



U.S. Department
of Transportation

**Federal Aviation
Administration**

AERONAUTICAL INFORMATION MANUAL

*Change 1
October 5, 2023*

**DO NOT DESTROY
BASIC DATED
April 20, 2023**

Aeronautical Information Manual

Explanation of Changes

Effective: October 5, 2023

a. 1-1-9. INSTRUMENT LANDING SYSTEM (ILS)

This change reflects the FAA Order JO 7110.65 guidance that allows a preceding arrival or departure in or over the ILS critical area when the weather is above 200' ceiling and 2000 RVR. The new guidance warns pilots of signal disturbances that may be encountered in any weather at or above standard CAT I minima.

b. 1-1-20. PRECISION APPROACH SYSTEMS OTHER THAN ILS AND GPS APPENDIX 3. ABBREVIATIONS/ACRONYMS

This change will result in the removal of references to SCAT-I DGPS from the AIM.

c. 3-5-2. MILITARY TRAINING ROUTES

This change adds language to paragraph 3-5-2 that defines what the Department of Defense Flight Information Publications (DoD FLIP) represent and describes instrument/visual routes (IR/VR) that can be found in charts and narratives. It also describes FAA's responsibility for providing information about them on IFR and VFR routes. Additionally, a note was added for users who require copies of the FLIP.

d. 3-5-8. WASHINGTON DC SPECIAL FLIGHT RULES AREA (SFRA) INCLUDING THE FLIGHT RESTRICTED ZONE (FRZ)

This change adds a new paragraph 3-5-8, Washington DC Special Flight Rules Area (SFRA) including the Flight Restricted Zone (FRZ), to the AIM to better inform pilots and reduce violations reference the requirements of 14 CFR Part 93.339 and Part 91.161, and 14 CFR 99.7 Special Security Instruction NOTAMS. The current paragraphs 3-5-8 and 3-5-9 are being renumbered 3-5-9 and 3-5-10, respectively.

e. 4-1-21. AIRPORT RESERVATION OPERATIONS AND SPECIAL TRAFFIC MANAGEMENT PROGRAMS

Dual-tone multi-frequency (telephone touch-tone signaling) interfaces are no longer available for use to receive an Electronic Special Traffic Management Program or Enhanced Computer Voice Reservation System reservation. Procedures for coordination processing are updated and some content has been revised for clarification.

f. 7-3-5. COLD TEMPERATURE AIRPORT PROCEDURES

This change adds an additional segment to FIG 7-3-1, Example Cold Temperature Restricted Airport List – Required Segments, along with guidance on how to apply a temperature correction to this segment. The change also rearranges the section for better flow, swapping the positions of updated subparagraphs e and f.

g. Editorial Changes

Editorial changes include updated and corrected references and typos; rewording subparagraph 8-1-2d to eliminate confusion between high altitude of aircraft vs. low cabin altitude pressure; clarifying language in subparagraph 11-2-2c2 to say that UAS that are flown exclusively for recreational purposes must be registered if they weigh more than 0.55 pounds (250 grams); updating the subscription information for this publication; and a hyperlink fix and hyperlink update for Helicopter Association International in subparagraph 10-2-1a.

h. Entire Publication

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

AIM Change 1

Page Control Chart

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k. ILS Course and Glideslope Distortion

1. All pilots should be aware that ILS installations are subject to signal interference by surface vehicles and aircraft (either on the ground or airborne). ILS CRITICAL AREAS are established near each localizer and glide slope antenna. Pilots should be aware of the level of critical area protection they can expect in various weather conditions and understand that signal disturbances may occur as a result of normal airport operations irrespective of the official weather observation.

2. ATC is not always required to issue control instructions to avoid interfering operations within ILS critical areas at controlled airports during the hours the Airport Traffic Control Tower (ATCT) is in operation. ATC responsibilities vary depending on the official weather observation and are described as follows:

(a) **Weather Conditions.** Official weather observation indicates a ceiling of 800 feet or higher and visibility 2 miles or greater, no localizer or glideslope critical area protection is provided by ATC unless specifically requested by the flight crew.

(b) **Weather Conditions.** Official weather observation indicates a ceiling of less than 800 feet or visibility less than 2 miles.

(1) Holding. Aircraft holding below 5,000 feet between the outer marker and the airport may cause localizer signal variations for aircraft conducting the ILS approach. Accordingly, such holding will not be authorized by ATC.

(2) Localizer Critical Area. When an arriving aircraft is inside the outer marker (OM) or the fix used in lieu of the OM, vehicles and aircraft will not be authorized in or over the precision approach critical area except:

[a] A preceding arriving aircraft on the same or another runway may pass over or through the localizer critical area, and;

[b] A preceding departing aircraft or missed approach on the same or another runway may pass through or over the localizer critical area.

(3) Glide Slope Critical Area. ATC will not authorize vehicles or aircraft operations in or over the glideslope critical area when an arriving aircraft is inside the outer marker (OM), or the fix used in lieu of the OM, unless the arriving aircraft has reported the runway in sight and is circling or side-stepping to land on another runway.

(c) **Weather Conditions.** Official weather observation indicates a ceiling less than 200 feet or runway visual range (RVR) less than 2000 feet.

(1) Localizer Critical Area. In addition to the critical area protection described in 1-1-9k2(b) above, when an arriving aircraft is inside the middle marker (MM), or in the absence of a MM, ½ mile final, ATC will not authorize:

[a] A preceding arriving aircraft on the same or another runway to pass over or through the localizer critical area, or;

[b] A preceding departing aircraft or missed approach on the same or another runway to pass through or over the localizer critical area.

3. In order to ensure that pilot and controller expectations match with respect to critical area protection for a given approach and landing operation, a flight crew should advise the tower any time it intends to conduct any autoland operation or use an SA CAT I, any CAT II, or any CAT III line of minima anytime the official weather observation is at or above a ceiling of 800 feet and 2 miles visibility. If ATC is unable to protect the critical area, they will advise the flight crew.

EXAMPLE-

*Denver Tower, United 1153, Request Autoland (runway) ATC replies with:
United 1153, Denver Tower, Roger, Critical Areas not protected.*

4. Pilots are cautioned that even when the critical areas are considered to be protected, unless the official weather observation including controller observations indicates a ceiling less than 200 feet or RVR less than 2000 feet, ATC may still authorize a preceding arriving, departing, or missed approach aircraft to pass through or over the localizer critical area and that this may cause signal disturbances that could result in an undesired aircraft state during the final stages of the approach, landing, and rollout.

5. Pilots are cautioned that vehicular traffic not subject to ATC may cause momentary deviation to ILS course or glide slope signals. Also, critical areas are not protected at uncontrolled airports or at airports with an operating control tower when weather or visibility conditions are above those requiring protective measures. Aircraft conducting coupled or autoland operations should be especially alert in monitoring automatic flight control systems and be prepared to intervene as necessary. (See FIG 1-1-8.)

NOTE—

Unless otherwise coordinated through Flight Standards, ILS signals to Category I runways are not flight inspected below the point that is 100 feet less than the decision altitude (DA). Guidance signal anomalies may be encountered below this altitude.

1-1-10. Simplified Directional Facility (SDF)

a. The SDF provides a final approach course similar to that of the ILS localizer. It does not provide glide slope information. A clear understanding of the ILS localizer and the additional factors listed below completely describe the operational characteristics and use of the SDF.

b. The SDF transmits signals within the range of 108.10 to 111.95 MHz.

c. The approach techniques and procedures used in an SDF instrument approach are essentially the same as those employed in executing a standard localizer approach except the SDF course may not be aligned with the runway and the course may be wider, resulting in less precision.

d. Usable off-course indications are limited to 35 degrees either side of the course centerline. Instrument indications received beyond 35 degrees should be disregarded.

e. The SDF antenna may be offset from the runway centerline. Because of this, the angle of convergence between the final approach course and the runway bearing should be determined by reference to the instrument approach procedure chart. This angle is generally not more than 3 degrees. However, it should be noted that inasmuch as the approach course originates at the antenna site, an approach which is continued beyond the runway threshold will lead the aircraft to the SDF offset position rather than along the runway centerline.

f. The SDF signal is fixed at either 6 degrees or 12 degrees as necessary to provide maximum flyability and optimum course quality.

g. Identification consists of a three-letter identifier transmitted in Morse Code on the SDF frequency. The appropriate instrument approach chart will indicate the identifier used at a particular airport.

1. Special instrument approach procedures must be issued to the aircraft operator if pilot training, aircraft equipment, and/or aircraft performance is different than published procedures. Special instrument approach procedures are not distributed for general public use. These procedures are issued to an aircraft operator when the conditions for operations approval are satisfied.

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.

REFERENCE—

AIM, Para 5–4–7, Instrument Approach Procedures, Subpara j.

Section 5. Other Airspace Areas

3-5-1. Airport Advisory/Information Services

- a. There are two advisory type services available at selected airports.

1. Local Airport Advisory (LAA) service is available only in Alaska and is operated within 10 statute miles of an airport where a control tower is not operating but where a FSS is located on the airport. At such locations, the FSS provides a complete local airport advisory service to arriving and departing aircraft. During periods of fast changing weather the FSS will automatically provide Final Guard as part of the service from the time the aircraft reports “on-final” or “taking-the-active-runway” until the aircraft reports “on-the-ground” or “airborne.”

NOTE-

Current policy, when requesting remote ATC services, requires that a pilot monitor the automated weather broadcast at the landing airport prior to requesting ATC services. The FSS automatically provides Final Guard, when appropriate, during LAA/Remote Airport Advisory (RAA) operations. Final Guard is a value added wind/altimeter monitoring service, which provides an automatic wind and altimeter check during active weather situations when the pilot reports on-final or taking the active runway. During the landing or take-off operation when the winds or altimeter are actively changing the FSS will blind broadcast significant changes when the specialist believes the change might affect the operation. Pilots should acknowledge the first wind/altimeter check but due to cockpit activity no acknowledgement is expected for the blind broadcasts. It is prudent for a pilot to report on-the-ground or airborne to end the service.

2. Remote Airport Information Service (RAIS) is provided in support of short term special events like small to medium fly-ins. The service is advertised by NOTAM D only. The FSS will not have access to a continuous readout of the current winds and altimeter; therefore, RAIS does not include weather and/or Final Guard service. However, known traffic, special event instructions, and all other services are provided.

NOTE-

The airport authority and/or manager should request RAIS support on official letterhead directly with the manager of the FSS that will provide the service at least 60 days in advance. Approval authority rests with the FSS manager and is based on workload and resource availability.

REFERENCE-

AIM, Para 4-1-9, Traffic Advisory Practices at Airports Without Operating Control Towers.

b. It is not mandatory that pilots participate in the Airport Advisory programs. Participation enhances safety for everyone operating around busy GA airports; therefore, everyone is encouraged to participate and provide feedback that will help improve the program.

3-5-2. Military Training Routes

a. National security depends largely on the deterrent effect of our airborne military forces. To be proficient, the military services must train in a wide range of airborne tactics. One phase of this training involves “low level” combat tactics. The required maneuvers and high speeds are such that they may occasionally make the see-and-avoid aspect of VFR flight more difficult without increased vigilance in areas containing such operations. In an effort to ensure the greatest practical level of safety for all flight operations, the Military Training Route (MTR) program was conceived.

b. The MTR program is a joint venture by the FAA and the Department of Defense (DoD). MTRs are mutually developed for use by the military for the purpose of conducting low-altitude, high-speed training. The routes above 1,500 feet AGL are developed to be flown, to the maximum extent possible, under IFR. The routes at 1,500 feet AGL and below are generally developed to be flown under VFR.

c. Generally, MTRs are established below 10,000 feet MSL for operations at speeds in excess of 250 knots. However, route segments may be defined at higher altitudes for purposes of route continuity. For example, route segments may be defined for descent, climbout, and mountainous terrain. There are IFR and VFR routes as follows:

1. IFR Military Training Routes--(IR). Operations on these routes are conducted in accordance with IFR regardless of weather conditions.

2. VFR Military Training Routes--(VR). Operations on these routes are conducted in accordance with VFR except flight visibility must be 5 miles or more; and flights must not be conducted below a ceiling of less than 3,000 feet AGL.

d. Military training routes will be identified and charted as follows:

1. Route identification.

(a) MTRs with no segment above 1,500 feet AGL must be identified by four number characters; e.g., IR1206, VR1207.

(b) MTRs that include one or more segments above 1,500 feet AGL must be identified by three number characters; e.g., IR206, VR207.

(c) Alternate IR/VR routes or route segments are identified by using the basic/principal route designation followed by a letter suffix, e.g., IR008A, VR1007B, etc.

2. Route charting.

(a) **IFR Enroute Low Altitude Chart.** This chart will depict all IR routes and all VR routes that accommodate operations above 1,500 feet AGL.

(b) **VFR Sectional Aeronautical Charts.** These charts will depict military training activities such as IR and VR information.

(c) **Area Planning (AP/1B) Chart (DoD Flight Information Publication--FLIP).** This chart is published by the National Geospatial-Intelligence Agency (NGA) primarily for military users and contains detailed information on both IR and VR routes.

REFERENCE--

AIM, Para 9-1-5, Subpara a, National Geospatial-Intelligence Agency (NGA) Products.

e. DoD FLIP-- Department of Defense Flight Information Publications describe IR/VR routes through charts and narratives, and the FAA provides information regarding these routes to all users via IFR and VFR charts.

NOTE--

DoD users that require copies of FLIP should 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.

3-5-3. Temporary Flight Restrictions

a. General. This paragraph describes the types of conditions under which the FAA may impose temporary flight restrictions. It also explains which FAA elements have been delegated authority to issue a temporary flight restrictions NOTAM and lists the types of responsible agencies/offices from which the FAA will accept requests to establish temporary flight restrictions. The 14 CFR is explicit as to what operations are prohibited, restricted, or allowed in a temporary flight restrictions area. Pilots are responsible to comply with 14 CFR Sections 91.137, 91.138, 91.141 and 91.143 when conducting flight in an area where a temporary flight restrictions area is in effect, and should check appropriate NOTAMs during flight planning.

b. The purpose for establishing a temporary flight restrictions area is to:

1. 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));

2. Provide a safe environment for the operation of disaster relief aircraft (14 CFR Section 91.137(a)(2));
or

3. Prevent an unsafe congestion of sightseeing aircraft above an incident or event which may generate a high degree of public interest (14 CFR Section 91.137(a)(3)).

4. Protect declared national disasters for humanitarian reasons in the State of Hawaii (14 CFR Section 91.138).

5. Protect the President, Vice President, or other public figures (14 CFR Section 91.141).

6. Provide a safe environment for space agency operations (14 CFR Section 91.143).

c. Except for hijacking situations, when the provisions of 14 CFR Section 91.137(a)(1) or (a)(2) are necessary, a temporary flight restrictions area will only be established by or through the area manager at the Air Route Traffic Control Center (ARTCC) having jurisdiction over the area concerned. A temporary flight restrictions NOTAM involving the conditions of 14 CFR Section 91.137(a)(3) will be issued at the direction of the service area office director having oversight of the airspace concerned. When hijacking situations are involved, a temporary flight restrictions area will be implemented through the TSA Aviation Command Center. The appropriate FAA air traffic element, upon receipt of such a request, will establish a temporary flight restrictions area under 14 CFR Section 91.137(a)(1).

d. The FAA accepts recommendations for the establishment of a temporary flight restrictions area under 14 CFR Section 91.137(a)(1) from military major command headquarters, regional directors of the Office of Emergency Planning, Civil Defense State Directors, State Governors, or other similar authority. For the situations involving 14 CFR Section 91.137(a)(2), the FAA accepts recommendations from military commanders serving as regional, subregional, or Search and Rescue (SAR) coordinators; by military commanders directing or coordinating air operations associated with disaster relief; or by civil authorities directing or coordinating organized relief air operations (includes representatives of the Office of Emergency Planning, U.S. Forest Service, and State aeronautical agencies). Appropriate authorities for a temporary flight restrictions establishment under 14 CFR Section 91.137(a)(3) are any of those listed above or by State, county, or city government entities.

e. The type of restrictions issued will be kept to a minimum by the FAA consistent with achievement of the necessary objective. Situations which warrant the extreme restrictions of 14 CFR Section 91.137(a)(1) include,

but are not limited to: toxic gas leaks or spills, flammable agents, or fumes which if fanned by rotor or propeller wash could endanger persons or property on the surface, or if entered by an aircraft could endanger persons or property in the air; imminent volcano eruptions which could endanger airborne aircraft and occupants; nuclear accident or incident; and hijackings. Situations which warrant the restrictions associated with 14 CFR Section 91.137(a)(2) include: forest fires which are being fought by releasing fire retardants from aircraft; and aircraft relief activities following a disaster (earthquake, tidal wave, flood, etc.). 14 CFR Section 91.137(a)(3) restrictions are established for events and incidents that would attract an unsafe congestion of sightseeing aircraft.

f. The amount of airspace needed to protect persons and property or provide a safe environment for rescue/relief aircraft operations is normally limited to within 2,000 feet above the surface and within a 3–nautical–mile radius. Incidents occurring within Class B, Class C, or Class D airspace will normally be handled through existing procedures and should not require the issuance of a temporary flight restrictions NOTAM. Temporary flight restrictions affecting airspace outside of the U.S. and its territories and possessions are issued with verbiage excluding that airspace outside of the 12–mile coastal limits.

g. The FSS nearest the incident site is normally the “coordination facility.” When FAA communications assistance is required, the designated FSS will function as the primary communications facility for coordination between emergency control authorities and affected aircraft. The ARTCC may act as liaison for the emergency control authorities if adequate communications cannot be established between the designated FSS and the relief organization. For example, the coordination facility may relay authorizations from the on-scene emergency response official in cases where news media aircraft operations are approved at the altitudes used by relief aircraft.

h. ATC may authorize operations in a temporary flight restrictions area under its own authority only when flight restrictions are established under 14 CFR Section 91.137(a)(2) and (a)(3). The appropriate ARTCC/airport traffic control tower manager will, however, ensure that such authorized flights do not hamper activities or interfere with the event for which restrictions were implemented. However, ATC will not authorize local IFR flights into the temporary flight restrictions area.

i. To preclude misunderstanding, the implementing NOTAM will contain specific and formatted information. The facility establishing a temporary flight restrictions area will format a NOTAM beginning with the phrase “FLIGHT RESTRICTIONS” followed by: the location of the temporary flight restrictions area; the effective period; the area defined in statute miles; the altitudes affected; the FAA coordination facility and commercial telephone number; the reason for the temporary flight restrictions; the agency directing any relief activities and its commercial telephone number; and other information considered appropriate by the issuing authority.

EXAMPLE–

1. 14 CFR Section 91.137(a)(1):

The following NOTAM prohibits all aircraft operations except those specified in the NOTAM.

Flight restrictions Matthews, Virginia, effective immediately until 9610211200. Pursuant to 14 CFR Section 91.137(a)(1) temporary flight restrictions are in effect. Rescue operations in progress. Only relief aircraft operations under the direction of the Department of Defense are authorized in the airspace at and below 5,000 feet MSL within a 2–nautical–mile radius of Laser AFB, Matthews, Virginia. Commander, Laser AFB, in charge (897) 946–5543 (122.4). Steenson FSS (792) 555–6141 (123.1) is the FAA coordination facility.

2. 14 CFR Section 91.137(a)(2):

The following NOTAM permits flight operations in accordance with 14 CFR Section 91.137(a)(2). The on-site emergency response official to authorize media aircraft operations below the altitudes used by the relief aircraft. Flight restrictions 25 miles east of Bransome, Idaho, effective immediately until 9601202359 UTC. Pursuant to 14 CFR Section 91.137(a)(2) temporary flight restrictions are in effect within a 4–nautical–mile radius of the intersection of county roads 564 and 315 at and below 3,500 feet MSL to provide a safe environment for fire fighting aircraft operations. Davis County sheriff’s department (792) 555–8122 (122.9) is in charge of on-scene emergency response activities. Glivings FSS (792) 555–1618 (122.2) is the FAA coordination facility.

3. 14 CFR Section 91.137(a)(3):

The following NOTAM prohibits sightseeing aircraft operations.

Flight restrictions Brown, Tennessee, due to olympic activity. Effective 9606181100 UTC until 9607190200 UTC. Pursuant

to 14 CFR Section 91.137(a)(3) temporary flight restrictions are in effect within a 3–nautical–mile radius of N355783/W835242 and Volunteer VORTAC 019 degree radial 3.7 DME fix at and below 2,500 feet MSL. Norton FSS (423) 555–6742 (126.6) is the FAA coordination facility.

4. 14 CFR Section 91.138:

The following NOTAM prohibits all aircraft except those operating under the authorization of the official in charge of associated emergency or disaster relief response activities, aircraft carrying law enforcement officials, aircraft carrying personnel involved in an emergency or legitimate scientific purposes, carrying properly accredited news media, and aircraft operating in accordance with an ATC clearance or instruction.

Flight restrictions Kapalua, Hawaii, effective 9605101200 UTC until 9605151500 UTC. Pursuant to 14 CFR Section 91.138 temporary flight restrictions are in effect within a 3–nautical–mile radius of N205778/W1564038 and Maui/OGG/VORTAC 275 degree radial at 14.1 nautical miles. John Doe 808–757–4469 or 122.4 is in charge of the operation. Honolulu/HNL 808–757–4470 (123.6) FSS is the FAA coordination facility.

5. 14 CFR Section 91.141:

The following NOTAM prohibits all aircraft.

Flight restrictions Stillwater, Oklahoma, June 21, 1996. Pursuant to 14 CFR Section 91.141 aircraft flight operations are prohibited within a 3–nautical–mile radius, below 2000 feet AGL of N360962/W970515 and the Stillwater/SWO/VOR/DME 176 degree radial 3.8–nautical–mile fix from 1400 local time to 1700 local time June 21, 1996, unless otherwise authorized by ATC.

6. 14 CFR Section 91.143:

The following NOTAM prohibits any aircraft of U.S. registry, or pilot any aircraft under the authority of an airman certificate issued by the FAA.

Kennedy space center space operations area effective immediately until 9610152100 UTC. Pursuant to 14 CFR Section 91.143, flight operations conducted by FAA certificated pilots or conducted in aircraft of U.S. registry are prohibited at any altitude from surface to unlimited, within the following area 30–nautical–mile radius of the Melbourne/MLB/VORTAC 010 degree radial 21–nautical–mile fix. St. Petersburg, Florida/PIE/FSS 813–545–1645 (122.2) is the FAA coordination facility and should be contacted for the current status of any airspace associated with the space shuttle operations. This airspace encompasses R2933, R2932, R2931, R2934, R2935, W497A and W158A. Additional warning and restricted areas will be active in conjunction with the operations. Pilots must consult all NOTAMs regarding this operation.

3–5–4. Parachute Jump Aircraft Operations

a. Procedures relating to parachute jump areas are contained in 14 CFR Part 105. Tabulations of parachute jump areas in the U.S. are contained in the Chart Supplement U.S.

b. Pilots of aircraft engaged in parachute jump operations are reminded that all reported altitudes must be with reference to mean sea level, or flight level, as appropriate, to enable ATC to provide meaningful traffic information.

c. Parachute operations in the vicinity of an airport without an operating control tower – there is no substitute for alertness while in the vicinity of an airport. It is essential that pilots conducting parachute operations be alert, look for other traffic, and exchange traffic information as recommended in paragraph 4–1–9, Traffic Advisory Practices at Airports Without Operating Control Towers. In addition, pilots should avoid releasing parachutes while in an airport traffic pattern when there are other aircraft in that pattern. Pilots should make appropriate broadcasts on the designated Common Traffic Advisory Frequency (CTAF), and monitor that CTAF until all parachute activity has terminated or the aircraft has left the area. Prior to commencing a jump operation, the pilot should broadcast the aircraft’s altitude and position in relation to the airport, the approximate relative time when the jump will commence and terminate, and listen to the position reports of other aircraft in the area.

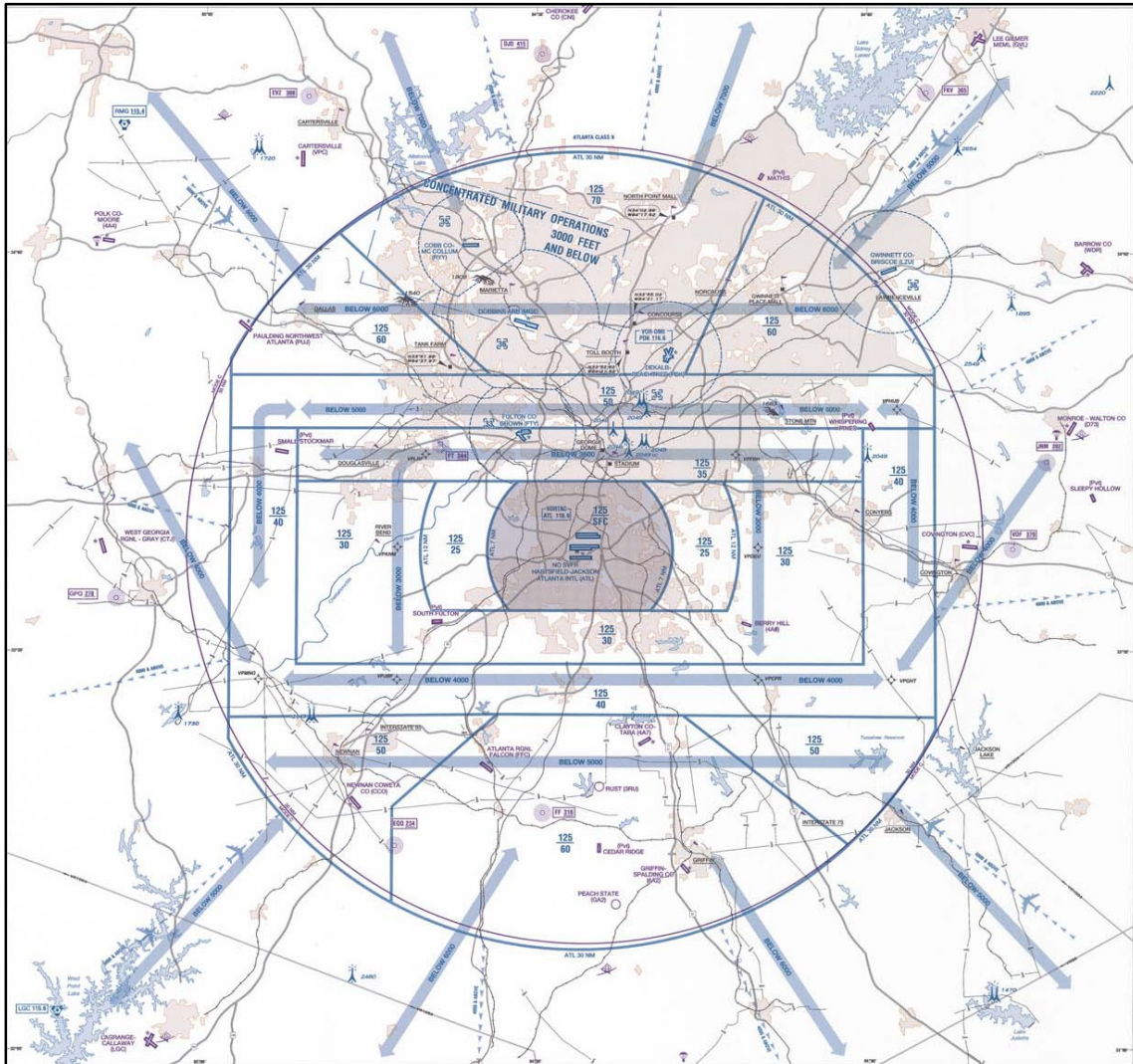
3–5–5. Published VFR Routes

Published VFR routes for transitioning around, under and through complex airspace such as Class B airspace were developed through a number of FAA and industry initiatives. All of the following terms, i.e., “VFR Flyway” “VFR Corridor” and “Class B Airspace VFR Transition Route” have been used when referring to the same or different types of routes or airspace. The following paragraphs identify and clarify the functionality of each type of route, and specify where and when an ATC clearance is required.

a. VFR Flyways.

1. VFR Flyways and their associated Flyway Planning Charts were developed from the recommendations of a National Airspace Review Task Group. A VFR Flyway is defined as a general flight path not defined as a specific course, for use by pilots in planning flights into, out of, through or near complex terminal airspace to avoid Class B airspace. An ATC clearance is NOT required to fly these routes.

FIG 3-5-1
VFR Flyway Planning Chart



2. VFR Flyways are depicted on the reverse side of some of the VFR Terminal Area Charts (TAC), commonly referred to as Class B airspace charts. (See FIG 3-5-1.) Eventually all TACs will include a VFR Flyway Planning Chart. These charts identify VFR flyways designed to help VFR pilots avoid major controlled traffic flows. They may further depict multiple VFR routings throughout the area which may be used as an alternative to flight within Class B airspace. The ground references provide a guide for improved visual navigation. These routes are not intended to discourage requests for VFR operations within Class B airspace but are designed solely to assist pilots in planning for flights under and around busy Class B airspace without actually entering Class B airspace.

3. It is very important to remember that these suggested routes are not sterile of other traffic. The entire Class B airspace, and the airspace underneath it, may be heavily congested with many different types of aircraft. Pilot

3-5-6. Terminal Radar Service Area (TRSA)

a. Background. TRSAs were originally established as part of the Terminal Radar Program at selected airports. TRSAs were never controlled airspace from a regulatory standpoint because the establishment of TRSAs was never subject to the rulemaking process; consequently, TRSAs are not contained in 14 CFR Part 71 nor are there any TRSA operating rules in 14 CFR Part 91. Part of the Airport Radar Service Area (ARSA) program was to eventually replace all TRSAs. However, the ARSA requirements became relatively stringent and it was subsequently decided that TRSAs would have to meet ARSA criteria before they would be converted. TRSAs do not fit into any of the U.S. airspace classes; therefore, they will continue to be non-Part 71 airspace areas where participating pilots can receive additional radar services which have been redefined as TRSA Service.

b. TRSAs. The primary airport(s) within the TRSA become(s) Class D airspace. The remaining portion of the TRSA overlies other controlled airspace which is normally Class E airspace beginning at 700 or 1,200 feet and established to transition to/from the en route/terminal environment.

c. Participation. Pilots operating under VFR are encouraged to contact the radar approach control and avail themselves of the TRSA Services. However, participation is voluntary on the part of the pilot. See Chapter 4, Air Traffic Control, for details and procedures.

d. Charts. TRSAs are depicted on VFR sectional and terminal area charts with a solid black line and altitudes for each segment. The Class D portion is charted with a blue segmented line.

3-5-7. Special Air Traffic Rules (SATR) and Special Flight Rules Area (SFRA)

a. Background. The Code of Federal Regulations (CFR) prescribes special air traffic rules for aircraft operating within the boundaries of certain designated airspace. These areas are listed in 14 CFR Part 93 and can be found throughout the NAS. Procedures, nature of operations, configuration, size, and density of traffic vary among the identified areas.

b. SFRAs. Airspace of defined dimensions, above land areas or territorial waters, within which the flight of aircraft is subject to the rules set forth in 14 CFR Part 93, unless otherwise authorized by air traffic control. Not all areas listed in 14 CFR Part 93 are designated SFRA, but special air traffic rules apply to all areas described in 14 CFR Part 93.

REFERENCE-

14 CFR Part 93, Special Air Traffic Rules

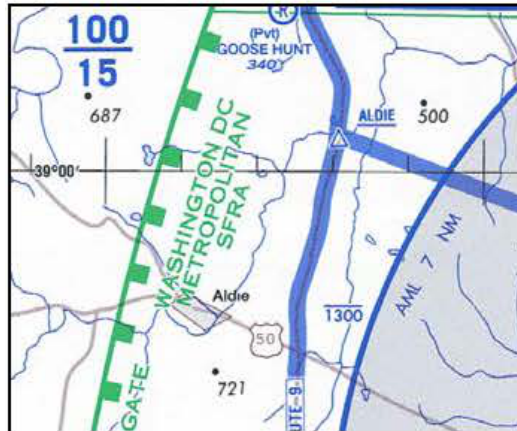
FAA Order JO 7110.65, Para 9-2-10, Special Air Traffic Rules (SATR) and Special Flight Rules Area (SFRA)

P/CG - Special Air Traffic Rules (SATR)

c. Participation. Each person operating an aircraft to, from, or within airspace designated as a SATR area or SFRA must adhere to the special air traffic rules set forth in 14 CFR Part 93, as applicable, unless otherwise authorized or required by ATC.

d. Charts. SFRAs are depicted on VFR sectional, terminal area, and helicopter route charts. (See FIG 3-5-4.)

FIG 3-5-4
SFRA Boundary



e. Additional information and resources regarding SFRA, including procedures for flight in individual areas, may be found on the FAA Safety website at <http://www.faasafety.gov>

3-5-8. Washington, DC, Special Flight Rules Area (SFRA) including the Flight Restricted Zone (FRZ)

A pilot conducting any type of flight operation in the Washington, DC, SFRA/FRZ must comply with the requirements in:

- a. 14 CFR Section 93.339, Washington, DC, Metropolitan Area Special Flight Rules Area including the FRZ.
- b. 14 CFR Section 91.161, Special Awareness Training for the DC SFRA/FRZ, also located on the FAA website at <https://www.faasafety.gov/>.
- c. Any 14 CFR Part 99.7 special security instructions for the DC SFRA/FRZ published via NOTAM by FAA in the interest of national security.

3-5-9. Weather Reconnaissance Area (WRA)

a. **General.** Hurricane Hunters from the United States Air Force Reserve 53rd Weather Reconnaissance Squadron (WRS) and the National Oceanic and Atmospheric Administration (NOAA) Aircraft Operations Center (AOC) operate weather reconnaissance/research aircraft missions, in support of the National Hurricane Operations Plan (NHOP), to gather meteorological data on hurricanes and tropical cyclones. 53rd WRS and NOAA AOC aircraft normally conduct these missions in airspace identified in a published WRA Notice to Air Missions (NOTAM).

b. **WRAs.** Airspace with defined dimensions and published by a NOTAM, which is established to support weather reconnaissance/research flights. ATC services are not provided within WRAs. Only participating weather reconnaissance/research aircraft from the 53rd WRS and NOAA AOC are permitted to operate within a WRA. A WRA may only be established in airspace within U. S. Flight Information Regions (FIR) outside of U. S. territorial airspace.

c. A published WRA NOTAM describes the airspace dimensions of the WRA and the expected activities within the WRA. WRAs may border adjacent foreign FIRs, but are wholly contained within U.S. FIRs. As ATC services are not provided within a WRA, non-participating aircraft should avoid WRAs, and IFR aircraft should expect to be rerouted to avoid WRAs.

3-5-10. Other Non-Charted Airspace Areas

a. **Stationary or Moving Altitude Reservation (ALTRV).** A Stationary or Moving ALTRV is announced via an airspace NOTAM issued by the Central Altitude Reservation Facility (CARF) or ARTCC. These

announcements will appear in CARF and/or ARTCC NOTAMS. This airspace ensures non-participating IFR aircraft remain separated from special activity. Non-participating VFR aircraft are permitted to fly through the area but should exercise vigilance.

b. ATC ASSIGNED AIRSPACE. Airspace of defined vertical/lateral limits, assigned by ATC, for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace and other IFR air traffic. ATCAA locations and scheduled activation information can be found on the FAA SUA website; a NOTAM will not be issued to announce the activation of this airspace.

(f) Transponder and ADS-B Out requirements do not apply to any aircraft that was not originally certificated with an electrical system, or that has not subsequently been certified with such a system installed, including balloons and gliders. These aircraft may conduct operations without a transponder or ADS-B Out when operating:

- (1) Outside any Class B or Class C airspace area; and
- (2) Below the altitude of the ceiling of a Class B or Class C airspace area designated for an airport, or 10,000 feet MSL, whichever is lower.

3. 14 CFR Section 99.13 requires all aircraft flying into, within, or across the contiguous U.S. ADIZ be equipped with a Mode C or Mode S transponder. Balloons, gliders and aircraft not equipped with an engine-driven electrical system are excepted from this requirement.

REFERENCE—

AIM, Chapter 5, Section 6, National Security and Interception Procedures.

4. Pilots must ensure that their aircraft transponder/ADS-B is operating on an appropriate ATC-assigned VFR/IFR code with altitude reporting enabled when operating in such airspace. If in doubt about the operational status of either feature of your transponder while airborne, contact the nearest ATC facility or FSS and they will advise you what facility you should contact for determining the status of your equipment.

5. In-flight requests for “immediate” deviation from the transponder requirements may be approved by controllers only for failed equipment, and only when the flight will continue IFR or when weather conditions prevent VFR descent and continued VFR flight in airspace not affected by the CFRs. All other requests for deviation should be made at least 1 hour before the proposed operation by contacting the nearest Flight Service or Air Traffic facility in person or by telephone. The nearest ARTCC will normally be the controlling agency and is responsible for coordinating requests involving deviations in other ARTCC areas.

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.

1. **SQUAWK (number).** Operate radar beacon transponder/ADS-B on designated code with altitude reporting enabled.

2. **IDENT.** Engage the “IDENT” feature (military I/P) of the transponder/ADS-B.

3. **SQUAWK (number) AND IDENT.** Operate transponder/ADS-B on specified code with altitude reporting enabled, and engage the “IDENT” (military I/P) feature.

4. **SQUAWK STANDBY.** Switch transponder/ADS-B to standby position.

5. **SQUAWK NORMAL.** Resume normal transponder/ADS-B operation on previously assigned code. (Used after “SQUAWK STANDBY,” or by military after specific transponder tests).

6. **SQUAWK ALTITUDE.** Activate Mode C with automatic altitude reporting.

7. **STOP ALTITUDE SQUAWK.** Turn off automatic altitude reporting.

8. **STOP SQUAWK (Mode in use).** Stop transponder and ADS-B Out transmissions, or switch off only specified mode of the aircraft transponder (military).

9. **SQUAWK MAYDAY.** Operate transponder/ADS-B in the emergency position (Mode A Code 7700 for civil transponder. Mode 3 Code 7700 and emergency feature for military transponder.)

10. SQUAWK VFR. Operate radar beacon transponder/ADS-B on Code 1200 in the Mode A/3, or other appropriate VFR code, with altitude reporting enabled.

4-1-21. Airport Reservation Operations and Special Traffic Management Programs

This section describes procedures for obtaining required airport reservations at airports designated by the FAA and for airports operating under Special Traffic Management Programs.

a. Slot Controlled Airports.

1. The FAA may adopt rules to require advance reservations for unscheduled operations at certain airports. In addition to the information in the rules adopted by the FAA, a listing of the airports and relevant information will be maintained on the FAA website www.fly.faa.gov/ecvrs.

2. The FAA has established an Airport Reservation Office (ARO) to receive and process reservations for unscheduled flights at the slot controlled airports. The ARO uses the Enhanced Computer Voice Reservation System (e-CVRS) to allocate reservations. Reservations will be available beginning 72 hours in advance of the operation at the slot controlled airport. Standby lists are not maintained. Flights with declared emergencies do not require reservations. Refer to the website for the current listing of slot controlled airports, limitations, and reservation procedures.

3. For more detailed information on operations and reservation procedures at a Slot Controlled Airport, please see 14 CFR Part 93, Subpart K – High Density Traffic Airports.

b. Special Traffic Management Programs (STMP).

1. Special programs may be established when a location requires special traffic handling to accommodate above normal traffic demand (for example, EAA AirVenture Oshkosh, SUN 'n FUN Aerospace Expo) or reduced airport capacity (for example, airport runway/taxiway closures for airport construction). The special programs may remain in effect until the problem has been resolved or until local traffic management procedures can handle the volume and a need for special handling no longer exists.

2. If an STMP is used to accommodate a special event, a domestic notice will be issued relaying the website address: www.fly.faa.gov/estmp. Domestic notice information includes: what airports are included in the STMP, the dates and times reservations are required, the time limits for reservation requests, the point of contact for reservations, and any other instructions.

c. Making Reservations. Detailed information and User Instruction Guides for using the Web reservation systems are available on the websites for the slot controlled airports (e-CVRS), www.fly.faa.gov/ecvrs; and STMPs (e-STMP), www.fly.faa.gov/estmp.

NOTE–

Users may contact the ARO at (540) 422-4246 if they have a problem with their reservation.

4-1-22. Requests for Waivers and Authorizations from Title 14, Code of Federal Regulations (14 CFR)

a. Requests for a Certificate of Waiver or Authorization (FAA Form 7711-2), or requests for renewal of a waiver or authorization, may be accepted by any FAA facility and will be forwarded, if necessary, to the appropriate office having waiver authority.

b. The grant of a Certificate of Waiver or Authorization from 14 CFR constitutes relief from specific regulations, to the degree and for the period of time specified in the certificate, and does not waive any state law or local ordinance. Should the proposed operations conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the applicant's responsibility to resolve the matter. The holder of a waiver is responsible for compliance with the terms of the waiver and its provisions.

c. A waiver may be canceled at any time by the Administrator, the person authorized to grant the waiver, or the representative designated to monitor a specific operation. In such case either written notice of cancellation, or written confirmation of a verbal cancellation will be provided to the holder.

4-1-23. Weather Systems Processor

The Weather Systems Processor (WSP) was developed for use in the National Airspace System to provide weather processor enhancements to selected Airport Surveillance Radar (ASR)-9 facilities. The WSP provides Air Traffic with warnings of hazardous wind shear and microbursts. The WSP also provides users with terminal area 6-level weather, storm cell locations and movement, as well as the location and predicted future position and intensity of wind shifts that may affect airport operations.

Chapter 5. Air Traffic Procedures

Section 1. Preflight

5-1-1. Preflight Preparation

a. Prior to every flight, pilots should gather all information vital to the nature of the flight, assess whether the flight would be safe, and then file a flight plan. Pilots can receive a regulatory compliant briefing without contacting Flight Service. Pilots are encouraged to use automated resources and review Advisory Circular AC 91-92, Pilot's Guide to a Preflight Briefing, for more information. Pilots who prefer to contact Flight Service are encouraged to conduct a self-brief prior to calling. Conducting a self-brief before contacting Flight Service provides familiarity of meteorological and aeronautical conditions applicable to the route of flight and promotes a better understanding of weather information. Pilots may access Flight Service through www.1800wxbrief.com or by calling 1-800-WX-BRIEF. Flight planning applications are also available for conducting a self-briefing and filing flight plans.

NOTE-

Alaska only: Pilots filing flight plans via "fast file" who desire to have their briefing recorded, should include a statement at the end of the recording as to the source of their weather briefing.

b. The information required by the FAA to process flight plans is obtained from FAA Form 7233-4, International Flight Plan. Only DoD users, and civilians who file stereo route flight plans, may use FAA Form 7233-1, Flight Plan.

NOTE-

FAA and DoD Flight Plan Forms are equivalent. Where the FAA specifies Form 7233-1, Flight Plan and FAA Form 7233-4, International Flight Plan, the DoD may substitute their Form DD 175, Military Flight Plan and Form DD-1801, DoD International Flight Plan as necessary. NAS automation systems process and convert data in the same manner, although for computer acceptance, input fields may be adjusted to follow FAA format.

c. FSSs are required to advise of pertinent NOTAMs if a *standard* briefing is requested, but if they are overlooked, do not hesitate to remind the specialist that you have not received NOTAM information. Additionally, FSS briefers do not provide FDC NOTAM information for special instrument approach procedures unless specifically asked. Pilots authorized by the FAA to use special instrument approach procedures must specifically request FDC NOTAM information for these procedures. Pilots who receive the information electronically will receive NOTAMs for special IAPs automatically.

NOTE-

Domestic Notices and International Notices are not provided during a briefing unless specifically requested by the pilot since the FSS specialist has no way of knowing whether the pilot has already checked the Federal NOTAM System (FNS) NOTAM Search website external links prior to calling. Airway NOTAMs, procedural NOTAMs, and NOTAMs that are general in nature and not tied to a specific airport/facility (for example, flight advisories and restrictions, open duration special security instructions, and special flight rules areas) are briefed solely by pilot request. Remember to ask for these notices if you have not already reviewed this information, and to request all pertinent NOTAMs specific to your flight.

REFERENCE-

AIM, Para 5-1-3, Notice to Air Missions (NOTAM) System.

d. Pilots are urged to use only the latest issue of aeronautical charts in planning and conducting flight operations. Aeronautical charts are revised and reissued on a regular scheduled basis to ensure that depicted data are current and reliable. In the conterminous U.S., Sectional Charts are updated every 6 months, IFR En Route Charts every 56 days, and amendments to civil IFR Approach Charts are accomplished on a 56-day cycle with a change notice volume issued on the 28-day midcycle. Charts that have been superseded by those of a more recent date may contain obsolete or incomplete flight information.

REFERENCE-

AIM, Para 9-1-4, General Description of Each Chart Series.

e. When requesting a preflight briefing, identify yourself as a pilot and provide the following:

1. Type of flight planned; e.g., VFR or IFR.
2. Aircraft's number or pilot's name.
3. Aircraft type.
4. Departure Airport.
5. Route of flight.
6. Destination.
7. Flight altitude(s).
8. ETD and ETE.

f. Prior to conducting a briefing, briefers are required to have the background information listed above so that they may tailor the briefing to the needs of the proposed flight. The objective is to communicate a "picture" of meteorological and aeronautical information necessary for the conduct of a safe and efficient flight. Briefers use all available weather and aeronautical information to summarize data applicable to the proposed flight. Pilots who have briefed themselves before calling Flight Service should advise the briefer what information has been obtained from other sources.

REFERENCE—

AIM, Para 7-1-5, Preflight Briefings, contains those items of a weather briefing that should be expected or requested.

g. FAA by 14 CFR Part 93, Subpart K, has designated High Density Traffic Airports (HDTA) and has prescribed air traffic rules and requirements for operating aircraft (excluding helicopter operations) to and from these airports.

REFERENCE—

Chart Supplement U.S., Special Notices Section

AIM, Para 4-1-21, Airport Reservation Operations and Special Traffic Management Programs.

h. In addition to the filing of a flight plan, if the flight will traverse or land in one or more foreign countries, it is particularly important that pilots leave a complete itinerary with someone directly concerned and keep that person advised of the flight's progress. If serious doubt arises as to the safety of the flight, that person should first contact the FSS.

REFERENCE—

AIM, Para 5-1-II, Flights Outside the U.S. and U.S. Territories.

i. Pilots operating under provisions of 14 CFR Part 135 on a domestic flight without having an FAA assigned 3-letter designator, must prefix the normal registration (N) number with the letter "T" on flight plan filing; for example, TN1234B.

REFERENCE—

AIM, Para 4-2-4, Aircraft Call Signs.

FAA Order JO 7110.65, Para 2-3-5, Aircraft Identity, Subpara a.

FAA Order JO 7110.10, Appendix B, FAA Form 7233-1, Flight Plan

5-1-2. Follow IFR Procedures Even When Operating VFR

a. To maintain IFR proficiency, pilots are urged to practice IFR procedures whenever possible, even when operating VFR. Some suggested practices include:

1. Obtain a complete preflight briefing and check NOTAMs. Prior to every flight, pilots should gather all information vital to the nature of the flight. Pilots can receive a regulatory compliant briefing without contacting Flight Service. Pilots are encouraged to use automated resources and review AC 91-92, Pilot's Guide to a Preflight Briefing, for more information. NOTAMs are available online from the Federal NOTAM System (FNS) NOTAM Search website (<https://notams.aim.faa.gov/notamSearch/>), private vendors, or on request from Flight Service.

c. A current list of CTAs is located at: https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dtpp/search/. Airports are listed by ICAO code, Airport Name, Temperature in Celsius, and affected segment(s).

d. Airport Criteria. The CTA risk analysis is performed on airports that have at least one runway of 2500 ft. Pilots operating into an airport with a runway length less than 2500 ft may make a cold temperature altitude correction in cold temperature conditions, if desired. Comply with operating and reporting procedures for CTAs.

e. ATC Reporting Requirements. Pilots must advise ATC with the corrected altitude when applying an altitude correction on any approach segment with the exception of the final segment.

f. Methods to apply correction: The FAA recommends operators/pilots use either the All Segments Method or the Individual Segments Method when making corrections at CTAs.

7-3-5. Cold Temperature Airport Procedures

a. PILOTS MUST NOT MAKE AN ALTIMETER CHANGE to accomplish an altitude correction. Pilots must ensure that the altimeter is set to the current altimeter setting provided by ATC in accordance with 14 CFR §91.121.

b. Actions on when and where to make corrections: Pilots will make an altitude correction to the published, “at”, “at or above”, and “at or below” altitudes on all designated segment(s) to all runways for all published instrument approach procedures when the reported airport temperature is at or below the published CTA temperature on the approach plate. A pilot may request an altitude correction (if desired) on any approach at any United States airport when extreme cold temperature is encountered. Pilots making a correction must comply with ATC reporting requirements.

c. Correctable altitudes: ATC does not apply a cold temperature correction to their Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) charts. Pilots must request approval from ATC to apply a cold temperature correction to any ATC assigned altitude. Pilots must not correct altitudes published on Standard Instrument Departures (SIDs), Obstacle Departure Procedures (ODPs), and Standard Terminal Arrivals (STARs).

d. Use of corrected MDA/DA: Pilots will use the corrected MDA or DA as the minimum altitude for an approach. Pilots must meet the requirements in 14 CFR Part 91.175 in order to operate below the corrected MDA or DA. Pilots must see and avoid obstacles when descending below the minimum altitude on the approach.

NOTE-

The corrected DA or MDA does not affect the visibility minima published for the approach. With the application of a cold temperature correction to the DA or MDA, the airplane should be in a position on the glideslope/glidepath or at the published missed approach point to identify the runway environment.

e. Acceptable use of the table for manual CTA altitude correction (see TBL 7-3-1): Pilots may calculate a correction with a visual interpolation of the chart when using reported temperature and height above airport. This calculated altitude correction may then be rounded to the nearest whole hundred or rounded up. For example, a correction of 130 ft from the chart may be rounded to 100 ft or 200 ft. A correction of 280 ft will be rounded up to 300 ft. This rounded correction will be added to the appropriate altitudes for the “Individual” or “All” segment method. The correction calculated from the table for the MDA or DA may be used as is or rounded up, but never rounded down. This number will be added to the MDA, DA, and all step-down fix altitudes inside of the FAF/PFAF.

1. No extrapolation above the 5000 ft column is required. Pilots may use the 5000 ft “height above airport in feet” column for calculating corrections when the calculated altitude is greater than 5000 ft above reporting station elevation. Pilots must add the correction(s) from the table to the affected segment altitude(s) and fly at the new corrected altitude. Do not round down when using the 5000 ft column for calculated height above airport values greater than 5000 ft. Pilots may extrapolate above the 5000 ft column to apply a correction if desired.


2. These techniques have been adopted to minimize pilot distraction by limiting the number of entries into the table when making corrections. Although not all altitudes on the approach will be corrected back to standard

day values, a safe distance above the terrain/obstacle will be maintained on the corrected approach segment(s). Pilots may calculate a correction for each fix based on the fix altitude if desired.

NOTE–

Pilots may use Real Time Mesoscale Analysis (RTMA): Alternate Report of Surface Temperature, for computing altitude corrections, when airport temperatures are not available via normal reporting.

f. How to apply Cold Temperature Altitude Corrections on an Approach.

1. All Segments Method: Pilots may correct all segment altitudes from the IAF altitude to the MA final holding altitude. Pilots familiar with the information in this section and the procedures for accomplishing the all segments method, only need to use the published “snowflake” icon,  /CTA temperature limit on the approach chart for making corrections. Pilots are not required to reference the CTA list. The altitude correction is calculated as follows:

(a) Manual correction: Pilots will make a manual correction when the aircraft is not equipped with a temperature compensating system or when a compensating system is not used to make the correction. Use TBL 7–3–1, ICAO Cold Temperature Error Table, to calculate the correction needed for the approach segment(s).

(1) Correct all altitudes from the FAF/PFAF up to and including the IAF altitude: Calculate the correction by taking the FAF/PFAF altitude and subtracting the airport elevation. Use this number to enter the height above airport column in TBL 7–3–1 until reaching the reported temperature from the “Reported Temperature” row. Round this number as applicable and then add to all altitudes from the FAF altitude through the IAF altitude.

(2) Correct all altitudes in the final segment: Calculate the correction by taking the MDA or DA for the approach being flown and subtract the airport elevation. Use this number to enter the height above airport column in TBL 7–3–1 until reaching the reported temperature from the “Reported Temperature” row. Use this number or round up to next nearest 100 ft. Add this number to MDA or DA, and any step–down fix altitudes in the final segment.

(3) Correct final holding altitude in the MA Segment: Calculate the correction by taking the MA holding altitude and subtract the airport elevation. Use this number to enter the height above airport column in TBL 7–3–1 until reaching the reported temperature from the “Reported Temperature” row. Round this number as applicable and then add to the final MA altitude only.

(b) Aircraft with temperature compensating systems: If flying an aircraft equipped with a system capable of temperature compensation, follow the instructions for applying temperature compensation provided in the airplane flight manual (AFM), AFM supplement, or system operating manual. Ensure that temperature compensation system is on and active prior to the IAF and remains active throughout the entire approach and missed approach.

(1) Pilots that have a system that is able to calculate a temperature-corrected DA or MDA may use the system for this purpose.

(2) Pilots that have a system unable to calculate a temperature corrected DA or MDA will manually calculate an altitude correction for the MDA or DA.

NOTE–

Some systems apply temperature compensation only to those altitudes associated with an instrument approach procedure loaded into the active flight plan, while other systems apply temperature compensation to all procedure altitudes or user entered altitudes in the active flight plan, including altitudes associated with a Standard Terminal Arrival (STAR). For those systems that apply temperature compensation to all altitudes in the active flight plan, delay activating temperature compensation until the aircraft has passed the last altitude constraint associated with the active STAR.

2. Individual Segment(s) Method: Pilots are allowed to correct only the marked segment(s) indicated in the CTA list (https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dtpp/search/). Pilots using the Individual Segment(s) Method will reference the CTA list to determine which segment(s) need a correction. (See FIG 7–3–1.)

FIG 7-3-1

Example Cold Temperature Restricted Airport List – Required Segments

<i>Identifier</i>	<i>Airport name</i>	<i>Temperature</i>	<i>Initial</i>	<i>Intermediate</i>	<i>Final</i>	<i>Missed</i>
<u>Montana</u>						
<i>KBTM</i>	<i>Bert Mooney</i>	<i>-25C</i>	<i>X</i>	<i>X</i>	<i>X</i>	
<i>KBZN</i>	<i>Bozeman Yellowstone Intl</i>	<i>-31C</i>		<i>X</i>		
<i>KEKS</i>	<i>Ennis Big Sky</i>	<i>-25C</i>			<i>X</i>	
<i>KGPI</i>	<i>Glacier Park Intl</i>	<i>-15C</i>		<i>X</i>		
<i>KHLN</i>	<i>Helena Rgnl</i>	<i>-17C</i>	<i>X</i>	<i>X</i>	<i>X</i>	

(a) **Manual Correction:** Pilots will make a manual correction when the aircraft is not equipped with a temperature compensating system or when a compensating system is not used to make the correction. Use FIG 7-3-1, ICAO Cold Temperature Error Table, to calculate the correction needed for the approach segment(s).

(1) **Initial Segment:** All altitudes from the intermediate fix (IF) altitude up to and including the IAF altitude. The correction may be accomplished by using the IF altitude or by using the All Segments Method (a) Manual correction (1). To correct the initial segment by using the IF altitude, subtract the airport elevation from the IF altitude. Use this number to enter the height above airport column in TBL 7-3-1 until reaching the reported temperature from the “Reported Temperature” row. Round this number as applicable and then add to the IF, IAF, and any step-down fix altitudes.

(2) **Intermediate Segment:** All altitudes from the FAF/PFAF up to but not including the IF altitude. Calculate the correction by taking FAF/PFAF altitude and subtracting the airport elevation. Use this number to enter the height above airport column in TBL 7-3-1 until reaching the reported temperature from the “Reported Temperature” row. Round this number as applicable and then add to FAF altitude and all step-down fix altitudes within the intermediate segment (inside of the waypoint labeled “IF”).

(3) **Final segment:** Calculate the correction by taking the MDA or DA for the approach flown and subtract the airport elevation. Use this number to enter the height above airport column in TBL 7-3-1 until reaching the reported temperature from the “Reported Temperature” row. Use this number or round up to next nearest 100 ft. Add this number to MDA or DA and any applicable step-down fix altitudes in the final segment.

(4) **Missed Approach Segment:** Calculate the correction by taking the final MA holding altitude and subtract the airport elevation. Use this number to enter the height above airport column in TBL 7-3-1 until reaching the reported temperature from the “Reported Temperature” row. Round this number as applicable and then add to the final MA altitude only.

(b) **Aircraft with temperature compensating system:** If flying an aircraft equipped with a system capable of temperature compensation, follow the instructions for applying temperature compensation provided in the AFM, AFM supplement, or system operating manual. Ensure the temperature compensation system is on and active prior to the segment(s) being corrected. Manually calculate an altimetry correction for the MDA or DA. Determine an altimetry correction from the ICAO table based on the reported airport temperature and the height difference between the MDA or DA, as applicable, and the airport elevation, or use the compensating system to calculate a temperature corrected altitude for the published MDA or DA if able.

g. Communication: Pilots must request approval from ATC whenever applying a cold temperature altitude correction. Pilots do not need to inform ATC of the final approach segment correction (i.e., new MDA or DA). This request should be made on initial radio contact with the ATC facility issuing the approach clearance. ATC requires this information in order to ensure appropriate vertical separation between known traffic. Pilots should query ATC when vectored altitudes to a segment are lower than the requested corrected altitude. Pilots are encouraged to self-announce corrected altitude when flying into a non-towered airfield.

1. The following are examples of appropriate pilot-to-ATC communication when applying cold-temperature altitude corrections.

(a) On initial check-in with ATC providing approach clearance: Missoula, MT (example below).

- Vectors to final approach course: Outside of IAFs: *“Request 9700 ft for cold temperature operations.”*
 - Vectors to final approach course: Inside of ODIRE: *“Request 7300 ft for cold temperature operations.”*
 - Missed Approach segment: *“Require final holding altitude, 12500 ft on missed approach for cold temperature operations.”*
- (b) Pilots cleared by ATC for an instrument approach procedure; “Cleared the RNAV (GPS) Y RWY 12 approach (from any IAF)”. Missoula, MT (example below).
- IAF: *“Request 9700 ft for cold temperature operations at LANNY, CHARL, or ODIRE.”*

7-3-6. Examples for Calculating Altitude Corrections on CTAs

All 14 CFR Part 97 IAPs must be corrected at an airport. The following example provides the steps for correcting the different segments of an approach and will be applied to all 14 CFR Part 97 IAPs:

a. Missoula Intl (KMSO). Reported Temperature -12°C : RNAV (GPS) Y RWY 12.

1. All Segments Method: All segments corrected from IAF through MA holding altitude.

(a) Manual Calculation:

- (1) Cold Temperature Restricted Airport Temperature Limit: -12°C .
- (2) Altitude at the Final Approach Fix (FAF) (SUPPY) = 6200 ft.
- (3) Airport elevation = 3206 ft.
- (4) Difference: $6200\text{ ft} - 3206\text{ ft} = 2994\text{ ft}$.
- (5) Use TBL 7-3-1, ICAO Cold Temperature Error Table, a height above airport of 2994 ft and -12°C . Visual interpolation is approximately 300 ft. Actual interpolation is 300 ft.
- (6) Add 300 ft to the FAF and all procedure altitudes outside of the FAF up to and including IAF altitude(s):
 - [a] LANNY (IAF), CHARL (IAF), and ODIRE (IAF Holding-in-Lieu): $9400 + 300 = 9700\text{ ft}$.
 - [b] CALIP (stepdown fix): $7000 + 300 = 7300\text{ ft}$.
 - [c] SUPPY (FAF): $6200 + 300 = 6500\text{ ft}$.
- (7) Correct altitudes within the final segment altitude based on the minima used. LP MDA = 4520 ft.
- (8) Difference: $4520\text{ ft} - 3206\text{ ft} = 1314\text{ ft}$.
- (9) AIM 7-3-1 Table: 1314 ft at -12°C is approximately 150ft. Use 150 ft or round up to 200 ft.
- (10) Add corrections to altitudes up to but not including the FAF:
 - [a] BEGPE (stepdown fix): $4840 + 150 = 4990\text{ ft}$.
 - [b] LNAV MDA: $4520 + 150 = 4670\text{ ft}$.
- (11) Correct JENKI/Missed Approach Holding Altitude: MA altitude is 12000:
 - [a] JENKI: $12000 - 3206 = 8794\text{ ft}$.
- (12) TBL 7-3-1: 8794 ft at -12°C . Enter table at -12°C and intersect the 5000 ft height above airport column. The approximate value is 500 ft.
- (13) Add correction to holding fix final altitude:
 - [a] JENKI: $12000 + 500 = 12500\text{ ft}$.

b. Temperature Compensating System: Operators using a temperature compensating RNAV system to make altitude corrections will be set to the current airport temperature (-12°C) and activated prior to passing the IAF. A manual calculation of the cold temperature altitude correction is required for the MDA/DA.

1. Individual Segments Method: Missoula requires correction in the intermediate and final segments. However, in this example, the missed approach is also shown.

(a) Manual Calculation: Use the appropriate steps in the All Segments Method above to apply a correction to the required segment.

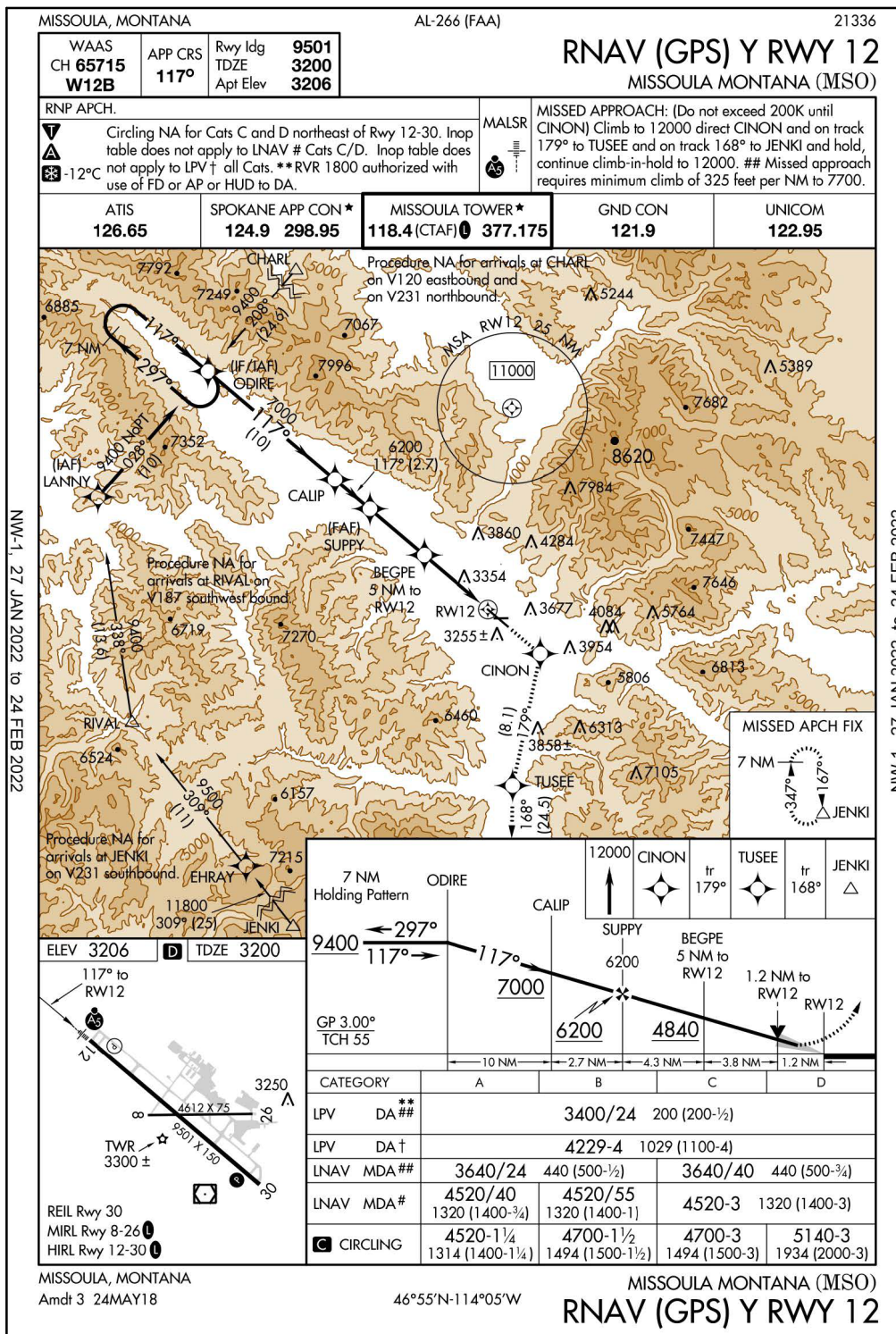
(1) Intermediate. Use steps 7-3-6a1(a)(1) thru (6). Do not correct the IAF or IF when using individual segments method.

(2) Final. Use steps 7-3-6a1(a)(7) thru (10).

(3) Missed Approach. Use steps 7-3-6a1(a)(11) thru (13).

(b) Temperature Compensating System: Operators using a temperature compensating RNAV system to make altitude corrections will be set to the current airport temperature (-12°C) and activated at a point needed to correct the altitude for the segment. A manual calculation of the cold temperature altitude correction is required for the MDA/DA.

FIG 7-3-2
Missoula Intl RNAV (GPS) Y RWY 12



3. A sinus block is prevented by not flying with an upper respiratory infection or nasal allergic condition. Adequate protection is usually not provided by decongestant sprays or drops to reduce congestion around the sinus openings. Oral decongestants have side effects that can impair pilot performance.

4. If a sinus block does not clear shortly after landing, a physician should be consulted.

d. Decompression Sickness After Scuba Diving.

1. A pilot or passenger who intends to fly after scuba diving should allow the body sufficient time to rid itself of excess nitrogen absorbed during diving. If not, altitude decompression sickness due to evolved nitrogen gas can occur during exposure to reduced barometric pressure (i.e., low cabin pressure) associated with increased altitude and may lead to a serious inflight emergency.

2. The recommended wait time before going to flight altitudes up to 8,000 feet is at least 12 hours after diving that did not require a controlled ascent (i.e., non-decompression stop diving), and at least 24 hours after diving that required a controlled ascent (i.e., decompression stop diving). The recommended wait time before going to flight altitudes above 8,000 feet is at least 24 hours after any SCUBA dive. These recommended altitudes are actual flight altitudes above mean sea level (AMSL) and not pressurized cabin altitudes. This takes into consideration the risk of aircraft decompression during flight.

8-1-3. Hyperventilation in Flight

a. Hyperventilation, or an abnormal increase in the volume of air breathed in and out of the lungs, can occur subconsciously when a stressful situation is encountered in flight. As hyperventilation “blows off” excessive carbon dioxide from the body, a pilot can experience symptoms of lightheadedness, suffocation, drowsiness, tingling in the extremities, and coolness and react to them with even greater hyperventilation. Incapacitation can eventually result from incoordination, disorientation, and painful muscle spasms. Finally, unconsciousness can occur.

b. The symptoms of hyperventilation subside within a few minutes after the rate and depth of breathing are consciously brought back under control. The buildup of carbon dioxide in the body can be hastened by controlled breathing in and out of a paper bag held over the nose and mouth.

c. Early symptoms of hyperventilation and hypoxia are similar. Moreover, hyperventilation and hypoxia can occur at the same time. Therefore, if a pilot is using an oxygen system when symptoms are experienced, the oxygen regulator should immediately be set to deliver 100 percent oxygen, and then the system checked to assure that it has been functioning effectively before giving attention to rate and depth of breathing.

8-1-4. Carbon Monoxide Poisoning in Flight

a. Carbon monoxide is a colorless, odorless, and tasteless gas contained in exhaust fumes. When breathed even in minute quantities over a period of time, it can significantly reduce the ability of the blood to carry oxygen. Consequently, effects of hypoxia occur.

b. Most heaters in light aircraft work by air flowing over the manifold. Use of these heaters while exhaust fumes are escaping through manifold cracks and seals is responsible every year for several nonfatal and fatal aircraft accidents from carbon monoxide poisoning.

c. A pilot who detects the odor of exhaust or experiences symptoms of headache, drowsiness, or dizziness while using the heater should suspect carbon monoxide poisoning, and immediately shut off the heater and open air vents. If symptoms are severe or continue after landing, medical treatment should be sought.

8-1-5. Illusions in Flight

a. **Introduction.** Many different illusions can be experienced in flight. Some can lead to spatial disorientation. Others can lead to landing errors. Illusions rank among the most common factors cited as contributing to fatal aircraft accidents.

b. Illusions Leading to Spatial Disorientation.

1. Various complex motions and forces and certain visual scenes encountered in flight can create illusions of motion and position. Spatial disorientation from these illusions can be prevented only by visual reference to reliable, fixed points on the ground or to flight instruments.

2. **The leans.** An abrupt correction of a banked attitude, which has been entered too slowly to stimulate the motion sensing system in the inner ear, can create the illusion of banking in the opposite direction. The disoriented pilot will roll the aircraft back into its original dangerous attitude, or if level flight is maintained, will feel compelled to lean in the perceived vertical plane until this illusion subsides.

(a) **Coriolis illusion.** An abrupt head movement in a prolonged constant-rate turn that has ceased stimulating the motion sensing system can create the illusion of rotation or movement in an entirely different axis. The disoriented pilot will maneuver the aircraft into a dangerous attitude in an attempt to stop rotation. This most overwhelming of all illusions in flight may be prevented by not making sudden, extreme head movements, particularly while making prolonged constant-rate turns under IFR conditions.

(b) **Graveyard spin.** A proper recovery from a spin that has ceased stimulating the motion sensing system can create the illusion of spinning in the opposite direction. The disoriented pilot will return the aircraft to its original spin.

(c) **Graveyard spiral.** An observed loss of altitude during a coordinated constant-rate turn that has ceased stimulating the motion sensing system can create the illusion of being in a descent with the wings level. The disoriented pilot will pull back on the controls, tightening the spiral and increasing the loss of altitude.

(d) **Somatogravic illusion.** A rapid acceleration during takeoff can create the illusion of being in a nose up attitude. The disoriented pilot will push the aircraft into a nose low, or dive attitude. A rapid deceleration by a quick reduction of the throttles can have the opposite effect, with the disoriented pilot pulling the aircraft into a nose up, or stall attitude.

(e) **Inversion illusion.** An abrupt change from climb to straight and level flight can create the illusion of tumbling backwards. The disoriented pilot will push the aircraft abruptly into a nose low attitude, possibly intensifying this illusion.

(f) **Elevator illusion.** An abrupt upward vertical acceleration, usually by an updraft, can create the illusion of being in a climb. The disoriented pilot will push the aircraft into a nose low attitude. An abrupt downward vertical acceleration, usually by a downdraft, has the opposite effect, with the disoriented pilot pulling the aircraft into a nose up attitude.

(g) **False horizon.** Sloping cloud formations, an obscured horizon, a dark scene spread with ground lights and stars, and certain geometric patterns of ground light can create illusions of not being aligned correctly with the actual horizon. The disoriented pilot will place the aircraft in a dangerous attitude.

(h) **Autokinesis.** In the dark, a static light will appear to move about when stared at for many seconds. The disoriented pilot will lose control of the aircraft in attempting to align it with the light.

3. Illusions Leading to Landing Errors.

(a) Various surface features and atmospheric conditions encountered in landing can create illusions of incorrect height above and distance from the runway threshold. Landing errors from these illusions can be prevented by anticipating them during approaches, aerial visual inspection of unfamiliar airports before landing, using electronic glide slope or VASI systems when available, and maintaining optimum proficiency in landing procedures.

(b) **Runway width illusion.** A narrower-than-usual runway can create the illusion that the aircraft is at a higher altitude than it actually is. The pilot who does not recognize this illusion will fly a lower approach, with the risk of striking objects along the approach path or landing short. A wider-than-usual runway can have the opposite effect, with the risk of leveling out high and landing hard or overshooting the runway.

Section 2. Special Operations

10-2-1. Offshore Helicopter Operations

a. Introduction

The offshore environment offers unique applications and challenges for helicopter pilots. The mission demands, the nature of oil and gas exploration and production facilities, and the flight environment (weather, terrain, obstacles, traffic), demand special practices, techniques and procedures not found in other flight operations. Several industry organizations have risen to the task of reducing risks in offshore operations, including the Helicopter Safety Advisory Conference (HSAC) (<http://www.hsac.org>), and the Offshore Committee of the Helicopter Association International (HAI) (<https://rotor.org/>). The following recommended practices for offshore helicopter operations are based on guidance developed by HSAC for use in the Gulf of Mexico, and provided here with their permission. While not regulatory, these recommended practices provide aviation and oil and gas industry operators with useful information in developing procedures to avoid certain hazards of offshore helicopter operations.

NOTE-

Like all aviation practices, these recommended practices are under constant review. In addition to normal procedures for comments, suggested changes, or corrections to the AIM (contained in the Preface), any questions or feedback concerning these recommended procedures may also be directed to the HSAC through the feedback feature of the HSAC website (<http://www.hsac.org>).

b. Passenger Management on and about Heliport Facilities

1. Background. Several incidents involving offshore helicopter passengers have highlighted the potential for incidents and accidents on and about the heliport area. The following practices will minimize risks to passengers and others involved in heliport operations.

2. Recommended Practices

(a) Heliport facilities should have a designated and posted passenger waiting area which is clear of the heliport, heliport access points, and stairways.

(b) Arriving passengers and cargo should be unloaded and cleared from the heliport and access route prior to loading departing passengers and cargo.

(c) Where a flight crew consists of more than one pilot, one crewmember should supervise the unloading/loading process from outside the aircraft.

(d) Where practical, a designated facility employee should assist with loading/unloading, etc.

c. Crane-Helicopter Operational Procedures

1. Background. Historical experience has shown that catastrophic consequences can occur when industry safe practices for crane/helicopter operations are not observed. The following recommended practices are designed to minimize risks during crane and helicopter operations.

2. Recommended Practices

(a) Personnel awareness

(1) Crane operators and pilots should develop a mutual understanding and respect of the others' operational limitations and cooperate in the spirit of safety;

(2) Pilots need to be aware that crane operators sometimes cannot release the load to cradle the crane boom, such as when attached to wire line lubricators or supporting diving bells; and

(3) Crane operators need to be aware that helicopters require warm up before takeoff, a two-minute cool down before shutdown, and cannot circle for extended lengths of time because of fuel consumption.

(b) It is recommended that when helicopters are approaching, maneuvering, taking off, or running on the heliport, cranes be shutdown and the operator leave the cab. Cranes not in use must have their booms cradled, if feasible. If in use, the crane's boom(s) are to be pointed away from the heliport and the crane shutdown for helicopter operations.

(c) Pilots will not approach, land on, takeoff, or have rotor blades turning on heliports of structures not complying with the above practice.

(d) It is recommended that cranes on offshore platforms, rigs, vessels, or any other facility, which could interfere with helicopter operations (including approach/departure paths):

(1) Be equipped with a red rotating beacon or red high intensity strobe light connected to the system powering the crane, indicating the crane is under power;

(2) Be designed to allow the operator a maximum view of the helideck area and should be equipped with wide-angle mirrors to eliminate blind spots; and

(3) Have their boom tips, headache balls, and hooks painted with high visibility international orange.

d. Helicopter/Tanker Operations

1. Background. The interface of helicopters and tankers during shipboard helicopter operations is complex and may be hazardous unless appropriate procedures are coordinated among all parties. The following recommended practices are designed to minimize risks during helicopter/tanker operations:

2. Recommended Practices

(a) Management, flight operations personnel, and pilots should be familiar with and apply the operating safety standards set forth in "Guide to Helicopter/Ship Operations", International Chamber of Shipping, Third Edition, 5-89 (as amended), establishing operational guidelines/standards and safe practices sufficient to safeguard helicopter/tanker operations.

(b) Appropriate plans, approvals, and communications must be accomplished prior to reaching the vessel, allowing tanker crews sufficient time to perform required safety preparations and position crew members to receive or dispatch a helicopter safely.

(c) Appropriate approvals and direct communications with the bridge of the tanker must be maintained throughout all helicopter/tanker operations.

(d) Helicopter/tanker operations, including landings/departures, must not be conducted until the helicopter pilot-in-command has received and acknowledged permission from the bridge of the tanker.

(e) Helicopter/tanker operations must not be conducted during product/cargo transfer.

(f) Generally, permission will not be granted to land on tankers during mooring operations or while maneuvering alongside another tanker.

e. Helideck/Heliport Operational Hazard Warning(s) Procedures

1. Background

(a) A number of operational hazards can develop on or near offshore helidecks or onshore heliports that can be minimized through procedures for proper notification or visual warning to pilots. Examples of hazards include but are not limited to:

(1) Perforating operations: subparagraph f.

(2) H₂S gas presence: subparagraph g.

(3) Gas venting: subparagraph h; or,

(4) Closed helidecks or heliports: subparagraph i (unspecified cause).

(b) These and other operational hazards are currently minimized through timely dissemination of a written Notice to Air Missions (NOTAM) for pilots by helicopter companies and operators. A NOTAM provides

- (c) Wind socks or indicator should be clearly visible to provide upward indication for the pilot.

i. Helideck/Heliport Operational Warning(s)/Procedure(s) – Closed Helidecks or Heliports

1. Background. A white “X” marked diagonally from corner to corner across a helideck or heliport touchdown area is the universally accepted visual indicator that the landing area is closed for safety of other reasons and that helicopter operations are not permitted. The following practices are recommended.

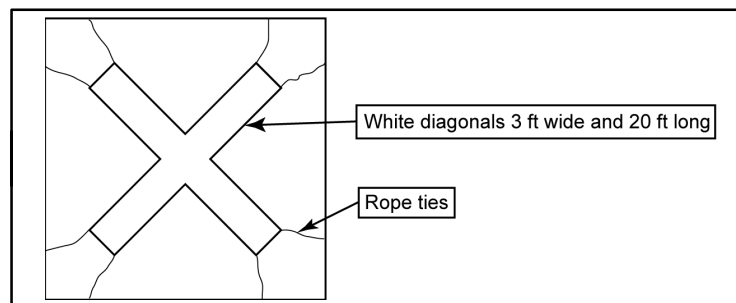
(a) Permanent Closing. If a helideck or heliport is to be permanently closed, X diagonals of the same size and location as indicated above should be used, but the markings should be painted on the landing area.

NOTE–

White Decks: If a helideck is painted white, then international orange or yellow markings can be used for the temporary or permanent diagonals.

(b) Temporary Closing. A temporary marker can be used for hazards of an interim nature. This marker could be made from vinyl or other durable material in the shape of a diagonal “X.” The marker should be white with legs at least 20 feet long and 3 feet in width. This marker is designed to be quickly secured and removed from the deck using grommets and rope ties. The duration, time, location, and nature of these temporary closings should be provided to and coordinated with company aviation departments, nearby helicopter bases, and helicopter operators supporting the area. These markers **MUST** be removed when the hazard no longer exists. (See FIG 10–2–2.)

FIG 10–2–2
Closed Helideck Marking



j. Offshore (VFR) Operating Altitudes for Helicopters

1. Background. Mid-air collisions constitute a significant percentage of total fatal offshore helicopter accidents. A method of reducing this risk is the use of coordinated VFR cruising altitudes. To enhance safety through standardized vertical separation of helicopters when flying in the offshore environment, it is recommended that helicopter operators flying in a particular area establish a cooperatively developed Standard Operating Procedure (SOP) for VFR operating altitudes. An example of such an SOP is contained in this example.

2. Recommended Practice Example

(a) Field Operations. Without compromising minimum safe operating altitudes, helicopters working within an offshore field “constituting a cluster” should use altitudes not to exceed 500 feet.

(b) En Route Operations

(1) Helicopters operating below 750’ AGL should avoid transitioning through offshore fields.

(2) Helicopters en route to and from offshore locations, below 3,000 feet, weather permitting, should use en route altitudes as outlined in TBL 10–2–1.

TBL 10-2-1

Magnetic Heading	Altitude
0° to 179°	750'
	1750'
	2750'
180° to 359°	1250'
	2250'

(c) **Area Agreements.** See HSAC Area Agreement Maps for operating procedures for onshore high density traffic locations.

NOTE–

Pilots of helicopters operating VFR above 3,000 feet above the surface should refer to the current Federal Aviation Regulations (14 CFR Part 91), and paragraph 3-1-4, Basic VFR Weather Minimums, of the AIM.

(d) **Landing Lights.** Aircraft landing lights should be on to enhance aircraft identification:

- (1) During takeoff and landings;
- (2) In congested helicopter or fixed wing traffic areas;
- (3) During reduced visibility; or,
- (4) Anytime safety could be enhanced.

k. Offshore Helidecks/Landing Communications

1. Background. To enhance safety, and provide appropriate time to prepare for helicopter operations, the following is recommended when anticipating a landing on an offshore helideck.

2. Recommended Practices

(a) Before landing on an offshore helideck, pilots are encouraged to establish communications with the company owning or operating the helideck if frequencies exist for that purpose.

(b) When impracticable, or if frequencies do not exist, pilots or operations personnel should attempt to contact the company owning or operating the helideck by telephone. Contact should be made before the pilot departs home base/point of departure to advise of intentions and obtain landing permission if necessary.

NOTE–

It is recommended that communications be established a minimum of 10 minutes prior to planned arrival time. This practice may be a requirement of some offshore owner/operators.

NOTE–

1. See subparagraph 10-2-1d for Tanker Operations.

2. Private use Heliport. Offshore heliports are privately owned/operated facilities and their use is limited to persons having prior authorization to utilize the facility.

l. Two (2) Helicopter Operations on Offshore Helidecks

1. Background. Standardized procedures can enhance the safety of operating a second helicopter on an offshore helideck, enabling pilots to determine/maintain minimum operational parameters. Orientation of the parked helicopter on the helideck, wind and other factors may prohibit multi-helicopter operations. More conservative Rotor Diameter (RD) clearances may be required under differing condition, i.e., temperature, wet deck, wind (velocity/direction/gusts), obstacles, approach/departure angles, etc. Operations are at the pilot's discretion.

2. Recommended Practice. Helideck size, structural weight capability, and type of main rotor on the parked and operating helicopter will aid in determining accessibility by a second helicopter. Pilots should determine that multi-helicopter deck operations are permitted by the helideck owner/operator.

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 more than 0.55 pounds (250 grams).

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/.*

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

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. Night Operations and Operations over People:

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,

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 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 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_fsdo/.
- 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/.

Abbreviation/ Acronym	Meaning
LAWRS	Limited Aviation Weather Reporting Station
LDA	Localizer Type Directional Aid
LDA/PRM . .	Localizer Type Directional Aid/Precision Runway Monitor
LGA	LaGuardia Airport
LIRL	Low Intensity Runway Lights
LLWAS	Low Level Wind Shear Alert System
LLWAS NE .	Low Level Wind Shear Alert System Network Expansion
LLWAS-RS .	Low Level Wind Shear Alert System Relocation/Sustainment
LNAV	Lateral Navigation
LOC	Localizer
LOP	Line-of-position
LORAN	Long Range Navigation System
LP	Localizer Performance
LPV	Localizer Performance with Vertical Guidance
LUAW	Line Up and Wait
LZ	Landing Zone
MAHWP . . .	Missed Approach Holding Waypoint
MAP	Missed Approach Point
MAWP	Missed Approach Waypoint
MDA	Minimum Descent Altitude
MEA	Minimum En Route Altitude
MEARTS . . .	Micro En Route Automated Radar Tracking System
METAR	Aviation Routine Weather Report
MGOW	Maximum Gross Operating Weight
MHz	Megahertz
MIRL	Medium Intensity Runway Lights
MM	Middle Marker
MOA	Military Operations Area
MOCA	Minimum Obstruction Clearance Altitude
MRA	Minimum Reception Altitude
MRB	Magnetic Reference Bearing
MSA	Minimum Safe Altitude
MSAW	Minimum Safe Altitude Warning
MSL	Mean Sea Level
MTI	Moving Target Indicator
MTOS	Mountain Obscuration
MTR	Military Training Route
MVA	Minimum Vectoring Altitude
MWA	Mountain Wave Activity
MWO	Meteorological Watch Office
NAS	National Airspace System
NASA	National Aeronautics and Space Administration

Abbreviation/ Acronym	Meaning
NAVAID	Navigational Aid
NAVCEN . . .	Coast Guard Navigation Center
NCWF	National Convective Weather Forecast
NDB	Nondirectional Radio Beacon
NEXRAD . . .	Next Generation Weather Radar
NGA	National Geospatial-Intelligence Agency
NM	Nautical Mile
NMAC	Near Midair Collision
NOAA	National Oceanic and Atmospheric Administration
NOPAC	North Pacific
NoPT	No Procedure Turn Required
NPA	Nonprecision Approach
NRS	Navigation Reference System
NSA	National Security Area
NSW	No Significant Weather
NTSB	National Transportation Safety Board
NTZ	No Transgression Zone
NWS	National Weather Service
OAT	Outside Air Temperature
OBS	Omni-bearing Selector
ODP	Obstacle Departure Procedure
OIS	Operational Information System
OIS	Obstacle Identification Surface
OM	Outer Marker
OOP	Operations Over People
ORD	Chicago O'Hare International Airport
P/CG	Pilot/Controller Glossary
PA	Precision Approach
PAO	Public Aircraft Operation
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PAR	Preferred Arrival Route
PC	Personal Computer
PDC	Pre-departure Clearance
PFD	Personal Flotation Device
PIC	Pilot-in-Command
PinS	Point-in-Space
PIREP	Pilot Weather Report
POB	Persons on Board
POFZ	Precision Obstacle Free Zone
POI	Principal Operations Inspector
PPS	Precise Positioning Service
PRM	Precision Runway Monitor
PT	Procedure Turn
QICP	Qualified Internet Communications Provider

Abbreviation/ Acronym	Meaning
RA	Resolution Advisory
RAA	Remote Advisory Airport
RAIM	Receiver Autonomous Integrity Monitoring
RAIS	Remote Airport Information Service
RBDT	Ribbon Display Terminals
RC	Radio–Controlled
RCAG	Remote Center Air/Ground
RCC	Rescue Coordination Center
RCLS	Runway Centerline Lighting System
RCO	Remote Communications Outlet
RID	Remote Identification
RPIC	Remote Pilot–in–Command
TAF	Aerodrome Forecast
RD	Rotor Diameter
REIL	Runway End Identifier Lights
REL	Runway Entrance Lights
RFM	Rotorcraft Flight Manual
RLIM	Runway Light Intensity Monitor
RMI	Radio Magnetic Indicator
RNAV	Area Navigation
RNP	Required Navigation Performance
ROC	Required Obstacle Clearance
RPAT	RNP Parallel Approach Runway Transitions
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RWSL	Runway Status Light
SAA	Sense and Avoid
SAFO	Safety Alerts For Operators
SAM	System Area Monitor
SAR	Search and Rescue
SAS	Stability Augmentation System
SATR	Special Air Traffic Rules
SBAS	Satellite–based Augmentation System
SDF	Simplified Directional Facility
SFL	Sequenced Flashing Lights
SFR	Special Flight Rules
SFRA	Special Flight Rules Area
SGI	Special Government Interest
SIAP	Standard Instrument Approach Procedure
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
SM	Statute Mile
SMGCS	Surface Movement Guidance Control System
SNR	Signal–to–noise Ratio
SOIA	Simultaneous Offset Instrument Approaches

Abbreviation/ Acronym	Meaning
SOP	Standard Operating Procedure
SPC	Storm Prediction Center
SPS	Standard Positioning Service
STAR	Standard Terminal Arrival
STARS	Standard Terminal Automation Replacement System
STMP	Special Traffic Management Program
sUAS	Small UAS
TA	Traffic Advisory
TAA	Terminal Arrival Area
TAC	Terminal Area Chart
TACAN	Tactical Air Navigation
TAS	True Air Speed
TCAS	Traffic Alert and Collision Avoidance System
TCH	Threshold Crossing Height
TD	Time Difference
TDLS	Tower Data Link System
TDWR	Terminal Doppler Weather Radar
TDZ	Touchdown Zone
TDZE	Touchdown Zone Elevation
TDZL	Touchdown Zone Lights
TEC	Tower En Route Control
THL	Takeoff Hold Lights
TIS	Traffic Information Service
TIS–B	Traffic Information Service–Broadcast
TLS	Transponder Landing System
TPP	Terminal Procedures Publications
TRSA	Terminal Radar Service Area
TRUST	The Recreational UAS Safety Test
TSO	Technical Standard Order
TWIB	Terminal Weather Information for Pilots System
U.S.	United States
UA	Unmanned Aircraft
UAM	Urban Air Mobility
UAS	Unmanned Aircraft System
UASFM	UAS Facility Map
UAV	Unmanned Aerial Vehicle
UFO	Unidentified Flying Object
UHF	Ultrahigh Frequency
USCG	United States Coast Guard
UTC	Coordinated Universal Time
UTM	UAS Traffic Management
UWS	Urgent Weather SIGMET
UWS	Urgent Weather SIGMET
VAR	Volcanic Activity Reporting

Abbreviation/ Acronym	Meaning
VASI	Visual Approach Slope Indicator
VCOA	Visual Climb Over the Airport
VDA	Vertical Descent Angle
VDP	Visual Descent Point
VFR	Visual Flight Rules
VGSI	Visual Glide Slope Indicator
VHF	Very High Frequency
VIP	Video Integrator Processor
VLOS	Visual Line of Sight
VMC	Visual Meteorological Conditions
V _{MINI}	Instrument flight minimum speed, utilized in complying with minimum limit speed requirements for instrument flight
VNAV	Vertical Navigation
V _{NE}	Never exceed speed
V _{NEI}	Instrument flight never exceed speed, utilized instead of V _{NE} for compliance with maximum limit speed requirements for instrument flight
VO	Visual Observer
VOR	Very High Frequency Omni-directional Range
VORTAC	VHF Omni-directional Range/Tactical Air Navigation
VOT	VOR Test Facility
VR	VFR Military Training Route
V _{REF}	The reference landing approach speed, usually about 1.3 times V _{so} plus 50 percent of the wind gust speed in excess of the mean wind speed.

Abbreviation/ Acronym	Meaning
V _{SO}	The stalling speed or the minimum steady flight speed in the landing configuration at maximum weight.
VTF	Vector to Final
VV	Vertical Visibility
VVI	Vertical Velocity Indicator
V _Y	Speed for best rate of climb
V _{YI}	Instrument climb speed, utilized instead of V _Y for compliance with the climb requirements for instrument flight
WA	AIRMET
WAAS	Wide Area Augmentation System
WFO	Weather Forecast Office
WGS-84	World Geodetic System of 1984
WMO	World Meteorological Organization
WMS	Wide-Area Master Station
WMSC	Weather Message Switching Center
WMSCR	Weather Message Switching Center Replacement
WP	Waypoint
WRA	Weather Reconnaissance Area
WRS	Wide-Area Ground Reference Station
WS	SIGMET
WSO	Weather Service Office
WSP	Weather Systems Processor
WST	Convective Significant Meteorological Information
WW	Severe Weather Watch Bulletin

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

a. The FAA will accept a flight plan in international format for IFR, VFR, SFRA, and DVFR flights. File the flight plan electronically via a Flight Service Station (FSS), FAA contracted flight plan filing service, or other commercial flight plan filing service. Depending on the filing service chosen, the method of entering data may be different but the information required is generally the same.

b. The international flight plan format is mandatory for:

1. Any flight plan filed through a FSS or FAA contracted flight plan filing service; with the exception of Department of Defense flight plans and civilian stereo route flight plans, which can still be filed using the format prescribed in FAA Form 7233-1.

NOTE–

DoD Form DD-175 and FAA Form 7233-1 are considered to follow the same format.

2. Any flight that will depart U.S. domestic airspace. For DoD flight plan purposes, offshore Warning Areas may use FAA Form 7233-1 or military equivalent.

3. Any flight requesting routing that requires Performance Based Navigation.

4. Any flight requesting services that require filing of capabilities only supported in the international flight plan format.

c. Flight Plan Contents

1. A flight plan will include information shown below:

(a) Flight Specific Information (TBL 4-1)

(b) Aircraft Specific Information (TBL 4-19)

(c) Flight Routing Information (TBL 4-20)

(d) Flight Specific Supplementary Information (Item 19)

2. The tables indicate where the information is located in the international flight plan format, the information required for U.S. domestic flights, and the location of equivalent information in the domestic flight plan format.

3. International flights, including those that temporarily leave domestic U.S. airspace and return, require all applicable information in the international flight plan. Additional information can be found in ICAO Doc. 4444 (Procedures for Air Navigation Services, Air Traffic Management), and ICAO Doc. 7030 (Regional Supplemental Procedures) as well as the Aeronautical Information Publications (AIPs), Aeronautical Information Circulars (AICs), and NOTAMs of applicable other countries.

TBL 4-1
Flight Specific Information

Item	International Flight Plan (FAA Form 7233-4)	Domestic U.S. Requirements	Equivalent Item on Domestic Flight Plan (FAA Form 7233-1)
Aircraft Identification	Item 7	Required	Item 2
Flight Rules	Item 8	Required	Item 1
Type of Flight	Item 8	No need to file for domestic U.S. flight	N/A
Equipment and Capabilities	Item 10 Item 18 PBN/; NAV/; COM/; DAT/; SUR/	Required	Item 3
Date of Flight	Item 18 DOF/	Include when date of flight is not today	N/A
Reasons for Special Handling	Item 18 STS/; RMK/	Include when special category is applicable	Item 11
Remarks	Item 18 RMK/	Include when necessary	Item 11
Operator	Item 18 OPR/	No need to file for domestic U.S. flight	N/A
Flight Plan Originator	Item 18 ORGN/	No need to file for domestic U.S. flight	N/A

d. Instructions for Flight-Specific Information Items

1. Aircraft Identification (Item 7) Aircraft Identification is always required. Aircraft identification must not exceed seven alphanumeric characters and be either:

(a) The ICAO designator for the aircraft operating agency, followed by the flight identification (for example, KLM511, NGA213, JTR25). When in radiotelephony the call sign to be used by the aircraft will consist of the ICAO telephony designator for the operating agency followed by the flight identification (for example, KLM511, NIGERIA213, JESTER25);

(b) The nationality or common mark and registration of the aircraft (for example, EIAKO, 4XBCD, N2567GA), when:

(1) In radiotelephony, the call sign to be used by the aircraft will consist of this identification alone (for example, CGAJS) or preceded by the ICAO telephony designator for the aircraft operating agency (for example, BLIZZARD CGAJS); or

(2) The aircraft is not equipped with radio.

NOTE—

1. Standards for nationality, common and registration marks to be used are contained in Annex 7, Chapter 2.

2. Provisions for using radiotelephony call signs are contained in Annex 10, Volume II, Chapter 5. ICAO designators and telephony designators for aircraft operating agencies are contained in Doc 8585—Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services.

NOTE—

Some countries' aircraft identifications begin with a number, which cannot be processed by U.S. ATC automation. The FAA will add a leading letter temporarily to gain automation acceptance for aircraft identifications that begin with a numeral. For flight-processing systems (e.g., ERAM or STARS) which will not accept a call sign that begins with a number, if the call sign is 6 characters or less, add a Q at the beginning of the call sign. If the call sign is 7 characters, delete the first character and replace it with a Q. Put the original call sign in the remarks section of the flight plan.

EXAMPLE—

9HRA becomes Q9HRA

5744233 becomes Q744233

2. Flight Rules (Item 8a)

(a) Flight rules are always required.

EXAMPLE–

DCT APN J177 LEXOR/N0467F380 J177 TAM/N0464F390 J177

6. Delay En Route (Item 15, Item 18 DLE/)

(a) ICAO defines Item 18 DLE/ to provide information about a delay en route. International flights with a delay outside U.S. domestic airspace should indicate the place and duration of the delay in Item 18 DLE/. The delay is expressed by a fix identifier followed by the duration in hours (H) and minutes (M), HHMM.

EXAMPLE–

DLE/EMI0140

(b) U.S. ATC systems will accept but not process information in DLE/. Therefore, for flights in the lower 48 states, it is preferable to include the delay as part of the route (Item 15). Delay in this format is specified by an oblique stroke (/) followed by the letter D, followed by 2 digits for hours (H) of delay, followed by a plus sign (+), followed by 2 digits for minutes (M) of delay: /DHH+MM.

EXAMPLE–

DCT EMI/D01+40 DCT MAPEL/D00+30 V143 DELRO DCT

7. Destination Airport (Item 16, Item 18 DEST/)

(a) Enter the destination airport. The airport should be identified using the four-letter location identifier from FAA Order JO 7350.9, Location Identifiers, or from ICAO Document 7910. FSS and FAA contracted flight plan filing services will allow up to 11 characters in the destination field. This will permit entry of non-ICAO identifier airports, and other fixes such as an intersection, fix/radial/distance, and latitude/longitude coordinates. Other electronic filing services may require a different format.

NOTE–

While user interfaces for flight plan filing are not specified, all flight plan filing services must adhere to the appropriate Interface Control Document upon transmission of the flight plan to the control facility.

(b) When the intended destination (Item 16) is outside of domestic U.S. airspace, or if using the paper version of FAA Form 7233–4, or if the chosen flight plan filing service does not allow non-ICAO airport identifiers in Item 13 or Item 16, use the following ICAO procedure. Enter four Z's (ZZZZ) in Item 13 and include the non-ICAO airport location identifier, fix, or waypoint location in Item 18 DEP/. A text description following the location identifier is permissible in Item 18 DEP/.

EXAMPLE–

DEST/06A MOTON FIELD

DEST/4AK6

DEST/MONTK

DEST /3925N07722W

8. Total Estimated Elapsed Time (Item 16)

All flight plans must include the total estimated elapsed time from departure to destination in hours (H) and minutes (M), format HHMM.

9. Alternate Airport (Item 16, Item 18 ALTN/)

(a) When necessary, specify an alternate airport in Item 16 using the four-letter location identifier from FAA Order 7350.9 or ICAO Document 7910. When the airport does not have a four-letter location identifier, include ZZZZ in Item 16c and file the non-standard identifier in Item 18 ALTN/.

(b) While the FAA does not require filing of alternate airports in the flight plan provided to ATC, rules for establishing alternate airports must be followed.

(c) Adding an alternate may assist during Search and Rescue by identifying additional areas to search.

(d) Although alternate airport information filed in a flight plan will be accepted by air traffic computer systems, it will not be presented to controllers. If diversion to an alternate airport becomes necessary, pilots are expected to notify ATC and request an amended clearance.

EXAMPLE–

ALTN/W50 2W2

10. Estimated Elapsed Times (EET) at boundaries or reporting points (Item 18 EET/)

EETs are required for international or oceanic flights when crossing a Flight Information Region (FIR) boundary. The EET will include the ICAO four-letter location identifier for the FIR followed by the elapsed time to the FIR boundary (e.g., KZNY0245 indicates 2 hours, 45 minutes from departure until the New York FIR boundary).

EXAMPLE–

EET/MMFR0011 MMTY0039 KZAB0105

11. Remarks (Item 18 RMK/)

Enter only those remarks pertinent to ATC or to the clarification of other flight plan information. Items of a personal nature are not accepted.

NOTE–

1. “DVRSN” should be placed in Item 11 only if the pilot/company is requesting priority handling to their original destination from ATC as a result of a diversion as defined in the Pilot/Controller Glossary.

2. Do not assume that remarks will be automatically transmitted to every controller. Specific ATC or en route requests should be made directly to the appropriate controller.

g. Flight Specific Supplemental Information (Item 19)

1. Item 19 data must be included when completing FAA Form 7233–4. This information will be retained by the facility/organization that transmits the flight plan to Air Traffic Control (ATC), for Search and Rescue purposes, but it will not be transmitted to ATC as part of the flight plan.

2. Do not include Supplemental Information as part of Item 18. The information in Item 19 is retained with the flight plan filing service for retrieval only if necessary.

NOTE–

Supplemental Information within Item 19 will be transmitted as a separate message to the destination FSS for VFR flight plans filed with a FSS or FAA contracted flight plan filing service. This will reduce the time necessary to conduct SAR actions should the flight become overdue, as this information will be readily available to the destination Flight Service Station.

3. Minimum required Item 19 entries for a domestic flight are Endurance, Persons on Board, Pilot Name and Contact Information, and Color of Aircraft. Additional entries may be required by foreign air traffic services, or at pilot discretion.

(a) After E/ Enter fuel endurance time in hours and minutes.

(b) After P/ Enter total number of persons on board using up to 30 alphanumeric characters. Enter TBN (to be notified) if the total number of persons is not known at the time of filing.

EXAMPLE–

P/005

P/TBN

P/ON FILE CAPEAIR OPERATIONS

(c) R/ (Radio) Cross out items not carried

(d) S/ (Survival Equipment) Cross out items not carried.

(e) J/ (Jackets) Cross out items not carried.

(f) D/ (Life Raft/Dinghies) Enter number carried and total capacity. Indicate if covered and color.

(g) A/ (Aircraft Color and Markings) Enter aircraft color(s).

EXAMPLE–

White Yellow Blue

4. N/ (Remarks. Not for ATC) select N if no remarks. Enter comments concerning survival equipment and information concerning personal GPS locating service, if utilized. Enter name and contact information for responsible party to verify VFR arrival/closure, if desired. Ensure party will be available for contact at ETA. (for example; FBO is open at ETA)

5. C/ (Pilot) Enter name and contact information, including telephone number, of pilot-in-command. Ensure contact information will be valid at ETA in case SAR is necessary.

FIG 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				
Weather (Destination) (Alternate)	<input type="checkbox"/> Present	Remarks	Report Weather Conditions Aloft			
	<input type="checkbox"/> Forecast		<i>Report immediately weather conditions encountered---particularly cloud tops, upper cloud layers, thunderstorms, ice, turbulence, winds and temperature</i>			
			Position	Altitude	Time	Weather Conditions
Weather (En Route)	<input type="checkbox"/> Present					
	<input type="checkbox"/> Forecast					
	<input type="checkbox"/> Pireps					
Winds Aloft	Best Crzg. Alt.					
Nav. Aid & Comm. Status.	<input type="checkbox"/> Destination					
	<input type="checkbox"/> En Route					
Airport Conditions	<input type="checkbox"/> Destination					
	<input type="checkbox"/> Alternate					
ADIZ	<input type="checkbox"/> Airspace Restrictions					
<p align="center">Civil Aircraft Pilots</p> <p>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 1-19 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).</p> <p><i>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.</i></p>						

PILOT/CONTROLLER GLOSSARY

PURPOSE

a. This Glossary was compiled to promote a common understanding of the terms used in the Air Traffic Control system. It includes those terms which are intended for pilot/controller communications. Those terms most frequently used in pilot/controller communications are printed in ***bold italics***. The definitions are primarily defined in an operational sense applicable to both users and operators of the National Airspace System. Use of the Glossary will preclude any misunderstandings concerning the system's design, function, and purpose.

b. Because of the international nature of flying, terms used in the Lexicon, published by the International Civil Aviation Organization (ICAO), are included when they differ from FAA definitions. These terms are followed by "[ICAO]." For the reader's convenience, there are also cross references to related terms in other parts of the Glossary and to other documents, such as the Code of Federal Regulations (CFR) and the Aeronautical Information Manual (AIM).

c. Terms used in this glossary that apply to flight service station (FSS) roles are included when they differ from air traffic control functions. These terms are followed by "[FSS]."

d. This Glossary will be revised, as necessary, to maintain a common understanding of the system.

EXPLANATION OF CHANGES

e. Terms Added:

AUTOMATED SERVICES

ENHANCED SPECIAL REPORTING SERVICE

FLIGHT DATA

INFLIGHT SERVICES

SE SAR

SPECIALIST-PROVIDED SERVICES

SURVEILLANCE ENHANCED SEARCH AND RESCUE

f. Terms Modified:

PILOT BRIEFING

TRAFFIC PATTERN

g. Editorial/format changes were made where necessary. Revision bars were not used due to the insignificant nature of the changes.

AUTOMATED MUTUAL-ASSISTANCE VESSEL RESCUE SYSTEM– A facility which can deliver, in a matter of minutes, a surface picture (SURPIC) of vessels in the area of a potential or actual search and rescue incident, including their predicted positions and their characteristics.

(See FAA Order JO 7110.65, Para 10–6–4, INFLIGHT CONTINGENCIES.)

AUTOMATED PROBLEM DETECTION (APD)– An Automation Processing capability that compares trajectories in order to predict conflicts.

AUTOMATED PROBLEM DETECTION BOUNDARY (APB)– The adapted distance beyond a facilities boundary defining the airspace within which EDST performs conflict detection.

(See EN ROUTE DECISION SUPPORT TOOL.)

AUTOMATED PROBLEM DETECTION INHIBITED AREA (APDIA)– Airspace surrounding a terminal area within which APD is inhibited for all flights within that airspace.

AUTOMATED SERVICES–Services delivered via an automated system (that is, without human interaction). For example, flight plans, Notices to Air Missions (NOTAM), interactive maps, computer-generated text-to-speech messages, short message service, or email.

AUTOMATED TERMINAL PROXIMITY ALERT (ATPA)– Monitors the separation of aircraft on the Final Approach Course (FAC), displaying a graphical notification (cone and/or mileage) when a potential loss of separation is detected. The warning cone (Yellow) will display at 45 seconds and the alert cone (Red) will display at 24 seconds prior to predicted loss of separation. Current distance between two aircraft on final will be displayed in line 3 of the full data block of the trailing aircraft in corresponding colors.

AUTOMATED WEATHER SYSTEM– Any of the automated weather sensor platforms that collect weather data at airports and disseminate the weather information via radio and/or landline. The systems currently consist of the Automated Surface Observing System (ASOS) and Automated Weather Observation System (AWOS).

AUTOMATED UNICOM– Provides completely automated weather, radio check capability and airport advisory information on an Automated UNICOM system. These systems offer a variety of features, typically selectable by microphone clicks, on the UNICOM frequency. Availability will be published in the Chart Supplement U.S. and approach charts.

AUTOMATIC ALTITUDE REPORT–

(See ALTITUDE READOUT.)

AUTOMATIC ALTITUDE REPORTING– That function of a transponder which responds to Mode C interrogations by transmitting the aircraft's altitude in 100-foot increments.

AUTOMATIC CARRIER LANDING SYSTEM– U.S. Navy final approach equipment consisting of precision tracking radar coupled to a computer data link to provide continuous information to the aircraft, monitoring capability to the pilot, and a backup approach system.

AUTOMATIC DEPENDENT SURVEILLANCE (ADS) [ICAO]– A surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position fixing systems, including aircraft identification, four dimensional position and additional data as appropriate.

AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST (ADS-B)– A surveillance system in which an aircraft or vehicle to be detected is fitted with cooperative equipment in the form of a data link transmitter. The aircraft or vehicle periodically broadcasts its GNSS-derived position and other required information such as identity and velocity, which is then received by a ground-based or space-based receiver for processing and display at an air traffic control facility, as well as by suitably equipped aircraft.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN.)

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT.)

(See COOPERATIVE SURVEILLANCE.)

(See GLOBAL POSITIONING SYSTEM.)

(See SPACE–BASED ADS–B.)

AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN (ADS–B In)– Aircraft avionics capable of receiving ADS–B Out transmissions directly from other aircraft, as well as traffic or weather information transmitted from ground stations.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT.)

(See AUTOMATIC DEPENDENT SURVEILLANCE–REBROADCAST.)

(See FLIGHT INFORMATION SERVICE–BROADCAST.)

(See TRAFFIC INFORMATION SERVICE–BROADCAST.)

AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT (ADS–B Out)– The transmitter onboard an aircraft or ground vehicle that periodically broadcasts its GNSS–derived position along with other required information, such as identity, altitude, and velocity.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN.)

AUTOMATIC DEPENDENT SURVEILLANCE–CONTRACT (ADS–C)– A data link position reporting system, controlled by a ground station, that establishes contracts with an aircraft’s avionics that occur automatically whenever specific events occur, or specific time intervals are reached.

AUTOMATIC DEPENDENT SURVEILLANCE- REBROADCAST (ADS–R)– A datalink translation function of the ADS–B ground system required to accommodate the two separate operating frequencies (978 MHz and 1090 MHz). 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.

AUTOMATIC DIRECTION FINDER– An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional radio beacon (NDB) ground transmitter. Direction is indicated to the pilot as a magnetic bearing or as a relative bearing to the longitudinal axis of the aircraft depending on the type of indicator installed in the aircraft. In certain applications, such as military, ADF operations may be based on airborne and ground transmitters in the VHF/UHF frequency spectrum.

(See BEARING.)

(See NONDIRECTIONAL BEACON.)

AUTOMATIC FLIGHT INFORMATION SERVICE (AFIS) – ALASKA FSSs ONLY– The continuous broadcast of recorded non–control information at airports in Alaska where a FSS provides local airport advisory service. The AFIS broadcast automates the repetitive transmission of essential but routine information such as weather, wind, altimeter, favored runway, braking action, airport NOTAMs, and other applicable information. The information is continuously broadcast over a discrete VHF radio frequency (usually the ASOS/AWOS frequency).

AUTOMATIC TERMINAL INFORMATION SERVICE– The continuous broadcast of recorded noncontrol information in selected terminal areas. Its purpose is to improve controller effectiveness and to relieve frequency congestion by automating the repetitive transmission of essential but routine information; e.g., “Los Angeles information Alfa. One three zero zero Coordinated Universal Time. Weather, measured ceiling two thousand overcast, visibility three, haze, smoke, temperature seven one, dew point five seven, wind two five zero at five, altimeter two niner niner six. I-L-S Runway Two Five Left approach in use, Runway Two Five Right closed, advise you have Alfa.”

(See ICAO term AUTOMATIC TERMINAL INFORMATION SERVICE.)

(Refer to AIM.)

AUTOMATIC TERMINAL INFORMATION SERVICE [ICAO]– The provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts throughout the day or a specified portion of the day.

AUTOROTATION– A rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.

E

EAS–

(See EN ROUTE AUTOMATION SYSTEM.)

EDCT–

(See EXPECT DEPARTURE CLEARANCE TIME.)

EDST–

(See EN ROUTE DECISION SUPPORT TOOL)

EFC–

(See EXPECT FURTHER CLEARANCE (TIME).)

ELT–

(See EMERGENCY LOCATOR TRANSMITTER.)

EMBEDDED ROUTE TEXT– An EDST notification that an ADR/ADAR/AAR has been applied to the flight plan. Within the route field, sub-fields consisting of an adapted route or an embedded change in the route are color-coded in cyan with cyan brackets around the sub-field.

(See EN ROUTE DECISION SUPPORT TOOL.)

EMERGENCY– A distress or an urgency condition.

EMERGENCY AUTOLAND SYSTEM– This system, if activated, will determine an optimal airport, plot a course, broadcast the aircraft's intentions, fly to the airport, land, and (depending on the model) shut down the engines. Though the system will broadcast the aircraft's intentions, the controller should assume that transmissions to the aircraft will not be acknowledged.

EMERGENCY DESCENT MODE– This automated system senses conditions conducive to hypoxia (cabin depressurization). If an aircraft is equipped and the system is activated, it is designed to turn the aircraft up to 90 degrees, then descend to a lower altitude and level off, giving the pilot(s) time to recover.

EMERGENCY LOCATOR TRANSMITTER (ELT)– A radio transmitter attached to the aircraft structure which operates from its own power source on 121.5 MHz and 243.0 MHz. It aids in locating downed aircraft by radiating a downward sweeping audio tone, 2-4 times per second. It is designed to function without human action after an accident.

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

E-MSAW–

(See EN ROUTE MINIMUM SAFE ALTITUDE WARNING.)

ENHANCED FLIGHT VISION SYSTEM (EFVS)– An EFVS is an installed aircraft system which uses an electronic means to provide a display of the forward external scene topography (the natural or man-made features of a place or region especially in a way to show their relative positions and elevation) through the use of imaging sensors, including but not limited to forward-looking infrared, millimeter wave radiometry, millimeter wave radar, or low-light level image intensification. An EFVS includes the display element, sensors, computers and power supplies, indications, and controls. An operator's authorization to conduct an EFVS operation may have provisions which allow pilots to conduct IAPs when the reported weather is below minimums prescribed on the IAP to be flown.

ENHANCED SPECIAL REPORTING SERVICE (eSRS)– An automated service used to enhance search and rescue operations that provides flight service specialists in Alaska direct information from the aircraft's registered tracking device.

EN ROUTE AIR TRAFFIC CONTROL SERVICES– Air traffic control service provided aircraft on IFR flight plans, generally by centers, when these aircraft are operating between departure and destination terminal areas.

When equipment, capabilities, and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

(See AIR ROUTE TRAFFIC CONTROL CENTER.)

(Refer to AIM.)

EN ROUTE AUTOMATION SYSTEM (EAS)– The complex integrated environment consisting of situation display systems, surveillance systems and flight data processing, remote devices, decision support tools, and the related communications equipment that form the heart of the automated IFR air traffic control system. It interfaces with automated terminal systems and is used in the control of en route IFR aircraft.

(Refer to AIM.)

EN ROUTE CHARTS–

(See AERONAUTICAL CHART.)

EN ROUTE DECISION SUPPORT TOOL (EDST)– An automated tool provided at each Radar Associate position in selected En Route facilities. This tool utilizes flight and radar data to determine present and future trajectories for all active and proposal aircraft and provides enhanced automated flight data management.

EN ROUTE DESCENT– Descent from the en route cruising altitude which takes place along the route of flight.

EN ROUTE HIGH ALTITUDE CHARTS–

(See AERONAUTICAL CHART.)

EN ROUTE LOW ALTITUDE CHARTS–

(See AERONAUTICAL CHART.)

EN ROUTE MINIMUM SAFE ALTITUDE WARNING (E-MSAW)– A function of the EAS that aids the controller by providing an alert when a tracked aircraft is below or predicted by the computer to go below a predetermined minimum IFR altitude (MIA).

EN ROUTE TRANSITION–

(See SEGMENTS OF A SID/STAR.)

EN ROUTE TRANSITION WAYPOINT

(See SEGMENTS OF A SID/STAR.)

eSRS–

(See ENHANCED SPECIAL REPORTING SERVICE.)

EST–

(See ESTIMATED.)

ESTABLISHED– To be stable or fixed at an altitude or on a course, route, route segment, heading, instrument approach or departure procedure, etc.

ESTABLISHED ON RNP (EoR) CONCEPT– A system of authorized instrument approaches, ATC procedures, surveillance, and communication requirements that allow aircraft operations to be safely conducted with approved reduced separation criteria once aircraft are established on a PBN segment of a published instrument flight procedure.

ESTIMATED (EST)–When used in NOTAMs “EST” is a contraction that is used by the issuing authority only when the condition is expected to return to service prior to the expiration time. Using “EST” lets the user know that this NOTAM has the possibility of returning to service earlier than the expiration time. Any NOTAM which includes an “EST” will be auto-expired at the designated expiration time.

ESTIMATED ELAPSED TIME [ICAO]– The estimated time required to proceed from one significant point to another.

(See ICAO Term TOTAL ESTIMATED ELAPSED TIME.)

ESTIMATED OFF-BLOCK TIME [ICAO]– The estimated time at which the aircraft will commence movement associated with departure.

ESTIMATED POSITION ERROR (EPE)–

(See Required Navigation Performance)

ESTIMATED TIME OF ARRIVAL– The time the flight is estimated to arrive at the gate (scheduled operators) or the actual runway on times for nonscheduled operators.

ESTIMATED TIME EN ROUTE– The estimated flying time from departure point to destination (lift-off to touchdown).

ETA–

(See ESTIMATED TIME OF ARRIVAL.)

ETE–

(See ESTIMATED TIME EN ROUTE.)

EXECUTE MISSED APPROACH– Instructions issued to a pilot making an instrument approach which means continue inbound to the missed approach point and execute the missed approach procedure as described on the Instrument Approach Procedure Chart or as previously assigned by ATC. The pilot may climb immediately to the altitude specified in the missed approach procedure upon making a missed approach. No turns should be initiated prior to reaching the missed approach point. When conducting an ASR or PAR approach, execute the assigned missed approach procedure immediately upon receiving instructions to “execute missed approach.”

(Refer to AIM.)

EXPECT (ALTITUDE) AT (TIME) or (FIX)– Used under certain conditions to provide a pilot with an altitude to be used in the event of two-way communications failure. It also provides altitude information to assist the pilot in planning.

(Refer to AIM.)

EXPECT DEPARTURE CLEARANCE TIME (EDCT)– The runway release time assigned to an aircraft in a traffic management program and shown on the flight progress strip as an EDCT.

(See GROUND DELAY PROGRAM.)

EXPECT FURTHER CLEARANCE (TIME)– The time a pilot can expect to receive clearance beyond a clearance limit.

EXPECT FURTHER CLEARANCE VIA (AIRWAYS, ROUTES OR FIXES)– Used to inform a pilot of the routing he/she can expect if any part of the route beyond a short range clearance limit differs from that filed.

EXPEDITE– Used by ATC when prompt compliance is required to avoid the development of an imminent situation. Expedite climb/descent normally indicates to a pilot that the approximate best rate of climb/descent should be used without requiring an exceptional change in aircraft handling characteristics.

FINAL MONITOR CONTROLLER– Air Traffic Control Specialist assigned to radar monitor the flight path of aircraft during simultaneous parallel (approach courses spaced less than 9000 feet/9200 feet above 5000 feet) and simultaneous close parallel approach operations. Each runway is assigned a final monitor controller during simultaneous parallel and simultaneous close parallel ILS approaches.

FIR–

(See **FLIGHT INFORMATION REGION**.)

FIRST PERSON VIEW– UAS operation in which imagery is transmitted to the UAS pilot by an onboard UA camera.

FIRST TIER CENTER– An ARTCC immediately adjacent to the impacted center.

FIS-B–

(See **FLIGHT INFORMATION SERVICE-BROADCAST**.)

FIX– A geographical position determined by visual reference to the surface, by reference to one or more radio NAVAIDs, by celestial plotting, or by another navigational device.

FIX BALANCING– A process whereby aircraft are evenly distributed over several available arrival fixes reducing delays and controller workload.

FLAG– A warning device incorporated in certain airborne navigation and flight instruments indicating that:

- a. Instruments are inoperative or otherwise not operating satisfactorily, or
- b. Signal strength or quality of the received signal falls below acceptable values.

FLAG ALARM–

(See **FLAG**.)

FLAMEOUT– An emergency condition caused by a loss of engine power.

FLAMEOUT PATTERN– An approach normally conducted by a single-engine military aircraft experiencing loss or anticipating loss of engine power or control. The standard overhead approach starts at a relatively high altitude over a runway (“high key”) followed by a continuous 180 degree turn to a high, wide position (“low key”) followed by a continuous 180 degree turn final. The standard straight-in pattern starts at a point that results in a straight-in approach with a high rate of descent to the runway. Flameout approaches terminate in the type approach requested by the pilot (normally fullstop).

FLIGHT CHECK– A call sign prefix used by FAA aircraft engaged in flight inspection/certification of navigational aids and flight procedures. The word “recorded” may be added as a suffix; e.g., “Flight Check 320 recorded” to indicate that an automated flight inspection is in progress in terminal areas.

(See **FLIGHT INSPECTION**.)

(Refer to **AIM**.)

FLIGHT DATA [FSS]– The primary task of the FSS flight data position is information management. Flight data services include the development, translation, processing, and coordination of aeronautical, meteorological, and aviation information.

FLIGHT FOLLOWING–

(See **TRAFFIC ADVISORIES**.)

FLIGHT INFORMATION REGION– An airspace of defined dimensions within which Flight Information Service and Alerting Service are provided.

a. **Flight Information Service**. A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

b. **Alerting Service**. A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid and to assist such organizations as required.

FLIGHT INFORMATION SERVICE– A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

FLIGHT INFORMATION SERVICE–BROADCAST (FIS–B)– A ground broadcast service provided through the ADS–B Broadcast Services network over the UAT data link that operates on 978 MHz. The FIS–B system provides pilots and flight crews of properly equipped aircraft with a cockpit display of certain aviation weather and aeronautical information.

FLIGHT INSPECTION– Inflight investigation and evaluation of a navigational aid to determine whether it meets established tolerances.

(See FLIGHT CHECK.)

(See NAVIGATIONAL AID.)

FLIGHT LEVEL– A level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. For example, flight level (FL) 250 represents a barometric altimeter indication of 25,000 feet; FL 255, an indication of 25,500 feet.

(See ICAO term FLIGHT LEVEL.)

FLIGHT LEVEL [ICAO]– A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hPa (1013.2 mb), and is separated from other such surfaces by specific pressure intervals.

Note 1: A pressure type altimeter calibrated in accordance with the standard atmosphere:

- a. When set to a QNH altimeter setting, will indicate altitude;
- b. When set to a QFE altimeter setting, will indicate height above the QFE reference datum; and
- c. When set to a pressure of 1013.2 hPa (1013.2 mb), may be used to indicate flight levels.

Note 2: The terms ‘height’ and ‘altitude,’ used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

FLIGHT LINE– A term used to describe the precise movement of a civil photogrammetric aircraft along a predetermined course(s) at a predetermined altitude during the actual photographic run.

FLIGHT MANAGEMENT SYSTEMS– A computer system that uses a large data base to allow routes to be preprogrammed and fed into the system by means of a data loader. The system is constantly updated with respect to position accuracy by reference to conventional navigation aids. The sophisticated program and its associated data base ensures that the most appropriate aids are automatically selected during the information update cycle.

FLIGHT PATH– A line, course, or track along which an aircraft is flying or intended to be flown.

(See COURSE.)

(See TRACK.)

FLIGHT PLAN– Specified information relating to the intended flight of an aircraft that is filed electronically, orally, or in writing with an FSS, third–party vendor, or an ATC facility.

(See FAST FILE.)

(See FILED.)

(Refer to AIM.)

FLIGHT PLAN AREA (FPA)– The geographical area assigned to a flight service station (FSS) for the purpose of establishing primary responsibility for services that may include search and rescue for VFR aircraft, issuance of NOTAMs, pilot briefings, inflight services, broadcast services, emergency services, flight data processing, international operations, and aviation weather services. Large consolidated FSS facilities may combine FPAs into larger areas of responsibility (AOR).

(See FLIGHT SERVICE STATION.)

(See TIE-IN FACILITY.)

FLIGHT RECORDER– A general term applied to any instrument or device that records information about the performance of an aircraft in flight or about conditions encountered in flight. Flight recorders may make records of airspeed, outside air temperature, vertical acceleration, engine RPM, manifold pressure, and other pertinent variables for a given flight.

(See ICAO term FLIGHT RECORDER.)

FLIGHT RECORDER [ICAO]– Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Note: See Annex 6 Part I, for specifications relating to flight recorders.

FLIGHT SERVICE STATION (FSS)– An air traffic facility which provides pilot briefings, flight plan processing, en route flight advisories, search and rescue services, and assistance to lost aircraft and aircraft in emergency situations. FSS also relay ATC clearances, process Notices to Air Missions, and broadcast aviation weather and aeronautical information. In Alaska, FSS provide Airport Advisory Services.

(See FLIGHT PLAN AREA.)

(See TIE-IN FACILITY.)

FLIGHT STANDARDS DISTRICT OFFICE– An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc.

FLIGHT TERMINATION– The intentional and deliberate process of terminating the flight of a UA in the event of an unrecoverable lost link, loss of control, or other failure that compromises the safety of flight.

FLIGHT TEST– A flight for the purpose of:

- a. Investigating the operation/flight characteristics of an aircraft or aircraft component.
- b. Evaluating an applicant for a pilot certificate or rating.

FLIGHT VISIBILITY–

(See VISIBILITY.)

FLIP–

(See DoD FLIP.)

FLY-BY WAYPOINT– A fly-by waypoint requires the use of turn anticipation to avoid overshoot of the next flight segment.

FLY HEADING (DEGREES)– Informs the pilot of the heading he/she should fly. The pilot may have to turn to, or continue on, a specific compass direction in order to comply with the instructions. The pilot is expected to turn in the shorter direction to the heading unless otherwise instructed by ATC.

FLY-OVER WAYPOINT– A fly-over waypoint precludes any turn until the waypoint is overflowed and is followed by an intercept maneuver of the next flight segment.

FLY VISUAL TO AIRPORT–

(See PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT.)

FLYAWAY– When the pilot is unable to effect control of the aircraft and, as a result, the UA is not operating in a predictable or planned manner.

FMA–

(See FINAL MONITOR AID.)

FMS–

(See FLIGHT MANAGEMENT SYSTEM.)

FORMATION FLIGHT– More than one aircraft which, by prior arrangement between the pilots, operate as a single aircraft with regard to navigation and position reporting. Separation between aircraft within the formation is the responsibility of the flight leader and the pilots of the other aircraft in the flight. This includes transition periods when aircraft within the formation are maneuvering to attain separation from each other to effect individual control and during join-up and breakaway.

a. A standard formation is one in which a proximity of no more than 1 mile laterally or longitudinally and within 100 feet vertically from the flight leader is maintained by each wingman.

b. Nonstandard formations are those operating under any of the following conditions:

1. When the flight leader has requested and ATC has approved other than standard formation dimensions.

2. When operating within an authorized altitude reservation (ALTRV) or under the provisions of a letter of agreement.

3. When the operations are conducted in airspace specifically designed for a special activity.

(See ALTITUDE RESERVATION.)

(Refer to 14 CFR Part 91.)

FRC–

(See REQUEST FULL ROUTE CLEARANCE.)

FREEZE/FROZEN– Terms used in referring to arrivals which have been assigned ACLTs and to the lists in which they are displayed.

FREEZE HORIZON– The time or point at which an aircraft's STA becomes fixed and no longer fluctuates with each radar update. This setting ensures a constant time for each aircraft, necessary for the metering controller to plan his/her delay technique. This setting can be either in distance from the meter fix or a prescribed flying time to the meter fix.

FREEZE SPEED PARAMETER– A speed adapted for each aircraft to determine fast and slow aircraft. Fast aircraft freeze on parameter FCLT and slow aircraft freeze on parameter MLDI.

FRIA–

(See FAA–RECOGNIZED IDENTIFICATION AREA.)

FRICTION MEASUREMENT– A measurement of the friction characteristics of the runway pavement surface using continuous self-watering friction measurement equipment in accordance with the specifications, procedures and schedules contained in AC 150/5320–12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces.

FSDO–

(See FLIGHT STANDARDS DISTRICT OFFICE.)

FSPD–

(See FREEZE SPEED PARAMETER.)

FSS–

(See FLIGHT SERVICE STATION.)

FUEL DUMPING– Airborne release of usable fuel. This does not include the dropping of fuel tanks.

(See JETTISONING OF EXTERNAL STORES.)

FUEL REMAINING– A phrase used by either pilots or controllers when relating to the fuel remaining on board until actual fuel exhaustion. When transmitting such information in response to either a controller question or pilot initiated cautionary advisory to air traffic control, pilots will state the APPROXIMATE NUMBER OF MINUTES the flight can continue with the fuel remaining. All reserve fuel SHOULD BE INCLUDED in the time stated, as should an allowance for established fuel gauge system error.

FUEL SIPHONING– Unintentional release of fuel caused by overflow, puncture, loose cap, etc.

FUEL VENTING–

(See FUEL SIPHONING.)

FUSED TARGET–

(See DIGITAL TARGET)

FUSION [STARS]– the combination of all available surveillance sources (airport surveillance radar [ASR], air route surveillance radar [ARSR], ADS-B, etc.) into the display of a single tracked target for air traffic control separation services. FUSION is the equivalent of the current single-sensor radar display. FUSION performance

is characteristic of a single-sensor radar display system. Terminal areas use mono-pulse secondary surveillance radar (ASR 9, Mode S or ASR 11, MSSR).

IFWP– Intermediate Fix Waypoint

ILS–

(See INSTRUMENT LANDING SYSTEM.)

ILS CATEGORIES– 1. Category I. An ILS approach procedure which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.– 2. Special Authorization Category I. An ILS approach procedure which provides for approach to a height above touchdown of not less than 150 feet and with runway visual range of not less than 1,400 feet, HUD to DH. 3. Category II. An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet (with autoland or HUD to touchdown and noted on authorization, RVR 1,000 feet).– 4. Special Authorization Category II with Reduced Lighting. An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet with autoland or HUD to touchdown and noted on authorization (no touchdown zone and centerline lighting are required).– 5. Category III:

a. IIIA.–An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.

b. IIIB.–An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.

c. IIIC.–An ILS approach procedure which provides for approach without a decision height minimum and without runway visual range minimum.

IM–

(See INNER MARKER.)

IMC–

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

IMMEDIATELY– Used by ATC or pilots when such action compliance is required to avoid an imminent situation.

INCERFA (Uncertainty Phase) [ICAO]– A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

INCREASED SEPARATION REQUIRED (ISR)– Indicates the confidence level of the track requires 5 NM separation. 3 NM separation, 1 ½ NM separation, and target resolution cannot be used.

INCREASE SPEED TO (SPEED)–

(See SPEED ADJUSTMENT.)

INERTIAL NAVIGATION SYSTEM (INS)– An RNAV system which is a form of self-contained navigation.

(See Area Navigation/RNAV.)

INFLIGHT REFUELING–

(See AERIAL REFUELING.)

INFLIGHT SERVICES [FSS]– Services provided to or affecting aircraft inflight or otherwise operating on the airport surface. This includes services to airborne aircraft, such as the delivery of ATC clearances, advisories or requests, issuance of military flight advisory messages, NOTAM delivery, search and rescue communications searches, flight plan handling, transcribed or live broadcasts, weather observations, PIREPs, and pilot briefings.

INFLIGHT WEATHER ADVISORY–

(See WEATHER ADVISORY.)

INFORMATION REQUEST (INREQ)– A request originated by an FSS for information concerning an overdue VFR aircraft.

INITIAL APPROACH FIX (IAF)– The fixes depicted on instrument approach procedure charts that identify the beginning of the initial approach segment(s).

(See FIX.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

INITIAL APPROACH SEGMENT–

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

INITIAL APPROACH SEGMENT [ICAO]– That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

INLAND NAVIGATION FACILITY– A navigation aid on a North American Route at which the common route and/or the noncommon route begins or ends.

INNER MARKER– A marker beacon used with an ILS (CAT II) precision approach located between the middle marker and the end of the ILS runway, transmitting a radiation pattern keyed at six dots per second and indicating to the pilot, both aurally and visually, that he/she is at the designated decision height (DH), normally 100 feet above the touchdown zone elevation, on the ILS CAT II approach. It also marks progress during a CAT III approach.

(See INSTRUMENT LANDING SYSTEM.)

(Refer to AIM.)

INNER MARKER BEACON–

(See INNER MARKER.)

INREQ–

(See INFORMATION REQUEST.)

INS–

(See INERTIAL NAVIGATION SYSTEM.)

INSTRUMENT APPROACH–

(See INSTRUMENT APPROACH PROCEDURE.)

INSTRUMENT APPROACH OPERATIONS [ICAO]– An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

- a.** A two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and
- b.** A three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note: Lateral and vertical navigation guidance refers to the guidance provided either by:

- a) a ground-based radio navigation aid; or
- b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

(See ICAO term INSTRUMENT APPROACH PROCEDURE.)

INSTRUMENT APPROACH PROCEDURE– A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

a. U.S. civil standard instrument approach procedures are approved by the FAA as prescribed under 14 CFR Part 97 and are available for public use.

b. U.S. military standard instrument approach procedures are approved and published by the Department of Defense.

c. Special instrument approach procedures are approved by the FAA for individual operators but are not published in 14 CFR Part 97 for public use.

(See ICAO term INSTRUMENT APPROACH PROCEDURE.)

INSTRUMENT APPROACH PROCEDURE [ICAO]– A series of predetermined maneuvers by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

(See ICAO term **INSTRUMENT APPROACH OPERATIONS**)

INSTRUMENT APPROACH PROCEDURE CHARTS–

(See **AERONAUTICAL CHART**.)

INSTRUMENT DEPARTURE PROCEDURE (DP)– A preplanned instrument flight rule (IFR) departure procedure published for pilot use, in graphic or textual format, that provides obstruction clearance from the terminal area to the appropriate en route structure. There are two types of DP, Obstacle Departure Procedure (ODP), printed either textually or graphically, and, Standard Instrument Departure (SID), which is always printed graphically.

(See **IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES**.)

(See **OBSTACLE DEPARTURE PROCEDURES**.)

(See **STANDARD INSTRUMENT DEPARTURES**.)

(Refer to **AIM**.)

INSTRUMENT DEPARTURE PROCEDURE (DP) CHARTS–

(See **AERONAUTICAL CHART**.)

INSTRUMENT FLIGHT RULES (IFR)– Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

(See **INSTRUMENT METEOROLOGICAL CONDITIONS**.)

(See **VISUAL FLIGHT RULES**.)

(See **VISUAL METEOROLOGICAL CONDITIONS**.)

(See ICAO term **INSTRUMENT FLIGHT RULES**.)

(Refer to **AIM**.)

INSTRUMENT FLIGHT RULES [ICAO]– A set of rules governing the conduct of flight under instrument meteorological conditions.

INSTRUMENT LANDING SYSTEM (ILS)– A precision instrument approach system which normally consists of the following electronic components and visual aids:

a. Localizer.

(See **LOCALIZER**.)

b. Glideslope.

(See **GLIDESLOPE**.)

c. Outer Marker.

(See **OUTER MARKER**.)

d. Middle Marker.

(See **MIDDLE MARKER**.)

e. Approach Lights.

(See **AIRPORT LIGHTING**.)

(Refer to 14 CFR Part 91.)

(Refer to **AIM**.)

INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)– Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling less than the minima specified for visual meteorological conditions.

(See **INSTRUMENT FLIGHT RULES**.)

(See **VISUAL FLIGHT RULES**.)

(See **VISUAL METEOROLOGICAL CONDITIONS**.)

INSTRUMENT RUNWAY– A runway equipped with electronic and visual navigation aids for which a precision or nonprecision approach procedure having straight-in landing minimums has been approved.

(See ICAO term **INSTRUMENT RUNWAY**.)

INSTRUMENT RUNWAY [ICAO]– One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

- a. Nonprecision Approach Runway**– An instrument runway served by visual aids and a nonvisual aid providing at least directional guidance adequate for a straight-in approach.
- b. Precision Approach Runway, Category I**– An instrument runway served by ILS and visual aids intended for operations down to 60 m (200 feet) decision height and down to an RVR of the order of 800 m.
- c. Precision Approach Runway, Category II**– An instrument runway served by ILS and visual aids intended for operations down to 30 m (100 feet) decision height and down to an RVR of the order of 400 m.
- d. Precision Approach Runway, Category III**– An instrument runway served by ILS to and along the surface of the runway and:
 - 1.** Intended for operations down to an RVR of the order of 200 m (no decision height being applicable) using visual aids during the final phase of landing;
 - 2.** Intended for operations down to an RVR of the order of 50 m (no decision height being applicable) using visual aids for taxiing;
 - 3.** Intended for operations without reliance on visual reference for landing or taxiing.

Note 1: See Annex 10 Volume I, Part I, Chapter 3, for related ILS specifications.

Note 2: Visual aids need not necessarily be matched to the scale of nonvisual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.

INTEGRATED DEPARTURE/ARRIVAL CAPABILITY (IDAC)– A Tower/TRACON departure scheduling capability within TBFM that allows departures to be scheduled into either an arrival flow or an en route flow. IDAC provides a mechanism for electronic coordination of departure release times.

INTEGRITY– The ability of a system to provide timely warnings to users when the system should not be used for navigation.

INTERMEDIATE APPROACH SEGMENT–

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

INTERMEDIATE APPROACH SEGMENT [ICAO]– That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, race track or dead reckoning track procedure and the final approach fix or point, as appropriate.

INTERMEDIATE FIX– The fix that identifies the beginning of the intermediate approach segment of an instrument approach procedure. The fix is not normally identified on the instrument approach chart as an intermediate fix (IF).

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

INTERMEDIATE LANDING– On the rare occasion that this option is requested, it should be approved. The departure center, however, must advise the ATCSCC so that the appropriate delay is carried over and assigned at the intermediate airport. An intermediate landing airport within the arrival center will not be accepted without coordination with and the approval of the ATCSCC.

INTERNATIONAL AIRPORT– Relating to international flight, it means:

- a.** An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for customs service.
- b.** A landing rights airport at which specific permission to land must be obtained from customs authorities in advance of contemplated use.
- c.** Airports designated under the Convention on International Civil Aviation as an airport for use by international commercial air transport and/or international general aviation.

(See ICAO term INTERNATIONAL AIRPORT.)

(Refer to Chart Supplement U.S.)

INTERNATIONAL AIRPORT [ICAO]– Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

NON-COOPERATIVE SURVEILLANCE– Any surveillance system, such as primary radar, that is not dependent upon the presence of any equipment on the aircraft or vehicle to be tracked.

(See COOPERATIVE SURVEILLANCE.)

(See RADAR.)

NONDIRECTIONAL BEACON– An L/MF or UHF radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and “home” on or track to or from the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

(See AUTOMATIC DIRECTION FINDER.)

(See COMPASS LOCATOR.)

NONMOVEMENT AREAS– Taxiways and apron (ramp) areas not under the control of air traffic.

NONPRECISION APPROACH–

(See NONPRECISION APPROACH PROCEDURE.)

NONPRECISION APPROACH PROCEDURE– A standard instrument approach procedure in which no electronic glideslope is provided; e.g., VOR, TACAN, NDB, LOC, ASR, LDA, or SDF approaches.

NONRADAR– Precedes other terms and generally means without the use of radar, such as:

a. Nonradar Approach. Used to describe instrument approaches for which course guidance on final approach is not provided by ground-based precision or surveillance radar. Radar vectors to the final approach course may or may not be provided by ATC. Examples of nonradar approaches are VOR, NDB, TACAN, ILS, RNAV, and GLS approaches.

(See FINAL APPROACH COURSE.)

(See FINAL APPROACH-IFR.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See RADAR APPROACH.)

b. Nonradar Approach Control. An ATC facility providing approach control service without the use of radar.

(See APPROACH CONTROL FACILITY.)

(See APPROACH CONTROL SERVICE.)

c. Nonradar Arrival. An aircraft arriving at an airport without radar service or at an airport served by a radar facility and radar contact has not been established or has been terminated due to a lack of radar service to the airport.

(See RADAR ARRIVAL.)

(See RADAR SERVICE.)

d. Nonradar Route. A flight path or route over which the pilot is performing his/her own navigation. The pilot may be receiving radar separation, radar monitoring, or other ATC services while on a nonradar route.

(See RADAR ROUTE.)

e. Nonradar Separation. The spacing of aircraft in accordance with established minima without the use of radar; e.g., vertical, lateral, or longitudinal separation.

(See RADAR SEPARATION.)

NON-RESTRICTIVE ROUTING (NRR)– Portions of a proposed route of flight where a user can flight plan the most advantageous flight path with no requirement to make reference to ground-based NAVAIDs.

NOPAC–

(See NORTH PACIFIC.)

NORDO (No Radio)– Aircraft that cannot or do not communicate by radio when radio communication is required are referred to as “NORDO.”

(See LOST COMMUNICATIONS.)

NORMAL OPERATING ZONE (NOZ)– The NOZ is the operating zone within which aircraft flight remains during normal independent simultaneous parallel ILS approaches.

NORTH AMERICAN ROUTE– A numerically coded route preplanned over existing airway and route systems to and from specific coastal fixes serving the North Atlantic. North American Routes consist of the following:

- a.** Common Route/Portion. That segment of a North American Route between the inland navigation facility and the coastal fix.
- b.** Noncommon Route/Portion. That segment of a North American Route between the inland navigation facility and a designated North American terminal.
- c.** Inland Navigation Facility. A navigation aid on a North American Route at which the common route and/or the noncommon route begins or ends.
- d.** Coastal Fix. A navigation aid or intersection where an aircraft transitions between the domestic route structure and the oceanic route structure.

NORTH AMERICAN ROUTE PROGRAM (NRP)– The NRP is a set of rules and procedures which are designed to increase the flexibility of user flight planning within published guidelines.

NORTH ATLANTIC HIGH LEVEL AIRSPACE (NAT HLA)– That volume of airspace (as defined in ICAO Document 7030) between FL 285 and FL 420 within the Oceanic Control Areas of Bodo Oceanic, Gander Oceanic, New York Oceanic East, Reykjavik, Santa Maria, and Shanwick, excluding the Shannon and Brest Ocean Transition Areas. ICAO Doc 007 *North Atlantic Operations and Airspace Manual* provides detailed information on related aircraft and operational requirements.

NORTH PACIFIC– An organized route system between the Alaskan west coast and Japan.

NOT STANDARD– Varying from what is expected or published. For use in NOTAMs only.

NOT STD-

(See NOT STANDARD.)

NOTAM–

(See NOTICE TO AIR MISSIONS.)

NOTAM [ICAO]– A notice containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

- a.** I Distribution– Distribution by means of telecommunication.
- b.** II Distribution– Distribution by means other than telecommunications.

NOTICE TO AIR MISSIONS (NOTAM)– A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

a. NOTAM (D)– A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the Flight Service Station. These NOTAMs will be stored and available until canceled.

b. FDC NOTAM– A NOTAM regulatory in nature, transmitted by USNOF and given system wide dissemination.

(See ICAO term NOTAM.)

NRR–

(See NON-RESTRICTIVE ROUTING.)

NRS–

(See NAVIGATION REFERENCE SYSTEM.)

NUMEROUS TARGETS VICINITY (LOCATION)– A traffic advisory issued by ATC to advise pilots that targets on the radar scope are too numerous to issue individually.

(See TRAFFIC ADVISORIES.)

P

P TIME–

(See PROPOSED DEPARTURE TIME.)

P-ACP–

(See PREARRANGED COORDINATION PROCEDURES.)

PAN-PAN– The international radio-telephony urgency signal. When repeated three times, indicates uncertainty or alert followed by the nature of the urgency.

(See MAYDAY.)

(Refer to AIM.)

PAO–

(See PUBLIC AIRCRAFT OPERATION.)

PAR–

(See PRECISION APPROACH RADAR.)

PAR [ICAO]–

(See ICAO Term PRECISION APPROACH RADAR.)

PARALLEL ILS APPROACHES– Approaches to parallel runways by IFR aircraft which, when established inbound toward the airport on the adjacent final approach courses, are radar-separated by at least 2 miles.

(See FINAL APPROACH COURSE.)

(See SIMULTANEOUS ILS APPROACHES.)

PARALLEL OFFSET ROUTE– A parallel track to the left or right of the designated or established airway/route. Normally associated with Area Navigation (RNAV) operations.

(See AREA NAVIGATION.)

PARALLEL RUNWAYS– Two or more runways at the same airport whose centerlines are parallel. In addition to runway number, parallel runways are designated as L (left) and R (right) or, if three parallel runways exist, L (left), C (center), and R (right).

PBCT–

(See PROPOSED BOUNDARY CROSSING TIME.)

PBN–

(See ICAO Term PERFORMANCE-BASED NAVIGATION.)

PDC–

(See PRE-DEPARTURE CLEARANCE.)

PDRR–

(See PRE-DEPARTURE REROUTE.)

PERFORMANCE-BASED NAVIGATION (PBN) [ICAO]– Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note: Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability, and functionality needed for the proposed operation in the context of a particular airspace concept.

PERMANENT ECHO– Radar signals reflected from fixed objects on the earth's surface; e.g., buildings, towers, terrain. Permanent echoes are distinguished from "ground clutter" by being definable locations rather than large areas. Under certain conditions they may be used to check radar alignment.

PERTI–

(See PLAN, EXECUTE, REVIEW, TRAIN, IMPROVE.)

PGUI–

(See PLANVIEW GRAPHICAL USER INTERFACE.)

PHOTO RECONNAISSANCE– Military activity that requires locating individual photo targets and navigating to the targets at a preplanned angle and altitude. The activity normally requires a lateral route width of 16 NM and altitude range of 1,500 feet to 10,000 feet AGL.

PILOT BRIEFING– The gathering, translation, interpretation, and summarization of weather and aeronautical information into a form usable by the pilot or flight supervisory personnel to assist in flight planning and decision-making for the safe and efficient operation of aircraft. These briefings may include, but are not limited to, weather observations, forecasts, and aeronautical information (for example, NOTAMs, military activities, flow control information, and temporary flight restrictions [TFR]).

(Refer to AIM.)

PILOT IN COMMAND– The pilot responsible for the operation and safety of an aircraft during flight time.

(Refer to 14 CFR Part 91.)

PILOT WEATHER REPORT– A report of meteorological phenomena encountered by aircraft in flight.

(Refer to AIM.)

PILOT'S DISCRETION– When used in conjunction with altitude assignments, means that ATC has offered the pilot the option of starting climb or descent whenever he/she wishes and conducting the climb or descent at any rate he/she wishes. He/she may temporarily level off at any intermediate altitude. However, once he/she has vacated an altitude, he/she may not return to that altitude.

PIREP–

(See PILOT WEATHER REPORT.)

PITCH POINT– A fix/waypoint that serves as a transition point from a departure procedure or the low altitude ground-based navigation structure into the high altitude waypoint system.

PLAN, EXECUTE, REVIEW, TRAIN, IMPROVE (PERTI)– A process that delivers a one-day detailed plan for NAS operations, and a two-day outlook, which sets NAS performance goals for high impact constraints. **PLAN:** Increase lead time for identifying aviation system constraint planning and goals while utilizing historical NAS performance data and constraints to derive successful and/or improved advance planning strategies. **EXECUTE:** Set goals and a strategy. The Air Traffic Control System Command Center (ATCSCC), FAA field facilities, and aviation stakeholders execute the strategy and work to achieve the desired/planned outcomes. **REVIEW:** Utilize post event analysis and lessons learned to define and implement future strategies and operational triggers based on past performance and outcomes, both positive and negative. **TRAIN:** Develop training that includes rapid and continuous feedback to operational personnel and provides increased data and weather knowledge and tools for analytical usage and planning. **IMPROVE:** Implement better information sharing processes, technologies, and procedures that improve the skills and technology needed to implement operational insights and improvements.

PLANS DISPLAY– A display available in EDST that provides detailed flight plan and predicted conflict information in textual format for requested Current Plans and all Trial Plans.

(See EN ROUTE DECISION SUPPORT TOOL)

PLANVIEW GRAPHICAL USER INTERFACE (PGUI)– A TBFM display that provides a spatial display of individual aircraft track information.

POFZ–

(See PRECISION OBSTACLE FREE ZONE.)

POINT OUT–

(See RADAR POINT OUT.)

POINT-TO-POINT (PTP)– A level of NRR service for aircraft that is based on traditional waypoints in their FMSs or RNAV equipage.

POLAR TRACK STRUCTURE– A system of organized routes between Iceland and Alaska which overlie Canadian MNPS Airspace.

POSITION REPORT– A report over a known location as transmitted by an aircraft to ATC.

(Refer to AIM.)

POSITION SYMBOL– A computer-generated indication shown on a radar display to indicate the mode of tracking.

POSITIVE CONTROL– The separation of all air traffic within designated airspace by air traffic control.

PRACTICE INSTRUMENT APPROACH– An instrument approach procedure conducted by a VFR or an IFR aircraft for the purpose of pilot training or proficiency demonstrations.

PRE-DEPARTURE CLEARANCE– An application with the Terminal Data Link System (TDLS) that provides clearance information to subscribers, through a service provider, in text to the cockpit or gate printer.

PRE-DEPARTURE REROUTE (PDRR)– A capability within the Traffic Flow Management System that enables ATC to quickly amend and execute revised departure clearances that mitigate en route constraints or balance en route traffic flows.

PREARRANGED COORDINATION– A standardized procedure which permits an air traffic controller to enter the airspace assigned to another air traffic controller without verbal coordination. The procedures are defined in a facility directive which ensures approved separation between aircraft.

PREARRANGED COORDINATION PROCEDURES– A facility's standardized procedure that describes the process by which one controller shall allow an aircraft to penetrate or transit another controller's airspace in a manner that assures approved separation without individual coordination for each aircraft.

PRECIPITATION– Any or all forms of water particles (rain, sleet, hail, or snow) that fall from the atmosphere and reach the surface.

PRECIPITATION RADAR WEATHER DESCRIPTIONS– Existing radar systems cannot detect turbulence. However, there is a direct correlation between the degree of turbulence and other weather features associated with thunderstorms and the weather radar precipitation intensity. Controllers will issue (where capable) precipitation intensity as observed by radar when using weather and radar processor (WARP) or NAS ground-based digital radars with weather capabilities. When precipitation intensity information is not available, the intensity will be described as UNKNOWN. When intensity levels can be determined, they shall be described as:

- a. LIGHT (< 26 dBZ)
- b. MODERATE (26 to 40 dBZ)
- c. HEAVY (> 40 to 50 dBZ)
- d. EXTREME (> 50 dBZ)

(Refer to AC 00-45, Aviation Weather Services.)

PRECISION APPROACH–

(See PRECISION APPROACH PROCEDURE.)

PRECISION APPROACH PROCEDURE– A standard instrument approach procedure in which an electronic glideslope or other type of glidepath is provided; e.g., ILS, PAR, and GLS.

(See INSTRUMENT LANDING SYSTEM.)

(See PRECISION APPROACH RADAR.)

PRECISION APPROACH RADAR– Radar equipment in some ATC facilities operated by the FAA and/or the military services at joint-use civil/military locations and separate military installations to detect and display azimuth, elevation, and range of aircraft on the final approach course to a runway. This equipment may be used

to monitor certain non-radar approaches, but is primarily used to conduct a precision instrument approach (PAR) wherein the controller issues guidance instructions to the pilot based on the aircraft's position in relation to the final approach course (azimuth), the glidepath (elevation), and the distance (range) from the touchdown point on the runway as displayed on the radar scope.

(See GLIDEPATH.)

(See PAR.)

(See ICAO term PRECISION APPROACH RADAR.)

(Refer to AIM.)

PRECISION APPROACH RADAR [ICAO]– Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to a nominal approach path, and in range relative to touchdown.

PRECISION OBSTACLE FREE ZONE (POFZ)– An 800 foot wide by 200 foot long area centered on the runway centerline adjacent to the threshold designed to protect aircraft flying precision approaches from ground vehicles and other aircraft when ceiling is less than 250 feet or visibility is less than 3/4 statute mile (or runway visual range below 4,000 feet.)

PRECISION RUNWAY MONITOR (PRM) SYSTEM– Provides air traffic controllers monitoring the NTZ during simultaneous close parallel PRM approaches with precision, high update rate secondary surveillance data. The high update rate surveillance sensor component of the PRM system is only required for specific runway or approach course separation. The high resolution color monitoring display, Final Monitor Aid (FMA) of the PRM system, or other FMA with the same capability, presents NTZ surveillance track data to controllers along with detailed maps depicting approaches and no transgression zone and is required for all simultaneous close parallel PRM NTZ monitoring operations.

(Refer to AIM)

PREDICTIVE WIND SHEAR ALERT SYSTEM (PWS)– A self-contained system used on board some aircraft to alert the flight crew to the presence of a potential wind shear. PWS systems typically monitor 3 miles ahead and 25 degrees left and right of the aircraft's heading at or below 1200' AGL. Departing flights may receive a wind shear alert after they start the takeoff roll and may elect to abort the takeoff. Aircraft on approach receiving an alert may elect to go around or perform a wind shear escape maneuver.

PREFERRED IFR ROUTES– Routes established between busier airports to increase system efficiency and capacity. They normally extend through one or more ARTCC areas and are designed to achieve balanced traffic flows among high density terminals. IFR clearances are issued on the basis of these routes except when severe weather avoidance procedures or other factors dictate otherwise. Preferred IFR Routes are listed in the Chart Supplement U.S., and are also available at https://www.fly.faa.gov/rmt/nfdc_preferred_routes_database.jsp. If a flight is planned to or from an area having such routes but the departure or arrival point is not listed in the Chart Supplement U.S., pilots may use that part of a Preferred IFR Route which is appropriate for the departure or arrival point that is listed. Preferred IFR Routes may be defined by DPs, SIDs, or STARs; NAVAIDs, Waypoints, etc.; high or low altitude airways; or any combinations thereof. Because they often share elements with adapted routes, pilots' use of preferred IFR routes can minimize flight plan route amendments.

(See ADAPTED ROUTES.)

(See CENTER'S AREA.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See INSTRUMENT DEPARTURE PROCEDURE.)

(See STANDARD TERMINAL ARRIVAL.)

(Refer to CHART SUPPLEMENT U.S.)

PRE-FLIGHT PILOT BRIEFING–

(See PILOT BRIEFING.)

PREVAILING VISIBILITY–

(See VISIBILITY.)

PRIMARY RADAR TARGET– An analog or digital target, exclusive of a secondary radar target, presented on a radar display.

PRM–

(See AREA NAVIGATION (RNAV) GLOBAL POSITIONING SYSTEM (GPS) PRECISION RUNWAY MONITORING (PRM) APPROACH.)

(See PRM APPROACH.)

(See PRECISION RUNWAY MONITOR SYSTEM.)

PRM APPROACH– An instrument approach procedure titled ILS PRM, RNAV PRM, LDA PRM, or GLS PRM conducted to parallel runways separated by less than 4,300 feet and at least 3,000 feet where independent closely spaced approaches are permitted. Use of an enhanced display with alerting, a No Transgression Zone (NTZ), secondary monitor frequency, pilot PRM training, and publication of an Attention All Users Page are required for all PRM approaches. Depending on the runway spacing, the approach courses may be parallel or one approach course must be offset. PRM procedures are also used to conduct Simultaneous Offset Instrument Approach (SOIA) operations. In SOIA, one straight-in ILS PRM, RNAV PRM, GLS PRM, and one offset LDA PRM, RNAV PRM or GLS PRM approach are utilized. PRM procedures are terminated and a visual segment begins at the offset approach missed approach point where the minimum distance between the approach courses is 3000 feet. Runway spacing can be as close as 750 feet.

(Refer to AIM.)

PROCEDURAL CONTROL [ICAO]– Term used to indicate that information derived from an ATS surveillance system is not required for the provision of air traffic control service.

PROCEDURAL SEPARATION [ICAO]– The separation used when providing procedural control.

PROCEDURE TURN– The maneuver prescribed when it is necessary to reverse direction to establish an aircraft on the intermediate approach segment or final approach course. The outbound course, direction of turn, distance within which the turn must be completed, and minimum altitude are specified in the procedure. However, unless otherwise restricted, the point at which the turn may be commenced and the type and rate of turn are left to the discretion of the pilot.

(See ICAO term PROCEDURE TURN.)

PROCEDURE TURN [ICAO]– A maneuver in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

Note 1: Procedure turns are designated “left” or “right” according to the direction of the initial turn.

Note 2: Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual approach procedure.

PROCEDURE TURN INBOUND– That point of a procedure turn maneuver where course reversal has been completed and an aircraft is established inbound on the intermediate approach segment or final approach course. A report of “procedure turn inbound” is normally used by ATC as a position report for separation purposes.

(See FINAL APPROACH COURSE.)

(See PROCEDURE TURN.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

PROFILE DESCENT– An uninterrupted descent (except where level flight is required for speed adjustment; e.g., 250 knots at 10,000 feet MSL) from cruising altitude/level to interception of a glideslope or to a minimum altitude specified for the initial or intermediate approach segment of a nonprecision instrument approach. The profile descent normally terminates at the approach gate or where the glideslope or other appropriate minimum altitude is intercepted.

PROGRESS REPORT–

(See POSITION REPORT.)

PROGRESSIVE TAXI– Precise taxi instructions given to a pilot unfamiliar with the airport or issued in stages as the aircraft proceeds along the taxi route.

PROHIBITED AREA–

(See SPECIAL USE AIRSPACE.)

(See ICAO term PROHIBITED AREA.)

PROHIBITED AREA [ICAO]– An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

PROMINENT OBSTACLE– An obstacle that meets one or more of the following conditions:

a. An obstacle which stands out beyond the adjacent surface of surrounding terrain and immediately projects a noticeable hazard to aircraft in flight.

b. An obstacle, not characterized as low and close in, whose height is no less than 300 feet above the departure end of takeoff runway (DER) elevation, is within 10 NM from the DER, and that penetrates that airport/heliport's diverse departure obstacle clearance surface (OCS).

c. An obstacle beyond 10 NM from an airport/heliport that requires an obstacle departure procedure (ODP) to ensure obstacle avoidance.

(See OBSTACLE.)

(See OBSTRUCTION.)

PROPELLER (PROP) WASH (PROP BLAST)– The disturbed mass of air generated by the motion of a propeller.

PROPOSED BOUNDARY CROSSING TIME– Each center has a PBCT parameter for each internal airport. Proposed internal flight plans are transmitted to the adjacent center if the flight time along the proposed route from the departure airport to the center boundary is less than or equal to the value of PBCT or if airport adaptation specifies transmission regardless of PBCT.

PROPOSED DEPARTURE TIME– The time that the aircraft expects to become airborne.

PROTECTED AIRSPACE– The airspace on either side of an oceanic route/track that is equal to one-half the lateral separation minimum except where reduction of protected airspace has been authorized.

PROTECTED SEGMENT– The protected segment is a segment on the amended TFM route that is to be inhibited from automatic adapted route alteration by ERAM.

PT–

(See PROCEDURE TURN.)

PTP–

(See POINT-TO-POINT.)

PTS–

(See POLAR TRACK STRUCTURE.)

PUBLIC AIRCRAFT OPERATION (PAO)– A UAS operation meeting the qualifications and conditions required for the operation of a public aircraft.

(See AC-1.1)

(See AIM)

PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT– A segment on an IAP chart annotated as "Fly Visual to Airport" or "Fly Visual." A dashed arrow will indicate the visual flight path on the profile and plan view with an associated note on the approximate heading and distance. The visual segment should be flown as a dead reckoning course while maintaining visual conditions.

PUBLISHED ROUTE– A route for which an IFR altitude has been established and published; e.g., Federal Airways, Jet Routes, Area Navigation Routes, Specified Direct Routes.

PWS–

(See PREDICTIVE WIND SHEAR ALERT SYSTEM.)

S

SAA–

(See SENSE AND AVOID.)

SAA–

(See SPECIAL ACTIVITY AIRSPACE.)

SAFETY ALERT– A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller’s judgment, places the aircraft in unsafe proximity to terrain, obstructions, or other aircraft. The controller may discontinue the issuance of further alerts if the pilot advises he/she is taking action to correct the situation or has the other aircraft in sight.

a. Terrain/Obstruction Alert– A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller’s judgment, places the aircraft in unsafe proximity to terrain/obstructions; e.g., “Low Altitude Alert, check your altitude immediately.”

b. Aircraft Conflict Alert– A safety alert issued by ATC to aircraft under their control if ATC is aware of an aircraft that is not under their control at an altitude which, in the controller’s judgment, places both aircraft in unsafe proximity to each other. With the alert, ATC will offer the pilot an alternate course of action when feasible; e.g., “Traffic Alert, advise you turn right heading zero niner zero or climb to eight thousand immediately.”

Note: The issuance of a safety alert is contingent upon the capability of the controller to have an awareness of an unsafe condition. The course of action provided will be predicated on other traffic under ATC control.

Once the alert is issued, it is solely the pilot’s prerogative to determine what course of action, if any, he/she will take.

SAFETY LOGIC SYSTEM– A software enhancement to ASDE–3, ASDE–X, and ASSC, that predicts the path of aircraft landing and/or departing, and/or vehicular movements on runways. Visual and aural alarms are activated when the safety logic projects a potential collision. The Airport Movement Area Safety System (AMASS) is a safety logic system enhancement to the ASDE–3. The Safety Logic System for ASDE–X and ASSC is an integral part of the software program.

SAFETY LOGIC SYSTEM ALERTS–

a. ALERT– An actual situation involving two real safety logic tracks (aircraft/aircraft, aircraft/vehicle, or aircraft/other tangible object) that safety logic has predicted will result in an imminent collision, based upon the current set of Safety Logic parameters.

b. FALSE ALERT–

1. Alerts generated by one or more false surface–radar targets that the system has interpreted as real tracks and placed into safety logic.

2. Alerts in which the safety logic software did not perform correctly, based upon the design specifications and the current set of Safety Logic parameters.

3. The alert is generated by surface radar targets caused by moderate or greater precipitation.

c. NUISANCE ALERT– An alert in which one or more of the following is true:

1. The alert is generated by a known situation that is not considered an unsafe operation, such as LAHSO or other approved operations.

2. The alert is generated by inaccurate secondary radar data received by the Safety Logic System.

3. One or more of the aircraft involved in the alert is not intending to use a runway (for example, helicopter, pipeline patrol, non–Mode C overflight, etc.).

d. VALID NON–ALERT– A situation in which the safety logic software correctly determines that an alert is not required, based upon the design specifications and the current set of Safety Logic parameters.

e. INVALID NON–ALERT– A situation in which the safety logic software did not issue an alert when an alert was required, based upon the design specifications.

SAIL BACK– A maneuver during high wind conditions (usually with power off) where float plane movement is controlled by water rudders/opening and closing cabin doors.

SAME DIRECTION AIRCRAFT– Aircraft are operating in the same direction when:

- a. They are following the same track in the same direction; or
- b. Their tracks are parallel and the aircraft are flying in the same direction; or
- c. Their tracks intersect at an angle of less than 45 degrees.

SAR–

(See **SEARCH AND RESCUE**.)

SATELLITE-BASED AUGMENTATION SYSTEM (SBAS) – A wide coverage augmentation system in which the user receives augmentation information from a satellite-based transmitter.

(See **WIDE-AREA AUGMENTATION SYSTEM (WAAS)**.)

SAW–

(See **AVIATION WATCH NOTIFICATION MESSAGE**.)

SAY AGAIN– Used to request a repeat of the last transmission. Usually specifies transmission or portion thereof not understood or received; e.g., “Say again all after **ABRAM VOR**.”

SAY ALTITUDE– Used by ATC to ascertain an aircraft’s specific altitude/flight level. When the aircraft is climbing or descending, the pilot should state the indicated altitude rounded to the nearest 100 feet.

SAY HEADING– Used by ATC to request an aircraft heading. The pilot should state the actual heading of the aircraft.

SCHEDULED TIME OF ARRIVAL (STA)– A STA is the desired time that an aircraft should cross a certain point (landing or metering fix). It takes other traffic and airspace configuration into account. A STA time shows the results of the TBFM scheduler that has calculated an arrival time according to parameters such as optimized spacing, aircraft performance, and weather.

SDF–

(See **SIMPLIFIED DIRECTIONAL FACILITY**.)

SE SAR–

(See **SURVEILLANCE ENHANCED SEARCH AND RESCUE**.)

SEA LANE– A designated portion of water outlined by visual surface markers for and intended to be used by aircraft designed to operate on water.

SEARCH AND RESCUE– A service which seeks missing aircraft and assists those found to be in need of assistance. It is a cooperative effort using the facilities and services of available Federal, state and local agencies. The U.S. Coast Guard is responsible for coordination of search and rescue for the Maritime Region, and the U.S. Air Force is responsible for search and rescue for the Inland Region. Information pertinent to search and rescue should be passed through any air traffic facility or be transmitted directly to the Rescue Coordination Center by telephone.

(See **FLIGHT SERVICE STATION**.)

(See **RESCUE COORDINATION CENTER**.)

(Refer to **AIM**.)

SEARCH AND RESCUE FACILITY– A facility responsible for maintaining and operating a search and rescue (SAR) service to render aid to persons and property in distress. It is any SAR unit, station, NET, or other operational activity which can be usefully employed during an SAR Mission; e.g., a Civil Air Patrol Wing, or a Coast Guard Station.

(See **SEARCH AND RESCUE**.)

SECNOT–

(See **SECURITY NOTICE**.)

SECONDARY RADAR TARGET– A target derived from a transponder return presented on a radar display.

SECTIONAL AERONAUTICAL CHARTS–

(See AERONAUTICAL CHART.)

SECTOR LIST DROP INTERVAL– A parameter number of minutes after the meter fix time when arrival aircraft will be deleted from the arrival sector list.

SECURITY NOTICE (SECNOT) – A SECNOT is a request originated by the Air Traffic Security Coordinator (ATSC) for an extensive communications search for aircraft involved, or suspected of being involved, in a security violation, or are considered a security risk. A SECNOT will include the aircraft identification, search area, and expiration time. The search area, as defined by the ATSC, could be a single airport, multiple airports, a radius of an airport or fix, or a route of flight. Once the expiration time has been reached, the SECNOT is considered to be canceled.

SECURITY SERVICES AIRSPACE – Areas established through the regulatory process or by NOTAM, issued by the Administrator under title 14, CFR, sections 99.7, 91.141, and 91.139, which specify that ATC security services are required; i.e., ADIZ or temporary flight rules areas.

SEE AND AVOID– When weather conditions permit, pilots operating IFR or VFR are required to observe and maneuver to avoid other aircraft. Right-of-way rules are contained in 14 CFR Part 91.

SEGMENTED CIRCLE– A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

(Refer to AIM.)

SEGMENTS OF A SID/STAR–

a. En Route Transition– The segment(s) of a SID/STAR that connect to/from en route flight. Not all SIDs/STARs will contain an en route transition.

b. En Route Transition Waypoint– The NAVAID/fix/waypoint that defines the beginning of the SID/STAR en route transition.

c. Common Route– The segment(s) of a SID/STAR procedure that provides a single route serving an airport/runway or multiple airports/runways. The common route may consist of a single point. Not all conventional SIDs will contain a common route.

d. Runway Transition– The segment(s) of a SID/STAR between the common route/point and the runway(s). Not all SIDs/STARs will contain a runway transition.

e. Runway Transition Waypoint (RTW)– On a STAR, the NAVAID/fix/waypoint that defines the end of the common route or en route transition and the beginning of a runway transition (In the arrival route description found on the STAR chart, the last fix of the common route and the first fix of the runway transition(s)).

SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE– An instrument approach procedure may have as many as four separate segments depending on how the approach procedure is structured.

a. Initial Approach– The segment between the initial approach fix and the intermediate fix or the point where the aircraft is established on the intermediate course or final approach course.

(See ICAO term INITIAL APPROACH SEGMENT.)

b. Intermediate Approach– The segment between the intermediate fix or point and the final approach fix.

(See ICAO term INTERMEDIATE APPROACH SEGMENT.)

c. Final Approach– The segment between the final approach fix or point and the runway, airport, or missed approach point.

(See ICAO term FINAL APPROACH SEGMENT.)

d. Missed Approach– The segment between the missed approach point or the point of arrival at decision height and the missed approach fix at the prescribed altitude.

(Refer to 14 CFR Part 97.)

(See ICAO term MISSED APPROACH PROCEDURE.)

SELF-BRIEFING– A self-briefing is a review, using automated tools, of all meteorological and aeronautical information that may influence the pilot in planning, altering, or canceling a proposed route of flight.

SENSE AND AVOID (SAA) – The capability of an unmanned aircraft to detect (sense) and avoid collisions with other aircraft and all obstacles, whether airborne or on the ground while operating in the NAS.

SEPARATION– In air traffic control, the spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.

(See **SEPARATION MINIMA**.)

(See ICAO term **SEPARATION**.)

SEPARATION [ICAO]– Spacing between aircraft, levels or tracks.

SEPARATION MINIMA– The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.

(See **SEPARATION**.)

SERVICE– A generic term that designates functions or assistance available from or rendered by air traffic control. For example, Class C service would denote the ATC services provided within a Class C airspace area.

SEVERE WEATHER AVOIDANCE PLAN (SWAP)– An approved plan to minimize the affect of severe weather on traffic flows in impacted terminal and/or ARTCC areas. A SWAP is normally implemented to provide the least disruption to the ATC system when flight through portions of airspace is difficult or impossible due to severe weather.

SEVERE WEATHER FORECAST ALERTS– Preliminary messages issued in order to alert users that a Severe Weather Watch Bulletin (WW) is being issued. These messages define areas of possible severe thunderstorms or tornado activity. The messages are unscheduled and issued as required by the Storm Prediction Center (SPC) at Norman, Oklahoma.

(See **AIRMET**.)

(See **CONVECTIVE SIGMET**.)

(See **CWA**.)

(See **GRAPHICAL AIRMEN'S METEOROLOGICAL INFORMATION**.)

(See **SIGMET**.)

SFA–

(See **SINGLE FREQUENCY APPROACH**.)

SFO–

(See **SIMULATED FLAMEOUT**.)

SFI

(See **SPECIAL GOVERNMENT INTEREST**.)

SHF–

(See **SUPER HIGH FREQUENCY**.)

SHORT RANGE CLEARANCE– A clearance issued to a departing IFR flight which authorizes IFR flight to a specific fix short of the destination while air traffic control facilities are coordinating and obtaining the complete clearance.

SHORT TAKEOFF AND LANDING AIRCRAFT (STOL)– An aircraft which, at some weight within its approved operating weight, is capable of operating from a runway in compliance with the applicable STOL characteristics, airworthiness, operations, noise, and pollution standards.

(See **VERTICAL TAKEOFF AND LANDING AIRCRAFT**.)

SIAP–

(See **STANDARD INSTRUMENT APPROACH PROCEDURE**.)

SID–

(See **STANDARD INSTRUMENT DEPARTURE**.)

SIDESTEP MANEUVER– A visual maneuver accomplished by a pilot at the completion of an instrument approach to permit a straight-in landing on a parallel runway not more than 1,200 feet to either side of the runway to which the instrument approach was conducted.

(Refer to AIM.)

SIGMET– A weather advisory issued concerning weather significant to the safety of all aircraft. SIGMET advisories cover severe and extreme turbulence, severe icing, and widespread dust or sandstorms that reduce visibility to less than 3 miles.

(See AIRMET.)

(See CONVECTIVE SIGMET.)

(See CWA.)

(See GRAPHICAL ARMEN'S METEOROLOGICAL INFORMATION.)

(See ICAO term SIGMET INFORMATION.)

(See SAW.)

(Refer to AIM.)

SIGMET INFORMATION [ICAO]– Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations.

SIGNIFICANT METEOROLOGICAL INFORMATION–

(See SIGMET.)

SIGNIFICANT POINT– A point, whether a named intersection, a NAVAID, a fix derived from a NAVAID(s), or geographical coordinate expressed in degrees of latitude and longitude, which is established for the purpose of providing separation, as a reporting point, or to delineate a route of flight.

SIMPLIFIED DIRECTIONAL FACILITY (SDF)– A NAVAID used for nonprecision instrument approaches. The final approach course is similar to that of an ILS localizer except that the SDF course may be offset from the runway, generally not more than 3 degrees, and the course may be wider than the localizer, resulting in a lower degree of accuracy.

(Refer to AIM.)

SIMULATED FLAMEOUT– A practice approach by a jet aircraft (normally military) at idle thrust to a runway. The approach may start at a runway (high key) and may continue on a relatively high and wide downwind leg with a continuous turn to final. It terminates in landing or low approach. The purpose of this approach is to simulate a flameout.

(See FLAMEOUT.)

SIMULTANEOUS CLOSE PARALLEL APPROACHES– A simultaneous, independent approach operation permitting ILS/RNAV/GLS approaches to airports having parallel runways separated by at least 3,000 feet and less than 4,300–feet between centerlines. Aircraft are permitted to pass each other during these simultaneous operations. Integral parts of a total system are radar, NTZ monitoring with enhanced FMA color displays that include aural and visual alerts and predictive aircraft position software, communications override, ATC procedures, an Attention All Users Page (AAUP), PRM in the approach name, and appropriate ground based and airborne equipment. High update rate surveillance sensor required for certain runway or approach course separations.

SIMULTANEOUS (CONVERGING) DEPENDENT APPROACHES– An approach operation permitting ILS/RNAV/GLS approaches to runways or missed approach courses that intersect where required minimum spacing between the aircraft on each final approach course is required.

SIMULTANEOUS (CONVERGING) INDEPENDENT APPROACHES– An approach operation permitting ILS/RNAV/GLS approaches to non-parallel runways where approach procedure design maintains the required aircraft spacing throughout the approach and missed approach and hence the operations may be conducted independently.

SIMULTANEOUS ILS APPROACHES– An approach system permitting simultaneous ILS approaches to airports having parallel runways separated by at least 4,300 feet between centerlines. Integral parts of a total system are ILS, radar, communications, ATC procedures, and appropriate airborne equipment.

(See PARALLEL RUNWAYS.)

(Refer to AIM.)

SIMULTANEOUS OFFSET INSTRUMENT APPROACH (SOIA)– An instrument landing system comprised of an ILS PRM, RNAV PRM or GLS PRM approach to one runway and an offset LDA PRM with glideslope or an RNAV PRM or GLS PRM approach utilizing vertical guidance to another where parallel runway spaced less than 3,000 feet and at least 750 feet apart. The approach courses converge by 2.5 to 3 degrees. Simultaneous close parallel PRM approach procedures apply up to the point where the approach course separation becomes 3,000 feet, at the offset MAP. From the offset MAP to the runway threshold, visual separation by the aircraft conducting the offset approach is utilized.

(Refer to AIM)

SIMULTANEOUS (PARALLEL) DEPENDENT APPROACHES- An approach operation permitting ILS/RNAV/GLS approaches to adjacent parallel runways where prescribed diagonal spacing must be maintained. Aircraft are not permitted to pass each other during simultaneous dependent operations. Integral parts of a total system ATC procedures, and appropriate airborne and ground based equipment.

SINGLE DIRECTION ROUTES– Preferred IFR Routes which are sometimes depicted on high altitude en route charts and which are normally flown in one direction only.

(See PREFERRED IFR ROUTES.)

(Refer to CHART SUPPLEMENT U.S.)

SINGLE FREQUENCY APPROACH– A service provided under a letter of agreement to military single-piloted turbojet aircraft which permits use of a single UHF frequency during approach for landing. Pilots will not normally be required to change frequency from the beginning of the approach to touchdown except that pilots conducting an en route descent are required to change frequency when control is transferred from the air route traffic control center to the terminal facility. The abbreviation “SFA” in the DoD FLIP IFR Supplement under “Communications” indicates this service is available at an aerodrome.

SINGLE-PILOTED AIRCRAFT– A military turbojet aircraft possessing one set of flight controls, tandem cockpits, or two sets of flight controls but operated by one pilot is considered single-piloted by ATC when determining the appropriate air traffic service to be applied.

(See SINGLE FREQUENCY APPROACH.)

SKYSPOTTER– A pilot who has received specialized training in observing and reporting inflight weather phenomena.

SLASH– A radar beacon reply displayed as an elongated target.

SLDI–

(See SECTOR LIST DROP INTERVAL.)

SLOW TAXI– To taxi a float plane at low power or low RPM.

SMALL UNMANNED AIRCRAFT SYSTEM (sUAS)– An unmanned aircraft weighing less than 55 pounds on takeoff, including everything that is on board or otherwise attached to the aircraft.

SN–

(See SYSTEM STRATEGIC NAVIGATION.)

SPACE-BASED ADS-B (SBA)– A constellation of satellites that receives ADS-B Out broadcasts and relays that information to the appropriate surveillance facility. The currently deployed SBA system is only capable of receiving broadcasts from 1090ES-equipped aircraft, and not from those equipped with only a universal access transceiver (UAT). Also, aircraft with a top-of-fuselage-mounted transponder antenna (required for TCAS II installations) will be better received by SBA, especially at latitudes below 45 degrees.

(See AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST.)

(See AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST OUT.)

SPACE LAUNCH AND REENTRY AREA– Locations where commercial space launch and/or reentry operations occur. For pilot awareness, a rocket-shaped symbol is used to depict space launch and reentry areas on sectional aeronautical charts.

SPEAK SLOWER– Used in verbal communications as a request to reduce speech rate.

SPECIAL GOVERNMENT INTEREST (SGI)– A near real-time airspace authorization for Part 91 or Part 107 UAS, which supports activities that answer significant and urgent governmental interests. These include: national defense, homeland security, law enforcement, and emergency operations objectives.

SPECIAL ACTIVITY AIRSPACE (SAA)– Airspace with defined dimensions within the National Airspace System wherein limitations may be imposed upon operations for national defense, homeland security, public interest, or public safety. Special activity airspace includes but is not limited to the following: Air Traffic Control Assigned Airspace (ATCAA), Altitude Reservations (ALTRV), Military Training Routes (MTR), Air Refueling Tracks and Anchors, Temporary Flight Restrictions (TFR), Special Security Instructions (SSI), etc. Special Use Airspace (SUA) is a subset of Special Activity Airspace.

(See SPECIAL USE AIRSPACE.)

SPECIAL AIR TRAFFIC RULES (SATR)– Rules that govern procedures for conducting flights in certain areas listed in 14 CFR Part 93. The term “SATR” is used in the United States to describe the rules for operations in specific areas designated in the Code of Federal Regulations.

(Refer to 14 CFR Part 93.)

SPECIAL EMERGENCY– A condition of air piracy or other hostile act by a person(s) aboard an aircraft which threatens the safety of the aircraft or its passengers.

SPECIAL FLIGHT RULES AREA (SFRA)– An area in the NAS, described in 14 CFR Part 93, wherein the flight of aircraft is subject to special traffic rules, unless otherwise authorized by air traffic control. Not all areas listed in 14 CFR Part 93 are designated SFRA, but special air traffic rules apply to all areas described in 14 CFR Part 93.

SPECIAL INSTRUMENT APPROACH PROCEDURE–

(See INSTRUMENT APPROACH PROCEDURE.)

SPECIAL USE AIRSPACE– Airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Types of special use airspace are:

a. Alert Area– Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. Alert Areas are depicted on aeronautical charts for the information of nonparticipating pilots. All activities within an Alert Area are conducted in accordance with Federal Aviation Regulations, and pilots of participating aircraft as well as pilots transiting the area are equally responsible for collision avoidance.

b. Controlled Firing Area– Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons and property on the ground.

c. Military Operations Area (MOA)– Permanent and temporary MOAs are airspace established outside of Class A airspace area to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. Permanent MOAs are depicted on Sectional Aeronautical, VFR Terminal Area, and applicable En Route Low Altitude Charts.

Note: Temporary MOAs are not charted.

(Refer to AIM.)

d. National Security Area (NSA)– Airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security of ground facilities. Pilots are requested to voluntarily avoid flying through the depicted NSA. When a greater level of security is required, flight through an NSA may be temporarily prohibited by establishing a TFR under the provisions of 14 CFR Section 99.7. Such prohibitions will be issued by FAA Headquarters and disseminated via the U.S. NOTAM System.

(Refer to AIM)

e. Prohibited Area– Airspace designated under 14 CFR Part 73 within which no person may operate an aircraft without the permission of the using agency.

(Refer to AIM.)

(Refer to En Route Charts.)

f. Restricted Area– Permanent and temporary restricted areas are airspace designated under 14 CFR Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency. Permanent restricted areas are depicted on Sectional Aeronautical, VFR Terminal Area, and applicable En Route charts. Where joint use is authorized, the name of the ATC controlling facility is also shown.

Note: Temporary restricted areas are not charted.

(Refer to 14 CFR Part 73.)

(Refer to AIM.)

g. Warning Area– A warning area is airspace of defined dimensions extending from 3 nautical miles outward from the coast of the United States, that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning area is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both.

SPECIAL VFR CONDITIONS– Meteorological conditions that are less than those required for basic VFR flight in Class B, C, D, or E surface areas and in which some aircraft are permitted flight under visual flight rules.

(See SPECIAL VFR OPERATIONS.)

(Refer to 14 CFR Part 91.)

SPECIAL VFR FLIGHT [ICAO]– A VFR flight cleared by air traffic control to operate within Class B, C, D, and E surface areas in meteorological conditions below VMC.

SPECIAL VFR OPERATIONS– Aircraft operating in accordance with clearances within Class B, C, D, and E surface areas in weather conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

(See SPECIAL VFR CONDITIONS.)

(See ICAO term SPECIAL VFR FLIGHT.)

SPECIALIST–PROVIDED SERVICES–

Services delivered directly by a flight service specialist via ground/ground communication, air/ground communication, in-person, or technology (for example, speech-to-text, email, or short message service).

SPEED–

(See AIRSPEED.)

(See GROUND SPEED.)

SPEED ADJUSTMENT– An ATC procedure used to request pilots to adjust aircraft speed to a specific value for the purpose of providing desired spacing. Pilots are expected to maintain a speed of plus or minus 10 knots or 0.02 Mach number of the specified speed. Examples of speed adjustments are:

a. “Increase/reduce speed to Mach point (number).”

b. “Increase/reduce speed to (speed in knots)” or “Increase/reduce speed (number of knots) knots.”

SPEED BRAKES– Moveable aerodynamic devices on aircraft that reduce airspeed during descent and landing.

SPEED SEGMENTS– Portions of the arrival route between the transition point and the vertex along the optimum flight path for which speeds and altitudes are specified. There is one set of arrival speed segments adapted from each transition point to each vertex. Each set may contain up to six segments.

SPOOFING– Denotes emissions of GNSS-like signals that may be acquired and tracked in combination with or instead of the intended signals by civil receivers. The onset of spoofing effects can be instantaneous or delayed, and effects can persist after the spoofing has ended. Spoofing can result in false and potentially confusing, or hazardingly misleading, position, navigation, and/or date/time information in addition to loss of GNSS use.

SPEED ADVISORY– Speed advisories that are generated within Time-Based Flow Management to assist controllers to meet the Scheduled Time of Arrival (STA) at the meter fix/meter arc. See also Ground-Based Interval Management–Spacing (GIM–S) Speed Advisory.

SQUAWK (Mode, Code, Function)– Used by ATC to instruct a pilot to activate the aircraft transponder and ADS–B Out with altitude reporting enabled, or (military) to activate only specific modes, codes, or functions. Examples: “Squawk five seven zero seven;” “Squawk three/alpha, two one zero five.”

(See TRANSPONDER.)

STA–

(See SCHEDULED TIME OF ARRIVAL.)

STAGING/QUEUING– The placement, integration, and segregation of departure aircraft in designated movement areas of an airport by departure fix, EDCT, and/or restriction.

STAND BY– Means the controller or pilot must pause for a few seconds, usually to attend to other duties of a higher priority. Also means to wait as in “stand by for clearance.” The caller should reestablish contact if a delay is lengthy. “Stand by” is not an approval or denial.

STANDARD INSTRUMENT APPROACH PROCEDURE (SIAP)–

(See INSTRUMENT APPROACH PROCEDURE.)

STANDARD INSTRUMENT DEPARTURE (SID)– A preplanned instrument flight rule (IFR) air traffic control (ATC) departure procedure printed for pilot/controller use in graphic form to provide obstacle clearance and a transition from the terminal area to the appropriate en route structure. SIDs are primarily designed for system enhancement to expedite traffic flow and to reduce pilot/controller workload. ATC clearance must always be received prior to flying a SID.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See OBSTACLE DEPARTURE PROCEDURE.)

(Refer to AIM.)

STANDARD RATE TURN– A turn of three degrees per second.

STANDARD TERMINAL ARRIVAL (STAR)– A preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

STANDARD TERMINAL ARRIVAL CHARTS–

(See AERONAUTICAL CHART.)

STANDARD TERMINAL AUTOMATION REPLACEMENT SYSTEM (STARS)–

(See DTAS.)

STAR–

(See STANDARD TERMINAL ARRIVAL.)

STATE AIRCRAFT– Aircraft used in military, customs and police service, in the exclusive service of any government or of any political subdivision thereof, including the government of any state, territory, or possession of the United States or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

STATIC RESTRICTIONS– Those restrictions that are usually not subject to change, fixed, in place, and/or published.

STATIONARY AIRSPACE RESERVATION– The term used in oceanic ATC for airspace that encompasses activities in a fixed volume of airspace to be occupied for a specified time period. Stationary Airspace Reservations may include activities such as special tests of weapons systems or equipment; certain U.S. Navy carrier, fleet, and anti–submarine operations; rocket, missile, and drone operations; and certain aerial refueling or similar operations.

(See STATIONARY ALTITUDE RESERVATION.)

STATIONARY ALTITUDE RESERVATION (STATIONARY ALTRV)– An altitude reservation which encompasses activities in a fixed volume of airspace to be occupied for a specified time period. Stationary ALTRVs may include activities such as special tests of weapons systems or equipment; certain U.S. Navy carrier, fleet, and anti-submarine operations; rocket, missile, and drone operations; and certain aerial refueling or similar operations.

STEP TAXI– To taxi a float plane at full power or high RPM.

STEP TURN– A maneuver used to put a float plane in a planing configuration prior to entering an active sea lane for takeoff. The STEP TURN maneuver should only be used upon pilot request.

STEPDOWN FIX– A fix permitting additional descent within a segment of an instrument approach procedure by identifying a point at which a controlling obstacle has been safely overflown.

STEREO ROUTE– A routinely used route of flight established by users and ARTCCs identified by a coded name; e.g., ALPHA 2. These routes minimize flight plan handling and communications.

STNR ALT RESERVATION– An abbreviation for Stationary Altitude Reservation commonly used in NOTAMs.

(See STATIONARY ALTITUDE RESERVATION.)

STOL AIRCRAFT–

(See SHORT TAKEOFF AND LANDING AIRCRAFT.)

STOP ALTITUDE SQUAWK– Used by ATC to instruct a pilot to turn off the automatic altitude reporting feature of the aircraft transponder and ADS-B Out. It is issued when a verbally reported altitude varies by 300 feet or more from the automatic altitude report.

(See ALTITUDE READOUT.)

(See TRANSPONDER.)

STOP AND GO– A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point.

(See LOW APPROACH.)

(See OPTION APPROACH.)

STOP BURST–

(See STOP STREAM.)

STOP BUZZER–

(See STOP STREAM.)

STOP SQUAWK (Mode or Code)– Used by ATC to instruct a pilot to stop transponder and ADS-B transmissions, or to turn off only specified functions of the aircraft transponder (military).

(See STOP ALTITUDE SQUAWK.)

(See TRANSPONDER.)

STOP STREAM– Used by ATC to request a pilot to suspend electronic attack activity.

(See JAMMING.)

STOPOVER FLIGHT PLAN– A flight plan format which permits in a single submission the filing of a sequence of flight plans through interim full-stop destinations to a final destination.

STOPWAY– An area beyond the takeoff runway no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff.

STRAIGHT-IN APPROACH IFR– An instrument approach wherein final approach is begun without first having executed a procedure turn, not necessarily completed with a straight-in landing or made to straight-in landing minimums.

(See **LANDING MINIMUMS**.)

(See **STRAIGHT-IN APPROACH VFR**.)

(See **STRAIGHT-IN LANDING**.)

STRAIGHT-IN APPROACH VFR– Entry into the traffic pattern by interception of the extended runway centerline (final approach course) without executing any other portion of the traffic pattern.

(See **TRAFFIC PATTERN**.)

STRAIGHT-IN LANDING– A landing made on a runway aligned within 30° of the final approach course following completion of an instrument approach.

(See **STRAIGHT-IN APPROACH IFR**.)

STRAIGHT-IN LANDING MINIMUMS–

(See **LANDING MINIMUMS**.)

STRAIGHT-IN MINIMUMS–

(See **STRAIGHT-IN LANDING MINIMUMS**.)

STRATEGIC PLANNING– Planning whereby solutions are sought to resolve potential conflicts.

sUAS–

(See **SMALL UNMANNED AIRCRAFT SYSTEM**.)

SUBSTITUTE ROUTE– A route assigned to pilots when any part of an airway or route is unusable because of NAVAID status. These routes consist of:

- a. Substitute routes which are shown on U.S. Government charts.
- b. Routes defined by ATC as specific NAVAID radials or courses.
- c. Routes defined by ATC as direct to or between NAVAIDs.

SUNSET AND SUNRISE– The mean solar times of sunset and sunrise as published in the Nautical Almanac, converted to local standard time for the locality concerned. Within Alaska, the end of evening civil twilight and the beginning of morning civil twilight, as defined for each locality.

SUPPLEMENTAL WEATHER SERVICE LOCATION– Airport facilities staffed with contract personnel who take weather observations and provide current local weather to pilots via telephone or radio. (All other services are provided by the parent FSS.)

SUPPS– Refers to ICAO Document 7030 Regional Supplementary Procedures. SUPPS contain procedures for each ICAO Region which are unique to that Region and are not covered in the worldwide provisions identified in the ICAO Air Navigation Plan. Procedures contained in Chapter 8 are based in part on those published in SUPPS.

SURFACE AREA– The airspace contained by the lateral boundary of the Class B, C, D, or E airspace designated for an airport that begins at the surface and extends upward.

SURFACE METERING PROGRAM– A capability within Terminal Flight Data Manager that provides the user with the ability to tactically manage surface traffic flows through adjusting desired minimum and maximum departure queue lengths to balance surface demand with capacity. When a demand/capacity imbalance for a surface resource is predicted, a metering procedure is recommended.

SURFACE VIEWER– A capability within the Traffic Flow Management System that provides situational awareness for a user–selected airport. The Surface Viewer displays a top–down view of an airport depicting runways, taxiways, gate areas, ramps, and buildings. The display also includes icons representing aircraft and vehicles currently on the surface, with identifying information. In addition, the display includes current airport configuration information such as departure/arrival runways and airport departure/arrival rates.

SURPIC– A description of surface vessels in the area of a Search and Rescue incident including their predicted positions and their characteristics.

(Refer to FAA Order JO 7110.65, Para 10–6–4, INFLIGHT CONTINGENCIES.)

SURVEILLANCE APPROACH– An instrument approach wherein the air traffic controller issues instructions, for pilot compliance, based on aircraft position in relation to the final approach course (azimuth), and the distance (range) from the end of the runway as displayed on the controller's radar scope. The controller will provide recommended altitudes on final approach if requested by the pilot.

(Refer to AIM.)

SURVEILLANCE ENHANCED SEARCH AND RESCUE (SE SAR)– An automated service used to enhance search and rescue operations that provides federal contract flight service specialists direct information from the aircraft's registered tracking device.

SUSPICIOUS UAS– Suspicious UAS operations may include operating without authorization, loitering in the vicinity of sensitive locations, (e.g., national security, law enforcement facilities, and critical infrastructure), or disrupting normal air traffic operations resulting in runway changes, ground stops, pilot evasive action, etc. The report of a UAS operation alone does not constitute suspicious activity. Development of a comprehensive list of suspicious activities is not possible due to the vast number of situations that could be considered suspicious. ATC must exercise sound judgment when identifying situations that could constitute or indicate a suspicious activity.

SWAP–

(See SEVERE WEATHER AVOIDANCE PLAN.)

SWSL–

(See SUPPLEMENTAL WEATHER SERVICE LOCATION.)

SYSTEM STRATEGIC NAVIGATION– Military activity accomplished by navigating along a preplanned route using internal aircraft systems to maintain a desired track. This activity normally requires a lateral route width of 10 NM and altitude range of 1,000 feet to 6,000 feet AGL with some route segments that permit terrain following.

ground-based air traffic surveillance sensors, typically from radar targets. TIS-B service will be available throughout the NAS where there are both adequate surveillance coverage (radar) and adequate broadcast coverage from ADS-B ground stations. Loss of TIS-B will occur when an aircraft enters an area not covered by the GBT network. If this occurs in an area with adequate surveillance coverage (radar), nearby aircraft that remain within the adequate broadcast coverage (ADS-B) area will view the first aircraft. TIS-B may continue when an aircraft enters an area with inadequate surveillance coverage (radar); nearby aircraft that remain within the adequate broadcast coverage (ADS-B) area will not view the first aircraft.

TRAFFIC IN SIGHT– Used by pilots to inform a controller that previously issued traffic is in sight.

(See NEGATIVE CONTACT.)

(See TRAFFIC ADVISORIES.)

TRAFFIC MANAGEMENT INITIATIVE (TMI)– Tools used to manage demand with capacity in the National Airspace System (NAS.) TMIs can be used to manage NAS resources (e.g., airports, sectors, airspace) or to increase the efficiency of the operation. TMIs can be either tactical (i.e., short term) or strategic (i.e., long term), depending on the type of TMI and the operational need.

TRAFFIC MANAGEMENT PROGRAM ALERT– A term used in a Notice to Air Missions (NOTAM) issued in conjunction with a special traffic management program to alert pilots to the existence of the program and to refer them to a special traffic management program advisory message for program details. The contraction TMPA is used in NOTAM text.

TRAFFIC MANAGEMENT UNIT– The entity in ARTCCs and designated terminals directly involved in the active management of facility traffic. Usually under the direct supervision of an assistant manager for traffic management.

TRAFFIC NO FACTOR– Indicates that the traffic described in a previously issued traffic advisory is no factor.

TRAFFIC NO LONGER OBSERVED– Indicates that the traffic described in a previously issued traffic advisory is no longer depicted on radar, but may still be a factor.

TRAFFIC PATTERN– The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

- a. Upwind Leg– A flight path parallel to the landing runway in the direction of landing.
- b. Crosswind Leg– A flight path at right angles to the landing runway off its upwind end.
- c. Downwind Leg– A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
- d. Base Leg– A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

NOTE–

ATC may instruct a pilot to report a “2-mile left base” to Runway 22. This instruction means that the pilot is expected to maneuver their aircraft into a left base leg that will intercept a straight-in final 2 miles from the approach end of Runway 22 and advise ATC.

REFERENCE–

Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25, Chapter 14, Airport Operations, Traffic Patterns.

- e. Final Approach– A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach.

NOTE–

ATC may instruct a pilot to report “5-mile final” to Runway 22. This instruction means that the pilot should maneuver their aircraft onto a straight-in final and advise ATC when they are five miles from the approach end of Runway 22.

REFERENCE–

■ *Pilot's Handbook of Aeronautical Knowledge, FAA–H–8083–25, Chapter 14, Airport Operations, Traffic Patterns.*

(See STRAIGHT-IN APPROACH VFR.)

(See TAXI PATTERNS.)

(See ICAO term AERODROME TRAFFIC CIRCUIT.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

TRAFFIC SITUATION DISPLAY (TSD)– TSD is a computer system that receives radar track data from all 20 CONUS ARTCCs, organizes this data into a mosaic display, and presents it on a computer screen. The display allows the traffic management coordinator multiple methods of selection and highlighting of individual aircraft or groups of aircraft. The user has the option of superimposing these aircraft positions over any number of background displays. These background options include ARTCC boundaries, any stratum of en route sector boundaries, fixes, airways, military and other special use airspace, airports, and geopolitical boundaries. By using the TSD, a coordinator can monitor any number of traffic situations or the entire systemwide traffic flows.

TRAJECTORY– A EDST representation of the path an aircraft is predicted to fly based upon a Current Plan or Trial Plan.

(See EN ROUTE DECISION SUPPORT TOOL.)

TRAJECTORY-BASED OPERATIONS (TBO)– An Air Traffic Management method for strategically planning and managing flights throughout the operation by using Time-Based Management (TBM), information exchange between air and ground systems, and the aircraft's ability to fly trajectories in time and space. Aircraft trajectory is defined in four dimensions – latitude, longitude, altitude, and time.

TRAJECTORY MODELING– The automated process of calculating a trajectory.

TRAJECTORY OPTIONS SET (TOS)– A TOS is an electronic message, submitted by the operator, that is used by the Collaborative Trajectory Options Program (CTOP) to manage the airspace captured in the traffic management program. The TOS will allow the operator to express the route and delay trade-off options that they are willing to accept.

TRANSFER OF CONTROL– That action whereby the responsibility for the separation of an aircraft is transferred from one controller to another.

(See ICAO term TRANSFER OF CONTROL.)

TRANSFER OF CONTROL [ICAO]– Transfer of responsibility for providing air traffic control service.

TRANSFERRING CONTROLLER– A controller/facility transferring control of an aircraft to another controller/facility.

(See ICAO term TRANSFERRING UNIT/CONTROLLER.)

TRANSFERRING FACILITY–

(See TRANSFERRING CONTROLLER.)

TRANSFERRING UNIT/CONTROLLER [ICAO]– Air traffic control unit/air traffic controller in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit/air traffic controller along the route of flight.

Note: See definition of accepting unit/controller.

TRANSITION– The general term that describes the change from one phase of flight or flight condition to another; e.g., transition from en route flight to the approach or transition from instrument flight to visual flight.

TRANSITION POINT– A point at an adapted number of miles from the vertex at which an arrival aircraft would normally commence descent from its en route altitude. This is the first fix adapted on the arrival speed segments.

TRANSITIONAL AIRSPACE– That portion of controlled airspace wherein aircraft change from one phase of flight or flight condition to another.

TRANSITIONAL HAZARD AREA (THA)– Used by ATC. Airspace normally associated with an Aircraft Hazard Area within which the flight of aircraft is subject to restrictions.

(See AIRCRAFT HAZARD AREA.)

(See CONTINGENCY HAZARD AREA.)

(See REFINED HAZARD AREA.)

TRANSMISSOMETER– An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. It is the measurement source for determining runway visual range (RVR).

(See VISIBILITY.)

TRANSMITTING IN THE BLIND– A transmission from one station to other stations in circumstances where two-way communication cannot be established, but where it is believed that the called stations may be able to receive the transmission.

TRANSPONDER– The airborne radar beacon receiver/transmitter portion of the Air Traffic Control Radar Beacon System (ATCRBS) which automatically receives radio signals from interrogators on the ground, and selectively replies with a specific reply pulse or pulse group only to those interrogations being received on the mode to which it is set to respond.

(See INTERROGATOR.)

(See ICAO term TRANSPONDER.)

(Refer to AIM.)

TRANSPONDER [ICAO]– A receiver/transmitter which will generate a reply signal upon proper interrogation; the interrogation and reply being on different frequencies.

TRANSPONDER CODES–

(See CODES.)

TRANSPONDER OBSERVED – Phraseology used to inform a VFR pilot the aircraft's assigned beacon code and position have been observed. Specifically, this term conveys to a VFR pilot the transponder reply has been observed and its position correlated for transit through the designated area.

TRIAL PLAN– A proposed amendment which utilizes automation to analyze and display potential conflicts along the predicted trajectory of the selected aircraft.

TRSA–

(See TERMINAL RADAR SERVICE AREA.)

TRUST–

(See THE RECREATIONAL UAS SAFETY TEST.)

TSAS–

(See TERMINAL SEQUENCING AND SPACING.)

TSD–

(See TRAFFIC SITUATION DISPLAY.)

TURBOJET AIRCRAFT– An aircraft having a jet engine in which the energy of the jet operates a turbine which in turn operates the air compressor.

TURBOPROP AIRCRAFT– An aircraft having a jet engine in which the energy of the jet operates a turbine which drives the propeller.

TURBULENCE– An atmospheric phenomenon that causes changes in aircraft altitude, attitude, and or airspeed with aircraft reaction depending on intensity. Pilots report turbulence intensity according to aircraft's reaction as follows:

- a. Light – Causes slight, erratic changes in altitude and or attitude (pitch, roll, or yaw).
- b. Moderate– Similar to Light 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.

c. Severe– Causes large, abrupt changes in altitude and or attitude. It usually causes large variations in indicated airspeed. Aircraft may be momentarily out of control.

d. Extreme– The aircraft is violently tossed about and is practically impossible to control. It may cause structural damage.

(See CHOP.)

(Refer to AIM.)

TURN ANTICIPATION– (maneuver anticipation).

TVOR–

(See TERMINAL-VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION.)

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(See LOST COMMUNICATIONS.)

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