



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE  
WASHINGTON DC

AFI1202V3\_AFGM2015-01  
13 April 2015

MEMORANDUM FOR DISTRIBUTION C  
MAJCOMs/FOAs/DRUs

FROM: HQ USAF/A3  
1630 Air Force Pentagon  
Washington, D.C. 20330-1630

SUBJECT: Air Force Guidance Memorandum to AFI 11-202V3, *General Flight Rules*

1. By Order of the Secretary of the Air Force, this AF Guidance Memorandum immediately implements changes to AFI 11-202, Volume 3, *General Flight Rules*. Compliance with this Memorandum is mandatory. To the extent its directions are inconsistent with other Air Force publications, the information herein prevails, in accordance with AFI 33-360, *Publications and Forms Management*.
2. In advance of an Interim Change to AFI 11-202 Volume 3, the Attachment to this Memorandum provides guidance changes that are effective immediately. An asterisk (\*) indicates newly revised material.

\*(Replace) Table 2.1. Maximum FDP

Aircraft Type	Basic Aircrew	Augmented Aircrew
Single Piloted Aircraft	12	NA
Fighter, Attack or Trainer (Dual Control)	12	16
Bomber, Reconnaissance, Electronic Warfare, or Battle Management (Dual Control)	16	24
Tanker/Transport	16	NA
Tanker/Transport with Sleeping Provisions <sup>1</sup>	16	24
Rotary Wing (without Auto Flight Control System)	12	14
Rotary Wing (with Auto Flight Control System)	14	18
Utility	12	18
Unmanned Aircraft System (Single Control)	12	NA
Unmanned Aircraft System (Dual Control)	16	NA
Tilt-rotor	16	NA

**NOTE 1:** Sleeping provisions are crew bunks or other MAJCOM-defined rest facilities aboard the aircraft. Rest facilities should provide adequate privacy and noise levels to obtain suitable rest.

\*(Replace) 2.6. Maximum Flying Time. 56 flight hours per 7 consecutive days, 125 flight hours per 30 consecutive days, and 330 flight hours per 90 consecutive days.

\*(Add) 2.6.1. Maximum flying time may be waived by MAJCOM/A3 when an ORM assessment determines that mission requirements justify the increased risk. At MAJCOM/A3

discretion, waiver authority may be further delegated to no lower than the operations group commander (or equivalent).

**\*(Replace)** 5.4.3.2.1. If the mission justifies the increased risk, MAJCOM/A3 may authorize a departure in VMC regardless of climb gradient compliance. At MAJCOM/A3 discretion, waiver authority may be further delegated to no lower than the operations group commander (or equivalent).

**\*(Replace)** 6.6.1. In lieu of MAJCOM guidance, when flying IFR, or VFR at night (unaided), over mountainous terrain with the outside air temperature (OAT) colder than ISA minus 10°C, plan to fly at least 1,000 ft. above published minimum altitudes obtained from terrain and IFR enroute charts (e.g. minimum enroute altitudes (MEA), minimum obstruction clearance altitudes (MOCA), OROCAs or other minimum safe altitudes during low-levels). MAJCOM/A3s may publish alternate MDS-specific guidance for aircraft that are equipped to measure and display true altitude with the outside air temperature (OAT) colder than ISA minus 10°C.

3. The guidance in this Memorandum becomes void after one year has elapsed from the date of this Memorandum, or upon incorporation by interim change to, or rewrite of the affected publication, whichever is earlier.

4. Air Force Flight Standards Agency POC for the Guidance Memorandum is Maj June Cruse, HQ AFFSA/XOF, DSN 884-8424, email: [june.cruse@us.af.mil](mailto:june.cruse@us.af.mil).

TOD D. WOLTERS, Lt Gen, USAF  
Deputy Chief of Staff, Operations

**BY ORDER OF THE  
SECRETARY OF THE AIR FORCE**

**AIR FORCE INSTRUCTION 11-202,  
VOLUME 3**



**7 NOVEMBER 2014**

***Flying Operations***

**GENERAL FLIGHT RULES**

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**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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**RELEASABILITY:** There are no releasability restrictions on this publication.

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OPR: HQ AFFSA/XOF

Certified by: HQ USAF/A3O  
(Brig Gen Giovanni Tuck)

Supersedes: AFI11-202V3, 22 October 2010

Pages: 75

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This instruction implements AFD 11-2, *Aircrew Operations*, by prescribing general flight rules that govern the operation of USAF aircraft (manned and unmanned) flown by USAF pilots, pilots of other services, foreign pilots, and civilian pilots. This instruction applies to Air Force activities operating aircraft on loan or lease, to the extent stipulated in the loan or lease agreement; Air Force Reserve Command (AFRC) units; and to Air National Guard (ANG) units. Public Aircraft Operations (PAO) under government contract for Air Force operations will comply with stipulations documented in written declaration of public aircraft status, applicable Title 14 Code of Federal Regulations (CFR) and this regulation. Air Force Instruction (AFI) 11-2 Mission Design Series (MDS) Specific, Volume 3 instructions (e.g., AFI 11-2KC-10, Volume 3) may contain specific operational guidance unique to individual aircraft and crew positions. MDS-specific, Volume 3 instructions will not be less restrictive than this instruction. Address questions concerning this instruction to Headquarters Air Force Flight Standards Agency (HQ AFFSA) at HQ AFFSA/XOF, 6500 S. MacArthur Blvd, Bldg 4, Room 240, Oklahoma City, OK 73169, email: [hqaffsa.xof@us.af.mil](mailto:hqaffsa.xof@us.af.mil). See Attachment 1 for a list of terms and abbreviations.

**Improvement Recommendations:** Use AF Form 847, *Recommendation for Change of Publication*, to recommend changes to this instruction in accordance with (IAW) AFI 11-215, *USAF Flight Manuals Program (FMP)*.

**NOTE:** The reports in this directive are exempt from licensing according to AFI 33-324, *The Air Force Information Collections and Reports Management Program*. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW Air Force Records

Information Management System (AFRIMS) Records Disposition Schedule (RDS). The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

## ***SUMMARY OF CHANGES***

This document has been updated to reflect current aviation guidance. It has been significantly re-organized in chapter and content layout from the previous version and should be thoroughly reviewed in its entirety. Tier waiver authorities (T-0, T-1, T-2, T-3) have been included to all mandated unit compliance items (Wing level and below) as prescribed by AFI 33-360, *Publications and Forms Management*.

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## Chapter 1

### ROLES AND RESPONSIBILITIES

#### 1.1. General.

1.1.1. **Pilot in Command Authority.** The Pilot in Command (PIC), regardless of rank, is responsible for, and is the final authority for the operation of the aircraft.

1.1.2. This AFI provides broad guidance and cannot address every situation. Aircrew will use best judgment to safely conduct flying operations.

1.1.3. Supplemental information to this AFI may be found in the AFMAN 11-217 series.

1.1.4. This instruction is a common source of flight directives that includes:

1.1.4.1. Air Force guidance;

1.1.4.2. Title 14 Code of Federal Regulations (CFRs) and the Aeronautical Information Manual (AIM); and,

1.1.4.3. International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs).

1.1.5. Unmanned Aircraft System (UAS) or Remotely Piloted Aircraft (RPA) applicability.

1.1.5.1. Categories 4 and 5 RPA operations shall follow this AFI; Categories 1-3 ("Small") UAS shall be governed by AFI 11-502V3, *Small Unmanned Aircraft Systems Operations*. UAS/RPA categories are listed in AFI 11-502V3.

**1.2. Waivers.** Directive guidance (will, shall, must, etc.) throughout this regulation are tiered IAW AFI 33-360, *Publications and Forms Management*. For examples of tiered waivers, see AFI 33-360. HAF/A3O designates the HQ AFFSA/CC as the Approving Official to concur with renewal of existing waivers. MAJCOM/A3 is waiver authority for MAJCOM supplements to this instruction and in the appropriate MDS-specific Volume 3.

1.2.1. **Waiver Process.** Coordination through HQ AFFSA/XOF ([hqaffsa.xof@us.af.mil](mailto:hqaffsa.xof@us.af.mil)) is required for the initiation of Tier 0 and 1 waivers and is recommended prior to initiation of Tier 2 and 3 waivers. HQ AFFSA/XOF will provide only written waivers; verbal waivers are not authorized.

1.2.1.1. **Tier 0:** Annotated by "(T-0)". Determined by respective non-AF authority (e.g. Congress, White House, Secretary of Defense, Joint Staff, etc.). The waiver authority is external to AF.

1.2.1.1.1. HQ AFFSA/XOF will be contacted to initiate Tier 0 waivers. Following a MAJCOM/CC (delegable no lower than MAJCOM/A3) request, HQ AFFSA/XOF will request AFI Certifying Official approval for a Tier 0 waiver after concurrence from the external agency (i.e. an Exemption to the CFRs granted by the Federal Aviation Administration (FAA) Administrator). Tier 0 waiver renewal requests will only be accepted from MAJCOM Stan/Eval.

1.2.1.1.2. Tier 0 guidance may include FAA guidance from the Codified Federal Regulations (CFRs) or ICAO guidance from the SARPs.

1.2.1.2. **Tier 1:** Annotated by “(T-1)”. Non-compliance puts Airmen, commanders or the USAF strongly at risk of mission or program failure, death, injury, legal jeopardy or unacceptable fraud, waste or abuse.

1.2.1.2.1. HQ AFFSA/XOF will initiate Tier 1 waivers. Following a MAJCOM/CC (delegable no lower than MAJCOM/A3) request, HQ AFFSA/XOF will request AFI Certifying Official concurrence. Tier 1 waiver renewal requests will only be accepted from MAJCOM Stan/Eval.

1.2.1.2.2. Tier 1 includes guidance that lends to standardization across all USAF wings and platforms.

1.2.1.3. **Tier 2:** Annotated by “(T-2)”. Non-compliance may degrade mission or program effectiveness or efficiency and has potential to create moderate risk of mission or program failure, injury, legal jeopardy or unacceptable fraud, waste, or abuse.

1.2.1.3.1. MAJCOM Stan/Eval will initiate Tier 2 waivers and will request MAJCOM/CC (delegable no lower than MAJCOM/A3) approval for all Tier 2 waivers. Tier 2 waivers only apply within the approving MAJCOM.

1.2.1.3.2. Tier 2 guidance includes instruction that lends to standardization across MAJCOM-specific wings and platforms. Once approved, MAJCOM Stan/Eval will send an informational copy to HQ AFFSA/XOF within 5 duty days.

1.2.1.4. **Tier 3:** Annotated by “(T-3)”. Non-compliance may limit mission or program effectiveness or efficiency and has a relatively remote potential to create risk of mission or program failure, injury, legal jeopardy or unacceptable fraud, waste, or abuse.

1.2.1.4.1. Wing commanders, delegable no lower than operations group commanders or equivalent, will initiate and approve Tier 3 waiver requests. Once approved, wings will send an informational copy to MAJCOM Stan/Eval and HQ AFFSA/XOF within 5 duty days.

1.2.1.4.2. Tier 3 guidance includes instruction that is limited to wing- and location-specified rules that do not affect AF-level standardization.

1.2.2. For the purposes of this instruction, flying MAJCOMS are: ACC, AETC, AFDW, AFGSC, AFMC, AFRC, AFSOC, AMC, DIA, NGB, PACAF, and USAFE. Commander Air Force forces (COMAFFORs) in the grade of O-8 or higher in Combatant Commands (CCMDs) are considered MAJCOM commanders only for forces under their operational control.

**1.3. Compliance.** The PIC will ensure compliance with this AFI and the following (see Attachment 1 for related publications):

1.3.1. Air Force, Major Command (MAJCOM), and Mission Design Series (MDS)-specific instructions;

1.3.2. Flight Information Publications (FLIP) and Foreign Clearance Guide (FCG);

1.3.3. Air Traffic Control (ATC) clearances;

1.3.4. Notices to Airmen (NOTAMs), aircraft technical orders; and,

1.3.5. Combatant Commander's instructions and other associated directives IAW the Air Component Commander's objectives.

**1.4. Operational Prerogative of Military Aircraft.** When operationally necessary, PICs are authorized to conduct military flight operations with due regard for the safety of navigation of civil traffic in international airspace IAW FLIP *General Planning* (GP). Except for pre-planned missions, PICs shall consider such operations in peacetime as a flight rule deviation and will comply with the reporting requirements in **paragraph 1.6.** (T-0). MAJCOMs may authorize tactical operations for training and compliance with **paragraph 1.2.5.**

**1.5. MAJCOM Supplements.** MAJCOM supplements shall not be less restrictive than this instruction and be IAW AFI 33-360. Submit supplements to HQ AFFSA/XOF ([hqaffsa.xof@us.af.mil](mailto:hqaffsa.xof@us.af.mil)) for coordination prior to publishing.

1.5.1. Tier 0 and 1 waivers shall not be published in MAJCOM supplemental guidance.

**1.6. Deviations.** An ATC clearance is not authority to deviate from this instruction. A PIC may only deviate from this instruction, flight rule, or ATC clearance to protect life, for safety of flight, or when an in-flight emergency requires immediate action.

1.6.1. **Notification.** When deviating from an ATC clearance, notify ATC of the action taken as soon as possible.

1.6.2. **Post-Flight Actions.** In the event of a deviation from a flight rule and/or when given traffic priority by ATC in an emergency, the PIC will verbally report the incident to a supervisor and commander within 24 hours of the incident and shall make a detailed written record (T-0). The unit will keep a copy of the record for a minimum of 1 year from the date of the incident and be prepared to provide the record to the appropriate investigating authority if required (T-0).

**1.7. Violations.** A violation may result when a USAF aircraft deviates from flight rules. FAA ATC deviation reports involving a USAF aircraft are processed by the Air Force Representative to the FAA (AFREP) IAW AFI 13-201, *Airspace Management*. Air Force ATC deviation reports involving USAF aircraft are processed IAW AFI 91-202, *The US Air Force Mishap Prevention Program*. Violations that occur in the airspace of foreign nations are processed IAW the procedures of that nation.

1.7.1. For any alleged violation, utilize aircraft call-sign for any contact with ATC. Do not release names of crewmembers to non-USAF agencies without the permission of the AFREP in coordination with the MAJCOM/A3 or HQ USAF/A3O.

1.7.2. If notified by an AFREP of a possible violation, MAJCOMs will preserve any available evidence for a minimum of 180 days and will contact the AFREP prior to disposal.

**1.8. Aviation Safety Reporting.** Potential hazards to aviation safety should be reported via the military Aviation Safety Action Program (ASAP) ([www.safety-masap.com](http://www.safety-masap.com)). Incidents involving damage to aircraft, personal injury, or intentional disregard of orders or instructions, whether reported to ASAP or not, shall be reported to a Flight Safety Officer (FSO) as soon as possible (T-0). Report hazardous air traffic events IAW AFMAN 91-223, *Aviation Safety Investigations and Reports*.

**1.9. Airworthiness.** For all issues concerning aircraft airworthiness certification, refer to AFI 62-601, *USAF Airworthiness*.

**1.10. Communication, Navigation, Surveillance (CNS) Certification and Approval.** USAF aircraft and aircrews must comply with the performance requirements and specifications appropriate for the route, procedure, and airspace unless exemptions or special procedures for non-equipped aircraft are granted (T-0).

1.10.1. Remotely Piloted Aircraft. See **paragraph 4.10.**

1.10.2. Operational Approvals. MAJCOM CNS procedures and training should provide a level of performance and safety that is consistent with civil airspace standards. HQ AFFSA will assist MAJCOMs with Operational Approvals. Contact AFFSA/XON ([hqaffsa.xon@us.af.mil](mailto:hqaffsa.xon@us.af.mil)) for capabilities that require specific operational approval.

**1.10.2.1. Lead MAJCOM responsibilities:**

1.10.2.1.1. Provide training, instructions, procedures, and minimum equipment lists for CNS capabilities to operators and maintenance personnel.

1.10.2.1.2. Receive HQ USAF/A3O endorsement for operational approvals. Initiate endorsement through AFFSA/XON.

1.10.2.1.3. Provide detailed MDS-specific guidance authorizing aircrew to exercise CNS capabilities including approvals, qualifications, and any restrictions or prohibitions.

1.10.2.1.4. Ensure CNS capabilities are properly certified and operationally approved IAW AFI 63-137, *Assurance of Communications, Surveillance/Air Traffic Management (CNS/ATM), Navigation Safety, and Next Generation Air Transportation System (NextGen) Performance*. Also reference AFI 63-112, *Cockpit Working Groups*.

**1.10.2.2. AFFSA responsibilities:**

1.10.2.2.1. Assist MAJCOMs with identifying and defining CNS requirements and accomplishing operational approvals.

1.10.2.2.2. Review MAJCOM approvals for consistency with civil standards and for completeness of operational procedures, flight manuals, and directives prior to staffing for endorsement.

**1.11. Primary Flight Reference (PFR).** Any PFR used for instrument flight shall be considered for endorsement by HQ USAF/A3O (T-1). Contact HQ AFFSA/XON ([hqaffsa.xon@us.af.mil](mailto:hqaffsa.xon@us.af.mil)) for PFR endorsement process.

1.11.1. USAF aircraft cockpits and UAS control stations must always provide full-time attitude, altitude, airspeed information, and the capability to recognize, confirm, and recover from unusual attitudes in all pilot positions (T-1).

1.11.1.1. UAS control stations must also display at all times: link status, link availability, lost link indications, and logic information (autopilot control mode, primary route, and contingency route) (T-1). *Exception:* Contingency route may be immediately available if not displayed at all times.

1.11.1.2. Lead Commands will define display requirements for aircraft not certified or authorized for instrument flight (T-1).

1.11.2. MAJCOMs will issue guidance for configuration of pilot-selectable flight displays. In actual instrument meteorological conditions (IMC) or when there is no discernible visual horizon, an HQ USAF/A3O-endorsed PFR shall be displayed in the pilot flying position.

## Chapter 2

### FLIGHT READINESS

**2.1. Crew Rest.** Crew rest is compulsory for aircrew members prior to performing any duties involving aircraft operations and is a minimum of 12 non-duty hours before the Flight Duty Period (FDP) begins (T-2). Crew rest is free time and includes time for meals, transportation, and rest. This time must include an opportunity for at least 8 hours of uninterrupted sleep. Crew rest period cannot begin until after the completion of official duties.

2.1.1. Aircrew members are individually responsible to ensure they obtain sufficient rest during a crew rest period.

2.1.2. Any official business interrupts the crew rest period. If crew rest is interrupted, individuals will immediately inform appropriate leadership or command and control (C2) and will either begin a new crew rest period or not perform flight duties (T-1). *Exception:* Aircrew may initiate mission-related communication with official agencies without interrupting crew rest.

2.1.3. Exceptions to the 12-Hour Minimum Crew Rest Periods. For continuous operations when basic aircrew FDPs are between 12 to 14 hours, subsequent crew rest may be reduced to a minimum of 10 hours by the PIC in order to maintain a 24-hour work/rest schedule (T-2). “Continuous operations” is defined as three or more consecutive FDPs of at least 12 hours duration with minimum crew rest period.

2.1.3.1. The 10-hour crew rest exception shall only be used to keep crews in 24-hour clock cycles, not for scheduling convenience or additional sortie generation.

2.1.3.2. Any reduction from 12-hour crew rest requires pre-coordination for transportation, meals, and quarters so that crewmembers are provided an opportunity for at least 8 hours of uninterrupted sleep.

**2.2. Flight Duty Period (FDP)** (see [Table 2 1](#)). FDP may be waived by MAJCOM/A3 when an ORM assessment determines that mission requirements justify the increased risk. At MAJCOM/A3 discretion, waiver authority may be further delegated to no lower than the operations group commander (or equivalent). Waivers to flight duty limitations may be published in MAJCOM guidance or on a case-by-case basis.

2.2.1. FDP begins when an aircrew member reports for a mission, briefing, or other official duty and ends at final engine shutdown after the final flight of the completed mission. FDP for UAS aircrew member ends at final engine shutdown, final in-flight handover briefing, or final crew swap, whichever occurs last.

2.2.2. When authorized by the waiver authority, the PIC may extend FDP a maximum of 2 hours to compensate for mission delays.

**2.3. Post-Flight Duties.** If official post-flight duties are anticipated to exceed 2 hours, commanders should consider reducing the FDP to ensure the safe completion of those duties.

**Table 2.1. Maximum FDP (Hours).**

<b>Aircraft Type</b>	<b>Basic Aircrew</b>	<b>Augmented Aircrew</b>
Single Piloted Aircraft	12	NA
Fighter, Attack or Trainer (Dual Control)	12	16
Bomber, Reconnaissance, Electronic Warfare, or Battle Management (Dual Control)	16	24
Tanker/Transport	16	NA
Tanker/Transport with Sleeping Provisions <sup>1</sup>	16	24
Rotary Wing/Tilt-rotor (without Auto Flight Control System)	12	14
Rotary Wing/Tilt-rotor (with Auto Flight Control System)	14	18
Utility	12	18
Unmanned Aircraft System (Single Control)	12	NA
Unmanned Aircraft System (Dual Control)	16	NA
<b>NOTE 1:</b> <i>Sleeping provisions are crew bunks or other MAJCOM-defined rest facilities aboard the aircraft. Rest facilities should provide adequate privacy and noise levels to obtain suitable rest.</i>		

**2.4. Deadhead Time.** Deadhead time is when an aircrew member flies as a passenger (no flight-related duties performed) while on flight orders and may be flown without crew rest.

2.4.1. If flight-related duties are planned to be performed in conjunction with deadheading, crew rest and FDP restrictions apply (T-2).

2.4.2. Deadhead time will not occur within 12 hours after accomplishing aircrew-related duties unless requested by the aircrew member and coordinated by C2 (T-3).

2.4.3. Deadhead crewmembers will be annotated as Mission Essential Personnel (MEP) on the Flight Authorization IAW AFI 11-401, *Aviation Management*.

**2.5. Alert Duty.** MAJCOMs establish alert and compensatory periods in keeping with mission requirements and risk management (RM).

**2.6. Maximum Flying Time.** 56 flight hours per 7 consecutive days, 125 flight hours per 30 consecutive days, and 330 flight hours per 90 consecutive days (T-1).

**2.7. Flight Readiness Limitations.**

2.7.1. **Aircrew members will not fly:**

2.7.1.1. Anytime the crewmember has not obtained the appropriate crew rest IAW paragraph 2.1. (T-2).

2.7.1.2. If any alcohol is consumed within 12 hours prior to takeoff (or assuming aircraft control for UAS) or if impaired by alcohol or any other intoxicating substance, to include the effects or after-effects.

2.7.1.3. Anytime a physical or psychological condition is suspected or known to be detrimental to the safe performance of flight duty. Consult a flight surgeon at the earliest opportunity.

2.7.1.4. While self-medicating, except IAW the “Official Air Force Aerospace Medicine Approved Medications” found in AFI 48-123, *Medical Examinations and Standards*.

2.7.1.5. Within 24 hours of compressed gas diving including SCUBA, surface supplied diving, hyperbaric (compression) chamber exposure or aircraft pressurization checks (to below sea level) that exceed 10 minutes duration (this restriction not applicable to UAS flight operations) (T-1). *Exceptions:* Following Helicopter Emergency Egress Device System (HEEDS) training, aircrew may only fly within the 24-hour window if the aircraft’s maximum altitude remains below 10,000 ft. MSL. Air Force divers on aeronautical orders will follow guidelines IAW SS521-AG-PRO-010 U.S. Navy Diving Manual for flying and diving restrictions (T-1).

2.7.1.6. Within 12 hours after completion of a hypobaric (altitude) chamber flight above 25,000 ft. mean sea level (MSL) (T-1). Personnel may fly as passengers in aircraft during this period provided the planned mission will maintain a cabin altitude of 10,000 ft. MSL or less. For altitude chamber flights to a maximum altitude of 25,000 ft. MSL or below, aircrew members may fly without restriction as crewmembers or passengers if cabin altitude is not planned to exceed 15,000 ft. MSL (this restriction not applicable to UAS flight operations). There are no restrictions following Reduced Oxygen Breathing Device (ROBD) training.

2.7.1.7. Within 72 hours after donating blood, plasma, or bone marrow (T-1).

2.7.2. **Medical.** Aircrew members must maintain a medical clearance from the flight surgeon to perform in-flight duties (T-1). Medical or dental treatment obtained from any source must be cleared by a flight surgeon prior to reporting for flight duty (T-1).

2.7.2.1. Use of any medication or dietary supplements is governed by AFI 48-123 and as approved by a flight surgeon. Aircrew members will not normally self-medicate. In the absence of other MAJCOM guidance, the following is a partial list of medications that may be used without medical consultation:

2.7.2.1.1. Single doses of over-the-counter (OTC) aspirin, acetaminophen, ibuprofen to provide analgesia for minor self-limiting conditions.

2.7.2.1.2. OTC skin antiseptics, topical anti-fungals, 1% hydrocortisone cream, or benzoyl peroxide for minor wounds and skin diseases which do not hinder flying duties or wear of personal equipment.

2.7.2.1.3. OTC antacids for mild isolated episodes of indigestion.

2.7.2.1.4. OTC hemorrhoidal suppositories.



2.7.2.1.5. OTC bismuth subsalicylate for mild cases of diarrhea.

2.7.2.1.6. OTC oxymetazoline or phenylephrine nasal sprays may be carried should unexpected ear or sinus block occur during flight. Aircrew may only use such sprays as “get me downs.” Do not use to treat symptoms of head congestion prior to flight.

**2.8. Alertness Management and Fatigue Mitigation.** MAJCOMs will provide guidance to address aircrew alertness and fatigue management.

2.8.1. **Fatigue Countermeasure Medications.** MAJCOMs will provide guidance on the use of go and no-go medications IAW AF/SG policy.

2.8.2. **Controlled Cockpit Rest.** Controlled cockpit rest may be implemented when the basic aircrew includes a second qualified pilot. All cockpit crewmembers must remain at their stations (T-0). Cockpit rest shall be limited to 45 minutes, taken by only one crewmember at a time, and must be restricted to non-critical phases of flight between cruise and one hour prior to planned descent (T-2). More than one rest period per crewmember is permitted. Cockpit rest is not authorized when aircraft system malfunctions increase cockpit workload (e.g., autopilot, navigation systems) (T-1). The resting crewmember must be awakened immediately if a situation develops that affects flight safety. Cockpit rest shall not be a substitute for any required crew rest (T-1).

2.8.3. Flight publications describe procedures for loss of pressurization, oxygen, cockpit temperature control, inoperative autopilot, and other in-flight malfunctions or emergencies that restrict flight duration and contribute to aircrew fatigue. Such limitations in-flight publications take precedence over less restrictive standards in this instruction.

**2.9. Aircrew Flight and Survival Equipment.** Wear and use authorized clothing and equipment IAW AFI 11-301, Volume 1, *Aircrew Flight Equipment (AFE) Program*, AFI 16-1301, *Survival, Evasion, Resistance and Escape (SERE) Program*, MAJCOM guidance, Special Instructions (SPINS), and the aircraft technical order (T.O.) (T-1).

2.9.1. **Spectacles.** Crewmembers that require corrective spectacles while performing aircrew duties must only use Air Force-provided spectacles (T-1). Crewmembers must also carry a spare set of clear Air Force-provided spectacles while performing aircrew duties (T-1).

2.9.2. **Sunglasses.** MAJCOMs will determine the types of sunglasses approved for flight.

2.9.3. **Contact Lenses.** Crewmembers who desire contact lenses must consult a flight surgeon, meet criteria, and follow guidelines outlined in AFI 48-123. While performing aircrew duty, comply with paragraph 2.9.1. (T-1).

2.9.4. **Laser Eye Protection.** MAJCOMs that permit aircrew laser eye protection will publish specific guidance on training and use prior to in-flight use. Aircrew will follow AFI 11-301, Volume 4, *Aircrew Laser Eye Protection (ALEP)*, when potential laser hazards exists.

2.9.5. **Night Vision Devices (NVDs).** Crewmembers must undergo a MAJCOM-approved initial certification course IAW AFI 11-202, Volume 1, *Aircrew Training*, prior to their initial flight with NVDs (T-1). If wearing clear spectacles, contact lenses, or laser eye protection with NVDs, conduct pre flight adjustments wearing both (T-1).

2.9.6. **Flashlights** (N/A for UAS). Each crewmember must have an operable flashlight for night operations (T-2).

## Chapter 3

### GENERAL FLIGHT RULES

#### 3.1. Professional Flying Standards.

3.1.1. **Reckless Flying.** The PIC is responsible for ensuring the aircraft is not operated in a careless, reckless, or irresponsible manner that could endanger life or property.

3.1.2. **Unauthorized Flight Demonstrations.** Unauthorized or impromptu flight demonstrations, maneuvers, events, or “fly-bys” are prohibited. AFI 11-209, *Aerial Event Policy And Procedures*, addresses authorized flight demonstrations.

**3.2. Nonrated Flyers.** Flying unit commanders must ensure nonrated personnel and civilians who perform in-flight duties receive an indoctrination course on MDS-specific missions, egress, emergency procedures, and use of flight and emergency equipment (T-0). A preflight briefing does not qualify as an indoctrination course.

**3.3. Transporting Passengers Under the Influence.** Ensure personnel suspected to be under the influence of intoxicants or narcotics are not allowed to board a USAF aircraft except in an emergency or when authorized by command and control authority.

**3.4. Tobacco Use.** Tobacco use in all forms, including electronic nicotine delivery systems, is prohibited on all aircraft (T-0).

**3.5. Transport of Drugs.** Do not allow the transport of narcotics, controlled substances, or other dangerous drugs unless such transport has been approved by a US Military, Federal, or State authority (T-0).

**3.6. Hazardous Cargo.** Ensure compliance with AFJI 11-204, *Operational Procedures For Aircraft Carrying Hazardous Material*.

**3.7. Flight Displays.** Comply with MAJCOM or MDS-specific guidance for configuration of pilot-selectable flight displays.

**3.8. Authorized Resources for Flight and Mission Related Duties.** Conduct flight and mission-related duties with MAJCOM-approved devices and resources. MAJCOMs will establish policy on the use of personal, public, or non-DoD resources for flight and mission duties (e.g. personally-owned devices, non-DoD networks, commercial websites).

**3.9. Portable Electronic Devices (PEDs).** The PIC will prohibit the use of any PED suspected of creating interference with systems on the aircraft (T-0).

3.9.1. **Non-Transmitting PEDs.** The following may be used at any time or altitude: portable voice recorders, hearing aids, heart pacemakers, electric shavers, calculators, watches, or any other portable electronic device authorized by the MAJCOM.

3.9.2. **Transmitting PEDs.** MAJCOM/A3 may authorize use of PEDs at any altitude with transmitters ON or OFF. In the absence of MAJCOM guidance, the PIC may authorize use of PEDs at or above 10,000 ft. MSL. with transmitter OFF (e.g. Airplane Mode).

3.9.3. **PED Connection to Aircraft.** MAJCOMs may authorize electrical connection of PEDs to aircraft power, data, or antennae with aircraft Program Manager approval. MAJCOMs will provide any applicable restrictions.

#### 3.9.4. PEDs used for Flight or Mission Duties.

3.9.4.1. Information displayed on PEDs used to facilitate operation of the aircraft (e.g. Tech Orders, takeoff and landing data (TOLD)) will only be used as approved IAW AFI 11-215, *USAF Flight Manuals Program (FMP)*.

3.9.4.2. PEDs used to facilitate execution of the mission (e.g. portable electronic flight bags, portable Global Positioning System (GPS) units) will only be used as authorized by the MAJCOM (T-1). MAJCOMs will evaluate PEDs to minimize risks associated with mission completion, safety, and security.

3.9.4.3. MAJCOMs will publish guidance on use of personally-owned hardware or software.

3.9.5. **Photo and Video Recording Devices.** Pilot use of handheld photo or video recording devices is prohibited when that pilot is the only one with immediate access to the flight controls (T-2).

3.9.6. **Medical Equipment.** Normally, only medical equipment referenced in the aircraft flight manual, MDS-specific instruction, or listed in the Air Force Medical Logistics website is permitted. See: <https://medlog.detrick.af.mil/index.cfm?event=memo.eqcat>.

**3.10. Aircraft Movement on the Ground.** Comply with AFI 11-218, *Aircraft Operations and Movement on the Ground*, and locally published procedures.

3.10.1. **Clearances.** Obtain clearance from ATC before taxiing, taking a runway, takeoff or landing at an airport with an operating control tower (T-0). Precisely read back all taxi and hold short instructions (T-0). If a taxi route requires crossing any runway, hold short until obtaining specific clearance to cross each runway (T-0). Do not taxi across or onto the assigned runway without clearance from ATC (T-0).

3.10.2. **Surface Movement Guidance and Control System (SMGCS).** Obtain MAJCOM-directed training and certification before participating in SMGCS taxi operations (T-0). MAJCOMs shall publish MDS-specific guidance for aircrew required to operate at SMGCS locations in low visibility. See AFI 11-218 for further guidance.

**3.11. Crew at Stations.** Crewmembers must occupy their assigned duty stations from takeoff to landing unless absence is normal in the performance of crew duties or in connection with physiological needs (T-0). Pilots shall not leave their duty station unless another qualified pilot establishes control of the aircraft (T-0).

**3.12. Sterile Cockpit.** In the absence of MAJCOM guidance, aircrew of fixed-wing aircraft shall minimize non-essential cockpit conversations and other extraneous activities which could interfere with flight duties when below 10,000 ft. MSL, during critical phases of flight, and during all taxi operations.

**3.13. Inflight Reporting.** See also AFI 10-206, *Operational Reporting*.

3.13.1. **Flight Safety Conditions.** Immediately report hazardous weather conditions, wake turbulence, volcanic activity, or large concentrations of birds or wildlife on or near the airfield to the appropriate controlling agency. Pilots shall report any other significant flight condition that may affect aviation safety. See pilot report (PIREP) procedures in the *Flight Information Handbook (FIH)*.

3.13.2. **Minimum or Emergency Fuel Advisory.** Declare “minimum fuel” or “emergency fuel” to the appropriate controlling agency when the aircraft may land at the intended destination with less than the MDS-specific minimum or emergency fuel reserves.

3.13.3. **Position Reports.** Report position as requested by ATC, host-nation procedures, or ICAO procedures (T-0). See IFR Supplement for position report format.

3.13.4. **Hazardous Laser Activity.** Report any hazardous laser activity. Reference AFI 11-301V4 for specific actions.

3.13.5. **Electromagnetic Interference.** Report any electromagnetic interference IAW Joint Spectrum Interference Resolution (JSIR) procedures in the FIH and AFI 10-707, *Spectrum Interference Resolution Program*.

### 3.14. Oxygen and Pressurization Requirements (N/A for UAS).

3.14.1. **Oxygen.** Ensure sufficient oxygen for the planned mission is available to all occupants before takeoff (T-0). Normally, aircrew will use supplemental oxygen any time the cabin altitude exceeds 10,000 ft. MSL.

3.14.2. **Unpressurized Operations.** When mission essential, aircrew trained IAW AFI 11-403, *Aerospace Physiological Training Program*, may operate aircraft unpressurized up to Flight Level (FL) 250 IAW MAJCOM guidance and the following restrictions (T-1):

3.14.2.1. Without supplemental oxygen:

3.14.2.1.1. Altitude is limited to 14,000 ft. MSL.

3.14.2.1.2. Flight time between 10,000 and 12,500 ft. MSL is unrestricted, but shall not exceed 1 hour if any portion of the flight is conducted in IMC, at night (with or without NVDs), while employing weapons, conducting airdrop, air-refueling, or if performing high-g maneuvers.

3.14.2.1.3. Flight time between 12,500 and 14,000 ft. MSL shall not exceed 30 minutes.

3.14.2.1.4. If any occupant is not trained IAW AFI 11-403, altitude and flight time are limited to 13,000 ft. MSL and 3 hours, but shall not exceed the limits in paragraphs 3.14.2.1.2 and 3.14.2.1.3.

3.14.2.2. Supplemental oxygen must be used by all occupants between 14,000 ft. MSL and FL250. Do not exceed FL250 unless occupants are wearing functional pressure suits (see paragraph 3.14.7).

3.14.3. **Pressurized Operations.** Pilots flying pressurized operations will normally maintain a cabin altitude below 10,000 ft. and comply with the supplemental oxygen requirements in **Table 3.1.** (T-1). If cabin altitude is between 10,000 ft. MSL and FL250, comply with **paragraph 3.14.2.**

**Table 3.1. Oxygen Requirements for Pressurized Aircraft.**

Pilot(s) <sup>1</sup>	Cockpit	Other Flight Deck Crew	Cabin/Cargo Area Crew	Pax

		Crew <sup>2</sup>			
10,000 ft. through FL 250	R	R	R	A	NA
Above FL 250 to FL 350	One I/One R	R	R	A	A
Above FL 350 to FL 410 (two pilots at controls )	I	R	R	A	A
Above FL 350 to FL 410 (one pilot at controls)	One O/One A	I	R	A	A
Above FL 410 to FL 450	One O/ One I	I	R	A	A
Above FL 450 to FL 500	One O/ One I	I	I	A	A
Above FL 500 to FL 600	G	G	G	G	G
Above FL 500 (Sustained)	S	S	S	S	S

**NOTE 1:** Single-pilot aircraft must follow the most restrictive guidance in this table.

**NOTE 2:** Cockpit crew is defined as those crew positions with access to flight controls or responsibility for flight engineer panel, communication, or navigation systems.

**LEGEND:**

**A - Oxygen available.** Carry or place portable oxygen units or extra oxygen outlets with masks throughout the cabin/cargo area so that any person has quick access to oxygen should a loss of pressurization occur.

**R - Oxygen readily available.** A functioning system and mask shall be located within arm's reach, and the regulator must be set to 100 percent and ON (when regulator is adjustable).

**I - Oxygen immediately available.** Must wear helmets with an oxygen mask attached to one side, or have available an approved quick-don style mask properly adjusted and positioned. Regulators shall be set to 100 percent and ON.

**O - Oxygen mask ON.** Regulator ON and normal.

**G - Wear a partial pressure suit.** Suit must provide 70mm Hg of assisted positive pressure breathing for altitude (pressure breathing for altitude system/get-me-down scenario).

**S - Wear a pressure suit.** Suit must provide a total pressure (atmospheric plus suit differential) of at least 141mm Hg to the head and neck with adequate body coverage to prevent edema and embolism.

**3.14.4. Procedures for Loss of Cabin Pressure.** Initiate an immediate descent to the lowest practical altitude, preferably below 18,000 ft. MSL. Do not allow cabin altitude to remain above FL250 unless occupants are wearing functional pressure suits (T-1). If any occupant lacks functioning oxygen equipment, descend to an altitude of 13,000 ft. MSL or less (terrain or fuel requirements permitting) and comply with paragraph 3.14.2. (T-1).

3.14.4.1. If cabin altitude exceeds 18,000 ft. MSL following the unintended loss of cabin pressure, aircrew and passengers must be evaluated by a flight surgeon or other aviation medical authority prior to further flight (T-1). If cabin altitude cannot be determined, use the aircraft altitude at the time of the event. Report a loss of cabin pressurization IAW AFMAN 91-223.

**3.14.5. Decompression Sickness (DCS).** If any occupant exhibits DCS symptoms, descend as soon as practical and land at the nearest suitable installation where medical assistance can be obtained (T-1). Individuals suspected of DCS shall be administered and remain on 100% oxygen (using tight-fitting mask or equivalent) until evaluated by an aviation medical authority (T-1). Decompression sickness may occur up to 12 hours after landing. Aircrew will not fly after a DCS event without specific authorization from a flight surgeon (T-1).

**3.14.6. Hypoxia.** If anyone on the aircraft experiences hypoxia symptoms, descend immediately to the lowest practical altitude and land at a suitable location to obtain medical assistance (T-1). Aircrew will not fly after a hypoxia event without specific authorization from a flight surgeon (T-1). For hypoxia symptoms caused by an On-Board Oxygen Generation System (OBOGS), follow MDS-specific guidance.

**3.14.7. High Altitude Operations.** Without functional pressure suits, maintain a cabin altitude below FL250 and adhere to the time limits in Table 3.2. (T-1). For high-altitude airdrop missions, use the oxygen requirements in AFI 11-409, *High Altitude Airdrop Mission Support Procedures*. If the aircraft lands between missions and the time on the ground equals or exceeds the time spent at or above a cabin altitude of FL210, the time of allowable duration can be reset to the maximum (T-1).

**Table 3.2. Cabin Altitude Time Limits (DCS Prevention) (N/A for U-2 Operations).**

Time (minutes)	Cabin Altitude (ft. MSL)
0	At or Above FL 250
45	24,000 – 24,999
70	23,000 – 23,999
120	22,000 – 22,999
200	21,000 – 21,999

**3.15. Aircraft Lighting.** Operate aircraft lighting according to the following guidance or IAW host-nation rules and theater SPINS (T-0):

3.15.1. **Position Lights.** Illuminate position lights (one per side minimum) between official sunset and sunrise (T-0); and,

3.15.1.1. When an engine is starting or running. Aircraft that do not have power available before start shall turn them on as soon as power is available (T-0); or,

3.15.1.2. While being towed, or when parked in an area likely to create a hazard, unless clearly illuminated by an outside source (T-0).

3.15.2. **Anti-collision or Strobe Lights.** If equipped, turn anti-collision or strobe lights on from just prior to engine start until engine shutdown (T-0).

3.15.2.1. Aircraft that do not have power available before engine start shall turn anti-collision or strobe lights on as soon as power is available (T-0).

3.15.2.2. Flashing lights may be switched off or reduced in intensity if they adversely affect the performance of duties, or subject an outside observer to harmful glare (T-0).

3.15.3. **Landing Lights.** If equipped, landing lights should be turned on when takeoff clearance is received, when commencing takeoff roll at an airport without an operating control tower, or when operating below 10,000 ft. MSL within normal MDS-specific operating procedures.

3.15.4. **Reduced Aircraft Lighting.** MAJCOMs may authorize reduced or lights-out operations in restricted areas, warning areas, host-nation approved areas, or designated airfields. Designated airfields shall be documented in a Letter of Agreement (LOA) (T-0).

### 3.16. Airfield Lighting.

3.16.1. Fixed-wing operations at night:

3.16.1.1. Will not be conducted from a runway unless it is outlined with operable lighting or high-intensity runway reflective markers and is clearly discernible (T-2).

3.16.1.2. Are restricted to military airfields or civilian airports with an appropriate LOA during non-contingency operations from unlighted runways or landing zones (or those using high-intensity runway reflective markers) (T-0).

3.16.1.3. Must comply with MDS-specific operating instructions, including comprehensive risk mitigation measures (such as infrared (IR) lighting requirements, NVD usage, non-participating aircraft procedures, NOTAM issuance, weather and lunar illumination requirements and RM assessments) (T-2).

3.16.2. Covert IR runway lighting used by qualified crews equipped with NVDs meets the intent of lighted landing surface.

3.16.3. Extreme Latitudes. In Alaska, areas located north of 60° North latitude, Antarctica, and areas located south of 60° South latitude, aircraft may be operated to unlighted airports during the period of civil twilight (T-0).

3.17. **Right-of-Way.** Each pilot must take whatever action is necessary to avoid collision, regardless of who has the right-of-way. The yielding aircraft must not pass over, under, abeam, or ahead of the other aircraft until well clear.

3.17.1. **Distress.** Aircraft in distress have the right-of-way over all other air traffic.



3.17.2. **Converging.** When converging at approximately the same altitude (except head-on or approximately so), the aircraft to the other's right has the right-of-way. Aircraft of different categories have the right-of-way in the following order of priority: balloons, gliders, aircraft towing or refueling other aircraft, airships, rotary- or fixed-wing aircraft.

3.17.3. **Approaching Head-On.** If aircraft are approaching each other head-on or approximately so, each shall alter course to the right.

3.17.4. **Overtaking Aircraft.** An overtaken aircraft has the right-of-way. The overtaking aircraft must alter course to the right.

3.17.5. **Landing.** An aircraft established on final approach has the right-of-way over other aircraft on the ground or in the air, except when two or more aircraft are approaching to land. In this case, the aircraft at the lower altitude has the right-of-way but it shall not use this advantage to cut in front of or overtake the other.

**3.18. Sense and Avoid.** Pilots under instrument flight rules (IFR) or visual flight rules (VFR), whether or not under radar control, are responsible for avoiding traffic, terrain/obstacles, and environmental hazards.

3.18.1. Standard IFR separation is provided between aircraft operating under IFR in controlled airspace. Within the National Airspace System (NAS), ATC provides traffic advisories on VFR aircraft on a time-permitting basis. Outside the NAS, consult ICAO and country-specific guidance outlined in the FCG and FLIP.

3.18.2. UAS without approved sense and avoid capabilities will be operated under specific arrangements with appropriate aviation authorities (e.g., FAA, host nation, or military control).

**3.19. Proximity of Aircraft.** Do not allow the aircraft to be flown so close to another that it creates a collision hazard. Use 500 ft. of separation as an approximate guide except for:

3.19.1. Authorized formation flights.

3.19.2. Emergency situations requiring assistance from another aircraft. If an emergency requires visual checks of an aircraft in distress, exercise extreme care to ensure this action does not increase the overall hazard. The capabilities of the distressed aircraft and the intentions of the crews involved must be considered before operating near another aircraft in flight.

3.19.3. MAJCOM-approved maneuvers in which participants are aware of the nature of the maneuver and qualified to conduct it safely (e.g. interceptor visual identification training).

**3.20. Dropping Parachutists, Stores, or Other Objects.** Do not allow objects to be dropped except in an emergency or when required for mission accomplishment. Report any accidental loss of equipment, aircraft parts, or cargo IAW AFI 10-206, *Operational Reporting*, and AFMAN 91-223.

**3.21. Fuel Jettison.** Do not jettison fuel except in an emergency or when required for mission accomplishment. When jettisoning fuel and circumstances permit, provide the appropriate ATC or flight service facility with intentions, altitude, location, and completion time. Report any jettisoning of fuel IAW AFI 10-206.

**3.22. Radio, Laser, and Other Electromagnetic Emitter Restrictions.** Equipment which transmits radio, laser, or other energy will only be operated for the intended purpose and in the authorized manner to prevent unintentional interference, damage, or injury (T-0).

**3.23. Communication, Navigation, and Surveillance Equipment.** Operate equipment as authorized by the MAJCOM. MAJCOMs will establish tactical operations guidance. When operating in controlled airspace under IFR, immediately report to ATC the loss or impairment of navigational, air-to-ground communications, or surveillance capability IAW the FIH.

**3.23.1. Transponders.** Operate the transponder IAW ATC instructions, host nation, MAJCOM directives, and theater SPINS (T-0). In the NAS, transponders will be operated in controlled airspace, including Mode C if installed, on the appropriate code or as assigned by ATC (T-0). Additionally, unless local procedures dictate otherwise, transponders should be turned to the “ON” or normal altitude reporting position prior to aircraft movement (T-0).

3.23.1.1. Mode S Flight ID. Prior to each flight, ensure the Mode S Flight ID matches the call sign entered exactly on the flight plan with no embedded spaces, dashes, extra characters, or added zeros (T-0). When the flight plan call sign is less than seven characters, place blank spaces only at the end.

3.23.1.2. Mode S Address. Prior to each flight, ensure the Mode S address is entered correctly. MAJCOMs will manage assigned dynamic addresses to ensure no two aircraft are airborne with the same address.

3.23.1.3. Mode 4/5. If required, Mode 4/5 operations are outlined in the Flight Information Handbook (See MODE 4/5 in glossary).

**3.23.2. Traffic Collision Avoidance System (TCAS).** Aircraft equipped with TCAS shall operate in the TCAS mode that provides both Traffic Alerts (TAs) and Resolution Advisories (RAs) unless otherwise dictated by the aircraft manual, formation flight requirements, MAJCOM guidance, mission requirements, or host-nation agreements.

3.23.2.1. TCAS on the Ground. While on the ground, operate in standby or TA Only (T-0). TA/RA will be selected during takeoff and landing (T-0).

3.23.2.2. Response to TCAS Alerts. Respond to all RAs regardless of ATC instructions, right-of-way rules, cloud clearance requirements, or other VFR/IFR flight rules, as directed by TCAS unless doing so would jeopardize the safe operation of the aircraft (e.g., descent into obstacles).

3.23.2.2.1. Do not deviate from an assigned ATC clearance based solely on TA information. Attempt to attain visual contact and maintain safe separation.

3.23.2.2.2. In the event of an RA, alter the flight path only to the extent necessary to comply with the RA.

3.23.2.2.3. After deviating from an ATC clearance in response to an RA, notify ATC of the deviation as soon as practical and promptly return to the current ATC clearance when the traffic conflict is resolved or obtain a new clearance.

**3.23.3. Terrain Awareness and Warning Systems (TAWS).** Comply with appropriate flight manual procedures and MAJCOM guidance upon receipt of a Ground Proximity Warning System (GPWS)/TAWS/Enhanced GPWS (EGPWS)/Ground Collision Avoidance

System (GCAS) warning. During VMC flight, terrain warnings do not need to be followed if the pilot can verify the warning is false by visual contact with terrain or obstacles.

#### **3.23.4. Global Navigation Satellite System (GNSS) Equipment.**

3.23.4.1. GPS Equipment. MAJCOMs will determine if GPS is approved as the primary means of navigation and provide guidance for its use. If GPS is not approved as primary, ensure the approved primary means of navigation (e.g., VOR, TAC, etc.) is operational and monitored (T-0).

3.23.4.2. GPS Standard Position Service (SPS) and Precise Position Service (PPS). Follow MAJCOM or SPINS guidance on use of SPS/PPS.

3.23.4.3. Receiver Autonomous Integrity Monitoring (RAIM) is required unless integrity is ensured by other means approved by the MAJCOM (T-0).

3.23.4.3.1. Active RAIM. If RAIM is not available, actively monitor an alternate means of navigation and inform ATC of any degraded capability (T-0).

3.23.4.3.2. Predictive RAIM (P-RAIM). Check P-RAIM prior to departure when possible (T-0). If RAIM is predicted to be unavailable for more than five minutes along the route of flight, the flight must rely on other approved equipment, be rerouted, or delayed (T-0). Not required if Wide-Area Augmentation System (WAAS) enabled and flight is in WAAS coverage area (T-0).

3.23.5. **RNAV Equipment other than GNSS.** (eLORAN, Inertial, Stellar, Doppler, Blended, Hybrid, Tightly-Coupled, EGI, DME/DME, GNSS other than GPS, etc.). MAJCOMs will determine if RNAV equipment other than GNSS is approved as the primary means of navigation and provide guidance for its use. If not approved as primary, ensure the approved primary means of navigation (e.g., GPS, VOR, TAC, etc.) is operational and monitored (T-0).

3.23.6. **Carry-On Equipment.** Use carry-on communication, navigation, and surveillance equipment as authorized by the MAJCOM (MAJCOMs are encouraged to coordinate the use of CNS equipment with the respective aircraft Program Office) (T-1). MAJCOMs will publish guidance and provide training on acceptable use, limitations, and hazards of carry-on equipment. See also **paragraph 3.9**.

**3.24. Formation Flights (Including Air Refueling).** Accomplish formation flights only as authorized by the MAJCOM.

3.24.1. Formation Briefing. Formation flight leads will brief formation flight operations to all participants in accordance with MAJCOM-approved guidance (T-0).

3.24.2. Formation in Reduced Vertical Separation Minimum (RVSM) Airspace within the NAS. Formation flights may operate in RVSM airspace if all participating aircraft are RVSM compliant or approved by ATC (T-0).

3.24.3. Aircraft Lighting. MAJCOMs may authorize formation flights to vary lighting configuration according to the aircraft type and mission requirement. The MAJCOM must provide guidance on this type of operation and ensure the guidance provides an equivalent level of visual identification as a single aircraft.

3.24.4. Transponder Operations.

3.24.4.1. Only one aircraft (normally the lead) of a standard formation should squawk (T-0).

3.24.4.2. Unless otherwise directed, receivers will not squawk when less than 3 nautical miles (NM) from the tanker (T-0).

3.24.4.3. Unless otherwise directed by ATC, all aircraft within a non-standard formation flight will squawk until established within the assigned altitude block and closed to the proper en route interval (T-0). When aircraft interval exceeds 3 NM, both the formation leader and the last aircraft will squawk (T-0).

3.24.5. Traffic Collision Avoidance System (TCAS) Operations.

3.24.5.1. Formation leads (and last aircraft, when formation length exceeds 3 NM) shall operate in TA mode unless otherwise required by ATC, host-nation agreement or specified in the MDS-specific guidance (T-0).

3.24.5.2. During refueling operations, the tanker aircraft will operate in TA mode (T-0).

3.24.6. Non-standard Formations. Non-standard formation flights may be conducted:

3.24.6.1. When approved by ATC;

3.24.6.2. Operating under VFR in visual meteorological conditions (VMC);

3.24.6.3. Operating within an authorized Altitude Reservation (ALTRV);

3.24.6.4. Operating under the provisions of a Letter of Agreement (LOA); or,

3.24.6.5. Operating in airspace specifically designated for a special activity.

**3.25. Large Scale Exercises.** MAJCOMs will conduct large-scale exercises in permanent or temporary special-use airspace (SUA) established according to FAA Joint Order (JO) 7400.2, *Procedures for Handling Airspace Matters*, and FAA JO 7610.4, *Special Operation*. When MAJCOMs approve large-scale exercises or short-term special missions they will ensure information on approved activities is available to the non-participating flying public and coordinate these operations with:

3.25.1. Affected non-participating military flying units;

3.25.2. Affected FAA Air Route Traffic Control Center (ARTCC);

3.25.3. Affected FAA regions through the Air Force representative (AFREP); and,

3.25.4. Other agencies, as appropriate.

**3.26. Aerobatics and Air Combat Tactics.** Aerobatics, air combat tactics and air-to-ground tactics which involve aerobatic type maneuvering must be performed in SUA, ATC-Assigned Airspace (ATCAA), military training routes (MTRs) or host-nation approved airspace IAW the guidelines in AFI 11-214, *Air Operations Rules and Procedures* (T-0). Aircraft deployed or based at overseas locations will operate IAW applicable host-nation agreements or ICAO SARPs (T-0). If the aircraft operating requirements (altitude requirements, maximum airspeeds, dropping of objects, etc.) dictated in the host-nation agreement are less restrictive than USAF/MAJCOM guidance, the most restrictive guidance shall be used (T-1).

**3.27. Temporary Flight Restriction (TFR) Airspace.** Aircraft will not operate in TFR airspace unless authorized (T-0).

**3.28. Uncontrolled Field Procedures.** Use runway favored by the winds if no other factors make that runway unacceptable (T-0). Announce your activities on the appropriate frequencies (T-0). UAS operations are prohibited at uncontrolled fields when other traffic is present (T-2).

**3.29. Obstacle Clearance Responsibility.** Pilots are never relieved of the responsibility for terrain and obstacle avoidance. The radio call “Radar Contact” only means the aircraft has been identified on radar. Responsibility is shared between pilot and controller only after navigational guidance is issued.

**3.30. Participating in Aerial Events.** Ensure compliance with AFI 11-209 when participating in aerial events, demonstrations, and static displays.

**3.31. Simulated Instrument Flight.**

3.31.1. For non-qualified instrument pilots, a safety observer who is able to clear outside at all times, should accompany the flight either as a crewmember or in a chase aircraft (T-0). If a chase aircraft is used, maintain continuous visual contact and two-way communications between aircraft (T-1). A safety observer is defined as a current and qualified instrument pilot or a fighter weapons systems operator (or other MAJCOM-designated aircrew member) with access to a set of flight controls (T-1).

3.31.2. Vision Restricting Devices. MAJCOMs must approve the use of vision restricting devices and provide specific approval for use during takeoffs and landings. Vision restricting devices will not be used without a safety observer (T-0).

3.31.2.1. Maintain at least 2,000 ft. of obstruction clearance when using vision restricting devices if the safety observer is in a chase aircraft, or not qualified as a pilot, or does not have full view of the flight instruments and access to the flight controls (T-1).

3.31.1. When not on an IFR flight plan, the aircraft must be equipped with a functional two-way radio and have the airport environment in sight when established on the final segment of an approach (T-0).

**3.32. Simulated Emergency Flight Procedures.**

3.32.1. Terminate simulated emergency training if an actual emergency occurs.

3.32.2. MAJCOMs must provide guidance when an instructor pilot or flight examiner does not have immediate access to the aircraft controls.

3.32.3. Passengers will not be onboard (T-1). *Exception:* simulated emergencies may be performed with passengers onboard if there is no flight deck crew participation; flight deck crew may participate with MAJCOM approval. (N/A for UAS).

3.32.4. Single-pilot aircraft require day (including civil twilight) VMC (N/A for UAS) (T-1).

3.32.5. Multi-pilot aircraft in day IMC require weather conditions at or above published circling minimums for the approach to be flown (N/A for UAS) (T-1).

3.32.6. Multi-pilot aircraft at night require weather conditions at or above 1,000 ft. ceiling and 2 SM visibility or circling minimums, whichever is higher (N/A for UAS) (T-1).

3.32.7. Simulated Flameout, Forced Landing, or Emergency Landing Patterns (SFO/ELP). At controlled fields where SFO/ELP maneuvers are conducted, the facility air traffic

manager shall issue an LOA with the appropriate military authority and adjacent facilities as required. The LOA shall conform to FAA Joint Order (FAA JO) 7610.4. (T-0).

3.32.7.1. MAJCOMs must provide guidance for SFO/ELP approaches when the T.O.s do not provide specific guidance; the approaches do not conform to the T.O. guidance; the approaches have not been coordinated with the ATC responsible for the airspace; or the airport/landing area does not have a prepared runway surface, an active tower/Runway Supervisory Unit (RSU), enough runway, or proper crash/rescue equipment (T-0).

**3.33. Vertical-Lift Operations.** For this instruction, tilt-rotor aircraft in vertical-flight mode will follow helicopter guidance (T-1). MAJCOMs will provide guidance on determining phase-of-flight for aircraft capable of transition to/from vertical flight.

## Chapter 4

### PREFLIGHT

**4.1. Flight Authorization.** Flights in USAF aircraft will be authorized and documented IAW AFI 11-401 and MAJCOM guidance (T-1).

**4.2. Pilot in Command.** The PIC must be current and qualified in the aircraft to be flown or under the supervision of a current and qualified instructor pilot (to include supervision from a formation position) (T-0). If any portion of the flight will be conducted in IMC or under IFR, the PIC must hold a current instrument qualification (T-0). *Exception:* Student pilots enrolled in Undergraduate Flying Training courses, Introduction to Fighter Fundamentals, and Pilot Instructor Training may act as PIC for syllabus-directed solo flights IAW FAA JO 7610.4 (T-0).

**4.3. Approval Authority.** The individual(s) designated on the Flight Authorization as the PIC is the approval authority for the flight (T-1).

4.3.1. Flying unit commanders must approve fixed-wing aircraft operations from other than established landing surfaces (e.g. highways, pastures).

**4.4. Flight Accountability.** To ensure flight accountability, file a flight plan IAW GP or provide the intended route of flight to a C2 mission agency (T-1). If unable to file on the ground, once airborne, file a flight plan with a Flight Service Station (FSS) or ATC facility as soon as practicable while staying clear of restricted airspace and flying VFR in controlled airspace.

**4.5. Mission Planning Requirements.**

4.5.1. Plan missions to the maximum extent possible. Obtain current and relevant information at all possible opportunities, including:

4.5.1.1. Weather observations and forecasts (T-1). See also paragraph 4.12.;

4.5.1.2. NOTAMs and Temporary Flight Restrictions (TFRs) (T-0);

4.5.1.3. Airfield Suitability and Restrictions Report (ASRR) information (T-1);

4.5.1.4. FLIP, to include appropriate navigational and plotting charts with current vertical obstructions (T-0);

4.5.1.5. Fuel requirements (T-0);

4.5.1.6. Bird advisories and hazard information (T-1);

4.5.1.7. Special Departure Procedures (SDP) (T-2);

4.5.1.8. As applicable: P-RAIM, Space Based Augmentation System (SBAS) coverage and NOTAMs, and air traffic management Service Availability (e.g. Automatic Dependent Surveillance-Broadcast (ADS-B) services) (T-0);

4.5.1.9. Aircraft T.O. (T-0);

4.5.1.10. MDS-specific, Volume 3 (T-1); and,

4.5.1.11. Applicable MAJCOM/COCOM guidance (e.g. flight crew information files (FCIF) and flight crew bulletins (FCBs)) (T-1).

**4.5.2. International Flights.** Comply with international procedures in FLIP GP, Area Planning (AP), ICAO guidance, host-nation procedures, and the FCG (T-0).

4.5.2.1. On all departures to or from a foreign location, use extra vigilance when checking passenger manifest, cargo, and likely areas aboard the aircraft where drugs, contraband, stowaways, or other illegal substances may be concealed.

4.5.2.2. Immediately report any suspected customs, agriculture, or immigration violations to the proper authorities (T-0).

**4.6. Off-Station Training.** Flying unit commanders will ensure off-station training is planned to achieve valid training requirements, presents a positive view of the USAF, and does not create an appearance of government waste or abuse.

**4.7. Military and Joint-Use Airports.** Aircrew may file to and land at US military and Joint-Use (i.e. MIL/CIV) fields.

**4.8. Civil Airports.**

4.8.1. MAJCOMs may authorize filing to or landing at civil airfields. Use of civil facilities not governed by agreement or law may result in landing fees or use fees charged to the pilot or the military unit.

4.8.2. "P-coded" Civil Airports (as listed in the IFR Supplement). Aircrew may file to or land USAF aircraft at US civil public airports when:

4.8.2.1. In an emergency;

4.8.2.2. Flying a helicopter or C-coded aircraft (e.g. C-130, C-12, C-40);

4.8.2.3. Necessary in the recovery of active air defense interceptor aircraft;

4.8.2.4. An alternate is required and no other suitable airport is available;

4.8.2.5. The wing commander or higher authority approves the flight and the airport manager grants permission in advance; or,

4.8.2.6. A US Government tenant unit (e.g. ANG, USCG) is listed for the airport of intended landing and airport facilities or ground support equipment can support the aircraft concerned.

**4.9. Volume Training.** Flying units shall coordinate with respective ATC agencies and civil airport authorities before conducting volume training at civil airports or along/through airways (T-0).

**4.10. UAS Airfields and Operations.**

4.10.1. Except for divert or emergency situations, MAJCOMs shall approve all airfields authorized for use by UAS. Operations may require an approved Certificate of Authorization (COA) and appropriate LOA between the employing unit, ATC, and airfield management (T-0).

4.10.2. For operations outside special use airspace (or when required within), the mission tasking authority shall coordinate through HQ USAF/A3O to obtain a COA or waiver from the FAA (T-0). Before submitting, verify the COA complies with current FAA requirements at <http://www.faa.gov/about/initiatives/uas/>.



**4.11. Aviation Into-Plane Reimbursement Card (AIR CARD®) Responsibilities.** Use the AIR CARD® only for fuel and required ground services (T-0). Refuel at military installations as a first choice followed by contract fixed base operators (FBOs) (T-0). Refuel at non-contract FBOs only if mission needs warrant servicing at such locations (T-0). Further information, including documentation procedures and updated lists of contract FBOs is available at <https://www.airseacard.com>.

**4.12. Weather Information.**

4.12.1. **Authorized Sources.** Obtain weather information from the prioritized sources listed in Air Force Handbook (AFH) 11-203V2, *Weather for Aircrews*, or in the FIH (T-1). MAJCOMs will provide guidance on use of non-DoD weather sources (e.g. commercial websites, flight planning services).

4.12.2. **Runway Visual Range (RVR).** RVR reports apply to all takeoffs, landings, and approaches to the runway and take precedence over any other visibility report for that runway. Use the static RVR when available. If only a variable RVR report is received and a static RVR cannot be determined, apply the lowest reported RVR value. If necessary, convert the reported visibility from one format to another (e.g. RVR to Prevailing Visibility (PV)) only for takeoffs and straight-in approaches using the conversion tables printed in the front of the Terminal Procedures Publication (TPP) booklet. For conversions, use the higher value; do not interpolate (T-0).

**4.13. Aeronautical Information and Publications.** Operational commanders are responsible for providing their crews with access to appropriate aeronautical information and publications for flight (T-1).

4.13.1. **Authorized Information and Publications.** Obtain and use information or publications from US Government (USG) sources as first preference (T-0). Do not use aeronautical information in flight which is out of date, incomplete, illegible, contains unfamiliar procedures, or is published in a language other than English (T-0).

4.13.1.1. **Non-USG Terminal Procedures.** Non-USG terminal procedures are authorized after a Terminal Instrument Procedures (TERPS) review IAW AFI 11-230. MAJCOM/A3 in the grade of O-8 or above may waive the TERPS review. This waiver authority will not be further delegated (T-0). MAJCOMs shall develop aircrew training for use of non-USG products.

4.13.2. **Electronic Equivalent and Non-Standard Formats.** Paper publications and documents are not required if replicated by electronic means and authorized by the MAJCOM. Formats which are rendered from a database or which do not maintain the original size, scale, format, or color may be authorized by the MAJCOM.

4.13.3. **Required Publications.** Follow MAJCOM or MDS-specific guidance for required publications to be available in the aircraft or accessible to UAS operators (e.g., navigation charts, FIH, TPP).

4.13.4. **NOTAMS.** Obtain NOTAMS from the Defense Internet NOTAM Service (DINS) (T-0). If unavailable, obtain NOTAMS by contacting one of the installations listed in FLIP or the nearest Aeronautical Information Service (T-0).

4.13.4.1. If using non-USG products or databases, obtain the associated NOTAMs, alerts, and advisories from the respective country or agency (T-0).

4.13.5. **Navigation, Terrain, and Obstacle Databases.** Obtain databases through MAJCOM-authorized processes. Review aeronautical navigation database NOTAMS prior to flight (T-0).

4.13.6. **Global Navigation Satellite System (GNSS) Predictive RAIM.** MAJCOMS will publish MDS-specific information for use of RAIM prediction procedures.

4.13.6.1. Precise Positioning Service (PPS) RAIM. MAJCOMS may authorize use of civil (i.e. Standard Positioning Service (SPS)) RAIM prediction services if a PPS RAIM prediction tool is not available.

#### 4.14. Area Navigation (RNAV) and Required Navigation Performance (RNP).

4.14.1. Before flight, confirm the availability of the performance-based operations infrastructure for the intended route and procedures (T-0).

4.14.2. If a specified RNP level cannot be achieved, revise the route or delay departure until the appropriate RNP level can be assured (T-0).

4.14.3. The onboard navigation database should be current for the region of intended operation (T-2). MAJCOMs will publish guidance for continued enroute operations with a non-current navigation database. For terminal procedure guidance see **paragraph 7.3.2**.

4.14.4. Ensure planned waypoints and procedures (departure, arrival, approach) are included in the current onboard navigation database prior to flight (T-0).

#### 4.15. IFR Flight.

4.15.1. Fly USAF fixed-wing aircraft under IFR to the maximum extent practical (T-1). Pilots shall fly under IFR if:

4.15.1.1. Weather conditions do not permit VFR flight (T-0);

4.15.1.2. Airspace rules require IFR flight (e.g. Class A airspace) (T-0);

4.15.1.3. Operating in excess of 180 knots true airspeed (KTAS) within (not simply crossing) federal airways (T-0); or,

4.15.1.4. Operating fixed-wing aircraft at night, unless the mission cannot be flown under IFR (T-0).

4.15.2. **IFR Destination Filing Requirements.** Flowcharts are available in Attachment 2 (Fixed-Wing) or Attachment 3 (Helicopter).

4.15.2.1. Required Weather.

4.15.2.1.1. **Fixed-Wing and Helicopter.** Prevailing weather for the estimated time of arrival (ETA) 1 hour at destination must be at or above the lowest compatible published landing minimums (TEMPO conditions may be below published minimums at ETA 1 hour) (T-0). Helicopters may reduce visibility by one-half, but no lower than 1/4 SM PV or 1,200 ft. RVR (T-0). See paragraph 4.15.3. for alternate requirements (T-0). *Exception:* MAJCOMs may authorize filing to a destination with weather below the lowest compatible landing minimums, but must establish

supplemental recovery procedures such as the use of two or more alternate airports, additional holding fuel, etc.

4.15.2.1.1.1. For a straight-in or sidestep approach, the forecast weather must meet required visibility minimums (T-0).

4.15.2.1.1.2. For a circling approach, the forecast weather must meet both the ceiling and prevailing visibility minimums (T-0).

4.15.2.1.1.3. For an RNAV/RNP/GNSS approach based on SBAS and annotated with the “W” symbol, weather must meet Lateral Navigation (LNAV) minimums (T-0).

4.15.2.1.2. UAS. In the absence of MAJCOM UAS weather guidance, follow manned fixed-wing and helicopter weather requirements.

#### 4.15.2.2. **Available Instrument Approach.**

4.15.2.2.1. Pilots may file IFR to a destination or an alternate with a compatible instrument approach (T-0). If there is no compatible published approach at the destination, pilots may file to a point served by a published approach where forecast weather at ETA 1 hour allows the pilot to continue on a composite IFR/VFR flight plan to the destination (T-0).

#### 4.15.3. **Requiring an IFR Alternate.**

4.15.3.1. **Weather.** An alternate is required when the worst weather at destination, to include TEMPO conditions, at the ETA 1 hour is less than:

4.15.3.1.1. **Fixed-Wing Aircraft.** A ceiling of 2,000 ft. and a visibility of 3 SM (T-1). MAJCOMs may lower this requirement as low as a ceiling of 1,000 ft. and a visibility of 2 SM if two or more suitable independent precision approaches are available and operable for the airport of intended landing at ETA 1 hour.

4.15.3.1.2. **Helicopters.** A ceiling of 1,000 ft. (or 400 ft. above the lowest compatible approach minimums, whichever is higher) and a visibility of 2 SM (T-1).

4.15.3.1.3. **UAS.** MAJCOMs will determine alternate airfield policies for UAS.

#### 4.15.3.2. **Other Conditions Requiring an Alternate:**

4.15.3.2.1. All compatible approaches require radar (T-1);

4.15.3.2.2. Required navigational aids (NAVAID) will be unmonitored (T-1);

4.15.3.2.3. The destination has no weather reporting capability (T-1); or,

4.15.3.2.4. The airfield’s lowest compatible approach weather minimums are greater than or equal to a 1,500 ft. ceiling or 3 SM visibility (T-1).

#### 4.15.3.3. **Exceptions:**

4.15.3.3.1. Remote or Island Destinations. MAJCOMs may authorize holding for a specified time in lieu of filing an alternate for remote or island destinations. MAJCOMs will define remote or island destinations and prescribe weather criteria and recovery procedures.

- 4.15.3.3.2. Alternate requirement may be cancelled enroute if weather conditions improve at destination to exceed paragraph 4.15.3.1.
- 4.15.3.4. **Selecting an Alternate.** The worst alternate forecast weather conditions for ETA 1 hour, to include TEMPO conditions (except those caused by thunderstorms, rain, or snow showers), will meet or exceed:
- 4.15.3.4.1. **Fixed-Wing Aircraft.** A ceiling of 1000 ft., or 500 ft. above the lowest compatible minimum, whichever is higher; and a visibility of 2 SM or 1 SM above the lowest compatible minimum, whichever is higher (T-1).
  - 4.15.3.4.2. **Helicopters.** A ceiling of at least 200 ft. above, and a visibility of at least 1 SM above the lowest compatible published landing minimum (T-1).
  - 4.15.3.4.3. **UAS.** MAJCOMs will establish UAS alternate airfield policies.
- 4.15.3.5. **Conditions Disqualifying an Alternate.** The disqualifying conditions below may be listed throughout various sources (e.g., TPP, NOTAMs, IFR Supplement):
- 4.15.3.5.1. All compatible approaches require radar (T-1).
  - 4.15.3.5.2. All compatible approaches require an unmonitored NAVAID (T-1).
  - 4.15.3.5.3. The airfield does not have a weather reporting service (T-1).
  - 4.15.3.5.4. “**▲**NA” (Alternate Not Authorized) on all compatible approaches (T-1).
  - 4.15.3.5.5. Any note disqualifying the airfield or all compatible approaches in the IFR Alternate Minimums section **▲** (T-1).
  - 4.15.3.5.6. All compatible approaches at the alternate require use of GNSS and planning to the destination was also based on the use of only GNSS approaches (T-1). *Exception:* Aircraft with approved WAAS/SBAS equipment if a WAAS compatible approach is available (T-1). Alternate weather planning will only be based on the LNAV minimums (T-1).
- 4.15.3.6. **MAJCOM Exception.** MAJCOM/A3 may authorize the use of any airfield as an alternate regardless of weather conditions if mission justifies the increased risk. This authority may not be further delegated.

#### 4.16. VFR Flight.

- 4.16.1. Weather. The forecast weather for the departure, planned route of flight, and arrival (1 hour of the ETA) must be at or better than the minimums contained in Table 6.1. or 6.2. (T-1).
- 4.16.2. Fly aircraft under VFR only when required for mission accomplishment. Mission examples include: operational necessity, host-nation requirements, training, proficiency or evaluation sorties, aircraft equipment that precludes IFR flight, and ATC or NAVAID limitations that preclude IFR flight. Comply with the AFMAN 11-217 series and the following:
- 4.16.2.1. Ensure VFR operations are authorized and properly planned.
  - 4.16.2.2. Utilize radar advisory and monitoring or control services when practical to ensure flight following by any available means (e.g. FSS or C2 agency).

4.16.2.3. When conditions (weather, airspace, etc.) prevent completing the mission under VFR, alter route and continue under VFR until reaching the destination, obtaining an IFR clearance, or landing at a suitable location.

4.16.2.4. When conducting tactical operations, fly under VFR unless compliance with VFR degrades mission accomplishment.

4.16.2.5. Special VFR (SVFR). Fixed-wing aircraft shall not fly under SVFR (T-1). MAJCOMs may allow helicopter aircrews to fly under SVFR IAW 14 CFR §91.157 (within the NAS) or appropriate host-nation guidance.

4.16.2.6. VFR Over-the-Top. When operating VFR above a ceiling, comply with AFMAN 11-217 (T-1).

4.16.2.7. IFR "VFR-on-Top." Pilots may request "VFR on Top" operations (IAW AFMAN 11-217) when the mission dictates.

#### 4.17. Flight Plans.

4.17.1. Ensure a flight plan is filed IAW MAJCOM guidance for any flight. By filing a flight plan, the PIC certifies:

4.17.1.1. The flight was properly ordered, authorized, and released IAW AFI 11-401;

4.17.1.2. The flight will be conducted IAW all governing directives (see paragraph 1.2.);

4.17.1.3. Compliance with [paragraph 4.5](#);

4.17.1.4. The flight plan has been reviewed for completeness and accuracy;

4.17.1.5. Responsibility for the safety of the aircraft, the formation, and its occupants;

4.17.1.6. The flight complies with Air Defense Identification Zone (ADIZ) restrictions and SUA or MTR scheduling and coordination procedures specified in FLIP and NOTAMs.

4.17.2. **Passenger Manifests and Crew Lists.** List passengers on a DD Form 2131, *Passenger Manifest*, or a MAJCOM-approved form (T-0). File the manifest and crew list with the flight plan, the passenger service facility, or other responsible agency (T-0). Notify C2 prior to departure if there is a passenger manifest (or crew list) change (T-1). When able, process crew and manifest changes with the original processing facility or with a responsible agency.

4.17.3. **Flight Plan Changes.** The format for making changes to a flight plan is printed on the back of the DoD IFR Supplement. Ensure ATC and/or destination is aware of changes to prevent erroneous Search and Rescue (SAR) or unannounced arrival. Before takeoff or while airborne, changes may be made to the original filed flight plan without re-filing provided:

4.17.3.1. The change does not penetrate an ADIZ;

4.17.3.2. The controlling ATC agency approves the change for an IFR flight; or,

4.17.3.3. The change complies with applicable host-nation rules.

4.17.4. **Closing the Flight Plan.** When landing at a tower-controlled airfield in the NAS, the flight plan should close automatically. In all other cases, close flight plans with an FSS or ATC facility by any means of communication available (T-0).

#### 4.18. Fuel Requirements.

4.18.1. Ensure sufficient fuel is available onboard the aircraft to comply with the requirements of this instruction and safely conduct the flight (T-0). Use MAJCOM-approved fuel efficiency techniques and procedures to the maximum extent practical. Before takeoff or immediately after in-flight refueling, the aircraft must have enough usable fuel to complete the flight:

4.18.1.1. To a final landing, either at the destination airport or alternate airport (if required), plus fuel reserves; or,

4.18.1.2. Between Air Refueling Control Points (ARCPs) and then to land at the destination (or a recovery base, if refueling is not successful), plus the fuel reserve.

4.18.1.2.1. Helicopters may fly between ARCPs without required fuel to destination or recovery base in the event of an unsuccessful air refueling.

4.18.2. **Alternate Airport Fuel Requirements.** When an alternate airport is required, fuel required for an approach and missed approach must be included in the total flight plan fuel if visibility-only weather criteria is used at destination (T-1). Fuel required for a missed approach is not required if both ceiling and visibility criteria are used.

4.18.3. **Fuel Reserve.** Ensure the aircraft is carrying enough usable fuel on each flight to increase the total planned flight time between refueling points by 10 percent (up to a maximum of 45 minutes for fixed-wing or 30 minutes for helicopters) or 20 minutes, whichever is greater (T-1). Compute fuel reserves using MAJCOM-defined consumption rates for normal cruising speeds or the following:

4.18.3.1. For reciprocating engine aircraft and helicopters, use fuel consumption rates for normal cruising altitudes (T-1).

4.18.3.2. For turbine-powered aircraft use fuel consumption rates that provide best endurance at 10,000 ft. MSL (T-1).

4.18.3.3. If the MAJCOM authorizes holding (instead of an alternate airport) for a remote or island destination, do not consider the prescribed holding time as part of the total planned flight time or fuel reserve (T-1).

4.18.4. **Equal Time Point (ETP).** In the absence of MDS-specific guidance, multi-engine aircraft without the availability to in-flight refuel, operated for extended periods over large bodies of water or desolate land areas (outside gliding distance to a suitable landing site) shall calculate and plot on a navigational chart an ETP to a suitable alternate for that mission leg. Contingency fuel requirements shall also be planned (i.e. engine-out depressurized flight from an ETP to a suitable landing site) (T-1).

#### 4.19. Preflight Briefings.

4.19.1. Prior to flight, ensure each crewmember and passenger is briefed on items affecting safety or mission completion (T-0). At a minimum, briefings will include:

4.19.1.1. Emergency signals and procedures (T-0);

4.19.1.2. Aircrew and passenger flight equipment/systems usage information to include the location and use of emergency exits, parachutes, oxygen, communications systems, and survival equipment (T-0); and,

4.19.1.3. Safety precautions and restrictions to include Foreign Object Damage (FOD) hazards and electronic device prohibitions (T-1).

## Chapter 5

### DEPARTURE

#### 5.1. Weather.

**5.1.1. Minimum Takeoff Weather.** Takeoffs are prohibited when existing weather is below landing minimums (T-2). Takeoff visibility must be greater than 500 RVR (150 meters) (T-1). MAJCOMs will publish alternative takeoff minimums and recovery procedures when takeoff weather is lower than published landing minimums.

5.1.1.1. Fixed-wing RVR Requirements. Minimums below 1600 RVR are not authorized unless the runway has operating centerline lights, visible runway centerline markings, and two operative RVR reporting systems (T-1). All RVR readings must meet or exceed minimum authorized values for departure (T-1).

**5.1.2. Freezing Precipitation.** Do not takeoff with ice, snow, frost, or other contamination adhering to the wings, control surfaces, propellers, engine inlets, or other critical surfaces of the aircraft, unless authorized by the flight manual (T-2).

5.1.2.1. A thin coating of frost is permitted on the fuselage, provided the lettering and/or paint lines are visible.

5.1.2.2. Light frost (up to 1/8 inch thick) caused by super-cooled fuel is permitted on the lower wing surface (i.e., below the fuel tank area) if the fuselage and all other control surfaces are free of icing. If deicing is required on any other aircraft surface, the under wing frost shall also be removed (T-2).

5.1.2.3. Information on the removal and prevention of frozen precipitation is contained in AF T.O. 42C-1-2, *Anti-Icing, De-Icing and Defrosting of Parked Aircraft*.

**5.1.3. Takeoff Near Hazardous Weather.** Do not takeoff where thunderstorms or other hazardous conditions are producing hail, strong winds, gust fronts, heavy rain, lightning, wind shear, or microbursts (T-1).

**5.2. Turns after Takeoff.** Do not turn after a takeoff until at least 400 ft. above the Departure End of the Runway (DER) elevation, at a safe airspeed, and past the end of the runway (if visible) unless specifically cleared by the controlling agency, required by a published procedure, or when executing a closed pattern (T-0).

**5.3. VFR Climb Performance.** Unless specifically authorized, fixed-wing multi-engine aircraft will not depart a location under VFR without ensuring that they can vertically clear published IFR departure procedure restrictions along the planned departure route with one engine inoperative (OEI) (T-2).

**5.4. IFR Climb Performance.** Unless otherwise published and charted with “ATC” designation, all climb gradients must be assumed to be obstacle based. Only MAJCOM-authorized procedures for climb performance assessment may be used (vice locally developed procedures). MAJCOMs may authorize SDPs. Aircrew must be trained before use of any SDP.

5.4.1. **Low Close-in Obstacles.** Ensure the aircraft can vertically clear applicable published low close-in obstacles along the planned ground track. Low close-in obstacles may be listed



in the Obstacle Departure Procedures ▼ (ODP) section, NOTAMs, or charted on the published procedure. Published or ATC climb gradients do not account for low close-in obstacles in their climb gradient calculations; therefore, low close-in obstacle clearance is not assured when complying with the published or ATC climb gradient.

**5.4.2. ATC Climb Gradient.** Aircraft are required to meet ATC climb gradients with all engines operating (AEO) (T-0). If the aircraft does not have the computed performance to meet the charted ATC climb gradient, coordinate with ATC prior to flight.

**5.4.3. Obstacle Climb Gradient.**

5.4.3.1. Ensure the aircraft can comply with the respective obstacle climb gradients below:

5.4.3.1.1. **Single Engine Aircraft and Helicopters.** Ensure the aircraft can meet or exceed 200 ft/NM or the published climb gradient, whichever is higher, to an appropriate IFR altitude (T-0).

5.4.3.1.2. **Multi-Engine Fixed-Wing Aircraft.** With OEI, ensure the aircraft can meet 200 ft/NM or the published climb gradient, whichever is higher, to an appropriate IFR altitude (T-0).

5.4.3.1.2.1. If unable to meet published obstacle climb gradient OEI, and operationally necessary, the MAJCOM/A3 may authorize subtraction of up to 48'/NM from the required obstacle climb gradient. This authority may be further delegated, but may not be delegated to the respective aircrew for which the waiver would apply (T-1). Subtraction does not apply to SDPs.

5.4.3.2. If unable to meet the required obstacle climb gradient, consider aircraft, mission, or environmental changes such as reducing aircraft gross weight or delaying for more favorable weather conditions. If still unable to comply with the required obstacle climb gradient, an IFR departure is not authorized (T-0).

5.4.3.2.1. If the mission justifies the increased risk, MAJCOM/A3 may authorize a departure in VMC regardless of climb gradient compliance. This authority may not be further delegated (T-1).

**5.5. IFR Departure Methods.** Obstacle Departure Procedures (ODPs) and/or Standard Instrument Departures (SIDs) should be flown to the maximum extent possible.

5.5.1. Depart IFR using one, or a combination of, the methods listed below. If the airport does not have one of these IFR departure methods, an IFR departure is not authorized (T-2).

5.5.1.1. Diverse Departure (ICAO - Omnidirectional Departure).

5.5.1.2. Obstacle Departure Procedure ▼ (ODP).

5.5.1.3. Standard Instrument Departure (SID).

5.5.1.4. Specific ATC Departure Instructions.

5.5.1.5. Non-Standard Takeoff Minimums.

5.5.1.6. MAJCOM Certified Procedure.

5.5.2. The following information applies to the departure methods listed above:

**5.5.2.1. Diverse Departure (ICAO - Omnidirectional Departure).** A diverse departure is an IFR departure procedure used at an airport that has at least one published approach but lacks non-standard takeoff minimums and/or IFR departure procedures. Track runway centerline to 400 ft. above the DER elevation before turning on course. Ensure aircraft will vertically clear applicable low close-in obstacles published in NOTAMs or the Takeoff Minima and ODPs ▼ before turning on course. Diverse departures are not authorized when an ODP, obstacle climb gradient, or non-standard takeoff weather minimums are published for the planned departure runway (T-0).

5.5.2.1.1. Sector Diverse Departure. Fly “sector” diverse departures as published (T-0).

**5.5.2.2. Obstacle Departure Procedures ▼ (ODP).** Also known as a “trouble T ▼”, ODP refers to textual or graphical instructions to ensure departure obstacle clearance. ODPs also include:

5.5.2.2.1. Visual Climb Over Airport (VCOA). Do not fly any VCOA procedure until completion of MAJCOM-specified training. The weather must be at or above the minimums published for the VCOA (T-0). Unless otherwise published, consider VCOA visibility requirements as the “remain within” distance and do not exceed this radius from the center of the airfield while climbing to the specified altitude (T-1). Notify ATC (or other traffic) when planning to depart via the VCOA (T-0). Except for MAJCOM-approved NVD trained and equipped aircrew, do not fly VCOA procedures at night (T-1).

5.5.2.2.2. Reduced Takeoff Runway Length (RTRL). When using a published RTRL procedure ensure the aircraft can attain a safe liftoff speed prior to the distance remaining specified in the procedure (T-0). MAJCOM-approved RTRL procedures will be considered a published ODP.

**5.5.2.3. Standard Instrument Departures (SID).** Follow SID procedures as published (T-0). Comply with applicable notes, low close-in obstacles, and climb gradients on the SID (T-0). SIDs without a published climb gradient have been assessed at 200 ft/NM. If the SID does not have published low close-in obstacles but has an ODP ▼ annotated, refer to the corresponding runway ODP for potential low close-in obstacles. Reference all published low close-in obstacle locations to ensure compliance.

5.5.2.3.1. Retrieve RNAV/RNP/GNSS procedures in their entirety by procedure name from a current navigation database and compare against approved publications (T-0).

**5.5.2.4. Specific ATC Departure Instructions.** ATC instructions refer to navigational guidance (e.g. heading, routing, and altitude) issued with a departure clearance.

5.5.2.4.1. If the departure runway has multiple published climb gradients, pilots must meet or exceed the highest gradient when departing via ATC instructions (T-0).

5.5.2.4.2. Outside the NAS in a non-radar environment, confirm minimum climb gradient for departure sector (T-0). The obstacle-based climb gradient is not standardized at 200 ft/NM outside the NAS.

**5.5.2.5. Non-Standard Takeoff Minimums.** Departures using non-standard takeoff minimums (ceiling and visibility) must ensure the aircraft is at or above the published ceiling by the end of the runway (OEI for multi-engine fixed-wing aircraft), then continue climbing at 200'/NM (or IAW 5.4.3.1.2.1.) to a minimum IFR altitude (T-1).

5.5.2.5.1. If the ODP has a non-standard takeoff minimum with a published climb gradient, cross the departure end of runway at the published ceiling then comply with the published climb gradient (T-1).

**5.5.2.6. MAJCOM Certified Procedure.** In Restricted Areas or during contingency operations, MAJCOM/A3s may develop and authorize departure procedures for their aircraft at specific locations if no other procedure can be developed IAW AFI 11-230, *Instrument Procedures*. Authority may not be further delegated (T-1). Complete MAJCOM-specific training before using such procedures.

## Chapter 6

### ENROUTE

#### 6.1. Airspace Clearance Authority.

6.1.1. **Uncontrolled Airspace.** The PIC is the clearance authority for IFR or VFR flight in uncontrolled airspace (T-0).

6.1.2. **Controlled Airspace.**

6.1.2.1. **VFR.** The PIC is the clearance authority for VFR flight (if allowed) in controlled airspace (T-0). If cancelling an IFR clearance, VFR flight following is not required if already in contact with the destination's control tower.

6.1.2.2. **IFR.** Pilots shall obtain ATC clearance before an IFR departure (or as soon as practicable after departure while maintaining VMC) or before entering controlled airspace (T-0).

#### 6.2. Minimum Aircraft Altitude.

6.2.1. **VFR.** In the NAS, fly appropriate VFR hemispheric altitudes when higher than 3,000 ft. above ground level (AGL), unless authorized by ATC (T-0). Do not apply these altitudes when turning or holding in a holding pattern of 2 minutes or less. Outside the NAS, fly altitudes or flight levels as specified in FLIP (T-0).

6.2.2. **IFR.** Except when necessary for takeoff, landing, or when being vectored by ATC, do not fly lower than:

6.2.2.1. On Airways, no lower than any published minimum for the airway (T-0).

6.2.2.2. Off Airways, no lower than:

6.2.2.2.1. The Off Route Obstacle Clearance Altitude (OROCA) (T-0);

6.2.2.2.2. The Off Route Terrain Clearance Altitude (ORTCA) (T-0); or,

6.2.2.2.3. An altitude that provides at least 1,000 ft. of clearance above all obstacles within 4 NMs of the course to be flown in non-mountainous terrain, or 2,000 ft. in mountainous terrain (T-0).

6.2.3. **Other Minimum Altitudes.** Except for MAJCOM-approved aerial demonstrations/events or during takeoff or landing, do not operate aircraft below an altitude that, should an emergency landing become necessary, creates undue hazard to persons or property.

6.2.3.1. **Military Routes and Special Use Airspace.** Adhere to minimum altitudes published in FLIP AP for all military routes and special use airspace (e.g., military operations area (MOAs), slow speed training routes (SR), IFR military training routes (IR), VFR military training routes (VR), controlled firing areas, restricted airspace) (T-0).

6.2.3.2. **Non-congested Areas.** Operate over non-congested areas at an altitude at or above 500 ft. AGL except over open water, in special use airspace (SUA), or in sparsely populated areas (T-0). Under such exceptions, do not operate aircraft closer than 500 ft. to any person, vessel, vehicle, or structure (T-0). Helicopters in FAA airspace or

operating IAW host-nation agreements may operate at lower altitudes and in closer proximity if they do not create a hazard to persons or property on the surface.

**6.2.3.3. Congested Areas.** Operate over congested areas (e.g., cities, towns, settlements) or groups of people at an altitude which ensures at least 1,000 ft. above the highest obstacle within a 2,000-ft. radius (T-0). Helicopters in FAA airspace or operating IAW host-nation agreements may operate at lower altitudes and in closer proximity if they do not create a hazard to persons or property on the surface.

**6.2.3.4. Flight over National Recreation Areas and Wildlife Refuges.** Operate no less than 2,000 ft. AGL (mission permitting) over: National Park Service monuments, seashores, lake shores, recreation and scenic riverways; US Fish and Wildlife Service refuges; and US Forest Service wilderness and primitive areas (T-0). This paragraph is not applicable to SUA, low-altitude tactical navigation areas and MTRs. Specific areas may require higher altitudes (see FLIP and sectional aeronautical charts).

**6.2.3.5. Disaster Areas.** Do not operate within a designated disaster area unless the aircraft is: assisting efforts, specifically cleared by ATC, or flying to or from an airport in the area without hampering or endangering relief activities (T-0). Check NOTAMs for disaster areas.

### **6.3. Aircraft Speed.**

**6.3.1. Supersonic Flight.** Do not operate aircraft at or above Mach 1 except as specified in AFI 13-201. See same guidance if inadvertent flight occurs above Mach 1.

#### **6.3.2. In the NAS:**

**6.3.2.1.** Do not exceed 200 knots indicated airspeed (KIAS) at or below 2,500 ft. AGL within 4 NM of the primary airport in Class C or Class D airspace unless authorized by ATC or required to maintain the minimum operating airspeed specified in the aircraft T.O. (T-0).

**6.3.2.2.** Do not exceed 200 KIAS in the airspace underlying Class B airspace or in a VFR corridor designated through Class B airspace unless required to maintain the minimum operating airspeed specified in the aircraft T.O. (T-0).

**6.3.2.3.** Do not exceed 250 KIAS below 10,000 ft. MSL (T-0). MAJCOMs may approve operations exceeding 250 KIAS below 10,000 ft. MSL:

**6.3.2.3.1.** Within restricted areas or MOAs.

**6.3.2.3.2.** Within DoD/FAA mutually developed instrument routes or DoD developed visual routes. (Do not exceed 250 KIAS on slow speed training routes (SR)).

**6.3.2.3.3.** Within unpublished DoD- and FAA-designated areas or routes. This provision is intended to accommodate speed requirements, as necessary to accomplish the national defense mission, on an interim basis until the area/route can be published.

**6.3.2.3.4.** During large-scale exercises or short-term special missions with appropriate coordination to ensure awareness of the nonparticipating flying public.

- 6.3.2.3.5. When the aircraft T.O. requires a higher airspeed. If the airspeed in the T.O. is listed as a range, fly the slowest practical speed in that range. MAJCOM supplements or MDS-specific Volume 3s do not constitute the aircraft T.O.
- 6.3.3. **Outside the NAS.** Do not exceed 250 KIAS below 10,000 ft. MSL unless: in international airspace and mission requirements dictate, ICAO/host-nation rules permit, or necessary to maintain the minimum safe airspeed in the aircraft T.O. (T-0).
- 6.3.4. **Holding.** Conduct holding at airspeeds prescribed in FLIP or MDS-specific guidance (T-0).

#### 6.4. Hazard Avoidance.

- 6.4.1. **Hazardous Weather.** Use all available information to avoid hazardous weather.
- 6.4.1.1. **“Severe” Conditions.** Do not operate in any forecast or actual severe condition (e.g. severe icing, turbulence) (T-2). See AFH 11-203 for detailed information.
- 6.4.1.2. **Thunderstorms.** Do not intentionally fly into a thunderstorm (T-2). Damaging lightning strikes, electrostatic discharges, and hail encounters can occur in apparently benign conditions. Do not fly in IMC in the vicinity of actual thunderstorms without operable weather radar (T-2).
- 6.4.2. **Volcanic Activity.** Unless conducting rescue operations, do not operate within 50 NM of known or reported hazardous volcanic ash (T-2). MAJCOMs may issue guidance on operations including procedures for inadvertent ash encounters and avoidance criteria.
- 6.4.2.1. Consult an authorized weather source for current Volcanic Ash Advisory Center (VAAC) ash cloud information (or significant meteorological information (SIGMET)). If unable to contact an authorized weather source consider areas depicted on VAAC charts (or SIGMETs) as hazardous. Encounters with volcanic ash will be reported as soon as possible to the controlling agency and aircraft maintenance authorities. Report volcanic ash encounters to pilot-to-metro service (PMSV) or other weather agencies to ensure rapid dissemination (T-0). See PIREP procedures in the FIH.
- 6.4.3. **Bird Watch Condition (BWC).**
- 6.4.3.1. BWC MODERATE. Operational commanders will consider restricting formation departures, approaches, and pattern work. To increase the chances of seeing and avoiding birds, avoid hard turns or excessive climb angles. During BWC Phase II periods (see AFI 91-202), accomplish one approach to a full stop unless mission needs warrant additional approaches and sufficient fuel exists to divert if BWC changes to SEVERE (T-3).
- 6.4.3.2. BWC SEVERE. Do not conduct flight operations except in an emergency (T-3). Arriving aircraft will either hold awaiting a lower BWC or divert (T-3). Non-emergency landings in BWC SEVERE require approval by the operations group commander (or designated representative) responsible for airfield flight operations (T-3).
- 6.4.3.3. Civil or Foreign Fields. Follow BWC MODERATE procedures if receiving a civilian ATC/Automatic Terminal Information Service (ATIS) hazard advisory to use caution for birds in the vicinity (T-3).

6.4.3.4. NATO countries may use a numerical system to report BWC (see NATO STANAG 3879). Use this intensity conversion: 0-4: low, 5: medium, 6-8: severe. Risk warning updates for NW Europe are available at <https://www.notams.jcs.mil/common/birdtam.html>

**6.5. Flight in Extreme Barometric Pressures.** If unable to display proper altimeter setting (i.e. barometric pressure is lower than 28 or higher than 31 inches of mercury), obtain operations group commander approval for sustained flight in IMC below FL180. See AIM for more information.

**6.6. Flight in Colder Than International Standard Atmosphere (ISA) Temperatures.** If the air temperature at altitude is lower than ISA, true altitude will be lower than indicated by the barometric altimeter.

6.6.1. When flying IFR, or VFR at night, over mountainous terrain with the outside air temperature (OAT) colder than ISA minus 10°C, plan to fly at least 1,000 ft. above published minimum altitudes obtained from terrain and IFR enroute charts (e.g. minimum enroute altitudes (MEA), minimum obstruction clearance altitudes (MOCA), OROCA's or other minimum safe altitudes during low-levels) (T-1).

## **6.7. Communications.**

6.7.1. **Emergency Frequencies.** If suitably equipped, monitor at least one emergency frequency at all times as mission and operational conditions permit (T-1). Report distress or emergency locator transmitter (ELT) transmissions to ATC (T-0).

## **6.8. RNAV and RNP Operations.**

### **6.8.1. Navigation Database Operations.**

6.8.1.1. Do not modify database waypoints or insert user-defined waypoints on RNAV, RNP, etc. routes or procedures except to change altitude and/or airspeed to assist in complying with an ATC instruction (T-0). Systems which allow additional waypoints on the track may be used.

6.8.1.2. Crosscheck the cleared flight plan against current FLIP, the navigation system textual display, and aircraft map display (if applicable) (T-0). Include confirmation of waypoint sequence, reasonability of track angles and distances, altitude or speed constraints, and identification of fly-by or fly-over waypoints (T-0). Do not execute any procedure for which there is doubt about validity of the navigation database or publications (T-0).

6.8.2. Random RNAV in the NAS. Radar monitoring is required on all unpublished (random) RNAV routes (T-0). Refer to FLIP GP.

6.8.3. Published RNAV routes (Q or T routes). If RNAV routes cannot be retrieved from the database, selecting and inserting ALL of the named fixes from the database is permitted.

**6.8.4. Use of RNAV Systems on Conventional Routes and Procedures.** Suitable RNAV systems may be used as a substitute or alternate means of navigation on conventional routes and procedures. MAJCOMs reference FAA Advisory Circular (AC) 90-108, *Use of Suitable Area Navigation (RNAV) Systems on Conventional Routes and Procedures*, and provide operational guidance. Outside the NAS, comply with host-nation/oceanic procedures (T-0).

6.8.4.1. MAJCOMs may approve the use of other RNAV systems (i.e. not “suitable” as defined in AC 90-108) to enhance IFR navigation on conventional routes and procedures. Underlying conventional NAVAIDS/routes/procedures must be tuned and monitored (T-0).

6.8.4.2. “Alternate means” refers to using a suitable RNAV system in lieu of operable conventional NAVAIDS or installed and operable avionics. “Substitute means” refers to using a suitable RNAV system in lieu of out-of-service conventional NAVAIDS or non-installed/non-operable avionics.

6.8.4.3. The following uses are prohibited:

6.8.4.3.1. Substitution for the final approach segment of a VOR/TACAN/NDB approach (T-1).

6.8.4.3.2. Navigation on LOC-based courses (including LOC back-course guidance) without monitoring the raw LOC data (T-1).

6.8.4.3.3. Navigation with DME/DME/IRU systems (without GNSS/WAAS input) unless specifically authorized by NOTAM or FAA guidance (T-2).

6.8.4.3.4. Use of a procedure identified as “NA” without exception by a NOTAM (T-0).

6.8.4.4. Except as prohibited, either substitute or alternate means of navigation may be used as follows:

6.8.4.4.1. Determine position relative to or distance from a VOR, TACAN, NDB, compass locator, or DME fix.

6.8.4.4.2. Determine position relative to or distance from a named fix defined by the intersection of a radial/bearing/course of a VOR/LOC/TACAN/NDB/compass locator.

6.8.4.4.3. Navigate to/from a VOR/TACAN/NDB/compass locator.

6.8.4.4.4. Hold over a VOR/TACAN/NDB/compass locator, or DME fix.

6.8.4.4.5. Fly an arc based upon DME.

6.8.4.5. Operating Requirements and Considerations.

6.8.4.5.1. Retrieve all NAVAIDS, fixes, and procedures from a current navigation database (T-0).

6.8.4.5.2. Tune, identify, monitor, and display the appropriate ground-based NAVAIDS whenever practicable (T-0).

6.8.4.5.3. Notify ATC when substituting for an out-of-service NAVAID (T-0).

**6.9. Performance-Based Operations.** Performance-based operations may be based on performance of a combination of navigation, communications, and/or surveillance capabilities (e.g., Required Navigation Performance (RNP)).

6.9.1. Do not execute performance-based operations (airspace/routes/procedures) without specific approval (T-2). MAJCOMs will publish special conditions or limitations associated with each performance-based airspace or procedure.



6.9.2. Follow equipment requirements and/or limitations published in FLIP (T-0).

6.9.3. Advise ATC if an equipment failure or other malfunction results in the loss of aircraft capability to continue operations (T-0).

6.9.4. When unable to comply with performance-based operations, revise the route or delay the operation (T-0).

#### 6.10. Legacy Special Civil Airspace Requirements.

6.10.1. **Minimum Navigation Performance Specifications (MNPS) Airspace.** MAJCOMs must provide approval and guidance for operations in MNPS Airspace. Comply with applicable FLIP area planning documents (T-0). HQ USAF/A3O, through HQ AFFSA/XOF ([hqaffsa.xof@us.af.mil](mailto:hqaffsa.xof@us.af.mil)), must approve waivers to the requirements of North Atlantic Track Minimum Navigation Performance Specifications (NAT MNPS) and/or Canadian Minimum Navigation Performance Specifications (CMNPS) airspace.

6.10.2. **Reduced Vertical Separation Minimums (RVSM) Airspace.** Unless specifically cleared by ATC, do not operate in RVSM airspace without functional RVSM equipment (T-0). Comply with applicable FLIP area planning documents (T-0). Notify ATC as soon as possible if required equipment fails after entering RVSM airspace (T-0).

6.11. **VFR Flight.** When in FAA airspace, adhere to the weather minimums listed in Table 6.1. (T-0). When outside of FAA airspace, comply with guidance in FLIP, FCG, or the ICAO VFR weather minimums depicted in Table 6.2. (T-0). When operating under VFR, aircrews must be able to control the aircraft by referencing visual cues from a discernible horizon regardless of cloud clearance requirements (T-0).

6.11.1. Before transition from IFR to VFR, establish appropriate visibility and cloud clearances IAW Table 6.1 or 6.2. (T-0).

6.11.2. During transition from VFR to IFR, maintain appropriate visibility and cloud clearance requirements to a minimum IFR altitude until receipt of the IFR clearance (T-0).

**Table 6.1. NAS VFR Cloud Clearance and Visibility Minimums (T-0).**

FAA Airspace Class	Prevailing or Flight Visibility	Distance from Cloud
Class A	Not Applicable	Not Applicable
Class B	3 SM	Clear of Clouds
Class C and Class D	3 SM	500 ft. below, 1,000 ft. above, and 2,000 ft. horizontal

Class E and G (Fixed-wing) Below 10,000 ft. MSL	3 SM	500 ft. below, 1,000 ft. above, and 2,000 ft. horizontal
Class E and G (Fixed-wing) At or above 10,000 ft. MSL	5 SM	1,000 ft. below, 1,000 ft. above, and 1 SM horizontal
Class E (Helicopter) Below 10,000 ft. MSL	3 SM	500 ft. below, 1,000 ft. above, and 2,000 ft. horizontal
Class E (Helicopter) At or above 10,000 ft. MSL	5 SM	1,000 ft. below, 1,000 ft. above, and 1 SM horizontal
Class G (Helicopter) Below 1,200 ft. AGL	Day: 1/2 SM Night: 1 SM	Clear of clouds if operated at a speed that allows the pilot adequate opportunity to see any air traffic or obstructions in time to avoid a collision.
Class G (Helicopter) Above 1,200 ft. AGL and Below 10,000 ft. MSL	Day: 1 SM Night: 3 SM	500 ft. below, 1,000 ft. above, and 2,000 ft. horizontal
Class G (Helicopter) Above 1,200 ft. AGL and Above 10,000 ft. MSL	5 SM	1,000 ft. below, 1,000 ft. above, and 1 SM horizontal
<b>NOTE:</b> When permitted by MAJCOM and ATC, helicopters, IAW SVFR, may operate in lower visibility conditions, if maneuvered at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid a collision.		

**Table 6.2. ICAO VFR Cloud Clearance and Visibility Minimums (T-0).**

ICAO Airspace Class	Flight Visibility	Distance from Cloud
Class A	Not Applicable	Not Applicable
Class B	8 KMs above 10,000 ft. MSL 5 KMs below 10,000 ft. MSL	Clear of clouds
Class C, D, and E	Same as Class B	1,500 m horizontal 300 m (1,000 ft.) vertical
Class F and G (Fixed-wing) Above 900 m (3,000 ft.) MSL or above 300 m (1,000 ft.) above terrain, whichever is higher	Same as Class B	Same as Class C, D, and E.
Class F and G (Fixed-wing) At and below 900 m (3,000 ft.) or 300 m (1,000 ft.) above terrain whichever is higher	5 KMs	Same as Class C, D, and E.
Class F (Helicopter) Above 900 m (3,000 ft.) or 300 m (1,000 ft.) above terrain whichever is higher	8 KMs above 10,000 ft. MSL 5 KMs below 10,000 ft. MSL	1,500 m horizontal 300 m (1,000 ft.) vertical.
Class F and G (Helicopter) At and below 900 m (3,000 ft.) or 300 m (1,000 ft.) above terrain whichever is higher	5 KMs (See NOTE)	Clear of cloud and in sight of the surface.

Class G (Helicopter)	8 KMs above	1,500 m horizontal
Above 900 m (3,000 ft.) or	10,000 ft. MSL	300 m (1,000 ft.) vertical
300 m (1,000 ft.) above terrain whichever is higher	5 KMs below 10,000 ft. MSL	
<b>NOTE:</b> When permitted by MAJCOM and ATC, helicopters, IAW SVFR, may operate in lower visibility conditions, if maneuvered at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid a collision.		

## Chapter 7

### ARRIVAL

#### 7.1. Weather.

7.1.1. **Destination Weather Update.** Obtain the latest destination airport conditions prior to beginning descent or commencing an approach (T-0).

7.1.2. **Required Approach Minimums.** Do not begin a descent if destination weather is below the following required approach minimums:

7.1.2.1. For a straight-in or sidestep approach, the required visibility minimums (T-0).

7.1.2.2. For a circling approach, both the required ceiling and visibility minimums (T-0).

7.1.3. **Changes to Weather During Arrivals.** If the reported weather decreases below minimums after starting a descent, receiving radar vectors for an approach, or established on any segment of an approach prior to the missed approach point (MAP), the approach may be continued to the MAP and either execute a missed approach or continue to land if conditions in paragraphs 7.5.2. and 7.5.3. are met.

7.1.4. **Approach or Landing Near Hazardous Weather.** Do not fly an approach or land at an airport where thunderstorms or other hazardous conditions are producing hail, strong winds, gust fronts, heavy rain, lightning, wind shear, or microbursts (T-2).

#### 7.1.5. Landing Criteria.

7.1.5.1. **Fixed-Wing.** MAJCOMs may authorize Category I Instrument Landing System (ILS) approaches to less than 2400 RVR at locations without Touchdown Zone/Centerline Lighting (TDZ/CL) (or when such system is inoperative) provided the approach is flown using guidance from an approved flight director, heads-up display, or coupled to an autopilot flown to a Decision Altitude (DA). In addition to MAJCOM approval, authorization must be stated on the instrument approach procedure (IAP) or be published in the inoperative components or visual aids table of the TPP (T-0).

7.1.5.1.1. Category I (1800 RVR or greater). Touchdown zone RVR must be equal to or greater than the specified minimums on the IAP (T-0).

7.1.5.1.2. Category II (1200 to less than 1800 RVR). Touchdown zone RVR must be equal to or greater than the specified minimums on the IAP (T-0).

7.1.5.1.3. Category III (RVR less than 1200). Touchdown, midfield, and rollout RVR must be equal to or greater than the specified minimums on the IAP (T-0). MAJCOMs will publish Category III RVR requirements if applicable.

7.1.5.2. **Helicopter.** Category A minimums may be used regardless of approach speed. Additionally, visibility minimums may be reduced by one-half, but no lower than 1/4 SM PV or 1,200 ft. RVR (T-0). Apply any inoperative approach lighting visibility correction before reducing minimums (T-0). Do not reduce the visibility minimums on Copter, Category II, Category III, circling procedures, or if "Visibility Reduction by Helicopters NA" is annotated on the procedure (T-0). Apply airspeed limitations IAW Table 7.1. (T-0).

**Table 7.1. Helicopter Use of Approach Procedures (T-0).**

Procedure	Helicopter Visibility Minimums	Helicopter MDA/DA	Maximum Speed Limitations
<b>Conventional (non-Copter)</b>	The greater of: - one-half the Category A visibility minimums, or - ¼ SM visibility, or - 1200 RVR	As published for Category A	Initiate the final approach segment at speeds up to the upper limit of the highest Approach Category authorized by the procedure, but must be slowed to no more than 90 knots indicated airspeed (KIAS) at the missed approach point (MAP) in order to apply the visibility reduction.
<b>Copter Procedure</b>	As published	As published	90 KIAS when on a published route/track
<b>Global Positioning System (GPS) Copter Procedure</b>	As published	As published	90 KIAS when on a published route or track, EXCEPT 70 KIAS when on the final approach or missed approach segment and, if annotated, in holding. Military procedures are limited to 90 KIAS for all segments.

**7.2. Cold Weather Altitude Corrections.** Add the values derived from the FIH Temperature Correction Chart to the published procedure altitudes IAW Table 7.2. (T-0). Advise ATC if any applied correction exceeds 80 ft. (T-1).

7.2.1. Do not apply a temperature correction to an ATC-assigned altitude (T-0). Radar vectoring altitudes assigned by ATC in the NAS are not temperature compensated and may be queried or refused if obstacle clearance is in doubt.

**Table 7.2. Cold Weather Altitude Corrections (T-0).**

Altimeter Setting Source Temperature	Published IAP	IAP in mountainous terrain	If altitude on the IAP is > 3000 ft. above the altimeter setting source  (N/A for High-Alt IAF)
Below 32° F / 0° C	Correct all altitudes inside FAF or below 1,000 ft. AGL		

		Correct all altitudes on the IAP
Below -22°F / -30° C		
<i><b>NOTE:</b> IAP includes minimum sector altitudes, missed approach altitudes, ESA, MSA, and DME arcs.</i>		

### 7.3. Types of Arrivals.

7.3.1. **Conventional Arrivals.** Fly these procedures using the appropriate conventional NAVAID(s) as the primary means of navigation except as authorized with approved RNAV equipment (T-0); see **paragraph 6.9**.

7.3.2. **RNAV/RNP/GNSS Arrivals.** Retrieve RNAV/RNP/GNSS procedures in their entirety by procedure name from a current navigation database and compare against approved publications (T-0).

7.3.3. **MAJCOM Certified Procedure.** Fly these procedures as authorized by the MAJCOM.

### 7.4. Types of Approaches.

7.4.1. **NDB/VOR/TACAN/ILS Approaches.** Fly these procedures using the appropriate conventional NAVAID(s) as the primary means of navigation except as authorized with approved RNAV equipment (T-0); see **paragraph 6.9**.

7.4.2. **RNAV/RNP/GNSS Approaches.** Retrieve RNAV/RNP/GNSS procedures in their entirety by procedure name from a current navigation database and compare against approved publications (T-0).

7.4.3. **Self-Contained Approaches (SCA).** SCAs are approved for IMC when developed by TERPS authority IAW AFI 11-230 and approved for use by the MAJCOM (T-1). When unable to develop a procedure IAW AFI 11-230 by a TERPS authority, see **paragraph 7.4.6**.

7.4.4. **Precision Runway Monitoring (PRM) Approaches.** Do not fly PRM approaches unless the aircrew and the aircraft are properly certified by the MAJCOM (T-0). If unable to accept a PRM approach clearance, contact Air Traffic Control System Command Center at 1-800-333-4286 to coordinate an arrival time. Without coordination, expect an ATC-directed divert to a non-PRM airport (T-0).

7.4.4.1. TCAS II equipped aircraft will fly the ILS PRM approach in TA/RA mode (T-0).

7.4.4.2. If an ATC breakout and a TCAS RA are received simultaneously, or shortly after one another, turns will be in accordance with ATC breakout instructions while vertical corrections will be in accordance with the TCAS system (T-0).

7.4.5. **Authorization Required Procedures.** Do not fly any RNP “Authorization Required”, conventional “Special Authorization”, or any procedure with a note requiring specific authorization without MAJCOM training and operational approval (T-0).

**7.4.6. MAJCOM Certified Procedure.** MAJCOM/A3s may develop and authorize an approach procedure for use in IMC for their aircraft. Authority may not be further delegated (T-1). Complete MAJCOM-specific training before using such procedures. These procedures may be conducted in the NAS (or elsewhere with host-nation agreement):

7.4.6.1. With ATC approval; or,

7.4.6.2. In conjunction with a published instrument approach procedure; or,

7.4.6.3. In SUA; or,

7.4.6.4. Under VFR.

## **7.5. Approach Minimums.**

**7.5.1. Determining Decision Height (DH)/Decision Altitude (DA)/Minimum Descent Altitude (MDA).** Determine minimum approach altitudes with the barometric altimeter except when directed by MAJCOM or aircraft T.O. guidance.

**7.5.2. Descent Below DH/DA/MDA.** Do not descend below DH/DA/MDA until sufficient visual reference with the runway environment has been established and in a position to execute a safe landing (T-0).

**7.5.3. Descent Below 100 ft.** Do not descend below 100 ft. above the threshold elevation (THRE) or touchdown zone elevation (TDZE) using the approach lights as a reference unless the red termination bars or the red side row bars are visible and identifiable (N/A on CAT III approaches) (T-0).

**7.6. Inoperative Approach Lighting System (ALS).** Unless paragraph 3.16.1. applies, when the runway ALS (or any portion, but not including sequenced flashers or visual glide slope indicators) as depicted on the procedure is inoperative, increase the published visibility minimums of an instrument approach by one of the following:

7.6.1. As directed by the inoperative components table in the TPP (T-0); or,

7.6.2. As stated on IAP, NOTAMs, ATIS, or other airport information source (T-0); or,

7.6.3. If no other guidance is provided, increase published visibility by ½ mile (T-0).

**7.7. Landing Gear Reporting Procedures.** Retractable gear aircraft will report gear down status to ATC or runway supervisory unit after extending the landing gear (T-1). This report shall be made during any approach prior to crossing the runway threshold (T-1).

## **7.8. Missed Approach.**

**7.8.1. Executing the Missed Approach.** If at the MAP/DH/DA and not in a position to execute a safe landing, immediately execute the appropriate missed approach procedure or ATC-issued climbout instructions (T-0). If beyond the MAP/DH/DA, coordinate with ATC for climb-out instructions (T-0).

7.8.1.1. The missed approach procedure should not be initiated until over the MAP/DH/DA unless otherwise cleared by ATC (T-0). Climbing prior to the MAP/DH/DA is permitted, but ATC should be advised as soon as practical.



7.8.1.2. During an emergency, if unable to comply with the missed approach routing or climb requirements, coordinate alternate climbout instructions to ensure obstacle clearance.

**7.8.2. Missed Approach Climb Performance.** Prior to starting any instrument approach, ensure compliance with the following missed approach climb gradients:

7.8.2.1. **Single Engine Aircraft.** Climb performance must meet or exceed 200 ft/NM or the published missed approach climb gradient, whichever is higher, to an appropriate IFR altitude (T-1).

7.8.2.2. **Multi-Engine Fixed-Wing Aircraft.** Using thrust available when starting the approach (AEO or OEI), ensure the aircraft can meet 200 ft/NM or the published missed approach climb gradient, whichever is higher, to an appropriate IFR altitude (T-1).

7.8.2.2.1. If unable to meet published missed approach climb gradient OEI, and operationally necessary, the MAJCOM/A3 may authorize subtraction of up to 48' /NM from the missed approach climb gradient. This authority may be further delegated, but may not be delegated to the respective aircrew for which the waiver would apply (T-1).

7.8.2.3. **Helicopter.** Climb performance must meet or exceed 200 ft/NM or the published missed approach climb gradient, whichever is higher, to an appropriate IFR altitude which ensures obstacle clearance or 400 ft/NM for "Copter Only" approaches (T-1).

**7.9. Land and Hold Short Operations (LAHSO).** Fixed-wing pilots are prohibited from accepting LAHSO clearances (T-1).

7.9.1. Aircrews may passively participate in LAHSO (land or take-off when another aircraft has been given a LAHSO clearance). The PIC is the final authority whether to take-off, land, or continue a touch-and-go when a merging aircraft has received a LAHSO clearance.

**7.10. Reduced Same Runway Separation (RSRS).** MAJCOMs may approve non-formation RSRS operations. Host ATC and user units will publish RSRS procedures (T-2). MAJCOM approval shall include MDS-specific RSRS criteria governing similar and dissimilar landing/touch-and-go/low approach operations.

**7.11. Helicopter Landing Areas.** Helicopters may operate from/to other than established landing areas (e.g., fields, highways, parks) if conducting an operational or training mission. For training missions, permission must be received to use the area and safeguards must exist to permit operations without hazard to persons or property (T-3).

**7.12. Landing With Hot Armament.** MAJCOMs will ensure units publish procedures for aircraft operations with hot armament.

7.12.1. Before landing with hot armament or practice munitions at any airfield where such procedures are unfamiliar, aircrew must:

7.12.1.1. Advise the tower of the circumstances (T-0);

7.12.1.2. Advise transient alert and other appropriate agencies (T-0); and,

7.12.1.3. Request taxi instructions to a designated safe (de-arm) area (T-0).

7.12.2. After landing, aircrew must:

7.12.2.1. Avoid taxiing into an area that could threaten personnel or equipment (T-0).

7.12.2.2. Ensure the ground crew is aware of the armament onboard (T-0); and,

7.12.2.3. Request assistance from the nearest DoD facility, if necessary (T-0).

**7.13. Touch-and-Go Landings.** MAJCOMs will publish guidance addressing operating conditions and qualifications.

**7.14. Turns after Touch-and-Go or Low Approach.** Do not turn after a touch-and-go or low approach until at least 400 ft. above the DER elevation, at a safe airspeed, and past the end of the runway (if visible) unless specifically cleared by the controlling agency, required by a published procedure, or when executing a closed pattern (T-0).

**7.15. Traffic Pattern Procedures.**

7.15.1. Fly traffic patterns IAW with control tower instructions, local flying procedures, AFMAN 11-217, or FLIP (T-0).

7.15.2. At airports with no control tower, follow the standard light signals or visual indicators that prescribe the direction of traffic and landing runway (T-0).

7.15.3. Helicopters should avoid the flow of fixed-wing aircraft unless operating at an equivalent airspeed.

**7.16. Practice Instrument Approaches Under VFR.** MAJCOM approval is required to practice instrument approaches under VFR (T-1). The following restrictions apply:

7.16.1. Maintain VFR cloud clearances and visibilities IAW [Table 6.1](#) and 6.2 (T-0);

7.16.2. Use terminal radar service when available (T-1);

7.16.3. Make all position reports IAW AFMAN 11-217 (T-1); and,

7.16.4. Request ATC clearance to fly the published missed approach (T-0).

**7.17. Night VMC Approaches.** Fly the most precise IAP available (T-2).

BURTON M. FIELD, Lt Gen, USAF  
DCS, Operations, Plans and Requirements

## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

*References*

AFH 11-203V1, *Weather for Aircrews*, 12 Jan 12

AFH 11-203V2, *Weather for Aircrews*, 16 May 02

AFI 10-206, *Operational Reporting*, 6 Sep 11

AFI 10-707, *Spectrum Interference Resolution Program*, 20 Jun 05

AFI 11-202V1, *Aircrew Training*, 22 Nov 10

AFI 11-209, *Aerial Event Policy And Procedures*, 4 May 06

AFI 11-214, *Air Operations Rules and Procedures*, 14 Aug 12

AFI 11-215, *USAF Flight Manuals Programs (FMP)*, 22 Dec 08

AFI 11-218, *Aircraft Operations and Movement on the Ground*, 28 Oct 11

AFI 11-230, *Instrument Procedures*, 27 Sep 13

AFI 11-301V1, *Aircrew Flight Equipment (AFE) Program*, 25 Feb 09

AFI 11-301V4, *Aircrew Laser Eye Protection (ALEP)*, 21 Feb 08

AFI 11-401, *Aviation Management*, 10 Dec 10

AFI 11-402, *Aviation and Parachutist Service, Aeronautical Ratings and Aviation Badges*, 13 Dec 10

AFI 11-403, *Aerospace Physiological Training Program*, 30 Nov 12

AFI 11-409, *High Altitude Airdrop Mission Support Program*, 1 Dec 99

AFI 11-502V3, *Small Unmanned Aircraft Systems Operations*, 26 Apr 12

AFI 13-201, *Airspace Management*, 21 Aug 12

AFI 16-1301, *Survival, Evasion, Resistance and Escape (SERE) Program*, 6 Sep 06

AFI 33-324, *The Air Force Information Collections and Reports Management Program*, 6 Mar 13

AFI 33-360, *Publications and Forms Management*, 25 Sep 13

AFI 48-123, *Medical Examination and Standards*, 5 Nov 13

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AFI 63-112, *Cockpit Working Groups*, 9 Aug 06

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AFI 65-503, *US Air Force Cost and Planning Factors*, 4 Feb 94

AFI 91-202, *The US Air Force Mishap Prevention Program*, 5 Aug 11

AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*, 11 Nov 94

AFMAN 11-217V1, *Instrument Flight Procedures*, 22 Oct 10

AFMAN 11-217V2, *Visual Flight Procedures*, 22 Oct 10

AFMAN 11-217V3, *Supplemental Flight Information*, 23 Feb 09

AFMAN 33-363, *Management of Records*, 1 Mar 2008

AFMAN 91-223, *Aviation Safety Investigations and Reports*, 16 May 13

AFPAM 11-216, *Air Navigation*, 1 Mar 01

AFPD 11-2, *Aircrew Operations*, 19 Jan 12

AFPD 11-3, *Aircrew Flight Equipment (AFE)*, 24 Sep 13

AFPD 11-4, *Aviation Service*, 1 Sep 04

FAA Advisory Circular 90-108, *Use of Suitable Area Navigation (RNAV) Systems on Conventional Routes and Procedures*

FAA Advisory Circular 120-76B, *Guidelines for the Certification, Airworthiness, and Operational Use of Electronic Flight Bags*

FAA AIM *Aeronautical Information Manual*

FAA Joint Order 7400.2J *Procedures for Handling Airspace Matters*

FAA Joint Order 7610.4 *Special Operations*

FAA Order 7110.118 *Land and Hold Short Operations (LAHSO)*

ICAO Doc 9613, *Performance Based Navigation (PBN) Manual*

NATO STANAG 3879, *Birdstrike Risk/Warning Procedures*

SS521-AG-PRO-010 *U.S. Navy Diving Manual*

Title 14 Code of Federal Regulations Parts 91, *Air Traffic and General Operating Rules*, Parts 121 and 135, *Air Carriers and Operators for Compensation or Hire: Certification and Operations*

T.O. 42C-1-2 *Anti-Icing De-Icing and Defrosting of Parked Aircraft*

***Prescribed Forms***

AF Form 70, *Pilot's Flight Plan and Flight Log*

AF Form 72, *Air Report (AIREP)*

DD Form 175, *Military Flight Plan*

DD Form 1801, *DoD International Flight Plan*

***Adopted Forms***

AF Form 847, *Recommendation for Change of Publication*

DD Form 2131, *Passenger Manifest*

*Abbreviations and Acronyms*

**AC**—Advisory Circular  
**ADIZ**—Air Defense Identification Zone  
**ADS-B**—Automatic Dependent Surveillance-Broadcast  
**AEO**—All Engines Operating  
**AFFSA**—Air Force Flight Standards Agency  
**AFH**—Air Force Handbook  
**AFI**—Air Force Instruction  
**AFJI**—Air Force Joint Instruction  
**AFMAN**—Air Force Manual  
**AFPD**—Air Force Policy Directive  
**AFRC**—Air Force Reserve Command  
**AFREP**—Air Force Representative to the FAA  
**AGCAS**—Automatic Ground Collision Avoidance System  
**AGL**—Above Ground Level  
**AIM**—Aeronautical Information Manual  
**AIR CARD**—Aviation Into-Plane Reimbursement Card  
**AIREP**—Air Report  
**ALS**—Approach Lighting System  
**ALTRV**—Altitude Reservation  
**ANG**—Air National Guard  
**AP**—Area Planning  
**ARCP**—Air Refueling Control Point  
**ARTCC**—Air Route Traffic Control Center  
**ASAP**—Aviation Safety Action Program  
**ASRR**—Airfield Suitability and Restrictions Report  
**ATC**—Air Traffic Control  
**ATCAA**—Air Traffic Control Assigned Airspace  
**ATIS**—Automatic Terminal Information Service  
**BWC**—Bird Watch Condition  
**C2**—Command and Control  
**CCMD**—Combatant Command

**CFIT**—Controlled Flight Into Terrain  
**CFR**—Code of Federal Regulations (Formerly FARs)  
**CMNPS**—Canadian Minimum Navigation Performance Standards  
**CNS**—Communications, Navigation, Surveillance  
**COA**—Certificate of Authorization  
**COMAFFOR**—Commander Air Force Forces  
**DA**—Decision Altitude  
**DCS**—Decompression Sickness  
**DER**—Departure End of the Runway  
**DH**—Decision Height  
**DINS**—Defense Internet NOTAM Service  
**DME**—Distance Measuring Equipment  
**EGI**—Embedded GPS/INS  
**EGPWS**—Enhanced Ground Proximity Warning System  
**ELP**—Emergency Landing Pattern  
**ELT**—Emergency Locator Transmitter  
**ESA**—Emergency Safe Altitude  
**ETA**—Estimated Time of Arrival  
**ETP**—Equal Time Point  
**FAA**—Federal Aviation Administration  
**FAAO**—Federal Aviation Administration Order  
**FBO**—Fixed-Base Operator  
**FCB**—Flight Crew Bulletin  
**FCG**—Foreign Clearance Guide  
**FCIF**—Flight Crew Information File  
**FDE**—Fault Detection and Exclusion  
**FDP**—Flight Duty Period  
**FIH**—Flight Information Handbook  
**FL**—Flight Level  
**FLIP**—Flight Information Publication  
**FMC**—Flight Management Computer  
**FMS**—Flight Management System

**FOD**—Foreign Object Damage  
**FSO**—Flight Safety Officer  
**FSS**—Flight Service Station  
**GCAS**—Ground Collision Avoidance System  
**GNSS**—Global Navigation Satellite System  
**GP**—General Planning  
**GPS**—Global Positioning System  
**GPWS**—Ground Proximity Warning System  
**HDD**—Head-Down Display  
**HEEDS**—Helicopter Emergency Egress Device System  
**HMD**—Helmet-Mounted Display  
**HUD**—Head-Up Display  
**IAP**—Instrument Approach Procedure  
**ICAO**—International Civil Aviation Organization  
**IFR**—Instrument Flight Rules  
**ILS**—Instrument Landing System  
**IMC**—Instrument Meteorological Conditions  
**INS**—Inertial Navigation System  
**IR**—Infrared  
**IR**—IFR Military Training Routes  
**ISA**—International Standard Atmosphere Instrument Routes  
**JO**—Joint Order  
**JSIR**—Joint Spectrum Interference Resolution  
**KIAS**—Knots Indicated Airspeed  
**KTAS**—Knots True Airspeed  
**LAHSO**—Land and Hold Short Operations  
**LNAV**—Lateral Navigation  
**LOA**—Letter of Agreement  
**MAJCOM**—Major Command  
**MAP**—Missed Approach Point  
**MDA**—Minimum Descent Altitude  
**MDS**—Mission Design Series

**MEA**—Minimum Enroute Altitude  
**MEP**—Mission Essential Personnel  
**MNPS**—Minimum Navigation Performance Specifications  
**MOA**—Military Operations Area  
**MOCA**—Minimum Obstruction Clearance Altitude  
**MSA**—Minimum Safe Altitude  
**MSL**—Mean Sea Level  
**MTR**—Military Training Route  
**NAS**—National Airspace System  
**NAT**—North Atlantic Track  
**NAVAID**—Navigational Aid  
**NM**—Nautical Mile  
**NOTAM**—Notices to Airmen  
**NVD**—Night Vision Device  
**OAT**—Outside Air Temperature  
**ODP**—Obstacle Departure Procedure  
**OEI**—One Engine Inoperative  
**OROCA**—Off Route Obstruction Clearance Altitude  
**ORTCA**—Off Route Terrain Clearance Altitude  
**OTC**—Over-the-Counter  
**PANS-OPS**—Procedures for Air Navigation Services-Aircraft Operations  
**PAO**—Public Aircraft Operations  
**PBN**—Performance Based Navigation  
**PBO**—Performance Based Operations  
**PED**—Portable Electronic Device  
**PFR**—Primary Flight Reference  
**PIC**—Pilot in Command  
**PIREP**—Pilot Report  
**PMSV**—Pilot-to-Metro Service  
**PPS**—Precise Position Service  
**PRM**—Precision Runway Monitoring  
**PV**—Prevailing Visibility



**RA**—Resolution Advisory

**RAIM**—Receiver Autonomous Integrity Monitoring

**RM**—Risk Management

**RNAV**—Area Navigation

**RNP**—Required Navigation Performance

**RPA**—Remotely Piloted Aircraft

**RSRS**—Reduced Same Runway Separation

**RSU**—Runway Supervisory Unit

**RTRL**—Reduced Takeoff Runway Length

**RVR**—Runway Visual Range

**RVSM**—Reduced Vertical Separation Minimum

**SAR**—Search and Rescue

**SARP**—Standards and Recommended Practices

**SBAS**—Satellite-Based Augmentation System

**SCA**—Self-Contained Approach

**SDP**—Special Departure Procedures

**SERE**—Survival, Evasion, Resistance, and Escape

**SFO**—Simulated Flameout

**SID**—Standard Instrument Departure

**SIGMET**—Significant Meteorological Information

**SM**—Statute Mile

**SMGCS**—Surface Movement Guidance and Control System

**SPINS**—Special Instructions

**SPS**—Standard Position Service

**SR**—Slow Speed Low Altitude Training Routes

**SUA**—Special Use Airspace

**SVFR**—Special Visual Flight Rules

**TA**—Traffic Alert

**TAWS**—Terrain Awareness and Warning System

**TCAS**—Traffic Alerting and Collision Avoidance System

**TDZ/CL**—Touchdown Zone/Centerline Lighting

**TDZE**—Touchdown Zone Elevation

**TEMPO**—Temporary  
**TERPS**—Terminal Instrument Procedures  
**TFR**—Temporary Flight Restriction  
**THRE**—Threshold Elevation  
**T.O.**—Technical Order  
**TOLD**—Takeoff and Landing Data  
**TPP**—Terminal Procedures Publication  
**TSO**—Technical Standard Order  
**UAS**—Unmanned Aircraft System  
**USCG**—United States Coast Guard  
**USG**—United States Government  
**VAAC**—Volcanic Ash Advisory Center  
**VCOA**—Visual Climb Over Airport  
**VFR**—Visual Flight Rules  
**VMC**—Visual Meteorological Conditions  
**VNAV**—Vertical Navigation  
**VR**—VFR Military Training Routes  
**WAAS**—Wide Area Augmentation System  
**WX**—Weather

### ***Terms***

**Aerobatics**—Intentionally performed spins, vertical recoveries, and other maneuvers that require pitch and bank angles greater than 90 degrees.

**Aircrew Member**—An individual, designated on the Flight Authorization who is an aircrew member as explained in AFD 11-4, *Aviation Service*, AFI 11-402, *Aviation and Parachutist Service*, *Aeronautical Ratings and Aviation Badges*, and is assigned to a position listed in AFI 65-503, *US Air Force Cost and Planning Factors*, and is designated on orders to fulfill specific aeronautical tasks.

**Aircrew or Crew**—The full complement of military, civilian and contract personnel required to operate a USAF aircraft and complete an assigned mission.

**Air Force Flight Standards Agency (AFFSA)**—HQ USAF Field Operating Agency charged with the development, standardization, evaluation and certification of procedures, equipment and standards to support global flight operations.

**Anti-collision Lights**—The primary flashing light system on the aircraft intended to attract the attention of others to enhance sense-and-avoid operations.

**ASAP**—An identity protected, self-reporting system designed to encourage the voluntary reporting of issues that increase risk to flight operations.

**Augmented Aircrew**—A basic aircrew supplemented by additional aircrew members to permit in-flight rest. If the basic aircrew requires only one pilot and a second qualified pilot (includes pilots enrolled in an AETC formal aircrew training course) is designated an aircrew member to augment pilot duties, the crew can be considered augmented.

**Automatic Dependent Surveillance-Broadcast**—A system of two avionics components consisting of a GPS and a transponder (usually Mode S) which will replace radar as the primary surveillance method worldwide. ADS-B consists of two different services: “ADS-B Out” transmits aircraft position to ATC and other aircraft, and “ADS-B In” which receives position of other aircraft and may include separation applications.

**Basic Aircrew**—Aircrew positions as defined in the aircraft T.O. (or MDS-specific AFI) for the normal operation of the aircraft or mission.

**Civil Twilight**—Evening Civil Twilight is the period that begins at sunset and ends in the evening when the center of the sun’s disk is 6 degrees below the horizon. Morning Civil Twilight begins prior to sunrise when the center of the sun’s disk is 6 degrees below the horizon, and ends at sunrise. Use an authorized weather source, the latest version of the Air Almanac, MAJCOM-approved computer program, or US Naval Observatory data to determine and calculate sun and moon data. Both periods of twilight are considered “day”, unless further restricted by the MAJCOM.

**Critical Phase of Flight**—In the absence of MAJCOM guidance, this term should include: terminal area operations including taxi, takeoff and landing, low-level flight, air refueling, airdrop, weapons employment, flight using NVDs, tactical/air combat and formation operations (other than cruise), and all portions of any test or functional check flight or any aerial demonstration.

**Day**—The time between the beginning of morning civil twilight and the end of evening civil twilight, as published in the Air Almanac.

**Decision Altitude (DA) / Decision Height (DH)**—A specified altitude during a precision approach at which a decision must be made to either continue the approach if the pilot acquires the required visual references, or immediately executes a missed approach. Decision Altitude is referenced to mean sea level and Decision Height is referenced to the threshold elevation.

**Emergency Fuel**—The point at which it is necessary to proceed directly to the airport of intended landing due to low fuel. Declaration of “emergency fuel” is an explicit statement that priority handling by ATC is both required and expected.

**FAA Exemption or Authorization**—An official written FAA document which provides the petitioner relief from specified parts of the CFRs.

**Fault Detection and Exclusion (FDE)**—A RAIM algorithm that can automatically detect and exclude a faulty satellite from the position solution when a sufficient number of redundant satellite measurements are available.

**Flight Management Computer (FMC) / Flight Management System (FMS)**—An on-board computer system that automates a wide variety of in-flight tasks, to include flight plan management, multi-sensor navigation, aircraft guidance, and performance management.

**Formation Flight**—More than one aircraft which, by prior arrangement between the pilots, operates 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. Such a group is treated for ATC purposes as a single aircraft.

**Fuel Reserve**—The amount of usable fuel that must be carried on each aircraft beyond that required to complete the flight as planned.

**Global Navigation Satellite System (GNSS)**—A generic term for satellite-based navigation, including GPS, SBAS/WAAS, and any other satellite navigation or augmentation system suitable for aviation use.

**Global Positioning System (GPS)**—The United States satellite-based radio navigation system that provides a global positioning, navigation, and timing service.

**Ground Control Element**—Comprises the UAS ground control station, power generation units, communications infrastructure and antenna arrays.

**ICAO**—The International Civil Aviation Organization (a UN Specialized Agency), headquartered in Montreal, Canada, is the global forum for civil aviation that works to achieve its vision of safe, secure, and sustainable development of civil aviation through cooperation amongst its member States. Promotes understanding and security through cooperative aviation regulation.

**Inertial Navigation System (INS)**—A self-contained dead reckoning system that senses acceleration along the three axes of the aircraft and calculates the distance traveled from a reference point. Accuracy of the system decreases with time.

**Instrument Meteorological Conditions (IMC)**—Ceiling, visibility, and cloud clearances that do not meet the criteria for VMC.

**Land and Hold Short Operations (LAHSO)**—Procedures developed to expedite traffic flow at civil and joint-use airports needing additional tools to increase capacity. Allows civilian aircraft to operate on intersecting runways simultaneously.

**Lateral Navigation (LNAV)**—RNAV non-precision approach providing lateral guidance.

**Low Close-in Obstacles**—Those obstacles within the Initial Climb Area that require an excessive climb gradient to a climb-to-altitude of 200 ft. or less above the Departure End of Runway elevation or alternate takeoff weather minimums. These obstacles are published in NOTAMs, on the SID chart, or in the IFR Take-off Minimums and (Obstacle) Departure Procedures section ▼ of the terminal procedure booklet. Typical chart notation is: “NOTE: Rwy 17L, tree 5610' from DER, 212' left of centerline, 82' AGL/2723' MSL.”

**Minimum Fuel**—Indicates that an aircraft's fuel supply has reached a state where, upon reaching the destination, it can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.

**Minimum Navigation Performance Specification (MNPS)**—Implemented in the North Atlantic region between FL285-420 and specifies a number of equipment, training, and procedural requirements. MNPS navigation accuracy is equivalent to RNP 12.6. Dual long-range

navigation systems (LRNS) and dual long-range communication systems are required. RVSM is mandatory in MNPS airspace. Aircraft that cannot meet dual LRNS requirements may be accommodated on special routings ("Blue Spruce" routes). Aircraft that cannot meet RVSM requirements are excluded from MNPS airspace unless operating on an ALTRV.

**Mode 4**—Transponder mode established to enable IFF (Identification Friend or Foe) functions between military aircraft or military aircraft and military ground stations. Uses classified codes, but operates on 1030 MHz and 1090 MHz; the same frequency pair used by the Air Traffic Control Radar Beacon System that civil air traffic uses for Mode 3A/C, Mode S, and TCAS. Mode 4 interrogation signals can suppress civil airborne transponders; therefore all Mode 4 operations in the NAS require prior authorization through the Air Force Frequency Management Agency (AFFMA): [affma.cc@pentagon.af.mil](mailto:affma.cc@pentagon.af.mil).

**Mode 5**—Performance upgrade to the current Mark XII IFF transponder system. Mode 5 provides new waveforms, new cryptography, more data, and improved radio frequency (RF) link margin to resolve many of the deficiencies identified with Mark XII. It will eventually replace the analog Mode 4 IFF system with digital IFF message formats which embed unprecedented combat relevant data.

**Mode S**—The primary role of the Mode S transponder is to "selectively" respond to interrogations, as opposed to responding to all interrogations, from a ground sensor or TCAS to provide airborne data information including identification, equipage, and altitude.

**Mountainous Terrain**—In the absence of other MAJCOM guidance, USAF aircrews shall consider as mountainous those areas defined in 14 CFR §95.11 for CONUS, Alaska, Hawaii and Puerto Rico. In other areas, use 500 ft. surface elevation change over a ½ NM.

**National Airspace System (NAS)**—The NAS is the common network of *United States* (U.S.) airspace: air navigation facilities, equipment, services, airports or landing areas, aeronautical charts, information/services, rules, regulations, procedures, technical information, manpower, and material. Included are system components shared jointly with the military. *United States*, in a geographical sense, means (1) the States, the District of Columbia, Puerto Rico, and the possessions, including the territorial waters (within 12 nautical miles) and (2) the airspace of those areas. **Note:** IAW ICAO Article 12 and Annex 2 and 11, the United States has accepted responsibility for providing air traffic services within airspace overlying the high seas beyond 12 miles from the coast (also known as international airspace). These flight information regions of international airspace include: Oakland Oceanic, Anchorage Oceanic, Anchorage Continental, Anchorage Arctic, Miami Oceanic, Houston Oceanic and New York Oceanic. Aircrews should be aware that although they are being provided air traffic services by the FAA, they are operating in international airspace and ICAO SARPS, FLIP, and AFI's are applicable.

**Navigation Specification**—A set of aircraft and aircrew requirements needed to support performance-based navigation operations within a defined airspace. Comprised of RNAV and RNP specifications.

**Night**—The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the Air Almanac.

**Non-Standard Formation**—Operations under any of the following conditions: 1. When the flight leader has requested and ATC has approved other than standard formation dimensions ( $\leq 1$  NM lateral separation or  $\leq 100$  ft. vertical separation), 2. When operating within an authorized

altitude reservation (ALTRV) or under the provisions of a letter of agreement, 3. When operations are conducted in airspace specifically designed for a special activity.

**OROCA**—An off-route altitude which provides obstruction clearance with a 1,000 ft. buffer in non-mountainous terrain areas and a 2,000 ft. buffer in designated mountainous areas within the United States. This altitude may not provide signal coverage from ground-based navigational aids, air traffic control radar, or communications coverage.

**ORTCA**—An off-route altitude that provides terrain clearance with a 3,000 ft. buffer from terrain. This altitude may not provide signal coverage from ground-based navigational aids, air traffic control radar, or communications coverage. This altitude is used on en route charts covering those areas outside the United States.

**P-Airfield**—Civil airport that permits use by transient military aircraft.

**Passenger**—An individual onboard the aircraft who is not on the flight authorization. See AFI 11-401 for further guidance.

**Performance-Based Operations (PBO)**—Operations based on stated aircraft and aircrew performance requirements addressing communications, navigation, and surveillance systems.

**Portable Electronic Devices (PEDs)**—Portable electronic devices which are not installed on an aircraft as standard equipment. PEDs may include temporary mounts, a data interface, an external antenna, and may require aircraft electrical power.

**Precise Positioning Service (PPS)**—GPS service available to authorized users via the encrypted P(Y) code ranging signal. PPS can offer greater accuracy and resistance to jamming and spoofing.

**Predictive RAIM (P-RAIM)**—Using a standard set of algorithms, the availability of RAIM may be determined based on the satellite coverage expected at an aircraft's ETA. Due to terrain masking and other factors (e.g., satellite fails after RAIM prediction made), P-RAIM does not guarantee there will be sufficient satellite coverage on arrival. P-RAIM does not have to reside in the GPS receiver. It can be provided by FAA Flight Service (US NAS only) and other ground-based RAIM algorithms.

**Prevailing Visibility (PV)**—The greatest horizontal visibility observed throughout at least half of the horizon circle. It need not be continuous throughout 180 consecutive degrees.

**Primary Flight Reference (PFR)**—Any display or suite of displays and instruments used to present the basic flight information needed for immediate control of the aircraft. PFR includes attitude (climb/dive angle or pitch and vertical velocity, bank angle, and a prominent horizon reference), indicated or calibrated airspeed, barometric altitude, heading, appropriate fault indications, and the capability to recognize and recover from an unusual attitude. UAS PFR includes link status, flight guidance mode, and logic.

**PRM Approach**—An instrument landing system (ILS) approach conducted to parallel runways whose extended centerlines are separated by less than 4,300 ft. and the parallel runways have a PRM system that permits simultaneous independent ILS approaches.

**Procedures for Air Navigation Services-Aircraft Operations (PANS-OPS)**—ICAO documents detailing specific procedures for the safety of air traffic navigation agreed to by ICAO signatories.

**Radar Required**—This note on an instrument procedure indicates aircraft using the procedure will be monitored by ATC radar during a particular phase of flight or throughout the entire procedure, as applicable. Coordination with air traffic is necessary to ensure ATC capability and agreement to provide these services before adding the note to any instrument procedure.

**Receiver Autonomous Integrity Monitoring (RAIM)**—An algorithm that verifies the integrity of the position output using redundant GPS measurements, or using GPS measurements and barometric aiding. An algorithm that uses additional information (e.g., multi-sensor system with inertial reference system) to verify the integrity of the position output may be acceptable as a RAIM-equivalent.

**Reduced Same Runway Separation**—Allows reduction of the normal ATC aircraft separation standards during landings and touch-and-goes and restricted low approach operations to increase the airport/runway capacity.

**Reduced Takeoff Runway Length Procedure (RTRL)**—Method used by TERPS to reduce high IFR climb gradients by shortening the available takeoff runway, thus increasing the distance to the obstacle, spot elevation, or terrain feature. Normally printed in the IAP ▼ section as: *“...or alternatively, w/ standard takeoff minimums and a normal 200'/NM climb gradient, takeoff must occur no later than 2200' prior to departure end of runway.”* Aircrews are not permitted to compute climb gradients in this manner.

**Reduced Vertical Separation Minimum (RVSM)**—Reduces the vertical separation between properly equipped and certified aircraft to 1000 ft. in special qualification airspace, normally between FL290-410 inclusive.

**Remotely Piloted Aircraft**—The aircraft portion of an unmanned aircraft system.

**Remote/Island Destination**—In the absence of more restrictive MAJCOM guidance, pilots will consider a remote/island destination as any aerodrome that, due to its unique geographic location, offers no suitable alternate within two hours flying time.

**RNAV (Area Navigation) Specification**—A navigation specification based on RNAV that does not include the requirement for on-board performance monitoring and alerting, designated by the prefix RNAV (e.g., RNAV 5, RNAV 1).

**RNAV (Area Navigation) System**—A navigation system which permits operation on any desired flight path within the coverage of ground-based, space-based, or self-contained navigation aids, or a combination of these.

**RNP (Required Navigation Performance) Specification**—A navigation specification based on RNAV that includes the requirement for on-board performance monitoring and alerting, designated by the prefix RNP (e.g., RNP 4, RNP APCH).

**RNP (Required Navigation Performance) System**—An RNAV system which supports on-board performance monitoring and alerting.

**Runway Environment**—The runway environment consists of one or more of the following elements: The approach light system (except that the pilot may not descend below 100 ft. above the Touch Down Zone Elevation using the approach lights as a reference unless the red termination bars or the red side row bars are also visible and identifiable), the threshold, threshold markings or threshold lights, the runway end identifier lights, the touchdown zone

lights, the runway or runway markings, the runway lights, the visual approach slope indicator. For more information refer to AFMAN 11-217.

**Runway Visual Range (RVR)**—The maximum distance in the direction of takeoff or landing at which the runway, or the specified lights or markers delineating it, can be seen from a position above a specified point on its center line at a height corresponding to the average eye-level of pilots at touch down. This value is normally determined by instruments located alongside and about 14 ft. above the runway and calibrated with reference to the high-intensity runway lights.

**Satellite Based Augmentation System (SBAS)**—Generic term for a wide coverage augmentation system to GNSS that calculates integrity and correction data on the ground and uses geostationary satellites to broadcast the data to SBAS users.

**Self-Contained Approach**—An arrival procedure, normally from an IFR altitude, to a runway, using only navigational equipment onboard the aircraft (GPS, radar, or other sensors).

**Single Medium Display**—A single medium display is a Head-Up Display (HUD), Head-Down Display (HDD), or Helmet-Mounted Display (HMD) presenting flight instrumentation on a single display such as a HUD combiner, a “glass” multifunction display, or a helmet visor.

**Special Departure Procedure (SDP)**—A procedure designed to allow a safe takeoff for multi-engine aircraft whose OEI climb rate would otherwise not meet the TERPS minimum climb gradient requirement. The runway and all known obstacles along a chosen takeoff path are analyzed and compared to the aircraft OEI takeoff and climb performance. The procedure provides a maximum allowable takeoff gross weight for given environmental conditions that ensure vertical and lateral obstacle clearance safety margins. The minimum allowable gross and net climb gradients for SDPs are typically lower than TERPS standards. Unlike TERPS, the takeoff path is selected to minimize obstacle clearance requirements and only those obstacles within the lateral limits of the chosen flight path are considered. Pilots should understand that most SDPs allow exactly zero feet of clearance between their aircraft and the offending obstacles, and provide no safety factor for pilot technique, less than 100% engine thrust, etc. The term SDP encompasses both the use of the textual obstacle data table information and the graphical departure procedures.

**Standard Formation**—A formation in which no participating aircraft is more than 1 NM horizontally and 100 ft. vertically from the lead aircraft.

**Standard Positioning Service (SPS)**—GPS service available to all users via the course/acquisition (C/A) code ranging signal.

**Stopover Flight**—A flight where intermediate stops are planned en route to a final destination.

**Strobe Lights**—Systems such as wingtip strobes or other similar strobe light installations.

**Tactical Operations**—Flight operations consisting of maneuvers that are unique to the employment of air power to: gain and maintain air superiority, prevent freedom of operation for the enemy in the objective area, and to assist naval and ground forces in the attainment of their objectives. Tactical operations must be specifically MAJCOM (or CCMD) defined, approved and implemented. These operations are normally practiced only on training or exercise missions, in a form of special use airspace or on designated training ranges or routes.

**Terminal Area Operations**—Terminal area operations are normally those flight phases conducted within 30 NM of an airfield of intended departure or landing, or those operations on



charted Standard Instrument Departures, on charted Standard Terminal Arrivals (STARs), or other flight operations between the last enroute fix/waypoint and an initial approach fix/waypoint.

**Terrain Alert Warning System (TAWS)**—Generic term for any on-board system taking inputs from terrain databases, radar altimeter, aircraft position sensors, etc. to activate a Ground Proximity Warning System or Automatic Ground Collision Avoidance System (AGCAS). Developed to help prevent Controlled Flight Into Terrain (CFIT) mishaps.

**Traffic Collision Avoidance System (TCAS)**—An airborne system that functions independently of the ground-based radar to provide collision avoidance protection between suitably equipped aircraft. TCAS I provides proximity warnings to pilots in the form of traffic advisories. TCAS II provides both traffic advisories and recommended vertical escape maneuvers, known as resolution advisories.

**Unmanned Aircraft System (UAS)**—Includes one or more control stations, one or more unmanned aircraft, aircraft control and payload datalinks, and mission payloads, designed or modified not to carry a human pilot and operated through remote or self-contained autonomous control. A UAS must meet all applicable requirements of a manned aircraft unless specifically exempted. The term RPA is specific to the Remotely Piloted Aircraft (the flying portion of the UAS).

**Unmonitored Navigational Aid**—Most NAVAIDs have internal monitoring systems that provide automatic shutdown or notification when a malfunction occurs. Unmonitored NAVAIDs lack the ability to immediately notify ATC when a malfunction occurs. The pilot may still use the NAVAID for all types of navigation, including instrument approaches, but must monitor the NAVAID for a loss of identification since no prior warning of operation may be available from ATC.

**Vertical Navigation (VNAV)**—A term that describes using GPS lateral and vertical guidance to define the minimums for a GPS non-precision or precision approach.

**VFR-on-Top**—ATC authorization for an IFR aircraft to operate in VFR conditions at any appropriate VFR altitude (as specified in FLIP and as restricted by ATC). A pilot receiving this authorization must comply with VFR visibility, distance from cloud criteria, and minimum IFR altitudes.

**VFR-over-the-Top**—VFR flight maneuver during which an aircraft on a VFR flight plan climbs over a ceiling in VMC, maintains VMC above the clouds, then descends in VMC and lands.

**Visual Meteorological Conditions (VMC)**—Meteorological conditions in which visual flight rules may be used; expressed in terms of visibility, ceiling height, and aircraft clearance from clouds along the path of flight. When these criteria do not exist, instrument meteorological conditions prevail and instrument flight rules (IFR) must be followed.

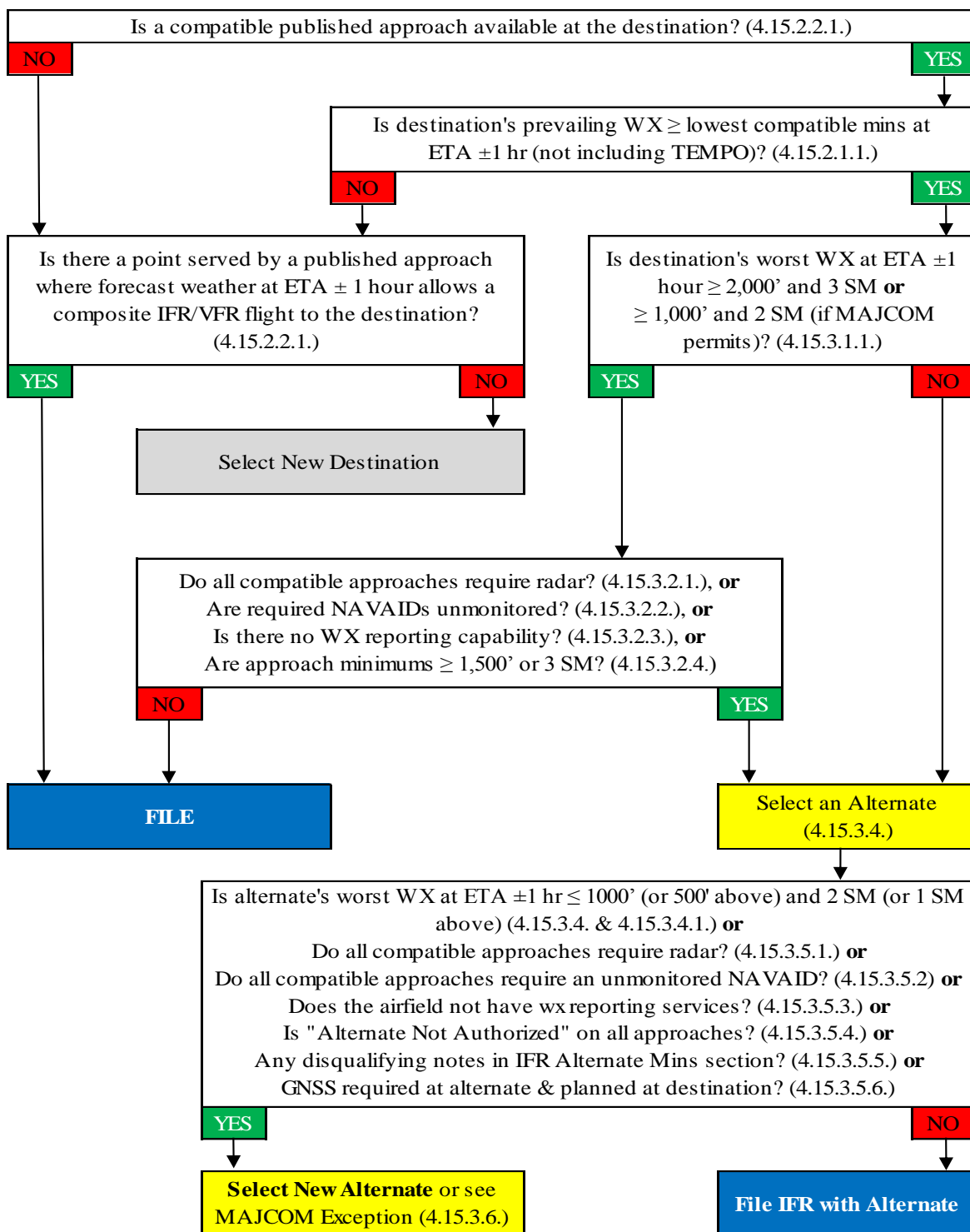
**WGS-84**—World Geodetic Survey-1984: Developed by the U.S. for world mapping, WGS 84 is an earth fixed global reference frame. It is the ICAO standard.

**Wide Area Augmentation System (WAAS)**—The U.S. implementation of SBAS which augments GPS SPS.

**Attachment 2**

**IFR FILING DECISION TREE - FIXED-WING**

### IFR Filing Decision Tree - **FIXED-WING**

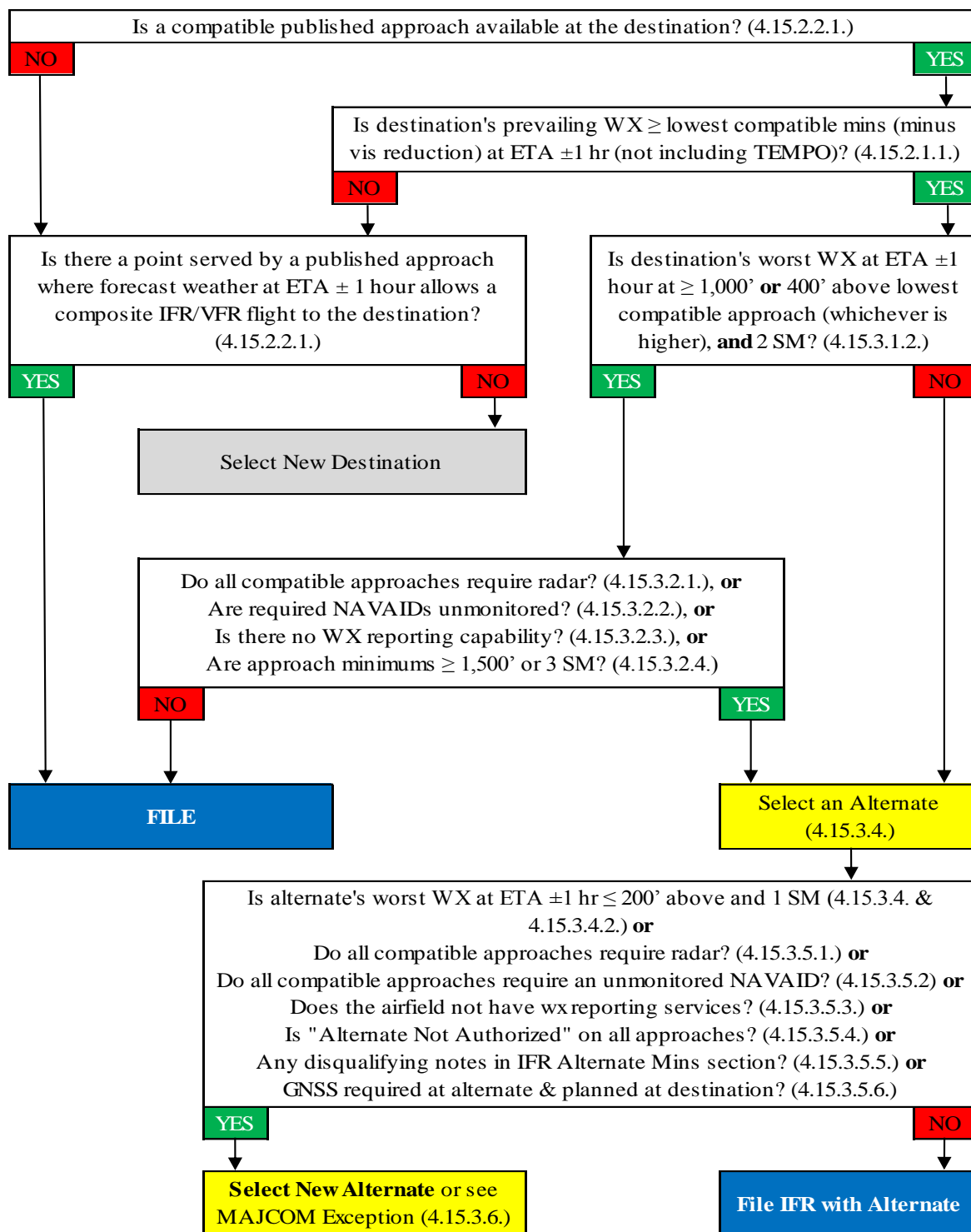


*Note:* Quick reference only, see full guidance to ensure complete flight planning.

**Attachment 3**

**IFR FILING DECISION TREE - HELICOPTER**

### IFR Filing Decision Tree - HELICOPTER



*Note:* Quick reference only, see full guidance to ensure complete flight planning.