronautical Information Manual (AIM), General Information—Code of Federal Regulations and Advisory Circulars section. It also adds a note, with a link, that sends users where current AC information can be found.

1–1–9. Instrument Landing System (ILS)

This change amends the Aeronautical Information Manual (AIM), 1-1-9 Instrument Landing System (ILS), subparagraph k, ILS Course Distortion, correcting deficiencies in the paragraph and better aligning content with that published in FAA Order JO 7110.65, paragraph 3-7-5. This change also adds controller observation and PIREPs to the sources contributing to the official weather observation.

1–1–17. Global Positioning System (GPS)

7–6–7. Mountain Flying

This change provides pilots guidance on the use of visual flight rules (VFR) waypoints for mountain pass entry points.

1–1–20. Precision Approach Systems Other Than ILS and GLS

This change removes references to the Transponder Landing System (TLS) from the Aeronautical Information Manual (AIM).

1–2–2. Required Navigation Performance (RNP)

This change reduces the lateral separation minima from 30 NM to 23 NM in the oceanic airspaces of Oakland Air Route Traffic Control Center (ARTCC), New York ARTCC, and portions of Anchorage ARTCC.

3–2–1. General

Figure 3-2-1 is being updated for readability and to provide the reader with a clear interpretation of the airspace classes within the National Airspace System.

3–2–3. Class B Airspace

3–2–4. Class C Airspace

4–1–8. Approach Control Service for VFR Arriving Aircraft

4–1–18. Terminal Radar Services for VFR Aircraft

4–4–11. IFR Separation Standards

4–5–3. Surveillance Radar

5–4–11. Radar Approaches

This change will eliminate the reference to Center Radar Presentation (CENRAP) in several paragraphs in the AIM.

3–5–2. Military Training Routes

This change to subparagraph 3-5-2e clarifies that Military Training Route (MTR) information from the Flight Information Publication (FLIP) is available through Flight Service. This change also adds a new subparagraph f that provides specific information for accessing MTR route information from the FAA. In addition, the former subparagraph f was re-lettered g and “while inflight” was added for clarification.

4–1–9. Traffic Advisory Practices at Airports Without Operating Control Towers

This change updates the AIM to incorporate the changes to the FAA Advisory Circular, AC90–66B, that address pilot recommended self-announce broadcasts along with recommendations for pilots conducting straight-in landings to non-towered airports. This change also adds the reference to the AC 90–66, Non-Towered Airport Flight Operations.

4–1–18. Terminal Radar Services for VFR Aircraft

This change adds the word “participating” and “and other participating VFR” in subparagraph 4-1-18b6 to clarify that the guidance only applies to participating visual flight rules (VFR) aircraft.

4–1–20. Transponder and ADS-B Out Operation

4–4–15. Use of Visual Clearing Procedures

This change expands the language in AIM paragraphs 4-1-20 and 4-4-15 to include the limitations inherent in visual scans for traffic and the benefits and best practices of using cockpit displays of traffic information to supplement visual scans to help overcome these limitations.

4–1–20. Transponder and ADS-B Out Operation

This change adds instruction to pilots participating as the lead aircraft in a visual flight rules (VFR) standard formation flight not receiving ATC services to squawk beacon code 1203. Additionally, paragraphs have been reordered and a duplicate section has been deleted.

4–3–6. Use of Runways/Declared Distances

This change clarifies responsibilities associated with air traffic control (ATC) selecting and/or assigning RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY. This change emphasizes that tailwind and crosswind considerations take precedence over delay/capacity considerations, and noise abatement operations/procedures. This change also provides note information that explains parallel runway number markings.

4–5–1. Radar

This change adds information to raise awareness regarding potential limitations on Air Traffic Control (ATC) radar for aircraft flying in the vicinity of wind turbine farms and expands the knowledge of pilots regarding the effects on aviation safety.

4–7–1. Introduction and General Policies

This change replaces “West Atlantic Route System” with “West Atlantic” in the title of the referenced Resource Guide for U.S. Operators.

5–3–4. Airways and Route Systems

References and a brief description of Y routes are added in Paragraph 5-3-4, Subparagraph a3. These point the reader to the Aeronautical Information Publication (AIP) for detailed information on flying Y routes.

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

5–4–9. Procedure Turn and Hold-in-Lieu of Procedure Turn

7–3–6. Examples for Calculating Altitude Corrections on CTAS

This change has updated the referenced instrument approach procedures (IAPs) due to the FAA Order 8260.19 update to remove the requirement to those references from the profile notes, and to add explanatory language that altitude restrictions at stepdown fixes in the final approach segment are not applicable to instrument landing system (ILS), Localizer Performance with Vertical Guidance (LPV), or LNAV/Vertical Navigation (VNAV) approaches.

5–4–23. Visual Approach

5–5–11. Visual Approach

This change adds content to address go-around responsibilities after conducting a visual approach for aircraft either instructed to remain within the traffic pattern or proceed as otherwise directed by air traffic control (ATC). This change also addresses the difference in approach clearances for locations with or without an operating control tower.

5–6–4. ADIZ Requirements

The Aeronautical Information Manual (AIM) and Aeronautical Information Publication (AIP) will be updated with the clarifying language previously added to the FDC NOTAM 2/8783, concerning the procedures and equipment required to operate into, out of, and within the Air Defense Identification Zone (ADIZ).

5–6–14. Law Enforcement Operations by Civil and Military Organizations

This change removes Paragraph 5-6-14 from the Aeronautical Information Manual (AIM).

7–1–1. National Weather Service Aviation Weather Service Program

7–1–4. Graphical Forecasts for Aviation (GFA)

7–1–6. Inflight Aviation Weather Advisories

7–1–8. Inflight Weather Advisory Broadcasts

This change removes the references to Traditional Alphanumeric Code (TAC) Airmen’s Meteorological Information (AIRMETs) over the contiguous United States. Also, it updates the description of AIRMETs and Significant Meteorological Information (SIGMETs) to better describe the products and how they are disseminated in the contiguous United States, Alaska and Hawaii.

7–1–10. Weather Observing Programs

This change clarifies that wind direction is reported relative to magnetic north in the Automatic Terminal Information Service (ATIS) as well as the Automated Surface Observation System (ASOS) and the Automated Weather Observation System (AWOS) broadcasts.

11–1–1. General

11–1–2. Access to The National Airspace System (NAS) for UAS Operators

11–2–1. Part 107 Small UAS and Recreational Flyers

11–2–2. Registration Requirements

11–3–1. Large Public UAS Operations

11–3–2. Exemptions Under 49 USC 44807, Special Authority for Certain Unmanned Systems

11–3–3. Emerging Large Civil UAS Operations

11–4–1. Recreational Flyers

11–4–2. 14 CFR Part 107, and Waivers to 14 CFR Part 107

11–4–3. Airspace Access for Public Aircraft Operations (PAOS)

11–4–4. 14 CFR Part 89 Remote Identification and FAA Recognized Identification Area (FRIA)

11–4–5. Airspace Access for 14 CFR Part 135 and Part 137

11–4–6. Airspace Restrictions to Flight

11–4–7. UAS Air Traffic Management (UTM)

11–5–1. UAS Pilot Certification and Requirements for Part 107 and Recreational Flyers

11–5–2. Pilot Certification and Requirements for Public Aircraft Operations (PAOS)

11–5–3. Pilot Certification for 14 CFR Part 135, Part 137, and Large Civil UAS

11–5–4. Foreign Pilot Certification

11–6–1. General

11–7–1. UAS Operations on Airports

11–8–1. Best Practices for UAS Operations

11–8–2. UAS Operations and Air Traffic Control (ATC)

11–8–3. Precautions: Flight Over or Near People, Vehicles, Manned Aircraft, and Night Operations

11–8–4. Accidents and Incidents: UAS Operator Responsibilities

11–8–5. Emergency UAS Authorizations Through Special Government Interest (SGI) Airspace Waivers

11–8–6. Environmental Best Practices

11–8–7. Resources for UAS Operations

Appendix 3. Abbreviations/Acronyms

This change adds Chapter 11, Unmanned Aircraft Systems (UAS), to the AIM.

Appendix 4. FAA Form 7233–4. International Flight Plan

This change removes existing instructions allowing alternate use of NAV/ to indicate Area Navigation (RNAV) capability to resolve incompatibility with required navigation performance (RNP) routing. Adds instructions for RNP Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes (STARs), which are being added to the NAS (for example, see the KSNA STAYY SID). Removes the legacy use of NAV/ for RNAV capability to avoid the NAV/ information overriding RNP capability filed in PBN/. Because ICAO guidance is moving towards use of standardized, unambiguous codes M1 and M2 for the two variations of RNP 2, the information relating to Australia’s practice is removed from the table.

Editorial Changes

Editorial changes include defining PIREP consistently as Pilot Weather Report and fixing incorrect references in paragraph 5-6-6; clarifying the location of ICAO publications in Subparagraph 9-1-5d; adding three airports to Table 7-1-11, TWIP-Equipped Airports; correcting hyperlinks in Paragraphs 7-6-15 and Appendix 4; replacing Figure 2-3-12 to a unit of measurement issue; fixing a number typo in 4-5-2d Example 14; removing an obsolete provision relating to Final Approach Runway Occupancy Signal (FAROS) in Subparagraph 2-1-6d5; updating examples of FAA Form 7233-4 and FAA Form 7233-1; fixing phrasing in Subparagraph 4-4-15g2(a); and removing a confusing note regarding colored airway systems from Subparagraph 5-3-4a1(b).

Entire Publication

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

Aeronautical Information Manual (AIM)

Basic Flight Information and ATC Procedures

* * * * *

Publication Schedule		
Basic or Change	**Cutoff Date for Completion**	**Effective Date of Publication**
Basic Manual	11/3/22	4/20/23
Change 1	4/20/23	10/5/23
Change 2	10/5/23	3/21/24
Change 3	3/21/24	9/5/24
Basic Manual	9/5/24	2/20/25
Change 1	2/20/25	8/7/25
Change 2	8/7/25	1/22/26
Change 3	1/22/26	7/9/26

* * * * *

Aeronautical Information Manual (AIM)

Code of Federal Regulations and Advisory Circulars

* * * * *

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

Note: *Current AC information can be found at: https://www.faa.gov/regulations_policies/advisory_circulars/.*

* * * * *

Chapter 1

1–1–9 Instrument Landing System (ILS)

* * * * *

k. * * *

2. * * *

(a) Weather Conditions. Official weather observation including controller observations and pilot reports (PIREPs) indicates a ceiling of less than 800 feet and/or visibility less than 2 miles.

(1) Localizer Critical Area. Except for aircraft that land, exit a runway, depart, or execute a missed approach, vehicles and aircraft are not authorized in or over the precision approach critical area when an arriving aircraft is inside the outer marker (OM) or the fix used in lieu of the OM. Additionally, whenever the official weather observation indicates a ceiling of less than 200 feet or RVR less than 2,000 feet, vehicles or aircraft operation are not authorized in or over the area when an arriving aircraft is inside the MM, or in the absence of a MM, 1/2 mile final.

* * * * *

1–1–17 Global Positioning System (GPS)

* * * * *

b. * * *

1. * * *

(e) * * *

(1) VFR waypoints provide VFR pilots with a supplementary tool to assist with position awareness while navigating visually in aircraft equipped with area navigation receivers. VFR waypoints should be used as a tool to supplement current navigation procedures. The uses of VFR waypoints include providing navigational aids for pilots unfamiliar with an area, waypoint definition of existing reporting points, enhanced navigation in and around Class B and Class C airspace, enhanced navigation around Special Use Airspace, and entry points for commonly flown mountain passes. VFR pilots should rely on appropriate and current aeronautical charts published specifically for visual navigation. If operating in a terminal area, pilots should take advantage of the Terminal Area Chart available for that area, if published. The use of VFR waypoints does not relieve the pilot of any responsibility to comply with the operational requirements of 14 CFR Part 91.

(2) VFR waypoint names (for computer-entry and flight plans) consist of five letters beginning with the letters "VP" and are retrievable from navigation databases. The VFR waypoint names are not intended to be pronounceable, and they are not for use in ATC communications. On VFR charts, stand-alone VFR waypoints will be portrayed using the same four-point star symbol used for IFR waypoints. VFR waypoints collocated with visual check points on the chart will be identified by small magenta flag symbols. VFR waypoints collocated with visual check points will be pronounceable based on the name of the visual check point and may be used for ATC communications. Each VFR waypoint name will appear in parentheses adjacent to the geographic location on the chart. Latitude/longitude data for all established VFR waypoints may be found in FAA Order JO 7350.9, Location Identifiers.

* * * * *

(7) Mountain pass entry points are marked for convenience to assist pilots with flight planning and visual navigation. Do not attempt to fly a mountain pass directly from VFR waypoint to VFR waypoint—they do not create a path through the mountain pass. Alternative routes are always available. It is the pilot in command's responsibility to choose a suitable route for the intended flight and known conditions.

Reference: *AIM ¶7-6-7, Mountain Flying.*

* * * * *

1–1–20 Precision Approach Systems other than ILS and GLS

* * * * *

b. * * *

2. General aviation operators requesting approval for special procedures should contact the local Flight Standards District Office to obtain a letter of authorization. Air carrier operators requesting approval for use of special procedures should contact their Certificate Holding District Office for authorization through their Operations Specification.

c. Special Category I Differential GPS (SCAT-I DGPS)

* * * * *

1–2–2 Required Navigation Performance (RNP)

* * * * *

d. * * *

TABLE 1–2–1
U.S. STANDARD RNP LEVELS

RNP Level	Typical Application	Primary Route Width (NM) Centerline to Boundary
0.1 to 1.0	RNP AR Approach Segments	0.1 to 1.0
0.3 to 1.0	RNP Approach Segments	0.3 to 1.0
1	Terminal and En Route	1.0
2	En Route	2.0
4	Oceanic/remote areas where performance-based horizontal separation is applied.	4.0
10	Oceanic/remote areas where performance-based horizontal separation is applied.	10.0

Chapter 2

2–1–6 Runway Status Light (RWSL) System

* * * * *

d. * * *

4. Do not proceed when lights have extinguished without an ATC clearance. RWSL verifies an ATC clearance; it does not substitute for an ATC clearance.

e. ATC Control of RWSL System:

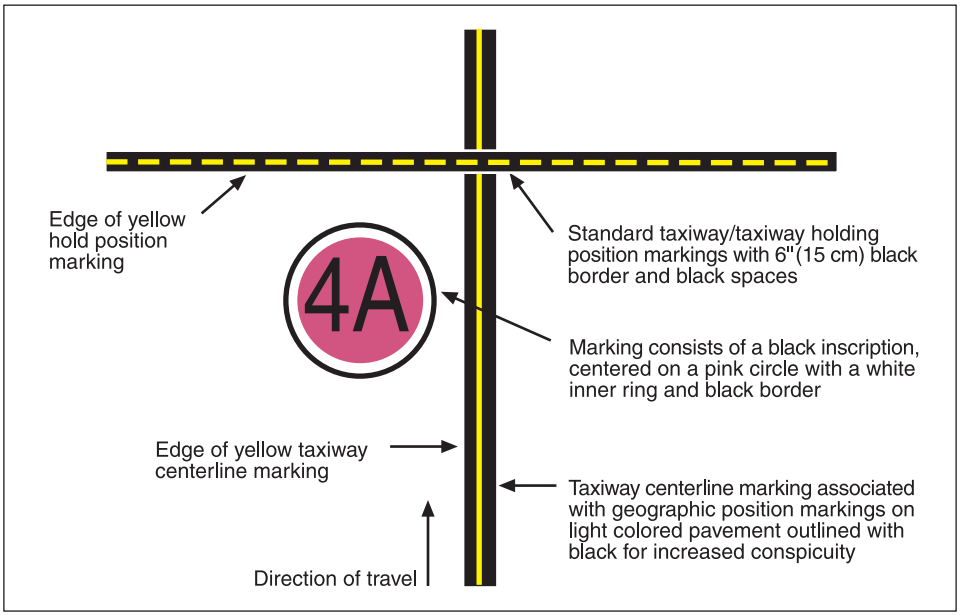
* * * * *

2–3–5 Holding Position Markings

* * * * *

d. * * *

FIGURE 2–3–12
Geographic Position Markings



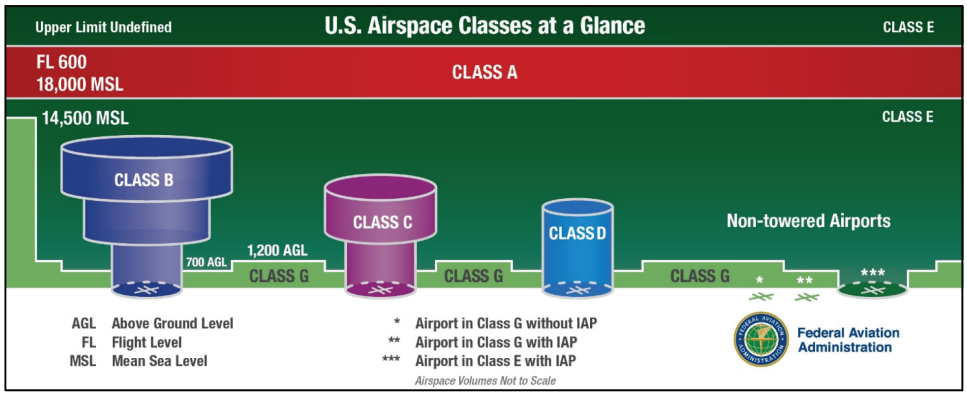
* * * * *

Chapter 3

3–2–1 General

a. * * *

FIGURE 3–2–1
Airspace Classes



* * * * *

3–2–3 Class B Airspace

* * * * *

e. * * *

Note: *Separation and sequencing of VFR aircraft will be suspended in the event of a radar outage as this service is dependent on radar. The pilot will be advised that the service is not available and issued wind, runway information and the time or place to contact the tower.*

* * * * *

3–2–4 Class C Airspace

* * * * *

e. * * *

4. * * *

(c) * * *

Note 2: *Pilot participation is voluntary within the outer area and can be discontinued, within the outer area, at the pilot's request. Class C services will be provided in the outer area unless the pilot requests termination of the service.*

Note 3: *Some facilities provide Class C services only during published hours. At other times, terminal IFR radar service will be provided. It is important to note that the communications and transponder/ADS-B requirements are dependent on the class of airspace established outside of the published hours.*

f. Secondary Airports

* * * * *

3–5–2 Military Training Routes

* * * * *

e. The FLIP contains charts and narrative descriptions of these routes. To obtain this publication contact:

Defense Logistics Agency for Aviation
Mapping Customer Operations (DLA AVN/QAM)
8000 Jefferson Davis Highway
Richmond, VA 23297-5339
Toll free phone: 1-800-826-0342
Commercial: 804-279-6500

MTR information from the FLIP is available for pilot briefings through Flight Service. (See subparagraph f below.)

f. Availability of MTR information.

1. Pilots may obtain preflight MTR information through Flight Service (see paragraph 5-1-1, Preflight Preparation).

2. MTR routes are depicted on IFR En Route Low Altitude Charts and VFR Sectional Charts, which are available for free download on the FAA website at https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/.

g. Nonparticipating aircraft are not prohibited from flying within an MTR; however, extreme vigilance should be exercised when conducting flight through or near these routes. Pilots, while inflight, should contact the FSS within 100 NM of a particular MTR to obtain current information or route usage in their vicinity. Information available includes times of scheduled activity, altitudes in use on each route segment, and actual route width. Route width varies for each MTR and can extend several miles on either side of the charted MTR centerline. Route width information for IFR Military Training Route (IR) and VFR Military Training Route (VR) MTRs is also available in the FLIP AP/1B along with additional MTR (slow routes/air refueling routes) information. When requesting MTR information, pilots should give the FSS their position, route of flight, and destination in order to reduce frequency congestion and permit the FSS specialist to identify the MTR which could be a factor.

Chapter 4

4–1–8 Approach Control Service for VFR Arriving Aircraft

* * * * *

d. * * *

Note: *Approach control services for VFR aircraft are normally dependent on ATC radar. These services are not available during periods of a radar outage.*

4–1–9 Traffic Advisory Practices at Airports Without Operating Control Towers

* * * * *

g. * * *

4. Straight-in Landings. The FAA discourages VFR straight-in approaches to landings due to the increased risk of a mid-air collision. However, if a pilot chooses to execute a straight-in approach for landing without entering the airport traffic pattern, the pilot should self-announce their position on the designated CTAF approximately 8 to 10 miles from the airport and coordinate their straight-in approach and landing with other airport traffic. Pilots executing a straight-in approach (IFR or VFR) do not have priority over other aircraft in the traffic pattern, and must comply with the provisions of 14 CFR 91.113 (g), Right-of-way rules.

5. Traffic Pattern Operations. All traffic within a 10-mile radius of a non-towered airport or a part-time-towered airport when the control tower is not operating, should monitor and communicate on the designated CTAF when entering the traffic pattern. Pilots operating in the traffic pattern or on a straight-in approach must be alert at all times to other aircraft in the pattern, or conducting straight-in approaches, and communicate their position to avoid a possible traffic conflict. In the airport traffic pattern and while on straight-in approaches to a runway, effective communication and a pilot's responsibility to see-and-avoid are essential mitigations to avoid a possible midair collision. In addition, following established traffic pattern procedures eliminates excessive maneuvering at low altitudes, reducing the risk of loss of aircraft control.

Reference: *FAA Advisory Circular (AC) 90-66, Non-Towered Airport Flight Operations.*

6. Practice Approaches. Pilots conducting practice instrument approaches should be particularly alert for other aircraft that may be departing in the opposite direction. When conducting any practice approach, regardless of its direction relative to other airport operations, pilots should make announcements on the CTAF as follows:

(a) Departing the final approach fix, inbound (nonprecision approach) or departing the outer marker or fix used in lieu of the outer marker, inbound (precision approach);

(b) Established on the final approach segment or immediately upon being released by ATC;

(c) Upon completion or termination of the approach; and

(d) Upon executing the missed approach procedure.

7. Departing aircraft should always be alert for arrival aircraft coming from the opposite direction.

8. Recommended self-announce broadcasts: It should be noted that aircraft operating to or from another nearby airport may be making self-announce broadcasts on the same UNICOM or MULTICOM frequency. To help identify one airport from another, the airport name should be spoken at the beginning and end of each self-announce transmission. When referring to a specific runway, pilots should use the runway number and not use the phrase "Active Runway."

* * * * *

4–1–18 Terminal Radar Services for VFR Aircraft

* * * * *

b. * * *

6. Participating VFR aircraft will be separated from IFR and other participating VFR aircraft by one of the following:

* * * * *

f. ATC services for VFR aircraft participating in terminal radar services are dependent on ATC radar. Services for VFR aircraft are not available during periods of a radar outage. The pilot will be advised when VFR services are limited or not available.

* * * * *

4–1–20 Transponder and ADS-B Out Operation

a. * * *

1. Pilots should be aware that proper application of transponder and ADS-B operating procedures will provide both VFR and IFR aircraft with a higher degree of safety while operating on the ground and airborne. Transponder/ADS-B panel designs differ; therefore, a pilot should be thoroughly familiar with the operation of their particular equipment to maximize its full potential. ADS-B Out, and transponders with altitude reporting mode turned ON (Mode C or S), substantially increase the capability of surveillance systems to see an aircraft. This provides air traffic controllers, as well as pilots of suitably equipped aircraft (TCAS and ADS-B In), increased situational awareness and the ability to identify potential traffic conflicts. Even VFR pilots who are not in contact with ATC will be afforded greater protection from IFR aircraft and VFR aircraft that are receiving traffic advisories. Nevertheless, pilots should never relax their visual scanning for other aircraft, and should include the ADS-B In display (if equipped) in their normal traffic scan.

* * * * *

4. * * *

(b) Aircraft equipped with ADS-B Out MUST operate with this equipment in the transmit mode at all times, unless otherwise requested by ATC.

5. Transponder and ADS-B Operation Under Visual Flight Rules (VFR).

(a) Unless otherwise instructed by an ATC facility, adjust transponder/ADS-B to reply on Mode 3/A Code 1200 regardless of altitude.

(b) When required to operate their transponder/ADS-B, pilots must always operate that equipment with altitude reporting enabled unless otherwise instructed by ATC or unless the installed equipment has not been tested and calibrated as required by 14 CFR Section 91.217. If deactivation is required, turn off altitude reporting.

(c) When participating in a VFR standard formation flight that is not receiving ATC services, only the lead aircraft should operate its transponder and ADS-B Out and squawk code 1203. Once established in formation, all other aircraft should squawk standby and disable ADS-B transmissions.

Note 1: *If the formation flight is receiving ATC services, pilots can expect ATC to direct all non-lead aircraft to STOP Squawk, and should not do so until instructed.*

Note 2: *Firefighting aircraft not in contact with ATC may squawk 1255 in lieu of 1200 while en route to, from, or within the designated firefighting area(s).*

Note 3: *VFR aircraft flying authorized SAR missions for the USAF or USCG may be advised to squawk 1277 in lieu of 1200 while en route to, from, or within the designated search area.*

Note 4: *VFR gliders should squawk 1202 in lieu of 1200.*

Reference: *FAA Order JO 7110.66, National Beacon Code Allocation Plan (NBCAP).*

6. A pilot on an IFR flight who elects to cancel the IFR flight plan prior to reaching their destination, should adjust the transponder/ADS-B according to VFR operations.

7. If entering a **U.S. Offshore Airspace Area** from outside the U.S., the pilot should advise on first radio contact with a U.S. radar ATC facility that such equipment is available by adding "transponder" or "ADS-B" (if equipped) to the aircraft identification.

8. It should be noted by all users of ATC transponders and ADS-B Out systems that the surveillance coverage they can expect is limited to "line of sight" with ground radar and ADS-B radio sites. Low altitude or aircraft antenna shielding by the aircraft itself may result in reduced range or loss of aircraft contact. Though ADS-B often provides superior reception at low altitudes, poor coverage from any surveillance system can be improved by climbing to a higher altitude.

* * * * *

b. * * *

1. * * *

Reference: *FAA Order JO 7110.66, National Beacon Code Allocation Plan (NBCAP).*

* * * * *

f. * * *

6. In-flight requests for "immediate" deviation from the ADS-B Out requirements may be approved by ATC only for failed equipment, and may be accommodated based on workload, alternate surveillance availability, or other factors. All other requests for deviation must be made at least 1 hour before the proposed operation, following the procedures contained in Advisory Circular (AC) 90-114, Automatic Dependent Surveillance–Broadcast Operations.

g. Cooperative Surveillance Phraseology. Air traffic controllers, both civil and military, will use the following phraseology when referring to operation of cooperative ATC surveillance equipment. Except as noted, the following ATC instructions do not apply to military transponders operating in other than Mode 3/A/C/S.

* * * * *

4–3–6 Use of Runways/Declared Distances

a. Runways are identified by numbers that indicate the nearest 10-degree increment of the azimuth of the runway centerline. For example, where the magnetic azimuth is 183 degrees, the runway designation would be 18; for a magnetic azimuth of 87 degrees, the runway designation would be 9. For a magnetic azimuth ending in the number 5, such as 185, the runway designation could be either 18 or 19. Wind direction issued by the tower is also magnetic and wind velocity is in knots.

Note 1: *At airports with multiple parallel runways whose magnetic azimuths are identical, each runway number will be supplemented by a letter and shown from left to right when viewed from the direction of approach.*

Note 2: *When multiple parallel runways at the same airport are separated by a large distance, such as by a central terminal or several terminals, the runways may be designated as non-parallel runways to avoid pilot confusion.*

Reference: *AC 150/5340-1, Standards for Airport Markings, Paragraph 2.3.5, Characteristics.*

b. * * *

1. ATC will assign the runway/s most nearly aligned with the wind when 5 knots or more, or the "calm wind" runway when less than 5 knots unless:

(a) Use of another runway is operationally advantageous, or

(b) A Runway Use Program is in effect.

Note: *Tailwind and crosswind considerations take precedence over delay/capacity considerations, and noise abatement operations/procedures.*

Reference: *FAA Order JO 7110.65, Paragraph 3-5-1, Selection.*

c. If a pilot prefers to use a runway different from that specified, the pilot is expected to advise ATC. ATC may honor such requests as soon as is operationally practicable. ATC will advise pilots when the requested runway is noise sensitive. When use of a runway other than the one assigned is requested, pilot cooperation is encouraged to preclude disruption of traffic flows or the creation of conflicting patterns.

Reference: *FAA Order JO 7110.65, Paragraph 3-5-1, Selection.*

d. Declared Distances.

* * * * *

4–4–3 Clearance Items

* * * * *

b. * * *

Reference: *AIM, ¶5-2-6, Abbreviated IFR Departure Clearance (Cleared…as Filed) Procedures; AIM, ¶5-2-9, Instrument Departure Procedures (DP)—Obstacle Departure Procedures (ODP) and Standard Instrument Departures (SID).*

4–4–11 IFR Separation Standards

* * * * *

c. * * *

Note: *Certain separation standards may be increased in the terminal environment due to radar outages or other technical reasons.*

4–4–15 Use of Visual Clearing Procedures and Scanning Techniques

* * * * *

g. Scanning Techniques for Traffic Avoidance.

1. Pilots must be aware of the limitations inherent in the visual scanning process. These limitations may include:

(a) Reduced scan frequency due to concentration on flight instruments or tablets and distraction with passengers.

(b) Blind spots related to high-wing and low-wing aircraft in addition to windshield posts and sun visors.

(c) Prevailing weather conditions including reduced visibility and the position of the sun.

(d) The attitude of the aircraft will create additional blind spots.

(e) The physical limitations of the human eye, including the time required to (re)focus on near and far objects, from the instruments to the horizon for example; empty field myopia, narrow field of vision and atmospheric lighting all affect our ability to detect another aircraft.

2. Best practices to see and avoid:

(a) ADS-B In is an effective system to help pilots see and avoid other aircraft. If your aircraft is equipped with ADS-B In, it is important to understand its features and how to use it properly. Many units provide visual and/or audio alerts to supplement the system's traffic display. Pilots should incorporate the traffic display in their normal traffic scan to provide awareness of nearby aircraft. Prior to entering or crossing any runway, ADS-B In can provide advance indication of arriving aircraft and aircraft in the traffic pattern. Systems that incorporate a traffic-alerting feature can help minimize the pilot's inclination to fixate on the display. Refer to 4-5-7e, ADS-B Limitations.

(b) Understand the limitations of ADS-B In. In certain airspace, not all aircraft will be equipped with ADS-B Out or transponders and will not be visible on your ADS-B In display.

(c) Limit the amount of time that you focus on flight instruments or tablets.

(d) Develop a strategic approach to scanning for traffic. Scan the entire sky and try not to focus straight ahead.

4–5–1 Radar

* * * * *

b. * * *

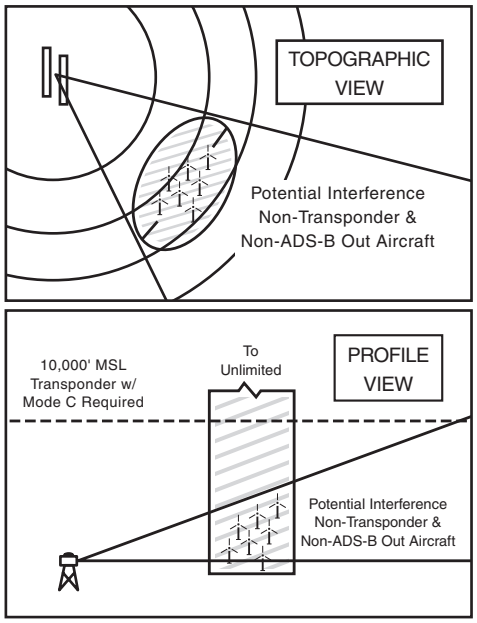
1. * * *

(g) With regard to air traffic radar reception, wind turbines generally do not affect the quality of air traffic surveillance radar returns for transponder and ADS-B Out equipped aircraft. Air traffic interference issues apply to the search radar and Non-Transponder/Non-ADS-B Out equipped aircraft.

Note: *Generally, one or two wind turbines don't present a significant radar reception loss. A rule of thumb is three (3) or more turbines constitute a wind turbine farm and thus negatively affect the search radar product.*

(1) Detection loss in the area of a wind turbine farm is substantial. In extreme circumstances, this can extend for more than 1.0 nautical mile (NM) horizontally around the nearest turbine and at all altitudes above the wind turbine farm. (See Figure 4-5-2.)

FIGURE 4–5–2
Wind Turbine Farm Area of Potential Interference



Note: *All aircraft should comply with 14 CFR §91.119(c) "…aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure."*

(2) To avoid interference Non-Transponder/Non-ADS-B Out equipped aircraft should avoid flight within 1.0 NM horizontally, at all altitudes, from the wind turbine farms.

(3) Because detection loss near and above wind turbine farms for search-only targets causes dropped tracks, erroneous tracks, and can result in loss of separation, it is imperative that Non-Transponder/Non-ADS-B Out equipped aircraft operate at the proper VFR altitudes per hemispheric rule and utilize see-and-avoid techniques.

(4) Pilots should be aware that air traffic controllers cannot provide separation from Non-Transponder/Non-ADS-B Out equipped aircraft in the vicinity of wind turbine farms. See-and-avoid is the pilot's responsibility, as these non-equipped aircraft may not appear on radar and will not appear on the Traffic Information Services–Broadcast (TIS-B).

(h) The controller's ability to advise a pilot flying on instruments or in visual conditions of the aircraft's proximity to another aircraft will be limited if the unknown aircraft is not observed on radar, if no flight plan information is available, or if the volume of traffic and workload prevent issuing traffic information. The controller's first priority is given to establishing vertical, lateral, or longitudinal separation between aircraft flying IFR under the control of ATC.

* * * * *

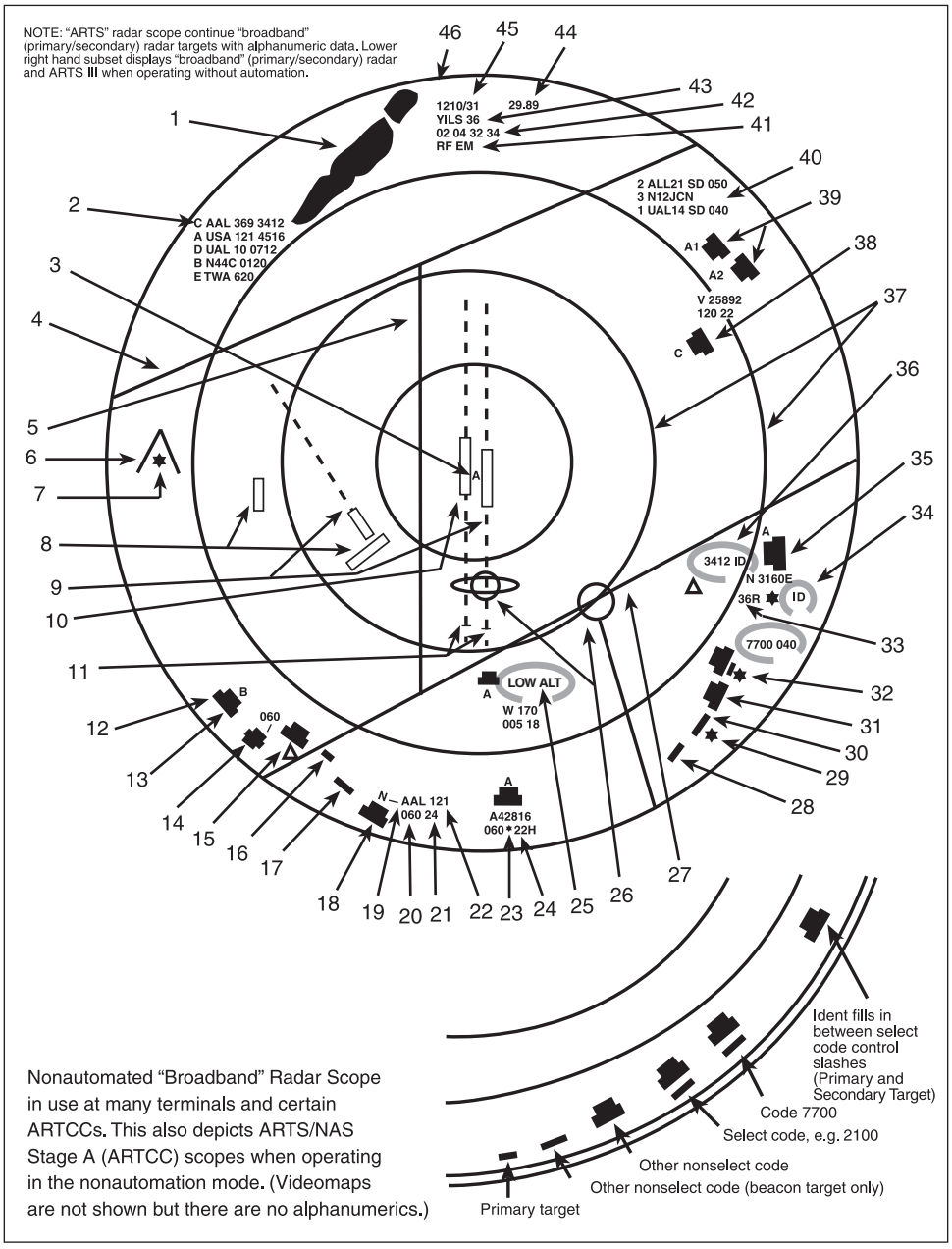
4–5–2 Air Traffic Control Radar Beacon System (ATCRBS)

* * * * *

c. * * *

Note: *Refer to figures with explanatory legends for an illustration of the target symbology depicted on radar scopes in the NAS Stage A (en route), the ARTS III (terminal) Systems, and other nonautomated (broadband) radar systems. (See Figures 4-5-3 and 4-5-4.)*

FIGURE 4–5–3
ARTS III Radar Scope With Alphanumeric Data



Note: *A number of radar terminals do not have ARTS equipment. Those facilities and certain ARTCCs outside the contiguous U.S. would have radar displays similar to the lower right hand subset. ARTS facilities and NAS Stage A ARTCCs, when operating in the nonautomation mode, would also have similar displays and certain services based on automation may not be available.*

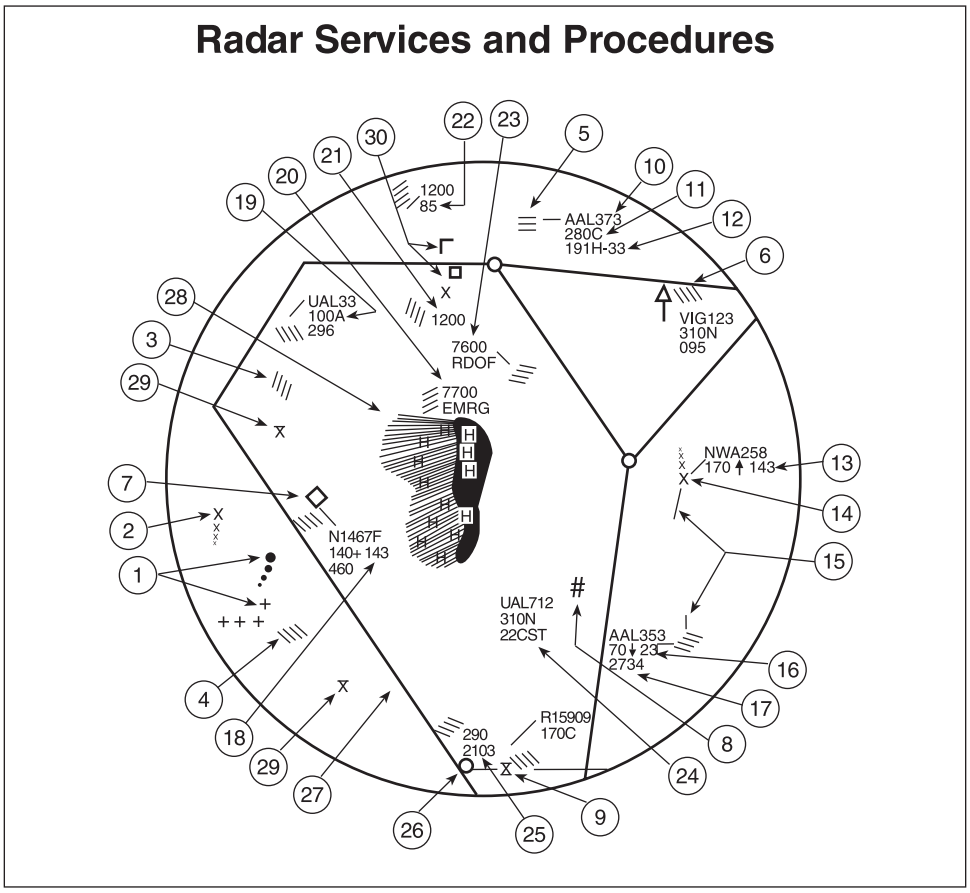
Example

* * * * *

14. *Untracked target select code (monitored) with Mode C readout of 6,000'*

* * * * *

FIGURE 4–5–4
NAS Stage A Controllers View Plan Display
This figure illustrates the controller's radar scope (PVD) when operating in the full automation (RDP) mode, which is normally 20 hours per day.
(When not in automation mode, the display is similar to the broadband mode shown in the ARTS III radar scope figure. Certain ARTCCs outside the contiguous U.S. also operate in "broadband" mode.)



* * * * *

4–5–3 Surveillance Radar

a. * * *

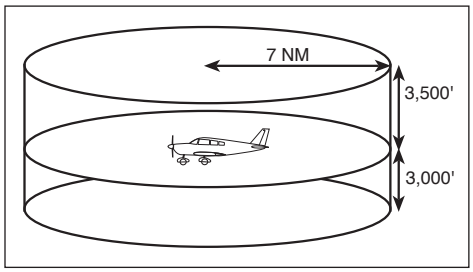
2. ARSR is a long-range radar system designed primarily to provide a display of aircraft locations over large areas.

b. Surveillance radars scan through 360 degrees of azimuth and present target information on a radar display located in a tower or center. This information is used independently or in conjunction with other navigational aids in the control of air traffic.

4–5–6 Traffic Information Service (TIS)

a. Introduction. The Traffic Information Service (TIS) provides information to the cockpit via data link, that is similar to VFR radar traffic advisories normally received over voice radio. Among the first FAA-provided data services, TIS is intended to improve the safety and efficiency of "see and avoid" flight through an automatic display that informs the pilot of nearby traffic and potential conflict situations. This traffic display is intended to assist the pilot in visual acquisition of these aircraft. TIS employs an enhanced capability of the terminal Mode S radar system, which contains the surveillance data, as well as the data link required to "uplink" this information to suitably-equipped aircraft (known as a TIS "client"). TIS provides estimated position, altitude, altitude trend, and ground track information for up to 8 intruder aircraft within 7 NM horizontally, +3,500 and -3,000 feet vertically of the client aircraft (see Figure 4-5-5, TIS Proximity Coverage Volume). The range of a target reported at a distance greater than 7 NM only indicates that this target will be a threat within 34 seconds and does not display a precise distance. TIS will alert the pilot to aircraft (under surveillance of the Mode S radar) that are estimated to be within 34 seconds of potential collision, regardless of distance or altitude. TIS surveillance data is derived from the same radar used by ATC; this data is uplinked to the client aircraft on each radar scan (nominally every 5 seconds).

FIGURE 4–5–5
TIS Proximity Coverage Volume



b. Requirements

1. In order to use TIS, the client and any intruder aircraft must be equipped with the appropriate cockpit equipment and fly within the radar coverage of a Mode S radar capable of providing TIS. Typically, this will be within 55 NM of the sites depicted in Figure 4-5-6, Terminal Mode S Radar Sites. ATC communication is not a requirement to receive TIS, although it may be required by the particular airspace or flight operations in which TIS is being used.

2. The cockpit equipment functionality required by a TIS client aircraft to receive the service consists of the following (refer to Figure 4-5-7):

FIGURE 4–5–6
Terminal Mode S Radar Sites

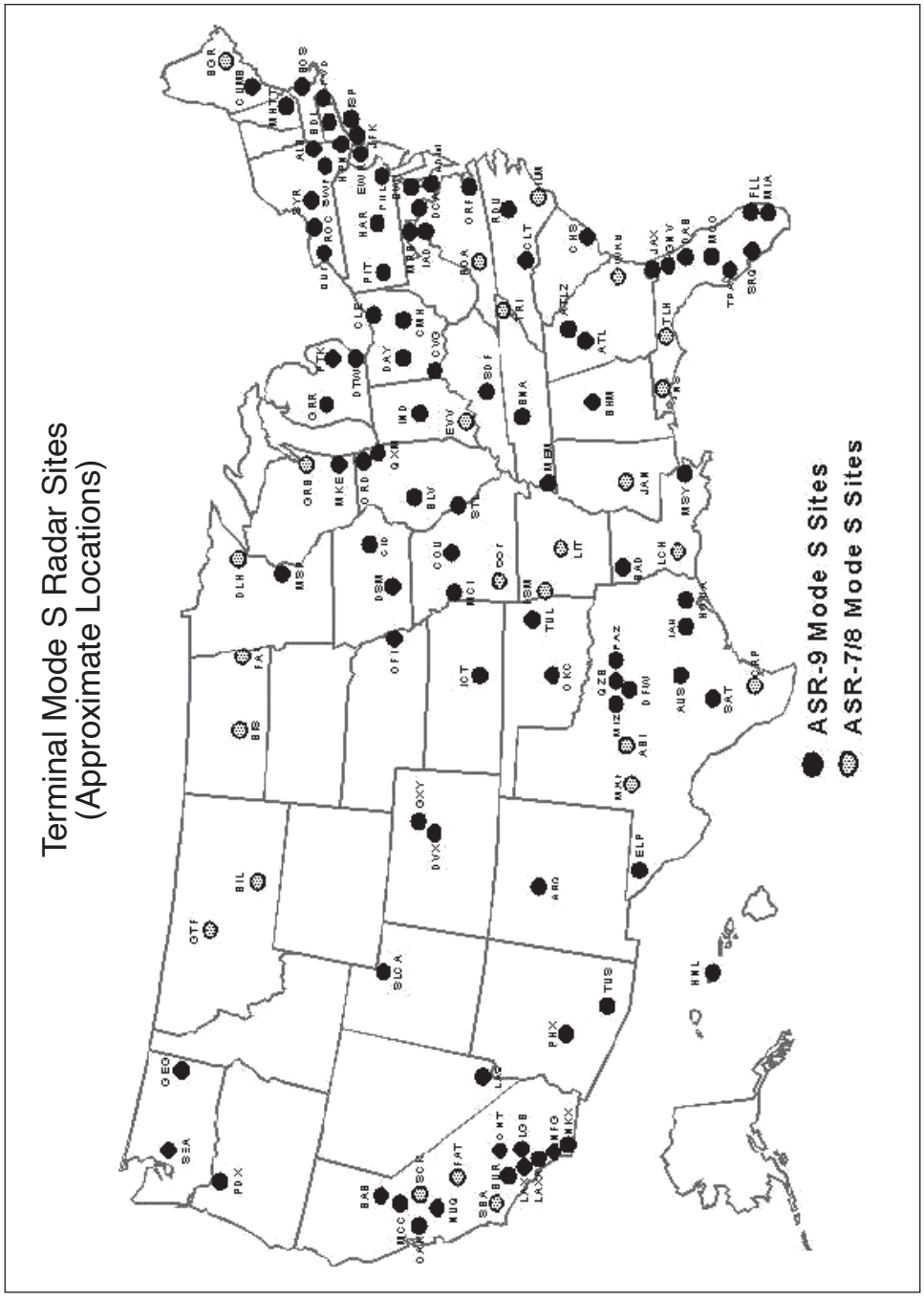
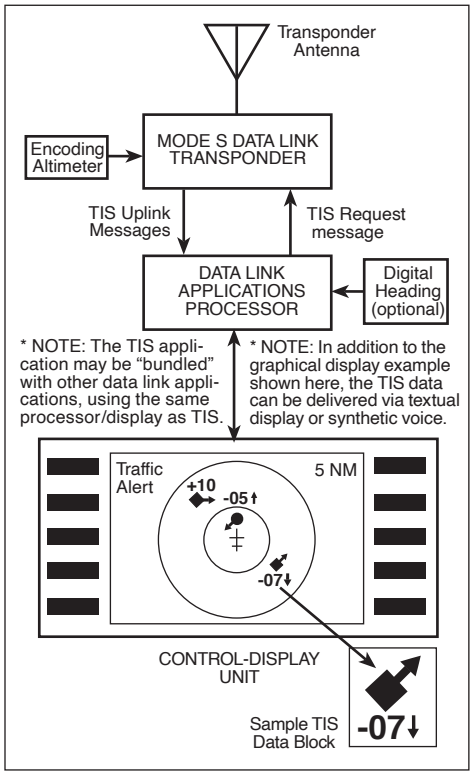


FIGURE 4–5–7
Traffic Information Service (TIS)
Avionics Block Diagram



* * * * *

4. TIS will initially be provided by the terminal Mode S systems that are paired with ASR-9 digital primary radars. These systems are in locations with the greatest traffic densities, thus will provide the greatest initial benefit. The remaining terminal Mode S sensors, which are paired with ASR-7 or ASR-8 analog primary radars, will provide TIS pending modification or relocation of these sites. See Figure 4-5-6, Terminal Mode S Radar Sites, for site locations. There is no mechanism in place, such as NOTAMs, to provide status update on individual radar sites since TIS is a non-essential, supplemental information service.

* * * * *

c. * * *

5. Depending on avionics system design, TIS may be presented to the pilot in a variety of different displays, including text and/or graphics. Voice annunciation may also be used, either alone or in combination with a visual display. Figure 4-5-7, Traffic Information Service (TIS), Avionics Block Diagram, shows an example of a TIS display using symbology similar to the Traffic Alert and Collision Avoidance System (TCAS) installed on most passenger air carrier/commuter aircraft in the U.S. The small symbol in the center represents the client aircraft and the display is oriented "track up," with the 12 o'clock position at the top. The range rings indicate 2 and 5 NM. Each intruder is depicted by a symbol positioned at the approximate relative bearing and range from the client aircraft. The circular symbol near the center indicates an "alert" intruder and the diamond symbols indicate "proximate" intruders.

6. The inset in the lower right corner of Figure 4-5-7, Traffic Information Service (TIS), Avionics Block Diagram, shows a possible TIS data block display. The following information is contained in this data block:

* * * * *

d. * * *

2. * * *

(b) TIS Client Altitude Reporting Requirement. Altitude reporting is required by the TIS client aircraft in order to receive TIS. If the altitude encoder is inoperative or disabled, TIS will be unavailable, as TIS requests will not be honored by the ground system. As such, TIS requires altitude reporting to determine the Proximity Coverage Volume as indicated in Figure 4-5-5. TIS users must be alert to altitude encoder malfunctions, as TIS has no mechanism to determine if client altitude reporting is correct. A failure of this nature will cause erroneous and possibly unpredictable TIS operation. If this malfunction is suspected, confirmation of altitude reporting with ATC is suggested.

* * * * *

(d) * * *

(1) TIS will typically be provided within 55 NM of the radars depicted in Figure 4-5-6, Terminal Mode S Radar Sites. This maximum range can vary by radar site and is always subject to "line of sight" limitations; the radar and data link signals will be blocked by obstructions, terrain, and curvature of the earth.

e. * * *

1. * * *

Note: *TIS operates at only those terminal Mode S radar sites depicted in Figure 4-5-6. Though similar in some ways, TIS is not related to TIS-B (Traffic Information Service–Broadcast).*

4–5–7 Automatic Dependent Surveillance–Broadcast (ADS-B) Services

a. * * *

1. Automatic Dependent Surveillance–Broadcast (ADS-B) is a surveillance technology deployed throughout the NAS (see Figure 4-5-8). The ADS-B system is composed of aircraft avionics and a ground infrastructure. Onboard avionics determine the position of the aircraft by using the GNSS and transmit its position along with additional information about the aircraft to ground stations for use by ATC and other ADS-B services. This information is transmitted at a rate of approximately once per second. (See Figure 4-5-9 and Figure 4-5-10.)

* * * * *

FIGURE 4–5–8
ADS-B, TIS-B, and FIS-B: Broadcast Services Architecture

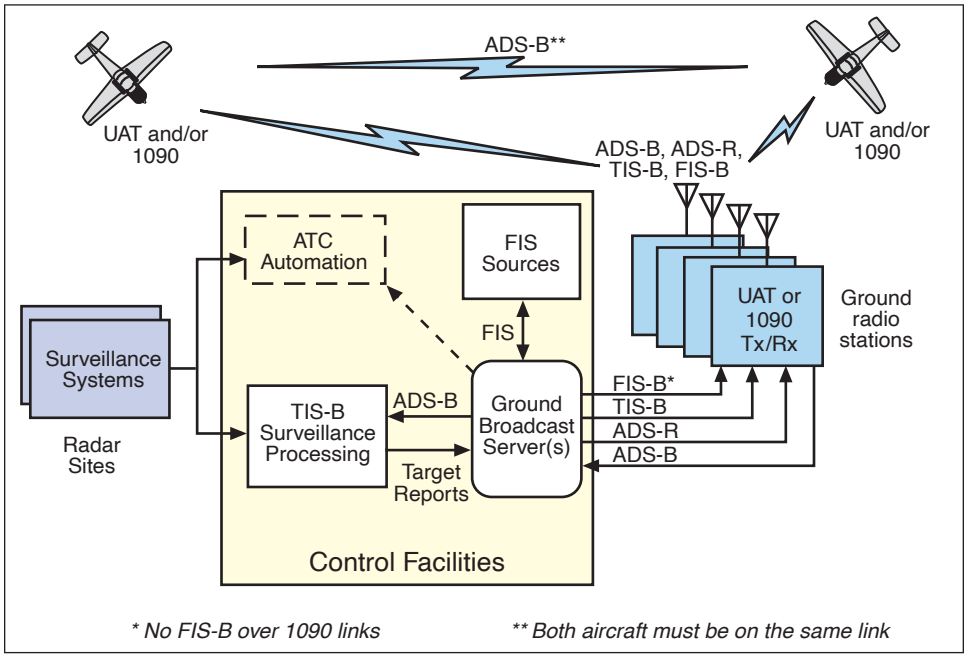


FIGURE 4–5–9
En Route – ADS-B/ADS-R/ TIS-B/FIS-B Service Ceilings/Floors

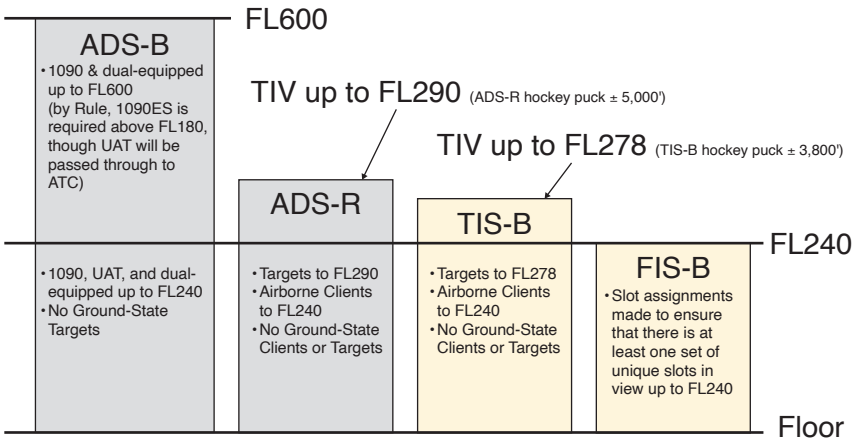
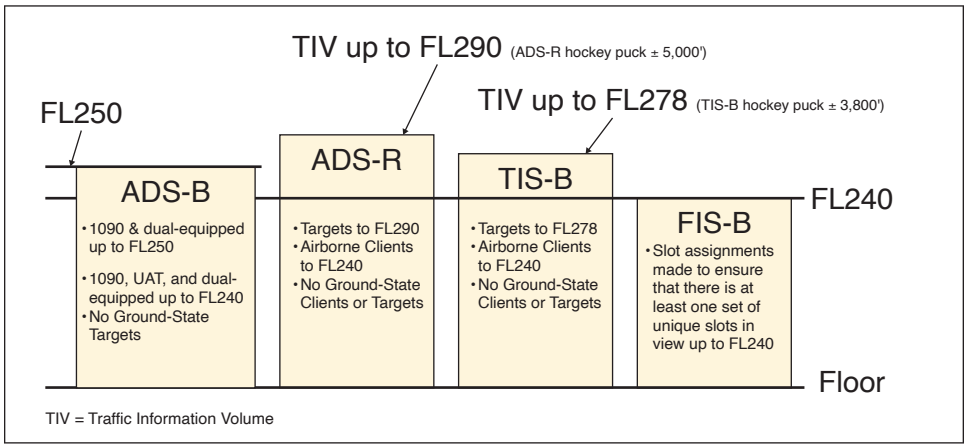


FIGURE 4–5–10
Terminal – ADS-B/ADS-R/ TIS-B/FIS-B Service Ceilings/Floors



* * * * *

4–5–8 Traffic Information Service–Broadcast (TIS-B)

a.* * *

TIS-B is the broadcast of ATC derived traffic information to ADS-B equipped (1090ES or UAT) aircraft from ground radio stations. The source of this traffic information is derived from ground-based air traffic surveillance sensors. TIS-B service will be available throughout the NAS where there are both adequate surveillance coverage from ground sensors and adequate broadcast coverage from ADS-B ground radio stations. The quality level of traffic information provided by TIS-B is dependent upon the number and type of ground sensors available as TIS-B sources and the timeliness of the reported data. (See Figure 4-5-9 and Figure 4-5-10.)

* * * * *

4–5–9 Flight Information Service–Broadcast (FIS-B)

a.* * *

FIS-B is a ground broadcast service provided through the ADS-B Services network over the 978 MHz UAT data link. The FAA FIS-B system provides pilots and flight crews of properly equipped aircraft with a cockpit display of certain aviation weather and aeronautical information. FIS-B reception is line-of-sight within the service volume of the ground infrastructure. (See Figure 4-5-9 and Figure 4-5-10.)

* * * * *

4–5–10 Automatic Dependent Surveillance–Rebroadcast (ADS-R)

a.* * *

ADS-R is a datalink translation function of the ADS-B ground system required to accommodate the two separate operating frequencies (978 MHz and 1090 ES). The ADS-B system receives the ADS-B messages transmitted on one frequency and ADS-R translates and reformats the information for rebroadcast and use on the other frequency. This allows ADS-B In equipped aircraft to see nearby ADS-B Out traffic regardless of the operating link of the other aircraft. Aircraft operating on the same ADS-B frequency exchange information directly and do not require the ADS-R translation function. (See Figure 4-5-9 and Figure 4-5-10.)

* * * * *

4–7–1 Introduction and General Policies

* * * * *

e. Useful information for flight planning and operations over the Gulf of Mexico, under this 50 NM lateral separation policy, as well as information on how to obtain RNP 10 or RNP 4 authorization, can be found in the West Atlantic, Gulf of Mexico, and Caribbean Resource Guide for U.S. Operators located at: https://www.faa.gov/headquartersoffices/avs/wat-gomex-and-caribbean-resource-guide.

* * * * *

Chapter 5

5–3–4 Airways and Route Systems

a. * * *

1. * * *

(b) The L/MF airways (colored airways) are predicated solely on L/MF navigation aids and are depicted in brown on aeronautical charts and are identified by color name and number (e.g., Amber One). Green and Red airways are plotted east and west. Amber and Blue airways are plotted north and south.

(c) The use of TSO-C145 (as revised) or TSO-C146 (as revised) GPS/WAAS navigation systems is allowed in Alaska as the only means of navigation on published air traffic service (ATS) routes, including those Victor, T-Routes, and colored airway segments designated with a second minimum en route altitude (MEA) depicted in blue and followed by the letter G at those lower altitudes. The altitudes so depicted are below the minimum reception altitude (MRA) of the land-based navigation facility defining the route segment, and guarantee standard en route obstacle clearance and two-way communications. Air carrier operators requiring operations specifications are authorized to conduct operations on those routes in accordance with FAA operations specifications.

* * * * *

3. * * *

(a) Published RNAV routes, including Q-routes, T-routes, and Y-routes, can be flight planned for use by aircraft with RNAV capability, subject to any limitations or requirements noted on en route charts, in applicable Advisory Circulars, NOTAMs, etc. RNAV routes are normally depicted in blue on aeronautical charts and are identified by the letter “Q,” “T,” or “Y” followed by the airway num-

ber (for example, Q13, T205, and Y280). Published RNAV routes are RNAV 2 except when specifically charted as RNAV 1. Unless otherwise specified, these routes require system performance currently met by GPS, GPS/WAAS, or DME/DME/IRU RNAV systems that satisfy the criteria discussed in AC 90-100A, U.S. Terminal and En Route Area Navigation (RNAV) Operations.
* * * * *

(3) Y-routes generally run in U.S. offshore airspace, however operators can find some Y-routes over southern Florida. Pilots must use GPS for navigation and meet RNAV 2 performance requirements for all flights on Y-routes. Operators can find additional Y-route requirements in the U.S. Aeronautical Information Publication (AIP), ENR 7.10, available on the FAA website.
* * * * *

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

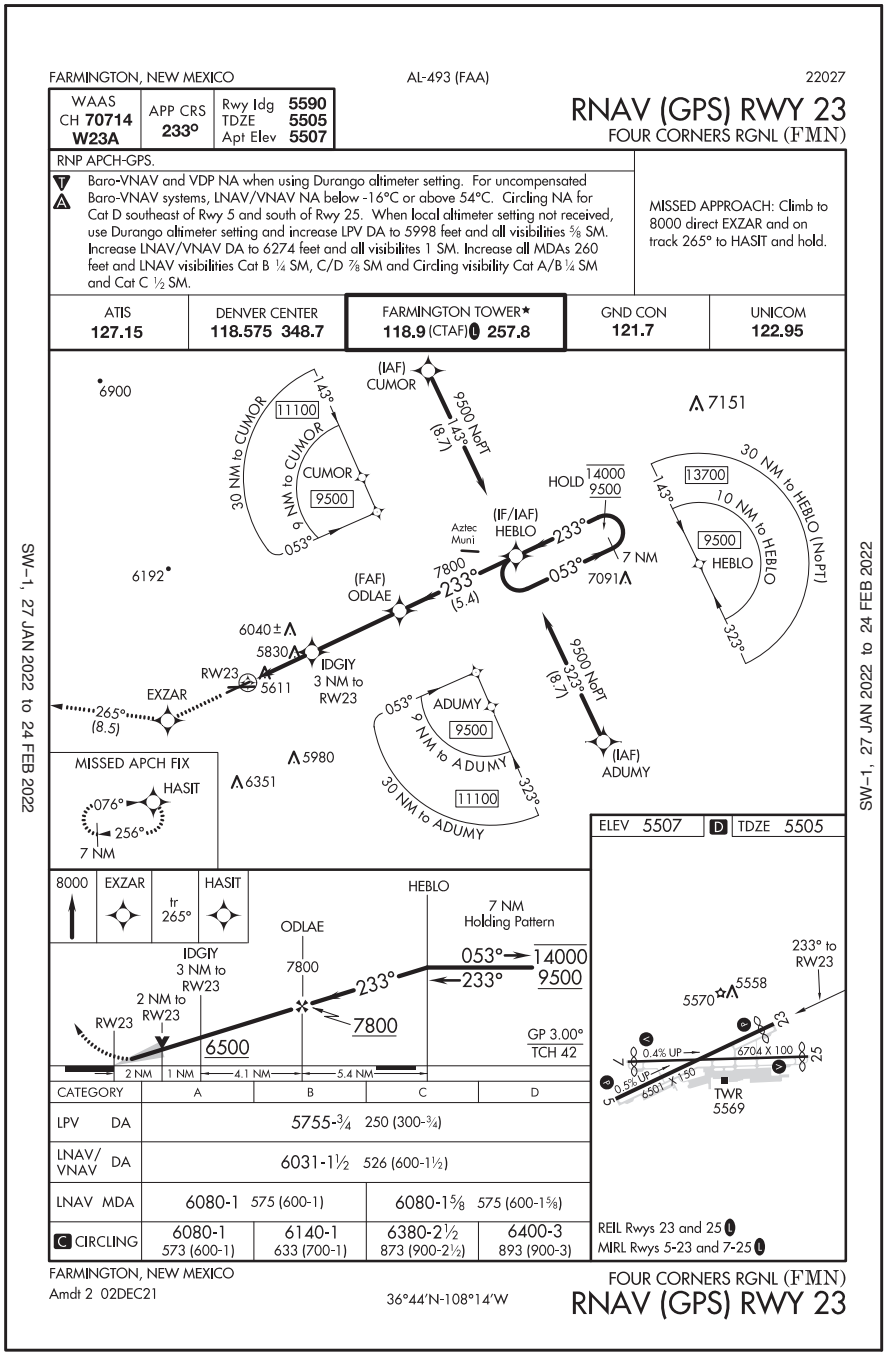
b. * * *

5. Altitude restrictions depicted at stepdown fixes within the final approach segment are applicable only when flying a Non-Precision Approach to a straight-in or circling line of minima identified as an MDA (H). These altitude restrictions may be annotated with a note “LOC only” or “LNAV only.” Stepdown fix altitude restrictions within the final approach segment do not apply to pilots using Precision Approach (ILS) or Approach with Vertical Guidance (LPV, LNAV/VNAV) lines of minima identified as a DA(H), since obstacle clearance on these approaches is based on the aircraft following the applicable vertical guidance. Pilots are responsible for adherence to stepdown fix altitude restrictions when outside the final approach segment (i.e., initial or intermediate segment), regardless of which type of procedure the pilot is flying. (See Figure 5-4-1.)
* * * * *

d. * * *

6. * * *

FIGURE 5–4–6
RNAV (GPS) Approach Chart



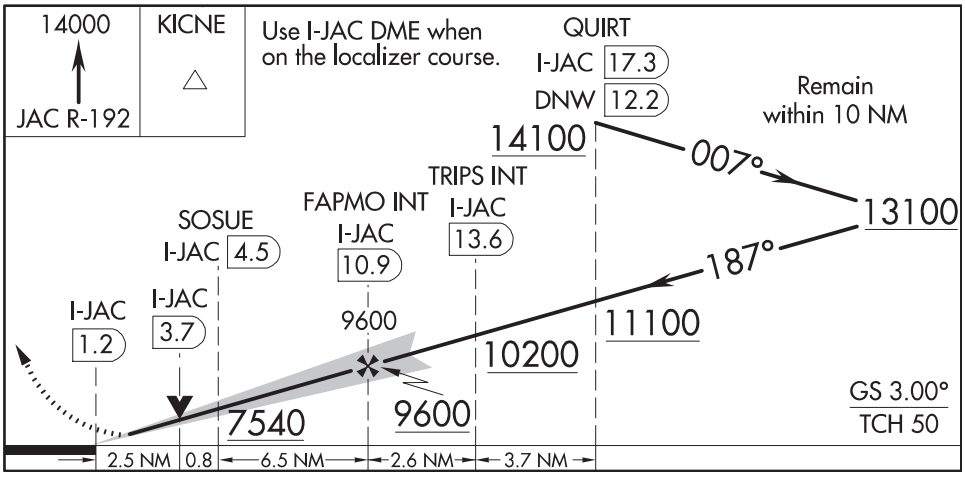
* * * * *

5–4–9 Procedure Turn and Hold-in-lieu of Procedure Turn

a. * * *

2. * * *

FIGURE 5–4–17



* * * * *

5–4–11 Radar Approaches

* * * * *

c. * * *

2. * * *

Note: *The published MDA for straight-in approaches will be issued to the pilot before beginning descent. When a surveillance approach will terminate in a circle-to-land maneuver, the pilot must furnish the aircraft approach category to the controller. The controller will then provide the pilot with the appropriate MDA.*

* * * * *

5–4–23 Visual Approach

* * * * *

d. Clearance for Visual Approach. At locations with an operating control tower, ATC will issue approach clearances that will include an assigned runway. At locations without an operating control tower or where a part-time tower is closed, ATC will issue a visual approach clearance to the airport only.

e. Separation Responsibilities. If the pilot has the airport in sight but cannot see the aircraft to be followed, ATC may clear the aircraft for a visual approach; however, ATC retains both separation and wake vortex separation responsibility. When visually following a preceding aircraft, acceptance of the visual approach clearance constitutes acceptance of pilot responsibility for maintaining a safe approach interval and adequate wake turbulence separation.

f. A visual approach is not an IAP and therefore has no missed approach segment. If a go-around is necessary for any reason, aircraft operating at controlled airports will be issued an appropriate clearance or instruction by the tower to enter the traffic pattern for landing or proceed as otherwise instructed. In either case, the pilot is responsible to maintain terrain and obstruction avoidance until reaching an ATC assigned altitude if issued, and ATC will provide approved separation or visual separation from other IFR aircraft. At uncontrolled airports, aircraft are expected to remain clear of clouds and complete a landing as soon as possible. If a landing cannot be accomplished, the aircraft is expected to remain clear of clouds and contact ATC as soon as possible for further clearance. Separation from other IFR aircraft will be maintained under these circumstances.

g. Visual approaches reduce pilot/controller workload and expedite traffic by shortening flight paths to the airport. It is the pilot's responsibility to advise ATC as soon as possible if a visual approach is not desired.

h. Authorization to conduct a visual approach is an IFR authorization and does not alter IFR flight plan cancellation responsibility.

* * * * *

i. Radar service is automatically terminated, without advising the pilot, when the aircraft is instructed to change to advisory frequency.

5–5–11 Visual Approach

a. * * *

6. In the event of a go-around, the pilot is responsible to maintain terrain and obstruction avoidance until reaching an ATC assigned altitude if issued.

7. Be aware that radar service is automatically terminated, without being advised by ATC, when the pilot is instructed to change to advisory frequency.

8. Be aware that there may be other traffic in the traffic pattern and the landing sequence may differ from the traffic sequence assigned by approach control or ARTCC.

* * * * *

5–6–4 ADIZ Requirements

* * * * *

b. * * *

1. Transponder Requirements. Unless otherwise authorized by ATC, each aircraft conducting operations into, within, or across the contiguous U.S. ADIZ must be equipped with an operable radar beacon transponder. The transponder must be turned on and squawking a discrete beacon code assigned by ATC or issued by FSS and displaying the aircraft altitude. Use of beacon code 1200 is not authorized. Use of the Universal Access Transceiver (UAT) anonymity mode is not authorized.

(a) For air defense purposes, aircraft equipped with an operable 1090es (DO–260b) ADS-B system operating outbound across the contiguous U.S. ADIZ may also be identified by the

ICAO aircraft address (otherwise known as the aircraft Mode S code). Therefore, use of a privacy ICAO aircraft address by outbound aircraft is not authorized.

(b) Pilots of outbound VFR aircraft must squawk a discrete beacon code assigned by ATC or issued by FSS.

(c) Nothing in this section changes the ADS-B OUT requirements of 14 CFR 91.225.

Reference: *14 CFR 99.13, Transponder-On Requirements; 14 CFR 91.225, Automatic Dependent Surveillance–Broadcast (ADS-B) Out equipment and use.*

* * * * *

5–6–6 Civil Aircraft Operations Within U.S. Territorial Airspace

* * * * *

c. * * *

5. Aircraft not registered in the U.S. must operate under an approved Transportation Security Administration (TSA) aviation security program (see paragraph 5-6-10 for TSA aviation security program information) or in accordance with an FAA/TSA airspace waiver (see paragraph 5-6-9 for FAA/TSA airspace waiver information), except as authorized in 5-6-6c7 below;

* * * * *

7. Aircraft not registered in the U.S., when conducting post-maintenance, manufacturer, production, or acceptance flight test operations, are exempt from the requirements in 5-6-6c5 above if all of the following requirements are met:

* * * * *

Editor Note: *¶5–6–14 "Law Enforcement Operations by Civil and Military Organizations" was removed and the following paragraphs were renumbered accordingly.*

5–6–14 Interception Signals

* * * * *

5–6–15 ADIZ Boundaries and Designated Mountainous Areas

* * * * *

5–6–16 Visual Warning System (VWS)

* * * * *

Chapter 7

7–1–1 National Weather Service Aviation Weather Service Program

* * * * *

c. * * *

4. Inflight aviation advisories (for example, Significant Meteorological Information (SIGMETs) and Airmen's Meteorological Information (AIRMETs)) are issued by three NWS Meteorological Watch Offices (MWOs); the Aviation Weather Center (AWC) in Kansas City, MO, the Alaska Aviation Weather Unit (AAWU) in Anchorage, AK, and the Weather Service Forecast Office (WFO) in Honolulu, HI. The AWC, the AAWU, and WSFO Honolulu issue area forecasts for selected areas. In addition, NWS meteorologists assigned to most ARTCCs as part of the Center Weather Service Unit (CWSU) provide Center Weather Advisories (CWAs) and gather weather information to support the needs of the FAA and other users of the system.

* * * * *

7–1–4 Graphical Forecasts for Aviation (GFA)

* * * * *

b. * * *

2. * * *

(d) Pilot Weather Report (PIREP)

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4. GFA Static Images. Some users with limited internet connectivity may access static images via the Aviation Weather Center (AWC) at: http://www.aviationweather.gov/gfa/plot. There are two static graphical images available, titled *Aviation Cloud Forecast and Aviation Surface Forecast*. The Aviation Cloud Forecast provides cloud coverage, bases, layers, and tops with AIRMETs for mountain obscuration and AIRMETs for icing overlaid. The Aviation Surface Forecast provides visibility, weather phenomena, and winds (including wind gusts) with AIRMETs for instrument flight rules conditions and AIRMETs for sustained surface winds of 30 knots or more overlaid. These images are presented on ten separate maps providing forecast views for the entire contiguous United States (U.S.) on one and nine regional views which provide more detail for the user. They are updated every 3 hours and provide forecast snapshots for 3, 6, 9, 12, 15, and 18 hours into the future. (See Figure 7-1-2 and Figure 7-1-3.)

Note: *The contiguous United States (U.S.) refers to the 48 adjoining U.S. states on the continent of North America that are south of Canada and north of Mexico, plus the District of Columbia. The term excludes the states of Alaska and Hawaii, and all off-shore U.S. territories and possessions, such as Puerto Rico.*

* * * * *

7–1–6 Inflight Aviation Weather Advisories

a. Inflight Aviation Weather Advisories are forecasts to advise en route aircraft of development of potentially hazardous weather. Inflight aviation weather advisories in the conterminous U.S. are issued by the Aviation Weather Center (AWC) in Kansas City, MO, as well as 20 Center Weather Service Units (CWSU) associated with ARTCCs. AWC also issues advisories for portions of the Gulf of Mexico, Atlantic and Pacific Oceans, which are under the control of ARTCCs with Oceanic flight information regions (FIRs). The Weather Forecast Office (WFO) in Honolulu issues advisories for the Hawaiian Islands and a large portion of the Pacific Ocean. In Alaska, the Alaska Aviation Weather Unit (AAWU) issues inflight aviation weather advisories along with the Anchorage CWSU. All heights are referenced MSL, except in the case of ceilings (CIG) which indicate AGL.

b. There are four types of inflight aviation weather advisories: the SIGMET, the Convective SIGMET, the AIRMET, and the Center Weather Advisory (CWA). All of these advisories use VORs, airports, or well-known geographic areas to describe the hazardous weather areas.

c. The Severe Weather Watch Bulletins (WWs), (with associated Alert Messages) (AWW) supplements these Inflight Aviation Weather Advisories.

d. SIGMET. A SIGMET is a concise description of the occurrence or expected occurrence of specified en route weather phenomena which is expected to affect the safety of aircraft operations.

1. SIGMETs:

(a) Are intended for dissemination to all pilots in flight to enhance safety.

(b) Are issued by the responsible MWO as soon as it is practical to alert operators and aircrews of hazardous en route conditions.

(c) Are unscheduled products that are valid for 4 hours; except SIGMETs associated with tropical cyclones and volcanic ash clouds are valid for 6 hours. Unscheduled updates and corrections are issued as necessary.

(d) Use geographical points to describe the hazardous weather areas. These points can reference either VORs, airports, or latitude–longitude, depending on SIGMET location. If the total area to be affected during the forecast period is very large, it could be that, in actuality, only a small portion of this total area would be affected at any one time.

Example:

Example of a SIGMET:

BOSR WS 050600
SIGMET ROMEO 2 VALID UNTIL 051000
ME NH VT
FROM CAR TO YSJ TO CON TO MPV TO CAR
OCNL SEV TURB BLW 080 EXP DUE TO STG NWLY FLOW. CONDS CONTG BYD 1000Z.

2. SIGMETs over the contiguous U.S.:

(a) Are issued corresponding to the areas described in Figure 7-1-5. and are only for non-convective weather. The U.S. issues a special category of SIGMETs for convective weather called Convective SIGMETs.

(b) Are identified by an alphabetic designator from November through Yankee, excluding Sierra and Tango. Issuance for the same phenomenon will be sequentially numbered, using the original designator until the phenomenon ends. For example, the first issuance in the Chicago (CHI) area (reference Figure 7-1-5) for phenomenon moving from the Salt Lake City (SLC) area will be SIGMET Papa 3, if the previous two issuances, Papa 1 and Papa 2, had been in the SLC area. Note that no two different phenomena across the country can have the same alphabetic designator at the same time.

(c) Use location identifiers (either VORs or airports) to describe the hazardous weather areas.

(d) Are issued when the following phenomena occur or are expected to occur:

(1) Severe icing not associated with thunderstorms.

(2) Severe or extreme turbulence or clear air turbulence (CAT) not associated with thunderstorms.

(3) Widespread dust storms or sandstorms lowering surface visibilities to below 3 miles.

(4) Volcanic ash.

3. SIGMETs over Alaska:

(a) Are issued for the Anchorage FIR including Alaska and nearby coastal waters corresponding to the areas described in Figure 7-1-4. and are only for non-convective weather. The U.S. issues a special category of SIGMETs for convective weather called Convective SIGMETs.

(b) Use location identifiers (either VORs or airports) to describe the hazardous weather areas.

(c) Use points of latitude and longitude over the ocean areas of the Alaska FIR.

(d) Are identified by an alphabetic designator from India through Mike.

(e) In addition to the phenomenon applicable to SIGMETs over the contiguous U.S., SIGMETs over Alaska are also issued for:

(1) Tornadoes.

(2) Lines of thunderstorms.

(3) Embedded thunderstorms.

(4) Hail greater than or equal to ¾ inch in diameter.

FIGURE 7–1–4
Alaska SIGMET and Area Forecast Zones

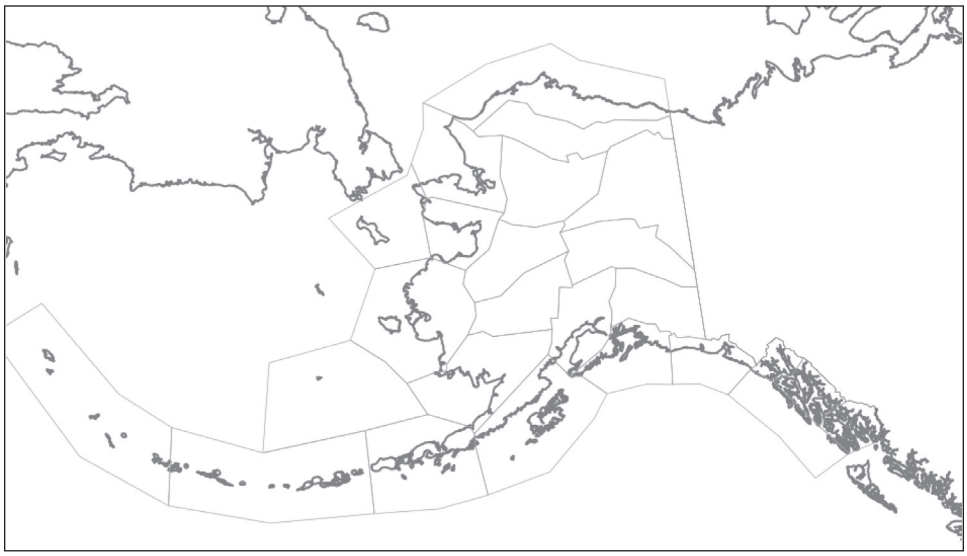


FIGURE 7–1–5
SIGMET Locations—Contiguous U.S.

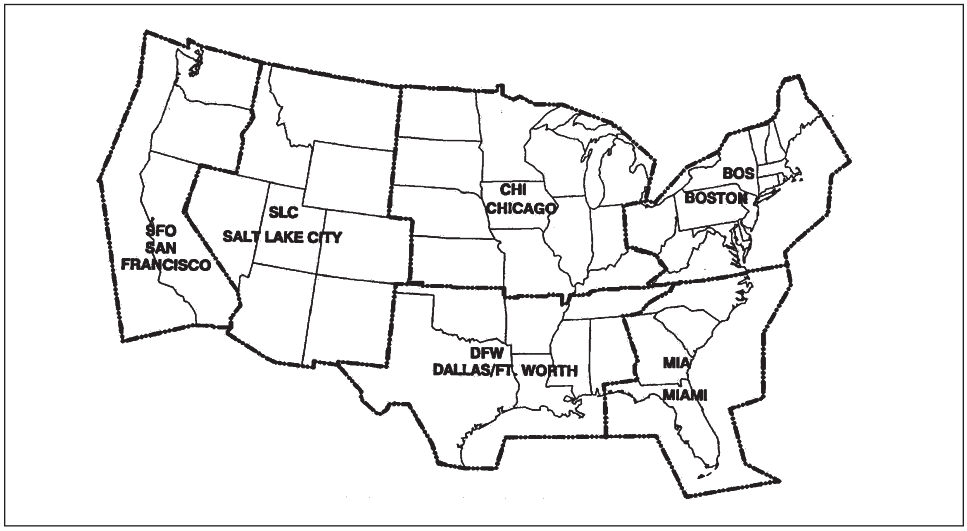
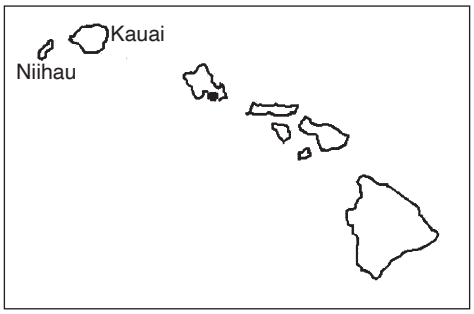


FIGURE 7–1–6
Hawaii Area Forecast Locations



4. SIGMETs over oceanic regions (New York Oceanic FIR, Oakland Oceanic FIR including Hawaii, Houston Oceanic FIR, Miami Oceanic FIR, San Juan FIR), points of latitude and longitude are used to describe the hazard area.

(a) SIGMETs over the Oakland Oceanic FIR west of 140 west and south of 30 north (including the Hawaiian Islands) are identified by an alphabetic designator from November through Zulu.

(b) SIGMETs over the Oakland Oceanic FIR east of 140 west and north of 30 north are identified by an alphabetic designator from Alpha through Mike.

(c) SIGMETs over the New York Oceanic FIR, Houston Oceanic FIR, Miami Oceanic FIR, and San Juan FIR are identified by an alphabetic designator from Alpha through Mike.

(d) In addition to SIGMETs issued for the phenomenon for the contiguous U.S., SIGMETs in the oceanic regions are also issued for:

(1) Tornadoes.

(2) Lines of thunderstorms.

(3) Embedded thunderstorms.

(4) Hail greater than or equal to ¾ inch in diameter.

e. Convective SIGMET

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f. AIRMET. AIRMETs are a concise description of the occurrence or expected occurrence of specified en route weather phenomena that may affect the safety of aircraft operations, but at intensities lower than those which require the issuance of a SIGMET.

1. AIRMETs contain details about IFR conditions, extensive mountain obscuration, turbulence, strong surface winds, icing, and freezing levels. Unscheduled updates and corrections are issued as necessary.

2. AIRMETs:

(a) Are intended to inform all pilots, but especially Visual Flight Rules pilots and operators of sensitive aircraft, of potentially hazardous weather phenomena.

(b) Are issued on a scheduled basis every 6 hours, except every 8 hours in Alaska. Unscheduled updates and corrections are issued as necessary.

(c) Are intended for dissemination to all pilots in the preflight and en route phase of flight to enhance safety. En route AIRMETs are available over flight service frequencies. Over the contiguous U.S., AIRMETs are also available on equipment intended to display weather and other non-air traffic control-related flight information to pilots using the Flight Information Service–Broadcast (FIS-B). In Alaska and Hawaii, AIRMETs are broadcast on air traffic frequencies.

(d) Are issued for the contiguous U.S., Alaska, and Hawaii. No AIRMETs are issued for U.S. Oceanic FIRs in the Gulf of Mexico, Caribbean, Western Atlantic, and Pacific Oceans.

TABLE 7–1–2
U. S. AIRMET ISSUANCE TIME AND FREQUENCY

Product Type	Issuance Time	Issuance Frequency
AIRMETs over the Contiguous U.S.	0245, 0845, 1445, 2045 UTC	Every 6 hours
AIRMETs over Alaska	0515, 1315, 2115 UTC (standard time)	Every 8 hours
	0415, 1215, 2015 UTC (Daylight savings time)	
AIRMETs over Hawaii	0400, 1000, 1600, 2200 UTC	Every 6 hours

3. AIRMETs over the Contiguous U.S.:

(a) Are displayed graphically on websites, such as, aviationweather.gov and 1800wxbrief.com, and equipment receiving FIS-B information.

(b) Provide a higher forecast resolution than AIRMETs issued in text format.

(c) Are valid at discrete times no more than 3 hours apart for a period of up to 12 hours into the future (for example, 00, 03, 06,

09, and 12 hours). Additional forecasts may be inserted during the first 6 hours (for example; 01, 02, 04, and 05). 00-hour represents the initial conditions, and the subsequent graphics depict the area affected by the particular hazard at that valid time. Forecasts valid at 00 through 06 hours correspond to the text AIRMET bulletin.

(d) Depict the following en route aviation weather hazards:

(1) Instrument flight rule conditions (ceiling < 1000' and/or surface visibility < 3 miles).

(2) Widespread mountain obscuration.

(3) Moderate icing.

(4) Freezing levels.

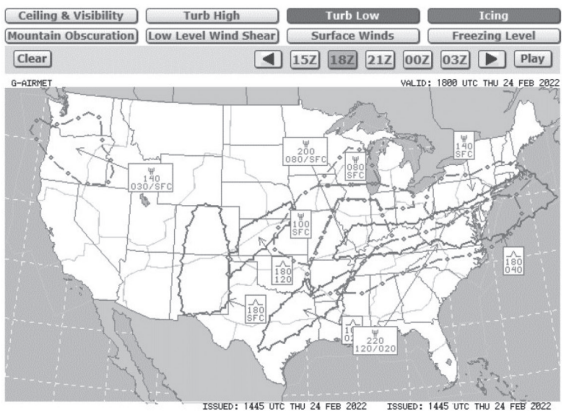
(5) Moderate turbulence.

(6) Non-convective low-level wind shear potential below 2,000 feet AGL.

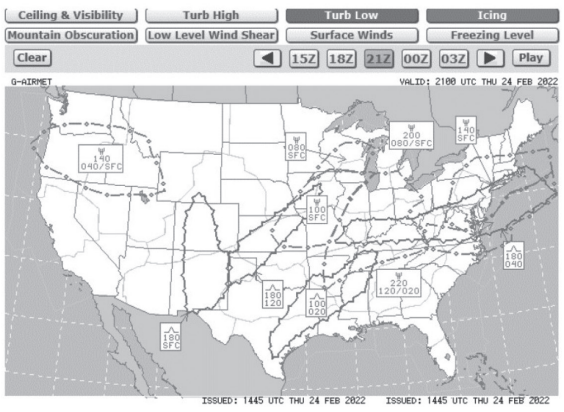
(7) Sustained surface winds greater than 30 knots.

4. Interpolation of time periods between AIRMETs over the contiguous U.S. valid times: Users must keep in mind when using the AIRMET over the contiguous U.S. that if a 00-hour forecast shows no significant weather and a 03-hour forecast shows hazardous weather, they must assume a change is occurring during the period between the two forecasts. It should be taken into consideration that the hazardous weather starts immediately after the 00-hour forecast unless there is a defined initiation or ending time for the hazardous weather. The same would apply after the 03-hour forecast. The user should assume the hazardous weather condition is occurring between the snap shots unless informed otherwise. For example, if a 00-hour forecast shows no hazard, a 03-hour forecast shows the presence of hazardous weather, and a 06-hour forecast shows no hazard, the user should assume the hazard exists from the 0001 hour to the 0559 hour time period.

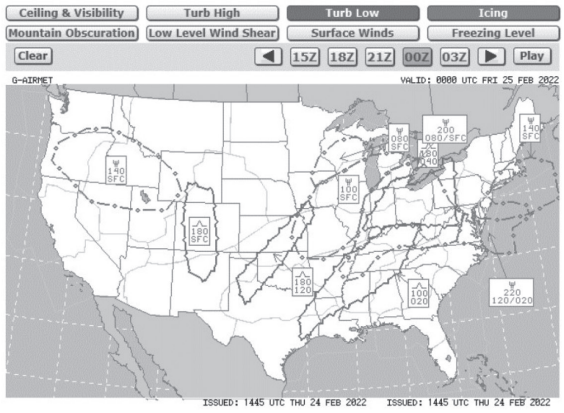
FIGURE 7–1–7
AIRMET over the Contiguous U.S.



Example: G-AIRMET Valid at 1800Z on February 24, 2022 Displaying:
Low Level Turbulence and Icing



Example: G-AIRMET Valid at 2100Z on February 24, 2022 Displaying:
Low Level Turbulence and Icing



Example: G-AIRMET Valid at 0000Z on February 25, 2022 Displaying:
Low Level Turbulence and Icing

5. AIRMETs over Alaska and Hawaii:

(a) AIRMETs over Alaska and Hawaii are in text format. The hazard areas are described using well-known geographical areas. AIRMETs over Alaska are issued for three Alaskan regions corresponding to Alaska area forecasts (See Figure 7-1-4).

(b) AIRMETs over Alaska are valid up to eight hours. AIRMETs over Hawaii are valid up to six hours. Unscheduled issuances contain an update number for easier identification.

(c) AIRMET Zulu describes moderate icing and provides freezing level heights.

Example:

Example of AIRMET Sierra issued for the Southeast Alaska area:

WAAK47 PAWU 241324
WA7O
JNUS WA 241315
AIRMET SIERRA FOR IFR AND MT OBSC VALID UNTIL 242115

LYNN CANAL AND GLACIER BAY JB
MTS OBSC BY CLDS/ISOL PCPN. NC.

CNTRL SE AK JC
MTS OCNL OBSC IN CLDS. NC.

SRN SE AK JD
PAWG–PAKT LN W OCNL CIGS BLW 010/VIS BLW 3SM BR. IMPR.

ERN GLF CST JE
OCNL CIGS BLW 010/VIS BLW 3SM BR/–RA BR. DTRT.

=JNUT WA 241315
AIRMET TANGO FOR TURB/STG SFC WINDS VALID UNTIL 242115

ERN GLF CST JE
OFSHR ICY BAY W SUSTAINED SFC WND 30 KTS
OR GTR. SPRDG E. INTSF.

=JNUZ WA 241315
AIRMET ZULU FOR ICING VALID UNTIL 242115

ERN GLF CST JE
16Z TO 19Z ALG CST W ICY BAY OCNL MOD ICEIC 080–160. FZLVL
045 EXC 015 INLAND. WKN.

Example:

Example of AIRMET Tango issued for Hawaii FA area:

WAHW31 PHFO 241529
WA0HI

HNLS WA 241600
AIRMET SIERRA UPDATE 2 FOR IFR VALID UNTIL 242200

NO SIGNIFICANT IFR EXP.

=HNLT WA 241600
AIRMET TANGO UPDATE 3 FOR TURB VALID UNTIL 242200

AIRMET TURB...HI
OVER AMD IMT S THRU W OF MTN.
TEMPO MOD TURB BLW 070.
COND CONT BEYOND 2200Z.

=HNLZ WA 241600
AIRMET ZULU UPDATE 2 FOR ICE AND FZLVL VALID UNTIL 242200
NO SIGNIFICANT ICE EXP

g. Watch Notification Messages

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7–1–8 Inflight Weather Advisory Broadcasts

a. ARTCCs broadcast a Convective SIGMET, SIGMET, AIRMET (except in the contiguous U.S.), Urgent Pilot Report, or CWA alert once on all frequencies, except emergency frequencies, when any part of the area described is within 150 miles of the airspace under their jurisdiction. These broadcasts advise pilots of the availability of hazardous weather advisories and to contact the nearest flight service facility for additional details.

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7–1–9 Flight Information Services (FIS)

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2. Table 7-1-3 lists the text and graphical products available through FIS-B and provided free-of-charge. Detailed information concerning FIS-B meteorological products can be found in Advisory Circular 00-45, Aviation Weather Services, and AC 00-63, Use of Cockpit Displays of Digital Weather and Aeronautical Information. Information on Special Use Airspace (SUA), Temporary Flight Restriction (TFR) and Notice to Air Missions (NOTAM) products can be found in Chapters 3, 4 and 5 of this manual.

* * * * *

4. FIS-B products are updated and transmitted at specific intervals based primarily on product issuance criteria. Update intervals are defined as the rate at which the product data is available from the source for transmission. Transmission intervals are defined as the amount of time within which a new or updated product transmission must be completed and/or the rate or repetition interval at which the product is rebroadcast. Update and transmission intervals for each product are provided in Table 7-1-3.

5. Where applicable, FIS-B products include a look-ahead range expressed in nautical miles (NM) for three service domains: Airport Surface; Terminal Airspace; and En Route/Gulf-of-Mexico (GOMEX). Table 7-1-4 provides service domain availability and look-ahead ranging for each FIS-B product.

TABLE 7–1–3
FIS-B OVER UAT PRODUCT UPDATE AND TRANSMISSION INTERVALS

Product	Update Interval[1]	Transmission Interval (95%)[2]	Basic Product
AIRMET	As Available	5 minutes	Yes
AWW/WW	As Available, then at 15 minute intervals for 1 hour	5 minutes	No
Ceiling	As Available	10 minutes	No
Convective SIGMET	As Available, then at 15 minute intervals for 1 hour	5 minutes	Yes
D-ATIS	As Available	1 minute	No
Echo Top	5 minutes	5 minutes	No
METAR/SPECI	1 minute (where available), As Available otherwise	5 minutes	Yes
MRMS NEXRAD (CONUS)	2 minutes	15 minutes	Yes
MRMS NEXRAD (Regional)	2 minutes	2.5 minutes	Yes
NOTAMs–D/FDC	As Available	10 minutes	Yes
NOTAMs–TFR	As Available	10 minutes	Yes
PIREP	As Available	10 minutes	Yes
SIGMET	As Available, then at 15 minute intervals for 1 hour	5 minutes	Yes
SUA Status	As Available	10 minutes	Yes
TAF/AMEND	6 Hours (±15 minutes)	10 minutes	Yes
Temperature Aloft	12 Hours (±15 minutes)	10 minutes	Yes
TWIP	As Available	1 minute	No
Winds aloft	12 Hours (±15 minutes)	10 minutes	Yes
Lightning strikes[3]	5 minutes	5 minutes	Yes
Turbulence[3]	1 minute	15 minutes	Yes
Icing, Forecast Potential (FIP)[3]	60 minutes	15 minutes	Yes
Cloud tops[3]	30 minutes	15 minutes	Yes
1 Minute AWOS[3]	1 minute	10 minutes	No
Graphical-AIRMET[3]	As Available	5 minutes	Yes
Center Weather Advisory (CWA)[3]	As Available	10 minutes	Yes
Temporary Restricted Areas (TRA)	As Available	10 minutes	Yes
Temporary Military Operations Areas (TMOA)	As Available	10 minutes	Yes

[1] The Update Interval is the rate at which the product data is available from the source.
[2] The Transmission Interval is the amount of time within which a new or updated product transmission must be completed (95%) and the rate or repetition interval at which the product is rebroadcast (95%).
[3] The transmission and update intervals for the expanded set of basic meteorological products may be adjusted based on FAA and vendor agreement on the final product formats and performance requirements.

Note 1: *Details concerning the content, format, and symbols of the various data link products provided should be obtained from the specific avionics manufacturer.*

Note 2: *NOTAM-D and NOTAM-FDC products broadcast via FIS-B are limited to those issued or effective within the past 30 days.*

TABLE 7–1–4
PRODUCT PARAMETERS FOR LOW/MEDIUM/HIGH ALTITUDE TIER RADIOS

Product	Surface Radios	Low Altitude Tier	Medium Altitude Tier	High Altitude Tier
CONUS NEXRAD	N/A	CONUS NEXRAD not provided	CONUS NEXRAD imagery	CONUS NEXRAD imagery
Winds & Temps Aloft	500 NM look-ahead range	500 NM look-ahead range	750 NM look-ahead range	1,000 NM look-ahead range
METAR	100 NM look-ahead range	250 NM look-ahead range	375 NM look-ahead range	CONUS: CONUS Class B & C airport METARs and 500 NM look-ahead range Outside of CONUS: 500 NM look-ahead range
TAF	100 NM look-ahead range	250 NM look-ahead range	375 NM look-ahead range	CONUS: CONUS Class B & C airport TAFs and 500 NM look-ahead range Outside of CONUS: 500 NM look-ahead range
AIRMET, SIGMET, PIREP, and SUA/SAA	100 NM look-ahead range. PIREP/SUA/SAA is N/A.	250 NM look-ahead range	375 NM look-ahead range	500 NM look-ahead range
Regional NEXRAD	150 NM look-ahead range	150 NM look-ahead range	200 NM look-ahead range	250 NM look-ahead range
NOTAMs D, FDC, and TFR	100 NM look-ahead range	100 NM look-ahead range	100 NM look-ahead range	100 NM look-ahead range

7–1–10 Weather Observing Programs

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d. Automated Surface Observing System (ASOS)/Automated Weather Observing System (AWOS) The ASOS/AWOS is the primary surface weather observing system of the U.S. (See Key to Decode an ASOS/AWOS (METAR) Observation, Figure 7-1-8 and Figure 7-1-9.) The program to install and operate these systems throughout the U.S. is a joint effort of the NWS, the FAA and the Department of Defense. ASOS/AWOS is designed to support aviation operations and weather forecast activities. The ASOS/AWOS will provide continuous minute-by-minute observations and perform the basic observing functions necessary to generate an aviation routine weather report (METAR) and other aviation weather information. The information may be transmitted over a discrete VHF radio frequency or the voice portion of a local NAVAID. ASOS/AWOS transmissions on a discrete VHF radio frequency are engineered to be receivable to a maximum of 25 NM from the ASOS/AWOS site and a maximum altitude of 10,000 feet AGL. At many locations, ASOS/AWOS signals may be received on the surface of the airport, but local conditions may limit the maximum reception distance and/or altitude. While the automated system and the human may differ in their methods of data collection and interpretation, both produce an observation quite similar in form and content. For the “objective” elements such as pressure, ambient temperature, dew point temperature, wind, and precipitation accumulation, both the automated system and the observer use a fixed location and time-averaging technique. The quantitative differences between the observer and the automated observation of these elements are negligible. For the “subjective” elements, however, observers use a fixed time, spatial averaging technique to describe the visual elements (sky condition, visibility and present weather), while the automated systems use a fixed location, time averaging technique. Although this is a fundamental change, the manual and automated techniques yield remarkably similar results within the limits of their respective capabilities.

3. * * *

(c) * * *

Note: *Wind direction is reported relative to magnetic north in ATIS as well as ASOS and AWOS radio (voice) broadcasts.*

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Note: *To decode an ASOS/AWOS report, refer to Figure 7-1-8 and Figure 7-1-9.*

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Figure 7–1–8
Key to Decode an ASOS/AWOS (METAR) Observation (Front)

METAR KABC 121755Z AUTO 21016G24KT 180V240 1SM R11/P6000FT -RA BR BKN015 OVC025 06/04 A2990
RMK AO2 PK WND 20032/25 WSHFT 1715 VIS 3/4V1 1/2 VIS 3/4 RWY11 RAB07 CIG 013V017 CIG 017 RWY11 PRESFR
SLP125 P0003 6009 T00640036 10066 21012 58033 TSNO $

TYPE OF REPORT	METAR: hourly (scheduled) report; SPECI: special (unscheduled) report.	METAR
STATION IDENTIFIER	Four alphabetic characters; ICAO location identifier.	KABC
DATE/TIME	All dates and times in UTC using a 24-hour clock; two-digit date and four-digit time; always appended with Z to indicate UTC.	121755Z
REPORT MODIFIER	Fully automated report, no human intervention; removed when observer signed-on.	AUTO
WIND DIRECTION AND SPEED	Direction in tens of degrees from true north (first three digits); next two digits: speed in whole knots; as needed Gusts (character) followed by maximum observed speed; always appended with KT to indicate knots; 00000KT for calm; if direction varies by 60° or more a Variable wind direction group is reported.	21016G24KT 180V240
VISIBILITY	Prevailing visibility in statute miles and fractions (space between whole miles and fractions); always appended with SM to indicate statute miles; values <1/4 reported as M1/4.	1SM
RUNWAY VISUAL RANGE	10-minute RVR value in hundreds of feet; reported if prevailing visibility is ≤ one mile or RVR ≤ 6000 feet; always appended with FT to indicate feet; value prefixed with M or P to indicate value is lower or higher than the reportable RVR value .	R11/P6000FT
WEATHER PHENOMENA	RA: liquid precipitation that does not freeze; SN: frozen precipitation other than hail; UP: precipitation of unknown type; intensity prefixed to precipitation: light (-), moderate (no sign), heavy (+); FG: fog; FZFG: freezing fog (temperature below 0°C); BR: mist; HZ: haze; SQ: squall; maximum of three groups reported; augmented by observer: FC (funnel cloud/tornado/waterspout); TS (thunderstorm); GR (hail); GS (small hail; <1/4 inch); FZRA (intensity; freezing rain); VA (volcanic ash).	-RA BR
SKY CONDITION	Cloud amount and height: CLR (no clouds detected below 12000 feet); FEW (few); SCT (scattered); BKN (broken); OVC (overcast); followed by 3-digit height in hundreds of feet; or vertical visibility (VV) followed by height for indefinite ceiling.	BKN015 OVC025
TEMPERATURE/DEW POINT	Each is reported in whole degrees Celsius using two digits; values are separated by a solidus; sub-zero values are prefixed with an M (minus).	06/04
ALTIMETER	Altimeter always prefixed with an A indicating inches of mercury; reported using four digits: tens, units, tenths, and hundredths.	A2990

Figure 7–1–9
Key to Decode an ASOS/AWOS (METAR) Observation (Back)

REMARKS IDENTIFIER: RMK	`RMK`
TORNADIC ACTIVITY: Augmented; report should include TORNADO, FUNNEL CLOUD, or WATERSPOUT, time begin/end, location, movement; e.g., `TORNADO B25 N MOV E.`	
TYPE OF AUTOMATED STATION: AO2; automated station with precipitation discriminator.	`AO2`
PEAK WIND: PK WND dddff(f)/(hh)mm; direction in tens of degrees, speed in whole knots, and time.	`PK WND 20032/25`
WIND SHIFT: WSHFT (hh)mm	`WSHFT 1715`
TOWER OR SURFACE VISIBILITY: TWR VIS vvvvv: visibility reported by tower personnel, e.g., `TWR VIS 2`; SFC VIS vvvvv: visibility reported by ASOS, e.g., `SFC. VIS 2`	
VARIABLE PREVAILING VISIBILITY: VIS $v_nv_nv_nv_nv_nVv_xv_xv_xv_xv_x$; reported if prevailing visibility is < 3 miles and variable.	`VIS 3/4V1 1/2`
VISIBILITY AT SECOND LOCATION: VIS vvvvv [LOC]; reported if different than the reported prevailing visibility in body of report.	`VIS 3/4 RWY11`
LIGHTNING: [FREQ] LTG [LOC]; when detected the frequency and location is reported, e.g., `FRQ LTG NE.`	
BEGINNING AND ENDING OF PRECIPITATION AND THUNDERSTORMS: w'w'B(hh)mmE(hh)mm; TSB(hh)mmE(hh)mm	`RAB07`
VIRGA: Augmented; precipitation not reaching the ground, e.g., VIRGA.	
VARIABLE CEILING HEIGHT: CIG $h_nh_nh_nVh_xh_xh_x$; reported if ceiling in body of report is < 3000 feet and variable.	`CIG 013V017`
CEILING HEIGHT AT SECOND LOCATION: CIG hhh [LOC]; Ceiling height reported if secondary ceilometer site is different than the ceiling height in the body of the report.	`CIG 017 RWY11`
PRESSURE RISING OR FALLING RAPIDLY: PRESRR or PRESFR; pressure rising or falling rapidly at time of observation.	`PRESFR`
SEA-LEVEL PRESSURE: SLPppp; tens, units, and tenths of SLP in hPa.	`SLP125`
HOURLY PRECIPITATION AMOUNT: Prrrr; in .01 inches since last METAR; a trace is P0000.	`P0003`
3- AND 6-HOUR PRECIPITATION AMOUNT: 6RRRR; precipitation amount in .01 inches for past 6 hours reported in 00, 06, 12, 18 UTC observations and for past 3 hours in 03, 09, 15, and 21 UTC observations; a trace is 60000.	`60009`
24-HOUR PRECIPITATION AMOUNT: $7R_{24}R_{24}R_{24}R_{24}$; precipitation amount in .01 inches for past 24 hours reported in 12 UTC observation, e.g., 70015.	
HOURLY TEMPERATURE AND DEW POINT: $Ts_nT_aT_aT_as_nT'_aT'_aT'_a$; tenth of degree Celsius; s_n: 1 if temperature below 0°C and 0 if temperature 0°C or higher.	`T00640036`
6-HOUR MAXIMUM TEMPERATURE: $1s_nT_xT_xT_x$; tenth of degree Celsius; 00, 06, 12, 18 UTC; s_n: 1 if temperature below 0°C and 0 if temperature 0°C or higher.	`10066`
6-HOUR MINIMUM TEMPERATURE: $2s_nT_nT_nT_n$; tenth of degree Celsius; 00, 06, 12, 18 UTC; s_n: 1 if temperature below 0°C and 0 if temperature 0°C or higher.	`21012`
24-HOUR MAXIMUM AND MINIMUM TEMPERATURE: $4s_nT_xT_xT_xs_nT_nT_nT_n$; tenth of degree Celsius; reported at midnight local standard time; 1 if temperature below 0°C and 0 if temperature 0°C or higher, e.g., 400461006.	
PRESSURE TENDENCY: 5appp; the character (a) and change in pressure (ppp; tenths of hPa) the past 3 hours.	`58033`
SENSOR STATUS INDICATORS: RVRNO: RVR missing; PWINO: precipitation identifier information not available; PNO: precipitation amount not available; FZRANO: freezing rain information not available; TSNO: thunderstorm information not available; VISNO [LOC]: visibility at secondary location not available, e.g., VISNO RWY06; CHINO [LOC]: (cloud-height-indicator) sky condition at secondary location not available, e.g., CHINO RWY06.	`TSNO`
MAINTENANCE CHECK INDICATOR: Maintenance needed on the system.	`$`
If an element or phenomena does not occur, is missing, or cannot be observed, the corresponding group and space are omitted (body and/or remarks) from that particular report, except for Sea-Level Pressure (SLPppp). SLPNO shall be reported in a METAR when the SLP is not available.	
U.S. DEPARTMENT OF TRANSPORTATION • FEDERAL AVIATION ADMINISTRATION • Aviation Weather Directorate, 400 7th Street, SW, Rooms 8200-8326, Washington, D.C. 20591	

e. Table 7-1-5 contains a comparison of weather observing programs and the elements reported.

f. Service Standards. During 1995, a government/industry team worked to comprehensively reassess the requirements for surface observations at the nation's airports. That work resulted in agreement on a set of service standards, and the FAA and NWS ASOS sites to which the standards would apply. The term "Service Standards" refers to the level of detail in weather observation. The service standards consist of four different levels of service (A, B, C, and D) as described below. Specific observational elements included in each service level are listed in Table 7-1-6.

* * * * *

TABLE 7–1–5
WEATHER OBSERVING PROGRAMS

Type	Element Reported												
	Wind	Visibility	Temperature Dew Point	Altimeter	Density Altimeter	Cloud/Ceiling	Precipitation Identification	Thunderstorm/ Lightning	Precipitation Occurrence	Rainfall Accumulation	Runway Surface Condition	Freezing Rain Occurrence	Remarks
ASOS	X	X	X	X	X	X	X			X		X	X
AWOS-A				X									
AWOS-A/V		X		X									
AWOS-1	X		X	X	X								
AWOS-2	X	X	X	X	X								
AWOS-3	X	X	X	X	X	X							
AWOS-3P	X	X	X	X	X	X	X						
AWOS-3T	X	X	X	X	X	X		X					
AWOS-3P/T	X	X	X	X	X	X	X	X					
AWOS-4	X	X	X	X	X	X	X	X	X	X	X	X	
Manual	X	X	X	X		X	X						X
Reference: FAA Order 7900.5, Surface Weather Observing, for element reporting.													

TABLE 7–1–6

Service Level A	
Service Level A consists of all the elements of Service Levels B, C and D plus the elements listed to the right, if observed.	10 minute longline RVR at precedented sites or additional visibility increments of 1/8, 1/16 and 0 Sector visibility Variable sky condition Cloud layers above 12,000 feet and cloud types Widespread dust, sand and other obscurations Volcanic eruptions
Service Level B	
Service Level B consists of all the elements of Service Levels C and D plus the elements listed to the right, if observed.	Longline RVR at precedented sites (may be instantaneous readout) Freezing drizzle versus freezing rain Ice pellets Snow depth & snow increasing rapidly remarks Thunderstorm and lightning location remarks Observed significant weather not at the station remarks
Service Level C	
Service Level C consists of all the elements of Service Level D plus augmentation and backup by a human observer or an air traffic control specialist on location nearby. Backup consists of inserting the correct value if the system malfunctions or is unrepresentative. Augmentation consists of adding the elements listed to the right, if observed. During hours that the observing facility is closed, the site reverts to Service Level D.	Thunderstorms Tornadoes Hail Virga Volcanic ash Tower visibility Operationally significant remarks as deemed appropriate by the observer
Service Level D	
This level of service consists of an ASOS or AWOS continually measuring the atmosphere at a point near the runway. The ASOS or AWOS senses and measures the weather parameters listed to the right.	Wind Visibility Precipitation/Obstruction to vision Cloud height Sky cover Temperature Dew point Altimeter

7–1–11 Weather Radar Services

* * * * *

c. * * *

FIGURE 7–1–10
NEXRAD Coverage

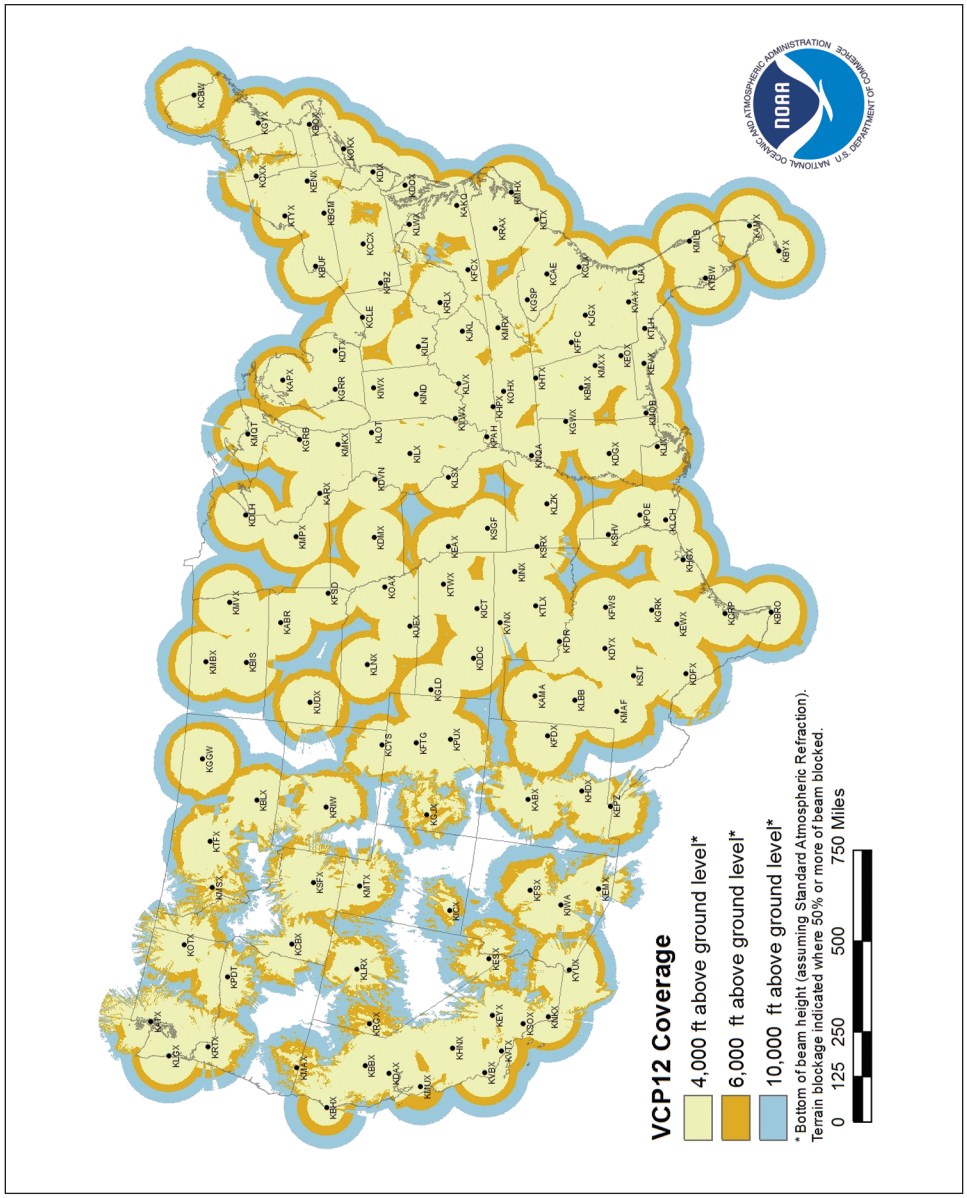


FIGURE 7–1–11
NEXRAD Coverage

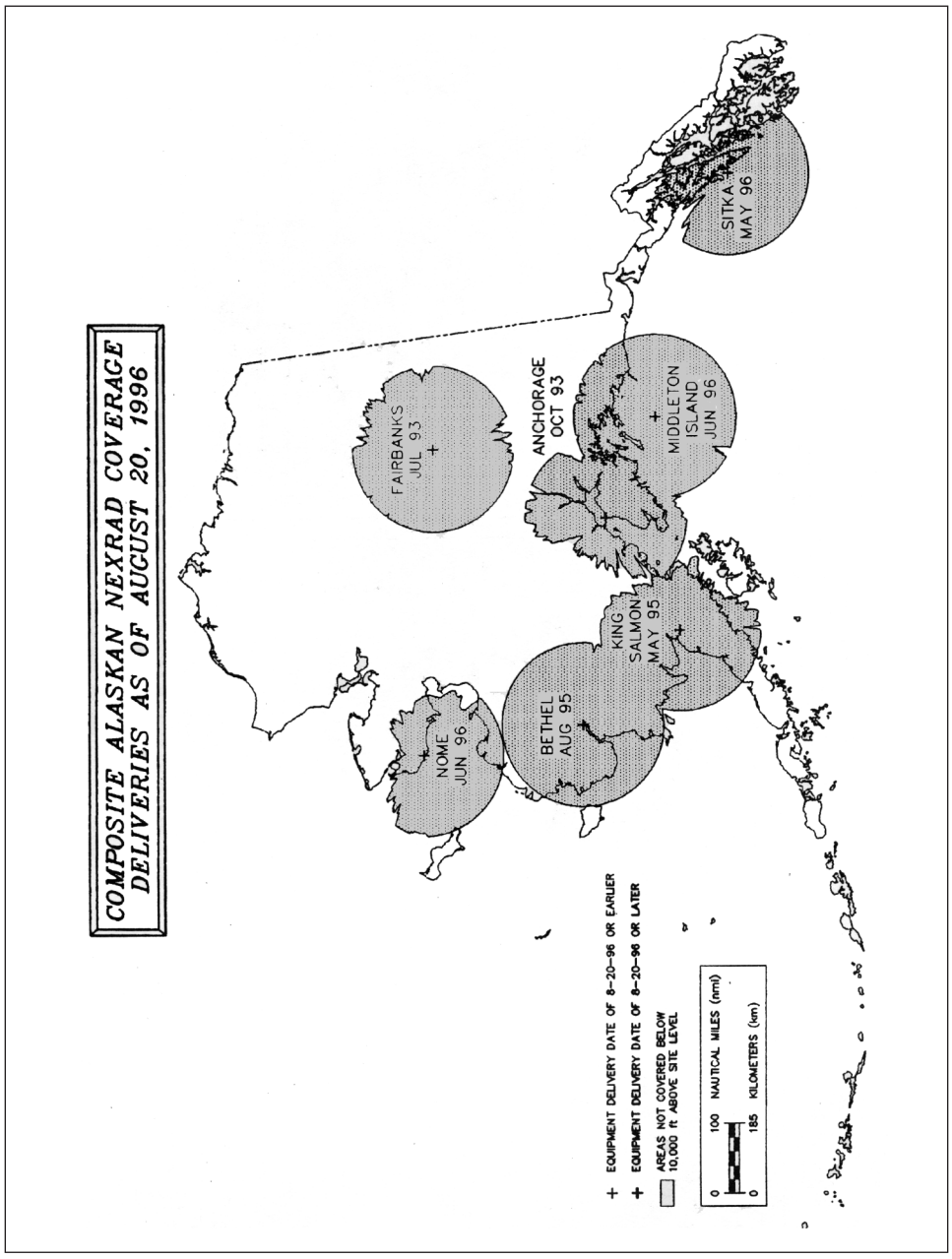
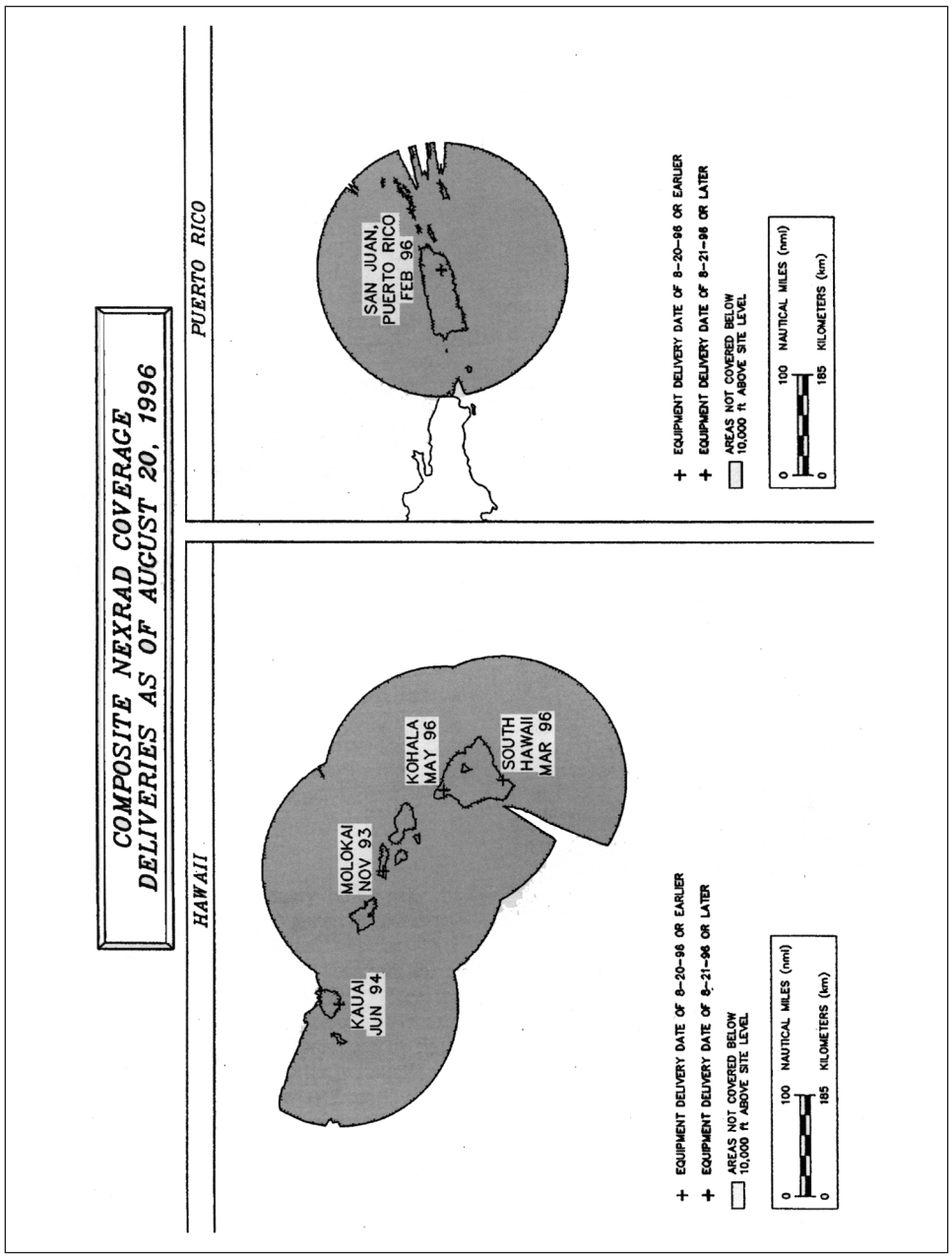


FIGURE 7–1–12
NEXRAD Coverage



* * * * *

7–1–13 Runway Visual Range (RVR)

* * * * *

f. Approach categories with the corresponding minimum RVR values. (See Table 7-1-7.)

TABLE 7–1–7
APPROACH CATEGORY/MINIMUM RVR TABLE

Category	Visibility (RVR)
Nonprecision	2,400 feet
Category I	1,800 feet*
Category II	1,000 feet
Category IIIa	700 feet
Category IIIb	150 feet
Category IIIc	0 feet

*1,400 feet with special equipment and authorization

7–1–18 Pilot Weather Reports (PIREPs)

* * * * *

e. The FAA, NWS, and other organizations that enter PIREPs into the weather reporting system use the format listed in Table 7-1-8. Items 1 through 6 are included in all transmitted PIREPs along with one or more of items 7 through 13. Although the PIREP should be as complete and concise as possible, pilots should not be overly concerned with strict format or phraseology. The important thing is that the information is relayed so other pilots may benefit from your observation. If a portion of the report needs clarification, the ground station will request the information. Completed PIREPs will be transmitted to weather circuits as in the following examples:

* * * * *

f. * * *

TABLE 7–1–8
PIREP ELEMENT CODE CHART

	PIREP Element	PIREP Code	Contents
1.	3-letter station identifier	XXX	Nearest weather reporting location to the reported phenomenon
2.	Report type	UA or UUA	Routine or Urgent PIREP
3.	Location	/OV	In relation to a VOR
4.	Time	/TM	Coordinated Universal Time
5.	Altitude	/FL	Essential for turbulence and icing reports
6.	Type Aircraft	/TP	Essential for turbulence and icing reports
7.	Sky cover	/SK	Cloud height and coverage (sky clear, few, scattered, broken, or overcast)
8.	Weather	/WX	Flight visibility, precipitation, restrictions to visibility, etc.
9.	Temperature	/TA	Degrees Celsius
10.	Wind	/WV	Direction in degrees magnetic north and speed in knots
11.	Turbulence	/TB	See AIM paragraph 7-1-21
12.	Icing	/IC	See AIM paragraph 7-1-19
13.	Remarks	/RM	For reporting elements not included or to clarify previously reported items

7–1–20 Definitions of Inflight Icing Terms

See Table 7-1-9, Icing Types, and Table 7-1-10, Icing Conditions.

TABLE 7–1–9
ICING TYPES

Clear Ice	See Glaze Ice.
Glaze Ice	Ice, sometimes clear and smooth, but usually containing some air pockets, which results in a lumpy translucent appearance. Glaze ice results from supercooled drops/droplets striking a surface but not freezing rapidly on contact. Glaze ice is denser, harder, and sometimes more transparent than rime ice. Factors, which favor glaze formation, are those that favor slow dissipation of the heat of fusion (i.e., slight supercooling and rapid accretion). With larger accretions, the ice shape typically includes “horns” protruding from unprotected leading edge surfaces. It is the ice shape, rather than the clarity or color of the ice, which is most likely to be accurately assessed from the cockpit. The terms “clear” and “glaze” have been used for essentially the same type of ice accretion, although some reserve “clear” for thinner accretions which lack horns and conform to the airfoil.
Intercycle Ice	Ice which accumulates on a protected surface between actuation cycles of a deicing system.
Known or Observed or Detected Ice Accretion	Actual ice observed visually to be on the aircraft by the flight crew or identified by on-board sensors.
Mixed Ice	Simultaneous appearance or a combination of rime and glaze ice characteristics. Since the clarity, color, and shape of the ice will be a mixture of rime and glaze characteristics, accurate identification of mixed ice from the cockpit may be difficult.
Residual Ice	Ice which remains on a protected surface immediately after the actuation of a deicing system.
Rime Ice	A rough, milky, opaque ice formed by the rapid freezing of supercooled drops/droplets after they strike the aircraft. The rapid freezing results in air being trapped, giving the ice its opaque appearance and making it porous and brittle. Rime ice typically accretes along the stagnation line of an airfoil and is more regular in shape and conformal to the airfoil than glaze ice. It is the ice shape, rather than the clarity or color of the ice, which is most likely to be accurately assessed from the cockpit.
Runback Ice	Ice which forms from the freezing or refreezing of water leaving protected surfaces and running back to unprotected surfaces.
Note: *Ice types are difficult for the pilot to discern and have uncertain effects on an airplane in flight. Ice type definitions will be included in the AIM for use in the “Remarks” section of the PIREP and for use in forecasting.*	

TABLE 7–1–10
ICING CONDITIONS

Appendix C Icing Conditions	Appendix C (14 CFR, Part 25 and 29) is the certification icing condition standard for approving ice protection provisions on aircraft. The conditions are specified in terms of altitude, temperature, liquid water content (LWC), representative droplet size (mean effective drop diameter [MED]), and cloud horizontal extent.
Forecast Icing Conditions	Environmental conditions expected by a National Weather Service or an FAA-approved weather provider to be conducive to the formation of inflight icing on aircraft.
Freezing Drizzle (FZDZ)	Drizzle is precipitation at ground level or aloft in the form of liquid water drops which have diameters less than 0.5 mm and greater than 0.05 mm. Freezing drizzle is drizzle that exists at air temperatures less than 0°C (supercooled), remains in liquid form, and freezes upon contact with objects on the surface or airborne.
Freezing Precipitation	Freezing precipitation is freezing rain or freezing drizzle falling through or outside of visible cloud.
Freezing Rain (FZRA)	Rain is precipitation at ground level or aloft in the form of liquid water drops which have diameters greater than 0.5 mm. Freezing rain is rain that exists at air temperatures less than 0°C (supercooled), remains in liquid form, and freezes upon contact with objects on the ground or in the air.
Icing in Cloud	Icing occurring within visible cloud. Cloud droplets (diameter < 0.05 mm) will be present; freezing drizzle and/or freezing rain may or may not be present.
Icing in Precipitation	Icing occurring from an encounter with freezing precipitation, that is, supercooled drops with diameters exceeding 0.05 mm, within or outside of visible cloud.
Known Icing Conditions	Atmospheric conditions in which the formation of ice is observed or detected in flight. **Note:** Because of the variability in space and time of atmospheric conditions, the existence of a report of observed icing does not assure the presence or intensity of icing conditions at a later time, nor can a report of no icing assure the absence of icing conditions at a later time.
Potential Icing Conditions	Atmospheric icing conditions that are typically defined by airframe manufacturers relative to temperature and visible moisture that may result in aircraft ice accretion on the ground or in flight. The potential icing conditions are typically defined in the Airplane Flight Manual or in the Airplane Operation Manual.
Supercooled Drizzle Drops (SCDD)	Synonymous with freezing drizzle aloft.
Supercooled Drops or Droplets	Water drops/droplets which remain unfrozen at temperatures below 0°C. Supercooled drops are found in clouds, freezing drizzle, and freezing rain in the atmosphere. These drops may impinge and freeze after contact on aircraft surfaces.
Supercooled Large Drops (SLD)	Liquid droplets with diameters greater than 0.05 mm at temperatures less than 0°C, i.e., freezing rain or freezing drizzle.

7–1–21 PIREPs Relating to Turbulence

* * * * *

b. Duration and classification of intensity should be made using Table 7-1-11.

TABLE 7–1–11
TURBULENCE REPORTING CRITERIA TABLE

Intensity	Aircraft Reaction	Reaction Inside Aircraft	Reporting Term: Definition
Light	Turbulence that momentarily causes slight, erratic changes in altitude and/or attitude (pitch, roll, yaw). Report as **Light Turbulence**;[1] or Turbulence that causes slight, rapid and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude. Report as **Light Chop**.	Occupants may feel a slight strain against seat belts or shoulder straps. Unsecured objects may be displaced slightly. Food service may be conducted and little or no difficulty is encountered in walking.	Occasional: Less than 1/3 of the time Intermittent: 1/3 to 2/3 Continuous: More than 2/3
Moderate	Turbulence that is similar to Light Turbulence but of greater intensity. Changes in altitude and/or attitude occur but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed. Report as **Moderate Turbulence**;[1] or Turbulence that is similar to Light Chop but of greater intensity. It causes rapid bumps or jolts without appreciable changes in aircraft altitude or attitude. Report as **Moderate Chop**.[1]	Occupants feel definite strains against seat belts or shoulder straps. Unsecured objects are dislodged. Food service and walking are difficult.	**Notes** 1. Pilots should report location(s), time (UTC), intensity, whether in or near clouds, altitude, type of aircraft and, when applicable, duration of turbulence. 2. Duration may be based on time between two locations or over a single location. All locations should be readily identifiable. **Examples** a. Over Omaha. 1232Z, Moderate Turbulence, in cloud, Flight Level 310, B707. b. From 50 miles south of Albuquerque to 30 miles north of Phoenix, 1210Z to 1250Z, occasional Moderate Chop, Flight Level 330, DC8.
Severe	Turbulence that causes large, abrupt changes in altitude and/or attitude. It usually causes large variations in indicated airspeed. Aircraft may be momentarily out of control. Report as **Severe Turbulence**.[1]	Occupants are forced violently against seat belts or shoulder straps. Unsecured objects are tossed about. Food Service and walking are impossible.	
Extreme	Turbulence in which the aircraft is violently tossed about and is practically impossible to control. It may cause structural damage. Report as **Extreme Turbulence.**[1]		

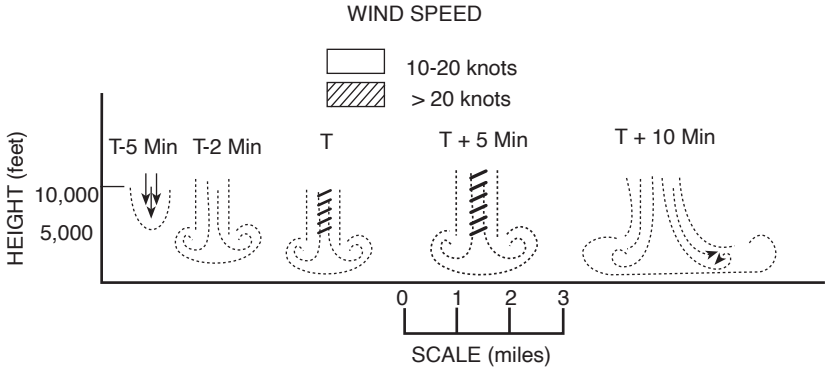
[1] High level turbulence (normally above 15,000 feet ASL) not associated with cumuliform cloudiness, including thunderstorms, should be reported as CAT (clear air turbulence) preceded by the appropriate intensity, or light or moderate chop.

7–1–24 Microbursts

* * * * *

c. The life cycle of a microburst as it descends in a convective rain shaft is seen in Figure 7-1-13. An important consideration for pilots is the fact that the microburst intensifies for about 5 minutes after it strikes the ground.

FIGURE 7–1–13
Evolution of a Microburst

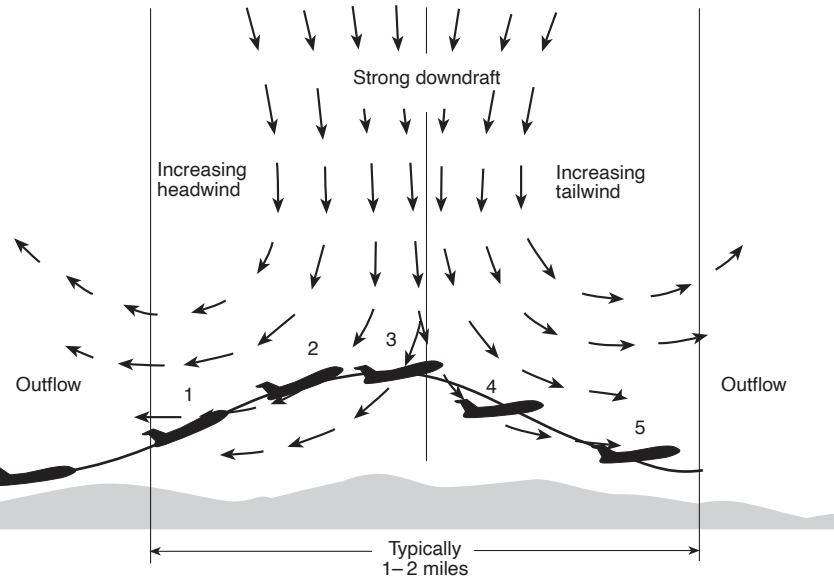


Vertical cross section of the evolution of a microburst wind field. T is the time of initial divegence at the surface. The shading refers to the vector wind speeds. Figure adapted from Wilson et al., 1984, Microburst Wind Structure and Evaluation of Doppler Radar for Wind Shear Detection, DOT/FAA Report No. DOT/FAA/PM-84/29, National Technical Information Service, Springfield, VA 37 pp.

* * * * *

e. Microburst wind shear may create a severe hazard for aircraft within 1,000 feet of the ground, particularly during the approach to landing and landing and take-off phases. The impact of a microburst on aircraft which have the unfortunate experience of penetrating one is characterized in Figure 7-1-14. The aircraft may encounter a headwind (performance increasing) followed by a downdraft and tailwind (both performance decreasing), possibly resulting in terrain impact.

FIGURE 7–1–14
Microburst Encounter During Takeoff



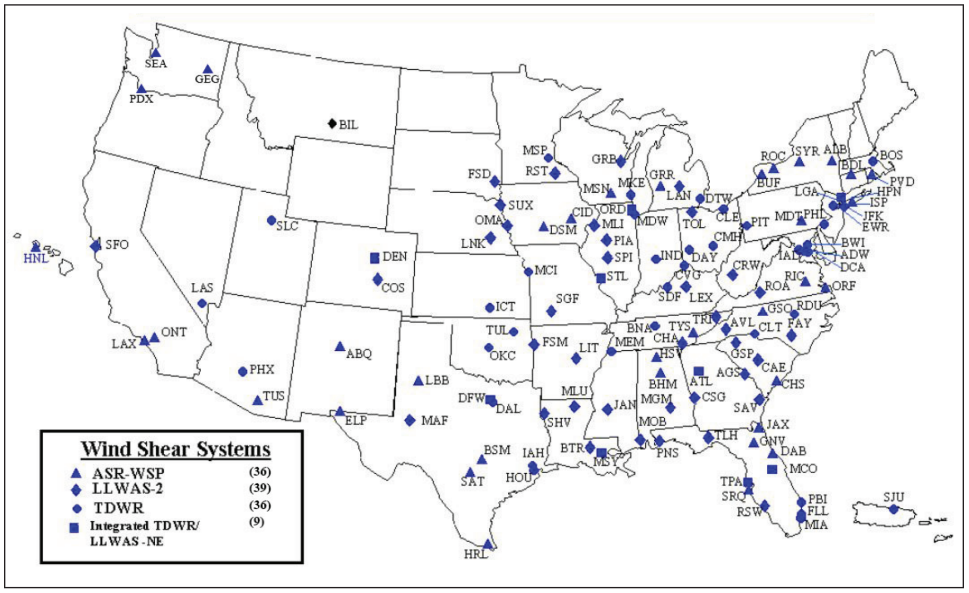
A microburst encounter during takeoff. The airplane first encounters a headwind and experiences increasing performance (1), This is followed in short succession by a decreasing headwind component (2), a downdraft (3), and finally a strong tailwind (4), where 2 through 5 all result in decreasing performance of the airplane. Position (5) represents an extreme situation just prior to impact. Figure courtesy of Walter Frost, FWG Associates, Inc., Tullahoma, Tennessee

f. * * *

1. * * *

(a) The FAA currently employs an integrated plan for wind shear detection that will significantly improve both the safety and capacity of the majority of the airports currently served by the air carriers. This plan integrates several programs, such as the Integrated Terminal Weather System (ITWS), Terminal Doppler Weather Radar (TDWR), Weather Systems Processor (WSP), and Low Level Wind Shear Alert Systems (LLWAS) into a single strategic concept that significantly improves the aviation weather information in the terminal area. (See Figure 7-1-15.)

FIGURE 7–1–15
NAS Wind Shear Product Systems

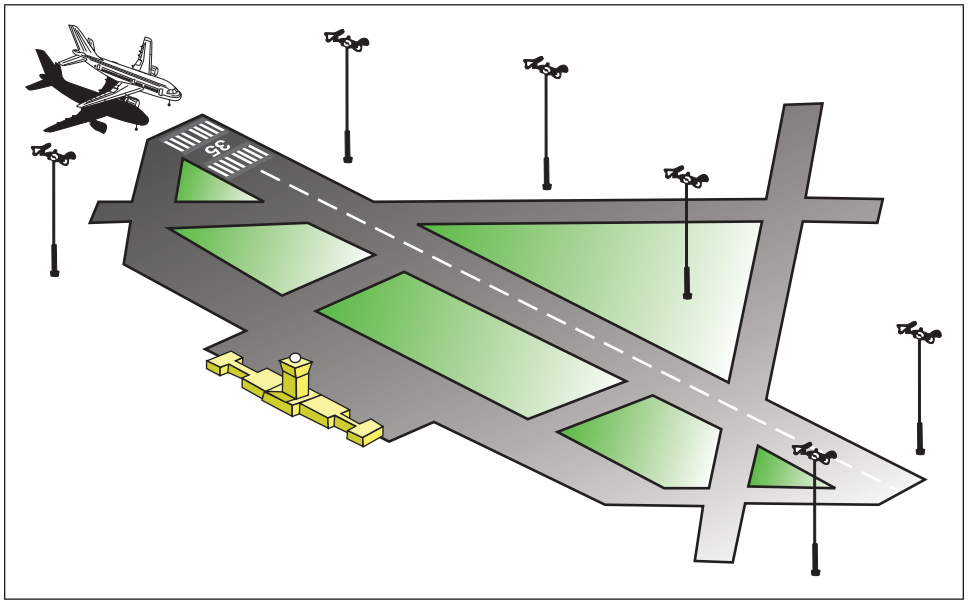


* * * * *

2. * * *

(a) The LLWAS provides wind data and software processes to detect the presence of hazardous wind shear and microbursts in the vicinity of an airport. Wind sensors, mounted on poles sometimes as high as 150 feet, are (ideally) located 2,000–3,500 feet, but not more than 5,000 feet, from the centerline of the runway. (See Figure 7-1-16.)

FIGURE 7–1–16
LLWAS Siting Criteria

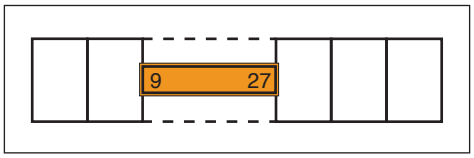


* * * * *

3. * * *

(a) TDWRs have been deployed at 45 locations across the U.S. Optimum locations for TDWRs are 8 to 12 miles off of the airport proper, and designed to look at the airspace around and over the airport to detect microbursts, gust fronts, wind shifts and precipitation intensities. TDWR products advise the controller of wind shear and microburst events impacting all runways and the areas 1/2 mile on either side of the extended centerline of the runways out to 3 miles on final approach and 2 miles out on departure. (Figure 7-1-17 is a theoretical view of the warning boxes, including the runway, that the software uses in determining the location(s) of wind shear or microbursts). These warnings are displayed (as depicted in the examples in subparagraph 5) on the RBDT.

FIGURE 7–1–17
Warning Boxes



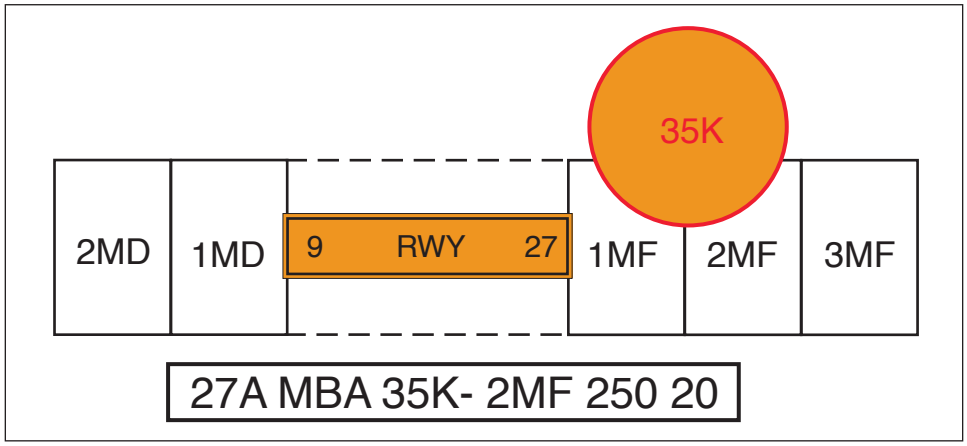
* * * * *

5. * * *

(a) * * *

Note: *(See Figure 7-1-18 to see how the TDWR/WSP determines the microburst location).*

FIGURE 7–1–18
Microburst Alert

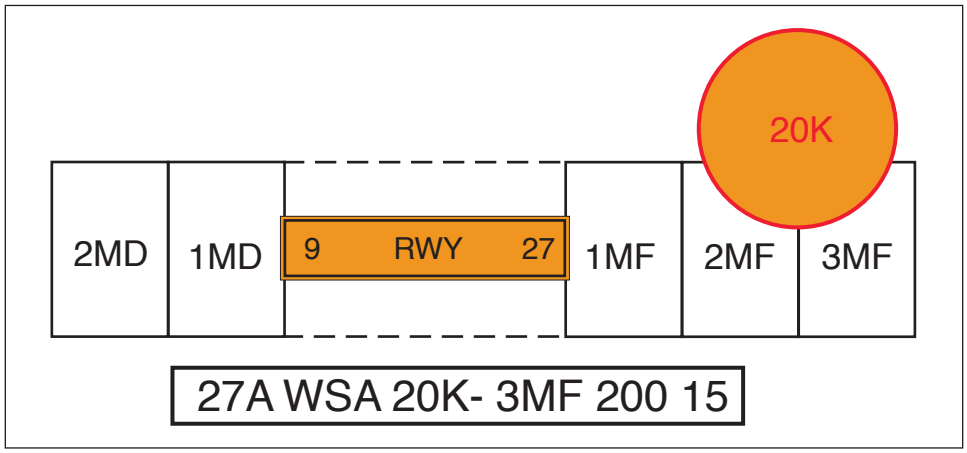


* * * * *

(b) * * *

Note: *(See Figure 7-1-19 to see how the TDWR/WSP determines the wind shear location).*

FIGURE 7–1–19
Weak Microburst Alert



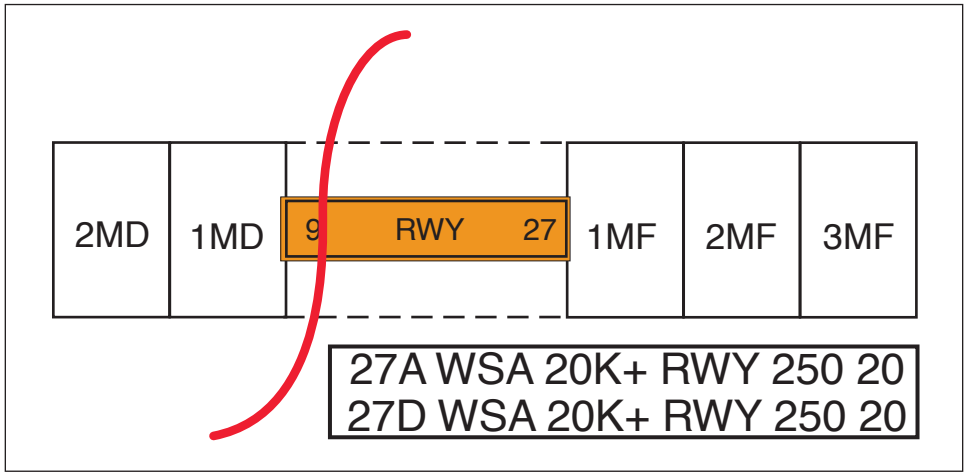
* * * * *

Reference: *FAA Order JO 7110.65, ¶3-1-8, Low Level Wind Shear/Microburst Advisories, Subpara b2(a).*

(c) * * *

Note: *(See Figure 7-1-20 to see how the TDWR/WSP determines the gust front/wind shear location.)*

FIGURE 7–1–20
Gust Front Alert



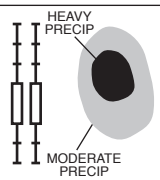
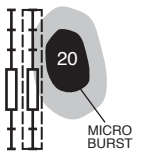
* * * * *

Reference: *FAA Order 7110.65, ¶3-1-8, Low Level Wind Shear/Microburst Advisories, Subpara b2(d).*

6. * * *

(a) With the increase in the quantity and quality of terminal weather information available through TDWR, the next step is to provide this information directly to pilots rather than relying on voice communications from ATC. The NAS has long been in need of a means of delivering terminal weather information to the cockpit more efficiently in terms of both speed and accuracy to enhance pilot awareness of weather hazards and reduce air traffic controller workload. With the TWIP capability, terminal weather information, both alphanumerically and graphically, is now available directly to the cockpit at 43 airports in the U.S. NAS. (See Figure 7-1-21.)

FIGURE 7–1–21
TWIP Image of Convective Weather at MCO International

WEATHER SITUATION	TWIP TEXT MESSAGE
	MCO 1800 TERMINAL WEATHER -STORM(S) 3NM N-E MOD PRECIP 4NM NE HVY PRECIP MOVG W AT 15KT .EXPECTED MOD PRECIP BEGIN 1805
	MCO 1810 TERMINAL WEATHER *MODERATE PRECIP BEGAN 1805 -STORM(S) ARPT ALQDS MOD PRECIP 1NM N-E HVY PRECIP MOVG W AT 15KT .EXPECTED HVY PRECIP BEGIN 1815

* * * * *

(c) * * *

TABLE 7–1–12
TWIP-EQUIPPED AIRPORTS

Airport	Identifier
Andrews AFB, MD	KADW
Hartsfield-Jackson Atlanta Intl Airport	KATL
Nashville Intl Airport	KBNA
Logan Intl Airport	KBOS
Baltimore/Washington Intl Airport	KBWI
Hopkins Intl Airport	KCLE
Charlotte/Douglas Intl Airport	KCLT
Port Columbus Intl Airport	KCMH
Cincinnati/Northern Kentucky Intl Airport	KCVG
Dallas Love Field Airport	KDAL
James M. Cox Intl Airport	KDAY
Ronald Reagan Washington National Airport	KDCA
Denver Intl Airport	KDEN
Dallas-Fort Worth Intl Airport	KDFW
Detroit Metro Wayne County Airport	KDTW
Newark Liberty Intl Airport	KEWR
Fort Lauderdale-Hollywood Intl Airport	KFLL
William P. Hobby Airport	KHOU
Washington Dulles Intl Airport	KIAD
George Bush Intercontinental Airport	KIAH
Wichita Mid-Continent Airport	KICT
Indianapolis Intl Airport	KIND
John F. Kennedy Intl Airport	KJFK
Harry Reid Intl Airport	KLAS
LaGuardia Airport	KLGA
Kansas City Intl Airport	KMCI
Orlando Intl Airport	KMCO
Midway Intl Airport	KMDW
Memphis Intl Airport	KMEM
Miami Intl Airport	KMIA
General Mitchell Intl Airport	KMKE
Minneapolis St. Paul Intl Airport	KMSP
Louis Armstrong New Orleans Intl Airport	KMSY
Will Rogers World Airport	KOKC
O'Hare Intl Airport	KORD
Palm Beach Intl Airport	KPBI
Philadelphia Intl Airport	KPHL
Phoenix Sky Harbor Intl Airport	KPHX
Pittsburgh Intl Airport	KPIT
Raleigh-Durham Intl Airport	KRDU
Louisville Intl Airport	KSDF
Salt Lake City Intl Airport	KSLC
Lambert-St. Louis Intl Airport	KSTL
Tampa Intl Airport	KTPA
Tulsa Intl Airport	KTUL
Luis Munoz Marin Intl Airport	TJSJ

7–1–28 Key to Aerodrome Forecast (TAF) and Aviation Routine Weather Report (METAR)

FIGURE 7–1–22

Key to Aerodrome Forecast (TAF) and Aviation Routine Weather Report (METAR) *Front*

TAF KPIT 091730Z 0918/1024 15005KT 5SM HZ FEW020 WS010/31022KT
FM01930 30015G25KT 3SM SHRA OVC015
TEMPO 0920/0922 1/2SM +TSRA OVC008CB
FM100100 27008KT 5SM SHRA BKN020 OVC040
PROB30 1004/1007 1SM -RA BR
FM101015 18005KT 6SM -SHRA OVC020
BECMG 1013/1015 P6SM NSW SKC

Note: Users are cautioned to confirm ***DATE*** and ***TIME*** of the TAF. For example FM**10**0000 is 0000Z on the **10th**. Do not confuse with ***1000Z!***

METAR KPIT 091955Z COR 22015G25KT 3/4SM R28L/2600FT TSRA OVC010CB 18/16 A2992 RMK SLP045 T01820159

Forecast	Explanation	Report
TAF	Message type: TAF: routine or TAF AMD: amended forecast; METAR: hourly; SPECI: special or TESTM: noncommissioned ASOS report	**METAR**
KPIT	ICAO location indicator	**KPIT**
091730Z	Issuance time: ALL times in UTC "Z", 2-digit date, 4-digit time	**091955Z**
0918/1024	Valid period: Either 24 hours or 30 hours. The first two digits of EACH four-digit number indicate the date of the valid period, the final two digits indicate the time (valid from 18Z on the 9th to 24Z on the 10th).	
	In U.S. **METAR**: CORrected ob; or AUTOmated ob for automated report with no human intervention; omitted when observer logs on.	**COR**
15005KT	Wind: 3-digit true-north direction, nearest 10 degrees (or VaRiaBle); next 2–3 digits for speed and unit, KT (KMH or MPS); as needed, Gust and maximum speed; 00000KT for calm; for **METAR**, if direction varies 60 degrees or more, Variability appended, e.g., 180V260	**22015G25KT**
5SM	Prevailing visibility: In U.S., Statute Miles and fractions; above 6 miles in **TAF** Plus6SM. (Or, 4-digit minimum visibility in meters and as required, lowest value with direction.)	**3/4SM**
	Runway Visual Range: R; 2-digit runway designator Left, Center, or Right as needed; "/"; Minus or Plus in U.S., 4-digit value, FeeT in U.S. (usually meters elsewhere); 4-digit value Variability, 4-digit value (and tendency Down, Up, or No change)	**R28L/2600FT**
HZ	Significant present, forecast and recent weather: See table (Fig 7-1-22)	**TSRA**
FEW020	Cloud amount, height and type: SKy Clear 0/8, FEW >0/8-2/8, SCaTtered 3/8-4/8, BroKeN 5/8-7/8, OVerCast 8/8; 3-digit height in hundreds of feet; Towering CUmulus or CumulonimBus in **METAR**; in **TAF**, only CB. Vertical Visibility for obscured sky and height "VV004". More than 1 layer may be reported or forecast. In automated **METAR** reports only, CLeaR for "clear below 12,000 feet."	**OVC010CB**
	Temperature: Degrees Celsius; first 2 digits, temperature "/" last 2 digits, dewpoint temperature; Minus for below zero, e.g., M06	**18/16**
	Altimeter setting: Indicator and 4 digits; in U.S., A: inches and hundredths; (Q: hectoPascals, e.g., Q1013)	**A2992**
WS010/ 31022KT	In U.S. **TAF**, nonconvective low-level (<2,000 feet) Wind Shear; 3-digit height (hundreds of feet); "/"; 3-digit wind direction and 2–3 digit wind speed above the indicated height, and unit, KT	

FIGURE 7–1–23

Key to Aerodrome Forecast (TAF) and Aviation Routine Weather Report (METAR) *Back*

Forecast	Explanation	Report
	In **METAR**, ReMarK indicator and remarks. For example: Sea-Level Pressure in hectoPascals and tenths, as shown: 1004.5 hPa; Temp/dewpoint in tenths °C, as shown: temp. 18.2°C, dewpoint 15.9°C	**RMK SLP045 T01820159**
FM091930	FroM: Changes are expected at: 2-digit date, 2-digit hour, and 2-digit minute **beginning** time: indicates significant change. Each FM starts on a new line, indented 5 spaces	
TEMPO 0920/0922	TEMPOrary: Changes expected for <1 hour and in total, < half of the period between the 2-digit date and 2-digit hour **beginning**, and 2-digit date and 2-digit hour **ending** time	
PROB30 1004/1007	PROBability and 2-digit percent (30 or 40): Probable condition in the period between the 2-digit date and 2-digit hour **beginning** time, and the 2-digit date and 2-digit hour **ending** time	
BECMG 1013/1015	BECoMinG: Change expected in the period between the 2-digit date and 2-digit hour **beginning** time, and the 2-digit date and 2-digit hour **ending** time	

Table of Significant Present, Forecast and Recent Weather – Grouped in categories and used in the order listed below; or as needed in TAF, No Significant Weather

QUALIFIERS

Intensity or Proximity

"–" = Light **No sign** = Moderate **"+"** = Heavy

"VC" = Vicinity, but not at aerodrome. In the U.S. **METAR**, 5 to 10 SM from the point of observation. In the U.S. **TAF**, 5 to 10 SM from the center of the runway complex. Elsewhere, within 8000m.

Descriptor

BC Patches **BL** Blowing **DR** Drifting **FZ** Freezing
MI Shallow **PR** Partial **SH** Showers **TS** Thunderstorm

WEATHER PHENOMENA

Precipitation

DZ Drizzle **GR** Hail **GS** Small hail or snow pellets
IC Ice crystals **PL** Ice pellets **RA** Rain **SG** Snow grains
SN Snow **UP** Unknown precipitation in automated observations

Obscuration

BR Mist (>5/8SM) **DU** Widespread dust **FG** Fog (<5/8SM) **FU** Smoke
HZ Haze **PY** Spray **SA** Sand **VA** Volcanic ash

Other

DS Dust storm **FC** Funnel cloud **+FC** Tornado or waterspout
PO Well-developed dust or sand whirls **SQ** Squall **SS** Sandstorm

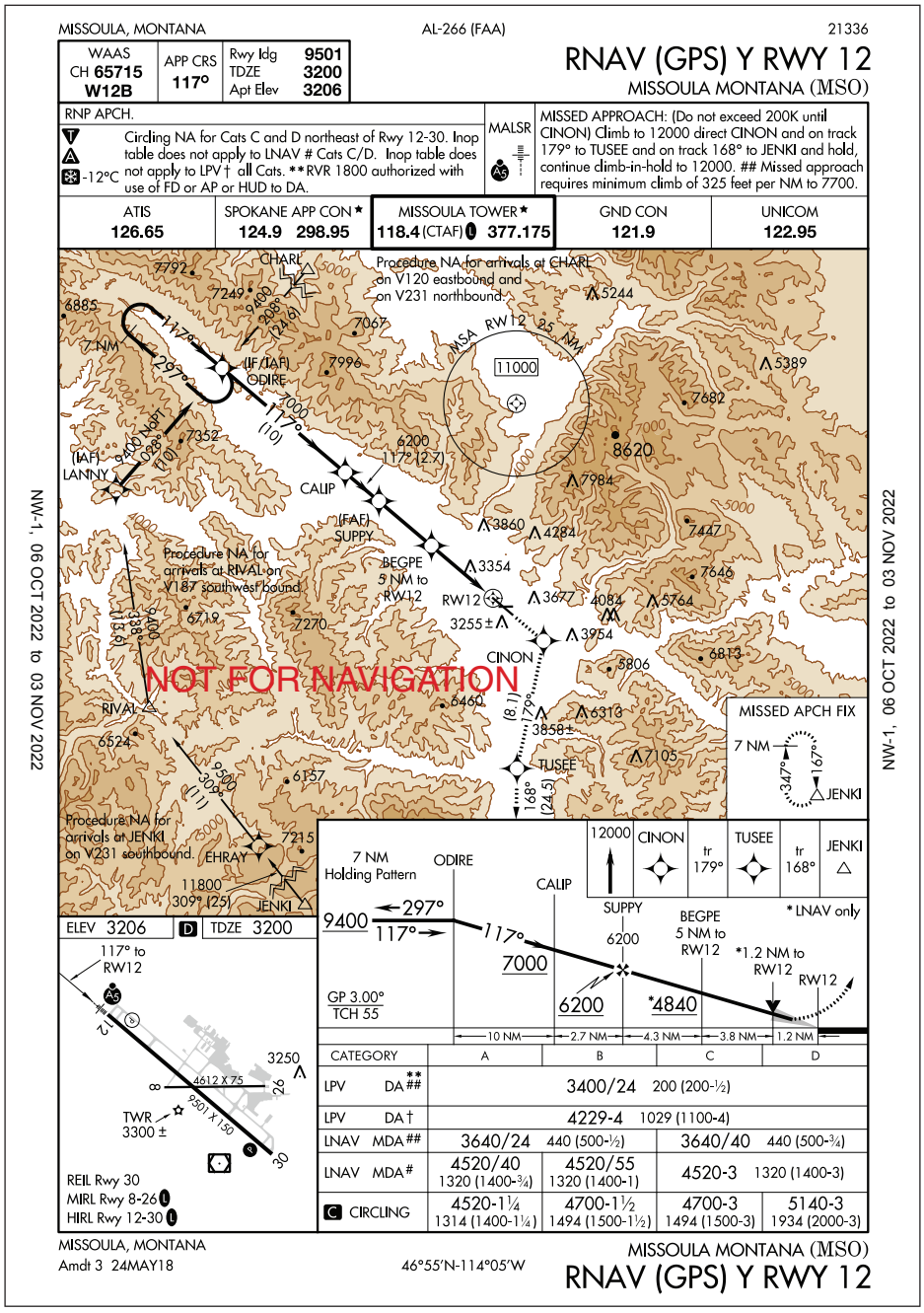
- Explanations in parentheses "( )" indicate different worldwide practices.
- Ceiling is not specified; defined as the lowest broken or overcast layer, or the vertical visibility.
- NWS **TAF**s exclude BECMG groups and temperature forecasts, NWS **TAF**s do not use PROB in the first 9 hours of a TAF; NWS **METAR**s exclude trend forecasts. U.S. Military **TAF**s include Turbulence and Icing groups.

August 2009

7–3–6 Examples for Calculating Altitude Corrections on CTAs

* * * * *

FIGURE 7–3–2
Missoula Intl RNAV (GPS) Y RWY 12



7–6–7 Mountain Flying

* * * * *

f. Navigating in confined terrain when flying through mountain passes can be challenging. For high-traffic mountain passes, VFR checkpoints may be provided on VFR navigation charts to increase situational awareness by indicating key landmarks inside confined terrain. A collocated VFR waypoint and checkpoint may be provided to assist with identifying natural entry points for commonly flown mountain passes. Pilots should reference the name of the charted VFR checkpoint, wherever possible, when making position reports on CTAF frequencies to reduce the risk of midair collisions. Pilots should evaluate the terrain along the route they intend to fly with respect to their aircraft type and performance capabilities, local weather, and their experience level to avoid flying into confined areas without adequate room to execute a 180 degree turn, should conditions require. Always fly with a planned escape route in mind.

Reference: *AIM, ¶1-1-17, Global Positioning System (GPS).*

* * * * *

7–6–15 Operations in Ground Icing Conditions

* * * * *

d. * * *

1. http://aircrafticing.grc.nasa.gov/index.html

2. Advisory Circular (AC) 91-74, Pilot Guide, Flight in Icing Conditions.

3. AC 135-17, Pilot Guide Small Aircraft Ground Deicing.

4. AC 135-9, FAR Part 135 Icing Limitations.

5. AC 120-60, Ground Deicing and Anti-icing Program.

6. AC 135-16, Ground Deicing and Anti-icing Training and Checking. The FAA Approved Deicing Program Updates is published annually as a Flight Standards Information Bulletin for Air Transportation and contains detailed information on deicing and anti-icing procedures and holdover times. It may be accessed at the following website by selecting the current year's information bulletins: https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/deicing/.

Chapter 9

9–1–5 Where and How to Get Charts of Foreign Areas

* * * * *

d. International Civil Aviation Organization (ICAO). A list of free ICAO publications and catalogs is available at the following website: https://www.icao.int/publications/Pages/default.aspx.

Chapter 11
Unmanned Aircraft Systems (UAS)

Section 1 General

11–1–1 General

a. UAS operations are governed by the Code of Federal Regulations (CFR) and the United States Code (USC). The type of operation, purpose of the flight, and weight of the UAS all factor into the specific rule that governs UAS operations.

b. 14 CFR Part 107, Small Unmanned Aircraft Systems. Examples of 14 CFR Part 107 operations include commercial aerial photography, commercial aerial survey, other operations for hire, and operations that are not conducted purely for pleasure/recreation. These operations will be referred to as Part 107 operations. Part 107 operations are limited to small UAS (sUAS) weighing less than 55 pounds.

c. 49 USC 44809, Exception for Limited Recreational Operations of Unmanned Aircraft Operations. Recreational flyers operate unmanned or model aircraft for pleasure or recreation. These operations are to be referred to as Recreational Flyer operations. Recreational flyers typically operate small UAS or model also called radio-controlled (RC) aircraft. Recreational flyers operating UAS weighing more than 55 pounds may operate in compliance with standards and limitations developed by a CBO and from fixed sites, which are described in subparagraph 11-4-1c1, Fixed Sites.

d. 14 CFR Part 91, UAS Operations. 14 CFR Part 91 operations include public UAS, and civil UAS 55 pounds or more Maximum Gross Operating Weight (MGOW). These operations will be referred to as Part 91 UAS operations in Chapter 11. For more information on public UAS operations, the requirements for qualification as a public operator, and how aircraft and pilots are certified, refer to AC 00-1.1, Public Aircraft Operations—Manned and Unmanned.

Note: *14 CFR Part 91 operations can include UAS weighing less than 55 lbs.*

Reference: *14 CFR Part 107, Small Unmanned Aircraft Systems; 49 USC 44809, Exception for Limited Recreational Operations of Unmanned Aircraft; FAA Order JO 7210.3, Chapter 5, Section 5, 14 CFR Part 91, UAS Operations; AC 00-1.1, Public Aircraft Operations—Manned and Unmanned.*

11–1–2 Access to the National Airspace System (NAS) for UAS Operators

a. UAS operations must be integrated into the NAS while maintaining existing operational capacity and safety without introducing an unacceptable level of risk to airspace users or persons and property on the ground. The FAA is committed to striking the appropriate regulatory and oversight balance to ensure that American innovation is able to thrive without compromising the safest, most efficient aerospace system in the world.

b. UAS operators can access the NAS in multiple ways. Generally, UAS weighing less than 55 pounds MGOW are permitted to operate within Visual Line of Sight (VLOS) up to 400 feet Above Ground Level (AGL) in uncontrolled (Class G) airspace. Operations within controlled airspace require specific authorization from Air Traffic Control (ATC).

1. Part 107 sUAS operators can request airspace authorizations via Low Altitude Authorization and Notification Capability (LAANC) or DroneZone to fly within Class B, Class C, Class D or within the lateral boundaries of the surface area of Class E airspace designated for an airport. Operations within controlled airspace can be readily approved in accordance with the altitude values indicated on the corresponding UAS Facility Map (UASFM). The UASFM values indicate the maximum altitude at which a UAS operation can be approved without any further coordination with the respective ATC facility. Part 107 remote pilots and operators may request "further coordination" for an airspace authorization to operate above UASFM values, up to 400 feet AGL. (See paragraph 11-4-2 for further information regarding Part 107 operations.)

Note: *Emergency airspace authorizations for Special Government Interest (SGI) UAS operations will be addressed in paragraph 11-8-5.*

2. Recreational flyer operations. Recreational flyers may operate in certain controlled and uncontrolled airspace under specific conditions. In Class B, C, D or the surface area of Class E airspace designated for an airport. The operator must obtain authorization prior to operating. In Class G airspace, the aircraft must be flying not more than 400 feet AGL and comply with all airspace restrictions and prohibitions. Recreational flyers may operate at an FAA-recognized fixed flying site above 400 feet AGL with a FAA-approved letter of agreement from the appropriate ATC authority or up to UASFM altitudes in controlled airspace with an airspace authorization obtained through LAANC.

3. Part 91 UAS Operations. Public UAS, and civil UAS 55 pounds or more MGOW operate under 14 CFR Part 91, UAS operations. Public UAS operators and civil, non-recreational UAS weighing 55 pounds or more MGOW are provided NAS access by compliance with certain parts of 14 CFR Part 21, experimental certificates, and 14 CFR Part 91, UAS Operations. Part 91 UAS operators require a COA to operate within the NAS. Specific geographic/altitude limitations are prescribed in the COA. Additional pilot and aircraft requirements are applicable to Part 91 UAS operations. See Chapter 11, Section 3, Large UAS (MGOW 55 Pounds or More), and paragraph 11-4-3, Airspace Access for PAO, for further information on Part 91 UAS operations.

Reference: *14 CFR Section 21.191, Experimental Certificates; FAA Order JO 7210.3, Chapter 5, Section 5, 14 CFR Part 91, UAS Operations.*

Section 2 Small Unmanned Aircraft System (sUAS)

11–2–1 Part 107 sUAS and Recreational Flyers

a. Part 107 sUAS. A regulatory first step for civil non-recreational UAS operations. To fly under 14 CFR Part 107, the UAS must weigh less than 55 pounds and the operator (called a remote pilot) must pass a knowledge test. Also, the UAS must be registered. Part 107 enabled the vast majority of routine sUAS operations, allowing flight within VLOS while maintaining flexibility to accommodate future technological innovations. Part 107 allows sUAS operations for many different purposes without requiring airworthiness certification, exemptions, or a COA for Class G airspace access. Part 107 includes the opportunity for individuals to request waivers for certain provisions of the rules, for example, Beyond Visual Line-Of-Sight (BVLOS). Part 107 also has specific restrictions which are not subject to waiver, such as the prohibition of the carriage or transport of Hazardous Materials (HAZMAT).

b. Recreational flyer UAS:

1. The FAA considers recreational UAS to be aircraft that fall within the statutory and regulatory definitions of an aircraft, in that they are devices that are used or intended to be used for flight in the air. As aircraft, these devices generally are subject to FAA oversight and enforcement.

Reference: *49 USC 40102, Definitions; 14 CFR Part 1, Definitions and Abbreviations.*

2. Recreational aircraft may operate in Class G airspace where the aircraft is flown from the surface to not more than 400 feet AGL, and the operator must comply with all airspace restrictions and prohibitions. The only exception to this altitude restriction in Class G airspace is at FAA- recognized fixed sites and sanctioned events, with specifically approved procedures for flights above 400 feet AGL.

Note: *Higher altitude airspace authorizations for Recreational Flyers are obtained through the FAA's DroneZone website at: https://faadronezone.faa.gov/#/.*

3. The Recreational UAS Safety Test (TRUST) module was developed in consultation with multiple UAS stakeholders and through interested party feedback. TRUST is available electronically, has no minimum age limit, and is provided by volunteer test administrators, vetted by the FAA. See AIM, paragraph 11-5-1, UAS Pilot Certification and Requirements for Part 107 and Recreational Flyers, for further information on TRUST. Also, additional information regarding TRUST is available at the FAA's The Recreational UAS Safety Test website.

Note: *The FAA's The Recreational UAS Safety Test website may be viewed at: https://www.faa.gov/uas/recreational_fliers /knowledge_test_updates/.*

4. Recreational UAS weighing more than .55 lbs must be registered. This can be done electronically through the FAA's DroneZone website. Owners must then label all model aircraft with their assigned registration number on the exterior of their aircraft so that the registration can be clearly seen and read from a reasonable distance. See paragraph 11-2-2, Registration Requirements, for more information on registering UAS.

Note: *The FAA's DroneZone website may be viewed at: https://faadronezone.faa.gov/#/.*

11–2–2 Registration Requirements

a. Nearly all UAS flown in the NAS are required to be registered in the FAA aircraft registration database. UAS weighing 55 pounds MGOW or more must be registered under 14 CFR Part 47, Aircraft Registration, while UAS less than 55 pounds may be registered under the FAA's newer 14 CFR Part 48 online system.

Note: *The FAA's Aircraft Registration Unmanned Aircraft (UA) website may be viewed at: https://www.faa.gov/licenses_certificates/aircraft _certification/aircraft_registry/UA/.*

Reference: *14 CFR Part 47, Aircraft Registration.*

b. Registering UAS under 14 CFR Part 47. For those UAS, which do not meet the weight stipulations for registration under 14 CFR Part 48, registration is accomplished under 14 CFR Part 47. 14 CFR Part 47 registration will result in an "N"-number like those assigned to manned aircraft. To learn more about the process and to register a UAS under Part 47, see the FAA's Aircraft Registration Unmanned Aircraft (UA) website. If desired by the owner, any UAS may be registered under 14 CFR Part 47.

Note: *The FAA's Aircraft Registration Unmanned Aircraft (UA) website may be viewed at: https://www.faa.gov/licenses_certificates/aircraft _certification/aircraft_registry/UA/.*

c. Registering UAS under 14 CFR Part 48. For most operators of sUAS (those UAS weighing less than 55 pounds MGOW), registration under 14 CFR Part 48, Registration and Marking Requirements for Small UA, will be most expedient and the least expensive. 14 CFR Part 48 registrants are those UAS flyers operating under either of the following statutes:

1. Part 107. Under the provisions of Part 107, all UAS must be registered regardless of weight. Operations under Part 107 are generally those involving commerce, but can be for recreation as well.

2. Recreational Flyers. UAS that are flown exclusively for recreational purposes must be registered if they weigh 0.55 pounds (250 grams) or more.

Note 1: *If you are not sure what kind of a drone flyer you are, refer to the FAA's User Identification Tool at: https://www.faa.gov/uas/getting_started/user_identification_tool/, or visit the FAA Getting Started webpage at: https://www.faa.gov/uas/getting_started/.*

Note 2: *Registrations cannot be transferred between 14 CFR Part 107 UAS and 49 USC 44809 UAS.*

Reference: *14 CFR Part 48, Registration and Marking Requirements for Small Unmanned Aircraft.*

d. How to register a UAS under 14 CFR Part 48:

1. To register a UAS online under Part 48, refer to the FAA's DroneZone website. When registering a UAS online under Part 48, you will need to select registration in either Part 107 or the exception for recreational flyers.

2. Registration fees for Part 107 registration are per sUAS, and the registration is valid for three years. Each Part 107 registered sUAS will receive a different number. Recreational flyer registration fees are per UAS and valid for three years, but the same registration number can be applied to any UAS in the registrant's ownership. The recreational flyer will receive one registration number that can be used for all UAS flown by that person. In order to register, a person must be 13 years of age or older and be a U.S. citizen or legal permanent resident. If the owner is less than 13 years of age, another person 13 years of age or older must register the UAS and that person must be a U.S. citizen or legal permanent resident.

3. An FAA registration certificate will be issued after UAS registration. The registration certificate (either paper copy or digital copy) must be available for inspection during all flight operations. If an individual other than the registered owner operates a UAS, the registration certificate (either paper copy or digital copy) must also be available for inspection during all flight operations. Federal law requires registered UAS operators, if asked, to show their certificate of registration to any federal, state, or local law enforcement officer. Failure to register a UAS that requires registration may result in regulatory and criminal penalties. The FAA may assess civil penalties up to $27,500.

Note: *The FAA's DroneZone website may be viewed at: https://faadronezone.faa.gov/#/.*

e. Labeling a UAS with a registration number. All UAS requiring registration must be marked with a registration number before being flown. The UAS registration number can be applied to the aircraft by engraving, a permanent label, or written on with a permanent marker. The registration number must be visible on the outside surface of the UAS.

Section 3 Large UAS (MGOW 55 Pounds or More)

11–3–1 Large Public UAS Operations

a. Large public UAS may have wingspans as large as commercial airliners, and may operate in and out of public/military dual-use airfields. Due to the high altitudes at which these UAS routinely operate, and the means through which they reach and vacate operating altitudes, encounters with manned or low-altitude unmanned traffic are rare.

b. Public users operating as "public aircraft" retain the responsibility to determine airworthiness and pilot qualifications. Aircraft certification and operating rules apply to the entire UAS, including the aircraft itself, the flight crew with their associated qualifications, the control station, and command and control links.

Note: *Large UAS operating in controlled airspace generally communicate on radio frequencies or through an ATC-to-PIC ground communications link assigned to that sector, terminal area, or control tower. The UAS PIC is required to comply with all ATC instructions and uses standard phraseology per FAA Order JO 7110.65, Air Traffic Control, and this manual.*

Reference: *49 USC 40102, Definitions; 49 USC 40125, Qualifications for Public Aircraft Status; FAA Order JO 7110.65, Air Traffic Control; AIM, ¶11-4-3, Airspace Access for Public Aircraft Operations PAO.*

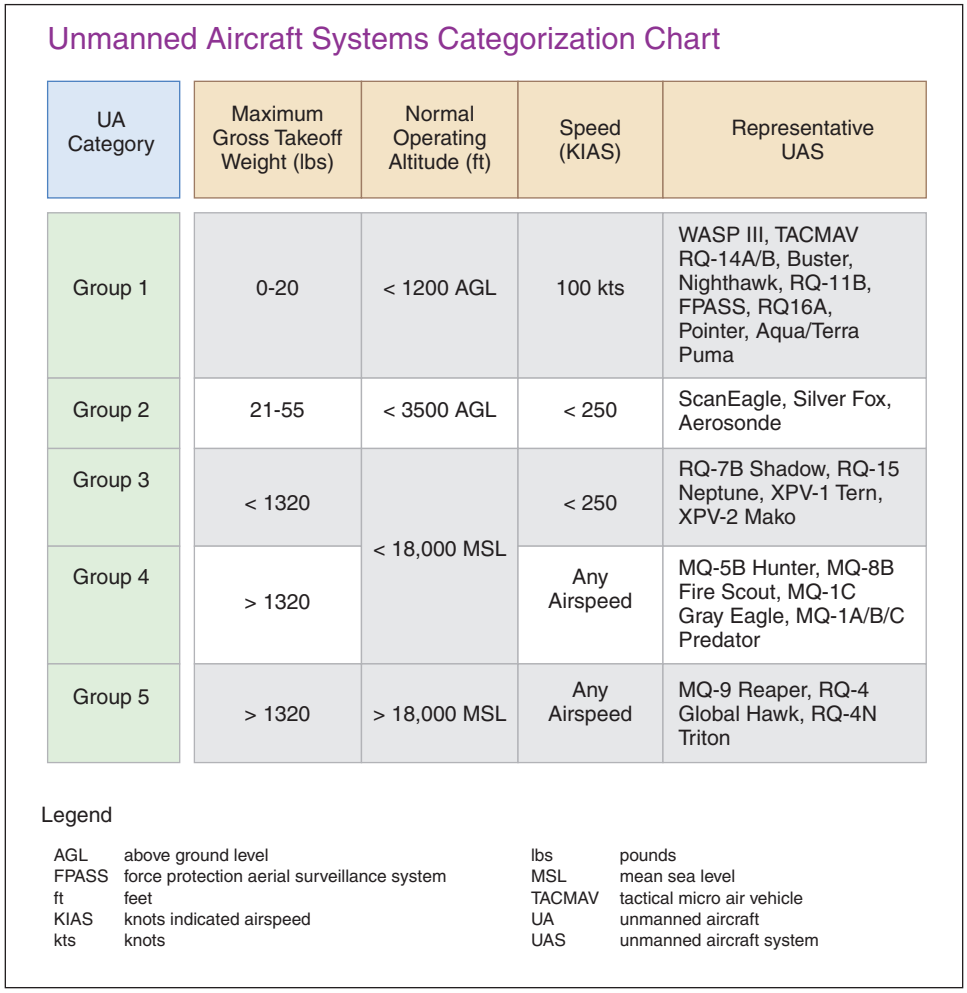
c. Operating characteristics of large public UAS. To illustrate the sizes and performance of large public UAS, consider the DoD UAS classification system. The categories (see Figure 11-3-1) are separated based on MGOW, normal operating altitude, and flying speed. These classifications do not apply to non-DoD civil aircraft. Generally, Groups 1 through 3 UAS will operate on and above military bases, in restricted or prohibited airspace. For this reason, these smaller tactical public aircraft will rarely be encountered by civil pilots. Groups 4 and 5 are the largest of DoD UAS, weighing over 1,320 pounds, and operating at all speeds and altitudes. Group 4 aircraft operate at all altitudes, usually below 18,000 feet MSL. Group 5 aircraft typically operate well above 18,000 feet MSL. UAS in Groups 4 and 5 require airfields with specially approved surfaces to safely operate. For specifications and descriptions of the aircraft models that the DoD operates, refer to military service fact sheets.

Note 1: *The category chart does not specify the actual high gross weights at which some DoD UAS actually operate. For instance, the RQ-4 Global Hawk regularly operates at approximately 32,000 pounds.)*

Note 2: *JP 3–30, III 31, Joint Publication 3–30, provides the UAS Categorization Chart and may be reviewed at: https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_30.pdf?ver=2019-09-04-142255-657.*

Note 3: *These websites provide unclassified descriptions, performance, and specifications of the varied UAS in the DoD's large category fleet: USAF Fact Sheets at https://www.af.mil/About-Us/Fact-Sheets/ and USN Fact Files at https://www.navy.mil/Resources/Fact-Files/.*

FIGURE 11–3–1
DoD UAS Categories



Unmanned Aircraft Systems Categorization Chart

UA Category	Maximum Gross Takeoff Weight (lbs)	Normal Operating Altitude (ft)	Speed (KIAS)	Representative UAS
Group 1	0-20	< 1200 AGL	100 kts	WASP III, TACMAV RQ-14A/B, Buster, Nighthawk, RQ-11B, FPASS, RQ16A, Pointer, Aqua/Terra Puma
Group 2	21-55	< 3500 AGL	< 250	ScanEagle, Silver Fox, Aerosonde
Group 3	< 1320	< 18,000 MSL	< 250	RQ-7B Shadow, RQ-15 Neptune, XPV-1 Tern, XPV-2 Mako
Group 4	> 1320		Any Airspeed	MQ-5B Hunter, MQ-8B Fire Scout, MQ-1C Gray Eagle, MQ-1A/B/C Predator
Group 5	> 1320	> 18,000 MSL	Any Airspeed	MQ-9 Reaper, RQ-4 Global Hawk, RQ-4N Triton

Legend

AGL	above ground level	lbs	pounds
FPASS	force protection aerial surveillance system	MSL	mean sea level
ft	feet	TACMAV	tactical micro air vehicle
KIAS	knots indicated airspeed	UA	unmanned aircraft
kts	knots	UAS	unmanned aircraft system

d. Large Public UAS Engineering Characteristics and Operating Areas:

1. Large public UAS may be sharing airspace with civil aircraft in the NAS. A wide variety of aircraft performance, voice radio communications, command and control link architecture, and operating procedures exists throughout the DoD and other large public UAS enterprises. For example, Group 4 DoD aircraft, such as the MQ-1 Predator and MQ-9 Reaper, are typically propeller-driven with propulsion units that are internal combustion piston- or turbine-powered. The largest public UAS include single-engine jet aircraft such as the RQ-4 Global Hawk and MQ-4C Triton.

2. VLOS and BVLOS link systems provide command and control for these large UAS operations. Voice communication capability in the largest public UAS is far more extensive than in the smaller aircraft. Many models are limited to a single voice radio transmitter and receiver system for control inside airspace managed by and/or delegated to the DoD.

3. Many of the larger public UAS are equipped with transponders to assist ATC with position and tracking information. These UAS usually operate under IFR under positive ATC control and will tend to be found at very high altitudes; not likely to be encountered by civil aircraft operators. Launch and recovery operations will be likewise under positive ATC control and these UAS will be separated from any other known aircraft traffic. Encounters with low-altitude small UAS, being flown in uncontrolled airspace or under low-altitude controlled airspace authorizations, are therefore unlikely. In accordance with 14 CFR Section 91.215(e)(2), ATC Transponder and Altitude Reporting Equipment and Use, no person may operate an unmanned aircraft under Part 91 with a transponder on unless: (1) the operation is conducted under a flight plan and the person operating the unmanned aircraft maintains two-way communications with ATC; or (2) the use of a transponder is otherwise authorized by the Administrator.

Note: *In accordance with 14 CFR Section 107.52, ATC Transponder Equipment Prohibition, unless otherwise authorized by the Administrator, no person may operate a sUAS under Part 107 with a transponder on.*

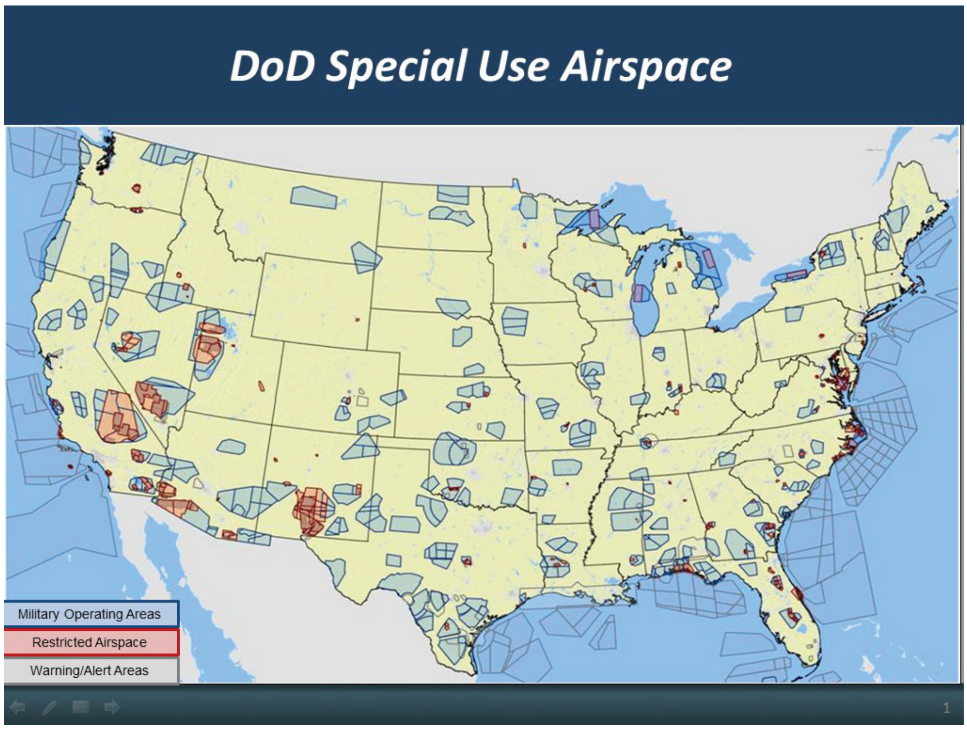
Reference: *14 CFR Section 91.215, ATC Transponder and Altitude Reporting Equipment and Use; 14 CFR Section 107.52, ATC Transponder Equipment Prohibition.*

e. Large Public UAS Launch, Recovery, and Operating Areas:

1. Large public UAS operations are widespread, they are also carefully managed to ensure enhanced safety for other NAS users. For this reason, DoD UAS operate in many types of special use airspace. See Figure 11-3-2 for examples of Special Use Airspace (SUA) used by DoD UAS.

2. Temporary Flight Restrictions (TFRs) are issued for the surrounding UAS operating locations and allow for the launch and recovery of larger UAS. Once outside of the terminal environment, DoD UAS utilize the full range of SUA, including Military Operating Areas (MOA), restricted areas, warning areas, and alert areas to conduct their missions.

FIGURE 11–3–2
DoD Special Use Airspace



11–3–2 Exemptions Under 49 USC 44807, Special Authority for Certain Unmanned Systems

a. Exemptions are granted to UAS operations which are permitted in accordance with Public Law 115–254, 49 USC 44807, Special Authority for Certain Unmanned Aircraft Systems. The Secretary of Transportation has determined that certain UAS are eligible to operate in the NAS without possessing the airworthiness certification normally required under 49 USC 44807. 49 USC 44807 permits the FAA to use a risk-based approach to determine whether an airworthiness certificate is required for a UAS to operate. Exemptions are generally requested by civil (non-public) UAS operators who fly UAS weighing 55 pounds or more, and thus cannot fly under 14 CFR Part 107. For civil UAS operations conducted under 49 USC 44807 of PL 115–254, the Secretary has determined that specific requirements necessary for safe operation can often be addressed in the form of grants of exemption(s). Operators who desire this regulatory relief must petition the FAA for exemption in accordance with 14 CFR Part 11 and the guidance provided on the FAA's Section 44807, Special Authority for Certain Unmanned Systems website. Examples of petitions that have been granted to conduct civil UAS operations include the following activities:

1. Closed-set motion picture and television filming.
2. Agricultural survey and spraying.
3. Aerial photography.
4. Land survey and inspection.
5. Inspection of structures.
6. Search and Rescue (SAR) operations.

Note: *Civil agricultural spraying operations will also require a 14 CFR Part 137 certificate; see paragraph 11-4-5, Airspace Access for 14 CFR Part 135 and 14 CFR Part 137.*

b. Exemption Application. Petitioners seeking a grant of exemption should fill out an online application on the public docket located on the FAA's regulations.gov website.

Reference: *49 USC 44807, Special Authority for Certain Unmanned Aircraft Systems.*

Note: *The FAA's Section 44807: Special Authority for Certain Unmanned Systems website may be reviewed at: https://www.faa.gov/uas/advanced_operations/certification/section_44807/. The FAA's Regulations.gov website may be reviewed at: https://www.faa.gov/regulations_policies/faa_regulations.*

11–3–3 Emerging Large UAS Civil Operations

a. Large civil UAS operations in the NAS are presently considered those UAS weighing 55 pounds or more with or without aircraft airworthiness certification, along with their control stations and radio links operating under 14 CFR Part 91. These operations may or may not receive ATC separation services, but will not be operating under UAS Traffic Management (UTM) structures. Examples of current large UAS civil operators include agricultural spraying and operation as radio/telephone airborne relays. Future large UAS operations will include carriage of cargo and passengers, and very long-endurance aircraft, staying aloft for extended periods of time.

Note: *Large is only used as a term to differentiate from those UAS weighing less than 55 pounds. Large UAS is not an FAA-recognized category of aircraft.*

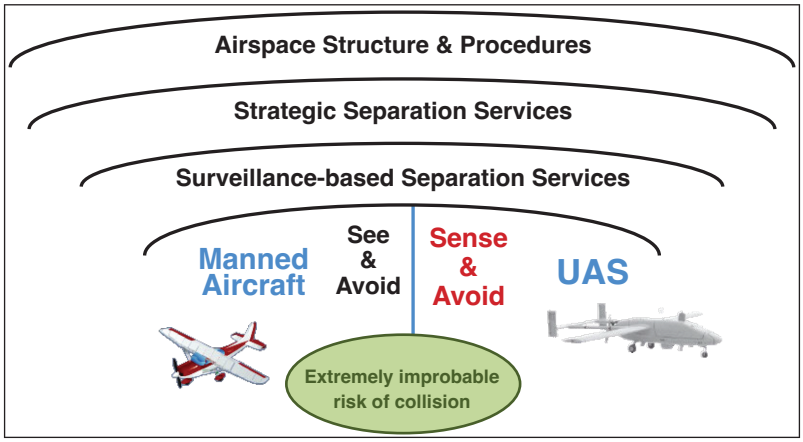
1. Large UAS must meet performance, equipage requirements, and adhere to relevant procedures commensurate with the airspace in which the UAS is operating.

2. Absent an onboard pilot, large UAS are unable to "see and avoid" other aircraft, as required by regulations governing the general operation of aircraft in the NAS under Title 14 CFR Section 91.111, Operating Near other Aircraft, and 14 CFR Section 91.113, Right of Way Rules: Except Water Operations. As a result, they

cannot use visual observation to remain “well clear” of other aircraft and avoid collisions. Therefore, an alternate means of compliance is required to remain well clear of other aircraft and surface obstacles, and avoid collisions.

3. Figure 11-3-3, A Layered Approach for Collision Avoidance, illustrates the different layers used to keep aircraft safely separated, beginning with airspace classification and design, then ending with the responsibility of the pilot to prevent collisions.

FIGURE 11–3–3
A Layered Approach for Collision Avoidance



b. Transition to full integration into the NAS. Over time, full integration of large UAS operations in the NAS will be achieved. Current large UAS operations will continue to be dependent on COAs, the issuance of NOTAMs, and possibly other measures (e.g., chase plane, segregated airspace) as currently used for accommodated operations. This integration is evolving with UAS technology advances, FAA regulatory changes, NAS automation, communications improvements, and evolving use cases and demand.

Note: *Transponder equipped UAS, during lost link events, if capable, will squawk secondary surveillance radar (SSR)/Transponder code 7400. If the UAS is not programmed for use of SSR code 7400, then code 7600 may be used.*

c. Large Civil Operations. The following are examples of test and evaluation operations being conducted with large civil and commercial UAS: cargo delivery, infrastructure inspection, surveillance, firefighting, environmental observation, signal relay, and atmospheric sampling.

Section 4 Airspace Access for UAS

11–4–1 Recreational Flyers

a. Advisory Circular 91–57, Exception for Limited Recreational Operations of Unmanned Aircraft, provides guidance for recreational flyers. Failure of a recreational flyer to adhere to any of the requirements for recreational status under 14 USC 44809 will result in the flight being considered 14 CFR Part 107 by the FAA, which may result in greater penalties if the operator is found operating in an unsafe manner. Recreational flyers may only operate under the statutory exception if they adhere to all of the conditions listed in the statute.

Reference: *AC 91-57, Exception for Limited Recreational Operations of Unmanned Aircraft; 49 USC 44809, Exception for Limited Recreational Operations of Unmanned Aircraft; 14 CFR Part 107, Small Unmanned Aircraft Systems.*

b. Operations in Class G airspace. Flights in Class G airspace will be the most common environment for many recreational flyers. The upper limit of recreational UAS operations in Class G airspace is 400 feet AGL. When operating in Class G airspace, the recreational flyer must follow the set of safety guidelines outlined and developed by a recognized Community-Based Organization (CBO).

c. Operations in controlled airspace or uncontrolled airspace above 400 feet AGL. If a recreational flyer desires to operate in class B, C, or D airspace, or within the lateral boundaries of the surface area of class E airspace designated for an airport, or in class G airspace above 400 feet, the operator must obtain prior authorization from the Administrator or designee before operating. For the recreational flyer wishing to enter controlled airspace, there are two basic routes:

1. Fixed sites are locations specifically authorized by the FAA, which are posted at the FAA’s interactive map on the UAS Data Delivery System (UDDS). On the map, small blue circles depict the location of these sites in controlled airspace and the altitude limits imposed on those sites. The altitude restrictions are derived from the UASFM which form the basic structure of LAANC and its operating procedures. Recreational flyers can access site-specific information by clicking on the blue circle.

Note: *These sites have existing letters of agreement or authorization (LOA) with the FAA. For the CBO to operate in controlled airspace, an airspace authorization agreement between the CBO and the FAA must be in place. Certain sites may have access restrictions or other operating limitations, which are available from the site sponsor.*

2. By request, through the LAANC Application. LAANC provides the recreational pilot with access, when permissible, to controlled airspace at or below posted UASFM altitudes in near-real time. LAANC also gives the recreational flyer the ability to stay notified of airspace restrictions and prohibitions. See paragraph 11-8-7 of this chapter for information on downloading the LAANC application.

d. CBO Sanctioned Events. Sanctioned events, also called sponsored events are generally of short duration and take place at an existing fixed site or temporary fixed site established specifically for the event.

1. CBO's requesting a sanctioned or sponsored event authorization within Class B, C, D, or within the lateral boundaries of the surface area of Class E airspace designated for an airport are obligated to make the location known to the FAA Administrator. Mutually agreed-upon operating procedures must be established with the event organizer. This is accomplished through a fixed site application in DroneZone.

2. CBO operations and events occurring at 400 feet AGL and below in Class G airspace do not require FAA review, approval or authorization. CBO's intending to conduct events in Class G airspace that may exceed 400 feet AGL must contact the FAA for further information.

11–4–2 14 CFR Part 107, and Waivers to 14 CFR Part 107

a. 14 CFR Part 107 was the first new rule dedicated to UAS operations. It was designed to provide a path for integration into the NAS for sUAS, flown under VLOS, and operated for non-recreational purposes. Part 107 allows remote pilots to fly for recreation. Part 107 grants certain flight permissions and altitudes in excess of those provided under 49 USC 44809, The Exception for Limited Recreational Operations of UAS, in view of the greater vetting required for 14 CFR Part 107 certification. Eligibility requirements to fly under 14 CFR Part 107, are listed in 14 CFR Section 107.61, Eligibility.

Note: *The Administrator may issue a certificate of waiver authorizing a deviation from 14 CFR Section 107.31, Visual Line of Sight Aircraft Operation, if the operation can safely be conducted under the terms of a certificate of waiver.*

Reference: *14 CFR Part 107, sUAS; 14 CFR Section 107.61, Eligibility; 14 CFR Section 107.31, Visual Line of Sight Aircraft Operation.*

b. Operations in Class G airspace. Part 107 remote pilots may fly in Class G airspace up to 400 feet AGL, and within 400 feet of a structure without prior coordination with ATC. Other limitations for Part 107 operators are described in 14 CFR Part 107.51, Operating Limitations for sUAS.

Reference: *14 CFR Section 107.51, Operating Imitations for Small Unmanned Aircraft.*

c. Operations in controlled airspace through LAANC. LAANC gives the remote pilot the ability to obtain near real-time airspace authorization within UASFM altitudes and stay notified of airspace restrictions and prohibitions. See paragraph 11-8-7, Resources for UAS Operators, for information on downloading LAANC.

d. Waivers to 14 CFR Part 107:

1. A waiver is an official document issued by the FAA which approves certain operations of UAS outside the limitations of a regulation. These waivers allow drone pilots to deviate from certain rules under 14 CFR Part 107 by demonstrating they can still fly safely using alternative methods or safety mitigations. 14 CFR Part 107 rules which can be waived are listed in 14 CFR Section 107.205, List of Regulations Subject to Waiver. Any subpart of 14 CFR Part 107 rule which is not specifically listed in 14 CFR Section 107.205, such as the §107.36 prohibition on the carriage or transport of HAZMAT, is not subject to waiver, and would require an exemption under 14 CFR Part 11, General Rulemaking Procedures. See paragraph 11-3-2, Exemptions Under 49 USC 44807, Special Authority for Certain Unmanned Systems, for guidance on requesting exemptions.

2. To request a 14 CFR Part 107 waiver, refer to the FAA's Part 107 Waiver website.

Note: *The FAA's Part 107 waiver website may be viewed at: https://www.faa.gov/uas/commercial_operators/part_107_waivers/.*

Reference: *14 CFR Section 107.205, List of Regulations Subject to Waiver; 14 CFR Part 11, General Rulemaking Procedures.*

11–4–3 Airspace Access for Public Aircraft Operations (PAOs)

a. General requirements for PAO status. Governmental entities, as defined by federal law 49 USC 40102(a)(41), Definitions, can fly as a public aircraft operation as long as the flight meets the definition of a governmental function 49 USC 40125, Qualifications for Public Aircraft Status. Public aircraft are aircraft owned and operated by the government of a state, the District of Columbia, or a territory or possession of the United States, or a political subdivision of one of these governments, except as provided in 49 USC 40125(b), Qualifications for Public Aircraft Status. Public aircraft can also be aircraft exclusively leased for at least 90 continuous days by the government of a state, the District of Columbia, or a territory or possession of the United States or a political subdivision of one of these governments, except as provided in 49 USC 40125(b), Qualifications for Public Aircraft Status.

Note 1: *The term "government function" refers to one of several activities undertaken by a government, such as national defense, intelligence missions, firefighting, search and rescue, law enforcement (including transportation of prisoners, detainees, and illegal aliens), aeronautical research, or biological or geopolitical resource management.*

Note 2: *An operation "for the public good" does not necessarily meet the qualifications for a public operation; for example, most volunteer fire departments in the United States will not qualify as PAOs.*

Note 3: *Public safety organizations often conduct operations under 14 CFR Part 107, as well as public aircraft operations.*

Reference: *49 USC 40102, Definitions; 49 USC 40125, Qualifications for Pubic Aircraft Status.*

b. A PAO is conducted under certain 14 CFR Part 91, UAS Operations Rules, with a COA granted to allow access to the NAS. A PAO COA allows blanket UAS operations in Class G airspace throughout the entire continental United States, including operations at night with appropriate lighting and training, for the duration of the COA. Waivers and/or authorizations to the COA can permit operations beyond the basic COA. Operating as a PAO requires adherence to specific conditions as directed in the COA. Operations under the public aircraft statute cannot include purposes that are not governmental functions. For example, a police UAS flying without remuneration to obtain footage for a department promotional video would not be a governmental function.

c. COA Application Process:

1. Public Declaration Letter (PDL). The first step in getting a PAO COA is to be recognized as an authorized government agency by submitting a PDL that shows the organization is indeed a governmental entity as defined by federal law. FAA general counsel reviews this letter, which is usually issued by a city, county, or state attorney Federal agencies are deemed to be governmental entities without submitting a PDL.

2. COA Request. If formally recognized as a governmental entity under federal law, entities are given access to the COA Application Process System (CAPS) or DroneZone, where a request for a PAO COA may be submitted. Operating as a PAO requires you to adhere to specific conditions as directed in your COA. Remember that an aircraft described in subparagraph (a), (b), (c), or

(d) of 49 USC 40102(a)(41), Definitions, does not qualify as a public aircraft under such section when the aircraft is used for commercial purposes (e.g., performing a non-governmental function).

Reference: *AC 00-1.1, Public Aircraft Operations—Manned and Unmanned; 49 USC 40102, Definitions.*

11–4–4 14 CFR Part 89 Remote Identification and FAA-Recognized Identification Areas (FRIAs)

a. Background:

1. Remote identification (RID) of UAS is crucial to UAS integration.

2. RID is the ability of a UAS in flight to provide identification and location information that can be received by other parties.

3. RID allows the FAA, national security agencies, law enforcement, and others to distinguish compliant airspace users from those potentially posing a safety or security risk. It helps these agencies find the control station when a UAS appears to be flying unsafely or where it is prohibited.

b. Remote ID Rule:

1. 14 CFR Part 89, Remote Identification (RID) of Unmanned Aircraft, will require most drones operating in U.S. airspace to have RID capability. UAS not equipped with RID capability will be limited to operating in specific FAA-approved geographic locations, such as FRIA.

Reference: *14 CFR Part 89, Remote Identification of Unmanned Aircraft.*

2. There are three ways drone pilots will be able to meet the identification requirements of the RID rule: Standard RID, RID Broadcast Module, and FRIAs.

(a) Standard RID. Only standard RID drones may be manufactured after the September 16, 2022, rule effective date. Unmanned aircraft broadcast the RID message elements directly from the unmanned aircraft from takeoff to shutdown. Message elements include: (1) A unique identifier to establish the identity of the unmanned aircraft; (2) an indication of the unmanned aircraft latitude, longitude, geometric altitude, and velocity; (3) an indication of the control station latitude, longitude, and geometric altitude; (4) a time mark; and (5) an emergency status indication. Operators may choose whether to use the serial number of the unmanned aircraft or a session ID (e.g., an alternative form of identification that provides additional privacy to the operator) as the unique identifier.

(b) RID Broadcast Modules. An unmanned aircraft can be equipped with a Remote ID broadcast module that broadcasts message elements from takeoff to shutdown. Message elements include: (1) The serial number of the broadcast module assigned by the producer; (2) an indication of the latitude, longitude, geometric altitude, and velocity of the unmanned aircraft; (3) an indication of the latitude, longitude, and geometric altitude of the unmanned aircraft takeoff location; and (4) a time mark.

(c) FAA-Recognized Identification Area:

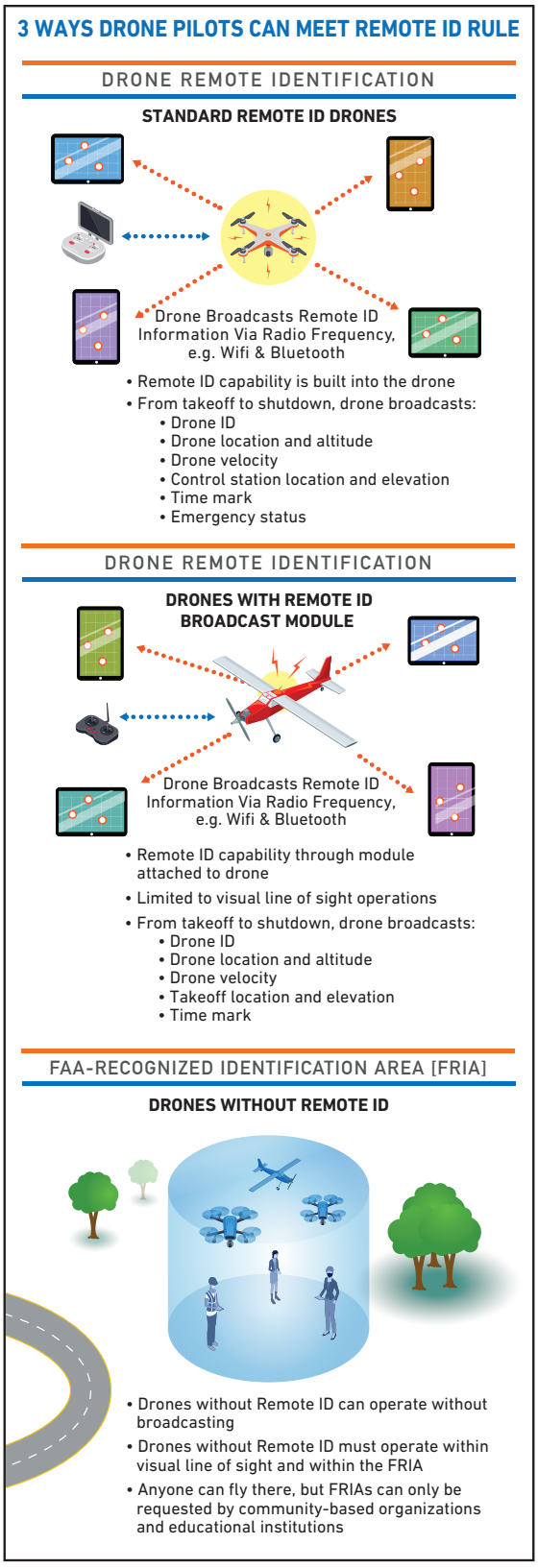
(1) An FAA-recognized identification area (FRIA) is a defined geographic area where persons can operate UAS without remote identification, provided they maintain visual line of sight. Organizations eligible to request establishment of a FRIA include CBOs recognized by the FAA and educational institutions. The latter group includes primary and secondary educational institutions, trade schools, colleges, and universities.

(2) To operate in a FRIA according to the 14 CFR Part 89, RID of unmanned aircraft, operators must be physically located within the boundaries of the FRIA, must only operate drones within those boundaries, and must operate within VLOS at all times. UAS equipped with RID broadcast capability must broadcast continuously even while operating within or transiting a FRIA.

Reference: *14 CFR Part 89, Remote Identification of Unmanned Aircraft.*

(3) Figure 11-4-1 illustrates the three ways UAS operators can comply with the new RID rule.

FIGURE 11–4–1
RID Paths to Compliance



11–4–5 Airspace Access for 14 CFR Part 135 and 14 CFR Part 137

a. 14 CFR Part 135, Operating Requirements: Commuter and on Demand Operations and Rules Governing Persons on Board Such Aircraft:

1. Civil operators of UAS may conduct commercial package delivery BVLOS, or may transport HAZMAT on an interstate basis (crossing state boundaries), only under 14 CFR Part 135. These types of operations are prohibited for UAS operating under 14 CFR Part 107, sUAS. Legally, these operations must be conducted under 14 CFR Part 91, UAS operations, in accordance with an air carrier certificate issued under 14 CFR Part 135, and an exemption from certain federal aviation regulations granted under 14 CFR Part 11, general rulemaking procedures.

Reference: *14 CFR Part 135, Operating Requirements: Commuter and on Demand Operations and Rules Governing Persons on Board Such Aircraft; 14 CFR Part 107, Small Unmanned Aircraft Systems; 14 CFR Part 11, General Rulemaking Procedures; FAA Order JO 7210.3, Chapter 5, Section 5, 14 CFR Part 91, UAS Operations.*

2. Generally, UAS cannot comply with certain 14 CFR regulations originally written for a manned aircraft environment and therefore require relief. UAS operators obtain relief from the requirements of these regulations through exemptions, waivers, and deviations. The relief document lists conditions and limitations which provide a level of safety at least equal to that provided by the rule from which relief is needed. Additionally, UAS operators must obtain a Certificate of Waiver or Authorization (COA) from the FAA Air Traffic Organization (ATO). Applicants for 14 CFR Part 135 certification should begin the process by contacting their local FAA Flight Standards District Office (FSDO).

Note: *Examples of such regulations include requirements for the provision of seat belts for aircrew and passengers, on-board carriage of an aircraft manual, etc.*

(a) Application for a 14 CFR Part 135 certificate. Application for a 14 CFR Part 135 air carrier certificate for UAS operations uses the same process as that for manned 14 CFR Part 135 applicants. For information on how to apply for an air carrier certificate issued under 14 CFR Part 135, see the FAA 14 CFR Part 135 Air Carrier and Operator Certification website.

Note: *The FAA 14 CFR Part 135 Air Carrier and Operator Certification website may be reviewed at: https://www.faa.gov/licenses_certificates/airline_certification/135_certification/.*

(b) Advisory Circular 120-49A, Parts 121 and 135 Certification is available to aid an applicant in Part 135 certification.

Reference: *AC 120-49, Parts 121 and 135 Certification.*

(c) Exemptions and COAs. Additional information on how to petition for an exemption and obtain a COA is available on the FAA Advanced Operations website.

Note: *The FAA's Advanced Operations website may be reviewed at: https://www.faa.gov/uas/advanced_operations/.*

b. 14 CFR Part 137, Agricultural Aircraft Operations:

1. Civil and public operators of UAS may conduct agricultural aircraft operations, as defined in 14 CFR Part 137.3, Definition of Terms. These operations must be conducted in accordance with an agricultural aircraft operator certificate issued under 14 CFR Part 137, and an exemption from certain federal aviation regulations granted under 14 CFR Part 11, General Rulemaking Procedures. Operators of sUAS, weighing less than 55 pounds MGOW may conduct agricultural aircraft operations under 14 CFR Part 107, sUAS, and 14 CFR Part 137. Operators of large UAS, weigh-

ing 55 pounds MGOW or more may conduct agricultural aircraft operations under 14 CFR Parts 91, UAS operations, and 14 CFR Part 137.

Reference: *14 CFR Part 137, Agricultural Aircraft Operations; 14 CFR Part 11, General Rulemaking Procedures; 14 CFR Part 107, Small Unmanned Aircraft Systems; FAA Order JO 7210.3, Chapter 5, Section 5, 14 CFR Part 91, UAS Operations.*

2. Generally, as is the case with 14 CFR Part 135 standard cargo operations, UAS cannot comply with certain 14 CFR regulations, and therefore require relief. For example, sUAS require relief from carriage of hazardous material (§107.36), aircraft certification (§137.19(d)), carriage of agricultural aircraft operator certificate (§137.33(a)), and, for large UAS, certain aircraft airworthiness requirements (14 CFR Parts 21 and 91). UAS operators obtain relief from the requirements of these regulations through an exemption. The exemption lists conditions and limitations which provide a level of safety at least equal to that provided by the rule. Additionally, large UAS operators must obtain a COA from the FAA ATO.

(a) Obtaining an exemption for 14 CFR Part 137 operations. For additional information on how to petition for an exemption and obtain a COA, go to the FAA's Advanced Operations website.

Note: *The FAA's Advanced Operations website may be viewed at: https://www.faa.gov/uas/advanced_operations/.*

(b) Advisory Circular 137-1, Certification Process for Agricultural Aircraft Operators, provides additional information on how to apply for an agricultural aircraft operator certificate issued under 14 CFR Part 137.

Reference: *AC 137-1, Certification Process for Agricultural Aircraft Operators.*

c. Hazardous Materials (HAZMAT):

1. A hazardous material also known as HAZMAT, or dangerous goods is any substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce. For example, lithium batteries, dry ice, and aerosol whipped cream are considered dangerous goods. These products may seem harmless, but when transported by air they can be very dangerous. Vibrations, static electricity, temperature and pressure variations can cause items to leak, generate toxic fumes, start a fire, or even explode if these products are not packaged and handled properly. More detailed information is located on the FAA's What are Dangerous Goods website.

Note: *The FAA's What are Dangerous Goods website may be viewed at: https://www.faa.gov/hazmat/what_is_hazmat/.*

2. The carriage/transportation of hazardous materials under 14 CFR Part 107, sUAS, is strictly prohibited at all times, and is not subject to waiver. In order to transport hazardous materials, UAS operators must follow the 14 CFR Part 135 certification regulatory path and must develop dangerous goods training programs and manuals as part of the 14 CFR Part 135 Air Carrier and Operator Certificates process, described on the FAA website and subparagraph 11-4-5a, and 14 CFR Part 135, Operating Requirements. A brief description of applicable regulations as they apply to UAS can be found on the FAA's UAS website.

Note: *The FAA's Unmanned Aircraft System (UAS) website may be viewed at: https://www.faa.gov/hazmat/air_carriers/operations/drones/.*

Reference: *14 CFR Part 107, Small Unmanned Aircraft Systems; 14 CFR Part 135, Operating Requirements: Commuter and on Demand Operations and Rules Governing Persons on Board Such Aircraft.*

11–4–6 Airspace Restrictions To Flight

a. General. The NAS extends from the ground to above 60,000 feet MSL and includes various classifications of airspace, both uncontrolled and controlled. sUAS remote pilots and recreational flyers are generally permitted access to uncontrolled airspace without special permission. However, this changes when access to controlled airspace is desired. All access to controlled airspace whether by manned or unmanned aircraft must be granted by ATC.

Note 1: *While the NAS is divided into controlled and uncontrolled airspace, users must remember that all airspace is regulated, and certain rules apply throughout the NAS.*

Note 2: *Recreational flyers are limited to 400 feet AGL in Class G airspace, without special authorization.*

b. Controlled airspace is a generic term that covers the different classification of airspace (Class A, Class B, Class C, Class D, and Class E airspace) and defined dimensions within which air traffic control services can be provided to Instrument Flight Rules (IFR) flights and to Visual Flight Rules (VFR) flights, in accordance with the airspace classification.

c. Special Use Airspace (SUA). SUA consists of that airspace wherein flight activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both. These areas are generally depicted on aeronautical charts and will be indicated on the B4UFly and LAANC applications for UAS.

d. Temporary Flight Restrictions:

1. Temporary Flight Restrictions (TFRs) are non-permanent airspace restrictions created to protect persons and property in the air or on the surface from an existing or imminent hazard associated with an incident on the surface, when the presence of low flying aircraft would magnify, alter, spread, or compound that hazard (14 CFR Section 91.137(a)(1)). TFRs can exist to protect aircraft from hazards, and also to protect people/objects on the ground from aircraft hazards. Examples of TFRs include natural disaster areas especially forest fires, floods, congested flight areas, the area around spacecraft launches and recoveries, certain stadium sporting events, and the security of national public figures.

2. UAS operators should be aware that substantial fines and penalties can be levied on UAS remote pilots or recreational flyers violating a TFR.

e. Special Restrictions over Critical Infrastructure:

1. Operating a UAS over our nation's critical infrastructure such as power grids, nuclear reactors, transportation centers, political or military sites, etc., can potentially create risk to people on the ground and also to fixed site facilities and associated infrastructure. To address security concerns, Public Law 114–190 and 115–254 mandated a process that would allow applicants to petition the FAA for restrictions from unmanned aircraft overflying their property.

2. Special Security Instructions under 14 CFR Section 99.7 of the public laws allow the FAA to prohibit the operation of aircraft in certain airspace, in the interest of national security. The 14 CFR Section 99.7 interim solution prohibits UAS over approved fixed site facilities and limits the fixed site facilities to Federal owned sites UAS operations may be approved under the SGI process.

3. UAS remote pilots and recreational flyers must carefully consider the need to fly over critical infrastructure and determine the legality of doing so, infractions may result in significant fines and legal actions.

Note: *For a list of critical infrastructure sites, see https://www.cisa.gov/critical-infrastructure-sectors.*

Reference: *Public Law 114–190, FAA Extension, Safety, and Security Act of 2016; Public Law 115–254, FAA Reauthorization Act of 2018; 14 CFR Section 99.7, Special Security Instructions.*

f. Special Flight Rules Area (SFRA). SFRAs are airspaces of defined dimensions, above land areas or territorial waters, within which the flight of aircraft is subject to special rules, established after the September 11, 2001, attacks. Examples include the Washington, DC, Los Angeles, and Hudson River SFRAs. All aircraft are highly regulated within SFRAs. The inner area of some SFRAs, the Flight Restricted Zone (FRZ) is very highly restricted and prohibits all but previously vetted aircrew and aircraft from entering. Refer to VFR Sectional Charts or the FAA's Restricted Airspace website for information on specific airspace limitations and instructions for requesting entry.

Note: *The FAA's Restricted Airspace website may be viewed at: https://www.faa.gov/newsroom/restricted-airspace-0.*

g. There can be certain local restrictions to airspace. While the FAA is designated by federal law to be the regulator of the NAS, some state and local authorities may also restrict access to local airspace. UAS pilots should be aware of these local rules.

h. Other Restrictions & Provisions:

1. Flight over or near natural habitat or nature preserves. See paragraph 11-8-6, Environmental Best Practices, for a discussion of UAS flight restrictions over or near wildlife.

2. No Drone Zones is an FAA concept and outreach to promote safe and responsible use of UAS. The effort assists landowners (private and public) with designating their land off-limits for UAS take-offs and landings. The idea behind the outreach is to allow landowners who wish to avoid interactions on their property with UAS to state this preference in advance of UAS take-offs or landings. No Drone Zones do not apply to airspace. Generally speaking, for a No Drone Zone in a public place to be legally enforceable, there must exist underlying authority (ordinance, law, etc.). If the property in question is privately owned, the landowner's right to designate no UAS use is enforceable through trespass law.

3. Flight over or near people and manned aircraft. In general, UAS remote pilots and recreational flyers should avoid flying over or near people or manned aircraft operations, and in any manner that could be construed as reckless or dangerous. See paragraph 11-8-3, Precautions: Flight Over or Near People, Manned Aircraft, and Night Flight, for specific information on flight over or near people.

4. Correctional Institutions. Flight over some federal prisons is restricted under 14 CFR Section 99.7, Special Security Instructions. Flight near other correctional institutions may be prohibited by other federal, state or local statutes. Subparagraph 11-4-6e, Special Restrictions over Critical Infrastructure, contains additional information regarding restrictions over critical infrastructure.

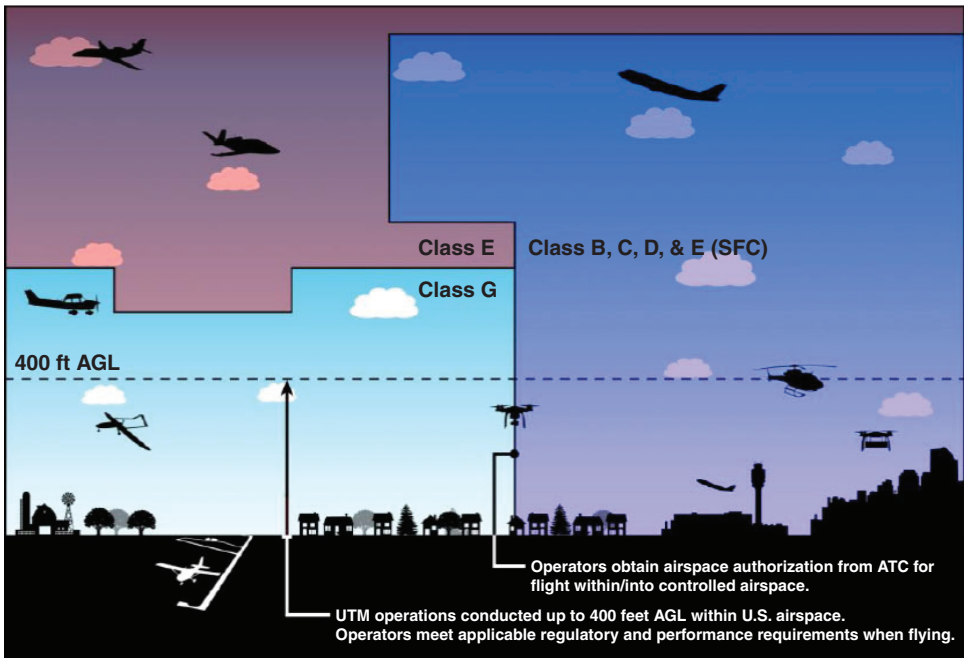
Reference: *14 CFR Section 99.7, Special Security Instructions.*

11–4–7 UAS Traffic Management (UTM)

a. UTM Operations. UTM is predicated on layers of information sharing and data exchange amongst a range of stakeholders including UAS operators, service providers, and the FAA to achieve safe operations. Operators share their flight intent with each other and coordinate to de-conflict and safely separate trajectories. The primary means of communication and coordination between operators, the FAA, and other stakeholders is through a distributed information network, rather than between pilots and air traffic controllers via traditional voice communications. The FAA makes real-time airspace constraints available to UAS operators, who are responsible for managing their own operations safely within these constraints without receiving ATC services from the FAA. However, the FAA does have access to applicable UTM operational information as necessary.

b. UAS operators not receiving ATC separation services are required to participate in UTM at some level using applicable services to meet the performance requirements of their operations. See Figure 11-4-2 for UTM in the context of Air Traffic Management operations. The number and type of services required varies based on the type and location of the intended operation and the associated communication, navigation, surveillance (CNS), and other operational needs.

FIGURE 11–4–2
UTM Operations in Context of Airspace Classes



c. Stakeholders in UTM:

1. FAA, the federal authority over aircraft operations in all airspace, and the regulator and oversight authority for civil aircraft operations in the NAS.

2. Operator, the person or entity responsible for the overall management of their operation. The operator meets regulatory responsibilities, plans flight/operations, shares operation intent information, and safely conducts operations using all available information.

3. Remote pilot-in-command (RPIC), the person responsible for the safe conduct of each UAS flight. An individual may serve as both the operator and the RPIC.

4. Other stakeholders (e.g., public safety and general public), can access information and/or utilize UTM services via the USS Network.

Section 5 UAS Pilot Testing, Certification and Responsibilities

11–5–1 UAS Pilot Certification and Requirements for Part 107 and Recreational Flyers

a. General:

1. Part 107 Operations. Any person who operates a civil sUAS in the NAS, for any operation that is not for recreational/pleasure purposes, must have a UAS pilot's certificate (also called the "Part 107 Certificate") with a Small Unmanned Aircraft System Rating.

2. Recreational Flyer Operations. A person who is flying a UAS for recreational/pleasure purposes in the NAS must have taken and passed TRUST, as required by 14 USC 44809.

b. Eligibility for Testing:

1. Part 107 operations. Applicants must be at least 16 years of age and be able to speak and understand English. For further information on Part 107 testing see the FAA's website, Become a Drone Pilot.

2. Recreational Flyer Operations. There are no minimum age or other eligibility requirements for a recreational UAS pilot to take TRUST.

c. Initial Testing for Certification:

1. Part 107 Operations:

(a) Current 14 CFR Part 61 certificate holder (Online Training). A person who holds a Part 61 manned pilot certificate (other than a Student pilot certificate), and who has a current flight review, as per 14 CFR Section 61.56, may complete Online Training that is offered by the FAA to obtain their 14 CFR Part 107, in lieu of taking the Initial Knowledge Test. However, a Part 61 certificate holder may also take the sUAS Initial Aeronautical Knowledge Test for certification.

(b) Non 14 CFR Part 61 certificate holder, or 14 CFR Part 61 certificate holder lacking currency (Initial Aeronautical Knowledge Test). A person who does not hold a 14 CFR Part 61 manned pilot certificate and/or they do not have a current flight review must take the Initial Aeronautical Knowledge Test at an FAA designated Knowledge Testing Center to obtain their sUAS Certificate.

2. Recreational Flyer Operations. Any person who flies a UAS for recreational use under 49 USC 44809 must take and pass TRUST. See the FAA website, The Recreational UAS Safety Test (TRUST).

Note: *A current 14 CFR Part 107 sUAS certificate holder may fly recreationally under that part, but must adhere entirely to 14 CFR Part 107 rules and requirements. If a Part 107 sUAS certificate holder wishes to fly under 49 USC 44809, they must take and pass TRUST.*

Note: *The FAA's website, The Recreational UAS Safety Test (TRUST), may be viewed at: https://www.faa.gov/uas/recreational_flyers/knowledge_test_updates.*

d. Recurrent Training (Testing) Requirements:

1. Part 107 operations:

(a) To exercise the privileges of a sUAS certificate that was issued under 14 CFR Part 107, a person must maintain currency. Therefore, the FAA requires that a person take a recurrent course within 24 months from the month the Initial Aeronautical Knowledge Test was passed, or the Online Training was completed.

(b) Recurrent training (online training) is found at the FAA's Become a Drone Pilot website.

Note: *The FAA's Become a Drone Pilot website may be viewed at: https://www.faa.gov/uas/commercial_operators/become_a_drone_pilot/.*

2. Recreational Operations. TRUST is taken on a once-and-done basis; no recurrent testing is required.

e. Pre-test Training Requirements:

1. Part 107 Operations:

(a) No documented pre-test training is required under Part 107 to take the Initial Aeronautical Knowledge Test. However, the FAA Remote Pilot Small Unmanned Aircraft Systems Study Guide is an excellent resource.

Note: *To view the FAA Remote Pilot—Small Unmanned Aircraft Systems Study Guide see: https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/remote_pilot_study_guide.pdf.*

(b) Initial Aeronautical Knowledge Test subject areas. The testing topics for the sUAS Knowledge Test can be found in 14 CFR Section 107.73, Knowledge and Training.

Reference: *14 CFR Section 107.73, Knowledge and Training.*

(c) Part 107 online training. This online training may be used by those who hold a 14 CFR Part 61 pilot certificate (not including a student pilot certificate) seeking 14 CFR Part 107 remote pilot certification. A person who holds a 14 CFR Part 61 pilot certificate must also show, at the time of certification, a current Flight Review as per 14 CFR Section 61.56.

2. Recreational Flyer Operations. No pre-test training is necessary to complete TRUST.

f. Endorsements and re-testing. Neither the Part 107 Initial Aeronautical Knowledge Test nor the Recreational TRUST have any requirements for flight instructor endorsements prior to testing. A person who fails the Initial Aeronautical Knowledge Test must wait 14 calendar days before they may retake the test. TRUST may be retaken at any time.

g. Registering to take the Part 107 sUAS Initial Aeronautical Knowledge Test:

1. Before a person can take the sUAS Initial Aeronautical Knowledge Test at an FAA recognized testing center, that person must obtain an FAA Tracking Number (FTN). To obtain an FTN a person must create an account in the Integrated Airman Certification and Rating Application (IACRA) system. For detailed instructions on how to obtain an FTN, see the FAA Airman Certificate Testing Service (ACTS) Contract Briefing.

Note: *Any person who has any FAA Airman Certificate will already have an FTN.*

Note: *The FAA's Airman Certificate Testing Service (ACTS) Contract Briefing, may be viewed at: https://www.youtube.com/watch?v=ETLsH8BruBM.*

2. Once an applicant has their FTN, they will go to the testing vendor's website and register for the test. The FAA testing vendor is PSI Services LLC.

Note: *The PSI Services LLC website may be viewed at: https://candidate.psiexams.com/.*

h. Applying for a 14 CFR Part 107 sUAS Certificate. The Become a Drone Pilot website has instructions on how to obtain the 14 CFR Part 107 Pilot Certificate, following testing or online training completion.

Note: *The Become a Drone Pilot website may be viewed at: https://www.faa.gov/uas/commercial_operators/become_a_drone_pilot/.*

i. Registering to take the Part 107 sUAS Initial Aeronautical Knowledge Test:

1. A person who holds a sUAS Certificate is afforded all of the privileges of the certificate. This includes the ability to operate at night and over people without a waiver, under certain conditions. See paragraph 11-8-3, Precautions: Flight Over or Near People, Vehicles, Manned Aircraft, and Night Flight, for further information on these operations.

2. Any remote pilot who holds a 14 CFR Part 107 sUAS certificate issued prior to April 6, 2021, must take the updated recurrent training (the online training) to operate at night or over people.

11–5–2 Pilot Certification and Requirements for Public Aircraft Operations (PAOs)

a. When operating as a PAO, the operator is required to train and the agency will self-certify pilots as competent to safely operate in the NAS.

b. For more information and best practices on pilot certification and training within the framework of a PAO, refer to AC 00-1.1, Public Aircraft Operations—Manned and Unmanned.

Reference: *AC 00-1.1, Public Aircraft Operations—Manned and Unmanned.*

11–5–3 Pilot Certification for 14 CFR Part 135, Part 137, and Large Civil UAS

a. Currently, FAA regulations require a commercial pilot certificate for 14 CFR Part 135 Remote PICs.

b. Pilot certification for 14 CFR Part 137. For civil UAS agricultural aircraft operations, the 14 CFR Section 137.19(b) and (c) requirement (that the pilot hold a private or commercial pilot certificate) is exempted; only a 14 CFR Part 107 pilot certificate is required. This policy pertains to all UAS regardless of weight. However, all civil pilots conducting agricultural aircraft operations must satisfactorily pass the knowledge and skill test of 14 CFR Section 137.19(e) and 14 CFR Section 137.41(b) or (c).

c. Pilot certification for other large civil UAS. Requirements for future large civil UAS operations will be addressed in future rulemaking.

11–5–4 Foreign Pilot Certification

a. Part 107 Operations:

1. Foreign national holding a U.S. issued 14 CFR Part 61 certificate. Foreign nationals are eligible for a sUAS certificate in the same way that a U.S. citizen is eligible.

2. Foreign national not holding a U.S. issued 14 CFR Part 61 certificate. A foreign national who does not hold a U.S.-issued 14 CFR Part 61 certificate, must take and pass the Initial Aeronautical Knowledge Test to obtain a sUAS Pilot Certificate in order to operate in the NAS.

b. Recreational Flyer Operations. A foreign national is required to have passed TRUST to fly a UAS recreationally under 49 USC 44809 in the United States.

c. Security vetting. All applicants, regardless of nationality, must pass a Transportation Security Administration (TSA) Security Threat Analysis (STA) before the FAA will issue a temporary or permanent Pilot's Certificate under Part 107.

d. Bi-lateral agreements. Currently, the United States does not have any bi-lateral agreements with any other countries that would allow the issuance of a U.S. sUAS certificate that is based on a foreign UAS Pilot's Certificate.

Section 6 Advanced Air Mobility

11–6–1 General

a. Advanced Air Mobility (AAM) is a rapidly-emerging, new sector of the aerospace industry which aims to safely and efficiently integrate highly automated aircraft into the NAS. AAM is not a single technology, but rather a collection of new and emerging technologies being applied to the aviation transportation system, particularly in new aircraft types. Notional AAM use-cases include Urban Air Mobility (UAM), Regional Air Mobility (RAM), public services, large cargo delivery, and private or recreational vehicles.

b. UAM and RAM are subsets of AAM activities occurring in urban environments.

Section 7 UAS Operations on Airports

11–7–1 UAS Operations on Airports

a. Larger public and civil UAS operate from military, civilian and dual-use airports with set protocols and agreements with local ATC, often operate under IFR.

b. sUAS operations on airports require coordination with the airport operator and respective air traffic control facility, Spectrum, the FAA Regional Airport District Office, or the State Department of Aviation, where applicable. Due to the complex nature of these operations, requests for on-airport operations within controlled airspace must be submitted via DroneZone for coordination with the air traffic control facility. On-airport operation requests are evaluated on a case-by-case basis due to the inherent risks associated with operating in close proximity to areas frequented by manned aircraft.

Note: *The FAA's DroneZone website may be viewed at: https://faadronezone.faa.gov/#/.*

Section 8 Other Information and Best Practices

11–8–1 Best Practices for UAS Operations

Responsibility of the UAS pilot. Just as is the case with a manned aircraft, the UAS remote pilot or recreational flyer is responsible for the safe operation of their unmanned aircraft. The remote pilot or recreational flyer must ensure that they are physically ready to fly and knowledgeable of the flight to be performed to include operational parameters, UAS limitations, local weather, and applicable flight rules; that the UAS itself is mechanically ready.

11–8–2 UAS Operations and Air Traffic Control (ATC)

Coordination and/or communication of airspace authorizations, between UAS pilots or operators and ATC, are handled within the airspace access processes (e.g., LAANC, DroneZone, CAPS). They are not coordinated extemporaneously and verbally between the UAS operator and ATC. Any requirements for coordination and/

or communication between UAS operator and ATC will be contained in individual COAs, which may include operational waivers, development of LOAs, and through other application processes which allow access to controlled airspace. Any air traffic services provided to sUAS operations shall be based upon the type of airspace authorization issued, along with the mitigations and limitations included in that authorization.

Note 1: *Small UAS operators should not contact ATC directly by radio or telephone for purposes of airspace access. Also, the use of an aviation radio frequency by the RPIC of a sUAS may constitute a violation of Federal Communications Commission rules. Remote pilots of larger UAS—which are usually under positive control by ATC and flying under Instrument Flight Rules—are an exception to this guideline.*

Note 2: *Small UAS operators are encouraged to monitor local CTAF radio traffic when operating on or near an airport, for situational awareness.*

11–8–3 Precautions: Flight Over or Near People, Vehicles, Manned Aircraft, and Night Operations

a. Flight over or near people and vehicles:

1. Remote pilots and recreational flyers should carefully consider the hazards of flight operations over or near people. 14 CFR Part 107, subpart D, Operations Over Human Beings, allows certain Operations Over People (OOP) and vehicles, based upon four different operational categories of UA weight and construction, and the likely severity of injury to people on the ground, in the case of contact. Part 107 operators may request a waiver to these restrictions.

2. Part 91 remote pilots may refer to restrictions and permissions, regarding flight over people, in their respective COAs.

3. Recreational flyers should consider the safety of other persons when flying. 49 USC 44809(a)(2), Exception for Limited Recreational Operations of Unmanned Aircraft, requires recreational flyers to operate in accordance with the safety guidelines of an accepted CBO; these guidelines will usually include safety precautions for flight near people.

4. For further information on the rules for flying over people or vehicles, see paragraph 11-4-6, Airspace Restrictions to Flight.

Reference: *14 CFR Part 107, Subpart D, Operations Over Human Beings; 49 USC 44809(a)(2), Exception for Limited Recreational Operations of Unmanned Aircraft.*

b. Flight in the Vicinity of Manned Aircraft:

1. The pilot of any unmanned aircraft operation retains the ultimate responsibility to avoid manned aircraft traffic. UAS operators should remember that manned aircraft may fly below 400 feet AGL; examples include helicopters, agricultural aircraft, light civil aircraft, and military aircraft. UAS pilots must ensure they have unblocked visual access to both their UAS and the airspace around it; not seeing a manned aircraft due to blocked line of sight does not absolve the UAS pilot from responsibility for avoidance.

2. Should public safety or emergency responder aircraft (e.g., police, fire suppression, helicopter emergency medical services) operations be interfered with by UAS, substantial fines can be levied on the UAS operators involved. Enforcement actions can include revocation or suspension of a pilot certificate, and up to a $20,000 civil penalty per violation.

c. Night Operations.

1. Night operations are permitted under 14 CFR Parts 91, 14 CFR Part 107, and Section 44809. However, requirements for meteorological visibility, and for the operator or visual observer (VO) to maintain VLOS with the UAS at all times, should be considered; see subparagraph 11-5-1i.

2. 14 CFR Section 107.29, Operation at Night, requirements include initial pilot training and equipment such as an anti-collision light which is visible for at least three statute miles, with a flash rate sufficient to avoid a collision.

3. Part 91 operators civil and PAO should refer to their specific COAs for any further instructions or limitations on night flight.

Reference: *14 CFR Section 107.29, Operation at Night.*

11–8–4 Accidents and Incidents: UAS Operator Responsibilities

a. Reporting responsibility. A drone crash or malfunction, irrespective of which flight rules govern the flight, may trigger a reporting requirement to either the FAA, the NTSB, or both. The NTSB reporting requirements listed in 49 CFR 830.5, Immediate Notification, are separate and distinct from the FAA reporting requirements. All UAS flyers operating in the NAS recreational, civil, and public are encouraged to read and follow NTSB reporting requirements should they experience a crash or malfunction that meets NTSB criteria and triggers NTSB reporting. See NTSB Reporting Requirements and subparagraph 11-8-4b. COAs issued to Part 91 civil and public operators will contain specific incident/accident reporting requirements for the operator.

1. Part 107 Operations. Part 107 operators have a reporting requirement described in 14 CFR Section 107.9, Accident Reporting. A remote pilot-in-command is required to report any sUAS crash that causes serious injury or loss of consciousness, or property damage other than to the UAS of over $500. Property damage refers to any property that is not part of the UA System or attached to the UAS.

2. Recreational Flyer Operations. Recreational flyers fully complying with the exception listed in 49 USC 44809 are not required to report crashes to the FAA. However, this does not alleviate the recreational flyer from the requirement to report the crash to the NTSB if the crash meets the NTSB reporting requirements.

3. Part 91 Operations. Part 91 operators typically flown by public aircraft operators, civil aircraft operators, or civil operators flying FAA type certificated UAS have unique reporting requirements delineated in the terms and conditions of their certificate of waiver/authorization and must comply with those specific requirements.

b. NTSB Reporting Requirements. The NTSB defines a UAS accident as an occurrence associated with the operations of any public or civil UAS that takes place between the time that the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its mission, in which any person suffers death or serious injury, or the UAS holds an airworthiness certificate and sustains substantial damage. In the case of a midair collision involving a UAS, any midair collision must be reported.

Reference: *14 CFR Section 830.5, Immediate Notification; 14 CFR Section 107.9, Accident Reporting.*

11–8–5 Emergency UAS Authorizations Through Special Government Interest (SGI) Airspace Waivers

a. Background. UAS are used by public safety agencies to respond to emergencies. The SGI process is for any Part 107 or Part 91 operator that either due to time limitations, airspace restrictions or emergency situations that requires expedited authorization by contacting the system operations support center (SOSC) at 9-ATOR-HQ-SOSC@faa.gov.

b. The SGI process, depending on the nature of the operation, can be completed in a matter of minutes. This process enables response to an emergency with UAS in an expeditious manner.

c. Public Safety organizations may apply for expedited airspace authorizations through the SGI process. The SGI process is defined in FAA Order JO 7210.3, Facility Operation and Administration.

Reference: *FAA Order JO 7210.3, Facility Operation and Administration.*

d. Additional information regarding SGI authorizations can be located at the FAA's Emergency Situations webpage.

Note: *The FAA's Emergency Situations website may be reviewed at: https://www.faa.gov/uas/advanced_operations/emergency_situations/.*

11–8–6 Environmental Best Practices

a. Unmanned aircraft operate in a similar environment to manned aircraft. Since most UAS operations are conducted at low altitude, hazards, risks and potential environment factors may be encountered on a more frequent basis. In addition to the Bird Hazards, Flight over National Refuges, Parks, and Forests, the following factors must also be considered:

1. Flight Near Protected Conservation Areas. UAS, if misused, can have devastating impacts on protected wildlife. UAS operators may check for conservation area airspace restrictions on the B4UFLY mobile app.

2. Flight(s) Near Noise Sensitive Areas. Consider the following:

(a) UAS operations and flight paths should be planned to avoid prolonged or repetitive flight at low altitude near noise sensitive areas.

(b) As described in FAA Order JO 1050.1, Environmental Impact: Policies and Procedures, an area is "noise sensitive" if noise interferes with any normal activities associated with the area's use.

Reference: *FAA Order JO 1050.1, Environmental Impact: Policies and Procedures.*

(c) To the extent consistent with FAA safety requirements, operators should observe best practices developed by the National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and National Oceanic and Atmospheric Administration when operating above areas administered by those agencies. The National Park Service provides additional guidance at their Unmanned Aircraft Systems website.

Note: *The National Park Service, Unmanned Aircraft Systems website may be viewed at: https://www.nps.gov/subjects/sound/uas.htm.*

b. Some bird species have shown the potential to attack UAS that approach their nesting and hunting areas too closely. The type of birds that are most likely to attack sUAS are raptors such as hawks, eagles, and falcons. However, gulls, geese, and crows have also been known to attack UAS. Aggressive bird attacks may damage UAS propellers or other critical equipment, and may result in sudden loss of power or engine failure. Remote pilots and recreational flyers should consider reviewing engine-out procedures, especially when operating near high bird concentrations.

11–8–7 Resources for UAS Operators

a. FAA.GOV/UAS. The FAA UAS website, www.faa.gov/uas, is the central point for information about FAA UAS rules, regulations, and safety best practices.

b. FAA DroneZone. The FAA DroneZone is the Agency's portal for registering drones, requesting Part 107 airspace authorizations and waivers, registering as a CBO, requesting fixed flying sites, and other tasks.

c. Local FAA offices (Flight Standards District Offices/FSDOs). FSDOs can be the best in-person source for UAS information. A list of FSDOs in the United States is at https://www.faa.gov/about/office_org/field_offices/fsdo/all_fsdos/.

d. Aeronautical Information. The FAA provides aeronautical information to NAS users, including UAS pilots, through a variety of methods, including publications like this manual, other publications, Advisory Circulars (ACs), charts, website and mobile applications, etc. Check https://www.faa.gov/air_traffic/flight_info/aeronav/ for these items.

e. The UAS Support Center. For general question or comment about UAS or drones, the FAA's Support Center is available at 844-FLY-MY-UA or UASHelp@faa.gov.

f. Clubs and Associations. Local UAS recreational clubs, CBO organizations, and business associations are excellent resources for information and updates on flying in the local region.

g. LAANC. LAANC is the Low Altitude Authorization and Notification Capability, a collaboration between FAA and industry. It automates the application and approval process for airspace authorizations. Using applications developed by an FAA-approved UAS service supplier (USS) you can apply for an airspace authorization at over 600 airports. Download the free LAANC app at https://www.faa.gov/uas/programs_partnerships/data_exchange/.

h. B4UFLY. The B4UFLY mobile application is a partnership between the FAA and Kittyhawk. The app helps recreational flyers know whether it is safe to fly their drone, as well as increases their situational awareness. Download the free B4UFLY app at https://www.faa.gov/uas/recreational_fliers/where_can_i_fly/b4ufly/.

i. Weather Sources. Aviation weather services (such as https://www.aviationweather.gov/) are generally targeted towards manned aviation, the FAA is currently working on UAS-specific weather applications.

j. NOTAMs. The Notice to Air Missions (NOTAM) system, like aviation weather sources, remains primarily predicated on manned aviation needs. However, the system provides continual updates on all aviation activity (to include UAS flight activities which have been input to the FAA), as well as airport status. The NOTAM system will be of greatest use to larger UAS activities, UAS en route operations in controlled airspace, and those flying to or from airports. NOTAMs, temporary flight restrictions (TFRs), and aircraft safety alerts can be accessed at https://www.faa.gov/pilots/safety/notams_tfr/.

Appendix 3: Abbreviations/ Acronyms

* * * * *

AAM	Advanced Air Mobility

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ATO	Air Traffic Organization

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BVLOS	Beyond Visual Line of Sight

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CBO	Community-Based Organization

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FRIA	FAA-Recognized Identification Area

* * * * *

HAZMAT	Hazardous Material

* * * * *

LAANC	Low Altitude Authorization and Notification Capability

* * * * *

MGOW	Maximum Gross Operating Weight

* * * * *

OOP	Operations Over People

* * * * *

PAO	Public Aircraft Operation

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PIC	Pilot-in-Command

* * * * *

RC	Radio-Controlled

* * * * *

RID	Remote Identification
RPIC	Remote Pilot-in-Command

* * * * *

SAA	Sense and Avoid

* * * * *

SGI	Special Government Interest

* * * * *

sUAS	Small UAS

* * * * *

TRUST	The Recreational UAS Safety Test

* * * * *

UAM	Urban Air Mobility

* * * * *

UASFM	UAS Facility Map

* * * * *

UTM	UAS Traffic Management

* * * * *

VLOS	Visual Line of Sight

* * * * *

VO	Visual Observer

* * * * *

Appendix 4: FAA Form 7233-4—International Flight Plan

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d. * * *

4. * * *

(b) * * *

TABLE 4–4

ITEM 18 NAV/, COM/, DAT/, AND SUR/ CAPABILITIES USED BY FAA

Item	Purpose	Entry	Explanation
NAV/ entries used by FAA	Radius to Fix (RF) capability	Z1	RNP-capable flight is authorized for Radius to Fix operations.
	Fixed Radius Transitions (FRT)	Z2	RNP-capable flight is authorized for Fixed Radius Transitions.
	Time of Arrival Control (TOAC)	Z5	RNP-capable flight is authorized for Time of Arrival Control.
	Advanced RNP (A-RNP)	P1	Flight is authorized for A-RNP operations.
	Helicopter RNP 0.3	R1	Flight is authorized for RNP 0.3 operations (pertains to helicopters only).
	RNP 2 Continental	M1	Flight is authorized for RNP 2 continental operations.
	RNP 2 Oceanic/ Remote	M2	Flight is authorized for RNP 2 oceanic/remote operations.
COM/ entries used by FAA	N/A	N/A	The FAA currently does not use any entries in COM/.
DAT/ entries used by FAA	Capability and preference for delivery of pre-departure clearance	Priority number followed by: • FANS • FANSP • PDC • VOICE	Entries are combined with a priority number, for example; 1FANS2PDC means a preference for departure clearance delivered via FANS 1/A; with capability to also receive the clearance via ACARS PDC. FANS = FANS 1/A DCL FANSP = FANS 1/A+ DCL PDC = ACARS PDC VOICE = PDC via voice (no automated delivery)
SUR/ entries used by FAA	Req. Surveillance Performance	RSP180	Aircraft is authorized for Required Surveillance Performance RSP180
		RSP400	Aircraft is authorized for Required Surveillance Performance RSP400
	ADS-B	260B	Aircraft has 1090 MHz Extended Squitter ADS-B compliant with RTCA DO-260B (complies with FAA requirements)
		282B	Aircraft has 978 MHz UAT ADS-B compliant with RTCA DO-282B (complies with FAA requirements)

Note 1: *Other entries in NAV/, COM/, DAT/, and SUR/ are permitted for international flights when instructed by other service providers. Direction on use of these capabilities by the FAA is detailed in the following sections.*

Note 2: *In NAV/, descriptors for advanced capabilities (Z1, P1, R1, M1, and M2) should be entered as a single character string with no intervening spaces, and separated from any other entries in NAV/ by a space.*

Example: *NAV/Z1P1M2 SBAS*

* * * * *

6. * * *

TABLE 4–13
FILING FOR PERFORMANCE BASED NAVIGATION (PBN) ROUTES

Type of Routing	Capability Required	Item 10a	Item 18 PBN/See NOTE 2	Item 18 NAV/See NOTE 3	Notes
RNAV SID or STAR (See NOTE 1)	RNAV 1	GR	D2		If GNSS
		DIR	D4		If DME/DME/IRU
RNP SID or STAR (See NOTE 2)	RNP 1 GNSS	GR	O2		If GNSS only
	RNP 1 GNSS	DGIR	O1		If GNSS primary and DME/DME/IRU backup
RNP SID or STAR with RF required (See NOTE 2)	RNP 1 GNSS	GRZ	O2	Z1	If GNSS only
	RNP 1 GNSS	DGIRZ	O1	Z1	If GNSS primary and DME/DME/IRU backup
Domestic Q-Route (see separate requirements for Gulf of Mexico Q-Routes)	RNAV 2	GR	C2		If GNSS
		DIR	C4		If DME/DME/IRU
T–Route	RNAV 2	GR	C2		GNSS is required for T-Routes
RNAV (GPS) Approach	RNP Approach, GPS	GR	S1		*Domestic arrivals do not need to file PBN approach capabilities to request the approach.*
RNAV (GPS) Approach	RNP Approach, GPS Baro–VNAV	GR	S2		
RNAV (GPS) Approach with RF required	RNP Approach, GPS RF Capability	GRZ	S2	Z1	
RNP AR Approach with RF	RNP (Special Authorization Required) RF Leg Capability	GR	T1		
RNP AR Approach without RF	RNP (Special Authorization Required)	GR	T2		

Note 1: *If the flight is requesting an RNAV SID only (no RNAV STAR) or RNAV STAR only (no RNAV SID) then consult guidance on the FAA website at https://www.faa.gov/about /office_org/headquarters_offices/ato/service_units/air_traffic_services/flight_plan_filing.*

Note 2: *PBN descriptor D1 includes the capabilities of D2, D3, and D4. PBN descriptor B1 includes the capabilities of B2, B3, B4, and B5. PBN descriptor C1 includes the capabilities of C2, C3, and C4.*

Note 3: *In NAV/, descriptors for advanced capabilities (Z1, P1, R1, M1, and M2) should be entered as a single character string with no intervening spaces, and separated from any other entries in NAV/ by a space.*

Example: *NAV/Z1P1M2 SBAS*

* * * * *

9. Eligibility for Reduced Oceanic Separation. Indicate eligibility for the listed reduced separation minima as indicated in the tables below. Full Operational Requirements for these services are found in the U.S. Aeronautical Information Publication (AIP) ENR 7, Oceanic Operations, available at http://www.faa.gov/air_traffic /publications/atpubs/aip_html/index.html.

* * * * *

TABLE 4–17

FILING FOR REDUCED OCEANIC SEPARATION WHEN RSP/RCP REQUIRED ON MARCH 29, 2018

Dimension of Separation	Separation Minima	RSP Requirement	RCP Requirement	PBN Requirement	Flight Plan Entries				
					RSP in Item 18 SUR/	RCP in Item 10a	CDPLC in Item 10a	PBN in Item 18 PBN/ (also File "R" in Item 10a)	PBN in Item 18 NAV/
Lateral	55.5 km 30 NM	180	240	RNP 2 or RNP 4	RSP180	P2	J5, and/or J6, and/or J7	L1	
Performance-based Longitudinal	5 Minutes	180	240	RNAV 10 (RNP 10) RNP 4, or RNP 2 oceanic/ remote	RSP180	P2	J5, and/or J6, and/or J7	A1 or L1	M2
Performance-based Longitudinal	55.5 km 30 NM	180	240	RNP 4 or RNP 2 oceanic/ remote	RSP180	P2	J5, and/or J6, and/or J7	L1	M2
Performance-based Longitudinal	93 km 50 NM	180	240	RNAV 10 (RNP 10) or RNP 4	RSP180	P2	J5, and/or J6, and/or J7	A1 or L1	

Note 1: *Filing of RNP 2 alone is not supported in FAA controlled airspace; PBN/L1 (for RNP 4) or PBN/A1 (for RNP 10) must be filed to obtain the indicated separation.*

Note 2: *Use of "RNP 2" in NAV/ signifies continental RNP 2 (and means the same as M1). Continental RNP 2 is not adequate for reduced oceanic separation. Descriptor M2 indicates RNP 2 global/oceanic RNP 2 capability.*

* * * * *

e. * * *

2. * * *

(a) Provide the appropriate 2–4 character aircraft type designator listed in FAA Order JO 7360.1, Aircraft Type Designators. FAA Order JO 7360.1 may be located at: Orders & Notices (faa.gov), then enter 7360.1 in the Search box.

* * * * *

g. * * *

5. * * *

FIGURE 4–1

FAA Form 7233-4, Pre-Flight Pilot Checklist and International Flight Plan

PRIVACY ACT STATEMENT: This statement is provided pursuant to the Privacy Act of 1974, 5 USC § 552a: The authority for collecting this information is contained in 49 U.S.C. §§ 40113, 44702, 44703, 44709, and 14 C.F.R. Part 6 - [Part 61, 63, 65, or 67. The principal purpose for which the information is intended to be used is to allow you to submit your flight plan. Submission of the data is voluntary. Failure to provide all required information may result in you not being able to submit your flight plan. The information collected on this form will be included in a Privacy Act System of Records known as DOT/FAA 847, titled "Aviation Records on Individuals" and will be subject to the routine uses published in the System of Records Notice (SORN) for DOT/FAA 847 (see www.dot.gov/privacy/privacyactnotices).

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0026. Public reporting for this collection of information is estimated to be approximately 2.5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are required to obtain or retain a benefit per 14 CFR Part 91. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the FAA at: 800 Independence Ave. SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, ASP-110.

Pre-Flight Pilot Checklist

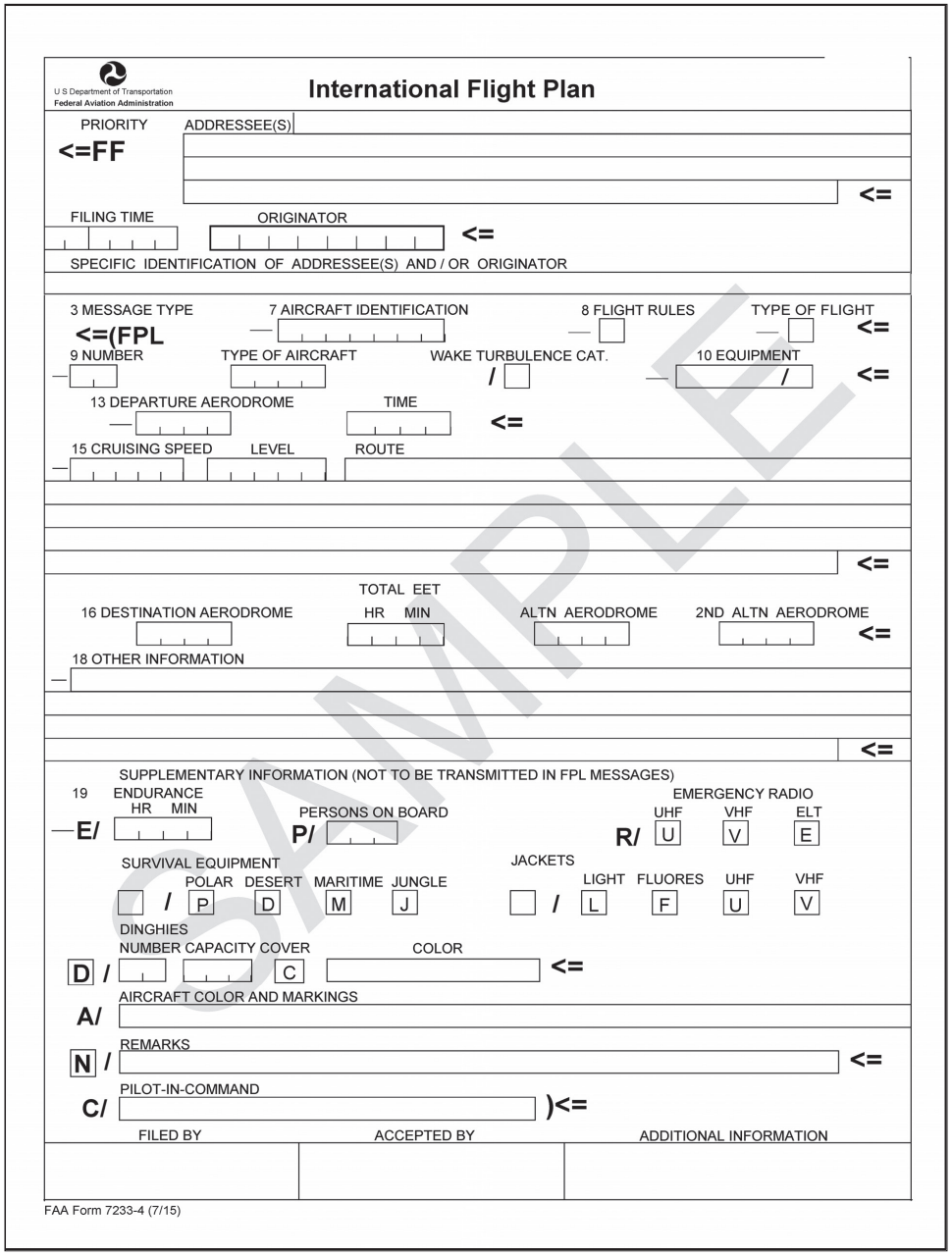
Aircraft Identification | Time of Briefing

			Remarks	Report Weather Conditions Aloft			
Weather (Destination) (Alternate)	☐	Present		*Report immediately weather conditions encountered—particularly cloud tops, upper cloud layers, thunderstorms, ice, turbulence, winds and temperature*			
	☐	Forecast		Position	Altitude	Time	Weather Conditions
Weather (En Route)	☐	Present					
	☐	Forecast					
	☐	Pireps					
Winds Aloft		Best Crzg. Alt.					
Nav. Aid & Comm. Status.	☐	Destination					
	☐	En Route					
Airport Conditions	☐	Destination					
	☐	Alternate					
ADIZ	☐	Airspace Restrictions					

Civil Aircraft Pilots

FAR Part 91 states that each person operating a civil aircraft of U S. registry over the high seas shall comply with Annex 2 to the Convention of International Civil Aviation, International Standards - Rules of the Air. Annex 2 requires the submission of a flight plan containing items 1-1 9 prior to operating any flight across international waters. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended).

International briefing information may not be current or complete. Data should be secured, at the first opportunity, from the country in whose airspace the flight will be conducted.



U S Department of Transportation
Federal Aviation Administration

International Flight Plan

PRIORITY
<=FF

ADDRESSEE(S)

<=

FILING TIME

ORIGINATOR

<=

SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND / OR ORIGINATOR

3 MESSAGE TYPE
<=(FPL

7 AIRCRAFT IDENTIFICATION

8 FLIGHT RULES

TYPE OF FLIGHT

<=

9 NUMBER

TYPE OF AIRCRAFT

WAKE TURBULENCE CAT.
/

10 EQUIPMENT
/

<=

13 DEPARTURE AERODROME

TIME

<=

15 CRUISING SPEED

LEVEL

ROUTE

<=

16 DESTINATION AERODROME

TOTAL EET
HR MIN

ALTN AERODROME

2ND ALTN AERODROME

<=

18 OTHER INFORMATION

<=

SUPPLEMENTARY INFORMATION (NOT TO BE TRANSMITTED IN FPL MESSAGES)

19 ENDURANCE
HR MIN
E/

PERSONS ON BOARD
P/

EMERGENCY RADIO
R/ UHF [U] VHF [V] ELT [E]

SURVIVAL EQUIPMENT
/ POLAR [P] DESERT [D] MARITIME [M] JUNGLE [J]

JACKETS
/ LIGHT [L] FLUORES [F] UHF [U] VHF [V]

DINGHIES
NUMBER CAPACITY COVER [C] COLOR
D /

<=

AIRCRAFT COLOR AND MARKINGS
A/

REMARKS
N /

<=

PILOT-IN-COMMAND
C/

)<=

FILED BY	ACCEPTED BY	ADDITIONAL INFORMATION

FAA Form 7233-4 (7/15)

Note: *Current FAA Form 7233-4 available at https://www.faa.gov/forms/.*

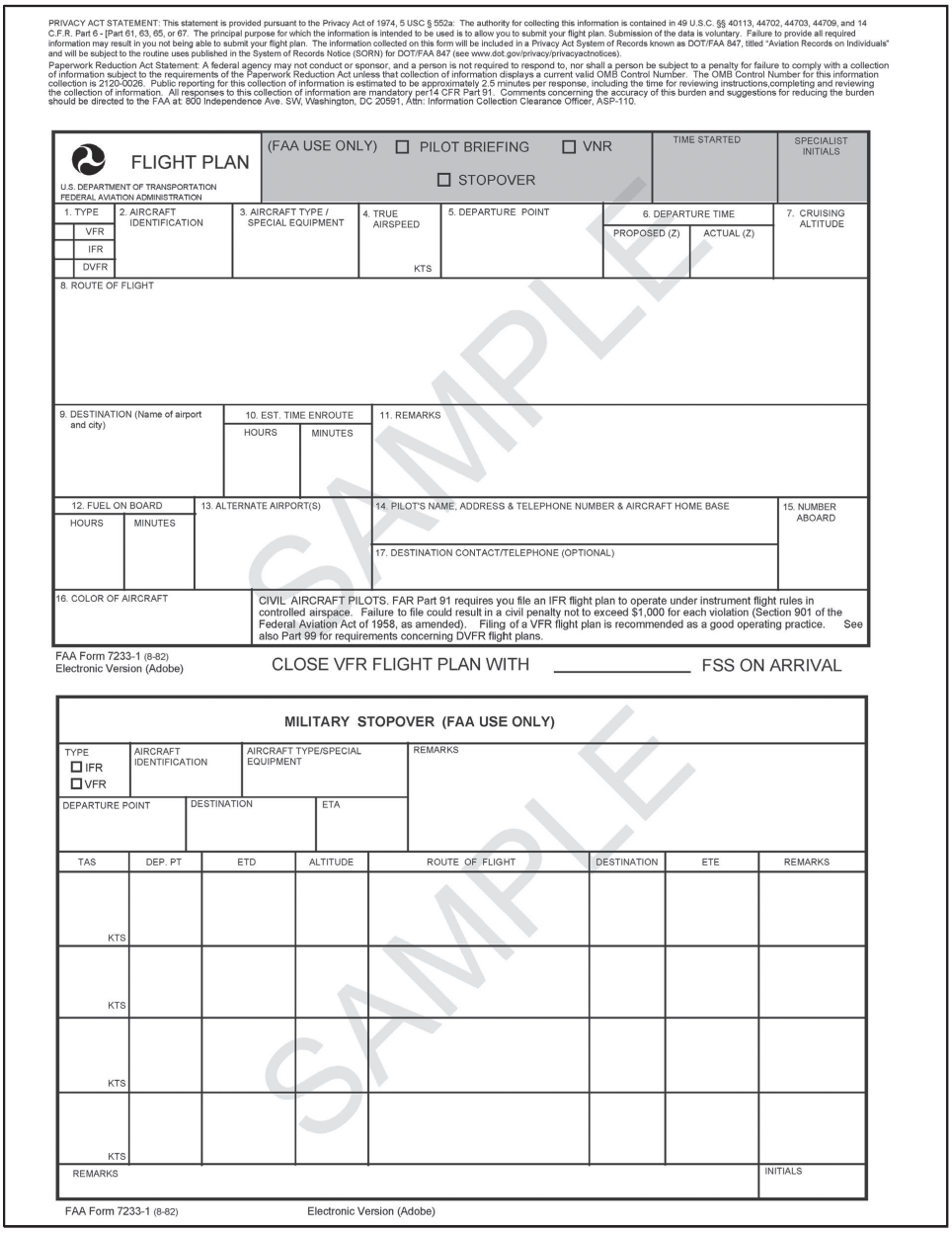
Appendix 5: Form 7233-1—Flight Plan

* * * * *

e. * * *

16. * * *

FIGURE 5–1
FAA Form 7233-1—Flight Plan
For Military/DoD, Civilian Stereo Route Flight Plan Use Only



PRIVACY ACT STATEMENT: This statement is provided pursuant to the Privacy Act of 1974, 5 USC § 552a: The authority for collecting this information is contained in 49 U.S.C. §§ 40113, 44702, 44703, 44709, and 14 C.F.R. Part 6 - [Part 61, 63, 65, or 67. The principal purpose for which the information is intended to be used is to allow you to submit your flight plan. Submission of the data is voluntary. Failure to provide all required information may result in you not being able to submit your flight plan. The information collected on this form will be included in a Privacy Act System of Records known as DOT/FAA 847, titled "Aviation Records on Individuals" and will be subject to the routine uses published in the System of Records Notice (SORN) for DOT/FAA 847 (see www.dot.gov/privacy/privacyactnotices).

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2120-0026. Public reporting for this collection of information is estimated to be approximately 2.5 minutes per response, including the time for reviewing instructions,completing and reviewing the collection of information. All responses to this collection of information are mandatory per14 CFR Part 91. Comments concerning the accuracy of this burden and suggestions for reducing the burden should be directed to the FAA at: 800 Independence Ave. SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, ASP-110.

FLIGHT PLAN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

(FAA USE ONLY) ☐ PILOT BRIEFING ☐ VNR ☐ STOPOVER

TIME STARTED | SPECIALIST INITIALS

1. TYPE	2. AIRCRAFT IDENTIFICATION	3. AIRCRAFT TYPE / SPECIAL EQUIPMENT	4. TRUE AIRSPEED	5. DEPARTURE POINT	6. DEPARTURE TIME		7. CRUISING ALTITUDE
☐ VFR ☐ IFR ☐ DVFR			KTS		PROPOSED (Z)	ACTUAL (Z)	

8. ROUTE OF FLIGHT

9. DESTINATION (Name of airport and city)	10. EST. TIME ENROUTE		11. REMARKS
	HOURS	MINUTES	

12. FUEL ON BOARD		13. ALTERNATE AIRPORT(S)	14. PILOT'S NAME, ADDRESS & TELEPHONE NUMBER & AIRCRAFT HOME BASE	15. NUMBER ABOARD
HOURS	MINUTES			
			17. DESTINATION CONTACT/TELEPHONE (OPTIONAL)	

16. COLOR OF AIRCRAFT

CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

FAA Form 7233-1 (8-82)
Electronic Version (Adobe)

CLOSE VFR FLIGHT PLAN WITH _____ FSS ON ARRIVAL

MILITARY STOPOVER (FAA USE ONLY)

TYPE	AIRCRAFT IDENTIFICATION	AIRCRAFT TYPE/SPECIAL EQUIPMENT	REMARKS
☐ IFR ☐ VFR			

DEPARTURE POINT	DESTINATION	ETA

TAS	DEP. PT	ETD	ALTITUDE	ROUTE OF FLIGHT	DESTINATION	ETE	REMARKS
KTS							
KTS							
KTS							
KTS							

REMARKS | INITIALS

FAA Form 7233-1 (8-82) Electronic Version (Adobe)

Note: *Current FAA Form 7233-1 available at https://www.faa.gov/forms/.*