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SECRETARY OF THE AIR FORCE**

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C-21 OPERATIONS PROCEDURES

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PURPOSE

This manual implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*. This is a specialized publication intended for use by Airmen who have graduated from technical training related to operation of this aircraft. It establishes guidance and procedures for operation of the C-21 aircraft to safely and successfully accomplish worldwide mobility missions. This manual applies to military and civilian members of the Regular Air Force, Air Force Reserve, and Air National Guard involved with employing C-21 aircraft. This publication does not apply to the United States Space Force. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF IMTs 847 from the field through Major Command (MAJCOM) Standardization and Evaluation (Stan/Eval) office. Operations Group Commanders (OG/CCs) should define local operating procedures in a unit supplement to this manual. OG/CCs shall obtain approval from MAJCOM prior to releasing their supplement. Send an electronic copy of the approved version to Air Mobility Command (AMC) Stan/Eval. The authorities to waive wing/unit level requirement in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See

DAFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestors commander for non-tiered compliance items. Tiering levels presented in this manual represent the lowest acceptable level and as such, higher levels may also approve the waiver. 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 interim change revises AFMAN 11-2C-21V3 due to fleet-wide avionics equipment modernization. Added off-station and enroute ground time guidance. Removed the minimum equipment list (MEL) tables as they are incorporated into the T.O. 1C-21A-1, *Flight Manual*, and clarified Column A and B definitions. Updated turbulence category; revised minimum required takeoff visibility; updated verbiage, navigation capabilities, and procedures throughout, consistent with modified avionics features. Numerous cited references have been updated, renamed, combined, or rescinded since the original publication of this AFMAN. Some outdated references have been individually corrected in identified paragraphs; however, not every instance has been corrected. The following references should be noted as updated throughout the publication; all references to AFI 33-360, *Publications and Forms Management*, changed to read DAFI 33-360, *Publications and Forms Management*; all references to AFI 11-202, Volume 3, *General Flight Rules*, AFMAN 11-217, Volume 1, *Instrument Flight Procedures*, and AFMAN 11-217, Volume 3, *Supplemental Flight Information*, changed to read AFMAN 11-202, Volume 3, *Flight Operations*; all references to AFI 11-202, Volume 3, *AMC Supplement, Flying Operations*, changed to read AFMAN 11-202, Volume 3, *AMC Supplement, Flight Operations*; all references to AFI 11-401, *Aviation Management*, changed to read DAFMAN 11-401, *Aviation Management*; all references to AFI 11-2C-21, Volume 2, *C-21 Aircrew Evaluation Criteria*, changed to read AFMAN 11-2C-21, Volume 2, *C-21 Aircrew Evaluation Criteria*; all references to AFI 11-218, *Aircraft Operations and Movement on the Ground*, changed to read AFMAN 11-218, *Aircraft Operations and Movement on the Ground*; all references to AFI 21-101, *Aircraft and Equipment Maintenance Management*, changed to read DAFI 21-101, *Aircraft and Equipment Maintenance Management*; all references to AFI 11-209, *Participation in Aerial Events*, changed to read DAFI 11-209, *Participation in Aerial Events*; all references to AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, changed to read DAFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*; all references to AFMAN 24-204, *Preparing Hazardous Materials for Military Air Shipments*, changed to read AFMAN 24-604, *Preparing Hazardous Materials for Military Air Shipments*; all references to AFI 11-2AE, Volume 3, *Aeromedical Evacuation (AE) Operations Procedures*, changed to read AFMAN 11-2AE, Volume 3, *Aeromedical Evacuation (AE) Operations Procedures*. A margin bar (|) indicates newly revised material.

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Chapter 1

GENERAL INFORMATION

1.1. General. This Air Force manual (AFMAN) provides guidance and procedures for operating the C-21 aircraft. It is an original source document, but for efficacy, it may restate information found in aircraft flight manuals, flight information publications (FLIP), and other Air Force directives. When guidance in this publication conflicts with another source document, that document takes precedence. For matters where this publication is the source document, waiver authority is IAW [paragraph 1.4](#). For matters where this publication repeats information in another document, follow waiver authority outlined in the source document.

1.2. Key Words Explained.

- 1.2.1. "Will", "Shall", and "Must" indicate a mandatory requirement.
- 1.2.2. "Should" indicates a preferred, but not mandatory, method of accomplishment.
- 1.2.3. "May" indicates an acceptable or suggested means of accomplishment.
- 1.2.4. "NOTE" indicates operating procedures, techniques, etc., considered essential to emphasize.
- 1.2.5. "CAUTION" indicates operating procedures, techniques, etc., which could result in damage to equipment if not carefully followed.
- 1.2.6. "WARNING" indicates operating procedures, techniques, etc., which could result in personal injury or loss of life if not carefully followed.

1.3. Deviations and Waivers. Do not deviate from guidance and procedures in this publication except when the situation demands immediate action to ensure safety. The Pilot in Command (PIC) is vested with ultimate mission authority and is responsible for each course-of-action taken.

1.3.1. Deviations. The PIC shall report deviations or exceptions taken without a waiver within 48-hours of deviation through command channels to their Chief of MAJCOM Stan/Eval who in turn notifies the Chief of AMC Stan/Eval (lead command) as appropriate for follow-on action. OG/CCs shall collect background information and submit a follow-up written report upon request. (T-2).

1.3.2. For the purposes of this manual, MAJCOMS are: AMC, National Guard Bureau, and United States Air Forces Europe (USAFE). Commanders, Air Force forces in the grade of O-8 or higher in Combatant Commands are considered MAJCOM commanders only for forces under their operational control.

1.3.3. Waivers affecting theater unique circumstances without an expiration date, must be approved by the MAJCOM A3, and included in the MAJCOM supplement. (T-2).

1.3.3.1. Long-term waivers, with specific expiration dates, affecting multiple aircraft or missions must be approved by the applicable MAJCOM A3 and sent from the appropriate MAJCOM Stan/Eval to AMC Stan/Eval. (T-2).

1.3.3.2. Short-notice waivers are for specific missions in execution. PICs shall use the Waiver Protocol procedure in [Chapter 4](#) to secure MAJCOM A3 approval for short-notice

waivers. (T-2). USAFE planning/execution agencies may use the Waiver Protocol to secure MAJCOM A3 approval for short-notice waivers.

1.3.3.3. Due to the unique nature of Operational Support Airlift/Executive Airlift (OSA/EA) missions, waiver authority for specific areas of this manual may be delegated to the unit's wing, group (or equivalent), or squadron commander (as indicated by the label "(T-3)"). If a waiver is approved, the waiver authority will inform the next higher level in the chain of command and the MAJCOM Stan/Eval with mission execution authority in a timely manner. (T-2).

1.3.3.4. Nothing in this manual shall be interpreted to prohibit a commander from withholding waiver authority, to include waiver authority delegated by this manual.

1.4. Supplemental Procedures. Each user MAJCOM or operational theater may supplement this publication according to AFD 11-2, *Aircrew Operations*, and AFI 33-360, *Publications and Forms Management*. Stipulate unique MAJCOM procedures and publish MAJCOM A3-approved permanent waivers in the MAJCOM supplement.

1.4.1. Combined Command Operations. Plan and conduct all operations that include forces from multiple MAJCOMs using provisions in this publication. Do not assume or expect aircrews to perform MAJCOM/Theater unique procedures without obtaining MAJCOM A3 approval and advance training.

1.4.2. Coordination Process. Forward MAJCOM approved supplements (attach AF Form 673, *Air Force Publication/Form Action Request*) to AMC Stan/Eval for mandatory coordination prior to approval.

1.5. Definitions. Find explanations or definitions of terms and abbreviations commonly used in the aviation community in Title 14, Code of Federal Regulations, Part 1, *Definitions and Abbreviations*; *FLIP General Planning*, [Chapter 2](#); and *The DoD Dictionary of Military and Associated Terms*. See [Attachment 1](#) for common terms used in this manual.

Chapter 2

COMMAND AND CONTROL

2.1. General. Command and Control encompasses the concepts and functions of execution authority, operational reporting/in-transit visibility, mission scheduling, and mission support (reference [Attachment 1](#), Glossary of References and Supporting Information). Aircrews should understand that individual command and control (C2) centers do not perform all of these functions. For example, the Joint Operational Support Airlift Center (JOSAC) and Air Force Special Air Mission Office (AF/ CVAM) scheduled missions, but neither hold execution authority, nor provide mission support. C2 centers are action agents for the Mobility Air Forces (MAF) Commander with execution authority (operational control) over mobility missions/forces.

2.1.1. AMC. RegAF operational units will primarily utilize Scott Air Force Base Command Post as their C2 center. (T-3). Missions may be supported with Integrated Flight Management (IFM) from 618th AOC (TACC) or AMC-approved commercial dispatch services (e.g. ARINC).

2.1.2. USAFE/ANG. C2 support is in accordance with command/local supplements.

2.1.3. When re-route or divert is directed by C2 agent that does not provide planning support (e.g. local Command Post), the aircrew should be afforded all time necessary to review planning documents, replan the mission, and ensure safe execution. With aircrew input, C2 agents should revise the mission itinerary as required, and notify customers of the changes when necessary.

2.2. Roles and Responsibilities.

2.2.1. MAJCOM. MAJCOMs will provide guidance and approve waivers (as required), where specified throughout this manual.

2.2.2. PIC. The PIC is the aircrew member designated by Competent authority, regardless of rank, as being responsible for, and is the final authority for the operation of the aircraft. The PIC will ensure the aircraft is not operated in a careless, reckless, or irresponsible manner that could endanger life or property (T-3). The PIC will ensure compliance with this manual and the following (T-3):

2.2.2.1. Headquarters Air Force, MAJCOM, and Mission Design Series-specific guidance;

2.2.2.2. FLIP and DoD *Foreign Clearance Guide* (FCG);

2.2.2.3. Air Traffic Control (ATC) clearances;

2.2.2.4. Notices to Airmen (NOTAMs);

2.2.2.5. Aircraft Technical Orders (T.O.); and,

2.2.2.6. Combatant Commander's instructions and other associated directives.

2.2.3. Aircrew. Individuals designated on the flight authorization are responsible to fulfill specific aeronautical tasks regarding operating USAF aircraft as specified in this AFMAN or by other competent, supplemental authority.

2.3. Execution Authority. Mission execution authority and C2 for C-21 missions vary depending on the location and type of mission flown.

2.3.1. AMC. Wing Current Operations serves as the single point of contact for mission assignments from outside agencies (i.e. AF/CVAM, JOSAC) and acts as liaison between the PIC, unit C2 staff, and those agencies during the mission planning phase. Unit C2 staff assist Current Operations with tail and aircrew availability information.

2.3.1.1. AF/CVAM is responsible for scheduling C-21 aircraft designated as Service Secretary Controlled Aircraft. During the execution phase, the user should coordinate significant mission changes (to include change in itinerary locations and scheduled time changes greater than one hour) through AF/CVAM.

2.3.1.2. JOSAC schedules aircraft made available to them by Current Operations, after unit C2 staff coordination.

2.3.2. USAFE/ANG. Tasking and execution approval is IAW command/local supplements.

2.3.3. Local Training Missions. The OG/CC serves as mission execution authority for local training missions.

Chapter 3

AIRCREW COMPLEMENT/MANAGEMENT

3.1. General. This chapter provides guidance and procedures to form/manage mobility aircrews. Commanders at all levels shall follow these guidance and procedures to form aircrews and to develop aircrew-related work/rest schedules that optimize efficiency of mobility forces engaged in worldwide operations. **(T-2).**

3.2. Aircrew Complement. Squadron commanders should form aircrews based on fragmentation order/mission directive, Crew Duty Time and Flight Duty Period (FDP) requirements, aircrew member qualifications, and other constraints to safely accomplish the mission tasking.

3.2.1. The basic crew complement for the C-21 is one aircraft commander (AC) and a pilot.

3.2.2. The C-21 does not have an augmented crew complement.

3.2.3. The minimum aircrew member complement for a local training flight is an AC and a pilot.

3.3. Aircrew Member Qualification. An aircrew member will be qualified, or in qualification training, to perform duties as a primary aircrew member. **(T-2).**

3.3.1. Senior leaders who complete a Senior Staff Qualification course (restricted AF Form 8, *Certificate of Aircrew Qualification*) or orientation for a Senior Staff Familiarization flight may occupy a primary crew position when under direct instructor supervision. Refer to AFI 11-401, *Aviation Management*, for procedures and requirements governing senior leader flying.

3.3.2. Crewmembers who complete the Senior Staff Course will log First Pilot, “FP” as the Flight Authorization Duty Code on the AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document*. **(T-2).**

3.3.3. Crewmembers who complete the Senior Officer Familiarization flight will log “OP” as the Flight Authorization Duty Code on the AFTO Form 781. **(T-2).**

3.4. Pilots. An instructor pilot (IP) must supervise non-current, non-mission ready (NMR), or unqualified pilots regaining currency or qualification (direct IP supervision during critical phases of flight). **(T-2).**

3.4.1. Missions with Passengers. To occupy a pilot’s seat with passengers, pilots must have a current AF Form 8 for the C-21 aircraft. **(T-2).** For takeoff, approach and landing one of the following conditions must be met:

3.4.1.1. Two qualified and current pilots (1 AC or higher, 1 FP or higher) must be at the controls. **(T-2).**

3.4.1.2. A qualified pilot non-current no more than 60 days for flying currency requirements and an IP providing direct supervision at the controls. **(T-2).** ACs regaining currency may be designated PIC.

3.4.1.3. A qualified NMR pilot accomplishing Mission Certification Training and an IP providing direct supervision at the controls. SQ/CCs may authorize crewmembers who

have completed all Mission Qualification Training flying training events prior to completing all mission ready-required ground training events to fly unsupervised on local training and routine unit missions, provided the remaining ground training items do not affect mission accomplishment for that flight.

3.4.1.4. A qualified AC upgrade candidate on an initial or requalification Operational Mission Evaluation (OME) and a qualified pilot (FP or higher) may occupy either pilot seat with passengers onboard, if under supervision of a qualified evaluator pilot (EP) during all phases of flight (AC upgrade candidates will be designated as “acting in the next higher crew qual” for evaluation purposes).

3.4.1.5. A basic qualified (valid C-21 AF Form 8) senior officer who has completed a Senior Officer Qualification course may occupy either pilot seat with passengers onboard, if under direct IP supervision.

3.4.2. Qualification Training. Initial qualification, requalification, or upgrade training (AC upgrade training allowed) for pilots will not be conducted on missions with passengers onboard. Mission certification training, OMEs, and line training/development missions may be conducted on missions with passengers onboard only if the individual in training is qualified to the applicable level. **(T-2).**

3.5. Off-station/Enroute Ground Time.

3.5.1. Mobility planners and C2 agents shall provide aircrews at least 16 hours ground time between engine shutdown and subsequent takeoff. **(T-3)**

3.5.2. Enroute stops should be scheduled for 1+15 (hrs+mins) ground time. At fields with known delays (fueling, long taxi, congestion, etc.) planners may request extended ground times up to 1+30. Fields with known fueling delays are those listed in FLIP or the Airfield Suitability and Restrictions Report (ASRR) with remarks indicating that fueling delays can be expected.

Chapter 4

AIRCRAFT OPERATIONS

4.1. Objective. Redundant systems may allow crews to safely perform some missions when a component/system is degraded. The PIC is the final authority in determining the overall suitability of an aircraft for the mission. The PIC will ensure a detailed explanation of the discrepancy is entered in the AFTO Form 781A, *Maintenance Discrepancy and Work Document*; and will include the following maintenance identifiers to effectively communicate aircraft status. **(T-3).**

4.1.1. Mission Essential (ME). The PIC will designate an item, system, or subsystem component essential for safe aircraft operation as ME. **(T-3).**

4.1.2. Mission Contributing (MC). The PIC will designate an item, system, or subsystem component, which is not currently essential for safe aircraft operation as MC. **(T-2).** These discrepancies should be cleared at the earliest opportunity. If circumstances change or mission safety would be compromised, re-designate as ME. Do not delay a mission to clear a MC discrepancy.

4.1.3. Open Item (OI). The PIC will designate maintenance discrepancies not expected to adversely impact the current mission or any subsequent mission as an OI. These items are normally cleared at home station. **(T-3).**

4.2. Minimum Equipment List (MEL) Guidance and Procedures. The MEL is a pre-launch document that lists the minimum equipment/systems to operate the aircraft. A list that would anticipate all possible combinations of equipment malfunctions and contingent circumstances is impractical. Consider equipment/systems with no listed exceptions as grounding items. A PIC who accepts an aircraft with degraded equipment/systems is not committed to subsequent operations with the same degraded equipment. PICs are not committed to operations with degraded equipment accepted by another PIC.

4.2.1. T.O. 1C-21A-1 provides the C-21 MEL. The PIC is responsible to account for the possibility of additional failures during continued operation with inoperative systems or components. The MEL is not intended for continued operation with inoperative systems/subsystems over an indefinite period.

4.2.2. Install all emergency equipment unless specifically exempted by mission requirements/directives.

4.2.3. Short-Notice Waivers. A PIC prepared to operate with a degraded MEL item (exceeding what is allowed for dispatch) shall request a waiver through C2 channels. The PIC shall provide the C2 agent: 1) nature of request, 2) individual crew member qualification, 3) mission leg(s) requiring the waiver, 4) weather or other adverse condition, and 5) the governing directive of waiver request to include volume, chapter, or paragraph. Initiate waiver requests as soon as possible; plan for waiver processing to take at least one hour **(T-3).**

4.2.4. PICs operating with waiver(s) for degraded equipment shall coordinate mission requirements (i.e., revised departure times, fuel requirements, maintenance requirements, etc.) with the controlling C2 agency and/or flight manager. **(T-3).**

4.2.5. If beyond C2 communication capability, or when it is necessary to protect the crew or aircraft from a situation not covered by this chapter and immediate action is required, the PIC may deviate according to [paragraph 1.4](#).

4.3. Waiver Protocol. Waivers to operate with degraded equipment are granted on a case-by-case basis. The PIC determines the need for a waiver after coordinating with the lowest practical level of command. Waiver authority is as follows for:

4.3.1. Training missions: OG/CC (or equivalent) with mission execution authority.

4.3.2. MAJCOM-directed and US Southern Command (USSOUTHCOM) missions: OG/CC (or equivalent) of the tasked unit. Initiate the request with the C2 agency supporting the mission.

4.3.3. Contingency missions: Director of Mobility Forces (DIRMOBFOR) (or equivalent) for the agency with C2, if not specified in the Operational Order (OPORD)/Tasking Order.

4.3.4. Other than MEL waivers: Determine governing source document (i.e. AFI, AFMAN, Flight Manual, Maintenance T.O., etc.) to ascertain the waiver authority. Use C2 channels to notify the appropriate waiver authority. Waivers of this nature may require an extended response time.

4.4. Technical Assistance. The PIC may request (at any time in the decision process) technical support from maintenance representatives, home unit Stan/Eval, and MAJCOM/A3 staff.

4.5. MEL Table Definitions/Column Identifiers. The MEL tables in T.O. 1C-21A-1 are arranged by aircraft system as a mechanism for the PIC to determine minimum system requirements. Components are listed by number installed and minimum required for flight. Requirements are defined by Home Station Departure/Main Operating Base (MOB) (Column A) and Enroute (Column B). Refer to the Remarks/Limitations/Exceptions column for clarification. All aircrews will consider bases supported by C-21 contractor logistics support (CLS) maintenance as MOB. **(T-3)** When transiting a MOB on a pre-positioning or an active leg of a mission, use Column A. **Note:** Column B requirements are not normally waived when transiting a MOB. Local training missions, to include off-station trainers (OSTs), fall under Column B.

4.5.1. Remarks/Limitations/Exceptions. Some technical information and procedures are contained in this column of the MEL table. This is not all-inclusive; crewmembers shall refer to the flight manual and other directives for procedures, techniques, limitations, etc. **(T-1)**.

4.5.1.1. One-time Flight Clarification: Normally a Red X discrepancy is downgraded for a one-time flight. This condition does not preclude carrying cargo and passengers, unless restricted by the authority who downgraded the Red X. The priority is to move the airplane to a repair capable facility. PICs must coordinate with appropriate agencies to ensure repair capability exists at the destination. **(T-3)**. One-time flights may include enroute stops only when necessary to recover the airplane. Example: An airplane departs on a gear-down flight from Djibouti International Airport and requires an enroute fuel stop (Cairo Internatinal Airport, Egypt) before landing at the nearest repair capable facility, Sigonella Naval Air Station, Italy.

4.5.1.1.1. One-time flight to nearest repair capable facility: Flight is limited to the nearest (shortest enroute time) repair capable base.

4.5.1.1.2. One-time flight to a repair capable facility: Flight is not restricted to the nearest repair capable facility.

4.5.1.2. Other Mission and Repair Clarifications:

4.5.1.2.1. Shall be repaired at next repair capable facility: Mission may continue as scheduled, item shall be repaired upon reaching a repair capable facility. **(T-3)**. Designate item ME upon reaching repair facility. Once maintenance action is initiated, and it is determined repairs are not possible, the PIC will discuss possible courses of action with C2 agency to return aircraft to service.

4.5.1.2.2. Mission dictates requirement: PIC shall consider the entire mission profile, not just the next leg. **(T-1)**. Example: An airplane is departing an enroute station with repair capability, after engine start the pilot discovers the #1 engine anti-ice is inoperative. Icing conditions are not forecasted for the next leg. However, because the mission spans several days and repair capability does not exist at the scheduled enroute stops, the PIC elects to have the item repaired prior to departing.

4.5.2. Warning and Caution annunciator lights not specifically mentioned in the MEL should normally be operative; however, the PIC should use good judgment in determining if the mission can proceed with a burned out bulb.

4.5.3. A PIC may request a waiver to depart from a contract maintenance location if parts are available, but the delay would be unacceptable for mission completion.

Table 4.1. DELETED

Table 4.2. DELETED

Table 4.3. DELETED

Table 4.4. DELETED

Table 4.5. DELETED

Table 4.6. DELETED

Table 4.7. DELETED

Table 4.8. DELETED

Table 4.9. DELETED

Table 4.10. DELETED

Table 4.11. DELETED

Table 4.12. DELETED

4.6. Supplements. Each MAJCOM may supplement the MEL (see [Chapter 1](#)).

4.7. Gear Down Flight Operations. Limit gear down flight operations to sorties required to move the aircraft to a suitable repair facility. Consider gear down flight only after the PIC exhausts all avenues to repair the aircraft in place.

Chapter 5

OPERATIONAL PROCEDURES

5.1. Duty Station. Both pilots shall be in their seats during flight, except one may be out of their seat for brief periods to meet physiological needs and crew duties. With both pilots in their seats, PICs may authorize rest periods for one pilot occupying a primary duty station during non-critical phases of flight, the other pilot will be awake and alert. Comply with AFI 11-202 Vol 3 and associated AMC Supplement regarding oxygen requirements when one pilot is out of the seat. (T-1).

5.2. Flight Station Entry. Aircrew do not permit passengers and observers access to primary crew positions.

5.3. Takeoff and Landing. An AC, or above, occupies either the left or the right seat during all takeoffs and landings (except for OME conducted IAW AFMAN 11-2C-21 Vol 2, *C-21 Aircrew Evaluation Criteria*). The designated PIC (A code) is not required to occupy a primary position, but still retains overall authority for conduct of the mission.

5.3.1. A qualified and current pilot certified as an AC, IP, or EP will accomplish all takeoffs, approaches, and landings under the following conditions (T-3):

5.3.1.1. Aircraft emergencies, unless conditions prevent compliance.

5.3.1.2. When operating to or from airfields requiring airfield related waivers. **Exception:** On OMEs transiting an airfield requiring a waiver, the OG/CC determines if an AC is required for the landing, taxi, or takeoff (e.g., ASRR, WBC waiver).

5.3.2. Unless the other pilot in the seat is a certified AC or higher, PIC with less than 100 primary assigned aircraft (PAA) hours since AC certification will make all takeoffs and landings under any of the following conditions (T-3):

5.3.2.1. Ceiling/visibility less than 300 feet (ft) and/or RVR 40 (3/4 SM visibility).

5.3.2.2. RCR less than 12.

5.3.2.3. Crosswind component greater than 15 knots.

5.4. Landing Gear and Flap Operation. The pilot flying (PF) will verbally command gear and flap operations. The pilot monitoring (PM) will verify appropriate airspeed and acknowledge the command prior to system operation. The pilot in the right seat will operate the landing gear selector switch regardless of whether that pilot is flying or monitoring. The PM will activate the flap lever regardless of seat position. Both PF and PM will visually confirm the gear position lights or flap position indicator following system operation to verify the desired position is attained. Instructors may operate gear or flaps as required for safe operation. Exceptions will be briefed prior to the applicable phase of flight (T-2).

5.5. Outside Observer/Jump Seat Duties. Available crewmembers will assist in clearing during taxi operations and any time the aircraft is below 10,000 ft MSL. (T-3).

5.6. Seat Belts. Seat belts will be worn IAW AFI 11-202 Vol 3 and associated AMC Supplement. In addition, all crewmembers will have shoulder harnesses (in addition to seat belts) fastened during taxi, takeoff, and landing. (T-2).

5.7. Aircraft Lighting. Follow aircraft lighting operating procedures IAW AFI 11-202 Vol 3, AFMAN 11-218, *Aircraft Operations and Movement on the Ground*, and applicable T.O.s.

5.8. Portable Electronic Devices. Follow portable electronic device procedures IAW AFI 11-202 Vol 3 and associated AMC Supplement. In addition, Aircrew members are allowed to use the USB charging port during all phases of flight, but will ensure that charging cords do not interfere with flight control movement, especially during critical phases of flight **(T-1)**. PICs may permit passengers to use the USB charging port, but aircrew usage is the priority. Aircrew should advise passengers that they may not use the port when it is in use by the aircrew.

5.9. Stabilized Approach. Conduct stabilized approach procedures IAW AFI 11-202 Vol 3 and associated AMC Supplement. In addition, Reg AF FTU instructors and Aircrew Training System (ATS) contract instructors train students to ensure they understand and are capable of complying with all aspects of stabilized approach criteria. FTU instructors must use their expertise and experience to only deviate from the guidelines of stabilized approach criteria as required during appropriate instructional scenarios. **(Exception:** For local trainers stabilized approach criteria need only be briefed once by each trainee). **(T-2)**.

5.10. Runway, Taxiway, and Airfield Requirements.

5.10.1. Minimum Runway and Taxiway Requirements. Minimum usable runway length (limited by applicable declared distances) is 5000 ft/1525m or 6000 ft/1830m for touch-and-gos. Minimum runway width is 70 ft. Minimum taxiway width is 35 ft. If operationally necessary, shorter runways are permitted provided:

5.10.1.1. A qualified IP or EP will perform the takeoff and landing. **(T-2)**.

5.10.1.2. Operations will be limited to daytime (the applicable OG/CC is waiver authority). **(T-3)**.

5.10.1.3. Takeoff distance does not exceed landing distance or landing distance is less than the requirements specified in paragraphs [5.10.2](#) and [5.10.2.1](#). **(T-2)**.

5.10.1.4. Runway available (limited by applicable declared distances) will not be less than 4,500 ft. **(T-3)**.

5.10.2. Runway Length for Takeoff and Landing. Do not takeoff if takeoff distance adjusted for RCR exceeds runway available (limited by applicable declared distances). Minimum runway for a normal landing is landing distance corrected for RCR. Minimum runway for a normal landing is landing distance based on a threshold crossing height of 50 ft. **(T-2)**.

5.10.2.1. Runway Length for Takeoff and Intersection Takeoffs. Normally, the PF will initiate takeoffs from the beginning of the approved usable portion of the runway. The decision to make intersection takeoffs rests solely with the PIC. **(T-3)**.

5.10.2.2. Pilots may accomplish intersection takeoffs provided the operating environment (i.e., gross weight, obstructions, climb criteria, weather, etc.) allows a safe takeoff and departure. Calculate takeoff performance based on the runway remaining from the point at which the takeoff is initiated.

5.10.2.3. During operations on runways partially covered with snow or ice, base takeoff computations on the reported runway surface condition (RSC) or RCR for the cleared portion of the runway. A minimum of 25 ft on either side of centerline should be cleared.

If 25 ft either side of centerline is not cleared, compute takeoff data based on the uncleared portion up to 25 ft either side of centerline.

5.10.2.4. Use of displaced thresholds. If approach end displaced thresholds are available and stressed or authorized for normal operations, they may be used to increase the runway available for takeoff. Departure end displaced thresholds (if stressed and authorized) may also be used for landing if needed.

5.10.3. Arresting Cables.

5.10.3.1. Do not land on (touchdown on) approach end arresting cables (does not include recessed cables). If the aircraft lands before the cable, the crew should contact the tower to have the cable inspected.

5.10.3.2. Do not takeoff or land over an approach end cable that has been reported as slack, loose, or improperly rigged by NOTAM, automated terminal information service (ATIS), or ATC.

5.10.3.3. When conditions permit (aircraft gross weight, runway length, weather, winds, TOLD, etc.) and the PIC has considered the potential for damaging the aircraft, make takeoff and landings beyond raised cable barriers. If PICs determine they need the entire length of the runway, use it. Be aware that operations over arresting gear barriers at speeds in excess of taxi speed may result in damage to the aircraft.

5.10.4. Runway Assessment and Condition Reporting, Runway Condition Reading (RCR), and Runway Surface Condition (RSC). Title 14, *Code of Federal Regulations* (CFR), Part 139 *Airport Certification*, and federally obligated airports report runway conditions using the Runway Condition Assessment Matrix (RCAM). Numerical Runway Condition Codes (RwyCC) have replaced RCR, RSC, and Mu readings at these airfields and are reported by airfield operations via FICON NOTAM when applicable (>25% overall surface contamination). Regardless of the method of runway surface condition reporting, comply with latest T.O. guidance when calculating TOLD. Use RCR values as prescribed in the aircraft flight manual. If a value is not reported, use RCR 12 for wet runways and RCR 6 for icy runways. Conversions from other braking action standards to RCR should be according to DoD FLIP documents. Normally, RCR values are not reported for taxiways and ramps. During periods of reported low RCR, the taxiways and ramps may have an even lower RCR than reported for the runway. The runway surface should be considered wet when water on the runway causes a reflective glare.

5.10.4.1. USAF aircrew shall continue to utilize the runway condition reading (RCR) provided at USAF airfields. If a RwyCC is requested, ATC will notify the aircrew RwyCC is not available and provide any available RCR, braking action advisories, RSC, and PIREP. (T-2).

5.10.4.2. When operating from 14 CFR Part 139 and federally obligated airports reporting RwyCC and current T.O. guidance does not annotate the new RwyCCs, aircrew will: (T-2).

5.10.4.2.1. Use the RCAM provided in the FLIP Enroute *Flight Information Handbook* (FIH) to associate RwyCC and/or Pilot Reported Braking Action (PRBA) with RCR and/or runway surface condition anytime an RwyCC or PRBA is reported to

the pilot. Aircrew will use the most conservative RCR value for all runway segments in either the RCAM or T.O. (T-2).

5.10.4.2.2. Use the new pilot reported braking action terms in the RCAM when providing a PIREP (Good, Good to Medium, Medium, Medium to Poor, Poor, or Nil).

5.10.4.3. The performance charts used to determine braking action are based on concrete runways. The RCR value for DRY is 23, WET is 12, and ICY is 6. For operations on wet, ungrooved runways, use RCR designated as “wet” in the aircraft flight manual for all takeoff and landing data. For operations on grooved runways, use reported RCR. Do not use runways with a reported RCR value less than 6.

5.10.5. Wind Restrictions. Consider airfields unusable for takeoff and landing when winds (including gusts) are greater than established below:

5.10.5.1. Maximum operating wind – 50 knots.

5.10.5.2. Maximum tailwind component – 10 knots.

5.10.5.3. Crosswinds – Maximum takeoff and landing crosswind component for any RCR 12 or above is 25 knots. Maximum takeoff and landing crosswind components, corrected for RCR, are shown in [Table 5.1](#).

5.10.5.4. The aircraft must be hangered at wind velocities of 85 knots or greater. (T-2).

Table 5.1. C-21 Takeoff and Landing Crosswind Components.

RCR VALUES	6	7	8	9	10	11	12 and above
Crosswind Component for Takeoff and Landing	10	12	15	17	20	22	25

5.11. Aircraft Taxi and Taxi Obstruction Clearance Criteria and Foreign Object Damage (FOD) Avoidance.

5.11.1. Aircraft Taxi and Taxi Obstruction Clearance Criteria: See AFMAN 11-218, *Aircraft Operations and Movement on the Ground*, and MAJCOM SUP (if applicable) for taxi obstruction clearance.

5.11.2. FOD Avoidance. See AFI 11-202 Vol 3. In addition, crews should:

5.11.2.1. Carefully review airfield layout paying particular attention to taxi routes, turn requirements, and areas for potential FOD.

5.11.2.2. Minimize power settings during all taxi operations.

5.11.2.3. Where practical, avoid 180° turns. If it becomes necessary to accomplish a 180° turn on a narrow runway, the turn should be accomplished at an intersection of a link taxiway or at a designated turn around pad.

5.12. Aircraft Speed. Maintain aircraft speed IAW AFI 11-202 Vol 3 and T.O.s.

5.13. Functional Check Flights (FCFs). Perform FCFs IAW T.O. 1-1-300, *Maintenance Operational Checks and Check Flights*, T.O. 1C-21A-6CF-1, *Functional Check Flight Manual*, AFI 21-101, *Aircraft and Equipment Maintenance Management*, and applicable MAJCOM 21-series directives. Crews should only perform tasks or functions contained in specific T.O.

guidance. If requested to perform a non-standard function, PICs should contact their OG/CC to see if an FCF applies.

5.13.1. FCF Restrictions. See T.O. 1-1-300 and AFI 21-101. Additionally, do not accomplish actual engine shutdown below 5,000 ft AGL.

5.13.2. The OG/CC, or deployed equivalent, may authorize temporary waivers to FCF procedures for aircrew qualification when operationally necessary. Permanent waivers require MAJCOM A3 approval IAW [Chapter 1](#).

5.13.3. The OG/CC is responsible for the wing FCF program. Publish additional guidance in local supplement to this manual. The OG/CC may authorize a partial FCF to check only those systems disturbed by maintenance, an inspection, or modification.

5.13.4. Conduct check flights within the designated check flight airspace of the base from which the flight was launched except when the flight must be conducted under specific conditions, not compatible with local conditions and area restrictions.

5.13.5. The decision to approve a combined FCF and ferry flight is the responsibility of the MAJCOM A3.

5.13.6. The OG/CC will only certify highly experienced instructors as FCF crewmembers. The OG/CC will determine FCF crew complement after a thorough operational risk management (ORM) assessment for that specific FCF flight. **(T-3)**.

5.13.7. Ideally, conduct FCFs in day VMC. OG/CCs may authorize a flight under a combination of VMC and IMC. Begin the flight in VMC. If the aircraft and all systems are operating properly, the crew may proceed IFR through cloud cover to “VFR on Top” for the altitude phase of the flight.

5.13.8. If a malfunction occurs during a FCF, the OG/CC may subsequently release the aircraft for flight providing the malfunction is not related to the condition generating the FCF, and the original condition operationally checked good.

5.13.9. IAW with T.O. 1C-21A-6CF-1, conditions requiring an FCF include (but are not limited to):

5.13.9.1. Major retrofit modifications.

5.13.9.2. Removal or replacement of moveable flight control surfaces.

5.13.9.3. Major repairs that would affect the flying characteristics of the aircraft.

5.13.9.4. Adjustment, removal or replacement of major components of the flight control system for which airworthiness cannot be verified by maintenance operational checks

5.13.9.5. Removal or replacement of both engines.

5.13.10. Stall flights. A Learjet-trained and certified test pilot (i.e. civilian manufacturer) is required to perform stall series check flights. If two contract pilots are not available, a qualified USAF instructor pilot may complete the crew, but will not perform the stall series. The Learjet test pilot will be the PIC for this flight. **(T-2)**.

5.13.10.1. Flight authorizations for stall flights conducted at contractor locations should be completed by the Government Flight Representative (GFR) for that location.

5.13.10.2. A Title 14 CFR, Part 145, *Repair Stations*, location does not have GFRs. For stall flights conducted at these locations, the flight authorization will be completed by the unit supplying the USAF pilot IAW AFI 11-401; the unit will place the civilian contractor pilot on the flight authorization, with the PIC (“A”) code. (T-2).

5.14. Participation in Aerial Events. See AFI 11-209, *Participation in Aerial Events*, for performance of flyovers, aerial reviews, and single maneuver events. IAW AFI 11-246, Volume 6, *Aircraft Demonstrations (C-17, C-130, KC/NKC-135)*, aircraft demonstrations for the C-21 are not authorized. (T-1)

5.15. Decision Altitude (DA) and Radio Altimeter (RA) Alerting.

5.15.1. Before departure, set the DA or RA for the briefed emergency return. (T-3)

5.15.2. For instrument approaches, set the DA to the barometric altitude required by the instrument approach procedure (or NOTAM) for the respective approach. (T-3)

5.15.3. For visual approaches, set the RA to 300 ft. (T-3)

5.16. Mode S. Aircrews will ensure flight ID is set in the transponder for every flight. Flight ID must match the flight plan exactly, cannot exceed seven characters, and can have no spaces.

5.17. Engine Running Offload and Onload (ERO) Procedures. An ERO may be made if it will not cause a deviation in scheduled itinerary of more than 30 minutes and all passengers are available. Controlling agency approval is required if deviation is more than 30 minutes early. In all cases, PICs will coordinate with local C2 agency, if available, when an ERO is conducted. Ensure all participants are aware of engine danger area.

5.18. Takeoff and Landing Data (TOLD). Use the AF Form 4040, *C-21 Takeoff/Landing Data (TOLD)*, or other MAJCOM approved form to post takeoff and landing data. All blocks of the TOLD card will be filled out (Takeoff and Landing) prior to engine start and computations will be verified by another pilot. Use of computerized TOLD programs or Electronic Flight Bags (EFB) Applications as a primary reference is limited to those approved by MAJCOM Stan/Eval or the C-21 SPO.

5.19. Mobility Aircrew Fall Protection. Aircrew members are prohibited from climbing onto the upper fuselage or wing surfaces unless there is an operational necessity. PICs will ensure no other personnel (excluding qualified ops/maintenance personnel) have access to, or are allowed to, climb onto the fuselage or wings. (T-3). **Exception:** Aircraft that do not have the ability to anchor the maintenance safety harness and lanyard are exempt from the harness requirement until a suitable alternate airfield is available.

Chapter 6

AIRCREW PROCEDURES

Section 6A—Pre-Mission

6.1. Aircrew Uniform.

6.1.1. Uniform wear will be IAW AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, AFI 11-301 Vol 1, *Aircrew Flight Equipment (AFE) Program*, and OG/CC-prescribed guidance and procedures based on mission and location requirements. **(T-3)**. C-21 aircrews are authorized to wear civilian attire and non-fire retardant uniforms while performing aircrew duties (this approval meets the waiver requirement of AFI 11-301 Vol 1). When the FCG requires civilian attire, dress conservatively.

6.1.2. OG/CCs determine clothing and equipment to be worn or carried aboard all flights commensurate with mission, climate, and terrain involved. Flight crews will comply with AFI 36-2903 standards at all times, including while off duty. **(T-3)**. Flight crews wear the aircrew uniform as directed by unit OG/CC or equivalent as specified in local supplement or MAJCOM supplement to this publication. See AFI 11-301 Vol 1 for minimum aircrew clothing requirements.

6.1.3. Personnel will have the appropriate cold weather clothing in their possession as directed by combatant command reporting instructions or special instructions (SPINS) when flying in Arctic and Antarctic regions. **(T-3)**. **Exception:** Not applicable to transoceanic flights or when staging or transiting Elmendorf Air Force Base, Alaska.

6.2. Personal Requirements.

6.2.1. Shot Record. Crewmembers must maintain worldwide shot requirements. **(T-2)**.

6.2.2. Driver's License. A valid state driver's license is required on each TDY where use of US government general purpose vehicles may be necessary. Crewmembers will contact the local airfield manager before driving on the flight line. **(T-3)**.

6.2.3. A reflective belt or suitable substitute will be worn on flight lines during hours of darkness or periods of reduced visibility. **(T-3)**.

6.3. Pre-Mission Actions.

6.3.1. Before transiting areas outside the CONUS, aircrews will review theater-specific information necessary to successfully operate there. **(T-3)**. The review, at a minimum, should include AFI 11-202 Vol 3 and associated AMC Supplement, AFTTP 3-3.C-21, *Combat Aircraft Fundamentals C-21*, Airspace classification, GDSS, ASRR, and Giant Report and Airport Qualification Program (AQP) (if available).

6.3.2. Obtain required customs forms.

6.3.3. Passenger Restrictions.

6.3.3.1. Space Available Seats. Release space available seats to the maximum extent possible unless overriding safety, legal or security concerns prohibit space available travelers from flying on specific missions. The only passengers on missions transporting

DVs will be those of the official party and those space available passengers authorized by the lead POC for the traveling party. Authorization must be approved 24 hours in advance.

6.3.3.2. Space Available Passengers. For other than revenue and White House missions, PICs shall release space available seats on mission legs when no official passengers are aboard (positioning and de-positioning legs). Coordinate with a C2 agency to release available seats to the passenger terminal. In addition, PICs will coordinate with the Air Terminal representative upon arrival to convey final seat release availability. PICs shall release maximum space available seats subject to the following restrictions (T-3):

6.3.3.2.1. Revenue Missions. These are missions for which the using agency (typically a government agency other than DoD) is reimbursing the DoD for use of the aircraft. Space available passengers on revenue missions must be approved 24 hours in advance by AF/CVAM, theater AMD or JOSAC (as appropriate) and the using agency contract officer through unit C2 agencies. This is essential to ensure proper funding and reimbursement. Consult C2 to determine mission revenue status if in doubt. Congressional Delegations (CODEL) are not revenue missions.

6.3.3.2.2. White House Support Missions. Space available passengers will generally not be permitted aboard White House support mission aircraft without express permission of AF/CVAM. This is normally due to the security status of the aircraft, which may include positioning and de-positioning legs. When it is necessary to move aircrew members or support personnel on White House support mission aircraft, the WHMO will be advised and permission obtained through the unit C2 and AF/CVAM. On de-positioning legs, space available passengers will usually be permitted if the aircraft is no longer required to maintain an upgraded security status.

6.3.3.2.3. Billing. Space available passengers on revenue missions may be subject to being billed commercial first-class airfare by the using agency for the applicable route, depending on that agency's policy. If the DV or on-board contract officer releases seats, the AC must ensure that any additional financial liability for the passengers is specified by the using agency on-board contract officer. PIC will ensure passengers understand and agree to any reimbursement conditions prior to boarding. (T-3).

6.4. Aircrew Publications Requirements. As a minimum, primary crewmembers will have in-flight access to the publications listed in [Table 6.1](#) during all phases of flight. (T-2). EFBs with the “ALL_Global” and “C21” folders satisfy this requirement and may be the primary source of publication reference in-flight, with the exception of T.O. 1C-21A-1CL-1, *Pilots' Abbreviated Flight Crew Checklist*, which shall be carried in paper format. (T-2). Any additional individual aircrew publication requirements may be specified in local supplements.

Table 6.1. Aircrew Publications.

Publication	Aircrew
T.O. 1C-21A-1, <i>Flight Manual</i>	PIC
T.O. 1C-21A-1-1, <i>Flight Manual Performance Data</i>	PIC
T.O. 1C-21A-1CL-1, <i>Pilots' Abbreviated Flight Crew Checklist</i>	Both pilots
AFI 11-202 Vol 3, <i>General Flight Rules</i>	PIC

AFI 11-202 Vol 3, AMC Supplement, <i>Flying Operations</i>	PIC
AFMAN 11-2C-21 Vol 3, <i>C-21 Operations Procedures</i>	PIC

Section 6B—Predeparture

6.5. Global Decision Scheduling System (GDSS) Account. Pilots will obtain a GDSS account prior to operating on IFM-planned sorties. Download aircrew departure papers using the GDSS account, at locations without an AMC C2 presence. For operational missions, ensure GDSS account passwords are active prior to departing home station. If there is no GDSS access contact the flight manager.

6.6. Flight Crew Information File (FCIF). Review FCIF IAW AFI 11-202 Vol 3 and associated AMC Supplement. Instructor pilots are responsible for briefing applicable FCIFs when flying with senior officer qualified generals.

6.7. Flight Crew Bulletins (FCB). For units that are authorized by MAJCOM to produce an electronic FCIF (eFCIF) in lieu of an FCB, the eFCIF will contain access to FCB-type items. (T-3).

6.8. Mission Kits. EFB's contain all forms and publications necessary for safe and efficient conduct of the mission. If paper copies of any of these forms are required to complete the planned mission (TOLD cards, flight authorizations, customs forms, etc.), required copies should be printed prior to departure. Mission kits with printed materials are not required to be prepositioned on the aircraft.

6.9. Route Navigation Kits. The PIC is responsible for the contents of route navigation kits. Kit contents are determined by the mission itinerary. Include all publications, charts, and forms required to fly the mission and comply with all FLIP and FCG requirements. PICs will verify the currency of route navigation publications prior to departure from home station. (T-3). Use of the NGA-produced EFB application with current data is considered a complete Route Navigation Kit.

6.10. Departure Planning. See AFMAN 11-202V3 and this chapter. C-21 aircrew will use [Table 6.2](#) for minimum takeoff weather requirements. (T-2)

***Table 6.2. Minimum Takeoff Weather.**

Mission	Visibility	Remarks
Operational (Note 1)	RVR 1000 (300 meters)	When less than RVR 1600, but equal to or greater than RVR 1000, the crew may take off if on an operational mission provided the runway has a minimum of 2 functioning RVR readouts (minimum RVR 1000 on all functioning readouts), visible runway centerline markings, and runway centerline lighting is operational. When 3 transmissometers are installed, all are controlling. Both pilots must be qualified. (T-2)
All Others (Note 2)	RVR 1600 (500 meters)	For runways with more than one operating RVR readout, RVR must read 1600 minimum on all. (T-2)

Notes:

1. If the runway has only one functional RVR readout, no centerline markings, or no centerline lighting, the minimum RVR is 1600. (T-2)
2. In the absence of RVR readouts, minimum reported visibility is 1/2SM (800 meters). (T-2)

6.10.1. AMC/A3 as the mission execution authority, deem all 618 AOC (TACC) and AF/CVAM missions as ‘operationally necessary’. Additionally, an ‘operationally necessary’ mission is defined as all missions that are not designated as training specific missions. A training mission will be considered ‘operationally necessary’ if external users are scheduled as part of the training mission. For all other training missions, the mission execution authority is the OG/CC or equivalent delegated no lower than the squadron Director of Operations.

6.10.2. Special Departure Procedure (SDP). IAW AFMAN 11-202V3, SDPs provided by Jeppesen Runway Analysis (JRA) (or MAJCOM-approved equivalent) are approved for use. In addition:

6.10.2.1. Operations Groups must certify all pilots prior to the use of SDPs. For C-21 aircraft, this training will be accomplished during Mission Qualification and Certification Training, which will be documented on the Letter of X. No additional training will be required. (T-2).

6.10.2.2. DELETED

6.10.2.3. There are no AEO climb charts in T.O. 1C-21A-1. All engine climb capability will be at least double the charted single-engine climb capability; provided flaps are in takeoff configuration, takeoff thrust is maintained and airspeed is V₂+25 knots or less.

6.10.2.4. When AEO climb gradient is most restrictive for takeoff (i.e. ATC climb gradient), use the obstacle takeoff and climb procedures described in T.O. 1C-21A-1, *C-21 Flight Manual*, Section 2.

6.11. Adverse Weather. (See also AFI 11-202 Vol 3 and associated AMC Supplement).

6.11.1. The C-21 is a Category II aircraft for turbulence. Crews should confirm the type of aircraft the forecast turbulence applies to, or what type of aircraft reported the encounter, to gain a more accurate picture for their route of flight. Turbulence category charts are found in Air Force Handbook (AFH) 11-203, Volume 2, *Weather for Aircrews-Products and Services*.

6.11.2. Flight in Colder Than International Standard Atmosphere (ISA) Temperatures. When performing approaches and landings at locations where temperatures are 0°C or below, refer to the FIH Section D, Temperature Correction Chart, and AFI 11-202 Vol 3, Temperature Correction paragraph, to ensure adequate obstacle clearance.

Section 6C—Preflight

6.12. Hazard Identification and Mitigation. After the entire crew is assembled at the aircraft, the PIC will brief primary mission hazards facing the crew during takeoff and climb-out. (T-2).

6.13. Aircrew Flight Equipment Requirements.

6.13.1. Oxygen. Oxygen on board for takeoff must be sufficient to accomplish the planned flight from the equal time point (ETP) to recovery should oxygen be required (minimum 1550 PSI). (T-2).

6.13.1.1. All C-21 aircraft normally have two emergency escape breathing devices (EEBD) and eight emergency passenger oxygen systems (EPOS) permanently pre-positioned on the aircraft. EPOS will be stored in their placarded locations throughout the aircraft. (T-2).

6.13.1.2. On flights carrying passengers, take the appropriate number of EPOSs out of the helmet bag and pre-position near each passenger seat. EPOSs will be distributed and their use demonstrated before departure. (T-3).

6.13.1.3. Aircrew members will comply with the oxygen requirements in AFI 11-202 Vol 3. (T-1).

6.13.1.4. Crewmembers occupying a crew station will have an oxygen mask connected and readily available for use from before engine start until engine shutdown. (T-1).

6.13.2. Rafts. On overwater flights, carry a life raft when the planned cruising altitude exceeds glide distance to land using a ratio of approximately 2 miles per 1000 feet (12:1 glide ratio). (T-1) For example, if planned cruising altitude is FL360, a life raft would be required if flying more than 72 miles from land. **Exception:** Departure and arrival corridors temporarily transiting over a body of water.

6.13.3. Life preserver units (LPUs) or Personal Floatation Device. An aircrew member will ensure an LPU is within easy reach of each passenger and aircrew member before takeoff on overwater flights (outside gliding distance to land). Ensure the appropriate number and type of life preservers are aboard for overwater missions carrying children and infants. LPUs will be stored in their placarded locations throughout the aircraft. (T-1).

6.13.4. Anti-exposure suit. Anti-exposure suits will no longer be pre-positioned on AMC aircraft. Any unit scheduled to conduct operations above 78 degrees North or below 60 degrees South (IAW Title 14 Code of Federal Regulation (CFR) Part 135, Subpart B, Section 135.98, *Operations in the North Polar Area*, and Title 14 CFR Part 121, Appendix P, *Requirements for ETOPS and Polar Operations*) will configure the aircraft with the appropriate quantity of anti-exposure suits prior to mission execution. (T-1).

6.14. Passenger Handling and Cargo Documentation . Reference [Chapter 11](#).

Section 6D—Enroute

6.15. Weather Forecasts. It is the pilot's responsibility to obtain updated destination weather prior to descent. Significant Meteorological Information (SIGMET) and National Weather Service in-flight weather advisories are issued for large areas. Contact an appropriate military weather facility or flight service station to determine mission applicability and impact.

Section 6E—Arrival

6.16. Instrument Approach Procedures. In FAA airspace, the C-21 is a Category C aircraft. If approach speeds exceed 140 KIAS, use the Category D minimums. Consult appropriate FLIP and AFMAN 11-202V3 for ICAO categories.

6.16.1. Flight Instrumentation Requirements.

6.16.1.1. Full flight instrumentation for a Category I ILS, for the pilot flying the approach, consists of an attitude indicator, a course deviation indicator, a means to identify the NAVAID (either aurally or by verifying the correct station identifier on the DME indicator), complete differential pressure instruments, and heading/compass systems.

6.16.1.2. Full flight instrumentation for a precision approach radar (PAR), for the pilot flying the approach, consists of complete differential pressure instruments, heading/compass systems, and an attitude indicator.

6.16.2. Category I ILS Procedures. Decision height for precision approaches will be as published, but no lower than 200 ft height above touchdown (HAT), unless the approach is an ILS SA CAT I approach. **(T-1).**

6.16.3. ILS Precision Runway Monitor (PRM) Approaches. Both pilots must be certified to conduct an ILS/PRM approach. **(T-2).** Refer to AFMAN 11-2C-21 Vol 1, *Aircrew Training*, for certification procedures. Comply with the following operational procedures:

6.16.3.1. Two operational VHF communication radios are required.

6.16.3.2. The approach must be briefed as an ILS/PRM approach.

6.16.3.3. If unable to accept an ILS PRM approach clearance, contact the FAA ATCSCC prior to departure time to obtain a pre-coordinated arrival time. Pilots who arrive at a PRM airport unable to accept PRM approach clearance, which did not contact ATC prior to departure, should expect an ATC directed divert to a non-PRM airport.

6.16.3.4. All breakouts from the approach shall be hand flown. Autopilots shall be disengaged when a breakout is directed.

6.16.3.5. Should a TCAS Resolution Advisory (RA) be received, the pilot shall immediately respond to the RA. If following an RA requires deviating from an ATC clearance, the pilot shall advise ATC as soon as practical. While following an RA, comply with the turn portion of the ATC breakout instruction unless the pilot determines safety to be a factor.

6.16.4. NDB approaches may be flown during day, night, or IMC conditions after compliance with any airfield restrictions in GDSS/ASRR. Recommend backing up each approach with available NAVAIDS/GPS to include loading the NDB approach in the FMS.

6.16.5. RNAV Procedures. Properly trained C-21 aircrews are permitted to fly RNAV and RNAV (GPS) approaches IAW [Table 6.3](#). The C-21 possess a suitable RNAV system as defined in FAA Advisory Circular (AC) 90-108, *Use of Suitable RNAV Systems on Conventional Routes and Procedures*, and may be used as a substitute or alternate means of navigation on conventional routes and procedures in accordance with AFMAN 11-202V3 and T.O. 1C-21A-1.

6.16.5.1. RNAV approaches may be flown to lateral navigation (LNAV) minimum descent altitude (MDA) using Vertical Navigation (VNAV) procedures to a derived decision altitude (DDA) = LNAV MDA(H) +50 ft.

6.16.5.2. DME/DME is not authorized for stand-alone RNAV departures or arrivals (SIDs/STARs) or RNAV or RNAV(GPS) approaches.

6.16.6. See **Table 6.3** for complete listing of C-21 communication, navigation, surveillance (CNS)/air traffic management (ATM) approved operations.

Table 6.3. C-21 CNS/ATM Operational Approvals (T-1).

Airspace/Equipment	Aircraft Certified	Operational Approval	Training Required	Notes
FM Immunity	Yes	N/A	No	
8.33 kHz Spacing VHF Voice Radios	Yes	N/A	No	
HF Voice	Yes	N/A	No	
FANS 1/A+ over ACARS	Yes	Yes	Yes	1
CPDLC (Required Communication Performance (RCP) 240)	Yes	Yes	Yes	1
ADS-C (Required Surveillance Performance (RSP) 180)	Yes	Yes	Yes	1
Datalink sub-network (VDL M0/A, VDL M2, SATCOM (SBD Iridium))	Yes	Yes	No	
ACARS ATS	Yes	Yes	No	
ATN B1 (Link 2000+)	Yes	No	N/A	
ATN B2	No	No	N/A	
ADS-B Out	Yes	Yes	No	
Mode 3A, C	Yes	N/A	No	
Mode S	Yes	N/A	No	
TCAS II version 7.0	Yes	N/A	Yes	1
TAWS	Yes	N/A	No	
RVSM	Yes	Yes	Yes	1
NAT HLA (Formerly MNPS)	Yes	Yes	Yes	2
Oceanic and Int'l Procedures	N/A	Yes	Yes	2
RNAV 10 (RNP 10)	Yes	Yes	No	
RNP 4	Yes	Yes	No	
RNAV 5 (B-RNAV, RNP 5)	Yes	Yes	No	3
P-RNAV	Yes	Yes	No	

RNAV 2, RNAV 1 (Includes Q- & T-routes, ODPs, SIDs & STARs)	Yes	Yes	Yes	1
RNP-1, RNP-2, RNP-0.3	Yes	Yes	No	
RNAV on Conventional Terminal Procedures	Yes	Yes	No	
Advanced RNP (A-RNP)	Yes	Yes	Yes	4, 5
RNAV (GPS) Approach (RNP Approach $\geq 0.3\text{NM}$)	Yes	Yes	No	5, 6
LNAV minimums	Yes	Yes	No	
LNAV/VNAV minimums	Yes	Yes	Yes	1
Baro-VNAV	Yes	Yes	Yes	1
LPV minimums	Yes	Yes	Yes	1
LP minimums	No	No	N/A	
Authorization Required Approach: "RNAV (RNP)", "RNP AR", "RNP AR APCH", or "SAAAR"	No	No	N/A	
Notes: 1. Training incorporated into initial qualification training (IQT). 2. Training incorporated into mission certification training (MCT). 3. See paragraph 9.4.4 . 4. This installation does not support fixed radius turns (FRT). 5. Radius to Fix (RF) legs must be flown with the autopilot coupled 6. Procedures with Missed Approach RNP $< 1\text{NM}$ are not approved.				

Section 6F—Miscellaneous

6.17. High Altitude Airfield Operations. Note: The following procedure is for operations at airfields from approximately 8,000 ft pressure altitude up to 10,000 ft pressure altitude. Reference the Pressurization System description in Section I, and Emergency Procedures in Section III, of T.O. 1C-21A-1 for further information.

6.17.1. Passengers. Passengers should be given a thorough briefing on the pressurization abnormalities to expect on arrival and departure. With these procedures, rapid changes in the cabin pressure will be experienced. Passengers should be briefed on how to clear their ears and warned of problems that may be encountered if they have sinus congestion. They should also expect a large volume of noise and hot air if the pressure altitude at the field is greater than 9,250 ft.

6.17.2. Engine Start and Taxi. Engine start should be accomplished with the Pressurization Automatic-Manual Switch in MAN. Engine start should be normal at pressure altitudes below 9,250 ft. For engine starts above 9,250 ft pressure altitude, start the engines with the Bleed Air Switches OFF to prevent emergency airflow into the cabin. N1 and N2 idle RPM indications will be higher. Cabin air should be turned ON normally during the Taxi Checklist.

6.17.3. Takeoff.

6.17.3.1. Pressure altitude less than 9,250 ft: Takeoff with the pressurization system in the manual mode, cabin air ON, and the Bleed Air Switches ON. The Cabin Altitude light will be on above approximately 8,500 ft pressure altitude. After liftoff, the copilot should raise the gear upon command of the pilot. Simultaneously, with the other hand, the copilot should use the Up/Down Manual Control Switch to decrease the cabin altitude to below 7,200 ft and return the pressurization system to automatic mode by placing the Automatic-Manual Switch to AUTO.

6.17.3.2. Pressure altitude greater than 9,250 ft: Takeoff with the pressurization system in the manual mode, cabin air ON, and the Bleed Air Switches OFF. The Cabin Altitude light will be on. Pressurization will have to be reestablished after airborne. After liftoff, the copilot should raise the gear upon command of the pilot. Simultaneously, with the other hand, the copilot should turn the Right Bleed Air Switch ON and use the Up/Down Manual Control Switch to decrease the cabin altitude to below 9,500 ft. Recycle the Right Bleed Air Switch from ON to OFF and then back to ON to reset the Emergency Pressurization Valves. Continue to decrease the cabin altitude to below 7,200 ft and return the pressurization system to automatic mode by placing the Automatic-Manual Switch to AUTO. Turn the Left Bleed Air Switch ON.

6.17.4. Approach. Set the Cabin Controller to its maximum and place the Pressurization Auto-Manual Switch to manual prior to landing. Use the Up/Down Manual Control Switch to raise the cabin altitude to field elevation. If landing at or above 9,500 ft pressure altitude, turn OFF the Bleed Air Switches to prevent emergency airflow.

6.17.5. Landing. Follow normal landing procedures. At touchdown, expect the primary outflow valve to fully open and dump any remaining pressure. During the After Landing Checklist, turn the Cabin Air Switch OFF in the normal sequence. The Cabin Safety Valve will open and further ensure that the cabin is unpressurized before opening the door.

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance on aircraft security and preventing and resisting aircraft piracy (hijacking) of the C-21 aircraft. AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking) (FOUO)*, AFI 31-101, *Integrated Defense*, and specific MAJCOM security publications contain additional guidance. Aircrews will not release information concerning hijacking attempts or identify armed aircrew members or missions to the public.

7.2. Security. The C-21 is a “Protection Level 4 (PL-4)” resource. Aircraft security at non-US military installations is the responsibility of the controlling agency.

7.3. Integrated Defense. The following security procedures will implement AFI 31-101, requirements for C-21 aircraft:

7.3.1. The aircraft will be parked in an established restricted area and afforded protection IAW AFI 31-101. **(T-2).** When the DV is a Code 4 (3-star general or civilian equivalent) or above, follow these procedures.

7.3.1.1. **Parking Locations.** Park DV aircraft in a prominent area so maintenance personnel and security forces patrols can closely monitor them.

7.3.1.2. **Notification Procedures.** Establish procedures to inform security forces of the arrival, parking arrangements, and departure of all DV aircraft.

7.3.2. At non-US military installations, the PIC determines the adequacy of local security capabilities to provide aircraft security commensurate with this chapter. If he or she determines security to be inadequate, the aircraft should depart to a station where adequate security is available.

7.3.3. The security force must be made aware of all visits to the aircraft. The security force POC must be identified to the PIC. **(T-3).**

7.3.4. **Locking and Sealing.** Lock the aircraft, including the tailcone access door, during a “Remain over night” on non-secure ramps and install the locking pin in the emergency exit window.

7.4. Detecting Unauthorized Entry.

7.4.1. When parking on a secure ramp, the aircraft will normally be left unlocked/unsealed to allow ground personnel immediate access. If, in the PIC judgment, the aircraft needs to be locked in order to detect unauthorized entry, then:

7.4.1.1. Secure the doors in a manner that will indicate unauthorized entry (e.g., tape inside of emergency exit window to airframe so that entry pulls tape loose).

7.4.1.2. Close and lock the door.

7.4.1.3. Wipe the immediate area around lock and latches clean to aid in investigation of a forced entry.

7.4.1.4. Report any unauthorized entry or tampering to the Office of Special Investigation, Security Forces, or local authorities, and the C2 agency. Have aircraft thoroughly inspected prior to flight.

7.5. Force Protection. Crews should be alert to possibility of terrorist activities at all times. Reference AFTTP 3-4, *Airman's Manual*, CJCS Guide 5260, *A Self-Help Guide to Antiterrorism*, and DoDI O-2000.16V1_AFI 10-245-O, *Antiterrorism (AT) Program Implementation*.

Chapter 8

TRAINING AND OPERATING LIMITATIONS

8.1. Passengers on Training Missions.

8.1.1. Initial qualification or re-qualification for pilots will not be conducted with passengers onboard (not applicable for MEP). **(T-3).**

8.1.2. Mission certification training, enroute evaluations (OME), and off station trainers may carry passengers only if the aircrew in training is qualified (completed aircraft check ride with a valid AF Form 8).

8.1.3. Touch-and-go landings and multiple approaches are prohibited with passengers onboard. **(T-3) Exceptions:**

8.1.3.1. May be flown with mission essential personnel (MEPs) on board.

8.1.3.2. When approved by the MAJCOM, maintenance personnel and civilian employees, under direct contract to the DoD and engaged in official direct mission support activities, are considered "mission essential." These personnel may be onboard when touch and-go landings are performed provided the mission is a designated training flight and an IP or EP is in command.

8.2. Touch-and-Go Landing Limitations.

8.2.1. Touch-and-go landings will only be accomplished under the direct supervision of an IP. **(T-2).**

8.2.2. Minimum usable runway length (limited by applicable declared distances) is 6000 ft/1830m. Minimum runway width: 70 ft. **(T-2).**

8.2.3. Minimum ceiling/visibility: 300 ft and RVR 40 (3/4 SM visibility or 1200 meters). **(T-2).**

8.2.4. RCR shall be 12 or higher. **(T-2).**

8.2.5. Do not accomplish touch-and-go landings on slush covered runways. **(T-2).**

8.2.6. Maximum crosswind component: 25 knots. **(T-2).**

8.2.7. Touch-and-go landings are prohibited with cargo onboard. **(T-3) Exceptions:**

8.2.7.1. Routine mail may be onboard provided it is properly secured in the baggage area.

8.2.7.2. AE equipment is not considered cargo.

8.2.7.3. Mission impaired capability awaiting parts (MICAP) may be accepted and carried provided there is no risk to damage of the cargo and the air terminal operations center (ATOC) representative agrees to the flight conditions. MICAP must be secured in the baggage area and not adversely affect the aircraft center of gravity (CG). **(T-2)**

8.3. Training on Operational Missions.

8.3.1. Crews may perform multiple approaches and touch-and-go landings on operational missions provided the following requirements are met:

8.3.1.1. Normal touch-and-go limitations apply and MEPs are briefed of the activity.

8.3.1.2. All transition training will be accomplished during the first 12 hours of the FDP only.

8.3.1.3. Pre-mission coordination requirements. Activity must be approved by C2 tasking/scheduling authority (AF/CVAM, JOSAC, etc.) and unit training is charged to unit. **(T-3)**. PICs will also coordinate with and receive approval from squadron Director of Operations and the airfield(s) where training is to be accomplished. **(T-3)**. As part of pre-mission planning, PICs should contact parent unit current operations and obtain training mission number(s) for use at each enroute location(s) where training events are planned. They should then coordinate with the C2 tasking/scheduling authority to ensure adequate ground time is available at planned training locations to allow for planned training events, clearing customs, required crew rest, etc. Once complete, wing current operations should re-cut the mission or coordinate with C2 to re-cut the mission and add the training mission number(s) in GDSS.

8.3.1.4. Upon initial arrival at the training location, close out the current line on the AFTO Form 781 and log the training time on the next line using the appropriate training mission symbol and number.

8.4. Simulated Emergency Flight Procedures.

8.4.1. Simulated emergency flight procedures will be conducted IAW AFI 11-202 Vol 3, the associated AMC Supplement, and this manual. Unless specifically authorized elsewhere in this chapter, do not practice emergency procedures that degrade aircraft performance or flight control capabilities in flight. Emergency procedure training with degraded aircraft performance will only be accomplished in the simulator. **(T-2)**. Following an actual emergency, training should only be resumed after the PIC determines it is safe.

8.4.2. Engine-out Limitations (Simulated). Simulated engine-out operations should only be conducted in the simulator. **Exceptions:** The OG/CC may approve simulated engine-out training in the aircraft on a case-by-case basis. This authorization is not intended to replace the use of the simulator.

8.4.2.1. When single engine operations in the aircraft are approved, landings may be performed with one thrust lever in idle. Simulated engine failure will not be initiated below 1,000 AGL or after beginning gear and flap extension. **(T-3)**. Simulated engine failure is not authorized at less than engine-out minimum control speed as published in the flight manual, during circling, or no-flap approach and landings.

8.4.2.2. When flying a simulated engine-out approach or landing, use both engines for all unplanned go-arounds.

8.4.2.3. When flying a simulated engine-out approach or landing, do not allow airspeed to go below the minimum speed for configuration from TO 1C-21A-1.

8.4.3. Simulated Emergency Flight Procedures may be accomplished on operational missions provided [paragraph 8.3](#) is complied with, and no passengers or MEPs are onboard.

8.4.4. Although the FLAPS UP/PARTIAL FLAP LANDING checklist is in the emergency procedures pages of T.O. 1C-21A-1 and T.O. 1C-21A-1CL-1, it is not considered an emergency to fly a partial or no flap landing for tactical or other (i.e. wind shear, etc.) non-

emergency operational considerations. This includes flying a partial or no flap landing for training. When performing a partial or no flap landing for training, tactical, or other non-emergency operational considerations, ensure the FLAPS UP/PARTIAL FLAP LANDING checklist is accomplished prior to beginning the BEFORE LANDING checklist.

8.5. Flight Maneuvers. Practice the following maneuvers in the simulator only. **(T-2)**
Exception: Maneuvers required for functional check flight (FCF) or FCF training are authorized in flight.

8.5.1. Simulated engine-out takeoffs.

8.5.2. Full Stalls. **Note:** Stall series FCFs in the aircraft must be flown by a Learjet-certified stall series pilot. **(T-2)** See [paragraph 5.13.10](#).

8.5.3. Approach to stalls, slow flight, and flight on the backside of the power curve.

8.5.4. Dutch rolls.

8.5.5. Jammed stabilizer approach and landing.

8.5.6. Split flap landings.

8.5.7. Landing with anti-skid off.

8.5.8. Landing with inoperative hydraulic system.

8.5.9. Aborted takeoffs.

8.5.10. Unusual attitudes.

8.5.11. Emergency descents.

8.5.12. Runaway pitch or roll trim, yaw demonstrations.

8.5.13. Emergency brake landing.

8.5.14. Simulated dual engine failure.

8.5.15. Actual engine shutdown.

8.5.16. Engine-out circling approach.

8.6. Debriefing Requirements (Reference Attachment 2).

8.6.1. Evaluator and instructor pilots will brief the following, as part of their training/evaluation briefings **(T-2)**:

8.6.1.1. Planned training area and seat changes.

8.6.1.2. Importance of both pilots to actively monitor the fuel balance.

8.6.1.3. Importance of maintaining at least minimum charted speeds for configuration.

8.6.2. Review and evaluate overall training performed. Each student or aircrew member should understand thoroughly what training has been accomplished. Ensure all training is documented.

8.7. Operating Limitations.

8.7.1. Option Approach and Visual Low Approaches. Initiate a planned missed approach according to the limitations in [Table 8.1](#).

8.7.2. Aircrew will only perform engine-out approaches and landings during daytime and clear of clouds with a discernable horizon present. (T-2).

8.7.3. Other simulated emergency approaches will be limited to non-critical phases of flight and will be kept to a minimum when IMC or at night. (T-2).

Table 8.1. Training Flight Restrictions.

Maneuver	Altitude	Remarks
Simulated engine failure	Initiate above 1,000 ft AGL in clean configuration, daytime, and clear of clouds	
Any simulated emergency (except engine failure)		
On takeoff	Initiate above 500 ft AGL	
On landing	Initiate above 500 ft AGL	
Restricted low approaches	Initiate above 500 ft AGL	
Instrument missed/low approaches	MDA/DA	Initiate practice instrument missed approaches no lower than the minimum altitude for the type of approach executed.
Simulated single engine missed approach (MA) or go-around	Initiate at or above 300 ft AGL	For all unplanned go-arounds from simulated single-engine approaches and if single engine missed approach occurs below 300 ft AGL, use BOTH throttles during MA/GA maneuver.
Planned go-arounds with simulated emergencies other than engine-out in VMC	Initiate at or above 100 ft AGL	Practice balked landings may be initiated below 100 ft AGL.

Chapter 9

NAVIGATION PROCEDURES

9.1. General. This chapter establishes procedures and requirements for worldwide enroute C-21 navigation. It is intended to be used in conjunction with procedures and requirements set forth in AFMAN 11-202V3, FCG, FLIP, national operating rules, Aeronautical Information Publications (AIP), and the International Civil Aviation Organization (ICAO) Document 7030, *Regional Supplementary Procedures (SUPPS)*.

9.2. Mission Planning.

9.2.1. Flight Plan. Cross-check the flight planned route against the route of flight entered on the DD Form 1801, *DoD International Flight Plan*, and the approved diplomatic clearance. **(T-3)**

9.2.2. Flight Planning Navigation Database. Flight plans created using commercial flight planning tools (e.g. ARINC Direct) use their own commercial navigation databases. Pilots are responsible for ensuring the accuracy of the flight plan waypoints against current aeronautical charts, terminal instrument procedures, or FLIP documents.

9.2.3. While the C-21 is capable of displaying magnetic and true heading information, it is currently not approved for operating in the area of magnetic unreliability (AMU).

9.2.3.1. There are areas of Canada outside the AMU where NAVAIDS are oriented to true or grid north and true tracks apply, even on airways. The C-21 is authorized to operate in areas outside the AMU with NAVAIDS oriented to true or grid north, provided all aircraft navigation systems are operating properly. A thorough review of navigation procedures in higher latitudes in AFMAN 11-202V3 is required prior to flight in these areas. **(T-3)**

9.2.3.2. OG/CC approval is required to operate in areas outside the AMU but above 73° North or below 60° South due to limitations of the magnetic variation database in the FMS.

9.2.4. True or grid north instrument approach procedures (except RNAV GPS) are limited to day, VMC only for the C-21. **(T-2)**

9.2.5. RNAV(GPS) approaches based on true or grid north are allowed during night or IMC provided the published RNAV(GPS) procedure includes all required magnetic heading information, the procedure is in the aircraft database and all other normal RNAV(GPS) requirements are met (RAIM, current database, etc.). **(T-2)**

9.3. Flight Progress. See AFI 11-202 Vol 3. In addition:

9.3.1. Remote or Oceanic Flight. All aircrews transiting remote or oceanic areas will accomplish the procedure outlined below prior to the first sortie of the day that will transit an area where GPS is the only means of navigation. **(T-2)**

9.3.1.1. DELETED

9.3.1.2. DELETED

9.3.1.3. Review T.O. 1C-21A-1 procedures for both normal and abnormal operations of the UNS-1Fw. **(T-3)** Areas of emphasis include:

9.3.1.3.1. “Power Failure” procedures and “FMS Troubleshooting for Pilots” procedures found in Section I of T.O. 1C-21A-1.

9.3.1.3.2. DELETED

9.3.1.3.3. Report all FMS navigation anomalies through unit stan/eval chain regardless of location or airspace type including CONUS locations. Operations group stan/eval (OGV) forwards reports to MAJCOM stan/eval who forwards to AMC/A3V as Lead Command. **(T-2)**

9.3.1.4. Prior to flight on oceanic flights, plot the oceanic portion on an appropriate chart and compute an Equal Time Point (ETP). **(T-2)**. PICs shall annotate the chart with the mission number, PIC’s name, and date. If practical, chart may be reused. **(T-2)**.

9.3.1.4.1. Calculating an ETP on an overwater leg is critical to knowing when you have reached a point where the time to either turn around and return to a suitable emergency airfield or to press ahead to the next suitable landing field is the same.

9.3.1.4.2. Use data from your CFP to determine distances and wind factors. The wind factors shown are the average (AWF) for the entire route and the first (WF1) and second (WF2) halves of the flight. Keep in mind the portion of the flight between suitable landing fields may not coincide with the first and second halves of the flight or your remote/oceanic routing (an alternate airfield may be closer to the side of your route). **Note:** The differences in the two-engine normal and single-engine LRC profiles are significant. Therefore, special attention during mission planning should be given to determining turnaround point if required due to engine loss. Initial estimates show the single-engine LRC ETP moves upwind of the two-engine ETP by as much as 30%.

9.3.2. Crosscheck the altimeters before or immediately upon coast out. Record readings of both altimeters.

9.3.3. When approaching each waypoint, recheck coordinates for the next waypoint.

9.3.4. Upon return to home station, turn in the charts (copies if reused) and applicable computer flight plans to the squadron. Squadrons will retain the charts, computer flight plans, and associated materials for a minimum of three months. **(T-2)**. Electronic copies of these materials are acceptable.

9.4. Navigation Aid Capability.

9.4.1. Comply with AFMAN11-202V3 and [Table 6.3](#) of this manual for operations in various types of airspace. **Note:** Due to rapidly evolving airspace and associated navigational aid equipment capability, pilots must maintain an in-depth knowledge of current FLIP requirements/policies. **(T-2)**

9.4.2. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace (FL290-FL410). Both the operator and the specific aircraft type must be approved for operations in these areas. **(T-2)**. Refer to FLIP Area Planning 1, 2, and 3 for theater unique information and the following for RVSM requirements:

9.4.2.1. Both primary altimeters, at least one autopilot, the altitude advisory system, and the transponder, must be fully operational. **(T-2)**. Request a new clearance to avoid this airspace should any of this equipment fail.

9.4.2.2. Engage the autopilot during level cruise, except when circumstances such as the need to re-trim the aircraft or turbulence require disengagement.

9.4.2.3. Continuously crosscheck the primary altimeters to ensure they agree ± 200 ft.

9.4.2.4. Limit climb and descent rates to 1,000 ft per minute when operating near other aircraft to reduce potential TCAS advisories.

9.4.2.5. Reference FLIP General Planning to assess your current Aircraft Designation and TD Code Suffix. Notify ATC of all updates to your originally filed navigation/transponder capabilities.

9.4.3. Required Navigation Performance (RNP) Airspace. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between routes.

9.4.3.1. Pilots will immediately notify ATC if any of the required equipment fails after entry into RNP-10 airspace and coordinate a plan of action. Document in the aircraft forms malfunctions or failures of RNP required equipment.

9.4.3.2. DELETED

9.4.4. RNAV-5 Airspace. The C-21 is approved for RNAV-5 airspace operations with no restrictions. Airspace where RNAV-5 is applied is considered special qualification airspace. RNAV-5 meets a track keeping accuracy equal or better than ± 5 NM for 95% of the flight time, but does not specify a containment (onboard performance monitoring and alerting) requirement. Minimum equipment to operate in this airspace is an approved GPS with RAIM provided that the system is monitored by the flight crew and that in the event of a system failure, the aircraft retains the capability to navigate with use of another GPS receiver, FMS or ground based NAVAIDs (i.e. VOR, DME, and NDB). Pilots will immediately notify ATC if any of the required equipment fails after entry into RNAV-5 airspace and coordinate a plan of action. **(T-0)** With sufficient ground-based NAVAID reception, the C-21 may continue to operate in RNAV-5 airspace. **Note:** Basic Area Navigation (B-RNAV) in Europe, or RNP-5 in the Middle East (where still used) airspace designations are phasing out of use and are considered equivalent to RNAV-5.

9.4.5. FM Immunity (FMI). The C-21 is equipped with dual FMI VHF navigation receivers and is considered fully compliant with no restrictions. Refer to the applicable area planning (AP) series for more information concerning FMI operations.

9.4.6. Precision Positioning Service (PPS). Currently no operational approval exists for the use of encrypted PPS for IFR navigation in civil controlled airspace. Crews will use GPS standard positioning service (SPS) unless specifically authorized by MAJCOM Stan/Eval.

Chapter 10

AIRCREW MAINTENANCE SUPPORT PROCEDURES

10.1. General. This chapter contains aircrew procedures not contained in the flight manual, other portions of this publication, or other publications.

10.2. Aircraft Servicing and Ground Operations. Aircrew are normally not required to service the aircraft; however, they are qualified and authorized to perform those aircrew maintenance support tasks found in this volume and may assist the normal maintenance function when critical contingency tasking dictate their use, provided this action does not impact crew duty and crew rest limits specified in [Chapter 3](#) of this manual. The aircrew performs these tasks only in the absence of qualified maintenance personnel and is designed for support of the aircraft and its mission while away from home station. Without exception, the applicable checklists will be used during all refueling and de-fueling operations. **(T-2).**

10.2.1. Aircraft Refueling. Aircrew members qualified in ground refueling may perform refueling duties. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed.

10.2.1.1. Avoid refueling with JP-8+100 while transiting airfields with JP-8+100 capabilities. AMC aircraft are not allowed to operate on JP-8+100, except in emergency conditions. All JP-8+100 locations are required to maintain a clean JP-8 capability to support transient aircraft. If inadvertent refueling with JP-8+100 occurs comply with the following:

10.2.1.1.1. De-fuel the aircraft prior to flight.

10.2.1.1.2. Make an AFTO Form 781 entry stating "Caution: Aircraft refueled using JP-8+100, preventative measures must be taken when de-fueling."

10.2.1.2. When crewmembers are required to refuel, a pilot acts as the refueling team supervisor. Pilots acting as refueling supervisors and panel operators comply with T.O. 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding (ATOS)*, and applicable C-21 series T.O.s.

10.2.2. Concurrent Ground Operations. See AFI 11-202 Vol 3 and associated AMC Supplement.

10.2.3. Aircrew Dash One Preflight Inspection Requirements. The aircrew dash one preflight inspection will remain valid until either: seventy two (72) hours from the time of inspection or another maintenance dash six preflight inspection is performed **(T-3).**

10.2.4. Fire Protection and Crash Rescue. A fire bottle, if available, should be positioned near the front of the aircraft prior to starting engines.

10.2.5. Aircrew and Maintenance Engine Runs.

10.2.5.1. A mixture of aircrew and maintenance personnel should not normally accomplish engine runs. When an aircrew member is required to start or run up engines for maintenance purposes, the following procedures apply:

10.2.5.2. Maintenance personnel accomplish all necessary inspections and preparations for the engine run. These actions include but are not limited to: intake/exhaust inspections, access panel security servicing, and AFTO Form 781 documentation.

10.3. Aircraft Recovery Away from Main Operating Base (MOB). The PIC is responsible for ensuring the aircraft is turned to meet subsequent mission taskings. If qualified maintenance specialists are unavailable, the aircrew is responsible for turning the aircraft to meet subsequent mission taskings.

10.3.1. The PIC is responsible for the recovery items including:

10.3.1.1. Parking and receiving.

10.3.1.2. Aircraft servicing, including Aircraft Ground Equipment (AGE) usage.

10.3.1.3. Supervision of minor maintenance within local capability.

10.3.1.4. Minor configuration changes to meet mission tasking.

10.3.1.5. Securing the aircraft before entering crew rest.

10.3.1.6. Coordinating aircraft security requirements.

10.3.1.7. Documenting AFTO 781-series forms.

10.3.2. In all cases where aircrews servicing the aircraft without qualified maintenance specialist assistance, comply with the appropriate maintenance T.O.

10.3.3. Aircrews are not qualified to accomplish the required ground inspections. In those instances where maintenance personnel are not available, the aircrew will enter a red dash symbol in the AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance*, updating current status and enter a red dash symbol and a discrepancy that reflects that the applicable maintenance inspection (i.e. preflight, thru-flight, basic post-flight) is overdue. **(T-2)**.

Chapter 11

CARGO AND PASSENGER PROCEDURES

11.1. General. A pilot coordinates loading or offloading with air terminal operations or the shipping agency; plans loads; and supervises onloading or offloading operations.

11.2. Responsibilities for Aircraft Loading.

11.2.1. AMC Designated Stations. The pilot is responsible for aircraft preflight, load planning (as required) of all cargo, preparing weight and balance documentation; operating aircraft equipment; tiedown, and checking the cargo against manifests. The pilot supervises and directs on/offloading and is responsible for safe movement of cargo into and out of the aircraft.

11.2.2. At locations without AMC air terminal or traffic personnel, the shipper assumes responsibilities in [paragraph 11.2.1.1](#) and provides sufficient qualified personnel and handling equipment for loading or offloading. Pilot responsibilities and authority are the same as described in [paragraph 11.2.1.2](#).

11.3. Emergency Exits and Safety Aisles.

11.3.1. No part of the passenger/patient load will extend over the aisle. **(T-3)** No passenger hand carried items may obstruct the aisle. **(T-3)** Any item that does not meet this requirement will be secured so as not to obstruct the aisle. **(T-3)**

11.3.2. Aircraft configured in the cargo configuration must ensure that an escape route is available to exit out of the main door and rear emergency escape hatch. **(T-3)**

11.4. Passenger Handling.

11.4.1. Passenger Missions:

11.4.1.1. Passenger Missions. File a copy of the passenger manifest with the most responsible on-scene agency if there is no base operations or other agency responsible for filing the manifest.

11.4.1.2. Passenger Operation of Emergency Exits. Prior to each flight, a pilot will formulate a passenger emergency egress plan. Only English-speaking, physically able adults (defined here as age 15 and older) will be seated next to the emergency exit. The intent of this is to ensure those passengers seated next to the emergency exit are aware of their duties and responsibilities in assisting the crew during emergency egress.

11.4.2. Passenger Handling. PICs are responsible for required passenger handling duties. Passengers are limited to 30 pounds of baggage unless specific allowance for excess baggage is authorized and planned by the controlling agency. Passengers with excess baggage may be transported after the PIC determines the aircraft weight limitations and mission requirements are satisfied.

11.4.2.1. Make every effort to enhance passenger comfort. See also AFI 11-202 Vol 3.

11.4.2.2. Accomplish passenger briefings according to aircraft checklist or approved briefing guides, printed passenger information guides IAW AFI 11-202 Vol 3, and Passenger briefing checklist insert.

11.4.2.3. Ensure the highest ranking DV is afforded the seat of preference, and other passengers are aware of the DV's status.

11.4.2.4. Release space available IAW **paragraph 6.3.3**.

11.4.3. Passenger Briefing. Use to complete passenger briefing as directed by MAJCOM. Follow MAJCOM guidance for posting briefing.

11.4.3.1. Passenger briefings will emphasize proper hand placement during activation of the EPOS.

11.4.3.2. Demonstration of onboard Aircrew Life Sustaining Equipment (ALSE) is required for all missions carrying passengers. Crews will ensure a demonstration kit is available prior to departure.

11.4.3.3. The baggage runner should be used whenever baggage/cargo is being loaded or downloaded from the aft cargo compartment. Use of runner protects the passenger seats from damage during the loading process.

11.5. Loaded Weapons. Weapons are considered loaded if a magazine or clip is installed in the weapon. This applies even though the clip or magazine is empty.

11.5.1. Personnel who will engage an enemy force immediately upon arrival (actual combat) may carry basic combat loads on their person. Weapons will remain clear with magazines or clips removed until immediately before exiting the aircraft. **(T-2)**.

11.5.2. Personnel who will not immediately engage an enemy force will store basic ammunition loads in a centralized location, as directed by the PIC, for redistribution upon arrival at the objective. **(T-2)**.

11.6. Weight and Balance. Accomplish weight and balance for this aircraft according to T.O. 1-1B-50, *Weight and Balance*, and T.O. 1C-21A-1-1 procedures. The unit possessing the aircraft maintains the primary weight and balance handbook containing the current aircraft status and provides a supplemental weight and balance handbook for each aircraft. AWBS is the only approved software program for automated C-21 weight and balance computations.

11.7. Procedures for Airlifting Hazardous Cargo.

11.7.1. C-21 aircraft are authorized to transport the following hazardous materials prepared and packaged IAW AFMAN 24-204. See also AFI 11-202 Vol 3 and associated AMC Supplement.

11.7.1.1. All Class/Divisions of explosives.

11.7.1.2. Class/Division 2.2 nonflammable aerosols and compressed gases limited quantities.

11.7.1.3. Class/Division 2.2 nonflammable high pressure spheres and canisters authorized in support of the USAF and DoD atmosphere research program.

11.7.1.4. Class 9 material (except magnetic material which may affect flight instruments).

11.7.1.5. Medical support equipment and supplies.

11.7.1.6. Class 8 aircraft batteries required for maintenance support or mobility requirements.

11.7.1.7. Hazardous materials accompanying Hammer Adaptive Communication Element personnel.

11.7.1.8. Hazardous materials in “Excepted Quantities”.

11.7.1.9. Consumer commodities

11.7.2. Other classes/divisions of hazardous materials are prohibited except by a waiver approved by the OG/CC or equivalent. Waiver approval must take into consideration the lack of onboard HAZMAT spill/clean-up kit and lack of cargo jettison capability.

11.7.3. Waivers are not authorized for:

11.7.3.1. Class/division 2.1 cryogenics.

11.7.3.2. Class/division 6.1 poisons with an inhalation hazard.

11.7.3.3. Class/division 2.3 toxic gases.

11.7.3.4. Class 7 radioactive material (yellow III).

11.7.4. Procedures in **paragraph 11.7.6** apply when aircraft carry any quantity of the following materials:

11.7.4.1. DoD class or division 1.1, 1.2, 1.3 (explosives).

11.7.4.2. DoD hazard class or division 1.4 (explosives) that transit the United Kingdom, Italy, or Hawaii.

11.7.4.3. Class or division 2.3 (poison gas).

11.7.4.4. Class 4.3 (dangerous when wet).

11.7.4.5. Class or division 6.1, (poison) PG I, zone A and B.

11.7.4.6. Class 7 (radioactive yellow III label).

11.7.4.7. Nuclear weapons, nuclear components, inert devices.

11.7.5. Procedures in **paragraph 11.7.6** also apply to nuclear related cargo, toxic chemical ammunition, highly toxic substances, hazard division 1.1 through 1.3 explosives, and infectious substances (including biological and etiological materials). In addition, it applies to Class 7 (Radioactive materials), which require a yellow III Label, and all other hazard classes or divisions, (except class 9 and other regulated material (ORM-D)) when shipped in quantities of 1,000 pounds (455 kilograms) or more aggregate gross weight. **Note:** Quantities not covered in paragraphs **11.7.4** and **11.7.5** are exempt from the procedures in **paragraph 11.7.6**.

11.7.6. The following procedures are established to satisfy the reporting requirements of AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*:

11.7.6.1. The PIC will be briefed when the quantities specified in paragraphs **11.7.4** and **11.7.5** are involved. **(T-2)**. The briefing will cover the following points:

11.7.6.1.1. Hazard class.

11.7.6.1.2. Proper shipping name.

11.7.6.1.3. DoD class or division when any type explosives are involved.

- 11.7.6.1.4. Net explosives weight for all DoD class or division 1.1, 1.2, and 1.3 explosives and gross weight of blasting agent aboard the aircraft.
- 11.7.6.1.5. Gross weight of hazardous materials other than the explosives above.
- 11.7.6.1.6. Passenger restrictions.
- 11.7.6.1.7. Written notification indicating "prior permission required" (PPR), obtained from the next base to be transited.
- 11.7.6.1.8. Smoking restrictions.
- 11.7.6.1.9. Flight plan annotation requirements.
- 11.7.6.1.10. Isolated parking and taxiing requirements.
- 11.7.6.1.11. Security classification, if appropriate.
- 11.7.6.1.12. Notification of the requirement to contact the next base to be transited at least 30 minutes prior to landing. (Such contact is not required for quantities other than those in paragraphs **11.7.4** and **11.7.5**).
- 11.7.6.1.13. Placard requirements.
- 11.7.6.1.14. Escort team requirement, if applicable.
- 11.7.6.1.15. Other special handling requirements.
- 11.7.6.2. Cargo documentation and loading procedures.
 - 11.7.6.2.1. The PIC will ensure proper documentation, certification and identification of cargo is furnished. AFMAN 24-204 contains detailed instructions on packaging, marking, labeling, and certification requirements associated with the airlift of hazardous materials. Hazardous materials/cargo not properly packaged and documented in accordance with AFMAN 24-204(I), will be rejected for air shipment by the pilot. **(T-2)**.
 - 11.7.6.2.2. Hazardous materials/cargo falls into many categories and the utmost precautions must be observed when handling or transporting these items. Load all hazardous material to permit easy access in-flight without moving other cargo. **(T-2)**. Adhere to the following appropriate safety precautions when loading hazardous cargo as appropriate:
 - 11.7.6.2.2.1. Ventilate the aircraft.
 - 11.7.6.2.2.2. Placard the aircraft.
 - 11.7.6.2.2.3. No smoking.
 - 11.7.6.2.2.4. Fire extinguishers must be available.
 - 11.7.6.2.2.5. Thoroughly inspect the cargo.
 - 11.7.6.2.2.6. Stow cargo away from heater outlets.
 - 11.7.6.2.2.7. Notify medical personnel in case of damage to radioactive materials.
 - 11.7.6.2.2.8. Use protective clothing and equipment.

11.7.6.3. Before engine start. Remove all placards from the aircraft. Provide controlling C2 agency parking location, approximate engine start time. Verify fire-fighting agency has the following hazardous materials information:

11.7.6.3.1. Class of hazardous material aboard and the DoD class or division for explosive materials aboard.

11.7.6.3.2. Net explosive weight for DoD class or division 1.1, 1.2, and 1.3 explosives.

11.7.6.3.3. ETD.

11.7.6.4. Before landing. Unless specifically prohibited by the theater commander, FLIP, or FCG, contact the agency specified in FLIP/FCG, base operations dispatcher, control tower or approach control at least 30 minutes (or as soon as practical) before ETA. Inform the agency that "hazardous materials" are onboard and verify hazardous materials/cargo message has been received. Request information is relayed immediately to base operations or the civil airport manager, crash and fire protection agency, and other support activities. If landing at a US civil airport without a tower, provide information to the nearest FAA flight service station. Transmit the following information: mission number, ETA, class of hazardous material, DoD class or division for explosives, net explosive weight, gross weight, and special handling requirements (e.g. isolated parking, security, technical escort teams, etc.).

11.7.6.5. DoD requires aircraft carrying DoD class or division 1.1, 1.2, and 1.3 explosives, hazardous class or division 2.3 or 6.1 zone A materials, and munitions to be parked in areas isolated from non-associated personnel and facilities. When such cargo is aboard, the PIC is responsible for ensuring the cargo is correctly identified to the tower or ground control. If the aircraft is not directed to an isolated area, identify the cargo again to tower or ground control. When identification is acknowledged, the host is solely responsible for selecting the parking area. Should host procedures be questionable, submit trip reports or hazard reports as appropriate, to document such occurrences.

11.7.6.6. The military host is responsible for placarding aircraft. When missions operate on non-military bases, the briefing to the PIC will include placarding requirements and, if required, placards will be furnished at the on-load base. **(T-2)**. The shipper and receiver make prior arrangements with the airport manager for shipments of hazardous materials requiring placarding. The shipper and receiver are responsible for cargo identification, firefighting procedures, and isolated parking requirements.

11.7.6.7. **Unscheduled Landing Due to In-flight Emergency.** Transmit unclassified information to the appropriate ATC facility as follows:

11.7.6.7.1. Nature of emergency and intent to land.

11.7.6.7.2. Aircraft position and ETA.

11.7.6.7.3. Number of personnel and location in aircraft.

11.7.6.7.4. Fuel on board.

11.7.6.7.5. Hazardous materials aboard, location of the cargo, and information listed in [paragraph 11.7.6.4.1](#).

11.7.6.7.6. After Unscheduled Landing. Contact the appropriate C2 center by telephone, HF radio, or message, giving arrival notice, hazardous materials information, and other pertinent information, as required.

Chapter 12

FUEL PLANNING

12.1. General. This chapter provides general C-21 fuel planning considerations and procedures. Missions should be planned at altitudes, routes, and airspeeds to minimize fuel usage. Publish local procedures in unit supplements to this publication. Do not use standard ramp fuel loads except for AE missions.

12.2. Fuel Conservation. Conserve aviation fuel when it does not adversely affect training, flight safety, or operational readiness. Aircrew and mission planners should manage aviation fuel as a limited commodity and precious resource. Fuel optimization should be considered throughout all phases of mission planning and execution. Comply with the following whenever consistent with technical order guidance and safety:

12.2.1. Fuel Loads. Excessive ramp and recovery fuel adds to aircraft gross weight and increases fuel consumption. Do not ferry extra fuel beyond optimum requirements for safe mission accomplishment and training objectives.

12.2.2. Flight Planning. Aircrew and mission planners should optimize flight plans and flight routing for fuel efficiency.

12.2.3. Center-of-Gravity (CG). Load and maintain aircraft at an aft CG whenever possible, consistent with mission requirements and Flight Manual restrictions.

12.2.4. Taxi. Consider engine-out taxi when permitted by Flight Manual.

12.2.5. Departure Planning. Consider use of opposite direction runway to reduce taxi and/or expedite departure routing if winds allow.

12.2.6. Takeoff. Consider a rolling takeoff when able. This saves fuel and engine wear. Clean up on schedule and do not delay gear and flap retraction.

12.2.7. Climb/Descent. In-flight procedures such as climb/descent profiles and power settings should also be considered for efficient fuel usage.

12.2.8. Weather Deviations. Attempt to coordinate for off-course deviation early so gross maneuvering is not required.

12.2.9. Cruise techniques. Attempt to trim the aircraft and match throttle settings whenever possible. Fly fuel-efficient speeds and altitudes to the maximum extent possible.

12.2.10. Approach. Fly most direct routing to arrival approach consistent with mission requirements.

12.2.11. Holding. If holding is required, hold clean at the most fuel-efficient altitude and request a large holding pattern. Hold at endurance or performance manual recommended holding speeds, conditions permitting.

12.2.12. Parking. Consider using shortest taxi route and avoid double blocking when able.

12.3. Fuel Planning Procedures. Aircrew should employ the following aviation fuel optimization measures without compromising flight safety or jeopardizing mission/training accomplishment:

12.3.1. Plan fuel to an alternate airfield only when AFI 11-202 Vol 3 and associated AMC Supplement or this publication require the filing of an alternate airfield.

12.3.1.1. When only one alternate airfield is required, use the closest suitable airfield meeting mission requirements (such as special requirements for HAZMAT or patients) and AFI 11-202 Vol 3 weather criteria.

12.3.1.2. If two alternate airfields are required, use the two closest suitable airfields meeting AFI-11-202 Vol 3 weather criteria and fuel plan to the more distant of the two.

12.3.1.3. When selecting an alternate airfield, suitable military airfields are preferred if within 75 nautical miles of destination. For 618 AOC (TACC) provided fuel plans, the ACFP/MAFPS default distance to an alternate airfield is 75 nautical miles. Consequently, where the alternate airfield is less than 75 nautical miles from the primary destination, ACFP/MAFPS will assume that the airfield is 75 nautical miles away.

12.3.1.4. The practice of selecting an alternate airfield in another weather system or selecting an alternate airfield based solely on maintenance capability should not be used.

12.3.1.5. ACFP/MAFPS will provide a route of flight to the primary alternate airfield if greater than 75 miles from the destination.

12.3.1.6. Alternate airfield selection is ultimately the AC's responsibility and should include multiple factors including landing fees, diplomatic relationships, and availability of contract gas. Fuel savings should not compromise mission effectiveness.

12.3.2. Using all available planning tools and guidance in this chapter, PICs determine the required ramp fuel load (RRFL).

12.3.3. Tankering fuel for convenience is prohibited. MAJCOM C2 or 618 AOC (TACC)-sanctioned tankered fuel is deemed operationally necessary, and will be included in the RRFL. **(T-3)**.

12.3.4. When there is a conflict between an on-time departure and defueling, the 618 AOC (TACC) or AMD deputy director of operations (DDO) or MAJCOM C2 equivalent determines which takes precedence. The OG/CC makes this determination when serving as execution authority for the mission.

12.4. Fuel Requirements. This paragraph implements standard minimum fuel requirements. In addition, see AFI 11-202 Vol 3 and associated AMC Supplement.

12.4.1. RRFL. As a minimum, RRFL consists of all fuel required for engine start, taxi, takeoff, climb, cruise, enroute reserves, alternate airfield/approach/missed approach (if required), descent, approach, landing, and contingency fuel. Plan fuel load using computer flight plan or AF Form 70, *Pilot's Flight Plan and Flight Log*, [Table 12.1](#), and the flight manual (fuel plan not required on local training missions remaining within 200 NMs).

12.4.2. Alternate airfield Fuel. Fuel for flight from intended destination to alternate airfield at optimum altitude and normal cruise speed. Compute fuel, time, and altitude from T.O. 1C-21A-1-1. When holding is required in lieu of an alternate airfield at a remote or island destination, compute holding for 2+00 hours using planned destination gross weight at FL200. This provides 1+15 minutes holding fuel in addition to the 45 minute reserve requirement. A remote or island destination is defined as any aerodrome, which, due to its unique geographic

location, offers no suitable alternate airfield (civil or military). The forecast weather at the remote or island destination must meet the criteria IAW AFI 11-202 Vol 3, associated AMC Supplement, and **paragraph 6.15** of this manual. **Note:** Plan initial arrival overhead destination with fuel for holding plus approach and landing or 1,000 pounds, whichever is greater. Additional fuel may be added to allow crews some flexibility when dealing with unplanned contingencies (e.g. weather avoidance, ATC delays, etc.). When dealing with unplanned contingencies, crews will still plan to touchdown with fuel reserve (minimum). Units may develop standard alternate airfield fuel requirements for local training missions; however, these fuel requirements will not be less than those specified in this chapter.

Table 12.1. C-21 Fuel Planning Chart.

Fuel Load Component	Requirement ³
1. Start, taxi, takeoff	200 pounds.
2. Enroute ¹	Fuel for planned climb and cruise to overhead destination at cruise altitude or initial approach fix altitude.
3. Enroute reserve	Fuel for 10 percent of flight time (up to a maximum of 45 minutes). Use holding operations charts at 10,000 ft at destination gross weight. When holding in lieu of alternate airfield is required, use 1+15 holding fuel computed at 20,000 ft.
4. Alternate airfield (if required)	Fuel from overhead destination to the alternate airfield at normal speed and altitude.
	OR
Alternate airfield, based on VIS only criteria (see AFI 11-202 Vol 3) ²	Fuel for descent, approach, and missed approach; use 300 pounds + fuel from destination to alternate airfield using climb and normal cruise charts.
5. Approach and landing	200 pounds.
6. Known holding delays	Fuel for planned holding when delays are anticipated.
7. Contingency	0+15 fuel using holding charts at 10,000 ft.
Notes: (1) Include all planned off-course maneuvering for departure or enroute deviations. (2). When two alternate airfields are required, compute fuel from the destination to the most distant alternate airfield only. (3) Compliance with this chart ensures fuel reserve requirements in AFI 11-202 Vol 3 and associated AMC Supplement.	

12.4.3. Plan to arrive at destination, or alternate airfield, with reserve fuel plus approach and landing or 1,000 pounds, whichever is greater.

12.4.4. Minimum fuel is 800 pounds. Crews should plan to terminate all missions with not less than 800 pounds (when required reserve is 1+15 crews should “plan” to land with approximately 1,000-1,200 pounds). When operating in FAA airspace, pilots will declare “minimum fuel” to the controlling agency when in their judgment the aircraft may land at the intended destination with less than these amounts.

12.4.5. Emergency fuel is 600 pounds. Crews will declare an emergency whenever it is determined that they will land with emergency fuel or less.

12.4.6. Ballast fuel may be required under certain aircraft configurations to keep the center-of-gravity within flight limits. Unless the PIC can accurately determine when it is safe to transfer the ballast fuel forward, do not plan on utilizing this fuel during normal operations.

12.4.7. Local supplements will not dictate “IAF” or “Top of Descent Fuel”. **(T-2)**.

12.4.8. Where weather forecast conditions dictate, add only one of the following fuel corrections. Thunderstorm corrections are not cumulative. Use the highest applicable correction for the forecast of conditions.

12.4.8.1. Fifteen minutes of fuel at enroute fuel burn rate (approximately 200 pounds) if forecast thunderstorms are scattered or numerous along the route of flight.

12.4.8.2. Eight minutes of fuel at enroute fuel burn rate (approximately 100 pounds) if forecast thunderstorms are few along the route of flight.

12.4.8.3. Five minutes of fuel at enroute fuel burn rate (approximately 50 pounds) if forecast thunderstorms are isolated along the route of flight.

12.4.9. Flight managers include, in the ACFP/MAFPS, 15 minutes (approximately 200 pounds) of East Coast hold down fuel for departures from Joint Base Andrews, MD, Dover AFB, DE, Martinsburg ANGB, WV, Joint Base McGuire-Dix-Lakehurst, NJ, Stewart ANGB, NY, and Westover ARB, MA. Hold down fuel is added as a departure bias and will be burned at the top of climb. Hold down fuel is annotated on the ACFP/MAFPS as “Fuel D” at the beginning of the ACFP/MAFPS and accounted for in the top of climb fuel block on the ACFP/MAFPS.

12.4.10. Flight managers include, in the ACFP/MAFPS, 15 minutes (approximately 200 pounds) of early descent fuel for Andrews, Dover, Martinsburg, McGuire, Stewart, and Westover arrivals from the west. Early descent fuel is added as an arrival bias and will be burned on the last leg. Early descent fuel is annotated on the ACFP/MAFPS as “Fuel D” at the beginning of the ACFP/MAFPS and accounted for in the last leg fuel block on the ACFP/MAFPS.

12.4.11. Depressurization Fuel. ACFP/MAFPS is currently incapable of calculating depressurization fuel. During all flight portions crews will discuss exercising depressurization procedures. Crews will calculate the fuel required to a recovery airfield in the event of depressurization at the ETP, to determine if additional fuel must be added to the ACFP/MAFPS RRFL. **(T-2)**. Plan to arrive at the recovery airfield with 0+30 minutes reserve fuel at optimal cruise speed for the depressurization transit altitude. Transit should be planned at 25,000 ft MSL when passenger supplemental oxygen is available or 10,000 ft MSL when passenger supplemental oxygen is not available.

Chapter 13

EMPLOYMENT

13.1. General. Planners and aircrews should reference AFTTP 3-3.C-21 for additional mission planning guidance. **Note:** Certain technical information was intentionally omitted or generalized to keep this chapter unclassified. Users should be aware that written additions to any portion of this document could cause it to become classified.

13.2. Checklists. Complete the Combat Entry/Exit Checklists at a convenient time prior to entering and upon departing the threat environment. **(T-2).** The Combat Entry/Exit Points are determined by theater guidance or known/suspected weapons engagement zone.

13.3. Approaches. Refer to AFTTP 3-3.C-21 for tactical approach techniques. Remain unpredictable: where multiple options are available, select the approach which best minimizes exposure to the threat while still allowing a high probability of landing on the first approach. **(T-2).**

13.3.1. The normal overhead pattern is not considered a tactical approach and may be flown at night and/or with passengers onboard.

13.3.2. Passengers are not permitted when performing tactical maneuvers for training or currency. **(T-3).**

13.3.3. When performing tactical maneuvers for currency or semi-annual training on operational missions, both pilots must be certified and current in tactical maneuvers. **(T-2).**

Table 13.1. Tactical Arrival Procedures and Restrictions.

Approach Type	Training Restrictions	Operational Restrictions
Tactical Slowdown Maneuver	VMC Day or Night	VMC Day or Night
Low Altitude Tactical Straight-In Approach	VMC Day Only	VMC Day Only
Random Steep Approach	VMC Day or Night	VMC Day or Night
Tactical Downwind and Tactical Base Approach	VMC Day or Night	VMC Day or Night
High Altitude Tactical Straight-In Approach	VMC Day or Night	VMC Day or Night
Tactical Instrument Approach	Same as normal IFR instrument procedures training	Same as normal IFR operations

13.4. Departures. Consult AFTTP 3-3.C-21 for specific descriptions of the maneuvers listed in [Table 13.2](#) below.

Table 13.2. Tactical Departure Procedures and Restrictions.

Departure Type	Training Restrictions	Operational Restrictions
Tactical Random Departure	VMC Day Only	VMC Day Only
Spiral-Up Departure	VMC Day or Night	VMC Day or Night

Chapter 14

AEROMEDICAL EVACUATION

14.1. Refueling Operations. (See also AFI 11-202 Vol 3, associated AMC Supplement, and AFMAN 11-2AE Vol 3, *Aeromedical Evacuation (AE) Operations Procedures, Addenda A*)

14.1.1. Concurrent servicing on the C-21 is only recommended:

14.1.1.1. If moving a critical patient would increase risk by an additional move off and back on the aircraft, or,

14.1.1.2. If there is no suitable location on the airfield to house the patient during the refueling, or:

14.1.1.3. If no suitable transportation (ambulance) is available to move the patient from the aircraft, or,

14.1.1.4. If the patient would be exposed to inclement weather.

14.1.2. The aircraft door will be open during all phases of the refueling operation if patients remain onboard. **(T-3)**. External power may be applied and cockpit Aeromed switches may be placed to the ON position prior to the start of refueling operations. However, medical life support equipment can still operate with all aircraft power removed during refueling operations.

14.1.3. As an additional safety measure, the PIC will ensure a fire truck is near the aircraft before commencing concurrent refueling and one C-21 pilot must remain at the aircraft at all times during the refueling. **(T-3)**. Stable, ambulatory patients are routinely deplaned prior to refueling if there is a suitable area to provide them shelter.

14.2. Aircraft Configuration.

14.2.1. On dedicated AE missions, configure the aircraft during pre-flight.

14.2.2. Litter Support Provisions.

14.2.2.1. Load planning will be according to theater guidelines for C-21 aircraft. **(T-2)**.

14.2.2.2. For patient transportation procedures refer to AFMAN 11-2AE Vol 3, and AFMAN 11-2AE Vol 3, Addenda A.

14.2.3. Available litter spaces and ambulatory seating depends on the aircraft cabin's mission configuration.

14.2.4. Therapeutic Oxygen. Unless the aircraft has the Spectrum or other approved system installed, therapeutic oxygen is not available and must be brought onboard for patient use. If needed, use the Patient Therapeutic Liquid Oxygen (PTLOX) system or compressed oxygen cylinder.

14.2.5. Integral patient/passenger emergency oxygen is not available on the aircraft. In the event of an emergency, patients and passengers will use the Emergency Passenger Oxygen System (EPOS).

14.2.6. AECMs will bring their own EEBDs as portable oxygen. **(T-3)**.

14.2.7. Do not secure aircraft or medical equipment adjacent to an emergency exit in a manner that will prevent or impede egress.

14.2.8. Life Preservers. Use the Adult/Child life preserver for litter patients.

14.3. Passengers and Cargo. The PIC, with the concurrence of the MCD, will ensure maximum aircraft utilization for passengers and cargo. Passenger restrictions based upon patient considerations will be identified when seats are released. The PIC will advise the appropriate C2 agency of the number seats available for passengers. **(T-2).**

14.4. Patient Death In-Flight. If a suspected death of a patient occurs in-flight, the planned itinerary will not be interrupted if the next scheduled stop is a US military airfield. **(T-3).** If the next stop is a civilian airfield that does not service a US military medical facility, or a foreign military airfield, that stop will be overflown (mission requirements allowing). **(T-3).** Coordination with command and control is essential.

14.5. SPECTRUM 500-LP (Military Version) Model 2500 US. The Spectrum 500 LP is the current unit approved for use on C-21 aeromedical evacuation missions. The litter system has self-contained oxygen, vacuum, compressed air, electrical power and an overhead light. This unit plugs directly into aircraft power. The aircraft manufacturer normally installs the SPECTRUM on the right side of the aircraft with the closet removed.

14.5.1. Specifications:

14.5.1.1. Bench Length: 75" (190.5 cm) [including end mounts].

14.5.1.2. Width: 17" (43.25 cm).

14.5.1.3. Height: 10.5" (26.67 cm) to top of bench.

14.5.1.4. Standard Unit Base Weight: 150 lbs. (68.04 kgs); total unit weight (standard unit, patient loading system, stretcher, and IV pole and table mounts): 240 lbs (108.86 kgs).

14.5.1.5. Patient Loading System (PLS): 36 lbs (16.33 kgs).

14.5.1.6. Stretcher: 40 lbs (18.14 kgs).

14.5.1.7. Air Pump Capacity: 11.89 Lpm @ 42 psi [4.0 amps, 4.3 lbs (1.95 kgs) – included in standard unit base weight].

14.5.1.8. Vacuum Pump: 10.47 Lpm @ 15 in. hg. [2.5 amps, 4.3 lbs (1.95 kgs) – included in standard unit base weight].

14.5.1.9. Power Required: 28 VDC aircraft electrical power (45.5 total amps).

14.5.1.10. Electrical Supply: (2) 115 volt AC duplex receptacles, (1) 7.5 amp, 28 volt DC receptacle.

14.5.1.11. Dual 350 watt, 115 volt, 15.6 amp AC inverters [4.8 lbs (2.177 kgs) – included in standard unit base weight].

14.5.1.12. Oxygen Supply: 3,500 L.

14.5.1.13. Dual Pneumatics.

14.5.1.14. Mobile Overhead Pneumatics.

14.5.1.15. Supply Outlets: Oxygen, Air, Vacuum.

14.5.1.16. IV pole and table mounts: 14 lbs (6.35 kgs).

14.6. Loading Instructions for Neonatal Transport System (NTS) onto SPECTRUM.

14.6.1. Ensure all loading crew members, including pilots, are briefed and fully understand loading procedures and individual responsibilities.

14.6.2. NTS must be the sled unit. Ensure the NTS sled unit is strapped in place, on the support gurney. **(T-2)**.

14.6.3. Loading may require five individuals: one aircrew member to guide unit from inside the aircraft and four individuals to slowly slide unit up ramp from outside aircraft (three will usually be the NCCAT team, plus an ambulance or flight crew member). Prepare the aircraft with the SPECTRUM-specific loading ramp placed into the appropriate location with bolt in front of ramp inserted into hole at head of the SPECTRUM base unit. Ensure the ramp is angled such that it does not touch the sides of the doorway, and does not contact the toilet in front of the SPECTRUM unit.

14.6.4. If available, the triangular ramp extension should be secured to SPECTRUM unit and ramp, extending toward the seat directly across from SPECTRUM unit.

14.6.5. Remove seat cushions from forward left passenger seat.

14.6.6. Place the legs of the ramp into the steel support stand. The ramp should be in the high position (the height is adjustable), such that it is similar in height to the gurney at full-up position. The gurney is wheeled into place, with the monitors of the NTS facing toward the rear of the plane (the rubber wheel will be at the front left when the gurney is pulled up to the ramp).

14.6.7. Release the support straps of the sled to the gurney.

14.6.8. The four members of the team will slowly advance the sled up the ramp. The gurney may be pulled away when the sled is completely on the ramp. The two members closest to the cabin door should exercise caution not to damage the doorframe and left, forward seat armrest when loading. Obey the flight crewmember on-board for changes in tempo of loading (this will minimize chance of damaging the far inside wall).

14.6.9. Once stabilized on the ramp, the aft left loading crew member follows the aft end of the NTS into the aircraft to help guide the unit in and lock into the base.

14.6.10. The flight crewmember ensures that the sled angles onto the base unit as it advances.

14.6.11. The remaining outside member and left loading crew member mentioned **paragraph 14.6.9** remove the ramp and supplement lateral support after the NTS sled is securely on the base unit.

14.6.12. The sled should now be secured to the base unit by the spring loaded metal plate mechanism on each end.

14.6.13. The power cord should be inserted into the spectrum power outlet.

14.6.14. When entire team is loaded, have ramp and lateral stabilizer supplement up and placed on board for use at next stop.

14.6.15. For deplaning NTS, reverse the steps as appropriate.

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Attachment 1

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Abbreviations and Acronyms

AC—Aircraft Commander

AE—Aeromedical Evacuation

AECM—Aeromedical Evacuation Crew Member

AFH—Air Force Handbook

AFMAN—Air Force Manual

AGL—Above Ground Level

AMC—Air Mobility Command

ANG—Air National Guard

AOA—Angle of Attack

ASRR—Airfield Suitability and Restrictions Report

ATC—Air Traffic Control

ATOC—Air Terminal Operations Center

BARO—Barometric

DDA—Derived Decision Altitude

MEP—Mission Essential Personnel

MICAP—Mission Impaired Capability Awaiting Parts

OST—Off-Station Trainer

RNAV—Area Navigation

C2—Command and Control

CAT I—Category I Approach

CFP—Computer Flight Plan

CG—Center of Gravity

DME—Distance Measuring Equipment

EFB—Electronic Flight Bag

EP—Evaluator Polit

ERO—Engine Running On/Offload
ETA—Estimated Time of Arrival
ETD—Estimated Time of Departure
ETP—Equal Time Point
FCB—Flight Crew Bulletin
FCF—Functional Check Flight
FDP—Flight Duty Period
FP—First pilot
FMS—Flight Management System
FOD—Foreign Object Damage
Ft—Feet
GDSS—Global Decision Support System
GPS—Global Positioning System
HF—High Frequency
IAW—In Accordance With
ICAO—International Civil Aviation Organization
IFF—Identification Friend or Foe
IFM—Integrated Flight Management
IFR—Instrument Flight Rules
ILS—Instrument Landing System
IMC—Instrument Meteorological Condition
IP—Instructor Pilot
JOSAC—Joint Operational Support Airlift Center
KIAS—Knots Indicated Airspeed
LNAV—Lateral Navigation
LRC—Long Range Cruise
MAF—Mobility Air Forces
MC—Mission Contributing
MCD—Medical Crew Director
MDA—Minimum Descent Altitude
ME—Mission Essential
MEL—Minimum Equipment List

MFD—Multifunction Display
MNPS—Minimum Navigation Performance Specification
MOB—Main Operating Base
MSL—Mean Sea Level
N1—Engine low-pressure fan/rotor speed in RPM
N2—Engine high-pressure fan/rotor speed in RPM
NDB—Non Directional Beacon
NM—Nautical Mile
NMR—Non-Mission Ready
NOTAMs—Notice to Airmen
OEI—One Engine Inoperative
OME—Operational Mission Evaluation
ORM—Operational Risk Management
PF—Pilot Flying
PIC—Pilot in Command
PM—Pilot Monitoring
PPR—Prior Permission Required
RAT—Ram Air Temperature
RCR—Runway Condition Reading
RegAF—Regular Air Force (active component of the Air Force)
RNAV—Area Navigation
RNP—Required Navigation Performance
RRFL—Required Ramp Fuel Load
RSC—Runway Surface Condition
RVSM—Reduced Vertical Separation Minimums
RwyCC—Runway Condition Code
SARP—Standards and Recommended Practice).
SID—Standard Instrument Departure
SIGMET—Significant Meteorological Information
SUP—Supplement
Sync—Synchronizer
TAWS—Terrain Awareness Warning System

TCAS—Traffic Collision Avoidance System

TOLD—Takeoff and Landing Data

VMC—Visual Meteorological Conditions

VNAV—Vertical Navigation

Terms

Advanced Computer Flight Plan/Mobility Air Forces Automated Flight Planning Service (ACFP/MAFPS)—An Air Force level system which is the follow on replacement for the Optimized AMC Flight Plan (formerly Jeppesen). The system brings an improved user interface to the customer, runs in Microsoft Windows®, and communicates with a mainframe located at Joint Base Scott, Illinois. Once the optimized flight plans are produced on the mainframe, they are transmitted back to the user's PC.

Aeromedical Evacuation (AE)—Movement of patients under medical supervision between medical treatment facilities (MTFs) by air transportation.

Aeromedical Evacuation Crew member (AECM)—Qualified Flight Nurse (FN) and Aeromedical Evacuation Technician performing AE crew duties.

AF/CVAM (Air Force Special Air Mission Office)—Agency within the office of HAF/A3 responsible for scheduling and committing all Air Force airlift requirements to support the White House or any other executive branch of the government. This office is the single coordinating agent for the SAM/CSM/DVG aircraft fleet and schedules SAM/CSM.

Airfield Suitability and Restrictions report (ASRR)—A quarterly publication published by AMC/A36AS, to establish airfield suitability and restrictions for AMC and AMC-gained C-5, KC-10, C-17, C-21, C-130, KC-46, and KC-135 aircraft operations. GDSS/GDSS2 provides the most up to date information available. Others use as information only, or as directed by assigned MAJCOM.

Airlift—Aircraft is considered to be performing airlift when manifested passengers or cargo are carried.

Air Mobility Division (AMD)—One of five divisions of the AOC, the AMD integrates and supports air mobility missions. They coordinate with the JFC, theater AMOCC (if established) and 618 AOC (TACC) in planning, tasking, and executing theater air mobility missions.

Air Traffic Control (ATC)—A service provided by an appropriate authority to promote the safe, orderly and expeditious use of the air transportation system and to maximize airspace utility.

Area Navigation-5 (RNAV-5)—Systems permitting aircraft navigation along any desired flight path within the coverage of ground or space-base navigation aids (NAVAIDS) or within the limits of the capability of self-contained aids or a combination of both methods. Although RNAV-5 specification does not include requirements for on-board performance monitoring and alerting, it does require that the on-board equipment keeps a lateral and longitudinal navigation accuracy on route of + 5 NM or better during 95% of the total flight time.

BLUE BARK—US military personnel, US citizen civilian employees of the Department of Defense, and the dependents of both categories who travel in connection with the death of an immediate family member. It also applies to designated escorts for dependents of deceased

military members. Furthermore, the term is used to designate the personal property shipment of a deceased member.

COIN ASSIST—DoD Space available travel program for prisoner of war/missing in action next-of-kin.

Command and Control (C2)—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission.

Command and Control Center—Each C2 Agency provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this AFMAN, C2 Agencies include operations centers, command posts, air mobility elements, tanker airlift control elements (TALCE), air mobility control centers, and tanker task forces.

Contingency Fuel—Identified extra to compensate for unforeseen circumstances during any phase of flight (i.e. un-forecasted weather, launch delay, etc.).

Contingency Mission—Mission operated in direct support of an OPORD, OPLAN, disaster, or emergency.

Direct Instructor Supervision—Supervision by an instructor of like specialty with immediate access to controls (for pilots, the instructor must occupy either the pilot or copilot seat).

Director, Mobility Forces (DIRMOBFOR)—COMAFFOR's and/or JFACC's designated coordinating authority for air mobility with all commands and agencies internal and external to the joint force. The DIRMOBFOR is normally a senior officer with an extensive background in air mobility operations and is familiar with the area of responsibility (AOR). The DIRMOBFOR provides mobility direction and guidance to the Air Mobility Division in the theater air and space operations center (AOC).

Distinguished Visitor (DV)—Passengers, including those of friendly nations, of 0-6 rank or equivalent status (or above), to include diplomats, cabinet members, members of Congress, and other individuals designated by the DoD due to their mission or position (includes BLUE BARK and COIN ASSIST).

Double Blocking—When an aircraft is required to block-in at one parking spot, then move to normal parking for final block-in. The extra time required for double blocking will be taken into account during mission planning/scheduling. To compensate for double blocking on departure, the aircrew "legal for alert time" may be adjusted to provide additional time from aircrew "show time" to departure. When double blocking is required on arrival, the aircrew entry into crew rest will be delayed until postflight duties are complete.

Equal Time Point—Point along a route at which an aircraft may either proceed to destination or first suitable airport or return to departure base or last suitable airport in the same amount of time based on all engines operating.

Execution—Command-level approval for initiation of a mission or portion thereof after due consideration of all pertinent factors. Execution authority is restricted to designated command authority.

Flight Information Publications (FLIP)—Sensitive flight critical mapping and charting type items produced by the National Geospatial-Intelligence Agency, foreign governments and commercial vendors that are distributed by Defense Distribution Mapping and varied civilian contractors. There are three standard types of Flight Information Publications (Planning, Enroute and Terminal) that cover eight geographic areas throughout the world. These items are produced in increments varying from 28 to 365 days. Sufficient quantities of each product type are produced and printed to adequately supply all active subscription accounts and depot shelf stock. Includes *General Planning* and *Flight Information Handbook*.

Fuel Reserve—Amount of usable fuel that must be carried beyond that required to complete the flight as planned.

Global Decision Support System (GDSS)—AMC's primary execution command and control system. GDSS is used to manage the execution of AMC airlift and tanker missions.

Global Positioning System (GPS)—This is a U.S. space-based positioning, velocity, and time system composed of space, control, and user elements. The space element, nominally is composed of 24 satellites in six orbital planes. The control element consists of five monitor stations, three ground antennas and a master control station. The user element consists of antennas and receiver processors that provide positioning, velocity, and precise timing to the user.

Ground Time—Interval between engine shut down (or arrival in the blocks if engine shutdown is not scheduled) and next takeoff time.

Hazardous Cargo or Materials—Articles or substances that are capable of posing significant risk to health, safety, or property when transported by air and classified as explosive (class 1), compressed gas (class 2), flammable liquid (class 3), flammable solid (class 4), oxidizer and organic peroxide (class 5), poison and infectious substances (class 6), radioactive material (class 7), corrosive material (class 8), or miscellaneous dangerous goods (class 9). Classes may be subdivided into divisions to further identify hazard, i.e., 1.1, 2.3, 6.1, etc.

Home Station Departure—For the purposes of **Chapter 4** of this manual, home station departure refers to a flight duty period which begins at the unit's home base and is planned to terminate at another location.

Instructor Supervision—Supervision by an instructor of like specialty. For critical phases of flight, the instructor must occupy one of the seats or stations, with immediate access to the controls.

Joint Operational Support Airlift Center (JOSAC)—The single manager for scheduling all DoD CONUS Operational Support Airlift (OSA) requirements. As part of USTRANSCOM's Operations and Logistics (J3) directorate, JOSAC performs consolidated scheduling of CONUS OSA aircraft. During peacetime, OSA missions provide support to DoD command, installation, and management functions while improving readiness and providing cost-effective training of aircrews. Wartime OSA missions move high priority passengers and cargo in direct support of combat or contingency operations.

Letter of X—AMC unit certification document populated by signed AF Form 4324s. Replaces use of AF Forms 381/4348 IAW AFI 11-202 Vol 2, AMCSUP1.

Local Training Mission—A mission scheduled to originate and terminate at home station (or an off-station training mission), generated for training or evaluation, and executed at the local level.

Medical Crew Director (MCD)—FN responsible for supervising patient care and AECMs assigned to AE missions. On missions where a FN is not onboard, the senior AET will function as MCD.

Mission—(1) The task, together with the purpose, that clearly indicates the action to be taken. (2) In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task. (3) The dispatching of one or more aircraft to accomplish one particular task.

Mobility Air Force (MAF)—Forces assigned to mobility aircraft or MAJCOMs with operational or tactical control of mobility aircraft.

Operational Mission—A missions executed at or above 618 AOC (TACC) level. Operational priority 1, 2, and 3 missions are tasked by the 618 AOC (TACC).

Operational Risk Management (ORM)—ORM is a logic-based, common sense approach to making calculated decisions on human, materiel, and environmental factors before, during, and after Air Force operations. It enables commanders, functional managers and supervisors to maximize operational capabilities while minimizing risks by applying a simple, systematic process appropriate for all personnel and Air Force functions.

Operational Support Airlift (OSA)—Movement of high priority passengers and cargo with time, place, or mission sensitive requirements.

Positioning and De-positioning Missions—Positioning missions are performed to relocate aircraft for the purpose of conducting a mission. De-positioning missions are made to return aircraft from bases at which missions have terminated.

Receiver Autonomous Integrity Monitoring (RAIM)—A technique whereby a GPS receiver/processor monitors the GPS. This integrity determination is achieved by a consistency check among redundant measurements.

Red X—A symbol that indicates that the aerospace vehicle, equipment or system equipment is considered unsafe or unserviceable and will not be flown or used until the unsatisfactory condition is corrected and/or the symbol is cleared. Refer to T.O. 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*, for more information.

Required Ramp Fuel Load (RRFL)—Minimum fuel required at engine start to complete the mission.

Significant Meteorological Information (SIGMET)—Area weather advisory issued by an ICAO meteorological office relayed to and broadcast by the applicable ATC agency. SIGMET advisories are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, severe and extreme turbulence, severe icing, and widespread dust or sand storms. SIGMETs frequently cover a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

Tanker Airlift Control Center (618 AOC (TACC))—Operations center that controls tanker and airlift forces worldwide through a network of computer systems. The 618 AOC (TACC) is organized into geographic cells consisting of East, West, and Emergency Action Cells. The 618 AOC (TACC) contains the following functions: Mobility Management, Global Channel Operations, Operations Management, Current Operations, Global Readiness, Weather, Logistics Readiness Center, Aerial Port Control Center, International Clearances, and Flight Plans.

Tankered Fuel—Additional fuel carried through a primary destination for use on a subsequent leg.

Training Mission—Mission executed at the unit level for the sole purpose of aircrew training for upgrade or proficiency. Does not include operational missions as defined in this AFMAN.

Attachment 2
DEBRIEF GUIDE

- I. MISSION OVERVIEW:
 - a. Purpose (Operational Mission, Training, Evaluation).
 - b. Objectives.

- II. SORTIE OVERVIEW: See **Note** below, Review Appropriate Items for Each Phase of Flight.
 - a. Predeparture Planning/Briefing/Paperwork (IFM Package).
 - b. Departure.
 - c. Enroute.
 - d. Mission – Low Level, Airdrop, Air Refueling, Aeromedical Evacuation.
 - e. Arrival/Landing.
 - f. Termination.

- III. TRAINING REVIEW (If Required):
 - a. Training Objectives Met
 - b. Additional Training Requirements
 - c. Student Critique, Evaluation Debrief

- IV. AFTER ACTION:
 - a. Events/Issues Warranting an ASAP Input or Other Safety Forms.
 - b. Paperwork (Training Folder, MAR, Fuel tracker web site, etc.).
 - c. Crew Rest Requirements/Legal for Alert Time.
 - d. Leadership Debrief (If Required).
 - i. Formal Training Mission.
 - ii. Flight Evaluation Debrief.
 - iii. Sub-Standard Aircrew Performance.

Note: Review all CRM and Threat/Error Management (TEM) items in each Phase of Flight:

- Situational Awareness.
- Crew Coordination and Verbalize/Verify/Monitor Adherence.
- External Communication
- Task Management.
- Threat Recognition/Management/Corrective Measures.
- Error Recognition/Management/Corrective Measures.
- Flight Integrity, Wingman Consideration.
- Safety Considerations.
- Successful/Unsuccessful – Root Cause of Success/Failure.

