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Flying Operations

C-212 OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD 11-2, *Aircraft Rules and Procedures*, AFI 11-202V3, *General Flight* Rules, and AFPD 11-4, *Aviation Ser*vice. It contains specific rules and procedures unique to C-212 aircraft that support Air Force objectives. This instruction is applicable to all units operating C-212 aircraft and applies to commanders, operations supervisors, and aircrews assigned or attached to all flying activities of these commands. It does not apply to the Air National Guard or Air Force Reserve Command. MAJCOMs may supplement this instruction. MAJCOMs will coordinate their supplement to this instruction with HQ AFFSA/XOF and HQ AFSOC/DOV before publication and forward one copy to HQ AFFSA/XOF after publication. Submit suggested improvements to this instruction on AF Form 847, **Recommendation for Change of Publication**, through stan/eval channels, to HQ AFSOC/DOV. This is a new instruction. 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. This instruction is affected by the Paperwork Reduction Act as amended in 1996. The Privacy Act of 1974 applies to certain information gathered pursuant to this instruction. The Privacy Act System Number F011 AF XO A, Air Force Operations Resource Management Systems (AFORMS) covers required information. The authority for maintenance of AFORMS is Title 37 U.S.C. 301a (Incentive Pay), Public Law 92-204, Section 715 (Appropriations Act for 1973), Public Laws 93-570 (Appropriations Act for 1974), 93-294 (Aviation Career Incentive Act of 1974), DoDD 7730.57 (Aviation Career Incentive Act of 1974 and Required Annual Report, February 5, 1976, with Changes 1 and 2), and Executive Order 9497.

This instruction contains references to the following field (subordinate level) publications and forms which, until converted to departmental level publications and forms, may be obtained from the respective MAJCOM publications office:

Chapter 1

GENERAL INFORMATION

1.1. Overview . This instruction governs Air Force C-212 aircrews. Use it in conjunction with aircraft flight manuals, flight information publications (FLIP), and applicable USAF directives. It is written for normal and contingency operations to reduce procedural changes at the onset of contingencies. Training procedures are included.

1.2. Applicability. This publication applies to all C-212 crewmembers. Crewmembers should have a thorough working knowledge of all procedures applicable to their crew position.

1.3. Deviations and Waivers. Do not deviate from the policies and guidance in this instruction, except:

1.3.1. For safety.

1.3.2. If beyond command and control communications capability, aircraft commanders may deviate from this directive as necessary to protect their crew and aircraft. Although this publication provides guidance for aircraft operations under most circumstances, it is not a substitute for sound judgment. Report deviations without waiver through stan/eval channels to HQ AFSOC/DOV within 48 hours, followed by a written report if requested.

1.3.3. When waived by the appropriate authority. Unless otherwise indicated, HQ AFSOC/DO is the waiver authority for this instruction. Request waivers through stan/eval channels to HQ AFSOC/DOV.

1.4. Supplements. MAJCOMs may supplement this instruction. If supplemented, it must be coordinated with HQ AFFSA and HQ AFSOC/DOV prior to publication.

1.5. Requisitioning and Distribution Procedures. This publication will be provided in electronic form at http//afpubs.hq.af.mil.

Chapter 2

COMMAND AND CONTROL

2.1. Overview. The AFSOC command and control (C^2) system is based on the principles of centralized monitoring and decentralized control and execution. The result is a C^2 mechanism which keeps the AFSOC commander informed on the current status of AFSOC forces while enabling the wing or group commander to exercise control over day to day operations.

2.2. Operational Control (OPCON). AFSOC is designated as the controlling agency for USSOCOM assigned Air Force aircraft, while theater special operations commands (SOCs) have OPCON of theater-based assets. In practice, responsibility for planning and executing AFSOC missions is routinely delegated to the wing or group commander. The commander, in turn, exercises control of non-closehold missions through the command post supporting the wing or group. In the event that assigned forces undergo a CHange in OPerational control (CHOP), responsibility for mission monitoring passes from the wing or group C^2 facility to the gaining command IAW the pertinent OPLAN, OPORD, or deployment or execution order.

NOTE:

For certain closehold activities, security considerations may compel the wing or group commander to shift mission monitoring responsibilities from the command post to another agency. The commander will ensure procedures are established for the responsible agency to monitor mission progress and advise the AFSOC Director of Operations and Commander as appropriate.

2.3. Mission Monitoring. Except for selected closehold missions, the group command center monitors aircraft which move to, from, or between off-station locations. When needed, the AFSOC Command Center tracks off-station aircraft via the AMC command and control system and direct reporting from aircrew and command post personnel. Key components of the AMC C^2 system are the Airlift Implementation and Monitoring System (AIMS), the Global Decision Support System (GDSS), and the various AMC C^2 facilities at numbered air forces (NAF), theater, and wing and group locations. Information on scheduled activity comes from the wings and groups, who input AIMS data for all upcoming missions except: (1) local missions not scheduled to land outside the local flying area or (2) closehold missions that cannot be accommodated by classified J-coded AIMS setups. When aircraft are deployed in support of operations and exercises, the Command Center obtains additional information from Situational Reports (SITREP) and Deployed Status Reports (DSR). The following monitoring procedures primarily apply to missions that are not closehold in nature and have not been CHOPed to another command.

2.4. Mission Commander. A mission commander will be designated when more than one aircraft or crew is deployed away from home station for training, exercises, or other operations. The mission commander will be an aircraft commander and should be fully mission ready. The mission commander will not be a primary crewmember for complex joint exercises. When a mission commander is not required, the aircraft commander assumes those responsibilities. Mission commander duties include, but are not limited to:

2.4.1. Briefing crews on local operating procedures.

2.4.2. Coordinating with ATC, CCT, range control, users and others that may have an impact on the mission.

2.4.3. Ensuring that DZs/LZs have a current survey (when necessary).

2.4.4. Ensuring personnel have ample and adequate billeting, messing, and transportation arrangements.

2.4.5. Ensuring maintenance personnel know of aircraft and fuel requirements.

2.4.6. Flight reporting IAW paragraph 2.3.2.

2.5. Aircraft Commander Responsibility and Authority. An aircraft commander is designated for all flights on the AFSOC Form 41, **Flight Authorization**. Aircraft commanders are:

2.5.1. In command of all persons aboard the aircraft.

2.5.2. Responsible for the welfare of their crew and safe mission accomplishment.

2.5.3. Vested with the authority necessary to manage their crew and accomplish the mission.

2.5.4. The final mission authority and will make decisions not specifically assigned to a higher authority.

2.5.5. The final authority for accepting a waiver affecting their crew or mission.

2.5.6. Charged with keeping the commander informed of mission progress and difficulties.

2.5.7. Responsible for flight reporting (paragraph 2.3.2) in the absence of a mission commander.

2.6. Mission Clearance Decision. The final decision to delay a mission may be made either by the agency with OPCON or the aircraft commander when, in the opinion of either, conditions are not safe to start or continue a mission. Final responsibility for the safe conduct of the mission rests with the aircraft commander. If the aircraft commander refuses a mission, it will not depart until the conditions have been corrected or improved so that the mission can operate safely. Another aircraft commander and aircrew will not be alerted to take the same mission under the same conditions.

2.6.1. The commander with OPCON must authorize diverting or rerouting a mission, except in an emergency or when required by en route or terminal weather conditions or facilities. In the event of an emergency or weather-related divert or reroute, the mission or aircraft commander must notify the controlling authority as soon as possible.

2.6.1.1. The controlling agency directing the rerouting or diversion is responsible for ensuring the aircraft is compatible with destination requirements and facilities.

2.6.1.2. The aircraft commander will notify the controlling agency of any aircraft or aircrew limitations that may preclude diverting or rerouting the mission.

2.6.2. When directing an aircraft to an alternate airfield, the controlling agency will ensure the aircraft commander is provided existing and forecast weather for the alternate. If the planned alternate is unsuitable upon arrival at destination, the controlling agency will advise the aircraft commander of other suitable alternates.

Chapter 3

CREW COMPLEMENT AND MANAGEMENT

3.1. Aircrew Qualification. Personnel assigned as a primary crewmember, or occupying a primary crew position during flight, must be qualified or in training for qualification in that crew position and mission.

3.1.1. Basic proficiency crewmembers may perform primary crew duties on tactical missions when receiving tactical mission qualification training or evaluations from a qualified instructor or flight examiner in their respective crew position.

3.1.2. Except for flight examiners, basic mission capable crewmembers may perform primary crew duties on tactical missions during unilateral training only, unless supervised by a qualified instructor in their respective crew position.

3.1.3. Noncurrent or unqualified crewmembers may perform crew duties only when supervised by a qualified instructor in their respective crew position. Pilot positions will be occupied by current and qualified pilots when passengers are on board IAW AFI 11-401, *Flight Management*. (Specific exceptions are listed in paragraph **6.31.**).

3.2. Crew Complement. Minimum crew complement is a pilot and copilot, as prescribed in the Airplane Flight Manual (AFM). A loadmaster is required for missions that include airdrops, passengers, or cargo. The unit commander may add crewmembers to enhance mission accomplishment or maximize training.

3.3. Additional Crewmembers (ACM). An ACM is one assigned in addition to the normal aircrew complement required for a mission. ACM status granted under this paragraph is applicable only to AFSOC aircraft.

3.3.1. Policy and Authorization. The unit commander may authorize ACM status to personnel assigned or attached to the unit. ACM status will not be granted to personnel on leave. The unit commander has approval authority for personnel traveling on ACM orders to fly on aircraft under their control.

3.3.2. Orders. ACM travel authority must be cited on the orders and include the crew position for which the individual is qualified. Travel orders which do not cite ACM authorization must be accompanied by written authorization (letter or message).

3.3.3. Logging of Flying Time. Flight examiners, flight surgeons, and medical technicians log flying time IAW AFI 11-401. Other ACMs log flying time only when approved by the aircraft commander.

3.3.4. Briefings. The aircraft commander or designated representative will brief all ACMs on emergency procedures, egress and appropriate FCIF items.

3.3.5. Security clearance. ACMs will possess a security clearance appropriate to the mission being performed.

3.4. Interfly. The wing or group commander or COMAFSOF is the approval authority for interfly on AFSOC aircraft under their control. In all cases, the crew will be qualified in the aircraft.

3.5. Scheduling Restrictions. Crewmembers will not be scheduled to fly nor will they perform crew duties:

3.5.1. Exceeding the maximum flying time limitations of AFI 11-202V3, *General Flight Rules*.

3.5.2. After consuming alcoholic beverages within 10 hours of show time, or 12 hours of departure time, whichever is earlier; within 12 hours of earliest anticipated alert time when on standby duty; or when under the influence of alcohol.

3.5.3. Within 24 hours after being administered anesthetics for dental or surgical procedures. Flight surgeons may authorize shorter periods of not less than 8 hours.

3.5.4. When taking oral or injected medication, unless an individual medical waiver has been granted by HQ AFSOC/SG. Mild analgesics, such as aspirin and aspirin substitute, may be used without prescription when the underlying illness is not cause for grounding. Dexedrine or similar stimulant "pep pills" will not be used unless authorized by HQ AFSOC/SG.

3.6. Crew Notification and Show Times. The recommended minimum show time is 1 ½ hours prior to scheduled departure for logistical missions, and 3 hours prior for tactical missions, unless special provisions are made for mission planning and preflight duties.

3.7. Crew Rest. The crew rest period is the non-duty period before crew duty time (CDT) begins. Crew rest is free time, which includes time for meals, transportation, and rest. The minimum crew rest period is 12 hours and is inviolate. Infringement of this period requires another 12 hours of crew rest. When a crewmember remains at the airfield to perform official duties, the crew rest period begins after termination of those duties.

3.7.1. If an aircraft is not capable of being airborne within 4 hours of scheduled departure time, the aircrew will be returned to crew rest or released from the flight. Provide 1 ½ hours minimum for aircraft preflight and stations time within the 4 hours. The unit commander may grant exceptions at the request of the aircraft commander. This paragraph applies to all missions, including unit training missions.

3.7.2. Post-mission crew rest is provided to crewmembers upon return to home station to recover from the cumulative effects of the mission and tend to personal needs. It begins when all post-mission duties are complete. Waiver authority is the wing or group commander, or COMAFSOF.

3.7.2.1. For missions exceeding 16 hours CDT, 1 hour of post-mission crew rest will be provided for each 3 hours TDY, not to exceed 72 hours. This time will not run concurrently with pre-departure crew rest (not applicable to continuing missions).

3.7.2.2. For missions less than 16 hours CDT, the unit commander determines post-mission crew rest time.

3.8. Crew Duty Time (CDT). CDT begins at showtime. When crewmembers perform other duties prior to flight-related duties, CDT begins when reporting for the other duties. CDT ends when all crewmembers have completed post-mission duties to include refueling, offloading, maintenance, etc. CDT does not include post-mission administrative duties. CDT will not exceed the following crew duty day (CDD) limitations:

3.8.1. The basic CDD is 16 hours, provided no pilot proficiency training, functional check flights (FCF) or tactical events are accomplished after 12 hours. If the autopilot is not operational or its use is denied for more than 4 hours, the CDD will be 12 hours. If the autopilot fails after departure, con-

tinue to the next scheduled stop then comply with the 12-hour limitation. There are no provisions for an augmented crew.

3.8.2. Deadhead time before or after performing primary crew duties is CDT. Crewmembers may perform primary crew duties after deadheading if their CDT will not exceed a basic CDD. Crewmembers may deadhead following primary crew duties if their CDT will not exceed 24 hours.

3.8.3. Crew rest and flight duty limitations may be waived or extended IAW AFI 11-202V3, and AFSOC Sup1.

Chapter 4

OPERATING GUIDELINES

4.1. Objective and Policy. A fully mission capable aircraft is the ultimate objective of the logistics effort. The final responsibility regarding equipment required for a mission rests with the aircraft commander. If one aircraft commander accepts an aircraft to operate a mission or mission segment without an item or system, this acceptance does not commit that aircraft commander, or a different aircraft commander, to subsequent operations with the same item or system inoperative.

4.2. Operating Guidelines. Comply with the CASA 212 Minimum Equipment List (MEL). The aircraft commander determines that the inoperative instrument or equipment does not constitute a hazard to the aircraft and is the approving authority for operations with degraded equipment within the guidelines of the MEL. The Squadron Commander is the approval authority for operations outside of the MEL.

Chapter 5

AIRLAND OPERATIONS

Section 5A—GeneralOperating Polices

5.1. Adherence To Rules. Comply with AFI 11-401, AFI 11-202V3 and supplements, AFMAN 11-217, *Instrument Procedures*, the Foreign Clearance Guide, Flight Information Publication (FLIP), and this instruction.

5.2. Checklists. Accomplish all checklists with strict discipline. A checklist is not complete until all items are accomplished.

5.2.1. The pilot flying the aircraft will initiate all checklists unless another procedure is established by the Airplane Flight Manual or this instruction.

5.2.2. The pilot is responsible for assuring all applicable checklists are onboard the aircraft.

5.2.3. Make personal notes in pencil on checklists and briefing and information guides, if desired. Such notes must be current.

5.3. Takeoff and Landing Policy:

5.3.1. The pilot in command will occupy either seat.

5.3.2. Instructor and flight examiner pilots may takeoff or land from either seat.

5.3.3. Aircraft commander qualified pilots and first pilots (FP) may takeoff or land from either seat.

5.3.4. An aircraft commander qualified pilot will land from the left seat during:

5.3.4.1. Aircraft emergencies, unless conditions prevent compliance.

5.3.4.2. Short field or substandard airfield operations except for required instructor upgrade training, evaluations, currency, or proficiency.

5.3.4.3. Missions operating in areas of hostile activity.

5.4. Copilot Landing Policy. Except as specified above, and provided no patients or DV4 or higher are on board, copilots (FC, MC) may takeoff or land from either seat.

5.5. Aircraft Maximum Gross Weight Policy. Comply with aircraft certification limitations. Waiver authority is HQ AFSOC/DOV or COMAFSOF.

5.6. Flap and Gear Operation Inflight. The non-flying pilot will actuate the flaps only on command of the pilot flying the aircraft.

5.7. Clearing. Crewmembers should pay extra attention to clearing outside the aircraft during all taxi operations and inflight during arrivals and departures.

5.8. Seat Belts. Provide a safety belt for all occupants over 2 years old.

5.8.1. Crewmembers occupying either the pilot, copilot, or jump seats will have seat belts fastened at all times.

5.8.2. All crewmembers will be seated with seat belts and shoulder harness fastened during taxi, take-offs, and landings. Flight examiners, instructors, and loadmasters performing required duties are excepted; however, they will have a designated seat and required restraint available.

5.8.3. All occupants will fasten seat belts securely when turbulence is encountered or anticipated, or when flying through areas of forecast clear air turbulence.

5.9. Aircraft Lighting: Use aircraft lighting IAW the Airplane Flight Manual, AFI 11-202 Volume 3 and applicable supplements.

5.10. Advisory Calls. Mandatory advisory calls are as follows (non-flying pilot):

5.10.1. Nonprecision approaches:

5.10.1.1. One hundred feet above minimum altitudes.

5.10.1.2. "Minimums" at MDA.

5.10.1.3. "Runway in sight." Make this call when the runway environment is in sight. Do not call too soon when obstructions to vision, such as fog, haze, low stratus clouds, etc., are present.

5.10.1.4. "Go-around." Call at missed approach point if the runway environment is not in sight.

5.10.2. Precision approaches:

5.10.2.1. One hundred feet above decision height (DH).

5.10.2.2. "Land." Make this call at decision height if the runway environment is in sight and the aircraft is in a position for a normal landing.

5.10.2.3. "Go-around." Make this call at decision height if the runway environment is not in sight or if the aircraft is not in a position for a normal landing.

5.10.3. Climb out:

5.10.3.1. Transition altitude.

5.10.3.2. One thousand feet below assigned altitude.

5.10.4. Descent:

5.10.4.1. Transition level.

5.10.4.2. One thousand feet above assigned altitude.

5.10.4.3. One thousand feet above initial approach fix altitude or holding altitude.

5.10.4.4. One hundred feet above procedure turn and final approach fix altitude.

5.11. Communications Policy:

5.11.1. Aircraft Interphone:

5.11.1.1. When available, all crewmembers will monitor interphone.

5.11.1.2. During takeoff roll, the pilot not flying the aircraft will make advisory calls IAW the aircraft Flight Manual. Any crewmember noting a safety of flight malfunction before refusal speed or decision speed, as appropriate for the situation, will state "Reject" and give a brief description of the malfunction.

5.11.1.3. Any crewmember seeing a variation of more than 100 feet from planned altitude, or deviations in heading, airspeed, or potential terrain or obstruction clearance problems will tell the pilot immediately.

5.11.2. Command Radios:

5.11.2.1. The pilot not flying the aircraft normally makes all radio calls.

5.11.2.2. All crewmembers will monitor the primary radio unless specifically directed to do otherwise by the aircraft commander or other chapters of this instruction.

5.11.2.3. The pilot operating the radios will tell the crew which radio is primary.

5.11.2.4. One of the pilots or a designated crewmember will monitor "Guard" regardless of primary radio.

5.11.2.5. One of the pilots will record and read back all ATC clearances.

Section 5B—GeneralAirland Procedures

5.12. Runway and Taxiway Requirements. Minimum criteria for normal, contingency, and STOL training operations are listed below. Multiple aircraft operations or other unusual circumstances may dictate increased runway and taxiway requirements. Performance data must be computed for all takeoffs and landings. All distances must be adjusted for unpaved, wet, soft, slushy, or icy runways and runway slope.

NOTE:

Distances published in tabulated data must be adjusted when operating from unpaved runways.

5.12.1. Normal Operations:

5.12.1.1. Minimum runway length for takeoff is Accelerate/Stop Distance.

5.12.1.2. Minimum runway length for landing is Normal Landing Distance From 50 feet, corrected for environmental conditions.

5.12.1.3. Minimum runway length for touch-and-go landings is: 3000 ft for approach-flap, 4000 ft for no-flap, and 5000 ft for full-flap touch-and-go landings.

5.12.2. STOL Operations:

5.12.2.1. Minimum runway length for takeoff is charted takeoff ground run plus 10%.

5.12.2.2. Minimum runway length for landing is charted landing ground roll plus 10%.

WARNING: Do not use tabulated data for initial STOL takeoff and landing. Performance is too critical for the approximations in tabulated data. All STOL takeoffs must meet a minimum of 1.9% single-engine climb gradient.

5.12.3. STOL Training Operations. LZs with minimum runway length may be simulated for training by placing the “box and one” at appropriate distances using the criteria of paragraph

5.12.4. If a short LZ is not available. Coordinate with CCT for desired markings.

5.12.5. Minimum runway width for all operations is 22 feet.

5.12.6. Minimum taxiway width for all operations is 15 feet.

5.12.7. When the runway available is not adequate for straight-ahead takeoff, assure a turnaround area is available.

5.13. Aircraft Taxi Obstruction Clearance Criteria:

5.13.1. Without wing walkers, avoid taxi obstructions by at least 25 feet, with wing walkers, by at least 10 feet.

5.13.2. When taxi clearance is doubtful, use a wing walker. If wing walkers are unavailable, deplane a crewmember to ensure obstruction clearance.

5.14. Takeoff and Landing Obstruction Criteria:

5.14.1. The mission directive is confirmation that AFSOC has reviewed the airfields of intended operation for obstructions and other hazards in accordance with Air Force and AFSOC directives. AFSOC will advise crews of known obstructions and other factors that could be hazardous to airland operations. Waiver authority for obstruction criteria is wing/group commander.

5.14.1.1. Approach Zone. No obstructions higher than 1 foot for every 11 feet (11:1) in the inner and outer zones as defined in AFI 13-217 *Assault Zone Procedures.*

5.14.1.2. Departure Zone. Base obstruction clearance requirements on predicted aircraft performance IAW the AFM and this instruction.

5.14.1.3. Lateral Clearance. Zone A, 38 feet measured from runway centerline, will have no obstructions higher than 36 inches. Zone B, from the edge of Zone A to 45 feet measured from runway centerline, will have no obstacles higher than 60 inches.

5.15. Reverse Taxi. Exercise extreme caution while backing an aircraft because of the inherent hazards. A third crewmember (loadmaster or additional pilot) is desired for backing.

5.15.1. The pilot will coordinate reverse taxi directions and signals to be used with the loadmaster or other crewmember.

5.15.2. Secure all cargo and ensure all passengers are seated.

5.15.3. Open the aft cargo door and lower the ramp to approximately the horizontal position.

5.15.4. The loadmaster or another crewmember will be on the ramp in position to direct reverse taxi, report any hazards and provide the pilot with timely interphone instructions on turns, distance remaining, condition of the maneuvering area, and stopping point. When an additional crewmember is not available to direct the operation, the pilot may still back the aircraft; be acutely aware of surroundings and inherent additional risks.

5.15.5. During night reverse taxi operations, the pilot will ensure visibility in the taxi area is sufficient to conduct safe taxi operations. Any source that provides adequate lighting of the taxi area may be used.

5.15.6. Stop no less than 25 feet from an obstruction even if using a wing walker.

5.16. Intersection Takeoffs. Normally, initiate takeoffs from the beginning of the approved usable portion of the runway. The decision to make intersection takeoffs rests solely with the aircraft commander. Base TOLD card computations on the runway remaining at the point the takeoff is initiated.

5.17. Reduced Power Operations. During training when multiple touch-and-gos are being performed, take-off power may be reduced to 90 percent or greater torque.

5.18. Aircraft Recovery from Unprepared Surfaces. Aircrews should not normally attempt to recover an aircraft after inadvertent entry onto soft, unprepared surfaces, which are not suitable for taxi. Ground crews using the appropriate equipment will accomplish aircraft recovery. Aircrews may accomplish recovery at austere locations if, after thorough inspection, the aircraft commander is sure there is no damage and the surface will support the aircraft. If there is damage or if there is any doubt that the surface will support the aircraft, aircrews will not attempt recovery.

5.19. Engines Running Onload or Offload (ERO). Use ERO procedures only when necessary to expedite aircraft movement or meet the time requirements of unit moves, training operations, exercises and contingencies. Do not use ERO procedures when explosive cargo is involved unless authorized by the exercise operation order or contingency air tasking orders.

5.19.1. The ERO procedures in this paragraph may be used for any mix of personnel or cargo. Aircraft commanders will assess available aircraft exits, prevailing weather, lighting, and parking location to ensure a safe operation.

5.19.2. General Procedures:

5.19.2.1. Aircraft commanders will brief crewmembers on the intended ERO operation, emphasizing specific crewmember duties.

5.19.2.2. Prior to landing, with approval of the pilot, open the aft cargo door. After landing, with approval of the pilot, the ramp to the horizontal position to prepare for cargo offload or onload, provided all equipment, cargo, and passengers remain secured in the cargo compartment

5.19.2.3. The parking brake will be set and one pilot will monitor brakes, interphone, and radio.

5.19.2.4. Operate engines in ground idle. If conditions warrant, lower flaps to reduce prop blast aft of the aircraft.

5.19.2.5. Turn wing inspection lights on during night ERO (N/A during NVG operations). Aircraft commanders should consider using any overt lighting that would assist the ERO and enhance safety.

5.19.2.6. Complete passenger and cargo manifests, crew lists, and weight and balance for the subsequent sortie if passengers or cargo are onloaded or offloaded.

5.19.2.7. Resume taxi when all crewmembers have verbally acknowledged that the aircraft is ready for taxi.

5.19.3. Onload and offload personnel or cargo through the safest exit.

5.19.3.1. After the aircraft is slowed to taxi speed, the crew may remove all tiedowns except one forward and one aft restraint. Remove remaining restraints only after the aircraft is stopped and vehicle drivers are in place. Brief drivers not to release vehicle parking brakes until all restraint is

removed and cleared by the crew. After clearance from the pilot is received, open the aft cargo door, lower the ramp to ground level, and clear off headset to direct onload or offload operations.

5.19.3.2. When part of the crew, the loadmaster will direct all onloading or offloading operations using pre-briefed signals. Other qualified loadmasters may direct the operation if available; however, the crew loadmaster retains overall responsibility for the operation.

5.19.3.3. Passengers will be escorted by a crewmember, if available, when enplaning or deplaning. Deplane passengers before cargo and enplane passenger after cargo unless cargo size or location dictates otherwise.

5.19.4. ERO for crew changes during local training missions are authorized provided ERO procedures are pre-briefed.

Section 5C—AustereLanding Zone Operations

5.20. Overview. Only fully mission qualified aircrews are authorized to operate in accordance with this section. Use normal takeoff and landing procedures whenever practical. Use STOL procedures when necessary for currency and proficiency training.

5.21. Landing Zone Requirements:

5.21.1. Minimum landing zone criteria is specified in section B of this chapter.

5.21.2. Landing zone markings vary depending upon the using agency. Crews normally use a modified AMP-3, "box and one" configuration for day or night. The length of the “box” should be 10% of the runway length or 200 ft, whichever is less. The markings used must be firmly established during mission planning and included in the aircrew briefing. Regardless of the system used, aircrew procedures will be in accordance with this section and the aircraft Flight Manual.

5.21.3. Communications and navigational aids vary based on mission requirements and aircraft and CCT capability.

5.21.4. Coordinate locally based services if available (established military airfields, etc.). If local services are not available or practical, the unit commander may authorize operations without CFR.

5.22. Landing Zone Assessment. The fluid situation during operations may make changes to the mission plan necessary. Carefully evaluate aircraft capabilities and the mission environment before the operation. Consider the following:

5.22.1. Security of the operating area.

5.22.2. Terrain and obstacle features along the approach or departure path.

5.22.3. Runway surface conditions (dust, small holes, damaged PSP, smooth).

5.22.4. Surface temperature and altitude.

5.22.5. Usable runway length and width.

5.22.6. Surface acceleration and deceleration factors (soft, dry, wet, ice, slope).

5.22.7. Gross weight of aircraft.

5.22.8. Surface winds (head, tail, cross, gusty).

5.22.9. Number of takeoffs and landings required.

5.23. Arrival. Plan arrival altitudes to minimize the threat. When more than one aircraft is involved, consider using multiple altitudes and traffic patterns.

5.24. Traffic Pattern. When the tactical environment permits, fly normal traffic patterns. Hostile activity or terrain may require significant modifications to normal traffic patterns. Options are to enter the traffic pattern via an initial, downwind, base, straight-in, or perpendicular to the runway. During hostile activity, the pilot can control several factors that may reduce the time in a threat envelope. These are altitude, arrival and departure flight path, proximity to the airfield, and proximity to known threats. The approach should be unpredictable. Comprehensive mission planning and knowledge of the threat location, density, and capability will dictate the specific tactics to be employed.

5.25. Specific Aircrew Procedures. The following procedures are in addition to the normal landing procedures in the AFM:

5.25.1. During the final stage of landing roll, reduce reverse thrust, if conditions permit, to prevent debris from causing a restriction to visibility or engine damage.

5.25.2. Do not land if the LZ is not properly identified or CCT gives an abort signal.

5.25.3. Brief the LZCO, or CCT, and subsequent aircrews on any unexpected hazards (dust, winds, hostile activity) encountered during takeoff or landing.

Section 5D—CombatLoading

5.26. Overview. Combat loading is comprised of two types of operations:

5.26.1. Passenger Combat Loading. The floor loading of troops, passengers, or patients. This is normally used for rapid exfiltration.

5.26.2. Rapid Infiltration. Floor loading of combat troops and equipment in conjunction with infiltration operations. This is done to expedite the employment of combat forces.

5.27. Passenger Combat Loading:

5.27.1. During contingency operations, rehearsals for contingencies or Joint exercises, maximum troops, passengers, or patients can be combat loaded on the aircraft without the use of installed seats, seat belts, or litter stanchions. All personnel will be seated and secured except those individual crewmembers having valid duties to perform.

5.27.2. If available, mattress or cushioning material may be used for seating.

5.27.3. Seat troops, passengers, and ambulatory patients facing forward.

5.27.4. Attach a tiedown strap for each row of personnel to provide forward restraint and body stability.

5.27.5. Excess baggage and cargo may be secured on the cargo floor and will decrease the number of troops, passengers, and patients proportionately.

5.27.6. When airlifting litter patients, position the litters longitudinally (patient's head aft) and secure each of the litters with the most stable and strongest material available (cargo straps, etc.). If the aircraft is equipped, hook the tiedown strap into a floor ring, run laterally, wrapping the strap around each litter handle once, hook the ratchet end to the nearest tiedown ring and tighten. For two litters side by side, use two tiedown straps for each end hooked into floor rings, run the straps laterally, one left and one right, over each outboard litter handle to the nearest tiedown ring and tighten.

5.28. Rapid Infiltration Procedures. These procedures are only authorized when conducting infil/exfil operations with dedicated unconventional forces. All personnel in the cargo compartment will be seated and secured except those crewmembers having valid duties to perform. Troops will provide their own restraining devices. If they do not have personal restraining devices, secure personnel using passenger combat loading procedures.

5.28.1. Preparation:

5.28.1.1. All restraints (except one forward and one aft) may be removed during taxiing to the off-load point. Self-propelled vehicles must have drivers in place with brakes set prior to removing restraints.

5.28.1.2. Vehicles will not be started in flight.

5.28.1.3. Fuel in vehicles loaded in the aircraft will be IAW AFJMAN 24-204 *Preparing Hazardous Material for Military Air Shipment*. Load in such a way that the filler neck of the gas tank is above the level of the fuel tank.

5.28.1.4. 2.75" Rockets may be taken out of shipping containers, but must be left in the shipping tubes and secured isolated from other cargo on the floor.

5.28.1.5. Troops may maintain their own ammo, but rounds may not be breached (chambered) until troops have exited the aircraft.

5.28.2. Notify the troop commander at 60, 30, 10, and 1 minute prior to touchdown.

5.28.3. Procedures After Touchdown:

5.28.3.1. Open the cargo ramp and door to the horizontal position when the pilot states, "Cleared to Open." Lower the ramp to the ground once the aircraft has stopped and the pilot states "Clear to Off-load."

5.28.3.2. The loadmaster will position the ground loading ramps.

NOTE:

If there is going to be a time delay before on-loading occurs, raise the ramp enough to allow the aircraft to be taxied in the event of an emergency.

5.28.3.3. Complete Offload or Onload. Close the ramp and notify the pilot when cleared to taxi.

5.28.3.4. Prior to takeoff, check that all exits are secure.

5.28.3.5. Secure the cabin and cargo compartment when airborne.

Chapter 6

GENERAL OPERATING POLICIES

Section 6A—Premission

6.1. Aircrew Uniforms. Wear the aircrew uniform on all missions, unless other attire is authorized (when the USAF Foreign Clearance Guide requires civilian attire, wear conservatively styled civilian clothing). Arctic clothing is recommended, but not required, for flights transiting Elmendorf AFB or Goose Bay AB.

6.2. Personal and Professional Equipment. Crewmembers will carry or wear personal and professional equipment as follows, unless otherwise specified by the mission:

6.2.1. Flight Kits. Carry a headset and operable flashlight on all flights. When oxygen masks are installed, flight deck crewmembers are not required to carry personal helmets and oxygen masks unless required for the mission.

6.2.1.1. Personal oxygen masks are required for all missions involving any pre-breathing.

NOTE:

Crewmembers will present their personal oxygen equipment to the life support facility for cleaning, maintenance, and communications testing every 30 days.

6.2.1.2. The loadmaster and any other personnel required to be mobile in the cargo compartment will wear helmets during aerial deliveries utilizing the aircraft anchor cables.

6.2.2. Identification Tags. Identification tags should be worn around the neck unless such wear creates a hazard. They may be carried in the flight suit pocket during missions requiring the wearing of a parachute or restraining harness.

6.2.3. Passports. Carry passports on missions when required by the Foreign Clearance Guide.

6.2.4. Shot Records. Carry shot records on all missions outside the CONUS, Alaska, or Hawaii. Aircrew members will ensure they meet immunization requirements for the mission.

6.2.5. Rings. Do not wear finger rings, earrings or other loose fitting jewelry while in, on, or around aircraft.

6.2.6. Glasses. Wear prescribed glasses or contact lenses as required by AFI 11-202, Volume 3.

6.2.7. Restricted Area Badges. Carry the restricted area badge when directed. Display the badge only in designated restricted areas.

6.2.8. Crewmembers will preflight NVGs if required for the mission. Log the visual acuity attained with the serial number of the NVGs. Aircraft commanders will preflight a spare set of NVGs. Ensure extra batteries and chem lights are available for all crewmembers.

6.3. Tool and Airdrop Kits. A tool kit may be on board if required. The unit will establish requirements for tools in these kits and the crewmember responsible for the kit. One airdrop kit will be on board for aerial delivery missions.

6.4. Publications and Aircraft Documentation. The aircraft commander will ensure the aircraft has within it the following:

6.4.1. Airplane Flight Manual and applicable navigation publications.

6.4.2. Normal, Abnormal and Emergency Procedures checklists.

6.5. Airfield Review. Aircraft commanders will review appropriate publications to ensure mission requirements can be met.

Section 6B—Predeparture

6.6. Flight Crew Information File (FCIF). Review volume I, part A, of the FCIF before all missions.

6.6.1. If new material has been added to the FCIF since the last review, enter the latest FCIF item number, date, and initials on the AFSOC Form 11, **FCIF Currency Record**.

6.6.2. Crewmembers delinquent in FCIF review and joining a mission en route will receive an FCIF update from their primary aircrew member counterpart on that mission. Instructor pilots who fly with general officers are responsible for briefing appropriate FCIF items.

6.6.3. Crewmembers not assigned or attached to that unit will certify FCIF review by entering the last FCIF number and their initials beside their name on the file copy of the flight authorization or their ACM orders.

6.6.4. Unit members will use these same procedures for the aircrew read file (ARF).

6.7. Unit Mission Kits. Mission kits are not required for all missions. The aircraft commander will ensure a mission kit is on board, if applicable. Refer to **Table 6.1.** for minimum contents.

Table 6.1. Unit Mission Kits.

SECTION I - PUBLICATIONS
1. AFI 23-202 *Buying Petroleum Products, and other Supplies and Services Off-Station*
SECTION II - FORMS
1. DD 1385, **Cargo Manifest**2. AF 15/15A, **USAF Invoice/Invoice Envelope**
3. AF 96, **Passenger Manifest**
4. AF 315, **USAF Avfuels Invoice**
SECTION III - MISCELLANEOUS
1. Other publications and forms as necessary for the particular mission

Section 6C—Briefings

6.8. Requirements. Briefings should be clear, concise, and designed to provide only mission essential information. Supplement and shorten briefings with visual aids, flimsies, checklists, etc., when practical.

Avoid needless repetition of published procedures. Schedule briefings after considering the particular mission, crew rest, and other pertinent factors. All aircrew members must be provided all applicable information available to ensure complete and professional aircrew planning. Squadron developed briefing guides should be used.

Section 6D—FlightPlanning

6.9. Call Signs. Use aircraft call signs as directed by higher headquarters.

6.9.1. Diplomatic Clearance. Certain countries grant diplomatic clearance by mission number. Pass the mission number and call sign to the controlling agency upon entering such country's airspace and then use the call sign directed by that agency.

6.9.2. Aeromedical Evacuation. Preface normal call signs with "Air Evac" when patients are aboard.

6.9.3. Search and Rescue. When tasked to participate in search, rescue and recovery operations, use the call sign "Air Force Rescue" plus the last five digits of the aircraft tail number.

6.10. Instrument Flight Rules. All missions will use IFR to the maximum extent possible IAW AFI 11-202, Volume 3, and applicable supplements.

6.11. Flight Plans:

6.11.1. Regardless of whether a flight plan is prepared by the aircrew or is furnished by another agency, the aircraft commander will verify the routes and altitudes to ensure proper terrain clearance.

6.11.2. Unscheduled changes in crew, passenger, and aeromedical patient lists are authorized provided corrections to the crew list or passenger manifest are filed with the local command and control center, base operations, FAA office, or airport manager's office, as appropriate to the airfield being transited.

6.12. International Procedures:

6.12.1. Review the USAF Foreign Clearance Guide (FCG) and brief crewmembers on applicable items before flying outside the CONUS.

6.12.2. Complete customs, immigration, agriculture, immunization, and quarantine as specified in the FCG. The unit dispatching the mission is responsible for border clearance and other special clearances.

6.13. Departure Planning. AFI 11-202, Volume 3 establishes IFR departure methods and climb gradients. Regardless of departure method, consider type of terrain and other obstructions on or in the vicinity of the planned departure route.

6.13.1. Gross Weight. The maximum gross weight for takeoff must never be exceeded. Twin-engine FAR Part 25 certificated aircraft require a minimum single engine climb gradient of 2.4 %. The minimum acceptable gradient is 1.9% (waiver authority: HQ AFSOC/DOV or COMAFSOF). Safety may dictate additional restrictions to flight for runway slope, icing, altitude, runway length, runway bearing capacity or obstacles in the flight path.

NOTE:

IFR operation at either a 2.4 % or 1.9% climb gradient place the aircraft in an obstacle environment that has not been surveyed by TERPS personnel. Aircraft commanders are therefore solely responsible for obstacle identification and avoidance IAW AFI 11-202V3, paragraph 8.7.2.2.

6.13.1.1. Computed single engine service ceiling will not be below the published MOCA (IFR flights) or planned VFR cruising altitude unless both of the following requirements are met:

6.13.1.1.1. The forecast weather for a critical route segment, as defined above, is day VMC allowing a VFR descent to a safe VFR altitude during an emergency.

6.13.1.1.2. Crews must plan emergency routes to emergency airfields on VFR charts (1:50,000 or 1:250,000) for the critical route segments and ensure that single-engine climb gradient or single-engine driftdown, as appropriate, will provide obstacle clearance.

6.13.2. Airfield Capability. For all IFR flights, the approach facility upon which minimums are based must be operational at the departure base and departure alternate, and approach equipment in the aircraft must be operational. Use runway visual range (RVR), when available, to determine the minimum visibility required for takeoff.

6.13.3. Minimum En route Altitude. The minimum altitude for non-tactical operations will be the highest minimum altitude along a route segment except when under positive radar control. Tactical minimum altitudes are as specified in **Chapter 9** of this instruction.

6.14. Alternate Planning:

6.14.1. Choose alternates that best meet mission conditions and conserve fuel. If possible avoid picking alternates within the same weather system when terminal forecasts are marginal. Alternates should be compatible with the mission load and should not be restricted by FLIP, the FCG, or diplomatic clearances. A weather alternate does not need en route maintenance capability.

6.14.2. The aircraft commander retains final authority in the choice of alternate; however, selection by support agencies should be used if the above criteria are met and the aircraft has already been serviced.

6.15. Destination Alternates. Alternate requirements will be in accordance with AFI 11-202, Volume 3, except as follows. If the destination is remote, or an island, with no alternate available, add 45 minutes holding fuel, in lieu of an alternate. The forecast weather at the remote or island destination must meet the restrictions listed in AFI 11-202, Volume 3.

6.16. Adverse Weather Planning. Plan all missions to avoid areas of forecast or known severe weather (including icing or severe turbulence) which may exceed aircraft limitations. Avoid thunderstorms and cumulonimbus clouds (CBs) using the following criteria:

6.16.1. Climb Out/En route Descent.

6.16.1.1. Normal Operations: 10 NM.

6.16.1.2. Tactical operations: 5 NM. Outside air temperature must be above 0 degrees at flight altitude. Avoid gust fronts and winds preceding a rapidly moving thunderstorm.

6.16.1.3. Do not fly within 2,000 feet directly above thunderstorms.

6.16.1.4. Avoid the rain shaft and cloud base of thunderstorms and CBs using the criteria of 6.16.1.1 and 6.16.1.2 above.

6.16.1.5. Avoid thunderstorms visually, by airborne radar, or by specific request of ground-based radar with a weather painting capability. When relying exclusively on ground-based radar for weather avoidance and the ground controller is unable to provide avoidance instructions, attempt to maintain VMC by:

6.16.1.5.1. Deviating course. Notify ATC of the number of miles and direction of the requested deviation. Maintain last altitude assigned by ATC.

6.16.1.5.2. Requesting a new route.

6.16.1.5.3. Requesting a change of altitude.

6.16.1.5.4. Diverting to alternate.

6.16.1.5.5. Declaring an emergency and requesting priority assistance if unable to maintain VMC in an area of significant weather and the ground radar facility cannot provide weather avoidance service.

6.16.1.6. The use of ground-based radar as the primary means of thunderstorm avoidance should be used only to depart an area of significant weather. It never should be considered a normal avoidance procedure. Use Flight Watch, also known as EFAS (En route Flight Advisory Service) on 122.0, or other weather facilities to aid in weather decisions.

6.16.2. Takeoff and Landing. The size and intensity of thunderstorms or CBs are so variable that the aircraft commander must determine avoidance criteria to be used during takeoff or landing. Takeoff and landing may be made without regard to the criteria in 6.16.1, provided.

6.16.2.1. The thunderstorm or CBs and associated gust front, if present, can be avoided.

6.16.2.2. The distance from the thunderstorm or CBs is increased as soon as possible after takeoff to meet the criteria in 6.16.1, above.

6.16.2.3. A missed approach course from the missed approach point is available which will provide separation similar to that for departures.

6.16.2.4. The aircraft is not flown below thunderstorms, CBs, or through the rain shaft associated with these clouds.

6.16.3. Lightning Avoidance. Lightning occurs at all levels in a thunderstorm. The majority of lightning discharges never strike the ground but occur between clouds or within the same cloud at nearly all temperatures and altitudes. Lightning also occurs in the clear air around the top and sides of storms. The following conditions are most favorable for lightning strikes and prolonged flight in them should be avoided when feasible:

6.16.3.1. Within 5,000 feet above or below the freezing level.

6.16.3.2. In clouds, or in any intensity of precipitation or turbulence.

6.17. Fuel Planning. Use the aircraft flight manual for fuel planning. Flying at long-range power settings at an altitude commensurate with the mission is the most conservative method and is encouraged.

However, aircraft commanders may elect to fly at other speeds and altitudes deemed appropriate for the mission. On fuel critical legs compare the actual fuel consumption rates with the predicted performance. In icing conditions, be especially alert for an increase in fuel required to reach the destination due to increased drag. Make every reasonable effort to conserve fuel.

6.17.1. Ensure enough fuel is carried to complete the mission within known constraints while allowing for required reserves.

6.17.2. Plan 15 minutes fuel (minimum) for start and taxi.

6.17.3. Plan an additional 15 minutes fuel per hour for that portion of the route where structural icing or thunderstorms requiring off-course maneuvering are forecast or reported.

6.17.4. IFR Fuel planning should include enough fuel to fly to the airport of intended landing, (if an alternate is required) fly from that airport to the alternate airport, and fly after that for 45 minutes at normal cruising speed.

6.17.5. VFR fuel planning should include enough fuel to fly to the first point of intended landing and, assuming normal cruising speed during the day fly for at least 30 minutes, or at night fly for at least 45 minutes.

6.17.6. When two alternates are required, flight plan to the most distant alternate.

6.17.7. Land with minimum fuel of 10 percent of the total planned flight time or 20 minutes, whichever is greater.

6.17.8. When passengers or patients are aboard, allow enough fuel to recover at a suitable airfield from the ETP at an altitude not requiring oxygen.

6.17.9. Cruise at the altitude that gives the best ground distance traveled for each pound of fuel consumed. As a rule of thumb, climb if ground speed is reduced less than 5 knots for each 1000 feet of altitude increase. Descend if ground speed will increase more than 5 knots for each 1000 feet of altitude decrease. Do not fly above cruise ceiling.

6.18. Authenticators and Classified Documents. Obtain and safeguard current authenticators and other classified materials required for the area being transited. Carry authenticators when flying into an ADZ, participating in exercises, on overseas missions, deployments, and when specified in operation plans. The COMSEC material required depends on the theater of operation and user. The base COMSEC custodian has access to the AFKAG 44 and AFKAG 14 and can assist in obtaining the material required for the mission.

6.19. Mission Folder. The unit will develop a mission folder for each mission to ensure all pre-departure information is available to aircrews. This folder will include the AFSOC Form 41, **Flight Authorization**, and other forms and information required for the mission.

6.20. Navigation Kits:

6.20.1. The aircraft commander will be issued a route navigation kit at the home station, which will remain with the aircraft until its return. Kits should contain sufficient quantities of material to cover the complete round trip from the issuing station, plus appropriate materials to cover the theater of operation.

6.20.2. Minimum contents of route navigation kits will be in accordance with **Table 6.3.** Commanders may modify the items of **Table 6.3.** as necessary for mission accomplishment.

Table 6.2. Route Navigation Kits.

PUBLICATION	MINIMUM QUANTITY
DOD FLIGHT INFORMATION PUBLICATIONS:	
Flight Information Handbook	1
IFR Supplement	1
VFR Supplement	1
Terminal Publications	1 Set
US GOVERNMENT FLIGHT INFORMATION PUBLICATIONS (NOAA):	
Airport/Facility Directories	1 Set
En route Charts	1 Set
Sectional Aeronautical Charts	1 Set
Terminal Publications	1 Set

NOTE:

Contents are for CONUS operations; supplement and adjust as required for OCONUS missions.

Section 6E—Preflight

6.21. Flight and Maintenance Log. Review the aircraft maintenance forms before applying power to the aircraft or operating aircraft systems. Ensure that the USAF Fuel Identaplate and/or contract fuel card is aboard the aircraft and applicable preflight is documented before flight.

6.22. Aircraft Servicing and Ground Operations:

6.22.1. Aircraft Refueling. Aircrew members qualified in refueling may perform refueling duties. Aircrews should refuel only when no qualified persons are available to fuel the aircraft, maintenance support or fueling services are not readily available, at austere locations, or when the mission would be delayed.

6.22.2. Concurrent Ground Operations. Simultaneous aircraft refueling or de-fueling and cargo loading or maintenance operations are authorized in accordance with TO 00-25-172. Refueling or de-fueling with passengers or patients aboard is authorized only for aeromedical evacuation missions IAW TO 00-25-172.

6.22.3. Fire Protection. An aircraft engine fire extinguisher system or cabin fire extinguishers fulfill the minimum requirements for fire protection during engine start. However, a portable fire extinguisher, if available, should be positioned outside of the wing tip for added fire protection.

6.22.4. Towing. If aircrew members are required to participate in towing operations, only pilots may perform cockpit duties. All crewmembers may act as wing walkers. At military installations the aircraft commander will coordinate with the on scene maintenance personnel for towing requirements and procedures. At non-military installations, the aircraft commander will coordinate towing requirements with the local Fixed Base Operator (FBO). The aircraft commander will ensure the tow team supervisor is qualified to tow the aircraft and all personnel involved in the operation are briefed on their specific duties. If the aircraft commander is satisfied the FBO and tow team supervisor are qualified, crewmembers do not have to be involved in the towing operation.

6.23. One-Time Flights. An aircraft may be released for a one-time flight with a condition that might be hazardous for continued use provided the aircraft is airworthy for one flight to another station.

6.23.1. The chief of maintenance, the senior maintenance officer, or the repair team chief must authorize this release.

6.23.2. HQ AFSOC/DO must authorize the flight after maintenance has released the aircraft.

6.23.3. The maintenance release, HQ AFSOC/DO approval, and the aircraft commander's concurrence are all required before the aircraft can be flown to the specified destination.

6.24. Life Support Requirements:

6.24.1. Oxygen. Oxygen on board must be sufficient to accomplish the planned flight.

6.24.2. Survival Equipment for over-water operations.

6.24.2.1. Adhere to applicable FARs (FAR 91.509). Unit commander may waive FAR requirements for survival equipment for over-water operations only if carrying additional survival equipment will degrade mission accomplishment.

6.24.2.2. Life Preservers. Life preservers will be sized and available at the crewmember's station while over water. Wear life preservers whenever below 2,000 feet over-water (except takeoff and landing). For over-water missions carrying children and/or infants, ensure appropriate number and type of life preservers are aboard.

6.24.3. Radio Equipment for over-water operations.

6.24.3.1. Adhere to applicable FARs (FAR 91.511). Unit commander may waive FAR requirements for radio equipment for over-water operations only if carrying additional equipment will degrade mission accomplishment or installation of radio equipment is impractical.

6.24.4. Emergency equipment.

6.24.4.1. Adhere to applicable FARs (FAR 91.513). Unit commander may waive FAR requirements for emergency equipment only if carrying additional equipment will degrade mission accomplishment or installation of emergency equipment is impractical.

6.24.5. Restraining Harnesses. Crewmembers will wear a restraining harness when near open doors or hatches in flight.

6.24.6. Survival Vests. Wear individual survival vests on all designated missions.

6.25. Life Support Equipment Documentation. The aircraft commander or designated representative will:

6.25.1. Prior to departing home station, ensure appropriate serviceable protective clothing, life support, survival, and dash 21 equipment for the entire mission are aboard the aircraft.

6.25.2. Prior to departing home station and following en route crew changes, review the aircraft life support equipment list to ensure required equipment is on board and required inspections have been completed.

6.25.3. Aircrew members discovering life support equipment missing will make an entry in the aircraft maintenance records.

6.26. Transponder Operations. Aircraft will not depart with an inoperative transponder. Aircraft may takeoff if the transponder was operational on the previous mission. Exception: If the transponder is inoperative and no repair capability exits, the aircraft may takeoff if ATC approves the flight. Mission requirements will dictate the use of IFF and aircraft commanders should comply with the appropriate OPORD or CONPLAN. Use the transponder in accordance with Table 6.4.

Table 6.3. Worldwide IFF Chart.

IFF MODE	NATO	LANTCOM & NOPAC BETWEEN 170E & 150E	ALL OTHER AREAS
1	IAW ACP 160, NATO SUPPS & USAFER 60-17	IAW ACP 160 US SUPP-1 (C)	
2	IAW ACP 160, NATO SUPPS	IAW ACP 160 US SUPP-1 (C) ANNEX A	
3	AS DIRECTED BY ATC	2000 (BERMUDA: 2100)	AS DIRECTED BY ATC, OTHERWISE IAW ACP 160 US SUPP-1 (C)
4	KEYED AND ON		

NOTE: Mode IV is not required within the boundaries of the 48 continuous states unless ADIZ penetration is anticipated.
NOTE: Carry a keyer for use in the event of rerouting or diversion, except on local training missions.

6.27. Cargo Documentation:

6.27.1. Proper cargo documentation will accompany each load. The cargo manifest with accompanying DD Form 1384, **Transportation Control and Movement Document (TCMD)** (interpreted punchcard deck or manual form), and special handling documents, as applicable, will be delivered to the aircraft before departure. The manifest will be one of the following:

6.27.1.1. Computer printed product.

6.27.1.2. The 80/80 (off-line manifest) listing.

6.27.1.3. DD Form 1385, **Cargo Manifest**.

6.27.2. DD Form 2133, **Joint Airlift Inspection Record**, will accompany the manifest if required.

6.28. Dropped Object Prevention. During aircraft exterior visual inspections, pay particular attention to surfaces, panels, and components which potentially could be dropped objects. If a dropped object is discovered and the mission is continued, the flight crew will:

6.28.1. Ensure a write up is entered in the aircraft flight and maintenance log.

6.28.2. Notify the operations center as soon as practical. Furnish route of flight, altitude, and weather (i.e., turbulence, etc.).

6.29. Narcotics. Crewmembers will ensure narcotics and other unauthorized items are not smuggled aboard the aircraft.

6.30. Cockpit Congestion and Loose Objects. The flight deck area will be kept as uncluttered and orderly as possible for all flight and ground operations. Specifically:

6.30.1. During engine start and ground operations, no items (checklist, charts, etc.) are placed to prevent inspection of aircraft instruments, engine gauges, or switches.

6.30.2. During flight, no items (checklists, charts, etc.) will be placed in a position that covers or hides any gauges.

6.30.3. Publication kits, flight kits, and personal items will not be placed where they could interfere with the flight controls.

6.31. Passenger Policy . DoD 4515.13-R, *Air Transportation Eligibility*, establishes criteria for passenger movement on DoD aircraft. It defines five categories of passenger travel: space-available, aeromedical evacuation, orientation, public affairs, and space-required. AFI 11-401, *Flight Management*, provides further guidance on orientation and public affairs travel. Refer to these publications directly for details not addressed in this instruction. In all cases, passengers will be manifested on a DD Form 96, **Passenger Manifest**. Refer to paragraph **3.3.** for ACM policy.

6.31.1. Space-available. Allows authorized passengers to occupy seats on DoD aircraft after all space-required passengers have been accommodated. Required documentation is listed in DoD 4515.13-R. Passengers process through the passenger terminal. Aircraft covered by this instruction will not be used for space-available travel.

6.31.2. Aeromedical Evacuation. Defined as the movement of patients by air. Specific guidance on eligibility and documentation is contained in DoD 4515.13-R. USCINCTRANSCOM is the single manager for policy and procedure.

6.31.2.1. Restrictions. If tasked to conduct aeromedical evacuation, both pilots must be fully qualified. Mission events and simulated EPs are prohibited.

6.31.3. Orientation. AFI 11-401, *Flight Management*, contains specific details on the Air Force Orientation Flight Program. There are four categories of orientation flight: incentive flights, distinguished visitor flights, familiarization flights, and spouse orientation flights. Authorized participants and approval authority are contained in AFI 11-401, Table 1.1. Document authorization by letter and manifest on DD Form 96. Requests for approval will include the mission profile and mission events to be accomplished. Forward requests through stan/eval channels. Report annual orientation activity IAW AFI 11-401 and applicable supplements.

6.31.3.1. Restrictions.

6.31.3.1.1. For spouse orientation, comply with restrictions in AFI 11-401 and applicable supplements.

6.31.3.1.2. For other orientation categories, both pilots must be fully qualified. Simulated EPs are prohibited. All other mission events may be conducted IAW the profile approved by approval authority listed in AFI 11-401, Table 1.1.

6.31.4. Public Affairs Travel. Defined as travel in the interest of adding to the public understanding of DoD activities. AFI 11-401, *Flight Management*, contains specific details on the Air Force Public Affairs Flight Program. Authorized participants and approval authority are contained in AFI 11-401, Table 1.1. Document authorization by letter and manifest on DD Form 96. Requests for approval will include the mission profile and mission events to be accomplished. Forward requests through public affairs channels.

6.31.4.1. Restrictions. Both pilots must be fully qualified. Simulated EPs are prohibited. All other mission events may be conducted as approved by approval authority. Passengers will be seated with belts fastened during threat maneuvers.

6.31.5. Space-required. DoD 4515.13-R lists several categories of passengers, not previously mentioned, who are authorized official travel on DoD aircraft.

6.31.5.1. Supported forces. A sub-category of space-required passenger defined by this instruction as US and foreign military personnel who are an integral part of the mission being performed. Approval is assumed by the mission tasking. Supported forces passengers must be properly manifested.

6.31.5.1.1. Restrictions. Both pilots must be fully qualified unless excepted by AFI 11-401, paragraph 1.12 (Requirements for Pilots in Dual-Controlled Aircraft). Simulated EPs are prohibited. There are no restrictions on mission events. Aircraft commanders will ensure that supported forces are briefed on the mission profile and mission events before flight.

6.31.5.2. Supporting forces. A sub-category of space-required passenger defined by this instruction as US and foreign military, DoD civilians, and US civilian employees under contract to the DoD, who directly support the mission or a deployment of an AFSOC unit. This may include, but is not limited to; maintenance, communications, intelligence, logistics, and flight test personnel, civilian contractors required for inflight checks or deployment support, FAA representatives, STS, and other military personnel who are on board to communicate/coordinate with other agencies. Off-station travel is documented by travel orders. Local flights will be documented by letter of authorization from the Group CC or COMAFSOF (Exception: Squadron Commanders may approve squadron assigned personnel). When frequent local flights are necessary, commanders may issue annual authorizations by name or AFSC as appropriate. When using this option, aircraft commanders will ensure that all restrictions in the following paragraph are complied with for each individual mission. Supporting forces must be properly manifested.

6.31.5.2.1. Restrictions. Both pilots must be fully qualified unless excepted by AFI 11-401, paragraph 1.12 (Requirements for Pilots in Dual-Controlled Aircraft). Simulated EPs are prohibited (Exception: EPs required for the purposes of a functional check flight or FAA flight evaluation are authorized. In this context, personnel on board are required for mission accomplishment. Limit personnel to absolute minimum required). Other mission events are authorized. Aircraft commanders will ensure that supporting forces are briefed on the mission profile and mission events before flight.

6.32. Military Customs Pre-clearance Inspection Program:

6.32.1. The military customs program (DOD 5030.49R and AFJM 24-204, *Preparing Hazardous Material for Military Air Shipment*) was developed to assist the DOD and other US Government agencies in the control of narcotics, contraband, prohibited agricultural products, and to expedite entry of DOD personnel and material into the Customs Territory of the United States.

6.32.2. This inspection will be accomplished by Military Customs inspectors immediately prior to departure and may involve more than one pre-clearance inspection on CONUS-bound aircraft. When security considerations necessitate deviation from this policy, mission planners must coordinate with the appropriate agency to ensure the mission is not jeopardized.

Section 6F—Departure

6.33. TOLD Cards. The pilot will complete TOLD cards in accordance with the AFM. The non-flying pilot will crosscheck the TOLD card for accuracy using the flight manual or approved tabulated data. Tabulated data will not be used for the first STOL landing or takeoff during STOL operations.

6.33.1. Cross-check minimum control, takeoff and landing speeds. When operating in high pressure altitude or high temperature environments, compute stall speed and compare with the minimum control speed. This will be done for the initial takeoff, landing, and for significant changes in operating conditions.

6.33.2. When performance is critical (e.g., short field operations or STOL operations, high altitudes, etc.), a pilot will crosscheck distances and ground roll in addition to the items in 6.33.1 above.

6.33.3. Following initial takeoff, re-compute data for pressure altitude changes of 1,000 feet, temperature changes of 5 degrees C, or gross weight changes of 1000 pounds. For STOL procedures,

re-compute data for pressure altitude changes of 500 ft., temperature changes of 2 degrees C, or gross weight of 500 pounds.

6.34. Departure Briefing. The pilot making the takeoff will brief the crew IAW this instruction and the Airplane Flight Manual.

6.35. Power Application. To help prevent over-temperatures, crewmembers will monitor engine parameters as throttles are advanced. Crewmembers should announce when power or temperature limits are reached, whichever occurs first. For STOL operations, power checks should be performed prior to departure.

6.36. Departure Monitoring. Additional crewmembers not flying the aircraft will back up the pilot and report any deviations from the planned departure. When radar facilities are available, departures will be radar monitored to the maximum extent possible.

Section 6G—En Route

6.37. Oxygen Requirements. Aircrew will comply with the oxygen requirements specified in AFI 11-202. Prior to flight, accomplish a communications and operations check of oxygen masks.

6.38. Flight Progress. Use all available navigational aids to maintain course centerline and positive fixing of the aircraft's position. Report malfunctions or loss of navigation capability, which degrades centerline accuracy to the controlling ARTCC immediately.

6.39. CIRVIS (AFM 10-206) and Other Reports. Report all vital intelligence sightings from aircraft as indicated in AFMAN 10-206, *Operational Reporting,* FLIP *General Planning* or Flight Information Handbook (FIH).

6.40. Inflight Meals. The aircraft commander and copilot will not consume inflight meals within 1 ½ hours of each other during flight if the meals were procured from the same vendor and consist of the same menu.

6.41. Communications. All communications will be in accordance with FLIP or as directed by the controlling agency. Required frequencies will be provided by the controlling authority in the communications electronics operating instructions (CEOI).

6.41.1. If at all possible, the number of air-to-air and air-to-ground nets should be limited to and compatible with the radios installed on the aircraft. If this is not possible the controlling authority will designate which aircraft will operate on a specific net. If it is not designated, the highest priority nets will be monitored with subsequent nets to be monitored on a time and communications system availability basis.

6.42. Inflight Emergency Procedures. Report deviations of directives that occur because of an emergency in accordance with AFI 11-202 and this directive.

6.42.1. Notification of Controlling Agencies. As soon as practical after completing the aircraft emergency action checklist, furnish the controlling agency and appropriate Command and Control Center

(CCC) a description and extent of the difficulty, assistance required, intentions, and any further pertinent information.

6.42.2. Turnaround Procedures. When a turnaround is necessary, use procedures in FLIP. Maintain VFR, reverse course, climb or descend to a VFR altitude or flight level, if not specified, and request ATC clearance. If unable to maintain VFR, obtain an ATC clearance before reversing course. A turnaround under IFR conditions, without ATC approval, will be made only after a thorough evaluation of the seriousness of the emergency, general traffic density, and known traffic operating in the immediate area. Normally, a climb or descent (with minimum change in altitude) to a VFR altitude or flight level would result in minimum exposure to other aircraft if a turnaround is required.

6.43. Continued Flight with Engine Failure. The flight will terminate at the nearest facility that in the judgment of the aircraft commander offers safe and favorable operating conditions. Crews should consider suitable diversion fields along their route of flight during preflight planning.

6.44. Fuel Jettisoning. Fuel will not be jettisoned except during combat conditions, emergency conditions, or rescue missions requiring gross weight reduction.

6.45. Medical Assistance. When a person aboard the aircraft requires medical care, the aircraft commander will inform the next station of next intended landing in sufficient time so the aircraft may be met by medical personnel. The request will include the sex, approximate age, and the nature of the medical problem.

6.46. Weather Forecasts:

6.46.1. The primary contact for inflight weather assistance is the Pilot Meteorological Service (PMSV). Another source is Flight Watch on 122.0.

6.46.2. Obtain latest weather prior to descent for landing at destination.

6.47. Low-Level Overwater Operations. The accumulation of salt spray on windshields and side windows is a factor which must be considered for low-level over-water flight. Salt deposits on windows will restrict visibility, possibly jeopardizing flying safety. Weigh the above factors against mission urgency prior to descent below 500 feet, when heavy seas or high surface winds exist. In some cases, it will be preferable to fly at a higher altitude to avoid this hazard.

Section 6H—Arrival

6.48. Crew Coordination. The pilot flying the approach will brief the crew on the descent, approach, and landing IAW this instruction. The non-flying pilot will monitor the approach and report any deviations from prescribed procedures. Crewmembers will confine their activities to aircraft operation, descent and approach monitoring, and checklist accomplishment from the initial descent point to block in. Under no circumstances will crewmembers deviate from these duties except for inflight emergencies.

6.49. Instrument Approach Minimums. Base approach minimums on aircraft approach categories established in FAR Part 97.

6.49.1. Circling Approach. Minimum descent altitude (MDA) will be as published for category aircraft. If the minimums are not published by category the minimums should be no lower than the value indicated below plus the published airport elevation.

6.49.1.1. Category A - 400 feet - 1 mile.

6.49.1.2. Category B - 400 feet - 1 miles.

6.49.1.3. Category C - 500 feet - 1 ½ miles.

6.49.1.4. Category D - 600 feet - 2 miles.

6.50. Weather Below Minimums. If the reported ceiling is below the minimum for the approach, but the visibility value is at or above the authorized minimums before initiating an en route descent or penetration and approach, make sure fuel remaining is sufficient to accomplish the en route descent or penetration, approach, missed approach, and flight to alternate with appropriate reserves.

6.50.1. An aircraft commander may hold at a destination which is below landing minimums, but forecast to improve to, or above minimums, provided:

6.50.1.1. Fuel remaining is more than required to hold for the appropriate holding time and fly to the alternate, and weather for the alternate is forecast to remain at or above alternate minimums for the period, including holding time.

6.50.1.2. Destination weather is forecast to be at or above minimums before the excess fuel will be consumed.

6.51. Instrument Approach Procedures:

6.51.1. Fly instrument approaches to maintain proficiency and to positively identify arrival airports. Visual approaches are authorized to maintain visual landing proficiency. Use radar monitoring when feasible.

6.51.2. Fly a precision approach, if available, at night and during marginal weather. If a PAR and ILS are available, fly one and use the other as a backup. If PAR or ILS is not available, fly any available approved instrument approach. On training or evaluation flights pilots may fly nonprecision approaches or VFR traffic patterns to complete requirements.

6.51.3. When flying a coupled approach, assume manual control at or above published minimum altitude (MDA/DH).

6.52. Radar Altimeter Procedures. Set the radar altimeters to the HAT or HAA for the approach being flown. Pilots will crosscheck radar altimeters during descent to ensure adequate terrain clearance is provided throughout the descent and maneuvering portion of the approach. Once established in a VFR traffic pattern, the radar altimeter may be set at pilot's discretion.

6.53. Wake Turbulence Avoidance. Pilots must exercise the discipline necessary to ensure wake turbulence avoidance criteria is observed during flight operations. Acceptance of a visual or contact approach clearance or instructions to follow an aircraft is acknowledgment that the pilot will maintain a safe interval for wake turbulence avoidance. The following instructions expand wake turbulence avoidance criteria, but do not replace guidance in DOD FLIP planning.

6.53.1. For flight behind heavy jets, follow the "Vortex Avoidance Procedures" in FLIP General Planning and **Chapter 7** of the FAA Airman's Information Manual.

6.53.2. Landing behind a larger aircraft -- same runway. Stay at or above the larger aircraft's final approach flight path. Land beyond its touchdown point.

6.53.3. Landing behind a larger aircraft -- parallel runway closer than 2,500 feet. Consider possible drift of vortex to your runway. Stay at or above the larger aircraft's final approach flight path. Land beyond its touchdown point.

6.53.4. Landing behind a departing larger aircraft—same runway. Land well prior to larger aircraft's rotation point.

6.53.5. Departing behind a larger aircraft. Rotate prior to larger aircraft's rotation point. Continue to climb above the larger aircraft's climb path until turning clear of its wake. Avoid subsequent headings that will cross below and behind a large aircraft.

6.53.6. Departing or landing after a larger aircraft executing a low approach, missed approach or touch-and-go landing.

6.53.7. Low approaches behind heavy jets will be flown no lower than that altitude which ensures the aircraft remains well above the flight path of the heavy jet.

6.53.8. Helicopters. In a slow hover-taxi or stationary hover near the surface, helicopter main rotor(s) generate downwash producing high velocity downwash vortices to a distance approximately three times the diameter of the rotor. In forward flight, departing or landing helicopters produce a pair of strong, high-speed trailing vortices similar to wing tip vortices of larger fixed wing aircraft.

6.53.9. Pilots operating directly behind a heavy jet at the same altitude or less than 1,000 feet below will request 5 miles air traffic wake turbulence separation (if not already provided) behind a heavy jet.

6.53.10. Pilots landing behind a heavy jet will request air traffic wake turbulence separation (if not already provided). This distance is measured at the time the preceding aircraft is over the landing threshold.

6.53.11. Appropriate time or distance intervals should be provided to departing aircraft: Two minutes or 5 miles radar separation when departing in a small/large aircraft behind a heavy jet.

Section 6I—Postflight

6.54. Classified Material:

6.54.1. Turn in authenticators and other classified materials at destination, and obtain receipts for classified material. CCCs will provide temporary storage for authenticators and classified materials during ground time at en route stops. Issue and turn-in of authenticators normally is a function of base operations. At locations where no storage facilities exist, the aircraft commander will ensure classified material is properly protected.

6.54.2. Remove any classified information in the FMS, UNS or GPS.

6.54.3. In an emergency, destroy or damage classified material and equipment prior to crash landing or bailout if possible.

6.55. Impoundment. If an aircraft is involved in a serious inflight incident, the aircraft commander should impound the aircraft immediately after landing and contact the controlling agency for further instructions.

Section 6J—Debriefing

6.56. Maintenance. The aircraft commander is responsible for insuring aircraft maintenance forms are correct. He may designate another crewmember to accomplish maintenance form completion.

6.56.1. Enter "aircraft subjected to salt spray" on the aircraft maintenance forms any time the aircraft is flown under 1,000 feet AGL over salt water, excluding takeoffs and landings.

6.56.2. The aircraft commander and other pertinent crewmembers will debrief maintenance personnel on the conditions of the aircraft, engines, avionics equipment, and installed special equipment immediately after arrival. At stations where no maintenance support is available, provide a thorough debrief to the Operations Center prior to entering crew rest.

6.57. Weather. The aircraft commander or a representative will pass significant information to the appropriate weather unit.

6.58. Intelligence. Debrief intelligence when applicable.

6.59. Crew Debriefing. On flight with other crewmembers, the aircraft commander will allow each crewmember the opportunity to discuss unusual aspects of the mission. Debriefings may be formal or informal. The appropriate forms will be completed and available for review by the commander or operations officer as soon as practical after mission completion.

6.60. Aircrew Notification Procedures. When transiting installations, the aircraft commander will establish a point of contact with base operations or local airport manager when crew-resting off base. The aircraft commander will be notified immediately in case of incident or emergency affecting the safety or security of the aircraft.

6.61. Electronic Devices. The use of electronic devices is as specified in AFI 11-202, Volume 3 and AFSOC Sup 1. For electronic devices not listed, the user will provide the aircrew a letter from the Aeronautical Systems Division, Deputy for Engineering (ASD/ENACE) certifying the device is approved for airborne use. If the aircrew detects any electronic interference from an electronic device used aboard the aircraft, discontinue use of device for the duration of the flight.

Chapter 7

AIRCRAFT SECURITY

7.1. Overview. This chapter provides guidance on aircraft security and unlawful seizure (hijacking) of AFSOC aircraft. Every reasonable effort will be made to resist an aircraft hijacking. Resistance may vary from dissuasion to direct physical confrontation, including the use of weapons. Aircrews will not release information concerning hijacking attempts or identify armed aircrew members to the public.

7.2. Security. C-212 aircraft are priority C resources. This security priority designation applies to operational aircraft, wherever they may be located, worldwide. Some aircraft contain equipment and documents which require protection as per DOD 5200.1 and AFI 31-401 *Managing the Information Security Program*. Requirements for protection of the aircraft in a transient status at US and foreign bases are found in DOD 5200.1 and AFI 31-401.

7.3. Procedures. The planning agency must ensure that adequate en route security is available. Aircraft commanders should determine what protection is needed. The amount of protection required will vary, depending on the location and ground time. Aircraft commanders will receive a threat assessment and security capability evaluation briefing at home station, and receive updates at en route stops. Aircraft commanders will assess the situation and take the following actions, if necessary:

7.3.1. Area Patrol. Request area patrol coverage from local security forces. If local authorities request payment for this service, use AF Form 3l5, **United States Air Force Invoice**.

7.3.2. Aircrew Surveillance. Direct armed crewmembers to remain with the aircraft and maintain surveillance over aircraft entrances and activities in the vicinity of the aircraft.

7.3.3. Departure Without Crew Rest. If local security forces are unacceptable or unavailable and the crew is not augmented with security police, the aircraft commander may waive crew duty time limitations and depart as soon as possible for a base listed as reliable.

7.3.4. Unauthorized Entry. If, in the aircraft commander's judgment, the aircraft needs to be locked and sealed to detect unauthorized entry:

7.3.4.1. Lock all doors.

7.3.4.2. Secure the hatches and doors in a manner that will indicate unauthorized entry; for example, wipe the immediate area around doors clean to help investigate forced entry. If the door has been tampered with, notify the appropriate local authorities, the controlling agency, and inspect the aircraft thoroughly.

7.3.4.3. Coordinate with the local base ops representative on procedures for servicing the aircraft while the crew is away.

7.4. Protective Standards for Aircraft Carrying Distinguished Visitors (DV). This paragraph applies specifically to aircraft transporting DVs Code 4 or above. Aircraft commanders are responsible for aircraft security at en route stops.

7.4.1. DOD Installations. Notify the base security police of estimated arrival and departure times. Request continuous security surveillance during the entire ground time. If the installation is unable to comply, arrange for the best protection available.

7.4.2. Non-DOD Installations. Contact the airport manager or installation commander to arrange for aircraft security. If available security is inadequate, purchase additional security using AF Form 315.

7.4.3. Locking. Lock the aircraft during all missions remaining over night (RON).

7.5. Arming of Crewmembers. When directed, a crewmember will carry a weapon.

7.5.1. Issue. Before departing home station, authorized crewmembers will obtain weapons and ammunition. Crewmembers must present a current AF Form 523, **USAF Authorization to Bear Firearms**, to be issued a weapon. Crewmembers will be reissued the same weapon until the mission terminates at home station. If an armed crewmember must leave the crew en route, transfer the weapon to another authorized crewmember, using AF Form 1297, **Temporary Issue Receipt**.

7.5.2. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels if available. To transfer loaded weapons to another crewmember, place the weapon on a flat surface. Do not use a hand-to-hand transfer.

7.5.3. Wearing of Weapons. Wear weapons in a holster, concealed at all times to protect the identity of armed crewmembers. Do not wear weapons off the flight line, except to and from the CCC, armories, and other facilities associated with aircrew activities such as, base operations, fleet service, cargo and passenger terminals, flight line cafeterias, snack bars, etc.

7.5.4. Crew Rest. During crew rest, store weapons in the most secure facility available, normally the base armory. Acceptable storage facilities are US and Allied military services armories, US National Guard and Reserve armories, and US civil law enforcement armories. If none of these are available, or the aircraft commander believes weapons' security may be compromised, crewmembers may secure the weapons in their quarters, but one crewmember must remain with the weapons. In this case, turn the ammunition over to the aircraft commander. If the country prohibits or restricts the entry of weapons, secure firearms and ammunition in the aircraft in the most secure and least visible location. Ensure the aircraft is locked.

7.6. General Hijacking Guidance. The hijacking of a AFSOC aircraft could create a serious international incident and jeopardize the safety of passengers and property. An aircraft is most vulnerable when the crew is on board and the aircraft is ready for flight. Hijackers cannot be dealt with as ordinary criminals. Some are mentally disturbed, emotionally unstable individuals for whom the threat of death is not a deterrent, but a stimulus to crime. Delay tactics have been most successful in saving lives and property. Crews must resist all attempts to hijack their aircraft. Resistance may vary from simple discouragement to direct physical attack with weapons. Detection of potential hijackers before they board the aircraft is the best solution to the problem.

7.6.1. Acceptance of Passengers. The host station passenger processing and manifesting facility should conduct anti-hijacking inspections. Do not board passengers unless the aircraft commander is fully satisfied with these inspections. Exception: supporting forces may be anti-hijack inspected at the aircraft by the aircrew.

7.6.2. Aeromedical Procedures. Medical facility commanders are responsible for anti-hijacking inspection of patients. When patients are delivered to the aircraft by civilian sources, the aircrew will perform required inspections before departure.

7.6.3. Contingency and Exercise Movements. During exercises or contingencies in support of combat operations involving the movement of large groups of personnel, the unit being supported should manifest passengers, and perform an anti-hijacking inspection.

7.6.4. Arms and Ammunition. Passengers will not carry weapons or ammunition on their person or in hand-carried baggage aboard an aircraft except special agents and guards of the Secret Service or State Department, and other individuals specifically authorized to carry weapons.

7.6.4.1. Take every precaution to prevent accidental discharge of weapons. If guards or couriers must clear their weapons, ask them to:

7.6.4.1.1. Move to a safe, clear area at least 50 feet from any aircraft, equipment, or personnel before unholstering or unslinging their weapons.

7.6.4.1.2. Clear weapons in accordance with standard safety procedures.

7.6.4.2. Troops and deadhead crewmembers will not retain custody of ammunition on an aircraft but will turn it in to the troop commander or aircraft commander. Troops may carry unloaded weapons and ammunition aboard the aircraft during combat operations. When the tactical situation dictates, weapons may be loaded at the order of the troop commander or team leader.

7.7. Ground Resistance. When the aircraft is on the ground, well planned and executed actions by ground forces and the crew provide the best opportunities to thwart a hijacking. Crewmembers (including ACMs) will know who is armed.

7.7.1. Initial Action. Delay movement of the aircraft to provide time for ground forces and the aircrew to evaluate the situation and coordinate their efforts.

7.7.2. Communications. Establish communications with ground agencies using radios, IFF/SIF equipment, or any covert means available.

7.7.3. Delaying Actions. Continue to delay until, in the judgment of the aircraft commander, further delay may result in homicidal attempts by the hijacker.

7.7.4. Positive Detainment. The aircraft will be detained or disabled when:

7.7.4.1. Requested by the aircraft commander.

7.7.4.2. Nuclear weapons are aboard.

7.7.4.3. Directed by COMAFSOC or higher for national security.

7.7.5. Local Procedures. The aircraft commander will review local ground support anti-hijacking procedures at en route bases before departure.

7.8. Inflight Resistance. After an aircraft is airborne, success in thwarting a hijacking attempt depends on the resourcefulness of the crew. Take advantage of any opportunity to regain control of the aircraft or influence the conduct of the flight.

7.8.1. If the hijacker does not permit the use of the radio and the aircraft is under positive control of an ATC facility, attempt to communicate by using the IFF/SIF.

7.8.2. Notify crew and passengers of the situation as soon as practical for maximum assistance against the hijacker.

7.8.3. Be as negative to all the hijacker's demands as possible. Initial response to the hijacker should leave the issue in doubt. Try to calm the hijacker. Get the hijacker to talk.

7.8.4. Convince the hijacker intermediate stops are necessary for fuel, maintenance, or other problems and these stops must be at US military installations because of incompatibility of fuel and starting units at other airfields. After landing, try to discharge passengers. Use ground forces to regain control of the aircraft.

7.8.5. Give reasons for not complying with the hijacker's demands; for example, inability to communicate with foreign sources (radio frequency or language problem), dangers from surface-to-air missiles, antiaircraft fire, or armed intercept by hostile aircraft.

7.8.6. Propose favorable alternatives; for example, landing in a neutral rather than unfriendly nation.

7.8.7. As a last resort:

7.8.7.1. Simulate emergencies to deceive the hijacker into believing a forced landing is necessary.

7.8.7.2. Use weapons against the hijacker.

7.9. Covert Communications. If in-the-clear radio transmissions are not possible:

7.9.1. To report "Am being hijacked," set transponder to Mode 3, Code 7500. When unable to change the transponder setting or when not under radar control, transmit a radio message which includes the phrase "(aircraft call sign) transponder seven five zero zero."

7.9.2. Controllers will acknowledge Code 7500 by asking the pilot to verify it. An affirmative response or no reply from the pilot indicates confirmation. Controllers will not ask further questions; they will flight-follow, respond to pilot requests, and notify appropriate authorities.

7.9.3. After the start of a hijacking, the aircrew may indicate to the air traffic controller that in-the-clear communications are not possible (the hijacker is in the cockpit) by using the word "TRIP" after the aircraft call sign prefix (MULL "TRIP" 33). The controller should respond using the word "TRIP" in the aircraft call sign. Use of the word "TRIP" in the aircraft call sign by the controller prior to its use by the aircrew asks the aircrew if clear communications are possible. In this situation, the aircrew response should include the word "TRIP" only if clear communications are not possible. After an aircrew has advised ATC that clear communications are not possible, ATC will limit radio transmissions to the minimum essential ATC functions until advised otherwise by the aircrew.

7.9.4. When controllers receive a hijacking report in the clear, they assign Code 7500 to the aircraft. The pilot may still change to Code 7700 later, if necessary.

7.9.5. To report "Situation appears desperate; want armed intervention," change from Code 7500 to 7700. When unable to change the transponder setting or when not under radar control, transmit "(aircraft call sign) transponder seven seven zero zero.

7.9.5.1. Remain on 7500 for at least 3 minutes or until receiving controller confirmation of Code 7500 from the controller, whichever is sooner, before changing to Code 7700.

7.9.5.2. Controllers treat aircraft squawking Code 7700 and not in radio contact with the ground as having an in-flight emergency (in addition to hijacking) and will follow their appropriate emergency procedures.

7.9.6. To report "Situation still desperate; want armed intervention and aircraft immobilized," leave full flaps down after landing or lower full flaps while on the ground and transmit "(aircraft call sign) flaps are down."

7.9.7. To report "Leave alone-do not intervene," retract flaps after landing and transmit "(aircraft call sign) flaps are retracted." Pilots who retract flaps after squawking Code 7700 should return to Code 7500 and remain on Code 7500 for the next leg of the hijacked flight unless the situation changes again. Transmit "(aircraft call sign) back on seven five zero zero" to emphasize that intervention is no longer desired.

7.10. Forced Penetration of Unfriendly Airspace:

7.10.1. Procedures. Procedures in this paragraph should prevent hostile actions against an aircraft which penetrates the boundary of an unfriendly nation as a result of a hijacking. Comply with instructions received by radio or from an interceptor. Without instructions comply with the following before entering unfriendly airspace:

7.10.1.1. Maintain an altitude between 10,000 and 25,000 feet MSL, if possible.

7.10.1.2. Fly the most direct courses to the destination demanded by the hijacker unless the hijacker insists on another route.

7.10.1.3. Transmit MAYDAY on 243.0, 121.5, or 2182.

7.10.1.4. Squawk Mode 3, Code 7700.

7.10.1.5. Destruction of Classified Material. Try to destroy all classified documents and equipment aboard the aircraft before landing in an unfriendly nation.

Chapter 8

FLYING TRAINING POLICY

8.1. Overview. This chapter outlines procedures, requirements, and restrictions for training and evaluation missions. See AFI 11-202, Volume 1 and 3, and Volumes 1 and 2 of this instruction for additional information.

8.2. Instructor or Flight Examiner Briefings. Before all training and evaluation missions, instructors or flight examiners brief their crew on the mission profile, training requirements, and objectives or evaluation requirements.

8.3. Debriefing. After all training flights, instructors will:

8.3.1. Review and critique student performance.

8.3.2. Review training requirements fulfilled for each student and aircrew member (all aircrew members should understand thoroughly what training was accomplished).

8.3.3. Answer technical questions.

8.3.4. Preview the objectives of the next mission.

8.3.5. Complete training paperwork.

8.4. Simulated Emergency Flight Procedures: Simulated emergencies are authorized in day or night VMC and day IMC if the weather is at or above circling minimums. Simulated emergencies are authorized in night IMC if the weather is at or above circling minimums or above 1000 ft ceiling and 2 miles visibility, whichever is higher.

8.4.1. Practice emergencies which require simulating an engine shutdown, placing switches in other than their normal position, or an abnormal configuration, only during training, evaluation, or currency flights when an instructor or flight examiner pilot has access to a functioning set of flight controls and required flight instrumentation.

8.4.1.1. Instructor pilot candidates who occupy a pilot seat, and are under the supervision of a flight examiner pilot without access to a functioning set of flight controls and required flight instrumentation, may practice simulated emergency procedures during initial upgrade or requalification evaluations to instructor pilot.

8.4.1.2. Preface all simulated emergencies with the word "simulated" and terminate simulated emergencies when an actual emergency arises.

8.4.2. Do not perform simulated emergencies when passengers or medical crewmembers (except flight surgeons performing required flight duties) are aboard.

8.4.3. Conduct simulated emergency flight procedures IAW AFI 11-202, Volume 3 and this directive. Use a realistic approach and do not compound emergencies. Limit simulated emergencies to non-critical phases of flight when possible. Notify the controlling agency if a nonstandard traffic pattern or pattern requiring special sequencing is anticipated.

8.4.4. Request "option approach" prior to initiating an approach when a landing or low approach option is desired. (Example: "Request ILS option approach."). An “Option Approach” is a touch-and-go, missed approach, low approach, stop-and-go, or full stop (ref. AIM).

8.4.5. Training restrictions for specific flight maneuvers are listed in paragraph **8.8.**

8.5. Touch-and-Go Landings. Touch-and-go landings are authorized on designated training, evaluation, or currency missions by any current and qualified pilot IAW the following stipulations:

8.5.1. The crosswind component must not exceed 15 knots. Pilots must use caution when performing touch-and-gos on other than dry, hard surfaced runways.

8.5.2. Touch-and-gos are prohibited on icy runways. Ceiling and visibility (RVR) must be at least 300 feet and ¾ mile (40).

8.5.3. Touch-and-go landings are not authorized when normal wake turbulence criteria is not met, or when intercepting or crossing the flight path of a heavy jet while performing an approach or landing.

8.5.4. Do not perform ground-idle touch-and-go landings.

8.6. Stop-and-Go Landings. Stop and go landings are authorized on designated training, evaluation, or currency missions. Any current and qualified pilot may perform stop-and-go landings IAW the following stipulations:

8.6.1. The crosswind component must not exceed 15 knots. Pilots must use caution when performing stop-and-gos on other than dry, hard surfaced runways. Stop-and-gos are prohibited on icy runways. Ceiling and visibility (RVR) must be at least 300 feet and ¾ mile (40).

8.6.2. Use minimum braking as required to stop and assure runway remaining is equal or greater than accelerate/stop distance. For multiple maximum braking landings, comply with the ground cooling requirements as specified in the airplane flight manual.

8.6.3. Runway remaining for takeoff must meet the requirements of paragraph **5.12.** of this instruction.

8.6.4. Stop-and-go landings are not authorized when normal wake turbulence criteria is not met, or when intercepting or crossing the flight path of a heavy jet while performing an approach or landing.

8.7. Simulated Instrument Flight. Do not use a hood or other artificial vision-restricting device. Simulated instrument flight may be flown and logged without use of a vision-restricting device.

8.8. Training Maneuver Restrictions:

8.8.1. Aborted Takeoff. Authorized during day or night VMC or with NVGs. Crosswind component must not 15 knots. The runway must be dry, hard surfaced, minimum of 60 feet wide, and long enough to meet normal takeoff distance requirements. Initiate the abort by stating "REJECT" before refusal speed. Do not practice aborts from touch-and-go or stop-and-go landings. If actual engine shutdown due to a simulated malfunction is to be practiced, it must be pre-briefed.

8.8.2. Actual Engine Shutdown and Airstart. One engine may be shut down in day VMC only, at a minimum of 5000 feet above the ground or cloud deck, whichever is higher. Do not shut down the engine unless the aircraft can remain clear of clouds and recover and land under visual flight rules.

8.8.3. Steep Turns. Determine stall speeds prior to making turns. Authorized in day VMC only. Do not exceed 60 degrees of bank. (Instructor not required).

8.8.4. V_{mc} Demonstration. Stall speed and engine inoperative minimum control should be determined prior to flight. Authorized in day VMC only, at a minimum altitude so that recovery is completed by 3000 feet AGL, 3000 feet above the cloud deck, or the manufacturer's recommended altitude, whichever is higher. Initiate recovery at the first recognition of loss of directional control by simultaneously reducing the power on the operating engine and reducing the angle of attack as necessary to regain directional control and airspeed.

CAUTION: There is a density altitude above which the stall speed is higher than the engine inoperative minimum control speed. When this density altitude exists below 3000 AGL because of high elevations, high temperatures, or both, an effective flight demonstration of loss of directional control may be hazardous and should not be attempted. It is determined prior to flight that the stall speed is above or equal to V_{mc}, this flight demonstration is impracticable.

8.8.5. Stalls.

8.8.5.1. Power-off Stalls. Determine actual stall speeds prior to maneuver. Authorized in day VMC only, at a minimum altitude so that recovery is completed by 3000 feet AGL, 3000 feet above the cloud deck, or the manufacturer's recommended altitude, whichever is higher. The stall may be entered from either straight or turning flight in the approach and landing configuration. Initiate recovery when buffet or decay of control effectiveness is encountered, actual stall speed is reached, engine RPM decay is detected, or any abnormal engine indication is discovered, whichever occurs first.

8.8.5.2. Power-on Stall. Not authorized.

CAUTION: There is a density altitude above which the stall speed is higher than the engine inoperative minimum control speed. Simulated or actual engine-out power-on stalls are prohibited.

8.8.6. Go Around or Missed Approach. Minimum altitude is 500 feet AGL when aircraft, equipment, or personnel are on the runway. Initiate VFR go-arounds no lower than 50 feet AGL when practicing simulated emergencies other than engine failure. Initiate practice instrument missed approaches no lower than the minimum altitude for the approach. (Instructor not required.)

8.8.7. Simulated Engine Failure, Forced Landing and Engine-Out Landing.

8.8.7.1. Simulated engine failure should not be lower than 300 feet AGL.

8.8.7.2. Simulate a failed engine by setting the throttle at 17% torque.

8.8.7.3. Use both engines for touch-and-go takeoffs.

8.8.8. Simulated Engine-Out Go-Around or Missed Approach. Initiate simulated engine-out go-around no lower than 200 feet AGL. Initiate simulated engine-out missed approach no lower than the minimum altitude for the approach.

Chapter 9

TACTICAL NAVIGATION PROCEDURES

9.1. Overview. Missions may be long-range with the low-level portion commencing before reaching the target area, or short to medium range with the entire mission being flown at low level. This chapter deals with mission en route procedures prior to reaching the target/objective area.

9.2. Weather Requirements. Weather must be VFR IAW AFI 11-202, Volume 3 for all tactical operations except for NVG Instrument Approaches. Reference **Attachment 2** for environmental effects on NVG flying.

9.3. Altimeter Settings. Use the best available altimeter setting. If the current altimeter setting is unknown, set altimeters to the minimum setting briefed for the mission.

9.4. Minimum En route Time. En route flight time from takeoff to time over target will be sufficient to safely accomplish all required checklists. For airdrops involving personnel, the aircraft commander and jumpmaster must approve en route time of less than 25 minutes.

9.5. En route Airspeeds:

9.5.1. High Altitude. Some missions include a high altitude portion of flight prior to and after penetration from target area. Missions must be planned to provide the crew with the flexibility necessary to compensate for such inflight factors as weather deviations, avoidance of reported and unreported ground or air threats, and unexpected head or tail winds.

9.5.2. Low Altitude. Arrival of the aircraft over the specific target at a designated time will be within plus or minus two minutes. Gaining or losing significant amounts of time at low level has proven to be highly undesirable. The gain or loss of time should be accomplished prior to low level so that planned low level entry time is achieved.

9.6. En Route Altitudes:

9.6.1. High Level. The selected altitude will depend upon factors such as fuel consumption, traffic control separation, radar capabilities, threats, and meteorological data.

9.6.2. Low Level. The selected altitude depends upon factors such as threats, moon illumination, equipment limitations, weather, and terrain/cultural features. Fly the highest altitude commensurate with detection and threat using the following criteria:

9.6.2.1. Day VMC. Maintain a minimum of 300 feet AGL modified contour altitude above the terrain by reference to the terrain and radar altimeter.

9.6.2.2. Night VMC With NVGs. Maintain a minimum of 500 feet AGL modified contour altitude above the terrain by reference to the terrain and radar altimeter.

9.6.2.3. Night VMC Without NVGs. Maintain a minimum of 500 feet AGL above the highest obstacle within 3 NM of course centerline.

9.6.2.4. Minimum Safe Altitude (MSA). MSA is a moderately low altitude which will provide positive terrain clearance when flight conditions are unacceptable for normal operations. To com-

pute the MSA for day modified contour, add the elevation of the highest obstruction or terrain feature within 3 NM of route centerline to the AGL flight altitude for that leg. For night visual operations, MSA will be computed using MSL altitudes. Compute by adding 1,000 feet to the highest obstacle or terrain feature within 5 NM of route centerline. Round all MSAs to the next higher 100-foot increment.

WARNING: An operable radar altimeter is required for low level flight below the appropriate MSA during night operations.

9.6.2.5. Emergency Safe Altitude (ESA). ESA is an altitude, which will provide positive terrain clearance in IMC during situations that require leaving the low-level structure. To compute the ESA, add 1,000 feet to the MSL elevation of the highest obstacle/terrain feature within 22 NM of course centerline for that route/route segment. For mountainous terrain, use 2,000 feet. Round to the next higher 100-foot increment.

9.7. Mission Planning. One day will normally be allocated for mission planning. Designate the crewmembers required to participate. They should be exempted from other duties so their full attention will be on the mission. Identify individual responsibilities to efficiently use the time available. Unit training missions and exercises should involve real world scenarios from planning to debrief. Plan for the current mission requirements and then plan for the "worst case" situation (i.e. max gross weight, adverse winds, abnormal fuel consumption, enemy compromise, downed aircraft etc.).

9.7.1. In preparation for mission planning, attempt to obtain as much as possible of the following:

9.7.1.1. High quality imagery of target area and landing zone. This facilitates final approach planning and LZ recognition.

9.7.1.2. Landing surface dimensions, obstacles, and surface conditions.

9.7.1.3. Moisture at the LZ or any other meteorological element that might affect landing surface weight bearing capability.

9.7.1.4. Threats (AOB, GOB, etc.).

9.7.1.5. Assemble as many different charts and photographs of the area of operations as possible. As a minimum the following three charts are required, when available.

9.7.1.5.1. Joint Operations Graph (JOG) 1:250,000. The JOG or equivalent is the primary chart for planning and flying the en route portion of the mission. The scale provides for a relatively small chart, uncluttered with extraneous information. It has latitude/longitude and UTM coordinates, and when properly prepared, is very "night" compatible.

9.7.1.5.2. VFR Sectional or Tactical Pilotage Chart (TPC) 1:500,000. The VFR sectional is consulted because it is updated more frequently than the JOG. It also provides accurate information on controlled airspace, major towers, airports, beacons, and power lines as well as current magnetic variation. The sectional should normally not be used for 200 foot contour flying as its scale does not allow sufficient detail for accurate pilotage, and is relatively cluttered.

9.7.1.5.3. Tactical 1:50,000 or larger. The tactical chart (1:50,000) is used to accurately locate and confirm unique map features and to transfer them to the JOG. It displays more detail in those areas, which may be difficult to interpret on the JOG. It should be used for the run in

from Initial Point (IP) to LZ/DZ. Consider using geological survey charts if 1:50,000 charts are not available. Relief charts are also very helpful, when available.

NOTE:

Use caution when transitioning to 1:50,000 charts from the JOG. The aircraft is traveling at a relatively faster rate over this chart and pilotage pacing will increase.

9.7.1.6. Because charts rapidly become outdated, aerial photos (especially low altitude oblique shots) should be requested for the entire route. As a minimum, a strip 5 NM either side of centerline from the IP to the LZ should be obtained.

9.7.1.7. Demographics and cultural features to facilitate identifying tactics and operating window.

NOTE:

If these requirements are not satisfied, additional maneuvering and reconnaissance may be required in the target area.

9.7.2. The pilots perform the following items for tactical missions.

9.7.2.1. Chart Preparation. Draw the route of flight on a topographic chart of 1:250,000 scale or larger. Center symbols depicting checkpoints, IPs, objectives, and so forth on the point. Course lines will not be drawn through these symbols. It is absolutely imperative that the navigation chart be prepared accurately with extreme care and attention to detail. Use one chart per mission. Do not use the same chart for a different mission in the same area. Avoid cluttering the chart. Outline only those features that you expect to see (significant terrain contours, railroads, power lines, towers, etc.). Annotate the chart with the following items:

9.7.2.1.1. Circled and labeled turn points/check points connected by course lines. Course-lines may be plotted either point-to-point or radius of turn.

9.7.2.1.2. A square will depict the initial point.

9.7.2.1.3. A triangle will depict the objective.

9.7.2.1.4. A circle with a diagonal line will depict emergency airfields.

9.7.2.1.5. A line across the course line will depict the combat entry point (CEP).

9.7.2.1.6. Magnetic course, leg distance, leg time, and MSA will be annotated in a course arrow box along each leg of the route. Optional course arrow boxes can be used as long as they contain, as a minimum, the above listed information.

9.7.2.1.7. ESA for the route/route segment and MSA for each leg/leg segment, as applicable. ESA will be conspicuously annotated on the chart. Circle the obstruction that each MSA is based upon.

9.7.2.1.8. When the CHUM is available, low level charts will be annotated with any added, deleted, or changed information as contained in the most recent CHUM or supplement. Charts will be chummed at least 22 NM either side of the planned route of flight. On the back of the chart, individuals will annotate current CHUM, chart edition, date chart completed, ground speed chart was drawn for and name.

9.7.2.1.9. Special use airspace, military training routes and other airspace boundaries that may affect the mission within 3 NM of course centerline.

9.7.2.1.10. Visual navigational checkpoints between turn points.

9.7.2.1.11. Threat locations and order of battle (OB) information as applicable to the mission. If this information is classified, the chart will be properly marked.

9.7.2.1.12. Location of inflight warnings.

9.7.2.1.13. For multi-engine aircraft, compute a single engine maximum altitude to determine if single engine capability exists along the route of flight.

9.7.2.2. Low Level Log. Use a low-level log to plan all low level missions.

9.7.2.2.1. The flying pilot will use an in-flight low level log during all low-level missions. The log may be computer generated or manually prepared. As a minimum, the log will contain the following information: ESA for the route or route segment, name of each turn point and coordinates, and for each leg, magnetic course, distance, time, and MSA.

9.7.2.2.2. The navigating pilot is encouraged to use a low-level log in flight, however it is not a substitute for an individually prepared route chart.

9.7.2.3. Route Selection. The route to and from the target area must be tactically sound but not so difficult as to inhibit successful navigation. Each mission will differ and involve numerous variables. Listed below are general rules for proper route selection.

9.7.2.3.1. Avoid brightly-lit areas, roads, and population centers.

9.7.2.3.2. Avoid planning the route near navaids or airports. Hazards include other aviation operations and detection by radar oriented on these facilities.

9.7.2.3.3. Plan to negotiate large north-south valleys on the moonlit side. This helps avoid shadows cast by the moon, and permits silhouetting of terrain features for navigation.

9.7.2.3.4. Plan to negotiate narrow valleys and passes in a east-west or west-east direction (depending on where the moon is) so the terrain will be visible and shadows avoided.

9.7.2.3.5. Never plan a route that heads directly into a low angle rising or setting moon. Alter the course, as necessary, to fly a zigzag course when left with no other choice.

9.7.2.3.6. Always select intermediate reference points (power lines, towers, roads, rivers, ponds, railroads, etc.) along each leg of the route for course confirmation and timing. Computing hard times for each of these points is time consuming but valuable. This provides rapid feedback on time status, which enables the crew to more easily recover in case of a late departure or mission time of arrival (TOA) changes.

9.7.2.3.7. If possible, plan to cross major roads, railroads, and rivers at large angles (90 degrees) in order to reduce exposure time. Avoid flying an en route segment, which follows lines of communication.

9.7.2.3.8. If it is impossible to avoid flight near population centers or major roads, and the area is hostile or compromising, consider flying that leg at a higher airspeed in order to reduce exposure time.

9.7.2.3.9. When computing headings, distances, and times for the route, compute the same information from barriers and prominent chart features. This will aid in re-establishing the aircraft on course if a turn point is missed or the crew becomes disoriented.

9.7.2.3.10. Anticipate power lines/wires being located near roads, towers, and buildings in open fields. Warn the pilot of upcoming power lines, towers, and other obstructions.

9.7.2.3.11. Plan alternate routes and cut-legs in the event the primary route is unusable due to weather, enemy compromise, mission TOA changes, late departures, etc. It is especially important to plan alternate run-ins in case of runway change or enemy compromise at the original IP. Mission planning and adherence to the planned route of flight is critical to the success of low-level operations. Flying off centerline may be necessary for more effective terrain masking or to avoid populated areas or known threats. These adjustments should be made during mission planning, if possible. Aircrews may deviate from planned route in flight due to unforeseen factors. Keep deviations to the minimum required. Maintain position awareness at all times.

9.7.2.4. Turn Point Selection. After a general route has been determined, select turn points to control movement and time along the route. Study the turn points carefully using all available charts and photos. Listed below are general rules for turn point selection.

9.7.2.4.1. Turn points should be unique natural or man made features that are detectable at a distance. Avoid features that are only visible when directly overhead. EXAMPLE: A small bridge in heavy vegetation or a small road X in the forest.

9.7.2.4.2. Turn points should contrast with the surrounding terrain. Small paved roads are poor features to use in terrain with heavy vegetation, but provide excellent contrast in a desert environment. Small bodies of water provide very little contrast in terrain with vegetation, but contrast well in the desert.

9.7.2.4.3. Avoid selecting turn points near towns as the town will invariably grow and may make detection of the turn point difficult. Additionally, over flying towns may compromise the security of the mission.

9.7.2.4.4. Turn points should not be in the vicinity of bright lights.

9.7.2.4.5. Turn points should be confirmed by using a prominent feature along the route and close to the turn point.

9.7.2.4.6. Consider the moon angle and illumination. The turn point should never fall within the shadow cast by nearby terrain features.

9.7.2.4.7. Try to select prominent barriers near turn points. It is often better to discard a good turn point with no barrier in favor of a more difficult turn point with an excellent barrier.

9.7.2.4.8. The first and last turn points of the route are the most important. An easily identifiable feature should be used even if the flight route must be altered slightly. This helps ensure positive location and timing. When planning an IP, allow enough time to get the aircraft configured and stable for the approach, but not so much time that drift/enemy compromise become limiting factors (4 to 8 miles works well).

9.7.2.4.9. If possible, LZs should have an IP that aligns the run-in with the runway axis. However, a good IP is more important than an exact alignment with the runway heading. If the

threat environment allows, consider conducting a “270” maneuver. This maneuver allows for IPs 90 degrees off runway axis, and for an “unaided” LZ, easier identification of the landing area. This maneuver takes approximately 1 minute from crossing the runway to touchdown.

9.7.2.4.10. In varying terrain, make note of the MSL altitude at each turn point to aid in turn point identification. This technique is especially valuable in mountainous terrain.

9.8. Crew Briefing: It is imperative that a complete and detailed crew briefing is conducted prior to low-level flight. This briefing is normally conducted by the navigating pilot and covers as a minimum the following items:

9.8.1. ESA and the determining obstacle.

9.8.2. Alternate airfields.

9.8.3. Combat entry point.

9.8.4. The location of inflight warnings.

9.8.5. For each leg, the course, distance, time, MSA and significant terrain or threats.

9.8.6. The objective area. Review the survey and any aerial photography or tactical charts (1:50,000) available and brief the following items:

9.8.6.1. For an LZ, brief the runway orientation, the run-in orientation, the LZ dimensions, significant obstacles, expected markings, planned point of touchdown and its coordinates, escape route in the event of a balked landing, and compare LZ length to performance data for landing and for takeoff.

9.8.6.2. For a DZ, brief the DZ orientation, its dimensions, significant obstacles, expected markings, point of impact and its coordinates, escape route, type of drop, altitude, green light time, CARP or HARP, and emergency procedures.

9.8.7. Action to follow (i.e. combat exit point, subsequent low-level route).

9.8.8. Pilots will brief emergency actions for loss of NVGs during critical phases of flight (takeoffs, landings, airdrops, etc.). Specific procedures are aircraft commanders’ discretion.

9.9. Inflight Aircrew Procedures: WARNING: It is recognized that 3 to 3.5 seconds are needed from the time a stimulus (perceived closure rate, crewmember input, etc.) is received and recognized until the reaction (control input, crewmember action, etc.) to the stimulus is complete. All crewmembers need to be cognizant of this relationship, especially during critical phases of flight.

9.9.1. The radar altimeter must be operational for flight below the appropriate MSA during night low level operations. Set the altitude clearance markers to 90 percent of the desired route altitude. Illumination of the low altitude warning lights indicates the aircraft is too low and an immediate correction is necessary.

9.9.2. Aircrew Duties. Specific duties are:

9.9.2.1. Pilot. Primarily responsible for terrain clearance, heading, and airspeed. Obstruction avoidance area of responsibility is immediately ahead and to the left of the aircraft.

9.9.2.2. Copilot. Primarily responsible for navigation and time control. Obstruction avoidance area of responsibility is immediately ahead and to the right of the aircraft. Provide the pre-turn

point information to include new magnetic course, distance, MSA, description of turn point, and significant terrain description. The other pilot will acknowledge the new magnetic course. The turn point briefing and course acknowledgment must be completed prior to the turn point so as not to distract the crew from positively identifying the turn point. Both pilots should reset their heading markers to the new course when able. Monitor the pilot's airspeed, heading and bank angle as a back up.

NOTE:

During low level operations, the pilots must be in their seats at all times. If either pilot must leave the seat, climb to the appropriate MSA prior to leaving the seat.

9.9.2.3. Loadmaster or Jumpseat. Backs up pilots on airspeeds, altitudes, headings, and terrain avoidance. Since the pilots are focusing their outside attention close to the aircraft, the LM or Jumpseat clears farther ahead for obstructions and other aircraft.

9.9.3. Updating the computer navigation system. Computer navigation system updates help maintain course and assist the visual acquisition of route checkpoints. Updates may be made at intermediate visual checkpoints as well as turn points.

9.9.4. Turns are normally made at the turn point. However, terrain masking may require turning at an offset turn point. When the turn point cannot be located visually, the turn will be initiated when at the preplanned linear boundary, the leg time elapsed or the computer navigation system distance-to-go stops decreasing.

9.9.5. GPS/FMS Procedures. Aircrews may use the FMS for situational awareness and as a backup to visual navigation. Ensure system use and operation does not interfere with navigation or aircraft control.

9.9.6. Emergency Procedures.

9.9.6.1. Disorientation. When a crew becomes disoriented, immediately establish your position by identifying a prominent terrain feature or landmark.

9.9.6.1.1. Climb to the emergency safe altitude (ESA) during IMC or minimum safe altitude (MSA) if in VMC. Maintain this altitude until positively fixing your position. While higher altitudes will increase the field of view and reduce the terrain hazard, it also exposes the aircraft to threats.

9.9.6.1.2. After obtaining a positive fix, descend and resume low level operations. Cross-check the timing and make any necessary adjustments.

9.9.6.1.3. Terrain, threat, weather, and mission are factors to consider when executing an emergency climb. The aircraft commander must consider each of these factors prior to his decision to make an emergency climb.

9.9.6.2. Engine Out:

9.9.6.2.1. Discontinue low level if feasible.

9.9.6.2.2. If low level flying is necessary, fly the appropriate minimum safe altitude.

9.9.7. Overwater Low-Level Procedures. When descending into an over-water low-level environment, the water may not be visible until approximately 100 feet AWL. To decrease the chance of

impacting the water, match the descending VVI to the height above the water. The LM will backup the pilots by monitoring VVI and altimeters.

9.9.8. En route Airspeed. During night low level operations, the crew must remain alert and be prepared to react properly in the event of an emergency, particularly engine failure. To help provide a margin of safety, fly the low-level route in accordance with the following procedures (not applicable to contingencies):

9.9.8.1. Minimum airspeed is V_2 + 10 with flaps up, and V_2 with flaps set at approach/take-off.

9.9.8.2. When minimum airspeeds results in excessive groundspeed, use offset maneuvering, orbits, etc., to control en route time.

9.10. Navigating to Covert Landing Zones. Some missions may require operations into unmarked and uncontrolled landing zones (LZ). Mission effectiveness depends upon detailed intelligence, extensive aircrew planning and study, precision en route navigation and time control, accurate and timely LZ recognition, and positive aircrew coordination.

NOTE:

During training, do not perform NVG landings to uncontrolled airfields. AFSOC special tactics personnel or appropriately qualified and cleared ATC personnel are required for setup and control of all NVG LZs. HQ AFSOC/DO is the waiver authority for this requirement.

9.10.1. Markings. LZs are marked in one of the following Airfield Marking Patterns (AMP) as defined in AFI 13-217:

9.10.1.1. AMP-1. Normally used to support day or night tactical airlift missions.

9.10.1.2. AMP-2. AMP-2 was formerly referred to as the reception party or "RCL" lighting pattern.

9.10.1.3. AMP-3. AMP-3 was formerly referred to as the "Box and One". This lighting system may use overt or covert lighting equipment.

9.10.1.4. AMP-4. AMP-4 was formerly referred to as the "Blacked out LZ". No markings are required.

9.10.2. Training. Aircrews will normally use AMP-3 with covert lighting or AMP-4 markings for training. To sustain proficiency in the most demanding situations, light configuration priority for the first approach is to an AMP-4 configuration.

9.10.2.1. Aircraft commander discretion applies due to weather, visibility, and moon illumination.

9.10.3. Fuel Planning. The chance of a successful landing to an unmarked LZ decreases when equivalent moon illumination is less than 5 per cent or there is little or no contrast between the LZ and surrounding area. Plan 20 minutes additional fuel for operations involving unmarked LZs.

9.11. Landing Zone (LZ) Surveys.

9.11.1. All LZs must be surveyed IAW AFI 13-217 and appropriate supplements.

9.11.2. ASOS Commander is the approval authority for all unpublished surveys. He is also the waiver authority for LZ criteria and survey requirements.

9.12. Terminal Area Landing Procedures:

9.12.1. Initial Approach. When pre-mission intelligence requirements are not satisfied for unsurveyed LZs, additional maneuvering and reconnaissance may be required in the target area. Perform reconnaissance maneuvering with approach flaps.

NOTE:

During operational training, aircraft must be stabilized, aligned with the runway at 100 feet AGL on final or a go around must be accomplished.

9.12.2. Multiple Patterns. When performing multiple takeoffs and landings, fly the pattern using the same airspeeds and procedures for a normal VFR pattern.

9.12.3. Communications. If landing clearance or go-around signals are to be given is via radio, two-way communications with the reception committee must be established prior to landing. If comm-out procedures are used, presence of a pre-briefed signal constitutes clearance to land. A signal must be pre-briefed to direct a go-around. Radio clearance is the primary method when more than one aircraft is using the landing zone at the same time.

Chapter 10

LOADMASTER PROCEDURES AND FORMS

10.1. Overview . In addition to the duties established in applicable T.O.s and other directives, the loadmaster will comply with the procedures and duties in this instruction. These items need not be briefed and will be performed as normal procedures. The aircraft commander may assign other duties as necessary. When part of the crew the loadmaster will:

10.1.1. Plan loads; handle troops and passengers; prepare equipment for airdrop; and supervise loading, tie-down, and offloading of cargo, baggage, and mission equipment.

10.1.2. Participate in the aerial delivery of equipment, supplies, and personnel.

10.1.3. Be assigned to the crew on airdrop missions and support missions carrying cargo or passengers as indicated by the AFSOC Form 41.

10.1.4. Refuel the aircraft if maintenance personnel are not available.

10.1.5. Perform any other inflight duties as briefed by the aircraft commander.

10.2. Responsibilities of Aircraft Loading:

10.2.1. Normally all air freight, fleet service, and servicing personnel are authorized to perform assigned duties in all AFSOC aircraft when escorted by an authorized individual. Airfreight personnel are responsible for completion of cargo documentation, palletizing, and movement of cargo to and from the aircraft. They will advise the crew of destination, size, weight, and type of cargo (classified, hazardous, etc.); coordinate traffic activities that may affect loading and offloading; and assign sufficient air freight loading personnel for cargo handling. Airfreight personnel are responsible for safe positioning of material handling equipment and cargo to or from the aircraft. Air freight personnel, under the direction of the crew, load, tie-down, and offload the cargo. They also assist in stowing the loading equipment. If cargo, aircraft equipment, or aircraft structure is damaged during loading or offloading, or loading personnel are injured, the crew will assure the aircraft commander, command post, or terminal operations officer is notified.

10.2.2. As part of the crew and when directed by the aircraft commander, the loadmaster is responsible for aircraft cabin preflight, load planning, preparation of weight and balance form, operation of aircraft equipment, supervision and direction of loading, offloading, tiedown, and coordination with loading crew supervisor for checking the cargo against manifests. The loadmaster supervises loading and is responsible for safe movement of cargo into and out of the aircraft.

10.2.3. At locations with no air terminal or traffic personnel, the shipper assumes responsibilities listed in paragraph **10.2.1.**

10.3. Emergency Exits and Safety Aisles. Load aircraft in such a manner that emergency exits are available as follows:

10.3.1. At least one cabin emergency exit is unobstructed.

10.3.2. At least one unobstructed emergency exit is available for each 10 passengers or troops. Seats erected across an emergency exit are not considered an obstruction.

10.3.3. Access to the rear of the aircraft must be maintained without exception.

10.4. Air Cargo Restraint Criteria. Cargo will be restrained IAW the airplane Airplane Flight Manual, Aircraft Operations Manual loading instructions or IAW **Chapter 5** of this instruction during Infil/Exfil operations.

10.5. Preflight Duties:

10.5.1. When designated, the loadmaster will normally report to the aircraft immediately after the crew briefing or as directed by the aircraft commander to begin preflight and/or loading duties.

10.5.2. AFSOC aircraft may be tasked to airlift channel cargo. If so tasked, the loadmaster (when designated) will contact the air terminal operations center (ATOC), airlift control element (ALCE), or air freight and passenger service to obtain the cargo and passenger breakdown and assist in planning of proposed load.

10.5.2.1. At stations where aircraft tie-down equipment is exchanged, make every effort to ensure that a one-for-one exchange occurs. If this is not possible, the aircraft commander will be notified of lost or missing equipment.

10.5.2.2. Security requirements for ammunition and weapons will be briefed to the loadmaster (when designated) during the initial load briefing at ATOC.

10.5.3. AFSOC aircraft may be tasked to support AFSOC or AMC passenger missions with approval of the aircraft and mission commander. Prior to releasing seats, ensure terminal operations and passenger-handling personnel are aware that passenger comfort and latrine facilities are extremely limited.

10.6. Passenger Handling. Loadmasters will ensure all passengers are manifested on AF Form 96. Give one copy to the aircraft commander for filing and retain sufficient copies for border clearance. The loadmaster will complete anti-hijacking requirements for personnel IAW **Chapter 7** of this instruction. Ensure all classified equipment is out of sight prior to passenger boarding. When part of the crew the loadmaster is the key figure concerning good passenger relations. Be aware of the concerns that may arise in the minds of passengers and anticipate their questions and actions.

10.6.1. Passengers may move about the cargo compartment. Good judgment must be exercised on the number of passengers allowed out of their seats at one time. Encourage passengers to keep seat belts fastened when seated.

10.6.2. Do not allow passengers to lounge on or tamper with equipment, cargo, or baggage.

10.6.3. Ensure classified equipment remains covered during the entire mission when passengers are on board and ensure passengers are denied access to this equipment.

10.7. Troop Movements . Every effort should be made to advise troops of mission progress or deviations. The troop commander should be identified prior to boarding.

10.7.1. Determine if the troop commander has any special requirements prior to departure, and advise the aircraft commander of these requirements if appropriate.

10.7.2. Determine if specific communications requirements exist and coordinate these requirements with the aircraft commander.

10.7.3. Determine if there is a need for the troops to perform any type of inflight rigging. Ensure the aircraft is loaded to accommodate inflight rigging if required. Inform the aircraft commander prior to inflight rigging. If turbulence is anticipated, the aircraft commander should inform the passengers in advance if possible.

10.7.4. Ensure troops do not have access to classified equipment during the mission. If troops require access to classified equipment, the requirement should be made known to the aircraft commander prior to the mission.

10.8. Border Clearance. Customs, Immigration, and Agriculture require certain forms for border clearance. If part of the crew, the loadmaster will ensure that required forms are contained in the aircraft mission kit. Distribute the forms to the crew, ensure their completion prior to landing, and deliver them to the proper persons.

10.9. Weight and Balance. Weight and balance for the aircraft is accomplished in accordance with T.O. 1-1B-50 and the Airplane Flight Manual, Aircraft Operations Manual loading instructions.

10.9.1. A basic handbook of weight and balance, T.O. 1-1B-40, containing current aircraft status, is maintained by the unit possessing the aircraft which provides a supplemental weight and balance handbook for each aircraft. This supplemental handbook is in a wear-resistant binder (metal cover) and may not contain T.O. 1-1B-40 if a certified copy of chart "C" provides the current basic weight, basic moment, and basic index. The binder will include sufficient copies of DD Form 365-4 and spreadsheet Weight and Balance Clearance Forms.

10.9.2. Compute weight and balance by using the Chart E mathematical (moments) method or the approved spreadsheet.

10.9.3. The weight and balance section of the unit possessing the aircraft is responsible for providing the appropriate agency with information required to keep documents current and accurate.

10.10. Fuel Weight Computation. Use the most accurate method available to compute wing fuel when calculating total fuel weight.

10.11. Loadmaster Forms. AFJMAN 24-204 gives detailed instructions on the preparation, distribution, and use of the following forms:

10.11.1. AF Form 96, **Passenger Manifest**.

10.11.2. AF Form 463, **Request for Flight Meals**.

10.11.3. DD Form 1385, **Cargo Manifest**.

10.11.4. DD Form 1854, **US Customs Accompanied Baggage Declaration**.

10.11.5. CF 7507, **General Declaration (Outward/Inward)**.

10.11.6. AF Form 127, **Traffic Transfer Receipt**.

10.11.7. DD Form 365-4, **Weight and Balance Clearance Form F**.

Chapter 11

AIRDROP PROCEDURES

Section 11A—General

11.1. Overview. This chapter describes weapon system employment during airdrop operations. See **Chapter 12** for CDS procedures.

11.2. Airdrop. Static Line airdrops will be conducted in VMC. HALO/HAHO airdrops may be accomplished "VFR on top" with AFI 11-202 Volume 3 cloud clearances, within active restricted airspace and a minimum of 1000 foot ceiling on the DZ. Pre-breathing, airspeed, altitudes and wind limits are as indicated in **Table 11.1.**,**Table 11.2.**, **Table 11.3.**, and **Table 11.4.** A manual CARP/HARP will be computed for all airdrops. (Reference AFI 11-231, *Computed Air Release Point Procedures*).

11.2.1. Floor Loading of Personnel. When standard seating configurations cannot be used due to mission requirements (i.e. personnel airdrop in conjunction with a rapid infil/exfil mission or CRRC airdrop) paratroopers may be seated and restrained using procedures in paragraph **5.28.** of this instruction. Floor loading is only authorized in support of special operations forces (SOF) and foreign counterparts during SOF operations, exercises and training, or during bilateral training in support of SOF. Floor loading of special operations forces will only be employed when the mission cannot be accomplished by using standard seating configurations.

11.2.2. Ramp and Door Operations:

11.2.2.1. Clearance to Open. Depending on the tactical situation, it may be desirable to open the ramp and door prior to the three-minute checklist. The pilot may direct ramp and door opening anytime after the six-minute advisory has been completed and clearance from the loadmaster is received. After the ramp and door is open, the loadmaster is cleared to complete the three-minute checklist. Consider aircraft position and the possibility of dropped objects when the door is opened.

11.2.2.2. Loadmaster-Jumpmaster Control. During the 3-minute checklist, the loadmaster will relinquish control of the door/ramp to the jumpmaster. The loadmaster will then take a position in such a manner as to provide maximum maneuverability for jumpmasters and safety personnel to perform their duties. Upon seeing the red jump lights illuminate, the loadmaster will notify the jumpmaster or safety personnel of the red light condition. The loadmaster will take no further action to stop any of the remaining parachutists. The loadmaster will count (if possible) any parachutists that exit the aircraft after the red light has illuminated. Control of the door will revert back to the loadmaster after all parachutists have exited or remaining parachutists have been stopped by the jumpmaster or safety and cleared from the door area. For multiple passes (i.e., racetracks), after assuming control of the door/ramp from the jumpmaster, the loadmaster will maintain control of the door/ramp until completion of the 3 minute checklist.

11.2.3. Multiple Passes (Racetracks). Multiple passes will not be made unless directed or previously agreed upon by all units involved. In the event multiple passes are performed, regardless of the time interval involved, all airdrop checklists will be accomplished. In the event like drops are accomplished during multiple passes, the checklist may be initiated at a point commensurate with the available time and type of drop, at the discretion of the aircraft commander.

11.2.4. Static Line Retrieval. To facilitate static line retrieval, airspeed will not be increased above 150 KIAS until static lines are retrieved. Loadmasters should allow static lines to wrap together before retrieving static lines. The loadmaster will retrieve static lines as soon as possible after parachutist and/or para-bundle exit is completed or exiting is suspended. During combat, static lines that cannot be retrieved will be cut so that the doors can be closed.

11.2.5. Tailgate Drops. Tailgate drops are those during which parachutists exit from the aircraft ramp. The following restrictions apply:

11.2.5.1. When possible, rig the anchor cable prior to takeoff.

11.2.5.2. Retrieve static lines and deployment bags prior to each additional pass to prevent fouling.

11.2.6. Combination Drops. Combination drops are those during which parachutists exit from the aircraft ramp and door after the gravity release of an airdrop load. The drop altitude will be determined by the item requiring the highest drop altitude as listed in **Table 11.3.**

11.2.6.1. Restrictions. Static lines will be retrieved after each pass to minimize fouling risk. For gravity ejected loads, for additional passes, close the cargo ramp and door and rig IAW appropriate rigging procedures.

11.2.6.2. Procedures. In addition to the equipment CARP, the aircrew will compute a personnel CARP down track from the equipment release point using the computed exit time for the equipment drop as the time interval between the equipment and personnel CARP. Use the same IAS and altitude as for the equipment for this computation. If the computed point of impact falls within 150 yards of any boundary of the drop zone, inform the jumpmaster.

11.2.7. Parachute Ballistics. Crews will not make airdrops using parachutes for which AFI 11-231 does not list ballistics unless the user provides approved ballistic data or K factor. The ballistics or K factor should be approved by HQ AFSOC/DOXT, Aeronautical Systems Division (ASD/ ENECA), or NATICK. This does not apply to formal/user test missions where the purpose of the test is to derive ballistic data for a specific load.

11.3. No-Drop Decisions:

11.3.1. Prior to one minute warning, when any condition exists that would make a safe drop doubtful, notify the aircraft commander.

11.3.2. After the 1 minute warning, any crewmember observing a condition that would jeopardize a safe drop will transmit "No Drop" on the interphone. The aircraft commander will immediately instruct the crew to follow the appropriate procedures.

11.3.3. On personnel airdrops where surface winds are unknown, e.g., blind drops to unmanned DZs, the jumpmaster and/or Army airborne mission commander (if designated) will be advised when drop altitude winds exceed 30 knots. In this instance, the decision to drop will be at their discretion.

11.3.4. If a no drop is called after the load restraint is removed and a racetrack is not planned, reapply the load restraint.

11.3.5. When only AF personnel are involved, CCT determines if surface conditions are hazardous to airdrop operations. For joint missions, the user makes the decision. If drops are suspended or can-

celed, CCT or the user, as applicable, will inform the drop aircraft as soon as possible and ensure red smoke/lights/flares are displayed on the DZ.

11.4. Airdrop Emergencies. If a malfunction occurs during an airdrop, the loadmaster will immediately notify the pilot and take appropriate action. Specific emergency procedures for each type airdrop are located in the expanded checklist. After all appropriate emergency actions are complete, accomplish the completion of drop checklist.

NOTE:

Prior to stations time, the pilot will ensure that all crewmembers have reviewed the emergency procedures for the proposed airdrop. Detailed emergency briefings will be conducted between the crewmembers.

11.5. Airdrop Communications Procedures:

11.5.1. Overview. Airdrops should be performed with minimum radio transmissions. In general, airborne assault or tactical re-supply missions are flown as planned, with radio calls made by "exception" only. Predetermined markings and authentication procedures, along with precise timing by the aircrew, are the basic ingredients for successful mission accomplishment. The using forces are trained to operate with minimum communications. Drop clearance is confirmed by the aircrew observing or receiving proper authentication.

11.5.2. Authentication. To preclude enemy radio intrusion and airdrops to enemy personnel, drop zones and radio transmissions should be authenticated. Incorrect authentication invalidates radio transmission.

11.5.2.1. Air-to-Ground. Meeting your TOT and flying the designated inbound heading provides your authentication to the ground party. Crews should be prepared to authenticate when initiating contact with the ground party.

11.5.2.2. Ground-to-Air. The ground party and drop zone is authenticated through the use of DZ markings, smoke or flares, beacons, coded light signals or radio transmissions.

11.5.3. Training Operations. Radio transmissions with the DZ are limited to those required for safety of flight considerations or factors affecting airborne force employment. This includes ATC directions, range clearance, unsafe surface conditions or mission changes. When the mission dictates radio silence, transmission of wind information and range/drop clearance is not required. Radio silence procedures will be coordinated prior to mission execution.

11.5.3.1. Drop clearance in VMC is confirmed by the aircrew observing the proper authentication, that is, the pre-briefed block letter identifier, correctly colored smoke/flare or other pre-briefed drop zone acquisition aid or markings.

11.5.3.2. No Drop or Mission Cancellation. A no drop or mission cancellation is communicated by the absence of pre-briefed markings (visual or electronic), observation of the block letter X, or red smoke/flare.

11.6. Types of Drop Zones:

11.6.1. Point DZ. This DZ has a specified location versus an area DZ that does not have a specific location. The majority of drop zones are point DZs. The location, size, and marking of point DZs are

determined prior to mission execution. The point of impact will be established a minimum of 100 yards from all boundaries of the DZ. The PI may be moved within the confines of the drop zone as long as the 100-yard buffer is maintained and both the user and supporter mutually agree upon its placement. When the PI is moved, the user assumes responsibility for injury to personnel and damage to equipment.

11.6.2. Area DZ. An area DZ consists of a prearranged flight path over a series of acceptable drop sites located not more than 1/2 NM (one km) on either side of track. A line of flight is established between two points (A and B). The distance between the two points will not exceed 15 NM (28 km) and should have changes in ground elevation less than 300 ft (90 m). The reception committee is free to receive the drop at any location along the line of flight.

11.6.2.1. Timing. The aircraft arrives at point "A" at the scheduled time and proceeds toward point "B." Once the DZ markings are located, the drop is conducted in the normal manner. All air-drop warnings (except the one minute warning) are based on TOA at point "A". The DZ will be marked for a total of 10 minutes, starting 2 minutes prior to ETA over point "A." Markings are removed at the end of the 10-minute period or when the first parachute is sighted.

11.6.2.2. DZ Altitude. Because a specific point is not used, use the average elevation of a flat terrain area DZ or the highest elevation of a rolling terrain area DZ for the terrain elevation when completing the CARP. Fly this MSL altitude for the drop.

11.7. Drop Zone Survey and Safety of Flight Requirements:

11.7.1. Drop Zone Survey. A DZ survey is required by the user during peacetime training for all aerial deliveries IAW AFI 13-217. The survey will be accomplished and signed by the user, i. e. combat control team (CCT), special tactics squadron (STS) Army Special Forces (SF), or Navy SEALS. See AFI 13-217 for additional information. The Assault Zone Availability Report (AZAR) is an AMC source document for available surveyed DZs.

11.7.2. Safety of Flight Review. A safety of flight review is required by AFSOC for all DZs. The review will be accomplished in conjunction with a DZ survey and will be signed by the appropriate approval authority IAW AFI 13-217. The airborne unit assumes all responsibility for personnel injury and damage on the DZ.

11.7.3. Foreign Drop Zone Surveys. Foreign DZ surveys are acceptable when accompanied by a safety of flight review. The airborne unit assumes all responsibility for personnel injury and damage on the DZ.

11.7.4. Contingencies. Formal DZ surveys are not required.

11.8. Drop Zone Markings:

11.8.1. Marked Drop Zones. The drop zone is marked with a coordinated visual signal (e.g., block letter, flares, smoke, mirror, etc.). No other markings are required. The PI is marked for CARP drops. The release point is marked for GMRS drops.

11.8.2. Blind Drop Zones. The drop zone is unmarked. The aircrew confirms the DZ location and determines the release point by onboard navigational equipment or visual offset points.

NOTE:

The chance of a successful drop decreases if equivalent moon illumination is less than 5 percent and/or there is little or no contrast between the DZ and the surrounding area. Plan 20 minutes additional fuel for operations involving unmarked drop zones.

11.9. Minimum Drop Zone Sizes. The minimum size DZ is mutually agreed upon by the Air Force and using unit commanders having control of the operation. The size should be based on mission requirements, aircraft or aircrew capabilities, and the items to be dropped. When conducting drops on blind DZs, consider terrain, and chart/equipment accuracy. The minimum DZ sizes in **Table 11.5.** can be used for planning. These Tables are based on optimum conditions. Safety zones have not been added to these Tables. GMRS and military free fall (MFF) DZ sizes are the responsibility of the using agency.

Section 11B—NavigatingTo The Release Point

11.10. Overview:

11.10.1. Positioning. Accurately positioning the aircraft at the release point is the most critical phase of the airdrop mission. Crew coordination is of the utmost importance to ensure that all warnings and checklists are completed, proper DZ line-up is maintained, and time over target (TOT) is within established tolerances.

11.10.2. Use visual means to execute the drop. The pilots are responsible for computing a release point for all drops. Actual release is made by, but not limited to, the following methods:

11.10.2.1. CARP/HARP.

11.10.2.2. Jumpmaster directed. (The pilots will compare their CARP/HARP with that of the jumpmaster and resolve any significant differences prior to the drop)

11.10.2.3. Ground Marked Release System (GMRS).

11.10.3. Aircrew Procedures. These are basic procedures used to arrive at the release point. Additional procedural considerations are discussed in paragraphs **11.11.** and **11.12.**

11.10.3.1. The pilot will brief the crew on the release method, the expected drift, release point location, desired magnetic heading (MH), drop altitude, drop airspeed, minimum safe altitude between IP and DZ, ground hazards/terrain in the drop area, escape heading, and altitude to be flown after drop.

11.10.3.2. Airspeed adjustments for time over target (TOT) control should be completed prior to reaching the IP.

11.10.3.3. Use course corrections that will position the aircraft upwind the required distance from centerline track so that large corrections will not be required on the final approach to the release point.

11.10.3.4. Steer to the release point as applicable for the type release.

11.10.3.5. Fly the AGL/MSL altitude and airspeed. When MSL altitudes are flown, the pressure altimeter is the primary reference, with the radar altimeter set 50 feet below drop altitude. The pilots are responsible for maintaining altitude, airspeed, and terrain separation.

11.10.3.6. Ten seconds prior to the release point, the non-flying pilot will call, “Ten seconds."

11.10.3.7. At the release point the green light (if so equipped) will be turned on at the command of the non-flying pilot.

11.10.3.8. During the Drop:

11.10.3.8.1. Maintain the desired track, making small corrections as necessary.

11.10.3.8.2. The non-flying pilot will call "Red Light" at the end of the programmed/computed time delay.

11.10.3.8.3. If the loadmaster observes any delay or malfunction of equipment, or delay of a parachutist to jump, advise the pilot.

11.10.3.9. Drop Zone Escape. Upon completion of the combat airdrop, it is imperative that the aircraft be configured for evasive maneuvers. After the aircraft has been reconfigured and the static lines have been retrieved/cut, the remainder of the completion of drop checklist may be deferred to a more convenient time when threat avoidance does not take precedence.

11.11. Visual Airdrop Procedures. As soon as the DZ is visible and identified by the pilot and copilot, they jointly confirm the release point location, lateral offset, and track required. The pilot flying the aircraft then assumes the responsibility for maintaining the desired track.

11.12. Ground Marked Release System (GMRS). Airdrops may be made using the GMRS. In this system, supported ground forces are responsible for computing a release point and providing ground markings (panels or lights). The DZ markings will be coordinated prior to the mission during joint planning. Aircrew procedures are the same as those employed during a manual CARP drop. There are several DZ marking patterns. The DZ marking most commonly used is the inverted "L". The inverted "L" utilizes a standard four marker pattern placed 100 meters left of the desired release point. The corner marker panel (release point marker) may be used for authentication through the use of a code light or special panel signal. Execute the drop when the aircraft arrives directly opposite and 100 meters to the right of the corner marker panel on the pre-briefed inbound heading. Refer to AFI 13-217 for GMRS markings depictions.

Section 11C—LowAltitude Airdrops

11.13. Personnel Drops:

11.13.1. Aircraft Configuration. The loadmaster will ensure the configuration of the aircraft is consistent with the number of personnel to be airdropped. Troop seats will be raised or lowered, as required, by airborne personnel under the supervision and instruction of the aircrew loadmaster.

11.13.2. Aircrew Procedures. Refer to the expanded checklist for normal and emergency airdrop procedures.

WARNING: During personnel airdrops insure all personnel are secured to the aircraft or have a static line connected prior to opening any doors. HALO/HAHO personnel will be configured and ready to jump.

11.13.3. Aircraft Emergency During Personnel Airdrop:

11.13.3.1. When an aircraft emergency occurs during or after the time the parachutists stand up and hookup, the following procedures will apply:

11.13.3.1.1. Under Acceptable Conditions:

11.13.3.1.1.1. Maintain an acceptable altitude and attitude for the parachutists to evacuate the aircraft. The minimum acceptable altitude is 400 feet AGL. If the jump must be made at airspeed in excess of 150 KIAS, the parachutists will be advised of the airspeed and altitude.

11.13.3.1.1.2. Order evacuation of the aircraft by giving the pre-briefed signals for preparation and bailout.

11.13.3.1.2. Under Unacceptable Conditions. When conditions are not acceptable for aircraft evacuation and/or drop is aborted for other reasons, the following procedures apply:

11.13.3.1.2.1. The red light will be turned "ON" and will remain on until all doors are closed.

11.13.3.1.2.2. The pilot will advise the loadmaster, who in turn will advise the jumpmaster to have the parachutists unhook, take their seats, and fasten their safety belts.

11.13.3.2. When an aircraft emergency occurs before the time the parachutists hookup, the crew will notify the jumpers to fasten their seat belts and prepare for an emergency landing.

11.14. Door Bundle:

11.14.1. Overview. A7A or A-21 containers weighing up to 500 pounds are referred to as door bundles and will be dropped from the aircraft using the personnel airdrop checklist. Door bundles may be dropped independently or in conjunction with personnel. When dropped with personnel, the bundle will be the first object to exit the aircraft.

11.14.1.1. Door bundles dropped off the ramp and door will be equipped with breakaway static lines IAW T.O.13C7-1- 11, or with parachutes packed in T-10 bags.

11.14.1.2. Bundles that exceed 500 pounds will be airdropped using CDS procedures.

11.14.2. Release Point. When door bundles are dropped with personnel, compute the CARP for the first paratrooper exiting after the bundle. Compute an additional CARP for the door bundle to ensure that it will impact within the DZ boundaries. Release the bundle at the personnel CARP, followed by the parachutists when the door is clear. When a door bundle is the only object being dropped, base the release on the CARP for the bundle.

11.15. Container Delivery System (CDS). CDS is a method of air-dropping supplies using gravity to extract the load from the aircraft. The type containers used are A-22, double A-22 or Combat Rubber Raiding Craft (CRRC). The bundles may be dropped with or without parachutist. When performing combination drops, the parachutist will exit after the container.

11.16. Free-Fall Delivery System. The delivery of certain types of supplies, such as bulk food products or clothing, can be accomplished without the use of parachutes. For free drop, wind drift need not be considered.

11.16.1. Drop Altitude. Normally, free-drop is accomplished at much lower altitudes than those required for paradrops. When possible, free-drops will be made at 200 feet AGL or less, but not below 50 feet AGL (see **Table 11.3.**). Freedrops at night without NVGs require a minimum drop altitude of 500 feet AGL.

11.16.2. Drop Zone Size. The trajectory of the items being dropped will determine the DZ size requirements. As a rule, the DZ length required equals the altitude of the aircraft over the release point plus a safety margin of 100 feet added to each end. Applying this rule, when dropping from 200 feet AGL, the required length will be 200 feet (altitude) plus 200 feet (safety margin) or 400 feet total.

11.17. Standard Airdrop Training Bundle (SATB):

11.17.1. Overview. The 15 pound training bundle is designated the standard airdrop training bundle and may be dropped to simulate personnel or equipment (CDS) airdrops. Conduct SATB missions at the altitude and airspeed specified for the type of drop being simulated and use the applicable tactical airdrop checklist. Training bundles will be assembled and have an identification tag attached IAW T.O.13C7-1-11, Appendix D. Training bundles will not be rigged with a breakaway static line.

11.17.2. Emergency Procedures: If a training bundle is outside the aircraft and fails to separate, make no attempt to retrieve it. Cut the bundle loose over the pre-briefed salvo area or DZ on clearance from the aircraft commander.

Section 11D—HighAltitude Airdrops

11.18. High Altitude Mission Requirements. Airdrops conducted above 3000 feet AGL are considered to be high altitude drops. In addition to the normal mission planning requirements, the following are unique to high altitude operations:

11.18.1. Prominent terrain features within the drop area should be selected to position the aircraft on the inbound course and to determine the release point.

11.18.2. Preflight weather and winds must be analyzed to determine the most advantageous inbound course. Whenever possible, the inbound course should be into the average wind vector.

11.18.3. High Altitude Oxygen:

11.18.3.1. Parachutists may operate without supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. Aircrew members will use supplemental oxygen as directed by AFI 11-202V3. When dropping from 18,000 feet MSL and higher, the pre-breathing procedures described in paragraph **11.18.3.2.** below will be used. When the aircraft installed oxygen system does not provide sufficient oxygen regulators for crew and parachutists, an oxygen console will be installed in the aircraft. The console will provide sufficient oxygen regulators for all parachutists and crewmembers not accommodated by the normal aircraft system.

11.18.3.2. Pre-breathing. All personnel will pre-breathe 100 percent oxygen at a cabin altitude as close to sea level as possible, but not greater than 10,000 feet cabin altitude on any mission scheduled for a drop at or above 18,000 feet MSL. Pre-breathing will be started so as to have the required pre-breathing time in **Table 11.1.** completed before the cabin altitude ascends through

10,000 feet MSL. A break in pre-breathing requires the pre-breathing period to be restarted or the individual whose pre-breathing was interrupted be removed from the flight.

Table 11.1. Pre-breathing Times.

DROP ALTITUDE	AIRCREW	PARACHUTISTS
At or above 18,000 to 25,000'	30 Min	30 Min HALO/HAHO

11.18.3.3. Aerospace Physiologist and Technician (AsPO) Requirements. An AsPO (AFSC 43A3, 4M0X1) will accompany all missions operating above 18,000 feet MSL regardless of the type of airdrop. The AsPO's duties will be to monitor inflight personnel, aircraft and supplemental oxygen equipment and life support equipment. Preflight, as is practical, all aircraft and supplemental oxygen equipment and life support equipment. The AsPO will advise and aid the loadmaster in positioning and securing the supplemental equipment used on the mission. The AsPO will brief all aircrew and jumpers prior to the first mission on the duties and responsibilities of the AsPO, physiological problems that may be encountered in flight, the importance of proper pre-breathing, the effects of wind blast and cold air on exposed tissue, and any special circumstances for a given mission. The AsPO will be on interphone and will normally be positioned forward of the oxygen console (when used).

11.18.3.4. HQ USAF/SGPA and HQ AFSOC/SG will be notified by the most expeditious manner of any physiological incident.

11.18.3.5. Emergency Procedures. If any person experiences decompression sickness or unusual pain, the pilot will:

11.18.3.5.1. Abort the mission.

11.18.3.5.2. Begin a descent. The type and degree of sickness or pain will determine the descent.

11.18.3.5.3. Proceed to the nearest base at which qualified medical assistance is available.

11.18.3.5.4. Advise the control tower of the emergency and request a doctor and an ambulance to meet the aircraft.

11.19. High Altitude Personnel Drop (HALO/HAHO) Procedures. A high altitude release point (HARP) solution will be computed for all high altitude personnel drops unless specific mission directives dictate otherwise.

11.19.1. High Altitude Low Opening (HALO). A clandestine method of inserting military parachutists into an objective area. Using military free fall skills, jumpers exit the aircraft from 3,000 to 25,000 feet above ground level and free fall to low altitudes prior to manually activating their parachutes. This technique minimizes exposure time under canopy for the jumpers and is a very accurate means of inserting special operations forces.

11.19.2. High Altitude High Opening (HAHO). A clandestine method of inserting military parachutists into an objective area. This tactic provides the ability to offset; that is, exit the aircraft miles from an objective area at high altitude, activate a high glide ratio parachute immediately, and glide to the intended landing point. This technique permits minimum exposure of the aircraft and crew to enemy surface-to-air countermeasures.

11.19.3. Flight Planning. In addition to the normal flight planning requirements to position the aircraft over the target area, the following are unique to HALO/HAHO operations using the HARP.

11.19.3.1. Detailed instructions for computing the HARP are contained in AFI 11-231.

11.19.3.2. Plot the preflight HARP and ensure the distance from the initial point (IP) to the preflight HARP allows sufficient time for the aircrew to verify the run-in, accomplish airdrop checklists, and if required, recompute and plot the inflight HARP. This should receive special consideration when performing HAHO airdrop operations.

11.19.3.3. A large-scale chart prepared for inflight use is highly desirable. This allows the aircrew to update the inflight HARP for a visual release.

11.19.4. Conduct Of Operations:

11.19.4.1. Low level flight to the target area with a climb is most desirable for HALO/HAHO operations. This may enable the aircrew to obtain current winds for updating the preflight HARP. High level flights are also possible but the HARP will have to be based on preflight winds. Positive identification of the drop zone area must be confirmed visually when conducting a visual HARP.

11.19.4.2. Initial Lineup. It is desirable that the aircraft be at drop altitude, inbound to the HARP not later than six minutes prior to the HARP. This amount of time is necessary to update the HARP and position the aircraft on the correct inbound course.

11.19.4.3. HARP Release. The following methods may be used in determining the HARP.

11.19.4.3.1. A visual drop may be accomplished whereby the pilot flies over the HARP. Positive identification of the drop zone area and/or HARP must be confirmed visually prior to calling the release. Verify an offset from the point of impact which will ensure the aircraft will track over the HARP. Once proper alignment is obtained, pick a geographic point on the horizon and fly a drift killed heading toward this point. Choose a reference point far enough from the DZ to ensure the point remains in constant view. Selection of timing points will assist in calling the release point (green light) since the DZ will disappear under the nose of the aircraft. Timing points should be abeam the drop zone, prior to the HARP and identified prior to the one-minute warning. Cultural features such as long straight roads or railroads make excellent timing points.

11.19.4.3.2. An onboard navigation system release may be accomplished when pre-briefed and coordinated with the parachutists. When this procedure is used, enter the IP and preflight HARP coordinates into the system. Comply with paragraph **11.19.3.2.** of this volume when selecting an IP. Update the HARP as necessary to compensate for winds that are different than those forecasted. Fly FMS or GPS steering to the release point (green light). When airdropping IAW these procedures, visual identification of the DZ is not required.

11.19.5. Drop Configuration:

11.19.5.1. Flaps. Normal configuration is zero degrees flaps. However, at high deck angles it may be desirable to use flaps.

11.19.5.2. Airspeed. Brief the jumpmaster on the airspeed used IAW **Table 11.2.**

11.19.5.3. Altitude. Pressure altitude will be used as the airdrop altitude reference.

11.19.5.4. Exits:

11.19.5.4.1. Parachutists will exit from the ramp. All parachutists, with the exception of the jumpmaster, will stand forward of the ramp hinge until the one minute warning.

11.19.5.4.2. All parachutists, including the jumpmaster, will exit the aircraft during the green light time.

11.19.6. Communications and Signals:

11.19.6.1. Hand Signals. The loadmaster will coordinate the following hand signals with the jumpmaster:

11.19.6.1.1. Time warnings (20,10,6,3, and 1 minute) will be given to the parachutists by the loadmaster pointing at a watch and indicating with fingers the correct warning.

11.19.6.1.2. Wind velocity on the DZ will be given by cupping one hand and blowing into it and indicating with upturned fingers the speed of the wind.

11.19.6.1.3. Passing the forefinger across the throat indicates a no-drop.

11.19.6.2. Written Messages. The load master will carry pencil and paper and write out messages that cannot be passed by hand signals.

11.19.7. Briefing. The following items will be added to the pilot-jumpmaster briefing:

11.19.7.1. Weather.

11.19.7.2. Emergency descent procedures and time to descend to 10,000 feet MSL.

11.19.7.3. HARP and prominent terrain features.

11.19.7.4. DZ markings.

11.19.7.5. Time at which all mission personnel will commence pre-breathing.

11.19.7.6. Location and duration of the green light.

Section 11E—AirdropRelated Information

11.20. Joint Airdrop Inspection Records. DD Form 1748, **Joint Airdrop Inspection Record**, will be accomplished prior to all equipment airdrops. Retention and disposition of the form will be in accordance with AFMAN 37-139, *Records Disposition Schedule*. A loadmaster will conduct the inspection with the user representative.

11.21. Identification of Airdrop Items. Immediate identification of aerial delivery items that land off the drop zone in unsecured areas may be necessary. The following procedures will aid in denying the enemy usable items and in minimizing the risk of loss of life over items that may be expendable. Aircraft commanders will be familiar with airdrop contents and the order in which it leaves the aircraft for radio transmission to the combat control team, if requested. Identify supplies or equipment by the following class numbering system:

11.21.1. Class I-Food and daily expendables.

11.21.2. Class II-Hardware, guns.

11.21.3. Class III-POL.

11.21.4. Class IV-Fortification materials (sandbags, etc.).

11.21.5. Class V-Ammunition (include the type):

11.21.5.1. Type "A"-Small arms.

11.21.5.2. Type "B"-Mortars.

11.21.5.3. Type "C"-Artillery.

11.21.6. Class VI-Civil relief supplies.

11.22. Inflight Rigging Procedures . During contingencies, joint operations, and unilateral training, inflight rigging may be necessary. Inflight rigging is a safe procedure if accomplished under a controlled situation. Accomplish inflight rigging only when the safety of the personnel required to be mobile in the cargo compartment is not jeopardized. The aircraft may have to change altitude.

11.23. Protective Headgear:

11.23.1. The loadmaster and any other personnel required to be mobile in the cargo compartment will wear helmets during or aerial deliveries utilizing the aircraft anchor cable. The flight helmet will be worn with the chinstrap fastened from the first warning until the aerial delivery is complete and the cargo compartment is secure. Lower helmet visors if possible.

WARNING: Loadmasters will not position themselves directly under the anchor cable supports during personnel/equipment airdrops requiring the use of the anchor cable.

11.23.2. After acknowledgment of the twenty-minute warning and donning of the helmet, the loadmaster may clear off headset with aircraft commander approval to facilitate movement.

11.23.3. Personnel in the cargo compartment not actively participating in the aerial delivery are not required to wear helmets. However, they will remain seated with seat belts fastened from the first warning until the aerial delivery is complete and the cargo compartment is secure.

11.24. Safety Device

11.24.1. Crew members will wear a restraint harness when performing duties near an open exit in flight. Fit the restraint harness and adjust the life line prior to flight. Connect the hook to a point that will preclude the wearer exiting the aircraft. The strap will not be connected to an anchor cable that has static lines attached to it for an airdrop.

11.24.2. Disconnect the hook, roll, and secure the lifeline to the restraint harness after the lifeline has been adjusted.

11.24.3. Connect the lifeline when anticipating movement near an open exit.

11.24.4. Other personnel required to be mobile in the cargo compartment, as determined by the mission/aircraft commander, will normally provide their own restraint harness/parachute.

11.25. Aerial Delivery Airspeeds. Recommended aerial delivery airspeeds are a function of the force required to inflate the parachute to minimize damage to the airdropped object. When the mission requires other than the recommended airspeed, ensure airspeed falls within the parachute range listed below.

Table 11.2. Aerial Delivery Airspeeds.

Type	Recommended Aerial Delivery Speed	Airspeed Delivery Speed Range
Personnel Door Bundle SATB (Ramp & Door)	120 KIAS	100 - 150 KIAS
CRRC/CDS	110 KIAS	N/A

11.26. Aerial Delivery Altitudes. The altitudes listed below are the minimum altitudes above the highest point on the drop zone AGL. Commanders may agree to higher altitudes. For combination drops, the load requiring the highest drop altitude determines the drop altitude. Airdrops at or above 3,000 feet AGL will be conducted with high altitude parachutes, either high velocity ring slot or high altitude high/low opening (HAHO)/HALO). Minimum altitudes shown are intended to provide guidance and not restrict the Army/Air Force commanders in their planning of combat airdrop missions. Altitudes are based on the technical design characteristics of the parachutes and represent the minimum at which the parachutes may be expected to perform their intended function with acceptable reliability. Use of lower altitudes than shown may result in the parachute(s) failing to achieve their design performance/reliability and introduce safety hazards to jump personnel or result in unacceptable damage to loads.

Table 11.3. Aerial Delivery Altitudes.

Type	Minimum Drop Altitude (Ft AGL)
Personnel	
Tactical Training	800 feet (Note 1)
Combat Operations	Determined by tactical situation
HALO (minimum opening)	2500 feet
SATB-P	500 feet
Door Bundle	
G-13/14	300 feet
T-10B	400 feet
T-7A	300 feet
CDS	
G-12 D	500 feet
G-12 E,G-13/14	400 feet
CRRC	
G-12 D/E	600 feet (boat only) ***Otherwise determined by personnel drop altitude.***
Free Fall	
Day or night using NVGs	50 feet (min),200 feet(max)
Night without NVGs	No lower than 500 feet.

NOTE 1: If the following criteria are not met, the minimum altitude is 1,000 feet AGL:

(1) Static lines are used.

(2) Parachutes are equipped with anti-inversion devices.

11.27. Aerial Delivery Winds. Aerial delivery wind limits/restrictions will be based on the information below. When surface winds are known, airdrop decisions will be based solely on surface wind limitations. When surface winds are unknown,(e.g., blind drops to unmanned DZs), the jumpmaster and/or airborne mission commander (if designated) will be advised when drop altitude winds exceed thirty knots for personnel drops. For blind bundle aerial deliveries to unmanned DZs, the aircraft commander will make the decision to drop. For operational rescue missions, the decision to deploy the jumpers is determined by the jumpmaster and aircraft commander.

Table 11.4. Aerial Delivery Wind Limits.

Type	Surface Wind Limits (Knots)
Personnel Non-Air Force Air Force	Discretion of user DZSO 13 (static line, land) 17 (static line, water) 18 (military free fall, land) 20 (military free fall, water)
Door Bundle G-13/14, T-10B, T-7A	Discretion of user DZSO
CDS G-12D/E G-13/14	13 20
CRRC G-12D/E	17 (sea state limits are at user's discretion)
SATB	25
Free Fall	Unlimited

Table 11.5. Recommended Minimum Drop Zone Size.

TYPE	SIZE (WIDTH X LENGTH)
Personnel-Static line	600yd X 600yd (550m X 550m) for one jumper - add 75yd (70m) for each additional jumper

TYPE	SIZE (WIDTH X LENGTH)
Door Bundle/ CDS	400yd X 400yd (365m X 365m) for one bundle - add 50yd (45m) for each additional bundle
SATB	200yd X 200yd (185m X 185m)
Free Fall Drop	Aircraft altitude + 200 feet with a 100 foot safety zone in each end.

Chapter 12

CONTAINER DELIVERY SYSTEM (CDS) AIRDROP PROCEDURES

12.1. Overview. The following procedures are for loading, tiedown, rigging, and airdrop of gravity extracted CDS bundles. CDS bundles are rigged IAW FM 10-501/T.O. 13C7-1-11. The maximum rigged weight of a bundle is 1760 pounds; the maximum rigged height is 65 inches. Each bundle is normally rigged using one G-12E parachute deployed by a 15-foot pilot parachute packed in a T-10 container bag. A secondary method may use a G-12D parachute deployed by a 68-inch pilot parachute. A maximum of three bundles may be airdropped at one time. Both the CDS bundles and accompanying parachutists may be airdropped on a single pass. A manual gate cut is used to release the bundle(s) at the release point.

WARNING: Do not exceed aircraft zero fuel weight or maximum take-off weight limitations.

WARNING: A 15-foot pilot parachute packed in a T-10 bag will be rigged non-breakaway to the anchor cable when the bundles are being followed by static line parachutists.

WARNING: A 68-inch pilot parachute will be rigged breakaway to the anchor cable when the bundles are being followed by parachutists.

WARNING: Both the bundles and parachutists' static lines will be hooked to the aircraft anchor cable. No more than 15 static lines will be attached to the anchor cable at any one time.

12.2. Aircraft Preparation. Prepare the aircraft for CDS airdrop in the following manner:

12.2.1. Remove and stow all required passenger/jump seats and seat support equipment. This will prevent the seats from interfering with the loading, rigging, and airdrop of the bundle(s).

12.2.2. Install the ramp roller conveyors, the ramp hinge cover, the cargo floor roller conveyors and pallet stops.

NOTES:

Install the Metric Systems or locally produced pallet stops in the floor seat tracks.

The cargo floor roller conveyors should be installed to provide adequate roller surface for the bundle(s), but should not be installed any farther forward than the normally installed right forward dual airline seat and table.

12.2.3. Rig the hand winch and anchor cable IAW the Aircraft Preparation for Airdrop, Static Line Personnel Checklist.

NOTE:

The hand winch is required for combination drops only.

12.3. Loading and Restraint. Use the aircraft support stands when loading containers in excess of 850 pounds. The bundle(s) will be positioned with the deployment parachute and static line towards the right side of the aircraft and centered on the roller conveyors. The fuselage station of the bundle(s) will be dependent on aircraft weight and balance requirements. The bundle(s) will be restrained IAW normal cargo restraint criteria using 5,000-pound tiedown straps. The ratchet end of the forward barrier strap will be attached to the left side of the aircraft to expedite removal after the release gate has been cut.

12.4. Installation of the CDS Release System. Type VIII nylon material will be used for the CDS release gate. The gate will be installed in the following manner:

12.4.1. Single CDS bundle. Tie one end of a 9 foot length of Type VIII nylon to a 2,500-lb tiedown ring installed in the left seat track with three alternating half hitches and an over hand knot in the running end. Route the free end of the gate through the CDS webbing just above the lower lateral band; go under the outer vertical bands and over the three center vertical bands. Tie the free end to a 2,500-lb tiedown ring in the right seat track with three alternating half hitches and an over hand knot in the running end. Remove all the slack from the Type VIII nylon.

12.4.2. Multiple CDS bundles. Start with a length of one turn double Type VIII nylon that will encircle all the bundles plus six feet. Make a loop in one end, tie an over-hand knot with the loop, then tie an over hand knot in the running end. Begin at the center aft side of the rear CDS container, route the free end of the Type VIII nylon just above the lower lateral band and under the left outer vertical band. Continue forward on the left side, routing the free ends under the outer vertical bands and over the three center vertical bands of all the containers. Upon reaching the forward left corner of the most forward CDS container, route the Type VIII nylon, aft to forward, through a 2,500 lb tiedown ring in the left seat track. Continue across the cargo compartment through a 2,500 pound tiedown ring installed in the right seat track, fwd to aft. Continue aft on the right side, route the Type VIII nylon the same as the left side, in reverse order. Upon reaching the loop end of the Type VIII nylon, run the free end through the loop and tie with three alternating half hitches and an over hand knot in the running end after removing all slack from the Type VIII nylon. Ensure the gate tie is centered on the three center vertical bands on the aft side of the rear CDS container.

12.4.3. Safety Ties. No safety ties are required for a single bundle. For multiple CDS bundles, the following safety ties will be made:

12.4.3.1. Tie the Type VIII nylon to the aft side of the rear CDS container webbing with one turn single length of 550 cord. The 550 cord should be routed under the CDS webbing and over the top of the gate knot. Tie the 550 cord with a square knot, locking knot, and an over hand knot in both running ends. If 550 cord is not available, use one turn triple 80-lb flat cotton tape. Tie the cotton tape with a surgeons knot and locking knot.

12.4.3.2. On the aft CDS container, the Type VIII nylon will be tied to the container webbing at the four outboard corners with one turn single length of 80 lb cotton tape. On all remaining bundles, the Type VIII nylon will be tied to the container webbing at the outboard corners of each container with one turn single length of ticket #5 cord. Tie with a surgeons knot and locking knot.

CAUTION: Failure to make all appropriate safety ties may result in the Type VIII nylon becoming entangled in the aircraft rollers or suspension parachutes preventing the bundles from exiting the aircraft or the suspension parachutes from inflating.

12.4.4. Forward Barrier. Install a 5,000-lb strap around the front of the forward container. Attach the hook end to a 2,500 lb tiedown ring installed in the right seat track approximately 36 inches aft of the forward edge of the bundle. The strap will be routed above the release gate and outside of all the container webbing. The ratchet end of the strap will be attached to a 2,500 lb tiedown ring located in the left seat track approximately 36 inches aft of the forward edge of the container. Remove all the slack from the forward barrier and ratchet it as tight as possible. Roll up any excess strap and tape it to itself. The forward barrier strap is rigged the same for single or multiple containers.

12.4.5. After attaching the static lines to the anchor cable, tie the static lines to the container webbing with one turn length of ticket #5 cord. Tie the ticket #5 cord with a surgeons knot and locking knot after removing all the slack from the static line between the anchor cable and the container.

12.5. CDS Containers and Parachutists Configuration. C-212 configurations for CDS airdrop will be dependent on mission requirements (i.e. weight, range, number of bundles, etc.).

12.6. CDS Airdrop Procedures. CDS will be airdropped IAW the Equipment Airdrop Checklist procedures (see the amplified checklist). A CARP/HARP will be computed for all CDS drops. The forward throw figure of 280 meters used in computing a CDS HARP/CARP takes into account both the forward throw and the exit time from the "green light" call. Normal CDS exit time is 3 seconds. Refer to AFI 11-231 for parachute ballistics, wind and altitude restrictions.

12.6.1. When a combination airdrop (CDS and personnel) is being conducted, a HARP/CARP will be computed for both the CDS bundles and the parachutists. The personnel release point will normally be used for combination drops. The airdrop altitude will be determined by the parachute with the higher altitude restrictions.

12.6.2. The CDS release gate will be manually cut by the loadmaster upon hearing and seeing "green light". The loadmaster will cut the gate on the left side of the aircraft so as to be in position to remove the forward barrier strap.

WARNING: Do not remove the forward barrier strap nor allow parachutists to proceed aft of the forward barrier strap until the bundles are clear of the aircraft.

12.6.3. The airspeed and flap setting for both a CDS and combination airdrop is 110 KIAS and "0"/no flap setting. This airspeed and flap setting produces an approximate deck angle of 6 to 8 degrees nose up and allows smooth gravity extraction of the load.

12.7. CDS Airdrop Emergency Procedures. CDS airdrop emergency procedures will be accomplished IAW the Equipment Airdrop Checklist Emergency Procedures. (See the amplified checklist).

WARNING: Avoid excessive aircraft maneuvers to assist in drop zone (DZ) alignment inside of the "3-minute Warning". Failure to do so may result in the bundles failing to exit the aircraft or injury to personnel in the cargo compartment.

WARNING: Avoid abrupt power changes or maneuvers to compensate for the center of gravity shift caused by bundle movement during extraction. Failure to do so may result in the bundles failing to exit the aircraft or injury to personnel in the cargo compartment.

12.8. Aircrew Requirements. The minimum aircrew required to conduct a CDS/combination airdrop are a pilot, copilot, and loadmaster. In the event of an airdrop emergency the copilot will assist the loadmaster with the emergency procedures.

Chapter 13

COMBAT RUBBER RAIDING CRAFT (CRRC) AIRDROP PROCEDURES

13.1. Overview. The following procedures are for loading, tiedown, rigging, and airdrop of a gravity extracted CRRC. For the purpose of these procedures, a CRRC is airdropped in the same manner as a CDS and the term CRRC will be used to refer to any type/size of rubber boat that is fully/partially inflated and is capable of being airdropped from the C-212 (i.e. RAM-Z, CRRC, F-470, etc.). The CRRC is rigged IAW applicable FM/AFTOs on a special operations Combat Expendable Platform (CEP). Each CRRC is normally airdropped using a G-12E parachute deployed by a 15 foot pilot parachute packed in a T-10 parachute container bag. A maximum of one CRRC may be airdropped at any one time. Both the CRRC and all accompanying parachutists may be airdropped on a single pass. A manual gate is used to release the CRRC at the release point.

WARNING: Do not exceed aircraft zero fuel weight or maximum take-off weight limitations.

WARNING: A 15 foot pilot parachute packed in a T-10 bag will be rigged non-breakaway to the anchor cable when the CRRC is being followed by static line parachutists.

WARNING: A 68 inch pilot parachute will be rigged breakaway to the anchor cable when the CRRC is being followed by parachutists.

WARNING: Both the CRRC and all parachutists will be hooked to the anchor cable. No more than 15 static lines may be attached to the anchor cable at any one time.

13.2. Aircraft Preparation. Prepare the aircraft for CRRC airdrop as follows:

13.2.1. Remove and stow all required passenger/jump seats and seat support equipment. This will prevent the seats from interfering with the loading, rigging and airdrop of the CRRC.

13.2.2. Install the ramp roller conveyors, ramp hinge cover, cargo floor roller conveyors and pallet stops.

NOTES:

Install the Metric Systems or locally produced pallet stops as close as possible to the forward edge of the CRRC platform.

The cargo floor roller conveyors should be installed to provide adequate roller surface for the CRRC platform, but should not be installed any farther forward than the normally installed right dual airline seat and table.

13.2.3. Rig the hand winch and anchor cable IAW the Aircraft Preparation for Airdrop, Static Line Personnel Checklist.

NOTE:

The hand winch is required for combination airdrops only.

13.3. Loading and Restraint. Use the aircraft support stands when loading a CRRC. The CRRC will be positioned approximately 12 inches forward of the ramp hinge and centered on the roller conveyors. Align the CEP center release gate hole with the center of the aircraft. The platform will be restrained IAW

normal aircraft restraint criteria using 5,000 lb tiedown straps. The ratchet end of the forward barrier strap will be attached to the left side of the aircraft to expedite removal after the release gate has been cut.

WARNING: The parachutists may move aft as the platform moves aft, however they must be immediately moved forward of the pallet stops if an emergency develops during platform extraction.

13.4. Installation of CRRC Release System. Type VIII nylon material will be used for the CRRC release gate. The gate will be installed in the following manner:

13.4.1. Tie one end of a 48 inch length of Type VIII nylon to the hole in the forward center edge of the CEP with a square knot and an overhand knot in the running end. Route the free end of the gate, aft to forward, through a 2,500-lb tiedown ring in the left cargo floor track. Continue across the cargo floor and route forward to aft through another 2,500 pound tiedown ring in the right cargo floor track. Run the free end back through the loop formed by the square knot and tie with three alternating half hitches and an overhand knot in the running end, after removing all the slack from the Type VIII nylon.

13.4.2. Forward Barrier. Install a 5,000 pound tiedown strap around the forward edge of the CRRC. Attach the hook end to a 2,500 pound tiedown ring installed in the right seat track approximately 36 inches aft of the forward edge of the CRRC. The forward barrier strap will be routed above the release gate and outside of all the CRRC webbing. The ratchet end of the strap will be attached to a 2,500 pound tiedown ring located in the left seat track approximately 36 inches aft of the forward edge of the CRRC. Remove all the slack from the forward barrier and ratchet it as tight as possible. Roll up any excess strap and tape it to itself.

13.4.3. Install a 24 inch two turn length of Type VIII nylon, as a tension strap, through the forward center hole of the CEP and around the release gate between the two 2,500 pound tiedown rings. Tighten the tension strap and secure with a square knot and locking knot with an over hand knot in each running end. Remove all slack from the gate.

13.4.4. After attaching the CRRC static line to the anchor cable, secure the static line to the CRRC webbing with one turn ticket #5 cord. Tie the ticket #5 cord with a surgeons knot and locking knot, after removing all the slack from the static line between the anchor cable and the CRRC webbing.

13.5. CRRC and Parachutists Configurations. C-212 configurations for CRRC airdrops will be dependent on mission requirements (i.e. weight, range, number of parachutists, type of boat, etc.). The rigged CRRC must meet a minimum rigged weight of 28 pounds per square foot (psf).

13.6. CRRC Airdrop Procedures. The CRRC will be airdropped IAW the Equipment Airdrop Checklist procedures (see the amplified checklist). A CARP/HARP will be computed for all CRRC airdrops. The forward throw figure of 280 meters used in computing a CRRC HARP/CARP takes into account both the forward throw and the exit time from the "green light" call. Normal CRRC exit time is 3 seconds. Refer to AFI 11-231 for parachute ballistics, wind and altitude restrictions.

13.6.1. When a combination airdrop (CRRC and personnel) is being conducted, a HARP/CARP will be computed for both the CRRC and parachutists. The personnel release point will normally be used for combination airdrops. The airdrop altitude will be determined by the parachute with the higher altitude restriction.

13.6.2. The CRRC release gate will be manually cut by the loadmaster upon hearing and seeing "green light". The loadmaster will cut the release gate on the left side of the aircraft so as to be in position to remove the forward barrier strap.

WARNING: The parachutists may move aft as the platform moves aft, however they must be immediately moved forward of the pallet stops if an emergency develops during platform extraction.

13.6.3. The airspeed and flap setting for both a CRRC and combination airdrop is 110 KIAS with a "0"/no flap setting. This airspeed and flap setting produces an approximate deck angle of 6 to 8 degrees nose up and allows smooth gravity extraction of the load.

13.7. CRRC Airdrop Emergency Procedures. CRRC airdrop emergency procedures will be accomplished IAW the Equipment Airdrop Emergency Checklist procedures.

WARNING: Avoid excessive aircraft maneuvers to assist in drop zone (DZ) alignment inside of the "3-Minute Warning". Failure to do so may result in the CRRC failing to exit the aircraft or injury to personnel in the cargo compartment.

WARNING: Avoid abrupt power changes or maneuvers to compensate for the center of gravity (CG) shift caused by the CRRC during extraction. Failure to do so may result in the CRRC failing to exit the aircraft or injury to personnel in the cargo compartment.

13.8. Aircrew Requirements. The minimum aircrew required to conduct a CRRC or combination airdrop is a pilot, copilot and a loadmaster. In the event of an airdrop emergency, the copilot will assist the loadmaster with the emergency.

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DCS/Air and Space Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFMAN 10-206, *Operational Reporting*

AFI 11-202V2, *Aircrew Standardization/Evaluation Program*

AFI 11-202V3, *General Flight Rules*

AFI 11-2C-212V1, *C-212 Training*

AFI 11-2C-212V2, *C-212 Aircrew Grading Criteria*

AFI 11-2C-212V3, *C-212 Operations Procedures*

AFI 11-231, *Computed Air Release Point Procedures*

AFI 11-401, *Flight Management*

AFI 13-217, *Assault Zone Procedures.*

AFI 23-202, *Buying Petroleum Products, and other Supplies and Services Off-Station*

AFJM 24-204, *Preparing Hazardous Material for Military Air Shipment*

AFI 31-401, *Managing the Information Security Program*

Abbreviations and Acronyms

AC—Aircraft Commander

ACM—Additional Crewmember

AFI—Air Force Instruction

AFJMAN—Air Force Joint Manual

AFM—Airplane Flight Manual

AFMAN—Air Force Manual

AFSOC—Air Force Special Operations Command

ALCE—Airlift Control Element

AIM—Aeronautical Information Manual

ARF—Aircrew Read File

AsPO—Aerospace Physiologist and Technician

ATC—Air Traffic Control

ATOC—Air Terminal Operations Center

ATS—Aircrew Training System

CARP—Computed Air Release Point

CCC—Command and Control Center

CCT—Combat Control Team

CDS—Container Delivery System

CEOI—Communications Electronics Operating Instructions

CEP—Combat Entry Point

COMAFSOF—Commander Air Force Special Operations Forces

CRRC—Combat Rubber Raiding Craft

CRS—Container Release System

CSS—Communication Surveillance System

DZ—Drop Zone

DZC—Drop Zone Control

DZCO—Drop Zone Control Officer

EOC—End of Course

EPE—Emergency Procedures Evaluation

ESA—Emergency Safe Altitude

ETP—Equal Time Point

FCG—Foreign Clearance Guide

FCIF—Flight Crew Information File

FCIS—Flight Crew Information Summary

FEF—Flight Evaluation Folder

FLIP—Flight Information Publications

FMS—Flight Management System

FOB—Forward Operating Base

GMRS—Ground Marked Release System

GPS—Global Positioning System

HAHO—High Altitude High Opening

HALO—High Altitude Low Opening

HARP—High Altitude Release Point

IAW—In Accordance With

IFF—Identification Friend or Foe

ILS—Instrument Landing System

IMC—Instrument Meteorological Conditions

IMC—Instrument Meteorological Conditions

IP—Initial Point

IP—Instructor Pilot

IRC—Instrument Refresher Course

JSOTF—Joint Special Operations Task Force

LPU—Life Preserver Underarm

LZC—Landing Zone Control

MCTOW—Maximum Certificated Takeoff Weight

MDA—Minimum Descent Altitude

MDS—Mission Design Specialty

MEL—Minimum Equipment List

MQF—Master Question File

MSA—Minimum Safe Altitude

NVG—Night Vision Goggles

NVG—Night Vision Goggle

OB—Order of Battle

OPR—Office of Primary Responsibility

PAR—Precision Approach Radar

PI—Point of Impact

RAMZ—Rigging Alternate Method Zodiac

RCL—Reception Committee Light

SATB—Standard Airdrop Training Bundle

STS—Special Tactics Squadron

TF—Terrain Following

TOA—Time of Arrival

TOLD—Takeoff and Landing Data

TOT—Time Over Target

TOT—Time over Target

UNS—Universal Navigation System

V1—Takeoff Decision Speed

V2—Takeoff Safety Speed

Vmc.—Minimum Control Speed With the Critical Engine Inoperative.

VMC—Visual Meteorological Conditions

VMC—Visual Meteorological Conditions

VVI—Vertical Velocity Indicator

WST—Weapons System Trainer

Terms

Accelerate/Stop Distance—The distance required to accelerate from a standing start to V_1, and then, assuming a failure of the critical engine, come to a full stop.

Additional Crewmember (ACM)—An individual possessing valid aeronautical orders in accordance with AFI 11-402 who is required to perform in-flight duties and is assigned in addition to the normal aircrew complement required for a mission.

Airdrop—Aerial delivery of personnel, supplies, or equipment from an aircraft in flight.

Basic Aircraft Qualified Crewmembers—Crewmembers qualified and current IAW Volume 1 of this instruction to fly the unit aircraft only on non-tactical missions.

Basic Mission Capable Crewmembers—An aircrew member who has satisfactorily completed mission qualification and is maintaining 50% of the applicable mission qualification currency requirements of this instruction.

Border Clearance—Those clearances and inspections required to comply with federal, state, and local agricultural, customs, immigration, and immunization requirements.

CAUTION:—Operating procedures, techniques, and so forth, which may result in damage to equipment if not carefully followed.

Combat Control Team (CCT)—A team of AF personnel organized, trained, and equipped to establish and operate navigational or terminal guidance aids, communications, and aircraft control facilities in support of tactical operations.

Combat Entry Point (CEP)—A geographical point inbound to the objective area where the hostile environment is penetrated.

Command and Control Center (CCC)—An agency used by a commander to plan, direct, and control operations. Each CCC provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this instruction, CCCs include the HQ AFSOC Command Center, HQ AMC Command Center, AMC NAF Operations Centers (OC), Command Posts (CP), Airlift Control Centers (ALCC), Airlift Coordination Centers (ACC), Airlift Control Elements (ALCE), Combat Control Teams (CCT), and the 427 SOS Operations Center.

Commander Air Force Special Operations Forces (COMAFSOF)—The commander designated by COMAFSOC who is responsible for management of Special Operations Forces (SOF) within a theater, a geographic area, or for a designated operation. The COMAFSOF is responsible to the SOC/CC for management of theater assigned SOF forces and is responsible to COMAFSOC for monitoring and management of SOF forces operating within the specific area of responsibility.

Computed Air Release Point (CARP)—A computed air position at which the release of personnel, equipment, containers, or bundles is initiated to land on a specific point of impact (PI). A CARP is

normally computed for all airdrops that do not have a free-fall vector other than vertical distance.

Contingency Mission—A mission operated in direct support of an operation plan, operation order, disaster, or emergency.

Deadhead Time—Duty time accrued by crewmembers in a passenger or additional crewmember (ACM) status.

Deployment—.The relocation of forces to desired areas of operation.

Deviation—Performing an action not in sequence with current procedures, directives, or instructions. Performing action(s) out of sequence due to unusual or extenuating circumstances is not considered a deviation. In some cases, momentary deviations may be acceptable; however, cumulative momentary deviations will be considered in determining the overall qualification level.

Drop Zone (DZ)—A specified area where airborne personnel, equipment, or supplies are airdropped.

Drop Zone Control Officer (DZCO)—An individual on a DZ required to monitor all airdrop operations except airdrop of Army Special Forces.

Employment—The tactical use of aircraft in a desired area of operation.

Equal Time Point (ETP)—The 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.

Error—Departure from standard procedures. Performing wrong actions or recording incorrect information.

Forward Operating Base (FOB)—An airfield without full support facilities used during tactical operations for an undetermined and sometimes extended period of time.

Hazardous Cargo or Materials—Explosive, toxic, caustic, nuclear, combustible, flammable, biologically infectious, or poisonous materials that may directly endanger human life or property, particularly if misused, mishandled or involved in accidents.

Heavy Aircraft—For the purposes of Wake Turbulence Separation Minima, aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.

High Altitude High Opening (HAHO)—A high altitude airdrop in which personnel deploy their parachutes immediately on exiting the aircraft (no programmed free fall).

High Altitude Low Opening (HALO)—Airdrop of personnel or containers using a programmed free fall (parachutist) or a staged parachute delivery.

High Altitude Release Point (HARP)—A computed air position at which parachutists, equipment, containers, or bundles are released to land on a specific point of impact. A HARP is computed for all HALO and HAHO drops.

High Level—Tactical operations conducted at or above 3,000 feet AGL.

Initial Point (IP)—A point near drop zones or landing zones over which final course alterations are made to arrive at the specified zone.

Joint Special Operations Task Force (JSOTF)—A task force composed of Army, Air Force, and Navy

special operation assets.

Low Level—Tactical operations conducted below 3,000 feet AGL.

Major—Adversely affected use of equipment, or violated safety.

Maximum Certificated Takeoff Weight (MCTOW)—Maximum certificated takeoff weight allowable just before brake release.

May—indicates an acceptable or suggested means of accomplishment.

Minimum Safe Altitude (MSA)—An intermediate altitude which will provide terrain clearance in VMC or IMC.

Minor—Did not detract from mission completion.

Mission Ready Crewmembers—Crewmembers current and fully qualified to perform the unit mission.

Mission Sortie—A mission sortie includes pre-mission planning, (if applicable), all appropriate mission checklists for an NVG route and either and NVG airdrop or an NVG takeoff, approach and landing.

Night Vision Goggles (NVG)—Self-contained, battery-operated devices that amplify light to enhance night vision.

NOTE—Operating procedures, techniques, and so forth, which are essential to emphasize.

Operational Control—Authority to direct accomplishment of a mission.

Overwater Flight—Any flight which exceeds power-off gliding distance from land.

Point of Impact (PI)—The point on the drop zone where the first airdropped parachutist or cargo item lands or is expected to land.

Shall—a mandatory requirement.

Should—indicates a recommended procedure that is required if practical.

Small Aircraft—For the purposes of Wake Turbulence Separation Minima, aircraft of 12,500 pounds of less maximum certificated takeoff weight (MCTOW).

Station Time (Air Force)—A specified time at which aircrew, passengers, and material are to be in the aircraft and prepared for flight. Passengers will be seated and loads tied down. Aircrews will have completed briefing and aircraft preflight inspection prior to station time. Normally, station time will be 30 minutes prior to takeoff time.

Station Time (Airborne)—A specified time when parachutists will be seated in the aircraft with seat belts fastened. This time normally will be 5 minutes prior to Air Force station time.

STOL—Short Takeoff and Landing. Includes all operations and airplanes the FAA has certified as having STOL performance characteristics.

Time Over Target (TOT)—The actual time an aircraft is at a geographic point or area carrying out an assigned mission.

Unilateral Air Force Training—AFSOC Aircrew training conducted to achieve and maintain mission ready or mission capable status. Types of missions include aircraft commander upgrade training, standardization and evaluation, and continuation training.

WARNING:—Operating procedures, techniques, and so forth, which may result in personal injury or

loss of life if not carefully followed.

Will—a mandatory requirement.

Attachment 2

THE NIGHT ENVIRONMENT WITH NVGS

A2.1. General. Survivability is a function of minimizing threat capabilities and maximizing aircraft systems to accomplish the mission. One way to maximize our capabilities is through the use of night low-level operations, which reduce the probability of detection by visual, electro-optic or electronic means. Night operations increase the chance of surprise and decrease the chance of detection and weapons engagement by enemy forces. To fly night low-level profiles, the use of night imaging devices is a necessity. A thorough understanding of the relationship between ambient illumination, the night imaging device and the terrain is essential to safe and effective aircraft operations in this environment.

A2.2. Objectives:

A2.2.1. Define luminance and illuminance

A2.2.2. Define albedo

A2.2.3. Identify the human eye's sensitivity to the spectral range

A2.2.4. Identity the four phases of the moon and length of the Lunar Cycle

A2.2.5. Describe how the altitude of the moon affects illumination.

A2.2.6. Describe how a thin and wispy cloud can appear "invisible" through NVG's.

A2.2.7. Identify the two characteristics that allow us to distinguish differences in terrain.

A2.3. Basics Of Light: Light which stimulates the unaided eye or the night imaging device is a form of electromagnetic radiation. This optical energy belongs to the same class of physical phenomena as radio waves, heat waves and x-rays. Optical radiation, or light, manifests itself as particles of energy called photons that can be thought of as wavelike in nature. The particle theory of light provides a description of the emission of light from a source, such as the moon. Its energy is measured radiometrically against a known standard or photometrically through perceptions of brightness and color. For the purposes of this manual, we will deal only in photometric units (Luminance, illuminance, candlepower and luminous flux or intensity). *Don't get wrapped up in the technical aspects of light theory presented here. It is more important to understand the basic principle of light propagation and how it affects what you see*.

A2.4. Luminance vs. Illuminance: Illuminance is the amount of light that strikes an object or surface at some distance from a source. The amount of ambient light that strikes the ground from the moon is an example of illuminance, and is expressed as either lux or foot-candles. Luminance, on the other hand, is the amount of light reflected or emitted from a surface. Moonlight reflecting off a lake is an example of luminance and is expressed as foot-lamberts. The moonlight striking the ground is illumination while the light reflected off the terrain that enables us to see it is luminance. The relationship between these two yields a ratio of incident light to reflected light and is called albedo. Every surface has a different albedo, so while illumination from the moon may remain constant, luminance from different terrain sources varies at night. It is for this very reason that an asphalt road is more difficult to see at night than a light colored concrete one.

A2.5. Light Propagation: Illumination and luminance are characteristics associated with the particle theory of light. The propagation of light through a medium (air) or optical system (the eye) is associated with wave theory. Regarded as a form of wave motion, light has the characteristics of wavelength, frequency and velocity. For our purposes, we will deal only with wavelength. All night imaging devices and the human eye are sensitive to different wavelength ranges of electromagnetic radiation, just as a radio receiver selectively tunes within a broad spectrum. Optical radiation is seen as a relatively small portion of the entire spectrum that includes visible light (.4 to .7 microns) and the near infrared (.7 to 3.0 microns). The human eye is only sensitive to the light between .4 and .7 microns, with the lower range being the cool colors such as purple and blue and the upper range being the warmer colors such as orange and red. A substantially higher degree of light energy exists outside the limits of visible light in the near infrared region. It is in this near infrared region that night imaging systems are most sensitive.

A2.6. Night Sky Illumination: There are many sources of ambient illumination that combine to light the night sky. Natural sources include the moon, stars, solar light and other background illumination. Artificial sources include light from urban areas, cars, fires and searchlights.

NOTE:

When effective illumination is less than 5% or during overcast sky conditions, sufficient light may be available, depending on surrounding area lighting, to safely conduct NVG operations. The decision on whether there is sufficient available illumination to safely conduct low-level NVG operations rests with the aircraft commander or flight lead.

A2.6.1. Moon**.** The moon provides the highest percentage of ambient illumination at night, reflecting towards the earth about 7% of the sunlight which falls upon it. The moon's albedo, or reflectivity, continually changes as the moon arcs across the sky. The moon angle, along its arc, changes approximately 15 degrees per hour and thus the ambient light level from the moon changes as the moon angle changes. Illuminance caused by sunlight reflected from the moon is affected by the following factors.

A2.6.1.1. Phases of the Moon. At the outset, it is important to make clear that one half of the moon's surface is always illuminated. To the earthbound observer, however, the amount of the illuminated half of the moon that can be seen changes throughout the month depending on the phase. There are four phases in the Lunar Cycle and conditions during each of the four phases will conform to a distinct pattern. The phase depends on how much of the sunlit half of the moon can be seen at any one time. Each phase lasts between 7 and 8 days each. In the new moon phase, the face is completely in shadow (no apparent disk) and is not visible because its time above the horizon occurs during daylight. The next phase, the first quarter moon, begins when moon illumination is approximately 50 percent and continues until slightly less than 100 percent of the apparent disk is illuminated. It is at its zenith around 1800 hours local time. The full moon phase begins when 100 percent of the moon is illuminated and ends 7 days later when about 50 percent is visible. It is at its zenith around 2400 hours local time. The third quarter moon is the last phase and ends when about 2 percent or less of the moon is visible. It is at its zenith at 0600 hours local time. The entire cycle is repeated each lunar month, usually 29½ days.

A2.6.1.2. Altitude of the Moon. As the moon revolves on a vertical arc, the distance from a stationary point to the moon varies as it moves on its easterly orbit. Referred to as the altitude of the moon, it is one example, at low altitude, the vertical component of moonlight incident to a horizontal surface is small compared to that at high altitude. At low altitude, light is attenuated by a

relatively long distance through the atmosphere of the earth. As the moon ascends in the sky, the distance through the atmosphere decreases and the vertical component of moonlight increases. The maximum ambient light level is achieved when the moon reaches the zenith position.

A2.6.1.3. Albedo of the Moon's Surface. Differences in reflectance of the moons surface during the lunar cycle affects the amount of illumination that reaches the earth. The moon is about 20 percent brighter at first quarter than at third quarter due to differences in the lunar surface.

A2.6.2. Stars. The stars provide an illuminance that is equivalent to about one-quarter of the actual light from the night sky with no moon. The majority of stars peak in spectral irradiance between .8 and 1.0 microns. This means the majority of optical energy is invisible to the human eye but falls within the response curve of night vision goggles.

A2.6.3. Background Illumination. The greatest portion (about 40 percent) of the natural light of the night sky on a moonless night, the airglow that originates in the upper atmosphere, is produced by the emission from atoms and molecules. Other minor sources are the aurora and zodiacal light caused by the scattering of sunlight from interplanetary particulate matter.

A2.6.4. Artificial sources. Lights from cities, cars and fires are normally sources of small amounts of illumination. Light from weapon flashes, flares and explosion contain significant levels of near infrared light and are intensified by night imaging devices. The light from these sources is most pronounced when overcast conditions exist. Infrared searchlights are useful in providing an artificial source light. Remember, however, that night vision devices will only use light reflected from the terrain. Therefore, IR searchlights may not be effective in locations where there is a lack of terrain contour, texture or obstacles. Flat terrain with sparse vegetation offers very little to reflect light.

A2.7. Weather and Visibility Restrictions. Weather and other visibility restrictions all serve to reduce the illumination, luminance or both. This reduction in turn reduces our ability to see key terrain features necessary for flight. Any condition of the atmosphere that absorbs, scatters or refracts the night sky's illumination will effectively reduce the usable light. Although an exact amount of reduction is impossible to apply to each condition, an estimation of light reduction can be made by considering the basic illumination as an atmospheric condition and its density.

A2.7.1. Clouds. The attenuating effects of clouds are difficult to describe due to their variability. The problem is exacerbated by the fact that water in low level clouds is found in the gaseous, liquid and sometimes even solid state. Because the amounts of water vapor available for any drop formation increases with temperature, summer clouds generally have higher liquid water contents than winter clouds. Thick, dense clouds can be easily seen with night vision devices, especially when silhouetted against the night sky. This also means that thick clouds will reduce the amount of illumination that strikes the ground and therefore reduce the luminance they have available for use. Thin and wispy clouds, however have much more space between their particles and pass more of the near infrared wavelengths through without being scattered. Because the near infrared wavelength is slightly longer, it has a greater chance of passing through the clouds than does the shorter visible wavelength. It is possible, therefore, for thin and wispy clouds, which may be seen with the naked eye to be invisible when viewed through night vision devices. This is possible if the clouds are:

A2.7.1.1. thin enough to allow the near infrared wavelengths to come through

A2.7.1.2. they are low level and set in the terrain as opposed to being set against the night sky and

A2.7.1.3. the ambient illumination is either very high (causing de-gain of the intensifier tubes) or very low (causing graininess).

The invisibility of thin clouds, which progress to thicker ones hiding terrain features, can create a severe hazard. How, if the cloud is invisible, does it hide terrain features? First, the cloud reduces visual and near infrared contrasts and detail. This produces a false perception of distance, resulting in a pilot either not seeing the terrain or thinking it is much farther away than it actually is. Second, the cloud may get progressively thicker, allowing the pilot to progress through the cloud without initially perceiving a "cloud wall." If a cloud is perceived, it is again thought to be off at a distance.

A2.7.2. Fog. The effect of fog on night vision devices is similar to that of clouds, with the only major differences being the distance from the ground. Particle size varies between 2 and 20 micrometers, very similar to that of clouds. Typically, fog has fewer particles and a smaller range of particle size than clouds. Fall is the most likely season and early morning is the most likely time to encounter fog. Urban areas tend to have less fog than rural areas and mountainous areas tend to have more fog than sites nearer sea level. A halo around ground light indicates that moisture is in the air and that ground fog may be forming.

A2.7.3. Rain. Droplet size and density are key ingredients to its visibility or invisibility. Light rains or mists cannot be seen by night vision devices, but will affect contrast, distance estimation and depth perception.

A2.7.4. Snow. Snow crystals, while small in size, are large in comparison to the wavelength of visible and near infrared light and will easily block or scatter those wavelengths. However, snow will not normally degrade infrared light as much as fog and rain due to its lesser density. Terrain recognition is more difficult in a snowy region due to the combination of a reduction in contrast and increase in reflectivity.

A2.7.5. Sand/Dust/Smoke. The effect of blowing sand, dust or smoke is similar to that created by the weather factors. However, the individual particulates in these obscurants are usually far denser, which means they can block energy even if less concentrated. The effect on the night vision device in this condition is significant in that it completely blocks the near infrared light striking and reflecting from the terrain.

A2.7.6. Obscurants. Battlefield obscurants, whether smoke or chemical produce similar effects to those described above. They will be most effective if they contain a mixture of small and large particles and are very dense. Attenuation by absorption, reflection or a combination of both may be used as a countermeasure against NVG operations.

NOTE:

The atmospheric conditions described on the previous pages all reduce the ambient illumination level. The changes are often very subtle reductions in contrast which are not perceived unless the aircrew member is looking for them. Common cues to reductions in ambient illumination due to visibility restrictions include: loss of celestial lights, loss of ground lights, reduced contrast or depth perception/distance estimation, reduced acuity or resolution, increased graininess or video noise, increased halo around light sources.

A2.8. Terrain Luminance: Our ability to see key terrain features is solely a function of the amount of light reflected off those features. Illumination from the night sky or some artificial source reflects off the terrain in varying degrees (depending on albedo), thereby allowing us to see that terrain. Reflection in the visible spectrum is used by the naked eye while night vision devices use reflections in the near infrared wavelengths. The two characteristics of the illuminated terrain responsible for our ability to distinguish differences in terrain features are contrast and shadows.

A2.8.1. Contrast. Contrast is a measure of the luminance difference between two or more surfaces. It varies from negative 100 percent to zero for surfaces darker than their backgrounds and from zero to infinity for surfaces brighter than their backgrounds. Contrast in the night terrain environment is dependent upon different albedo values for each type of terrain surface. Since the eyes and the night vision device use reflected light off the terrain, albedos are critical to determining the amount of light available for night terrain avoidance. These differences can become very important, especially at lower ambient light levels. As an example, a flight progressing from fields covered with fresh snow (.85 albedo) to a forest of coniferous trees (.14 albedo) on a clear moonless night (.0008 lux) creates very different levels of terrain luminance. Over the snow, 85 percent of the incident light is reflected off the terrain while the forest reflects only 14 percent of the same light. The effect of albedo contrast is more pronounced at lower ambient light levels. Albedos will also vary with conditions of the terrain. For instance, dry sand is twice as reflective as wet sand. Overall contrast is improved with higher light levels. As the ambient light increases, more light is reflected, shades become more recognizable and an object's overall definition is improved.

A2.8.1.1. Roads. The surface of some dirt roads provides excellent contrast with surrounding terrain. Roads that cut through heavy forested areas are easily recognized if visible through foliage. The light color of concrete highways, normally an excellent reflective surface, is easily identified during most light-level conditions. Asphalt roads, however, are usually difficult to identify because the dark surface absorbs available light.

A2.8.1.2. Water. There is very little color contrast between a landmass and a body of water during low light conditions. When viewed from the air, lakes or rivers appear dark gray in color. As the light level increases, water begins to change color, land-water contrast increases and reflected moonlight is easily detected. When a surface wind exist, the ripples on the surface improve the contrast, which further aids in terrain identification.

A2.8.1.3. Forested areas. Heavily forested areas do not reflect light and generally appear as dark at night. Because heavy vegetation provides no contrast, forests conceal objects and terrain features. Excellent contrast does exist between deciduous and coniferous trees as well as between open fields and surrounding forested areas.

A2.8.1.4. Desert. Camouflaged military targets are normally hard to recognize in the desert. During high illumination, mountain ranges can be easily identified because of the dark color of barren mountains against the light color of the desert floor. Lower rises in terrain between the viewer and the higher ranges are difficult to identify in low ambient light.

A2.8.2. Shadows. It should be noted that our ability to distinguish terrain features is dependent upon shadows produced by contours creating a luminous texture. Shadows are dependent on the angle of the light source and the contour of the terrain. Every object or surface will cast a shadow if there is sufficient contour and light source. The direction in which the shadow is cast depends on the position of the light source while the length of the shadow depends upon the angle of the light source.

A2.9. Cockpit Lighting . NVG compatible lighting allows the crewmember to see cockpit instruments underneath the NVG while not measurably affecting NVG performance. Although NVG filters allow the use of cockpit lighting that will not adversely effect gain and image quality, unfiltered aircraft lighting is incompatible. If the lighting is not properly modified, it will emit wavelengths that affect NVG performance. There are aircraft in the inventory that have not been fully modified to be NVG compatible. The following points are provided for clarification:

A2.9.1. Just because a light is green or blue does not mean it is compatible. When the filament in a light glows, it releases a significant amount of near-IR energy that will affect NVG gain and performance. Light bulbs and other energy sources in the cockpit must be modified in some manner to block the emissions of all energy to which NVGs are sensitive in order to make them NVG compatible.

A2.9.2. Turning down the brightness of incompatible cockpit lighting will not make them compatible because NVGs are also sensitive to the near-IR energy emitted by the lights. Attempting to turn down lighting to reduce the effect on goggles can be a two edged sword—the NVG image will still be degraded and vital instruments may not be readable with the unaided eye.

A2.9.3. An incompatible light does not have to be within the NVG field of view for it to have an effect on gain.

A2.10. Emergency Situations. In general, consider the type of emergency and what actions might be required from the pilot or the crew. If the NVGs will not be useful during emergency procedures, consider removing them. However, if you can gain valuable information from the NVGs, aircrews may continue to use them.

A2.11. Inadvertent IMC. One of the most dangerous situations that can be experienced with NVGs is flight into undetected meteorological conditions. The inability of the NVGs to see various areas of moisture can lull the aircrew to continue further into IMC to a point where there is virtually no visual information. This can result in a gradual loss of scene detail and place the aircrew in an area of heavy moisture and, in the low-level environment, place the aircrew in a potential conflict with masked terrain. Looking underneath or around the NVGs with the unaided eye can aid in detecting IMC, but be aware that you can be in precipitation without seeing it in the NVG image. Use all cues available to you. The following NVG cues will help alert you to impending IMC:

A2.11.1. Halos surrounding incompatible light sources outside the cockpit (e.g., external lights from another aircraft) may change in appearance. Normally sharp edges to the halos can become less distinct and the halo may appear larger due to energy dispersion from the moisture.

A2.11.2. A gradual loss of scene detail, visual acuity, or terrain contrast.

A2.11.3. Partial or complete loss obstruction of the moon and stars.

A2.11.4. An increase in scintillation.

A2.11.5. The glow or flash from your aircraft external lights/strobes/landing lights may become visible or intensify.

A2.12. Spatial Disorientation. Spatial disorientation can occur anytime during flight. Although NVGs usually improve situational awareness and reduce the possibility of spatial disorientation, they can also enhance momentary disorientation. This is due to the limited field of view and lower resolution. Main-

taining spatial orientation at night requires complex conscious processing of data from various instruments, displays and references. The task of maintaining spatial orientation competes with the usual tasking of navigation, terrain masking, terrain avoidance, etc. Constant vigilance and a good scan pattern, both inside and outside the cockpit, must be maintained to help prevent spatial disorientation. Keeping the horizon in the NVG scan can help avoid spatial disorientation. If you feel disorientated, react in exactly the same way as if you were on a non-NVG flight.

A2.13. Overconfidence. Aircrew members must not become over confidant in the capabilities of the NVGs. Goggles are only one tool used during night flight, and many situations can degrade or eliminate their effectiveness. Aircrews need to be cognizant of NVG limitations and prepared to transition to other flight aids, primarily aircraft instrumentation. Remember that NVGs do not turn night into day. After your initial NVG experience, there may be a natural tendency to be overly confident in your abilities. While, over time, there will undoubtedly be an increase in your skill level, it is not enough to compensate for the multiple variables in the night environment. The complacent mind-set could be a setup for a mishap.