BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE MANUAL 11-2AC-130J, VOLUME 3

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Flying Operations

AC-130J OPERATIONS PROCEDURES

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This manual implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*, and references Air Force Instruction (AFI) 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, Air Force Manual (AFMAN) 11-202, Volume 3, *General Flight Rules* and Major Command (MAJCOM) supplements thereto. It provides policies and procedures for the operation of all AC-130J aircraft under most circumstances, but should not replace sound judgment. This AFMAN applies to all civilian employees and uniformed members of the Regular Air Force, Air National Guard and Air Force Reserve who operate or maintain AC-130J aircraft. This publication does not apply to the United States Space Force (USSF). This publication requires the collection and/or maintenance of information protected by the Privacy Act of 1974 authorized by Title 10 U.S.C., Sec 9013, Secretary of the Air Force. The applicable SORN F011 AF XO A, Aviation Resource Management Systems is available at: **https://dpcld.defense.gov/privacy/SORNS.aspx** . Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the Department of the Air Force Form 847, *Recommendation for Change of Publication;* route DAF Form 847s from the field through the appropriate functional chain of command, AFSOC/A3V, 100 Bartley Street, Suite 141W, Hurlburt Field, FL 32544-1015 or **AFSOC.A3V@us.af.mil**. Ensure all records generated as a result of processes prescribed in this publication adhere to AFI 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. This publication may be supplemented at any level, but all direct supplements must be routed to the office of primary responsibility (OPR) of this publication for coordination prior to certification and approval. The authorities to waive wing, unit, delta or garrison level requirements in this

publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the publication OPR for non-tiered compliance items. Failure to obey all sections within this publication constitutes a violation of Article 92(1), UCMJ—failure to obey lawful order or regulation. Article 92(1) of the UCMJ does not apply to members of the ANG while in Title 32 status (that is, activated for state duty under state command), but ANG members may be subject to an equivalent article under a state military justice code."

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed. Major changes include allowable crew complement, the removal of the touch-and-go certification requirement, major revision of the fuel planning chapter, incorporation of standard operating procedures, the addition of night vision goggles (NVG) airland procedures, and additional formation requirements and procedures. References have been updated throughout.

Chapter 1

ROLES AND RESPONSIBILITIES

1.1. General. This publication provides guidelines and restrictions for AC-130J operations and applies to AC-130J aircrews at all management levels concerned with the operation of the AC-130J. It is a compilation of information from aircraft flight manuals, Flight Information Publications (FLIP), and other Air Force directives. This publication is regulatory in nature and takes precedence over guidance in Air Force Tactics, Techniques, and Procedures (AFTTP). It is written for normal and contingency operations to reduce procedural changes at the onset of contingencies. Training procedures are included. When guidance in this AFMAN conflicts with another basic/source document, that document takes precedence. For matters where this AFMAN is the source document, waiver authority is in accordance with (IAW) Paragraph 1.4. AFSOC/A3V has overall responsibility for the administration of this volume.

1.2. Applicability. This AFMAN is applicable to all crewmembers operating the AC-130J.

1.3. Key Definitions.

1.3.1. "Will" and "Must" indicate a mandatory requirement.

1.3.2. "Should" indicates a preferred, but not mandatory, method of accomplishment.

1.3.3. "May" indicates an acceptable or suggested means of accomplishment.

1.3.4. "***WARNING***" indicates operating procedures, techniques, which may result in personal injury or loss of life if not carefully followed.

1.3.5. *"**CAUTION**"* indicates operating procedures, techniques, which may result in damage to equipment if not carefully followed.

1.3.6. ***"Note:"*** indicates operating procedures, techniques, which are considered essential to emphasize.

1.4. Deviations and Waivers. Do not deviate from the policies and guidance in the AFMAN except when the situation demands immediate action to ensure safety.

1.4.1. Although this publication provides guidance for aircraft operations under most circumstances, it is not a substitute for sound judgment. When it is necessary to protect the crew and aircraft from a situation not covered by this publication and when immediate action is required, the pilot in command (PIC) has ultimate authority and responsibility for the course of action to be taken. Report deviations, without a waiver, through channels to Air Force Special Operations Command Director of Operations (AFSOC/A3) within 48 hours, followed by a written report.

1.4.2. Crews requiring waivers or technical assistance should contact the controlling agency for proper coordination. The PIC must consider all factors (crew duty time/flight duty period (FDP), aircrew qualification levels, type mission, and sortie duration, weather, notices to airmen (NOTAM), and alternates) before requesting the waiver. It is highly recommended that the PIC contact squadron leadership, Squadron Commander (SQ/CC), Director of Operations (DO), Assistant Director of Operations (ADO), or Operations Group Standardizations and Evaluations (OG/OGV) for any advice or assistance prior to waiver request (time permitting). Transmit mission data to the controlling command and control (C2) agency by any means

available (i.e., Defense Switching Network (DSN), High Frequency (HF) radio, Iridium phone and L-Band Satellite Communication (SATCOM)).

1.5. Local Supplements Coordination Process. Units will send one copy of **Chapter 10** (Local Procedures) supplements to AFSOC/A3V for validation.

1.6. Requisitioning Procedures. This AFMAN must only be delivered electronically to the end user. Printing is at the discretion of the individual units.

Chapter 2

COMMAND AND CONTROL (C2)

2.1. General. The AFSOC C2 system is based on the principles of centralized monitoring and decentralized control and execution. The result is a C2 mechanism which keeps the AFSOC Commander informed of the current status of AFSOC forces while enabling the Wing or Group Commander to exercise control over day-to-day operations.

2.2. MAJCOM & Operational Control (OPCON) Authority. Absent an approved command relationship to the contrary, AFSOC is designated as the active and reserve controlling agency for United States Special Operations Command (USSOCOM)-assigned Air Force Special Operations Forces (SOF) aircraft, while Theater Special Operations Commands (TSOCs) 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 Wing or Group Commander, in turn, exercises control of non-sensitive missions through the command post supporting the wing or group. In the event that assigned forces undergo a change in OPCON, responsibility for mission monitoring passes from the wing or group C2 facility to the gaining command. Changeover will be accomplished IAW the pertinent Operational Plan, Operational Order, or deployment or execution order. **(T-0)** When Air National Guard (ANG) aircrews operate in a status other than Title 10, the members' state governor, typically through delineated authorities to their appointed Adjutant General will control aircrews when executing Continental United States (CONUS) Domestic Operations (DOMOP) missions. **(T-0)** The ANG Command Center may serve as the reporting agency for ANG aircraft supporting ANG missions.

2.3. Commander, Air Force Special Operations Forces (COMAFSOF). The Commander, USSOCOM or TSOC, may designate a COMAFSOF. This should be done in writing, and the designation letter will include the individual by name, and the geographic area of authority. In the absence of a USSOCOM or TSOC commander designated COMAFSOF, AFSOC/A3 may designate an individual with waiver authority equivalent to a designated COMAFSOF. This must be done in writing, and the designation letter should include the individual by name, and the geographic area of authority. **(T-2)** The designation letter should be updated to reflect any personnel changes as a result of prolonged deployments.

2.4. Operations Center. The AFSOC Operations Center monitors all off-station AFSOC aircraft via Theater Battle Management Core Systems (TBMCS) – Execution Status and Monitoring (ESTAT), the Global Decision Support System (GDSS2), Theater Situation Reports, and aircrew Deployed Status Reports (DSR). Aircraft equipped with Blue Force Tracker (BFT) devices are tracked near real time via the Common Operating Picture (COP). Inputs to these various tracking tools are provided by the C2 agency with OPCON.

2.4.1. PIC or mission commander flight reporting duties to the Operations Center:

2.4.1.1. Stations with Mobility Air Force (MAF) C2 Agency. Aircrews will provide a "Thirty Minute" Out Call. **(T-3)** Transmit an ultra-high frequency (UHF) or very high frequency (VHF) arrival advisory to the destination C2 agency approximately 30 minutes prior to arrival. Provide Estimated Time in Blocks (ETB). Local MAF C2 agents will enter mission data (arrival, departure, and advisory messages) in GDSS2 when applicable. Additionally, aircrews must keep their controlling C2 agency appraised of all actual takeoff

and landing times, projected takeoff times, and other related information within 30 minutes after landing. **(T-3)**

2.4.1.2. Stations without MAF C2 Agency. Transmit mission data (arrival, departure, and advisory messages) to the controlling C2 agency, within 30 minutes after landing, by any means available. **(T-3)** Preference in the following order: Defense Switched Network (DSN)/ commercial telephone, high frequency (HF) phone patch, Iridium Phone. For critical C2 communications (i.e., aircraft waiver request, maintenance delay, etc.), voice communications are the primary method.

2.4.2. Provide controlling C2 agency with daily DSR. **(T-3)**

2.4.3. For reporting agencies contacts, see **Table 2.1**. Reporting Agencies.

2.5. Wing Commander. Wing Commanders or equivalent hold waiver/approval authority for items normally authorized at or below wing level. This includes the following items:

2.5.1. Deployments.

2.5.2. Air Apportionment Allocation Conference taskings.

2.5.3. Joint Air Apportionment Allocation Conference (JAAAC) taskings.

2.5.4. Joint Combined Exchange Training (JCET) / Counter Narcotics Training missions.

2.5.5. Other specified missions as tasked via the SOF Air Tasking Order (ATO) in Special Operations Forces applications (SOFAPPS).

2.5.6. CONUS and outside continental United States (OCONUS) forces that depart a Theater Special Operations Command (TSOC)/Joint Special Operations Air Component (JSOAC) Area of Responsibility (AOR) enroute to United States Northern Command (NORTHCOM) AOR.

2.5.7. Air Reserve Component (ARC) and ANG forces (under Title 10).

2.5.8. Depart home station for AFSOC-directed contingencies/deployments/exercises (under Title 10).

2.5.9. Wing Commander OPCON terminates when forces enter a TSOC/JSOAC AOR and picks up when forces exit a TSOC/JSOAC AOR.

2.6. 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. **(T-3)** The mission commander will be rated and should be a field grade officer. **(T-3)** The mission commander will not be a primary crewmember for exercises but may fly as a crewmember on non-exercise related missions. **(T-3)** The individual responsible for the overall employment of all air assets assigned to the mission. Required for multi-element, multi-event formations, and/or where mission complexity dictates. **(T-3)** Mission commanders are responsible for overall mission execution as well as aircraft and personnel supporting the mission. Duties include but are not limited to:

2.6.1. Briefing crews on local operating procedures.

2.6.2. Coordinating with Air Traffic Control (ATC), Combat Control Team (CCT), Special Tactics Squadron (STS), range control, users and others that may have an impact on the mission.

2.6.3. Ensuring personnel have ample and adequate billeting, eating and transportation arrangements.

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

2.7. Deputy Mission Commander (DMC). Required on all missions employing a dedicated airborne mission commander (AMC), on all multi-element formation missions, and on all single element formations of three aircraft or more. **(T-3)** The DMC assumes command if conditions prevent the mission commander from controlling the mission. The DMC may be a primary crewmember and is usually the Formation Commander on mission commander-controlled missions. The DMC will not be on the same aircraft as the mission commander. **(T-3)** On missions not employing a dedicated mission commander, the DMC is chosen from the PICs, and Weapon Systems Officers (WSOs) involved in the formation. **(T-3)** DMC duties will mirror mission commander duties listed in 2.6.

2.8. Pilot in Command. AF Form 4327A *Crew Flight (FA) Authorization,* identifies a pilot in command for all flights. PICs are designated by the FA approving authority and are:

2.8.1. In command of and responsible for the welfare of all persons on board the aircraft. **(T-2)**

2.8.2. Responsible for the safe accomplishment of the mission. **(T-2)**

2.8.3. Vested with the authority necessary to manage their crew and safely accomplish the mission. **(T-2)**

2.8.4. The final mission authority and will make decisions not specifically assigned to a higher authority. **(T-2)**

2.8.5. The final authority for accepting a waiver affecting the crew or mission. **(T-2)**

2.8.6. Charged with keeping the applicable commander informed of mission progress and difficulties. **(T-2)**

2.8.7. For required maintenance support when away from home station, PICs will coordinate with A4 Combat Logistics Operations. **(T-2)** Combat Logistics Operations may be contacted at: DSN 579-8925/8935, commercial 850-884-8925 or email **afsoca4.a4modclo@us.af.mil**.

2.9. Civilian Law Enforcement Support. It is the policy of the Department of Defense (DoD) to assist civilian law enforcement officials to the maximum extent practicable and as permitted by DODI 3025.21*, Defense Support to Civilian Law Enforcement Agencies* and DODI 2014.18, *Defense Support of Civil Authorities (DSCA)*. See also AFI 10-801, *Defense Support of Civil Authorities,* which provides policies and procedures service members must follow when supporting federal, state, and local civilian law enforcement agencies. It establishes specific limitations and restrictions on the use of Air Force personnel, equipment, facilities, and services by civilian law enforcement organizations. Report all requests for assistance and coordinate all requests from civilian law enforcement authorities with the servicing staff judge advocate and through the appropriate C2 channels. **(T-0)**

2.10. Mission Clearance Decision. The final decision to delay a mission may be made either by the agency with OPCON or the PIC 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 PIC. **(T-2)** If the PIC refuses a mission, it will not depart until the conditions have been corrected or improved so that the mission can operate safely. **(T-2)** Another PIC and aircrew will not be alerted to take the same mission under the same conditions. **(T-3)** Due to potential *posse comitatus* issues with military support of civilian law enforcement, consultation with the servicing staff judge advocate is critical. Further, while limited exceptions exist for emergency situations, the requirement to coordinate all requests for such assistance through command channels may not be waived.

2.10.1. Diverting or rerouting a mission must be authorized by the commander with OPCON, except in an emergency or when required by enroute or terminal weather conditions or facilities. **(T-3)** In the event of an emergency or weather related divert or reroute, the mission commander PIC must notify the controlling authority as soon as possible. **(T-3)**

2.10.1.1. The controlling agency directing the diversion or rerouting is responsible for ensuring destination requirements or facilities are adequate for the aircraft and aircrew. **(T-3)**

2.10.1.2. The PIC will notify the controlling agency of any aircraft or aircrew limitations that may preclude diverting or rerouting the mission. **(T-3)**

2.10.2. When directing an aircraft to an alternate airfield, the controlling agency will ensure the PIC is provided existing and forecasted weather for the alternate. **(T-3)** If the planned alternate is unsuitable upon arrival at destination, the controlling agency will advise the PIC of other suitable alternates. **(T-3)**

Table 2.1. Reporting Agencies.

AFSOC Operations Center		
Telephone	DSN	312-579-8900
	Commercial	850-884-8900
	Toll-Free	800-451-7705
	RSDN	579-0212
FAX	Not Available	
E-mail	afsoc.coc@us.af.mil	
Secure E-mail	afsoc.coc@socom.smil.mil	
1 SOW		
Telephone	DSN	312-579-8100
	Commercial	850-884-8100
	Toll-Free	800-346-6679
	RSDN	579-3601
FAX	DSN	312-579-6778
	Commercial	850-884-6778
E-mail	1sow.cmd.pst1@us.af.mil	
27 SOW		
Telephone	DSN	312-681-2253
	Commercial	575-784-2253
	Toll-Free	800-346-6679

	RSDN	299-5653
FAX	DSN	312-681-6406
	Commercial	505-784-6406
E-mail	27SOWCP@us.af.mil	
RAF Mildenhall (100 ARW) Command Post (CP)		
Telephone	DSN	314-238-2121
	Commercial	011 (00)44-207-499/894
Eglin AFB (96 ABW) CP		
Telephone	DSN	312-875-4020
	Commercial	850-883-4020
Kadena AB (18 WG) CP		
Telephone	DSN	315-634-8516/8405
	Commercial	011-(00)81-6117
919th SOW Command Center Duke Field FL (Voicemail Box 101, after Midnight Central Time)		
Telephone	DSN	875-6701
	Commercial	(850) 883-6701
	Toll-Free	1-800-437-8843
E-mail	919SOW.CP.WORKFLOW@us.af.mil	
Secure E-mail	919SOWCP@afmc.af.smil.mil	
193 SOW		
Telephone	DSN	312-423-2249/2250
	Commercial	717-948-2249/2250
Fax	DSN	312-423-2402
	Commercial	717-948-2402
E-mail	193sow.cp.omb@ang.af.mil	
Secure E-mail	193sow.cp@ang.af.smil.mil	

Chapter 3

AIRCREW COMPLEMENT AND MANAGEMENT

3.1. Aircrew Qualification. Each person assigned as a primary crewmember must be qualified or in training for qualification in that crew position, mission, and Mission Design Series (MDS) aircraft. **(T-2)**

3.1.1. Basic proficiency crewmembers may perform primary crew duties on any non-mission sortie, and on mission sorties (including unilateral training, joint training, and exercises) when receiving mission qualification training or evaluations under the supervision of a qualified instructor or flight examiner in their respective crew position.

3.1.2. Basic mission capable (BMC) crewmembers may perform primary crew duties on any unilateral training mission. For other missions, the unit commander must determine the readiness of each mission capable crewmember to perform primary duties. **(T-2)**

3.1.3. Noncurrent (NC) or unqualified (UNQ) pilots may perform crew duties only on designated training or evaluation missions under the supervision of a qualified instructor or flight examiner pilot. Comply with the requirements for pilots in dual controlled aircraft in DAFMAN 11-401, *Aviation Management*. **(T-2)**

3.1.4. NC or UNQ crewmembers may perform duties in their primary crew position on any mission when under the direct supervision of a qualified instructor or flight examiner in their respective crew position. In this case, the student crewmember and the instructor or flight examiner fulfills the requirement for one primary position as specified in **Table 3.1**.

3.1.5. For the purpose of aircraft/mission familiarization, the Group Commander (OG/CC), or COMAFSOF may authorize unqualified personnel to perform duties (any tasks the qualified crewmember would normally accomplish) in non-pilot crew positions during flight under direct instructor supervision. **(T-3)** The purpose of this familiarization training is to enable the individual a better understanding of various crew positions on the AC-130J. DAFMAN 11-401, *Aviation Management,* and MAJCOM Supplements contain information on orientation flight requirements.

3.1.6. Students attending the Weapons Instructor Course may perform duties during non-critical phases of flight in all crew positions on WIC syllabus-approved training sorties when under the direct supervision of an MDS-qualified instructor in that crew position.

3.2. Crew Complement. Minimum crew complement will be as specified in the flight manual and in **Table 3.1 and Table 3.2**. The group commander or COMAFSOF is the waiver authority for all other crew positions above the minimum specified by the flight manual. **(T-3)**

Table 3.1. Crew Qualification Complement Non-mission Sorties. (T-3)

Crew Position	Basic Crew	Basic Augmented
Mission Pilot (MP)/ First Pilot (FP)	1[1]	2[1]
Mission Copilot (MC)/ First Copilot (FC)	1	1
Combat Systems Officer (CSO)	0[2]	0[2]
Weapon Systems Officer	0[2]	0[2]

Aerial Gunner (AG)	1	2
Note 1: Every non-mission sortie must have a certified Aircraft Commander or Basic Aircraft Qualification (BAQ) Only Aircraft Commander		
Note 2: CSO or flight deck qualified WSO is required for any sortie requiring CAT I procedures and/or sorties with air-to-air refueling (AAR). AAR may be accomplished without a CSO/WSO with squadron DO approval.		

Table 3.2. Crew Qualification Complement Mission Sorties. (T-3)

Crew Position	Mission Crew	Mission Augmented
Mission Pilot (MP)	1[1]	2[1,2,5,6]
Mission Copilot (MC)	1[7]	1[5,7]
Combat Systems Officer (CSO)	1[3]	2[3,5]
Weapon Systems Officer (WSO)	1[3]	2[3,5]
Aerial Gunner (AG)	4[4]	5[5]
Note 1: Every mission sortie must have a certified Aircraft Commander.		
Note 2: Both MPs must be qualified in all phases of the mission to be accomplished. Transfer of PIC duties between certified Aircraft Commanders will be briefed to the crew.		
Note 3: Comply with the following requirements: --A CSO or WSO that is NC or is undergoing training for weapons systems added to their initial qualification may be supervised by an instructor occupying the other MOP position. An UNQ CSO or WSO requires a standing instructor. If both the CSO and WSO are UNQ each will require a standing instructor. --Block 20+/30: Mission sorties may be conducted with 0 CSOs and 2 WSOs provided at least one WSO is flight deck special mission qualified but may not be conducted with 2 CSOs and 0 WSOs. --Block 30: A qualified WSO may occupy either Station 1, or 2. A WSO with a flight deck special mission qualification may perform flight deck duties. A CSO may only occupy Station 2 with instructor WSO oversight.		
Note 4: Only 2 AGs are required for dry fire/PGM only live fire missions. For live fire operations, AGs may be reduced to 3 with squadron DO approval. A Lead Gun is required for any live fire mission (gun and/or PGM).		
Note 5: On local training sorties and combat/contingency operations, squadron DO or mission commander may augment the crew complement for all crew positions based on specific mission requirements.		
Note 6: A standing instructor pilot may conduct live/dry fire supervision for weapon(s) employment training provided both pilots flying are at least BAQ.		
Note 7: A qualified MP may fulfill the MC requirement.		

3.3. Mission Essential Personnel (MEP) and Additional Crewmembers (ACM). See DAFMAN 11-401, AFMAN 11-202 Volume 3, and any associated AFSOC Supplements.

3.4. Interfly. Interfly is the exchange and/or substitution of aircrew members and/or aircraft between MAJCOMs to accomplish flying missions. Normally, interfly should be limited to specific operations/tests, exercises, or special circumstances.

3.4.1. Air Force Special Operations Command Plans and Integrations (AFSOC/A4RX) maintains current memoranda of agreement (MOA) between AFSOC, Air Force Reserve Command (AFRC), National Guard Bureau (NGB), Air Force Material Command (AFMC), Air Education Training Command (AETC), and Air Combat Command (ACC) for interfly using AFSOC-assigned aircraft. Unless specified in the MOA:

3.4.1.1. Aircraft ownership will not be transferred. **(T-2)**

3.4.1.2. The operational squadron will prepare and sign the flight authorizations. **(T-2)**

3.4.1.3. As a minimum, crewmember(s) will be basic aircraft qualified in the MDS-aircraft and model, as well as systems or configuration required to fly the aircraft and/or mission. **(T-2)** If non-current, comply with paragraphs **3.1.3** and **3.1.4**.

3.4.1.4. Crewmember(s) will follow operational procedures defined in this Volume, AFTTP 3-1, *General Planning and Employment Considerations,* and AFTTP 3-3. AC-130J, *Combat Fundamentals AC-130J*, (or equivalent), and the applicable technical orders for the MDS. **(T-2)**

3.4.1.5. Flight and ground mishap reporting responsibility will be handled IAW DAFI 91-204, *Safety Investigations and Reports* as well as MAJCOM supplements. **(T-2)**

3.4.2. Waiver Authority.

3.4.2.1. With a valid MOA. Group commander or COMAFSOF is the approval authority for interfly on AFSOC aircraft under their control. **(T-3)** In all cases, the crew will be qualified in the aircraft MDS. **(T-2)**

3.4.2.2. No MOA/expired MOA. AFSOC/A3 is the approval authority for interfly on AFSOC aircraft. **(T-2)**

3.4.2.3. Contingency operations must be approved by both AFSOC/A3 and respective Major Command Director of Operations (MAJCOM/A3). **(T-1)**

3.4.3. Aircrew members assigned to the USAF Weapons School (USAFWS) are authorized to participate in orientation flights in AFSOC aircraft operated by crews from the 14th Weapons Squadron (WPS).

3.4.4. Aircrew members assigned to the USAFWS are authorized to occupy duty positions on AFSOC aircraft operated by 14 WPS. Crewmember must be under instructor supervision if not current or qualified in the MDS. **(T-2)**

3.4.4.1. The above authorizations are extended to senior leadership in the USAFWS chain of command.

3.4.4.2. Flights conducted under the above provisions will be with the normal syllabi. **(T-2)**

3.5. Intrafly. Intrafly is the exchange and/or substitution of aircrew members from separate units under the same MAJCOM to accomplish flying missions. Normally, intrafly should be used only to relieve qualified manpower shortfalls.

3.5.1. The Group Commander possessing the aircraft or COMAFSOF is approval authority for intrafly between units.

3.5.2. As a minimum, crew member(s) will be qualified in the MDS-aircraft and model, as well as systems or configuration required to fly the aircraft and/or mission. **(T-2)**

3.5.3. Aircrew will follow operational procedures defined in AFMAN 11-2AC-130J, Vol 3 (or equivalent), AFTTP 3-1 and 3-3 AC-130J, and the applicable MDS Technical Order (TO) AC-130J aircrews flying C-130J variant aircraft will follow AFMAN 11-2AC-130J, Vol 1, *AC-130J Aircrew Training* (or equivalent), AFMAN 11-2AC-130J, Vol 2,*Aircrew Evaluation Criteria* (or equivalent), and the applicable MDS TO **(T-2)**

3.6. Alert Crew Procedures. See AFMAN 11-202, Vol 3 and any applicable AFSOC Supplement for alert procedures.

3.7. Flight Duty Period and Crew Rest Restrictions. See AFMAN 11-202, Vol 3 and AFSOC Sup. For the AC-130J, the aircraft type is considered Tanker/Transport. Sleeping provisions are not available on the AC-130J.

3.8. Scheduling Restrictions. Refer to AFMAN 11-202, Vol 3 for restrictions on performance of crew duties. **(T-2)**

3.9. AFSOC Alert Aircraft. Whenever operationally feasible, maintain aircraft on alert status IAW the following:

3.9.1. Park the aircraft in a designated alert parking area to expedite taxi and takeoff.

3.9.2. Have a crew other than the alert crew preflight the alert aircraft. It is the intent of this procedure to allow the alert period and aircraft preflight validity period to be aligned. This should prevent the need to update the preflight during the alert period.

3.9.3. The alert aircraft may fly for purposes other than actual alert missions provided the following conditions are met:

3.9.3.1. Alert requirements can be met with sufficient fuel to meet mission requirements

3.9.3.2. Direct communication contact is maintained with the primary controlling agency.

3.9.3.3. Controlling agencies are notified any time the alert aircraft departs the local area.

3.9.4. If maintenance actions are not required, the aircraft can be resealed for alert once the through flight inspection is completed. A new flight crew preflight is not required until the end (72 hours) of the initial preflight period.

3.9.5. Should the aircraft remain on alert for more than 72 hours, a complete aircrew preflight is then required. **(T-3)**

3.9.6. Once the aircraft is accepted for alert, an AG will ensure an entry is made in the Air Force Technical Order (AFTO) Form 781, *Aerospace Vehicle Flight Data Record* stating, at a minimum, the date and time the aircraft was preflighted.

3.9.7. Consider alert aircraft off-limits to all personnel except alert crewmembers. No maintenance may be performed on the aircraft without approval of the unit/mission commander. Upon being told to launch, the crew is required to check the area in which maintenance was performed, prior to flight. **(T-3)**

Chapter 4

AIRCRAFT OPERATING GUIDELINES

4.1. Objectives. 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 PIC. If the PIC accepts an aircraft to operate a mission or mission segment without an item or system, this acceptance does not commit that PIC, or a different PIC, to accept subsequent operations with the same item or system inoperative. When the PIC considers an item essential, designate the component Mission Essential (ME) on the AFTO Form 781A, *Maintenance Discrepancy and Work Document*, and repair or replace the item prior to departure. **(T-2)**

4.2. Guidance. This chapter provides guidance on how to operate with degraded equipment. If the PIC elects to operate with degraded equipment or aircraft system(s), coordinate mission requirements (examples include revised departure times, fuel requirements, maintenance requirements), prior to flight with the mission control agency to ensure the decision does not adversely impact follow-on missions.

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

4.3.1. The PIC must account for the possibility of additional failures during continued operation with inoperative systems or components. **(T-2)** The MEL is not intended for continued operation over an indefinite period with systems/subsystems inoperative.

4.3.2. All emergency equipment will be installed and operational unless specifically exempted by mission requirements/directives. **(T-2)**

4.3.3. PICs operating with waiver(s) for degraded equipment must coordinate mission requirements (revised departure times, fuel requirements, maintenance requirements). **(T-3)**

4.3.4. If beyond C2 communication capability, or when it is necessary to protect the crew or aircraft from a situation not covered by this chapter and immediate action is required, the PIC may deviate. Report these deviations (without waiver) to Operations Group (OG)/CC within 48 hours of the event. **(T-2)**

4.4. Waiver Protocol. Waivers to operate with degraded equipment will be granted on a case-by- case basis. **(T-2)**

4.4.1. MAJCOM/A3 or COMAFSOF (mission execution authority) is the MEL waiver authority unless designated otherwise in this chapter. Initiate the request with MAJCOM C2 agency.

4.4.2. The waiver request should include the following information:

4.4.2.1. Reason for the request.

4.4.2.2. Individual crewmember qualifications.

4.4.2.3. Mission leg(s) requiring the waiver.

4.5. Technical Assistance Service. The PIC may request (at any time in the decision process) technical support and additional assistance from their home unit, MAJCOM staff, and maintenance representatives.

4.6. One-time Flights. Refer to TO 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures,* for downgrade authority and procedures. One-time flight approval authority is OG/CC or COMAFSOF. The owning maintenance group commander (or designated official), the senior maintenance officer, or the on-site chief of an AFMC repair team must first authorize the release. **(T-2)** PIC concurrence is required before the aircraft can be flown. **(T-3)**

4.7. Fuel System. The primary concern with inoperative fuel boost pumps or quantity indicators is fuel balance and wing loading. Degraded operation is permissible; however, flight crews must consider potentially trapped fuel and decreased range should further degradation occur. **(T-2)** This paragraph and the MEL provides guidelines for degraded fuel system operations under most circumstances. **Note:** Although the fuel quantity indications can be displayed on multiple Heads Down Displays (HDDs) System Status Displays as well as on the hard panels, repetitions in excess of one indication per tank are not relevant. The 'number installed' includes one indication per tank and the 'number required' specifies the number of tanks that must have an operative indication.

4.7.1. Inoperative main fuel tank indicator restrictions.

4.7.1.1. In-flight, fuel will not be transferred into or out of a main fuel tanks with an inoperative indicator or its symmetrical tank except for the following:

4.7.1.1.1. Fuel transfer into a main tank with an inoperative indicator will only be accomplished during contingency or emergency fuel need situations. **(T-2)** All transfers, under these conditions, require more than one crewmember to monitor and coordinate the fuel transfer. **(T-2)**

4.7.1.1.2. A reliable source of known quantity transferred must be available. **(T-2)** This source can be either the internal aircraft operating fuel quantity indicators or in-flight refueling tanker fuel onload data. **(T-2)**

4.7.1.2. Begin cross-feed operations when the symmetrically opposite quantity indicator has decreased to 1,500 pounds (inboards) and 2,500 pounds (outboards). **(T-2)**

4.7.1.3. Engine out training using the engine corresponding to the inoperative indicator or its symmetrically opposite will not be conducted during tank to engine operation. **(T-2)**

4.7.1.4. Maintain symmetrical engine fuel flow. **(T-2)**

4.7.1.5. Plan to land with a minimum of 4,000 pounds calculated main tank fuel when operating with an inoperative fuel tank indicator. **(T-2)**

4.7.2. When an external tank indicator is inoperative and the tank cannot be visually checked empty due to foam modification, comply with the following prior to flight:

4.7.2.1. Check pressure with each pump in the external tank. If no pressure is obtained, the tank is verified empty. **(T-2)**

4.7.2.2. If pressure is obtained, ground transfer the fuel from the external tank until verified empty. Defuel the external tank if unable to ground transfer. **(T-2)**

4.7.2.3. When unable to verify an external tank is empty prior to engine start, ground transfer or cross feed the fuel from the external tank until verified empty. **(T-2)**

4.7.3. Maintain symmetrical tanks within 1,000 pounds at all times. **(T-2)** If small amounts (4,000 pounds or less) must be transferred, then transfer up to 1,000 pounds into the tank with the inoperative indicator followed by an equal amount into the tank(s) with operative indicator(s). **(T-2)** If large amounts of fuel must be transferred, then transfer 1,000 pounds into the tank with the inoperative indicator, then up to 2,000 pounds as needed into the tank(s) with the operative indicators, then up to 1,000 pounds as needed into the tank with the inoperative indicator to bring all tanks symmetrical, or continue up to 2,000 pounds as needed, repeating the cycle until desired fuel quantity and balance is achieved in applicable tanks. **(T-2)**

4.8. Landing Gear System. If a landing gear system or position indicator malfunction is encountered, only a full stop landing will be made. **(T-2)** The discrepancy will be corrected prior to the next flight. **(T-2) Exception:** If repair capability does not exist and a positive determination is made that further flight can be accomplished with the gear down and locked, the aircraft may be flown to a destination where repair capability exists provided the gear is not moved from the down and locked position. Required enroute stops are authorized.

4.9. Navigation Systems. Refer to **Table 4.14**.

4.10. Soft Panel Operations.

4.10.1. For partial or complete hard panel failures, aircrews may revert to soft panel operations. Normally, if a soft panel is selected due to hard panel failure, it should be used for the remainder of the flight. Doing so will mitigate the hazards associated with restoring hard panel functionality for an item when the mission computer commanded state is unknown. Accomplishing the ENGINE SHUTDOWN and BEFORE LEAVING AIRPLANE checklists after the aircraft is parked will ensure the soft panel retains control of the particular item throughout shutdown. In all cases, PICs must consider the increased workload associated with using soft panels. **(T-2)**

4.10.2. Hard panel failures may be the result of a physical failure or loss of communication with the mission computer (MC), an aircraft reboot may recover hard panel functionality. To determine if hard panel functionality can be regained, the following procedures must be followed in sequential order:

4.10.2.1. Completely power down when accomplishing the BEFORE LEAVING AIRPLANE checklist. **(T-2)**

4.10.2.2. Complete all checklist items in the POWER UP checklist. Do not proceed past the POWER UP checklist until it can be determined if the hard panel has recovered. Depending on the system effected (examples include auxiliary power unit (APU), bleed air, landing gear), do not apply bleed air or hydraulics until hard panel functionality can be determined. **(T-2)**

4.10.2.3. To determine if a hard panel has recovered, ensure hard panel and soft panel selections/settings are identical. Press the Line Select Key (LSK) to turn the soft panel OFF. If a Communication/Navigation/Identification (CNI) “Check (CHK) HARD PNL”

or a referenced hard panel fault Advisory Caution and Warning System (ACAWS) message (examples include "APU PNL FAULT", "DEF SYS PNL FAULT"), does not appear, press the "VERIFY OFF" LSK. If feasible, check hard panel functionality.

4.10.2.4. If a CNI "CHK HARD PNL" or a referenced hard panel fault ACAWS message appears, the hard panel has not recovered. The "CHK HARD PNL" message indicates there is a mismatch between the soft panel and hard panel commands to the MC independent of physical switch positions. Referenced hard panel fault messages are self-explanatory.

4.10.2.5. If it is determined that the hard panel has not recovered, at the PIC discretion, the mission may continue to a station supporting a repair capability, including enroute stops. Do not reselect the hard panel. **(T-2)** The PIC will not takeoff when using two or more soft panels for control of aircraft systems. **(T-2) Exception:** The restriction concerning two or more soft panels does not include REFUEL CONTROL soft panel usage.

4.10.3. After returning to home station or repair facility with a hard panel malfunction, aircrews will shut down and turn the aircraft over to maintenance personnel for required actions. **(T-2)**

4.11. MEL Table Definitions/Column Identifiers for Tables 4.1 to 4.23.

4.11.1. System Item – Name of components or systems installed.

4.11.2. Installed – Number of components or systems installed.

4.11.2.1. In some cases, a component can be controlled from either a hard panel or from a soft panel. Similarly, some indications can be viewed on either a hard panel or a soft panel. Since switch functions (or indications) may be duplicated on each of the three Communication/Navigation/Identification Management Unit (CNI-MU) displays, the number of switches (or indications) installed may not always be clear. To clarify this condition, switches (or indications) are listed as '1' in the installed column even when they are duplicated on a soft panel.

4.11.2.2. Although the indications on each pilot's Heads Down Displays (HDDs) can be repeated on more than one HDD, repetitions of data in excess of one per pilot are not relevant for flight and are not counted in this MEL. In general, the flight deck is designed to provide one set of data for the pilot and one set of data for the copilot (in addition to the standby instruments). Thus, for most HDD indications, the number installed is listed as '2'— one for each pilot.

4.11.3. Required – The minimum number (quantity) of items required for operation provided the conditions specified in the remarks or exception column are met.

4.11.3.1. Unless otherwise noted, when the item is a switch (or indication) which is duplicated on a soft panel, the number required for dispatch may be satisfied by either the hard panel switch (or indication) or by the switch (indication) on one of the associated soft panels. For HDD indications, the number required is '2' if both pilots must have an indication, '1' if only one pilot must have an indication and '0' if neither pilot is required to have the indication. **(T-2)** For essential flight data (heading, altitude, airspeed, attitude and when required, navigation data), the pilot's and copilot's displays must have independent sources. **(T-2)**

4.11.4. Remarks and Exceptions. Some technical information and procedures are contained in this column. This information is not all-inclusive; crewmembers must refer to the flight manual and other directives for procedures, techniques, limitations.

Table 4.1. Air-conditioning and Pressurization. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Air-conditioning System	2	1	One may be inoperative provided: (1) (1) Cross-flow valve is operative, and (2) (2) Associated Flow Control Valve is CLOSED, and (3) (3) Consideration is given to the type of mission, fuel quantity, required cruise altitude and oxygen quantity.
Air-conditioning Control Panel	1	0	May be inoperative provided control is available through the associated soft panel.
a. Automatic Temperature Control System	2	0	May be inoperative provided: (1) (1) Respective Manual Temperature Control System is operative, **OR** (2) (2) Respective Air-conditioning System is considered inoperative, and temperature control is not required.
b. BA/ECS Channels	2	1	**Note:** Loss of the 2d Channel will result in loss of all pneumatic-powered components and systems (except engine anti-ice).
c. Cargo Compartment Recirculation Fan	1	0	See Flight Manual for cooling restrictions.
d. Cross-flow Valve	1	0	May be inoperative provided both air-conditioning systems are serviceable, **OR** only one air-conditioning system is operative, and the valve is manually positioned to Cargo Compartment 100% open.
e. Flow Control Valve			
(1) Cargo Compartment Air- conditioning System	1	0	May be inoperative provided: (1) (1) Divider Valve operative, and (2) (2) Right Wing Isolation Valve is operative, and (3) (3) Cross-flow Valve is operative.
(2) Flight Station Air-conditioning System	1	0	May be inoperative provided: (1) (1) Divider Valve operative, and (2) (2) Left Wing Isolation Valve is operative, and (3) (3) Cross-flow Valve is operative.

f. Temperature Control Valve	2	0	May be inoperative provided: (1) (1) Valve is failed in the normal temperature range, OR (2) Air-conditioning System is considered inoperative.
g. Duct Overheat Temperature Sensor	2	1	May be inoperative provided associated Air- conditioning System is considered inoperative.
Auxiliary Vent Valve, Flight Deck	1	0	
Auxiliar Vent Valve, Cargo Compartment	1	0	
Avionics Cooling System			
(1) Avionics Cooling Fans	2	1	
b. Cargo Compartment Avionics Cooling Fans	2	1	
c. Overhead Console Cooling Fans	2	1	If both fail in-flight, damage to Heads Up Displays (HUDs) may occur. Use Primary Flight Display (PFDs) as required. If HUDs are stowed, pull the associated ECB
Cargo Under Floor Heat System	1	0	May be inoperative provided consideration is given to Outside Air Temperature (OAT) and the number of personnel onboard.
Pressurization System			
a. Automatic Pressure Control System	1	0	One channel may be inoperative if system is still operative. May be completely inoperative provided: (1) (1) Manual Pressurization System is operative, and (2) (2) Consideration is given to the additional crew workload caused by using Manual Pressurization, OR (3) (3) Aircraft is operated unpressurized, and Consideration is given to required cruise altitude, fuel/oxygen quantity, and OAT.
(1) CONST Altitude (ALT) Mode	1	0	May be inoperative provided consideration is given to the type of mission to be flown.

b. Emergency Depressurization Handle	1	0	May be inoperative provided: (2) (2) Aircraft is operated unpressurized, and (3) Consideration should be given to required cruise altitude, fuel/oxygen quantity, and OAT **Note:** N/A If mission essential equipment is installed in the center escape hatch.
c. Emergency Depressurization Switch	1	0	May be inoperative provided: (1) (1) Control is available through the associated soft panel, OR (2) (2) Aircraft is operated unpressurized, and (3) (3) Consideration should be given to required cruise altitude, fuel/oxygen quantity, and OAT.
d. Manual Pressurization Control System	1	0	May be inoperative provided: (1) (1) Automatic Pressurization System is operative OR (2) (2) Aircraft is operated unpressurized, and (3) (3) Consideration should be given to required cruise altitude, fuel/oxygen quantity, and OAT.
e. Outflow Valve	1	0	May be inoperative provided: (1) (1) Valve is manually positioned to full open, and (2) (2) Pressurization Mode Select Switch is positioned to NO PRESS, and (3) (3) Aircraft is operated unpressurized, and (4) (4) Consideration should be given to required cruise altitude, fuel/oxygen quantity, and OAT.
f. Safety Valve	1	0	May be inoperative provided: (1) (1) Outflow Valve is manually positioned to full open, and (2) (2) Aircraft is operated unpressurized, and (3) (3) Consideration should be given to required cruise altitude, fuel/oxygen quantity, and OAT

Table 4.2. Auto Flight. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Auto/Throttle (A/T) System	2	0	

Digital Autopilot (DA) System	2	0	May be inoperative provided: (1) (1) Associated autopilot is not essential for performance of mission requirements.
Digital Autopilot/Flight Director (DA/FD) Controls			**Note:** An automatic altitude control system capable of maintaining altitude within 65 feet of that assigned is required for operation in Reduced Vertical Separation Minimums (RVSM) airspace.
a. Autopilot Disengage Switch (Control Wheel)	2	0	Both may be inoperative provided another method of disengaging the autopilot is operative (e.g., Go-around (G/A) Switch). **Note:** Failure of either Autopilot Disengage switch will disengage any autopilot function that is engaged at that time and will prevent either autopilot from reengaging until the switch function is repaired. Deselecting flight director modes on the Reference (REF)/MODE panel does not disengage the autopilot. The one exception is deselecting Approach (APPR) after glideslope capture. This will disengage the autopilot.
b. Autopilot Engage Lever	2	0	May be inoperative provided associated autopilot is considered inoperative.
c. Course Knob	2	0	May be inoperative provided: (1) (1) Associated DA/FD Navigation (NAV) and APPR Modes (except Integrated Navigation (INAV) are considered inoperative, and (2) (2) Associated Course Arrow and indication is considered inoperative (except in INAV Mode), and (3) (3) Departure/route/approach to destination (and alternate, if applicable) does not require use of VHF Omnidirectional range (VOR)/Instrument Landing System (ILS)/ Beacon (MB) or Tactical Air Navigation (TACAN).
d. G/A Switch	2	0	Consider Go-around implications.
e. Heading Knob	2	0	May be inoperative provided: (1) (1) Associated DA/FD Heading Mode is considered inoperative, and (2) (2) Associated Heading Marker is considered inoperative.
f. Lateral Axis (LAT) OFF Switch	1	0	May be inoperative provided the Autopilot Lateral Off Mode is considered inoperative.

g. Pitch Axis (PITCH) OFF Switch	1	0	May be inoperative provided the Autopilot Pitch Off Mode is considered inoperative. **Note:** An automatic altitude control system is required for operation in RVSM airspace.
h. Pitch Control Wheel	1	0	May be inoperative provided: (1) (1) Autopilot Pitch Attitude Hold Mode is operative, OR (2) (2) Autopilot Pitch Mode is considered inoperative, and Autopilot Pitch OFF Switch is positioned to OFF.
i. Pitch Synchronization (SYN) Switch	2	0	
j. Reference Mode (REF/MODE) Panel	2	2	
(1) ALT SEL Switch	2	0	May be inoperative provided: (1) (1) Associated Altitude Alert System is considered inoperative, and (2) (2) Associated DA/FD Altitude Select (SEL) Mode is considered inoperative, and (3) (3) Ground Collision Avoidance System (GCAS) is serviceable. **Note:** An altitude alerting system is required for operation in RVSM.
(2) BARO SET Switch	2	1	**Note:** Both Baro set switches must be operational for operation in RVSM.
(3) Mode Select Switch	18	0	Individual Mode Select Switch(es) may be inoperative provided associated mode(s) is considered inoperative. **Note:** For a given mode to be inoperative, both the pilot and copilot switches for that mode would have to be inoperative. **Note:** An automatic altitude control system is required for operation in RVSM airspace.
(4) Reference Select Switch	2	1	
(5) Reference Set Knob	2	1	
k. Turn Ring	1	0	May be inoperative provided: (1) (1) Autopilot Roll Attitude Hold Mode is operative, **OR** (2) (2) Autopilot Lateral Mode is considered Inoperative and,

			(3) (3) Autopilot LAT OFF Switch is switched Off.
Digital Autopilot/Flight Director (DA/FD) Indications			
a. AFCS Annunciator Panel	2	0	May be inoperative provided inoperative annunciation(s) is operative on the Heads Up Display (HUD) or HDD Primary Flight Display (PFD) at affected location.
b. Reference Set Panel Display	2	0	May be inoperative provided: (1) (1) Individual Reference Annunciations and Markers (e.g., HUD, PFD cards, lines on tapes, carets) are operative, **OR** (2) (2) Associated Reference Annunciations and Markers (e.g., HUD, PFD cards, lines on tapes, carets) are considered inoperative.
Flight Director System	2	0	May be inoperative provided flight director is not required for mission accomplishment or approach.
Control Wheel Hush Switch	2	1	

Table 4.3. Communications. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Control Wheel Microphone Switch	2	1	
Flight Station Speaker	2	1	
Get Home Radio Panel	1	1	
Identification Friend or Foe (IFF) System	1	0	Maybe inoperative unless associated IFF mode 1,2,4 are required for mission accomplishment. May be inoperative unless associated IFF Mode 3, C, S are required by ATC
a. Antenna	2	1	Mode 4 and Mode S require both antennas.
Public Address (PA) System	1	0	May be inoperative if passengers or troops are carried and, at the discretion of the crew, effective and safe communications can be conducted.
Ultra High Frequency (UHF)/Very High Frequency (VHF) Radios	4	2	May be inoperative unless essential for performance of mission, route, and Air Traffic Control requirements. **Note:** UHF No. 1 or VHF No. 1 must be operative
HF Radios	2	0	1 required for long-range communications. Consider mission impact.

ARC 231 Radio	2	0	Consider mission impact.

Table 4.4. Electrical System. (T-2)

System Item	Installed	Required	Remarks or Exceptions
AC Generator, Engine	4	3	May be inoperative if repair capability is not available. Flight to a destination with repair capability, including enroute stops, may be made provided no other generator malfunctions exist. The generator will be removed, and the generator mount padded before flight.
Batteries	2	2	
DC Voltmeter	1	1	
Electrical Control Panel	1	0	May be inoperative provided control is available through the associated soft panel.
Electronic Circuit Breaker Unit	14	14	ECBUs 1-13 are required. ECBU #14 may be inoperative with Squadron DO approval. Crews should expect a reduced rate of fuel dumping and consider mission fuel dumping requirements
Indications (System Status Display)			
a. Load meter Indications	5	3	One Engine and APU load meter and AC voltmeter may be inoperative provided the APU generator is operational.
b. Voltmeter Indication, AC	5	3	Essential avionics AC bus and main avionics AC busses may be inoperative. See load meter indications.
c. Voltmeter Indication, DC	2	2	
Inverters			
a. Essential Avionics AC Bus	1	1	
b. Essential Avionics AC 26V Power	1	1	
c. Main Avionics AC Bus	1	1	
d. Main Avionics AC 26V Power	1	1	
Regulated Power Supply (RPS) System	8	0	May be inoperative provided the equipment normally powered through the inoperative Regulated Power Supply System is not required,

			OR Control is available through the associated soft panel.
Transformer Rectifiers (TR)	4	4	

Table 4.5. Equipment. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Aerial Delivery System (ADS)			
a. Aerial Delivery Control Panel	1	0	May be inoperative provided: (1) (1) Control is available through associated Soft Panel, **OR** (2) (2) Airdrop operations will not be conducted.
Multifunction Control Display (MFCD)	1	0	Not used in the AC-130J. Ensure circuit breakers are pulled/strapped IAW aircraft technical orders.
Pallet Lock Control Unit (PLCU)	6	0	Not used in the AC-130J. Ensure circuit breakers are pulled/strapped IAW aircraft technical orders.

Table 4.6. Fire Protection. (T-2)

System Item	Installed	Required	Remarks or Exceptions
APU Fire Control Handle Lights	1	1	
APU Fire Detection Loop	2	1	Flight to a station with repair capability, including enroute stops is authorized **Note:** 0 operative APU Fire Detection Loops are required if the APU is considered inoperative. See **Table 4.18.**
Bleed Air Overheat Detection Sensors	14	7	One sensor in each zone may be inoperative for flight to a station with repair capability, including enroute stops.
Engine/APU Fire Extinguisher Bottle	2	2	
Engine Fire Control Handle Lights	4	4	
Engine Fire Detection Loop	8	4	One loop in each nacelle may be inoperative for flight to a station with repair capability, including enroute stops.

Fire and Overheat Detector System (FODS) Controller	2	1	One-time flight authorized to repair facility, including enroute stops is authorized.
Smoke Detector	4	1	The under flight deck detector must be operational.

Table 4.7. Flight Controls. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Aileron Trim Indicator	1	1	
Aileron Trim System	1	1	
Elevator Trim Indicator	1	1	
Elevator Trim System	1	1	
Elevator Trim Tab Control Wheel Switch	4	4	
Elevator Trim Tab Power Selector Switch	1	1	
Emergency Elevator Trim Tab Switch	1	1	
Flap Position Indicator, Avionic Management Unit (AMU)	1	1	
Flap Position Indicator Gauge	1	0	May be inoperative provided Flap Position Indicator (AMU) is operative. **Note:** Consider impacts of using AMU for Flap Position indication.
Rudder System Direct Reading Pressure Gauge	2	0	
Rudder Trim Indicator	1	1	
Rudder Trim System	1	1	
Stick Pusher System	1	0	Flight to a destination with repair capability, including enroute stops, may be made provided the Stall Warning System is operational.
Stall Warning System	1	1	**Note:** All stall warning system aural and visual warnings must be functional.
a. Angle of Attack Sensor	2	1	

Table 4.8. Fuel. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Auxiliary and External Tank Empty Pressure Switch	2	0	Both may be inoperative provided the quantity gauges are serviceable.
Auxiliary Tank Magnetic Sight Gauge	2	0	Both may be inoperative provided Magnetic Sight Gauge is not required to determine

			Auxiliary Tank fuel quantity.
Boost Pump, Main Tank	4	3	One may be inoperative provided: (1) (1) Applicable Flight Manual Limitations and Procedures are observed, and (2) (2) Main Tank Transfer Pumps are operative and, (3) (3) ECBs for inoperative Main Tank Boost Pump are strapped opened.
Cross-Ship Manifold Fuel Pressure Indication	1	1	
Cross-feed Valve	4	0	May be inoperative provided: (1) (1) Associated Fuel Level Control Valve is operative, and (2) (2) Affected Valve is secured CLOSED, and (3) (3) Main Tank Transfer Pumps are operative, and (4) (4) Cross-ship Separation Valve is operative, and (5) (5) Consider mission impact **Note:** Valve must be manually closed if failed open or ECBs opened if valve is failed closed.
Cross-ship Separation Valve	3	2	Two required for in-flight refueling missions.
	3	0	May be inoperative provided valve(s) is/are electrically disconnected and secured OPEN.
Fuel Control Panel	2	0	May be inoperative provided control is available through the associated Soft Panel.
Fuel Dump Valve	2	1	May be inoperative provided the valve is secured CLOSED and at least 2 cross-ship valves are operative.
Fuel Management Controller	1	1	One channel may be inoperative.
Fuel Firewall Shutoff Valve	4	4	
Fuel Level Control Valve (FLCV)			**Note:** Mission fuel requirements must be considered before accepting inoperative FLCVs.
a. Fuel Level Control Valve, Auxiliary Tank	2	0	Both may be inoperative provided valve is not required for ground or in-flight air-to-air refueling.

b. Fuel Level Control Valve, Main Tank	6	0	All may be inoperative provided: (1) (1) Valve is not required for ground or in- flight refueling, and (2) (2) All Main Tank Transfer Pumps are operative, and (3) (3) All Main Tank Cross-feed Valves are operative, and (4) (4) Cross-ship Separation Valves are operative, and Note: In the outboard tanks, if an inboard Fuel Level Control Valve is failed closed, the associated tank cannot be fully fueled on the ground and if an outboard Fuel Level Control Valve is failed closed, the associated tank cannot be fully refueled in-flight.
Fuel Pressure Relief Valve	2	2	
Fuel Pressure Transducer	1	0	
Fuel Quantity Indications See **paragraph 4.7** for detailed guidance and procedures.			**Note:** Although the fuel quantity indications can be displayed on multiple HDD System Status Displays as well as on the hard panels, repetitions in excess of one indication per tank are not relevant. The 'number installed' includes one indication per tank and the 'number required' specifies the number of tanks that must have an operative indication.
a. Auxiliary Tank	2	0	Two may be inoperative provided: (1) (1) All Fuel Flow Indicators are operative, and (2) (2) Associated Fuel Transfer Pump is operative, and (3) (3) All other Fuel Quantity Indicators for tanks with fuel on the same side of the Cross-ship Valve are operative, and (4) (4) Fuel quantity in the associated tank is verified by an accepted procedure before each takeoff (i.e., verified empty, magnetic sight gauge).
b. External Tank (if installed)	2	0	One may be inoperative provided: (1) (1) All Fuel Flow Indicators are operative, and (2) (2) At least one associated Fuel Transfer Pump is operative, and

			(3) (3) All other Fuel Quantity Indicators for tanks with fuel on the same side of the Cross-ship Valve are operative, and (4) (4) Fuel quantity in the associated tank is verified by an accepted procedure before each takeoff (dipstick). OR Two may be inoperative provided associated Fuel Tanks are verified EMPTY.
c. Main Tank	4	3	One may be inoperative provided: (1) (1) All Fuel Flow Indicators are operative, and (2) (2) Associated Fuel Boost Pump is operative, and (3) (3) All other Fuel Quantity Indicators for tanks with fuel on the same side of the Cross-ship Valve are operative, and (4) (4) Fuel quantity in the associated tank is verified by an accepted procedure before each takeoff (dipstick).
d. Totalizer	1	0	
Fuel Quantity Preset Switch	2	0	
Single Point Refueling Drain Valve	1	0	May be inoperative provided the manifold is manually drained by maintenance. **Note:** Air-to-air in-flight refueling is not allowed with an inoperative SPR Drain Valve.
Single Point Refuel Valve	1	0	May be inoperative provided alternate refueling procedures can be used. **Note:** Air-to-air in-flight refueling is not allowed with an inoperative SPR valve.
Transfer Pump			
a. Transfer Pump, Auxiliary Tank	2	0	May be inoperative provided ECBs for inoperative pump are open. If pump is inoperative, associated tank is considered unusable.
b. Transfer Pump, External Tank	4	2	One pump in each tank may be inoperative provided ECBs for inoperative External Tank Transfer Pump are opened.
	4	0	Both pumps in each tank may be inoperative provided: (1) (1) ECBs for inoperative pumps are open, and (2) (2) Both tanks are empty.

c. Transfer Pump, Main Tank	4	3	One may be inoperative provided ECBs for inoperative transfer pump are open and the respective Main Tank Boost Pump is operative.

Table 4.9. Hydraulic Systems. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Hydraulic Control Panel	1	0	May be inoperative provided control is available through the associated Soft Panel.
Hydraulic Pumps			
a. Auxiliary Hydraulic Pump	1	1	
b. Engine Hydraulic Pump	4	4	
c. Hand Pump, Auxiliary	1	0	May be inoperative provided no air-to-air refueling is required
d. Suction Boost Pump	2	2	
Hydraulic System Indications (System Status Display)			
a. Auxiliary System Pressure	1	0	May be inoperative provided the direct reading gauge is serviceable.
b. Booster System Pressure	1	0	May be inoperative provided Rudder Boost Pressure Indication is operative.
c. Utility System Pressure	1	0	May be inoperative provided Rudder Boost Pressure Indication is operative.

Table 4.10. Ice and Rain Protection. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Angle of Attack Sensor Anti-ice System	2	1	May be inoperative provided the associated Angle of Attack sensor is considered inoperative.
Ice Detector	2	0	Both may be inoperative provided: (1) (1) Wing Leading Edge Lights are operative, **OR** (2) (2) Aircraft is not operated in known or forecast icing conditions.
Ice Protection Control Panel	1	0	May be inoperative provided control is available through the associated soft panel.
Engine Anti-ice Valve	4	0	Valve may be inoperative provided the failed valve has failed OPEN. If failed CLOSED do not operate in known or forecast icing conditions. **Note:** Consider aircraft performance impact if inoperative valve has failed OPEN.

NESA Windshield Heat System	2	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions. Reference flight manual airspeed restrictions for continued operations.
Pitot Heat System	2	1	Pilot Side may be inoperative if ADC 1 is considered inoperative. Co-pilot side must be operative.
Propeller Ice Protection System	4	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions.
Propeller De-icing Timer Unit	1	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions.
Total Air Temperature Sensor Anti-ice System	2	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions.
Windshield Defog	2	0	
Windshield Wiper	2	0	
Wing and Empennage Ice Protection System	1	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions.

Table 4.11. Landing Gear and Brakes. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Antiskid System	1	0	May be inoperative provided: (1) (1) Antiskid System ECBs are opened, and (2) (2) Flight Manual Performance limitations are applied, and (3) (3) Must be repaired at first capable repair facility, and (4) (4) Restricted to one Full Stop landing.
Brake Pressure Indication			
a. Emergency Brake Pressure Indication	1	0	May be inoperative provided the Auxiliary System Pressure direct reading gauge is operative.
b. Normal Brake Pressure Indication	1	0	May be inoperative provided Utility System Pressure Indication is operative.
Landing Gear Lever Lock	1	0	May be inoperative provided Landing Gear Control Panel is considered inoperative. **Note:** On associated Soft Panel the Lock Function is satisfied by the Verify Switch.
Landing Gear Position Indicator	3	3	
Landing Gear Handle Warning Light	2	0	May be inoperative provided GCAS is operational.

Table 4.12. Lights. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Flight Station Lighting			May be inoperative provided sufficient lighting is operative to make each instrument, control and other device for which it is provided easily readable.
a. Copilot Displays Light Circuit	1	1	
b. Lamp Test Circuit	1	1	

Table 4.13. Navigation. (T-2)

System Item	Installed	Required	Remarks or Exceptions
ADC	2	1	**Note:** Both must be operative for operation in RVSM airspace.
Automatic Direction Finding (ADF) System	2	0	Both may be inoperative provided departure/ route/approach to destination (and alternate, if applicable) does not require use of ADF **Note:** All components must be operative for an ADF to be considered operative.
Cursor System	2	0	May be inoperative unless required to accomplish mission objectives.
Digital Mapping System	1	0	
Terrain Awareness and Warning System (TAWS)	1	0	
Embedded Global Positioning/Inertial Navigation System (EGI)	2	0	May be inoperative provided: (1) (1) Overwater (out of Navigation Aid {NAVAID}range) or Basic Area Navigation (BRNAV) flight will not be conducted, and (2) (2) Consult FLIP for airspace restrictions.
Global Positioning System (GPS)	2	0	Note: With GPS inoperative, the In-flight Alignment capability will not be available.
Ground Collision Avoidance System	1	0	May be inoperative provided passengers will not be carried. **Note:** Consideration should be given to tactical operations and crew experience.
Inertial Navigation Unit	2	1	Both must be functional to meet requirement of redundant heading, altitude, and airspeed information for Civil Airspace compliance.
Radar, Low Power Color	1	0	Required if thunderstorms or hazardous conditions that can be detected by airborne radar are forecast or exist along route of flight. **Note:** Consider operational mission impacts.

a. Control Panel	2	0	May be inoperative provided: (1) (1) Control is available through the associated Soft Panel, and (2) (2) Modes other than the Map or Weather (WX) Modes are not essential to accomplish mission objectives, and (3) (3) Consider operational mission impacts.
Radar Altimeter (RADALT)	2	1	One may be inoperative provided Category (CAT) II ILS approaches will not be flown. See Tactical Employment chapter for additional tactical restrictions.
Standby Flight Instruments			
a. Inclinometer (Slip ball)	2	0	May be inoperative provided HUD Slip/Skid Indicator at affected position is operative.
b. Magnetic Compass	1	1	
c. Standby Airspeed/Altimeter	1	1	
d. Standby Attitude	1	1	
Tactical Air Navigation	2	0	All components must be operative for the TACAN to be considered operative. If both TACANs are inoperative, Distance Measuring Equipment (DME) is not available.
Total Air Temperature Sensor	2	2	
Traffic Alert Collision Avoidance System (TCAS)	1	0	May be inoperative provided: (1) (1) TCAS is deactivated and secured, and (2) (2) TCAS is not necessary for compliance with ATC requirements
UHF Direction Finder System	1	0	May be inoperative unless essential for performance of mission objectives.
VHF Navigation System (VOR/ILS/MB)	2	1	The No. 1 system must be operative. **Note:** All components must be operative for a VHF Navigation System to be considered operative.

Table 4.14. Oxygen. (T-2)

System Item	Installed	Required	Remarks or Exceptions

Crew Oxygen System	2	2	Quantity: 15 liters minimum (5L forward and 10L aft) or as Directed in **Chapter 6**. Single LOX system operations may be utilized to fly to a capable repair facility. Crews will follow the procedures in the OXYGEN SYSTEM section of the flight manual and the limitations in **paragraph 6.21.2** of this manual.
Oxygen Regulators	BL20+ 18 BL30 22	3	All crewmember occupied positions must have an operable regulator.

Table 4.15. Pneumatic. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Bleed Air Augmenter Valve	4	3	One may be inoperative provided: (1) (1) Affected valve is CLOSED, and (2) (2) All Nacelle Shut Off Valves are operative.
		Less than 3	May conduct a one-time flight to repair facility. Fly unpressurized (Manual / Open) and with no icing forecast.
Bleed Air Divider Valve	1	0	May be inoperative provided: (1) (1) Affected valve is OPEN, and (2) (2) Both Wing Isolation Valves are operative.
Bleed Air Pressure Indication	1	1	
Bleed Air Environmental Control System Electronic Controller	1	1	One channel may be inoperative.
Nacelle Shutoff Valve	4	4	
Wing Isolation Valve	2	1	One may be inoperative provided (1) (1) Affected valve is OPEN, and (2) (2) Divider Valve is operative.

Table 4.16. System Integration and Display. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Avionics Management Unit (AMU)	2	1	**Note:** All displays and data fields must be operative for the Associated Avionic Management Unit (AMU) to be considered operative.

Bus Adapter Unit (BAU) Type I	6	4	BAU 3 (daytime only) and/or 6 will be used as replacements or can be failed (swap modules). 1,2,4, & 5 must be operational.
Bus Adapter Unit Type II	4	4	
Bus Interface Unit (BIU)	2	2	
Communication/ Navigation/ Breaker Panel (CNBP)	1	1	**Note:** All displays and data fields must be operative for the CNBP to be considered operative. However, when an input is not present and the correct 'data not available' or 'fail' indication is displayed, the CNBP may still be considered operative provided the failed indication is not required for the current mission or flight.
Communication/ Navigation/ Identification Management Unit (CNI-MU)	4	2	Block 20 aircraft only have 3 CNI-MU installed. CNI-MU located at the CSO/AFD station may be inoperative unless required for mission accomplishment. **Note:** All components required for mission accomplishment must be operative for a CNI-MU to be considered operative.
Communication/ Navigation/ Identification System Processor (CNI-SP)	2	1	One may be inoperative for one time flight to repair facility.
Data Bus, (1553B)			
a. Avionics Bus	2	2	
b. Communication/ Navigation Bus	2	2	
c. Display Bus	2	2	
d. Electronic Warfare Bus	1	0	Unless required for mission accomplishment.
e. Interprocessor Communication Bus	1	1	
f. Panel Bus	2	2	
Heads Down Display (#1- #4)	4	3	One may be inoperative provided the HUD on the affected side is fully operational. **Note:** All data fields and displays must be operative for the associated HDD to be considered operative. However, when an input is not present and the correct 'data not available' or 'fail' indication (which may be a blank or removal of the indication) is displayed, the affected HDD may still be considered operative provided the failed

			indication is not required for the current mission.
HDD (#5 - #8)	4	0	Consider mission impact.
Heads Up Display (HUD)	2	1	One may be inoperative provided (1) (1) Both HDDs on the affected side are fully operational, and (2) (2) The Pilot Flying (PF) HUD must be operational for CAT II ILS operations
	2	0	Both may be inoperative provided: (1) (1) Heads Down Displays (HDDs) #1 through #4 are operative (including operative independent PFDs in the pilot and copilot positions), and (2) (2) Forecast weather at destination is at or above CAT I ILS approach minimums.
a. HUD Control Panel	2	0	May be inoperative provided the associated HUD is considered inoperative.
b. HUD Declutter Switch, (Control Wheel)	2	0	
Pilot Side HUD	1	0	Pilot Side HUD should be operational for all tactical missions. 30mm/105mm Live-fire without an operational side HUD should not normally be executed, but may be executed at the discretion of the squadron DO to meet mission requirements that justify the increased risk.
Mission Computer	2	2	One may be inoperative for one time flight to repair facility.

Table 4.17. Auxiliary Power Unit. (T-2)

System Item	Installed	Required	Remarks or Exceptions
AC Generator, APU	1	0	May be inoperative provided APU electrical power is not required. External electrical power or aircraft battery power must be available for starting engines.
Auxiliary Power Unit	1	0	May be inoperative provided APU bleed air or electrical power is not required. An alternate air source and external electrical power or aircraft battery power must be available for starting engines.
Bleed Air System, APU	1	0	May be inoperative provided APU bleed air is not required. An alternate air source must be available for starting engines.

Inlet Door, APU	1	0	May be inoperative provided: (1) (1) Inlet Door can be operated manually, and, (2) (2) Inlet Door is secured CLOSED prior to departure, **OR** (3) (3) Inlet Door is secured CLOSED and, (4) (4) APU is considered inoperative.

Table 4.18. Doors. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Cargo Ramp and Door System	1	0	Warning light, latching mechanisms, and locking systems will be operative for pressurized flight. **Note:** Aircraft may continue to destination if ramp locks malfunction in-flight. Do not pressurize the airplane if the ramp locks fail to lock. **Note:** Cargo will not be carried on the ramp with a malfunctioning ramp lock system.
a. Ramp Latches	10	9	One may be inoperative provided: (1) (1) All remaining latches are operative, and (2) (2) Latch Warning System is operative, and (3) (3) Ramp is verified CLOSED and LATCHED before each departure, and (4) (4) Cabin differential pressure is limited to 5 in. hg, and (5) (5) No cargo is carried on the ramp.
Cargo Door and Ramp Indicators			
a. Ramp/Door FULL Light	1	0	May be inoperative provided Ramp position airdrop light (aft cargo comp) is operative.
b. Ramp Position Airdrop Light	1	0	May be inoperative provided Ramp/Door FULL Light (flight station) is operative.
c. Ramp Warning Light	1	0	May be inoperative provided: (1) (1) ACAWS RAMP OPEN PRESSURIZED and RAMP OPEN 250 messages are operative, OR (2) (2) Ramp is verified CLOSED and LATCHED before each departure, OR (3) (3) Aircraft is operated unpressurized.
Cargo Door and Ramp Sensors			

a. ADS Arm Position Switches	2	0	
Crew Entrance Door	1	1	
a. Door Warning Light	1	0	May be inoperative provided the ACAWS CREW DOOR OPEN messages are operative.
Paratroop Door	1	1	
a. Door Warning Light	2	0	May be inoperative provided the associated ACAWS L TROOP DOOR OPEN 250 or R TROOP DOOR OPEN 250 message is operative.

Table 4.19. Propellers. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Propeller	4	4	
Propeller Control Panel	1	0	May be inoperative provided control is available through the associated Soft Panel.
a. Propeller Control Switch	4	0	May be inoperative provided control is available through the associated Soft Panel.
b. Prop Sync Switch	1	0	
Propeller Synchrophasing	1	0	

Table 4.20. Powerplant. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Automatic Thrust Control System (ATCS)	1	1	If ATCS is degraded, a component/sensor has potentially failed. If maintenance is not available and takeoff is necessary, flight with ATCS DEGRADED (Caution) must be authorized by the OG/CC. Operation with ATCS inoperative procedures will be followed.
Engine Assembly	4	4	
Engine Controls			
a. Engine Start Panel	1	0	May be inoperative provided control is available through the associated Soft Panel.
b. Full Authority Digital Electronic Controls (FADEC) Panel	1	1	

c. Low Speed Ground Idle Switch	4	0	
d. Oil Cooler Flap Indications	4	0	May be inoperative provided control is available through the associated Soft Panel and oil temp indication(s) is/are operational for affected oil cooler flap(s).
Engine Indicating System			
a. Fuel Flow Indication	4	4	
b. Gas Generator Speed (NG) Indication	4	4	
c. Horse Power Indication	4	4	
d. Measured Gas Temperature (MGT) Indication	4	4	
e. Oil Pressure Indication, Engine	4	4	
f. Oil Pressure Indication, Gearbox	4	4	
g. Oil Quantity Indication	4	0	May be inoperative provided the oil quantity is verified before flight and the OIL QTY 1 (2, 3, or 4) Low Oil Indicator is operational.
h. Oil Temperature Indication	4	4	
i. Power Turbine Speed (NP) Indication	4	4	
Engine Oil System			
a. Oil Cooler Flap Automatic Control	4	0	May be inoperative provided Oil Cooler Flap Manual Control is operative.
b. Oil Cooler Flap Manual Control	4	4	
System Item	Installed	Required	Remarks or Exceptions
Full Authority Digital Electronic Controls (FADEC)	8	7	One may be inoperative provided all dedicated sensor input and control logic is serviceable to/from the operative FADEC on the engine with lost redundancy and ATCS Inoperative Takeoff procedures are carried out. All eight engine FADECs must be serviceable for auto shutdown to be operative. ATCS will be degraded. If maintenance is not available and takeoff is necessary, flight with ATCS DEGRADED (Caution) must be authorized by the OG/CC.

Nacelle Interface Unit (NIU)	4	4	

Table 4.21. In-flight Refueling System. (T-2)

System/Item	Installed	Required	Remarks/Exceptions/Limitations
Universal Aerial Refueling Receptacle Slipway Installation (UARRSI) System	1	0	System required for in-flight refueling. **Note:** The Aux Hydraulic system and/or the Override signal amplifier will not be used for training flights. Refer to training restrictions in **Chapter 9** of this publication.

Table 4.22. Defensive Systems and Situational Awareness Equipment. (T-2)

System Item	Installed	Required	Remarks or Exceptions
Countermeasures Dispensing System (CMDS)	1	0	Consider mission impact. Check Special Instructions (SPINS).
CMDS Remote Dispense Switches	3	0	Consider mission impact. Check SPINS.
Defensive Systems Control Panel	1	0	Consider mission impact. Check SPINS.
Missile Warning System	1	0	Consider mission impact. Check SPINS.
Radar Warning Receiver	1	0	Consider mission impact. Check SPINS.

Chapter 5

AIRLAND OPERATIONS

5.1. Aircraft Maximum Gross Weight Operations. Aircraft maximum gross weight without waiver is 164,000 pounds. Waiver authority for operations above 164,000 pounds up to and not to exceed 171,000 pounds is the OG/CC. MAJCOM/A3 or COMAFSOF is the waiver authority for gross weights above 171,000 pounds. The maximum waiverable gross weight is 175,000 pounds. Operations above 164,000 pounds require an AFTO Form 781A entry with the actual gross weight at which the aircraft was operated.

5.2. Checklists. Aircrews must be familiar with notes, warnings, and cautions without direct reference to TOs. **(T-2)**

5.2.1. The only pages (or inserts) authorized in checklist binders are C-130 series TOs, aircrew checklists, AFSOC approved checklists, briefing guides, and unit approved information guides. **(T- 2)** Units may construct locally approved in-flight guide and will provide a copy to OG/OGV (or equivalent) for approval. **(T- 2)**

5.2.2. Annotate write in changes and personal notes in accordance with AFI 11-215, *USAF Flight Manuals Program.***(T-1)**

5.3. Flight Deck Entry.

5.3.1. All personnel on the flight deck must be in compliance with **Paragraph 5.9.1**. **(T-2)** The following personnel are authorized on the flight deck during takeoff, landing, and critical phases of flight:

5.3.1.1. Additional crewmembers (if seats are not required by primary crewmembers or flight examiners).

5.3.1.2. Individuals approved by the OG/CC or COMAFSOF. This includes MEPs and passengers on orientation flights IAW DAFMAN 11-401and applicable supplements.

5.3.2. The PIC may authorize passengers (except patients) to visit the flight deck during non-critical phases of flight. Refer to **Paragraph 3.1.5** for unqualified personnel access restrictions to any primary crew station.

5.4. Takeoff and Landing Guidance.

5.4.1. An aircraft commander, or above, will occupy either the left or the right seat during all takeoffs and landings. **(T-2)** The designated PIC is not required to occupy a primary position, but still retains overall authority for conduct of the mission.

5.4.2. The left seat pilot will land during aircraft emergencies. **(T-2) Exception:** A certified instructor pilot may takeoff or land from either seat under any condition.

5.4.3. A MP or First Pilot (FP) may take off and land from either seat.

5.4.4. A MP, or FP during AC upgrade with IP in the right seat, will takeoff/land from the left seat under the following conditions: **(T-2)**

5.4.4.1. During formation departures and recoveries.

5.4.4.2. During substandard airfield operations.

5.4.4.3. During missions operating in areas of hostile airspace. **(T-2)** For units operating in defined combat zones, SQ/CC or deployed equivalent (with G-Series orders) may authorize landings from the right seat at specific airfields. **Exception:** Main operating bases with an instrument approach do not require approval if the instrument approach is flown.

5.4.4.4. At airfields that require any waiver approval. **(T-2) Exception:** Non-Department of Defense (DoD) approach waivers.

5.4.4.5. At certification airfields specified in the Air Mobility Command Airfield Suitability and Restrictions Report (ASRR) via GDSS. **(T-2)**

5.4.5. Pilots in "Instructor Pilot" upgrade training may take off and land from the right seat under the supervision of an Instructor pilot during formation departures and recoveries and during substandard airfield operations.

5.4.6. PICs who possess less than 200 hours as a qualified MP will make all takeoffs and landings when the right seat is occupied by a Copilot (CP) or FP. **(T-3)**

5.5. Copilot/First Pilot Landing Guidance. Except as specified in **paragraph 5.4,** and provided no distinguished visitor (DV) 4 or higher are onboard, copilots may takeoff or land:

5.5.1. From either seat if an instructor pilot or evaluator pilot (EP) occupies the other seat. **(T-2)**

5.5.2. From the right seat if the PIC has accumulated at least 200 hours as a qualified MP. **(T-3)**

5.6. Landing Gear, Landing/Taxi Lights and Flap Operation.

5.6.1. The pilot monitoring (PM) will operate the landing gear, landing, and taxi lights. PM will actuate the landing gear only after the command of the PF the aircraft. **(T-2)** Prior to actuation of the landing gear, the PM will acknowledge the command. **(T-2)**

5.6.2. The PM will operate the flaps only after the command of the pilot flying (PF). **(T-2)** Prior to operating the flaps, the PM will acknowledge the PF's command. **(T-2)**

5.7. Use of Outside Observers. Use crewmembers to assist in clearing during all taxi operations and in-flight during arrivals and departures. **(T-2)**

5.8. Seat Belts. Crewmembers occupying the pilot and copilot positions will have seat belts fastened from engine start through shutdown. **(T-2)** All occupants will comply with the following:

5.8.1. All occupants will be seated with seat belts fastened during taxi, takeoffs, and landings. **(T-2) Exception:** Evaluators, instructors, crewmembers performing duties, medical personnel performing required duties; however, those individuals will have a designated seat and required restraint available. (T-2)

5.8.2. All occupants will be provided a seat belt and will fasten it securely when turbulence is encountered or anticipated, or in areas of forecast clear air turbulence. **(T-2)**

5.9. Aircraft Lighting. For single ship, non-tactical operations refer to AFMAN 11-202 Vol 3. Pilots will use landing lights at night in unlighted areas. **(T-2)** Pilots will use taxi lights in-flight any time the landing gear is extended, unless reflections cause pilot distractions. **(T-2)**

5.9.1. Pilots will use anti-collision lights or strobe lights from takeoff to landing on all flights. **(T-2)** The PIC may turn off anti-collision lights when it is in the best interest of safety to do so. Aircraft with both anti-collision lights and strobe lights inoperative may continue to a base where repairs can be made.

5.9.2. Night Vision Goggles (NVG) operations may dictate that external lights are turned off or Infrared (IR) lenses used. Conduct training operations with reduced or no external lighting within the confines of designated Restricted or Warning areas or host nation approved areas IAW AFMAN 11-202 Vol 3. Single ship aircraft will display normal aircraft lighting outside Special Use Airspace (SUA). **(T-2)** In standard formation, all aircraft except the last in the formation should display formation lights (with brightness set as required) and IR anti-collision lights (as required). The last aircraft in the formation will display lights using guidance prescribed in AFMAN 11-202 Vol 3. **(T-2) Note:** Formations may vary lighting as necessary provided adequate visual identification for the formation to be maintained.

5.9.3. Contingency operations may dictate that external lights are off and internal lights are limited to the minimum necessary for aircrew activities.

5.10. Advisory/Required Calls. The PF will announce changes to the level of automation, flight director and autopilot mode section, and mode transition, (examples include "Autopilot engaged", "Altitude hold", "Auto-throttles", "Nav-Capture"), and/or when circumstances require deviating from normal procedures. **(T-2)** Tables 5.1 through Table 5.4 depict mandatory calls for takeoff, climb out and descent, non-precision and precision approaches. **(T-2)**

Table 5.1. Takeoff.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Takeoff – prior to Refusal Speed	"Reject (brief description)"[1]	"Reject"[1]
At Refusal Speed	"Go"[2]	
At Rotation Speed	"Rotate"	
Notes **1.** 1. Prior to refusal speed, any crewmember noting a safety of flight condition/malfunction will state "Reject" and give a brief description of the malfunction. **2.** 2. If refusal speed equals takeoff speed, "Go" is not required.		

Table 5.2. Climb Out and Descent.

PHASE OF FLIGHT	PF CALL	PM RESPONSE
Climb Out - Transition Altitude	State Altimeter[1]	State Altimeter[1]
Climb Out - 1,000 below assigned altitude Flight Level (FL)	"Passing # Feet for # Feet"	"Checks"
Descent - Transition Level	State Altimeter[1]	State Altimeter[1]
Descent - 1,000 above assigned altitude/FL, initial approach fix, or holding altitude	"Passing # Feet for # Feet"	"Checks"

Table 5.3. Non-precision Approach.

PHASE OF FLIGHT	PM CALL	PF RESPONSE

100 above Final Approach Fix (FAF) altitude, step-down altitude(s), and Minimum Descent Altitude (MDA)	"100 Above"	
At MDA	"Minimums"	
Runway environment in sight	"Runway in Sight"	State Intentions[1]
At Missed Approach Point (MAP)	"Missed Approach Point"	State Intentions[1]
Note 1. The PF will announce intentions to land or go-around no later than the MAP.		

Table 5.4. Precision Approach.

PHASE OF FLIGHT	PM CALL	PF CALL
100 ft above FAF/GSI Altitude, and Decision Altitude (DA) or Decision Height (DH)	"100 Above"	
At DA or DH with:		
Runway Environment in Sight	"Land"[1, 5]	"Landing"[1,4,5] or "Going Around"
Approach Lights in Sight	"Continue"[2]	"Continuing"[2,4] or "Going Around"
Neither in Sight	"Go Around"[3]	"Going Around"
Note 1: Aircrew will not descend below DA or DH until sufficient visual reference with the runway environment has been established and the aircraft is in position to execute a safe landing.		
Note 2: The pilot will not descend below 100 ft above the TDZE using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable.		
Note 3: The PM stating "Go Around" is an advisory call that the PM does not have the runway environment in sight.		
Note 4: If at any time prior to DA or DH, or after a "Continue" or "Continuing" call has been made, the PF acquires sufficient visual reference with the runway and is in position to execute a safe landing, the PF will call "Landing".		
Note 5: If at any time prior to DA or DH, or after a "Continue" call has been made, the PM acquires sufficient visual reference with the runway, the PM will call "Land".		

5.10.1. Deviations:

5.10.1.1. The PM will inform the PF when heading or airspeed deviations are observed, or when altitude is more than 100 feet from the desired and no attempt is being made to correct the deviation. **(T-2)**

5.10.1.2. Any crewmember seeing a deviation of 200 feet altitude or 10 knots in airspeed, or a potential terrain or obstruction problem, will immediately notify the PF. **(T-2)** Deviations from prescribed procedures will also be announced. **(T-2)**

5.11. Communications Guidance.

5.11.1. Aircraft Interphone:

5.11.1.1. All crewmembers will monitor the primary net. Crewmembers will notify the PIC before going off headset and advise when back on headset. **(T-2)**

5.11.1.2. Do not discuss classified information on the interphone during unsecure radio transmissions. **(T-2)**

5.11.1.3. Classified interphone or radio transmissions will be recorded on the CVR if it is operating. Ensure the CVR remains on and running until the tape is clear of any recorded classified conversations. **(T-2)**

5.11.1.4. Non-aircrew members may monitor interphone or radio transmissions only when specifically approved by the PIC. The PIC will brief communications guidance to these personnel prior to flight. The PIC must ensure no one monitors classified information for which they are not cleared or transmits classified information over unsecure radios. **(T-2)**

5.11.1.5. Sterile Cockpit. Limit conversation to that essential for crew coordination and mission accomplishment during checklists, taxi, munitions upload/download, takeoff, weapons delivery, AAR, approach, landing, and any other critical phase of flight. **(T-2)**

5.11.2. Command Radios:

5.11.2.1. The PM (or designated crewmember) will inform the crew which radio is primary.

5.11.2.2. All crewmembers will monitor the primary radio unless specifically directed to do otherwise by the PIC or subsequent chapters of this publication. **(T-2)** The PIC will designate crewmembers required to monitor other radios as required.

5.11.2.3. During emergencies, request simultaneous UHF and VHF transmissions when operating in a terminal area under radar control. **(T-2)**

5.12. Pilot Proficiency with Munitions.

5.12.1. AC-130Js may conduct pilot proficiency training at joint-use or military (MIL) fields with munitions onboard provided a letter of agreement between the OG/OGV or COMAFSOF and airfield manager is on file. A list of approved airfields will be published in local area procedures. **(T-2)** If an emergency situation requires the gunship to full stop at the airfield, the PIC will ensure the aircraft is parked IAW **Chapter 17**, **Table 17.1**. **(T-2)**

5.13. Wind Limitations. Maximum crosswind limits are IAW aircraft takeoff limitations. Remain within the "Recommended" or "Caution" areas of the crosswind charts for normal takeoffs and landings. **(T-2)** All simulated engine out landings must fall within the "Recommended" area unless otherwise approved by the Group Commander/COMAFSOF (for contingency operations). **(T-3)**

5.14. Runway Condition Reading (RCR) and Runway Surface Condition (RSC). The performance charts used to determine braking action are based on concrete runways. The runway surface should be considered wet when water on the runway causes a reflective glare. The RCR values for the following runway surfaces in **Table 5.5** are estimates based on operational experience and should be used only as a guide.

Table 5.5. RCR Values.

TYPE SURFACE	RCR (DRY)	RCR (WET)

Asphalt	23	12
Aluminum Matting	20	10
M8A1/With Anti-skid Pierced Steel Plank (PSP)	20	8
M8A1/Without Anti-skid PSP	13	3
Clay/Crushed Rock/Coral	16	5

5.14.1. Limit AC-130J operations into and out of slush or water covered runways to a covering of one inch. This number is based on performance charts where an RSC of 10 is equal to one inch of slush or water. **(T-2)**

5.14.2. Performance data where more than one inch of slush or water is present may not be accurate.

5.15. Wake Turbulence Avoidance. Adhere to aircraft wake turbulence avoidance and separation criteria contained in DoD FLIP planning (General Planning **Chapter 5**). **(T-2)**

5.16. Crew Resource Management (CRM). CRM is a critical part of the successful employment of the AC-130J. Due to the AC-130J architecture, aircrew should ensure they coordinate any manipulation of the CNI-MU, Radar, TAWS, and fuel panel. The PIC will ensure CRM is covered during the aircrew briefing. **(T-2)**

5.16.1. “Time Out" is the common assertive statement for use by all crewmembers. The use of "Time Out" will:

5.16.1.1. Provide a clear warning sign of a deviation or loss of situational awareness.

5.16.1.2. Provide an opportunity to break the error chain before a mishap occurs.

5.16.1.3. Notify all crewmembers when someone sees the aircraft or crew departing from established guidelines, the briefed scenario, or that someone is uncomfortable with the developing conditions.

5.16.2. As soon as possible after a "Time Out" has been called, the aircrew will take the following actions:

5.16.2.1. Safety permitting, stabilize the aircraft and ensure terrain clearance.

5.16.2.2. The initiating crewmember will voice their concerns to the crew.

5.16.2.3. The PIC will provide all other crewmembers with the opportunity to voice inputs relative to the stated concerns.

5.16.2.4. After considering all inputs, the PIC will direct the aircrew to continue the current course of action or direct a new course of action.

5.16.3. ACAWS crew coordination. Preface all ACAWS messages by stating “ADVISORY”, “CAUTION”, or “WARNING” followed by reading the displayed message verbatim prior to silencing the audio alert.

5.16.4. Fuel Panel. The fuel panel is considered a “verification panel.” The PM/CSO/AG should advise the PF before operating the panel (i.e., priming, cross-feeding, tank-to- engine, transferring, nonstandard configurations, and dumping). After completing the task, the PM should verify the panel is set correctly. To facilitate this coordination, pilots should plan to make changes to the fuel panel during periods of low workload such as before taxi and during cruise segments.

5.16.5. Critical Action Coordination.

5.16.5.1. Flight critical/irreversible actions should always be confirmed by two crewmembers. These actions include, but are not limited to, pulling the engine fire handle, placing the engine start switch to stop, moving a propeller control switch to feather, discharging agent, dumping fuel, and pulling ECBs. The crewmember performing the action points to the affected switch/handle and verbally seeks confirmation from a second crewmember (i.e., "CONFIRM NUMBER ONE"). The crewmember confirming the action looks at the affected switch/handle and acknowledges (i.e., "NUMBER ONE CONFIRMED").

5.16.5.2. Once the fire handle is pulled, the ACAWS messages indicating the shutdown condition/situation may disappear. Verifying and verbally confirming associated ACAWS messages prior to engine shutdown will assist the aircrew to determine if the engine can be restarted or if a greater emergency arises.

5.17. Automation. Aircraft automation does not command crew actions. The automated systems may recommend or perform actions; however, the aircrew will determine and verify the proper course of action.

5.17.1. The PF determines the most desirable level of automation for a given situation.

5.17.2. If the AFCS/flight director provides unexpected commands to the flight controls, the PF will revert to lower levels of automation or manual flight as necessary before attempting to resolve system problems.

5.17.3. Crews will follow the guidance below, except for cruise flight (above 3,000 above ground level {AGL}): **(T-2)**

5.17.3.1. The PF will fly the aircraft and maintain a dedicated head-up lookout. If the PF intends to be head-down, aircraft control must be transferred to the PM, who will remain head-up. Head-down time does not include momentary scanning/manipulation of the CNI-MU, HDDs, and panels.

5.17.3.2. Any crewmember that observes both pilots head-down at the same time must immediately alert the PF.

5.17.3.3. If the PM must divert attention away from normal clearing and monitoring duties for an extended period of time, the PM will state "Head-down". The PF will verbally acknowledge this call. The PM will verbalize "Head-Up" after completion of duties. The PF will then update the PM on current status as required.

5.17.4. A closed loop system of entering data and verifying the correct data is entered before allowing the aircraft automation to perform a function is critically important. Regardless of who initiates the action, the other pilot must verify the data and both pilots will monitor the aircraft for the appropriate response.

5.17.4.1. **Table 5.6** and **Table 5.7** provide standard actions for both pilots during automated and manual flight.

5.17.4.2. Automated flight is defined as the autopilot fully engaged and coupled to the Flight director. Use auto-throttles as desired. ***CAUTION:*** If the auto-throttles are disengaged for sustained descents during automatic flight, it is possible that altitude capture

may occur with the power levers at or near Flight Idle and result in an approach to stall condition.

5.17.4.3. Manual flight is defined as the PF providing manual input to the flight controls or autopilot. Use auto-throttles as desired.

Table 5.6. Automated Flight. (T-2)

	PF	PM
REF/MODE PANEL		
Reference Settings (1) (HP, RAD, ALT, IAS, FPA, MINS)	-Set as required	-Verify Settings
Mode Selections (ALT, NAV, HDG, APPR, IAS, VS)	-Select desired mode -Announce mode status	-Verify and acknowledge
LATERAL FLIGHT		
Direct To/Intercept Course To/Route Modification	-Verify route modification -Direct the PM to execute	-Modify route as directed -Execute when directed
Radar Vector/Heading Change	-Set the heading reference -State setting	-Verify and acknowledge
VERTICAL FLIGHT		
Climb/Descent clearance	-Set new FL/altitude reference or verify/acknowledge setting	-Set new FL/altitude reference or verify/acknowledge setting
Notes 1. For arrival/approach planning, the PF may transfer aircraft control to the PM and set all reference settings as required for the planned approach.		

Table 5.7. Manual Flight. (T-2)

	PF	PM
REF/MODE PANEL		
Reference Settings (1) (HP, RAD, ALT, IAS, FPA, MINS)	-Direct PM to set if required -Verify settings	-Set as directed by PF
Mode Selections (ALT, NAV, HDG, APPR, IAS, VS)	-Select desired mode - Announce mode status	-Verify and acknowledge
LATERAL FLIGHT		
Direct To/Intercept Course To/Route Modification	-Verify route modification -Direct the PM to execute	-Modify route as directed -Execute when directed
Radar Vector/Heading Change	-Verify and acknowledge	-Set heading reference

		-State setting
VERTICAL FLIGHT		
Climb/Descent clearance	-Verify and acknowledge setting	-Set new FL/altitude reference
Notes 1. For arrival/approach planning, the PF may transfer aircraft control to the PM and set all reference settings as required for the planned approach.		

5.18. Ground Collision Avoidance System (GCAS)/Terrain Awareness and Warning System. (TAWS).

5.18.1. When a GCAS TERRAIN or TAWS TERRAIN/OBSTACLE AHEAD alert occurs and terrain/obstacle clearance cannot be assured visually, immediately change the flight path (within 3 to 5 seconds) by initiating a takeoff power climb. Continue the climb until a safe altitude is reached or until exiting the alert envelope. With terrain and obstacles clearly in sight, the PF will call terrain/obstacle in sight, state intentions, and visually remain clear of terrain/obstacles. If the situation degrades and a GCAS PULL UP or TAWS TERRAIN/OBSTACLE PULL UP alert occurs, immediately execute the Wind Shear/GCAS/TAWS alert recovery in the flight manual. **(T-2)** ***WARNING:*** Do not delay pull-up for diagnosis of the low altitude warning.

5.18.2. In TACTICAL mode, several GCAS alert envelopes are modified to allow for maneuvering in close proximity to terrain. Normally, this mode is most suitable for modified contour flight and VFR low-altitude arrivals but, at the PIC's discretion, may be used for any tactical operation.

5.19. Radar Altimeter.

5.19.1. Instrument Approaches.

5.19.1.1. Precision Approaches.

5.19.1.1.1. Set RADALT reference to HAT minus 50 feet **(T-2).**

5.19.1.1.2. CAT II ILS. Set published radar altimeter minimums. **(T-2)**

5.19.1.2. Non-precision Approaches. Setting the RADALT as prescribed below is meant to adequately alert the crew to an unsafe terrain clearance condition (Altitude-Altitude) in the absence of a "Minimums-Minimums" alert. Setting the RADALT to a higher setting than prescribed may result in premature/unexpected Altitude-Altitude advisories and prevent the GCAS minimums alert.

5.19.1.2.1. Straight-in Approaches. Normally set RADALT reference to 250 feet (minimum setting). **(T-2)**

5.19.1.2.2. Circling Approaches. Normally set RADALT reference to 300 feet (minimum setting). **(T-2)**

5.19.1.3. When established on a published approach in instrument meteorological conditions (IMC), or at night when terrain clearance cannot be assured, and an "Altitude-Altitude" special alert is heard, initiate an immediate go-around. Once terrain clearance is confirmed, resume normal operations. In day Visual Meteorological Conditions (VMC),

the aircrew will evaluate the alert and determine the appropriate course of action (continue the approach or go-around). **(T-2)**

5.20. Runway and Taxiway Requirements. Use normal takeoff and landing procedures whenever practical. For mission accomplishment, if approach end overruns are available and stressed or authorized for normal operations, they may be used to increase the runway available for takeoff. Minimum runway width is 60 feet or 19 meters. Minimum taxiway width is 30 feet or 9 meters. **(T-2)**

5.20.1. Use of wheel brakes. Any time wheel brakes are used on landing rollout greater than that defined in the TO 1C-130(A)J-1, *Flight Manual* as a "partial brake landing", the PIC will ensure the flight manual cooling time constraints are complied with. **(T-3)** Brake cooling times may be disregarded if the runway available is equal to or greater than Critical Field Length (CFL) using an RCR of 2. For operational missions, the squadron/mission commander may waive both the brake cooling times and CFL.

5.20.2. Normal Operations (Non-Training):

5.20.2.1. Takeoff. Minimum runway length are critical field length. **(T-2)**

5.20.2.2. Landing. The minimum runway required for normal landings is the charted landing distance over 50-foot obstacle with outboard engines in high-speed ground idle and inboard engines in max reverse (2OB HGI; 2IB REV. in the performance manual), and maximum anti-skid braking. **(T-2)**

5.20.2.2.1. If runway length available for landing is less than required by the previous criteria, crews may use landing ground roll plus 1,500 feet when approved by the squadron commander. In this case, ensure the landing touchdown is in the first 500 feet of the runway. **(T-3)** ***WARNING:*** Aircraft performance and obstacle clearance is based on obtaining and then maintaining obstacle clearance speed as quickly as possible. Aircraft performance below obstacle clearance speed may not allow safe clearance of obstacles.

5.20.2.3. Landing. See **Table 5.8**.

5.20.2.3.1. Always compute landing performance with 2 engines in reverse, 2 engines in ground idle, and max anti-skid braking. **(T-3)** Group Commanders (COMAFSOF for contingency operations) may approve the use of all 4 in reverse.

Table 5.8. Normal Operations. (T-2)

Type of Maneuver/Restriction	Runway Length
Min Runway Length (Training Ops)	3,000 feet (1)
Normal Takeoff	CFL
Touch and Go-Flaps 50%	5,000 feet
Touch and Go- Flaps 0% or100%	6,000 feet
Normal Landing Distance	Landing Distance over 50-foot Obstacle Plus Corrections (2)
Minimum Runway Width	
Normal Operations	60 feet (19 meters) (1)

Notes
1. 1. MAJCOM/A3 may waive runway length/width and taxiway width requirements.
2. 2. Minimum runway required for normal landings is the charted landing distance over 50-foot obstacle with outboard engines in HSGI and inboard engines in max reverse. Runway Visual Range (RVR) less than 40 (3/4 mile) – add 1,000 feet. RVR equal to or greater than 40 (3/4 mile) – add 500 feet. If runway length available for landing is less than required by the previous criteria, crews may use landing ground roll plus 1,500 feet when approved by the squadron commander. In this case, you must ensure the landing touchdown is in the first 500 feet of the runway. **(T-2)**

5.21. Aircraft Taxi Obstruction Clearance Criteria.

5.21.1. Without wing walkers, avoid taxi obstructions by at least 25 ft; with wing walkers, by at least 10 ft. **Exception:** Locally based aircraft may taxi within 25 ft of obstacles without a wing walker when fixed taxi routes are marked and the obstruction is permanent, but will still be no closer than 10 ft. Taxi routes must be used by the same model aircraft for which they were designed and in the specifically designed parking spots. Support equipment must be located in appropriately designated areas. **(T-2)**

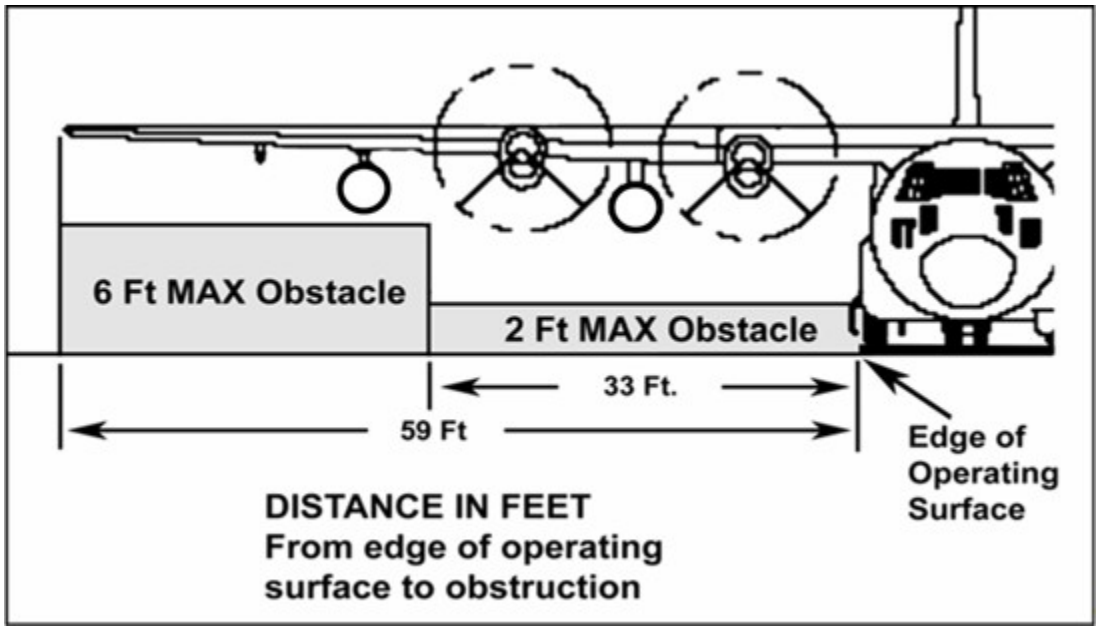
5.21.2. Whenever taxi clearance is doubtful, use a wing walker. If wing walkers are unavailable, deplane a crewmember to ensure obstruction clearance. **(T-2)**

5.21.3. Use low speed ground idle when practical. If foreign object damage (FOD) is a problem, the outboard engines may be shut down provided gross weight, taxiway conditions, and weather are favorable.

5.21.4. After landing and clearing the runway, with the approval of the pilot, the AG may open the aft cargo door and lower the ramp to horizontal to prepare for cargo offload or onload. Ensure all equipment, cargo, and passengers remain secured in the cargo compartment.

5.21.5. Pilots will be advised of any known obstructions that penetrate shaded area in **Figure 5.1**.

Figure 5.1. Ground Operations Obstruction Clearance Criteria.



5.22. Reverse Taxi.

5.22.1. The pilot will coordinate engine status/utilization with CP and taxi directions and signals with the AG and marshaller (if using one) prior to commencing reverse taxi operations. **(T-2)**

5.22.2. Secure all cargo and ensure all passengers are seated with seat belts fastened prior to aircraft movement. **(T-2)**

5.22.3. Open the cargo door (**Exception:** If common launch tubes (CLTs) are installed) and lower the ramp to approximately 12" above horizontal. **(T-2)**

5.22.4. Ensure both M1 and M2 sensors are in the STOW position.

5.22.5. The AG will be on the aircraft ramp in the best position to direct reverse taxi, report any hazards, and provide the pilot with timely interphone instructions on turns, distance remaining, conditions of the maneuvering area, and stopping point. **(T-2)** If four or five ground loading ramps or three canary slides are installed, at least one will be removed to allow unobstructed vision from the cargo ramp while backing. **(T-2)** During night reverse taxi operations, the pilot and AG will ensure that visibility in the taxi area is sufficient to conduct safe taxi operations. **(T-2)** Do not taxi within 25 ft. of an obstacle nor stop less than 25 ft. from an obstruction, even if using wing walkers. **(T-2)**

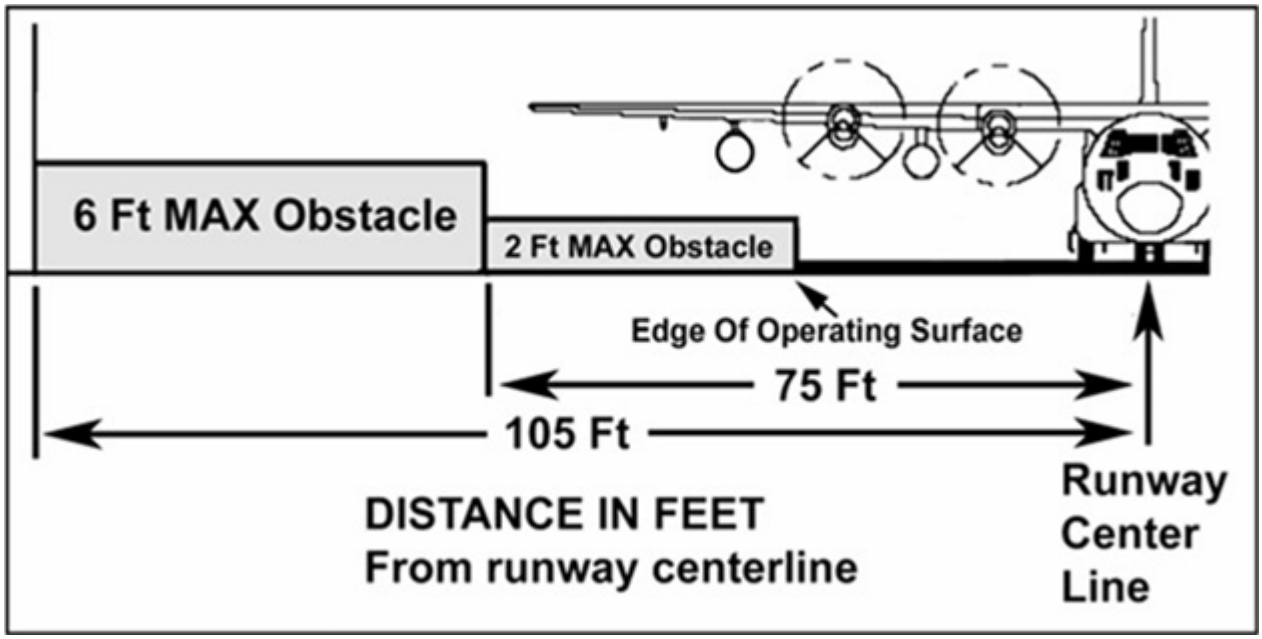
5.23. Takeoff and Landing Obstruction Clearance Criteria.

5.23.1. PICs will comply with the ASRR requirements prior to operating at airfields classified as "special PIC airports" or "certification airfields" by the ASRR. **(T-2)**

5.23.2. An airfield is considered suitable for C-130 operations when no obstructions penetrate the shaded area of **Figure 5.2**. This ensures obstruction clearance only if the aircraft is maintained within 35 ft of runway centerline and the angle of bank does not exceed 5 degrees. **(T-2)**

5.23.3. When an obstruction penetrates the shaded area of Figure 5.2, specific approval by the Group Commander/COMAFSOF (for contingency operations) is required and the PIC must be advised of the height and location of the obstruction, as well as specific procedures to avoid the obstacle (i.e., landing beyond the obstacle). **(T-3)**

Figure 5.2. Takeoff and Landing Obstruction Clearance Criteria.



5.24. Operations Over Arresting Cables.

5.24.1. Avoid landing on (touching down on) arresting cables (does not include recessed cables). **(T-2)** If the aircraft lands on or before the cable, the crew should contact the tower to have the cable inspected. **(T-2)**

5.24.2. Operations on runways where the arresting cable has less than eight tie-downs are authorized when required for mission accomplishment.

5.24.3. For all operations over arresting cables, cross the cable on runway centerline to minimize the potential for damage to the aircraft and antennas. Maintain appropriate back pressure on the aircraft yoke during taxi operations to reduce nose landing gear downforce.

5.25. Three-Engine Takeoffs. Actual engine-out takeoffs require MAJCOM/A3 (COMAFSOF for contingency operations) waiver.

5.26. Aircraft Recovery from Unprepared Surfaces. Aircrews should not attempt to recover an aircraft after inadvertent entry onto surfaces that are not suitable for taxi. Ground crews using appropriate equipment will normally recover the aircraft. Aircrew may recover the aircraft at austere locations if, after thorough inspection, the PIC is sure there is no aircraft damage, and the surface will support the aircraft.

5.27. Engines Running On-load or Offload (ERO). Do not use ERO procedures when explosive cargo (hazard class 1.1-1.4) is involved unless authorized by the exercise operation order or contingency air tasking orders. **Exception:** Ordnance intended to be employed by the aircraft

may be loaded with engines running IAW appropriate flight manual and local operating procedures.

5.27.1. The ERO procedures in this paragraph may be used for any mix of personnel or cargo. The aft cargo door and ramp is preferred when more than 10 passengers are involved. The PIC will assess prevailing weather, lighting, and parking location to ensure safe operations. **(T-2)**

5.27.2. General Procedures:

5.27.2.1. The PIC will brief crewmembers on the intended ERO operation, emphasizing specific crewmember duties. **(T-2)**

5.27.2.2. The parking brake will be set and one pilot will monitor brakes, interphone, and radio. **(T-2)**

5.27.2.3. Operate engines in ground idle (low speed, if applicable). **(T-2)** If conditions warrant, consider using Hotel mode to further reduce propeller blast.

5.27.2.4. Turn wing leading edge lights on during night EROs. **(T-2)** Taxi lights may be used at the discretion of the pilot.

5.27.2.5. Complete passenger and cargo manifests, crew lists and Department of Defense (DD) Form 365-4, *Weight and Balance Clearance Form F,* for the subsequent sortie. **(T-2)** **Note:** DD Form 365-4 is not required for the subsequent sortie if the aircraft will depart empty.

5.27.2.6. Resume taxi after the AG states the aircraft is “clear to taxi”.

5.27.2.7. Do not onload or offload through two different doors simultaneously. **(T-2)** ***WARNING:*** Due to the hazards involved (examples include propeller blast, proximity to engines and propellers, lack of paratroop doorsteps), only hand transferable items of cargo may be on/offloaded through the paratroop doors during EROs. **(T-2)**

5.27.3. Personnel onload and offload through the crew entrance door.

5.27.3.1. The pilot will give clearance to open the crew entrance door. **(T-2)**

5.27.3.2. During on/offload, station a crewmember (normally the AG) on interphone (cord held taut) approximately 25 ft and at a 45-degree angle from the aircraft axis.

5.27.3.3. Brief deplaning personnel to remain forward of the interphone cord.

5.27.4. Personnel or cargo on/offload through the aft cargo door and ramp.

5.27.4.1. Upon clearance from the pilot, open the aft cargo door if CLT’s are not installed and lower the ramp to horizontal.

5.27.4.2. The AG will direct all on/offload operations using prebriefed signals. Personnel will be directed by the designated AG when enplaning or deplaning. Other qualified AGs may direct the operation, if available, but the prebriefed crew AG retains overall responsibility for the operation. **(T-2)**

5.27.5. Engine Running Crew Change (ERCC). Authorized during unit training missions. The enplaning crew will not approach the aircraft until the deplaning AG is in position on headset outside the aircraft. **(T-2)** Keep ERCCs to the absolute minimum necessary to accomplish the

mission. Units may publish further guidance in **chapter 10** of this manual to address local procedures.

5.28. NVG Airland Operations. NVG Airland operations are limited to takeoff, approach, and landings flown in visual meteorological conditions (VMC) and instrument meteorological (IMC) on improved runways with Airfield Marking Pattern 4 (AMP-4) (Unmarked LZs) as outlined in DAFMAN 13-217, *Drop Zone, Landing Zone, and Helicopter Landing Zone Operations*. **(T-2)** For operational missions requiring NVG Airland procedures, the pilot must be NVG Airland certified. **(T-2)**

5.28.1. NVG Aircraft Lighting Requirements. Aircraft must be equipped with NVG compatible flight deck lighting or be modified to preclude NVG washout. **(T-2)** When landing with NVGs, the landing lights and taxi lights may be ON or OFF at the discretion of the aircraft commander to provide the optimal NVG picture. Wing tip lights will be ON during training operations to provide situation awareness for other aircraft operating at the airfield. **(T-2)**

5.28.1.1. Aircraft cockpit lighting will be NVG compatible or modified to preclude NVG washout. **(T-2)**

5.28.1.2. Aircraft should be equipped with a curtain to isolate cargo compartment light from the flight deck and another curtain to isolate aft flight deck light from the pilots/loadmaster. Cargo lighting should be kept as low as possible but not so low as to impede safety.

5.28.2. Individual Aircrew Required Equipment.

5.28.2.1. For flight operations the Pilot and Copilot must carry an individual set of NVGs, plus one spare (including batteries). **(T-2)** The aircraft commander will preflight the spare NVG set and adjust to their vision. **(T-2)** Pilots and copilots will wear the same model/type of NVGs. **(T-2)**

5.28.2.2. The minimum NVG visual acuity varies with the model/type of NVGs, combined with the test method used. **Table 5.9** depicts the minimum visual acuity standard for each type of AN/AVS-9 NVG models. The numbers in parentheses indicate the number of blocks that must be clearly visible to pass preflight visual acuity check. **(T-2)** The primary method for preflight testing NVGs prior to flight is the ANV-20/20 tester. For aircrew preflight, if the acuity prescribed in **Table 1** is not achievable, have the NVGs verified by a Life Support Technician. If the NVGs pass the acuity check by the Life Support Technician, they are acceptable for flight.

Table 5.9. Minimum NVG Visual Acuity Table. (T-2)

NVG Model	USAF Resolution Chart	AL 20/20 Grating Chart	20/20 Tester (High-light)	20/20 Tester (Low-light)
F4949 C,D,F,L (AN/AVS-9)	20/40 (8 of 9)	20/40 (5 of 9)	20/40	20/45
F4949 G, H (AN/AVS-9)	Incompatible	20/30 (7 of 9)	20/30	20/40

5.28.2.3. Aircrew members should use soft contact lens (SCL) prescription eyewear. If SCLs are incompatible or not available, ensure the appropriate industrial safety-lens prescription eyewear is used (Ref: DAFMAN 48-123).

5.28.3. Restrictions

5.28.3.1. NVG Touch and Goes are permitted with a certified NVG instructor pilot in the left seat or right seat. **(T-2)**

5.28.3.2. NVGs require some form of ambient light (overt or covert; natural or artificial) to operate. Effective illumination will be at least 10% or 0.87 millilux. **(T-3)**

5.28.3.3. The radar altimeters must be operational for all training flights. **(T-2)**

5.28.3.4. During NVG airland training flights, if either pilot's NVGs fail within one mile from touchdown, a go-around will be executed. **(T-2)**

5.28.3.5. Consideration should be given to allotting additional time at the aircraft when modifications, such as NVG taping, are required for NVG operations.

Chapter 6

GENERAL OPERATING POCEDURES

Section 6A—Pre-Mission

6.1. Aircrew Uniforms.

6.1.1. Wear the aircrew uniform as outlined in DAFI 36-2903, *Dress and Personal Appearance of Air Force Personnel* and AFI 11-301, Vol 1, *Aircrew Flight Equipment (AFE) Program*, for minimum aircrew clothing requirements. When the United States Air Force (USAF) Foreign Clearance Guide (FCG) requires civilian attire, dress conservatively. **(T-2)**

6.1.2. All aircrew members will have flight gloves readily available. **(T-2)**

6.1.3. Crewmembers will remove rings (to include those made of silicone or rubber) and scarves before performing aircrew duties. **(T-2)**

6.1.4. Arctic clothing is required when engaged in arctic or Antarctic operations, or when required by local operating procedures. **(T-2)**

6.2. Personal Requirements and Professional Equipment.

6.2.1. Passports. Carry passports on missions when required by the FCG. **(T-2)**

6.2.2. Immunizations. Aircrew members will ensure they meet immunization requirements for the mission. **(T-2)**

6.2.3. Identification Tags. Identification tags will be carried on the person during all flights, i.e., worn around the neck (tucked inside clothing), in a flight suit pocket, or attached to a boot. **(T-2)**

6.2.4. Restricted Area Badges. Carry the restricted area badge on all missions (except actual combat missions). **(T-2)** Display the badge only in designated restricted areas. **(T-2)**

6.2.5. Carry a headset, helmet, oxygen mask, and operable flashlight on all flights. **(T-2)**

6.2.5.1. Crewmembers will not wear wigs, hairpieces, ornaments, pins, clips, other hair fasteners, or earrings in the aircraft or on the flight line. **(T-2) Exception:** Plain elastic hair fasteners or plastic barrettes are allowed, providing they do not interfere with the wearing of headsets or helmets, or the donning of oxygen equipment. All devices will be accounted for before and after flight. **(T-2)**

6.2.6. A tool kit will be onboard for all flights. **(T-2)** Hostile Environment Repair Kits satisfy this requirement. Squadrons may establish additional equipment to be carried if required. Refer to AFSOCM 11-201.

6.2.6.1. The AG will ensure a gun tool kit is onboard for all live-fire missions. **(T-2)** HQ AFSOC/A3V will publish requirements for gun tool kits via the Addendum A to this manual. Additionally, AGs will ensure gun-clearing tools are available at off-station locations if the hot gun return location is not planned for home station. **(T-2)** ***WARNING:*** AGs will not clear guns from outside the aircraft unless mission requirements dictate and no qualified maintenance/Explosive Ordnance Disposal (EOD) personnel are available to do so. **(T-2)**

6.2.7. NVGs. All crewmembers required to carry NVGs will preflight them prior to flight for missions using NVGs. **(T-2)** If available, the PIC will preflight and carry one spare set of NVGs. **(T-2)** Each crewmember will carry approved spare batteries for their own NVGs. **(T-2)**

6.2.8. Pilots will wear NVGs with similar acuity and gain. **(T-2)**

6.3. Aircrew Publications Requirements. Aircrew Publications Requirements. PIC will ensure the publications specified in **Table 6.1** are current and available on the aircraft for all missions. **(T-2)** Each individual aircrew member will ensure they have a current crew position checklist and fanfold checklist (if applicable) as required in **Table 6.1**. Units may specify additional publications in their local supplement. Primary crewmembers will carry their respective crew position aircrew guide (ACG) on all missions. **(T- 2)**

Table 6.1. Aircrew Publications.

Publication	Crew Position/Location
TO 1C-130(A)J-1, *Flight Manual*	On Aircraft
TO 1C-130(A)J-1CL-1, *Pilot/CSO Checklist*	Pilot/CSO
TO 1C-130(A)J-1CL-2, *AG Checklist*	AG
TO 1C-130(A)J-1CL-3, *WSO/SO Checklist*	WSO/CSO
AFMAN 11-202, Vol 3, *General Flight Rules*	On Aircraft
AFMAN 11-2AC-130J, Vol 3 (or equivalent), *AC-130J General Operating Procedures*	On Aircraft
TO 1C-130(A)J-1-1, *Performance Data*	On Aircraft
TO 1C-130(A)J-1-4, *Communications/Navigation/Identification-Management System (CNI-MS)*	On Aircraft
ATP-3.3.4.2 (D), *Air-to-Air Refueling Procedures*	On Aircraft
UNITED STATES ATP 3.3.4.2 (D) STANDARDS RELATED DOCUMENT (SRD)	On Aircraft
AFTTP 3-3. AC-130J	On Aircraft
TO 1C-130(A)J-9, *Cargo Loading Manual*	On Aircraft
TO 1C-130(A)J-9CL-1, *Cargo Loading Checklist USAF Series AC-130J Aircraft*	AG
TO 1C-130(A)J-5-1, *Sample Basic Weight*	AG
TO 1C-130(A)J-5-2, *Load Data Manual*	On Aircraft
TO 1C-130(A)J-6CF-1, *Acceptance or functional check flight (FCF) Procedures*	On Aircraft
AFSOCM 11-201, *Hostile Environment Repair Procedures*	On Aircraft
TO 1C-130(A)J-1-43, *Precision Strike Package*	On Aircraft

6.3.1. Electronic Publications (E-Pubs). See AFMAN 11-202, Vol 3 AFSOC Sup for E-Pubs guidance.

Section 6B—Pre-Departure

6.4. Flight Crew Information File. Aircrew will review Volume I, of the Flight Crew Information File (FCIF) before all missions. **(T-2)** Crewmembers will certify their FCIF review as approved by OG/OGV(examples include Patriot Excalibur (PEX) and flight authorization). **(T-2)**

6.4.1. PICs will verify crewmembers have certified FCIF review prior to flight. **(T-2)**

6.4.2. Crewmembers' delinquent in FCIF and joining a mission enroute will receive an FCIF update from their primary aircrew member counterpart on that mission. **(T-2)** Instructor pilots flying with general officers are responsible for briefing appropriate FCIF items. **(T-2)**

6.4.3. Crewmembers that do not have a unit FCIF card (or if PEX is not available) 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. **(T-2)**

6.5. Aircraft Mission Kits. Units will maintain one mission kit per aircraft. **(T-2)** The entire mission kit may be stored electronically on an approved e-tools device and must follow the guidelines as established in previous paragraphs. Prior to off-station departures, the PIC or a designated representative will ensure a current mission kit is onboard the aircraft in electronic or paper format. **(T-2)** The kit will contain, but is not limited to, the items listed in **Table 6.2** **(T-2)** Items required by a unit or wing directive to be carried by an individual crewmember need not be duplicated in the mission kit. Maintain sufficient quantities of directives and planning documents to allow implementation of evacuation and contingency plans. **(T-2)**

Table 6.2. Aircraft Mission Kit.

Section I – Publications
1. 1. AFMAN 11-2AC-130J, Vol 1 (or equivalent), *AC-130J Aircrew Training* 2. 2. AFMAN 11-2AC-130J, Vol 2 (or equivalent), *AC-130J Aircrew Evaluation Criteria* 3. 3. AFMAN 11-2AC-130J, Vol 3 (or equivalent), *AC-130J General Operating Procedures* 4. 4. DoD 4140.25-M, *DoD Management of Bulk Petroleum Products, Natural Gas, and Coal* 5. 5. ATP-56 (B), *NATO Air to Air Refueling Procedures* 6. 6. AMC Airfield Suitability and Restrictions Report (ASRR) 7. 7. DAFMAN 11-401, *Aviation Management* 8. 8. DoD Foreign Clearance Guide (when applicable)
Section II – Forms

1. 1. AF Forms a. a. 15, *USAF Invoice* b. b. 70, *Pilot's Flight Plan and Log* c. c. 315, *USAF AV Fuels Invoice* d. d. 457, *USAF Hazard Report* e. e. 651, *Hazardous Air Traffic Report* f. f. 791, *Aerial Tanker In-flight Issue Log*[1] g. g. 1297, *Temporary Issue Receipt* h. h. 2282, *Statement of Adverse Effect – Use of Government Facilities* i. i. 4108, *C-130 Fuel Log* j. j. 4116, *C-130 Flight Plan Record* k. k. 4118, *SCA Planning Form* l. l. 4139, *Special Operations Refueling CS In-flight Worksheet*	2. 2. DD Forms: a. a. 175, *Military Flight Plan* b. b. 175-1, *Flight Weather Briefing* c. c. 1385, *Cargo Manifest* d. d. 1801, *DoD International Flight Plan* e. e. 1854, *US Customs Accompanied Baggage Declaration or CF6059B, Customs Declaration* f. f. 2131, *Passenger Manifest* g. g. Customs Border Protection (CBP) 7507, *General Declaration (Outward/ Inward) Agriculture, Customs, Immigration and Public Health* 3. 3. AFSOC Forms: a. a. 88, *Dedicated Crew Chief Trip Report* b. b. 97, *AFSOC Aircraft Incident*
Section III - Miscellaneous	
1. 1. Foreign Nation Custom Forms (when applicable) 2. 2. All applicable local forms	

6.6. Route Navigation Kits.

6.6.1. The route navigation kits will contain sufficient quantities of material to cover the planned mission and global operations as required. **(T-2)** The minimum contents of route navigation kits are in **Table 6.3**.

6.6.2. On local unit training sorties, local area navigation kits may be used in lieu of route navigation kits in **Table 6.3**. Contents of these kits will be determined by the unit. **(T-2)**

Table 6.3. Route Navigation Kit Contents Item (applicable to area of operation).

Item (Applicable to Area of Operations)	Quantity Required
FLIP Planning (GP, AP/1, AP/2, AP/3, AP/4)	1
FLIP IFR Supplement	1
FLIP Flight Information Handbook (FIH)	1
FLIP Enroute Charts (High and Low)	1
FLIP Area Charts (Terminal)	1
FLIP Instrument Approach Procedures (High and Low)	2
Standard Instrument Departures (SIDs)	2
Operations Report (OPREP)-3 Report Format	1
Maps and Charts	As Required
FLIP VFR Supplement	1
Note: Units may modify the kit to carry only FLIP documents for the theater in which the mission will operate.	

Section 6C—Briefings

6.7. Briefing Requirements. Crewmembers and supporting/supported forces will not fly unless they attend the crew briefings for their mission. **(T-2) Exception:** When pre-mission requirements dictate, PIC may excuse certain members from the briefing. The PIC will ensure that those members receive a face-to-face briefing prior to engine start. **(T-2)**

6.8. Aircrew Intelligence Briefing. Aircrews will receive an intelligence briefing that will emphasize terrorist, enemy, and friendly political and military development in the area in which they will be flying. **(T-2)** Obtain timely intelligence updates prior to entering a specific AOR. **(T-2)** In theater, aircrews should receive intelligence updates on initial arrival at a forward operating location (FOL), or enroute stop, and thereafter when significant developments occur. Report information of possible intelligence value to the local intelligence office as soon as practical to ensure timely dissemination of mission reports (MISREPs). **(T-2)**

Section 6D—Flight Planning

6.9. Flight Planning/Data Verification.

6.9.1. Computer Flight Plan (CFP): Use CFP as the official source of performance, navigation, and climatic data, including enroute wind information. **(T-2)** If stand-alone computer-based plans are used, each mission segment should utilize best wind data available. Use only AFSOC validated CFPs. **(T-2)**

6.9.1.1. Use CFPs to the maximum extent practical. Flight crews may manually compute flight plans. The PIC has final responsibility for flight plan accuracy and diplomatic clearance compliance.

6.9.1.2. Verify CFPs for route of flight and fuel computation accuracy before departure. All waypoint data retrieved from a database should be verified by one or more of the following methods: **(T-2)**

6.9.1.2.1. Latitude/longitude from current FLIP.

6.9.1.2.2. Bearing/distance from a flight plan.

6.9.1.2.3. Ground Based NAVAIDs.

6.9.2. When conducting IPRA operations, both pilots or one pilot and CSO will verify CNI-MU Landing Zone (LZ) and IPRA waypoint information. **(T-2)**

6.9.3. Emergency Safe Altitudes/ Minimum Safe Altitudes

6.9.3.1. An Emergency Safe Altitude (ESA) will be calculated within 22NM of route centerline. **(T-2)** To compute the ESA, add 1,000 feet (2,000 feet in mountainous terrain) to the highest obstacle or terrain feature (rounded to next higher 100-foot increment).

6.9.3.2. A Route Minimum Safe Altitude (RT MSA) will be calculated within 5NM of centerline. **(T-2)** To compute the RT MSA, add 500 feet (1,000 feet in mountainous terrain) to the highest obstacle or terrain feature (rounded to next higher 100-foot increment).

6.9.3.3. An Objective Minimum Safe Altitude (OBJ MSA) will be calculated no less than a 10NM radius of Restricted Operation Zone (ROZ) or objective area center point. **(T-2)** If actual ROZ dimension is greater than 10 NM calculate OBJ MSA for actual ROZ

dimension. (Example 1: ROZ diameter is 5NM then the OBJ MSA will be calculated at 10NM. Example 2: ROZ diameter is 15NM then the OBJ MSA will be calculated at 15NM). To compute the OBJ MSA, add 500 feet (1,000 feet in mountainous terrain) to the highest obstacle or terrain feature (rounded to next higher 100-foot increment).

6.10. Communications Security (COMSEC) and Classified Material. Obtain and safeguard COMSEC and other classified/keying material required for the mission. Carry authenticators and Identification Friend or Foe (IFF) Mode 4 codes, when flying into an Air Defense Identification Zone (ADIZ), participating in exercises, on overseas missions, deployments, and when specified in operation plans. **(T-2)**

6.10.1. The base COMSEC custodian has access to the AFKAG 44/AFKAG 14 and can assist in obtaining the material required for the mission. Squadrons maintain the COMSEC material used on most missions. All squadron members that require access to COMSEC material will be properly trained. **(T-2)** Base/squadron COMSEC Responsible Officer (CRO) is the point of contact for current training requirements. **(T-2)**

6.10.2. CCCs will provide temporary storage for COMSEC/classified materials during ground time at enroute stops. Issue and turn-in of COMSEC is normally a function of the squadron CRO.

6.10.2.1. Remove classified/sensitive information (such as secure voice/DAMA, IFF, mission information) stored in all aircraft systems. **(T-2)**

6.10.3. If possible, destroy classified material and equipment prior to crash landing or bailout.

6.11. Call Signs. Use voice call sign listing or as specified in mission directives/tasking for all missions except local area training missions. **(T-2)** Use squadron or wing static call signs as directed for local area training missions. **(T-2)**

6.11.1. Search and Rescue (SAR). When tasked to participate in SAR operations, use the call sign "AIR FORCE RESCUE" plus the last five digits of the aircraft tail number. **(T-2)**

6.12. Departure/Arrival Planning. Comply with AFMAN 11-202, Vol 3. If using a flight plan furnished by another agency, the PIC and copilot will verify routes and flight altitudes to ensure proper terrain clearance. **(T-2)**

6.13. TOLD Verification Requirement.

6.13.1. To verify CNI TOLD, both pilots will cross-check CNI TOLD INIT entries. **(T-2)**

6.13.2. TOLD ENTRIES Takeoff Page 3/4 and 4/4. For an IFR departure, aircraft weight must be less than or equal to the calculated maximum aircraft weight for the type of three- engine departure listed (normal or 50-flap at obstacle clearance speed). **(T-2)**

6.14. Adverse Weather.

6.14.1. Flight into areas of forecast or reported severe turbulence is prohibited. **(T-2)**

6.14.1.1. Anytime wind shear may be encountered on departure or approach, it is recommended that aircrews select weather mode on one NAV RADAR display and wind shear mode on another NAV RADAR display.

6.14.1.2. The PIC is responsible for ensuring all passengers are seated, with seat belts fastened, when areas of moderate or greater turbulence are encountered or anticipated.

(T- 2) ***WARNING:*** Serious injury may occur if passengers do not have their seat belts fastened and the aircraft encounters moderate or severe turbulence.

6.14.2. Flight into areas of forecast or reported severe icing is prohibited. **(T-2)** Prolonged operation, such as cruise flight or holding, in areas of moderate icing should be avoided.

6.14.2.1. Do not takeoff under conditions of freezing rain or freezing drizzle. **(T-2)**

6.14.2.2. Freezing precipitation, snow, freezing fog (consider equivalent to moderate icing), or temperatures near 0°C, may cause ice or frost to accumulate on aircraft surfaces. When an aircraft requires de-icing/anti-icing prior to takeoff, refer to the following:

6.14.2.2.1. Aircrews will only use de-ice and anti-ice fluids listed in their respective flight manual. **(T-2)** Aircrews will be familiar with and follow all restrictions in their associated flight manual with respect to anti-ice/de-ice procedures and holdover times. **(T-2)**

6.14.2.2.2. Military (MIL)-A-8243 Type I and Type II de-icing fluids do not provide any anti-icing benefit, and therefore do not have holdover times.

6.14.2.2.3. In all cases, PICs will ensure a visual inspection of the aircraft is completed within 5 minutes of departure. **(T-2)**

6.14.3. ***CAUTION:*** Aircraft damage may occur 20 nm or more from any thunderstorms. Aircrews must familiarize themselves with information on thunderstorm development and hazards. Refer to AFH 11-203V1, *Weather for Aircrews,* and AFH 11-203V2, *Weather for Aircrews-Products and Services*. Do not fly directly above (within 2,000 feet) thunderstorms or cumulonimbus clouds. **(T-2)** If unable to clear thunderstorms or cumulonimbus clouds by at least 2,000 feet vertically, avoid them by at least:

6.14.3.1. 20 nm at or above flight level (FL) 230. **(T-2)**

6.14.3.2. 10 nm below FL 230. **(T-2)**

6.14.4. The size and intensity of thunderstorms and/or cumulonimbus clouds are so variable that the PIC must determine avoidance takeoff and landing criteria. Takeoff, approach, and landing may be made without regard to the criteria in paragraphs **6.14.3**, **6.14.3.1**, and **6.14.3.2** provided:

6.14.4.1. The thunderstorm and/or cumulonimbus clouds and the associated gust front, if present, can be avoided. **(T-3)**

6.14.4.2. The distance of from the thunderstorms or cumulonimbus clouds is increased as soon as possible after takeoff to meet the criteria in **paragraph 6.14.3.2**. **(T-3)**

6.14.4.3. The missed approach course from the missed approach point will provide separation similar to that of a normal departure. **(T-3)**

6.14.5. The use of ground-based RADAR as a means of thunderstorm avoidance should only be used to assist in departing an inadvertently penetrated area of significant weather when aircraft WX RADAR is inoperative.

Section 6E—Pre-flight

6.15. Operational Risk Management (ORM). ORM is a logic based, common sense approach to making calculated decisions on human, material, and environmental factors before, during, and after all operations. USAF guidance on ORM is contained in AFI 90-802, *Risk Management*. PICs will accomplish ORM worksheets IAW AFSOC/MAJCOM and local guidance as part of preflight activities. **(T-2)**

6.15.1. Flying units will develop a local ORM program to include personal ORM risk assessment for all missions. **(T-2)**

6.15.2. The PIC will ensure an ORM risk assessment is accomplished by all crewmembers as part of preflight activities. **(T-2)**

6.16. AFTO Form 781, *Aerospace Vehicle Flight Data Record.* Review the AFTO Form 781 before applying power to the aircraft or operating aircraft systems. The Exceptional Release (ER) must be signed before flight. **(T-2)** A maintenance officer, maintenance superintendent, or authorized civilian normally signs the ER. If one of these individuals is not available, the PIC may sign the ER. Ensure that the DD Form 1896, *DoD Fuel Identiplate* and AIR card are onboard the aircraft. **(T-2)**

6.16.1. Authority to Clear a AFTO Form 781 Red X**.** Aircrew are not normally authorized to clear a Red X. If a situation is encountered where the aircraft is on a Red X and qualified maintenance personnel are not available to clear it, the PIC may obtain authorization to clear the Red X from the home station maintenance group commander or designated representative following guidance located in TO 00-20-1. **(T-3)**

6.16.1.1. At enroute stations, AGs are authorized to clear Red X symbols for; intake and exhaust inspections, dust covers, and plugs installed, and aircraft panels removed and installed to facilitate other maintenance when qualified maintenance personnel are not available. **(T-2)**

6.16.2. In-process Inspections. AGs must be aware of their responsibility to perform in-process inspections when clearing Red X symbols. During the assembly where further assembly will prevent the required inspection of the item, an in-process inspection will be performed. **(T-2)** The inspection will be documented IAW TO 00-20-1. **(T-2)**

6.17. Forms Management. In addition to the procedures in TO 00-20-1 and DAFMAN 11-401, the AG will assist the PIC in maintaining the AFTO Form 781. Verify the exceptional release is signed before flight and resigned, if necessary, at enroute stops. **(T-2)**

6.17.1. After each flight, ensure the number of discrepancies (if any), landings, and flight duration time(s) are entered on the AFTO 781H*, Aerospace Vehicle Flight Report and Maintenance Document*. Review all AFTO 781A discrepancies to ensure symbols, date discovered, and clear, detailed entries were entered and the discovered by blocks are completed for each discrepancy. **(T-2)**

6.17.2. IAW, DoD Manual 4140.25M Vol II, *DoD Management of Bulk Petroleum Products, Natural Gas, and Coal*; AFI 23-201, *Fuels Management*; AFMAN 23-110 Vol 1, *Basic USAF Supply Manual*; and AFI 11-253, *Managing Off-Station Purchases of Aviation Fuel and Ground Services*, all off-station fuel purchases (to include in-flight refueling) will be logged on AFTO 781H and AF Form 664, *Aircraft Fuels Documentation Log* if applicable. **(T-2)**

6.17.3. IAW AFMAN 23-110, Vol 1, **paragraph 1.26.,** an aircrew member will record all in-flight transfers from C-130 tanker aircraft to any receiver aircraft on the AF Form 791, *Aerial Tanker In-flight Issue Log*. This form will also be accomplished for fuel jettison in excess of 1,000 lbs. **(T-2)** IAW AFMAN 23-110, Vol 1, **paragraph 1.27** and **paragraph 1.37**. Turn completed forms in during maintenance debrief. **(T-2)**

6.18. Dash One Preflight. The aircrew Dash One preflight inspection, once completed, is valid for 72 hours provided the aircraft is sealed. **(T-2)**

6.18.1. When an aircrew assumes a pre-flighted spare or quick-turn, a thorough visual inspection will be performed, paying particular attention to areas affected by maintenance or servicing. **(T-2)**

6.18.2. Except to prepare for UEIs and contingencies/evacuations, Dash One preflight inspections are normally done in preparation for flight by the aircrew assigned to fly the mission designated for that aircraft, that day.

6.18.3. The following guidelines apply to aircrew assigned to preflight and/or seal aircraft. A crew should not preflight more than 4 aircraft in a 12-hour period. Refer to crew rest/flight duty period guidance in AFMAN 11-202, Vol 3. Aircrews performing preflight duties will be afforded 12 hours rest between preflight shifts. **(T-2)**

6.18.4. Duties Not Including Flying crewmembers may accomplish preflights with the concurrence of the flight surgeon. It is the responsibility of the crewmember to know his/her duty limitations. Crewmembers should have the flight surgeon document the DD Form 2992, *Medical Recommendation for Flying or Special Operational Duty* appropriately IAW with DAFMAN 48-123, *Medical Examinations and Standards*. **(T-2)**

6.18.5. Unqualified crewmembers will not preflight aircraft except under the supervision of an instructor in their respective crew position. **(T-2)**

6.19. Alert Aircraft Procedures. Maintain aircraft on alert status as follows: **(T-2)**

6.19.1. Aircraft preflight times should align the alert period and aircraft preflight validity period, eliminating the need to update the preflight during the alert period. Park the aircraft in a designated alert parking area to expedite taxi and takeoff.

6.19.2. Sealing the Aircraft.

6.19.2.1. Upon certification of the flight manual Dash One inspection, annotated by an entry in the AFTO Form 781A, aircraft will have the crew entrance door sealed and the paratroop door security paddles installed after completing a full Before Leaving the Airplane checklist. **(T-3)** The seal number, date, time, fuel, and LOX will be entered in pen**. (T-3)**

6.19.2.2. The block certifying the preflight at a minimum should resemble **Figure 6.1**.

Figure 6.1. Aircraft Seal Certification.

-1 C/W at 1800z
Fuel 39K
LOX 63L
Seal # N-XXXXXX

6.19.2.3. Only the LM/AG will seal the aircraft. **(T-2)**

6.19.2.4. If entry is required by maintenance personnel after sealing, operations and maintenance must mutually agree. **(T-2)** Depending upon the maintenance performed, the operations leadership (examples include Mission Commander, Director of Operations, and Commander) will determine if a new Dash One preflight is required. Clearly document the reason for entry, maintenance accomplished, and new seal number on the AFTO Form 781A. Once the maintenance is accomplished, the maintenance officer or superintendent are the only maintainers authorized to reseal the aircraft. If a new Dash One is required and completed, it must be documented as described above. Crewmembers need not be present to reseal aircraft. If maintenance is performed, the crew is required to inspect the affected area prior to flight. **(T-2)**

6.19.3. The alert aircraft may be flown for purposes other than actual alert missions provided the following conditions are met: **(T-2)**

6.19.3.1. Ensure sufficient fuel remains onboard to meet alert commitments.

6.19.3.2. Maintain communications with the primary controlling agency.

6.19.3.3. If maintenance actions are not required, the aircraft can be resealed for alert once the thru-flight inspection is completed. In all cases, a new preflight is not required until the end of the initial preflight period.

6.19.4. If the alert aircraft is changed to a different preflighted/sealed aircraft, or an alert crew change occurs and the same aircraft remains on alert, the preflight or alert crew will, as a minimum, check the AFTO Form(s) 781, apply power to the aircraft and check the following systems (as applicable):

6.19.4.1. Interior and exterior for proper configuration and special equipment.

6.19.4.2. Fuel quantity.

6.19.4.3. Survival and emergency equipment.

6.19.4.4. Navigation and communication equipment.

6.19.4.5. Liquid oxygen quantity.

6.19.4.6. Hydraulic reservoirs and accumulator charges.

6.19.5. Should an aircraft remain on alert for more than 72 hours, a complete aircrew preflight is then required. **(T-2)**

6.19.6. Once the aircraft is accepted for alert, the AG will ensure an entry is made in the AFTO Form 781H stating as a minimum, the date and time the aircraft was preflighted. **(T-2)**

6.20. Aircraft Servicing and Ground Operations.

6.20.1. Aircraft Refueling. Crewmembers may perform refueling duties at austere locations or at stations without maintenance support. Aircrews should not refuel except in cases when maintenance support is not readily available, the mission would be unacceptably delayed or to complete ground refueling certification training. **(T-2)**

6.20.2. Concurrent Ground Operations. Simultaneous aircraft refueling/defueling and cargo loading, or maintenance operations is authorized using guidance in accordance with DAFI 21-101, *Aircraft and Equipment Maintenance Management,* TO 00-25-172, *Ground Servicing of Aircraft and Static grounding/bonding*, MDS specific TO and any established local procedures. **(T-2)**

6.20.3. Liquid Oxygen Servicing. Under no conditions are crewmembers allowed to service liquid oxygen. **(T-2)**

6.20.4. Fire Protection, Ground Operations and Crash Rescue.

6.20.4.1. The aircraft engine fire extinguisher system fulfills the minimum requirements for fire protection during engine start. If available, position a portable fire extinguisher for added fire protection. **(T-2)**

6.20.4.2. A fireguard is required for all engine starts except normal APU starts. **(T-2)** A crewmember or ground controller may act as fireguard.

6.20.5. Propulsion System Checks (Engine Runs). When conducting maintenance-requested propulsion system checks, comply with the following:

6.20.5.1. Prior to conducting the checks, complete an ORM assessment and review risk mitigation actions. The minimum crew complement for the checks will be the crew complement required for aircraft taxi. Start with the preflight checklist and accomplish all checklists through before leaving the aircraft checklist. **(T-2)**

6.20.5.2. During the propulsion system checks, follow normal flight manual procedures and limitations (do not combine maintenance procedures/limitations into the checks). Set power as requested and relay instrument readings, but limit troubleshooting to the scope of the aircraft flight manual. Checks requiring functional check flight (FCF) procedures will be performed by FCF-qualified crews. **(T-2)**

6.20.5.3. When conducting propulsion system checks in areas of reduced traction, ensure all personnel onboard are seated with lap belts fastened. **(T-2)**

6.20.6. Towing**.** Aircrew members will not normally participate in towing operations. The PIC will coordinate with the senior maintenance officer or superintendent to ensure the towing supervisor and crew are qualified. At non-USAF installations, the PIC must have approval from the airfield operations officer or manager prior to towing. The PIC will ensure the tow team supervisor briefs all personnel on their duties and the associated hazards. Proper checklists will be used. If any doubt exists as to the qualification of tow team personnel or the safety of the operation, make no attempt to tow the aircraft until qualified Air Force personnel can be located. Under no circumstances will any crewmember act as the towing supervisor. **(T-2)**

6.20.7. When thunderstorms are reported within 10 nm of the airfield, only operations leading to an immediate engine start and departure may continue. However, personnel must be prepared to cease all activities in the event lightning within 5 nm is declared. When advised of lightning within 5 nm of the airfield, all flight line activities will cease, and personnel will seek shelter. Unless an immediate takeoff is a safer course of action, taxiing aircraft will return to parking. **(T-2)**

6.20.7.1. Munitions loading will not be initiated, unless it can be completed before lightning becomes a hazard. If munitions loading has begun and lightning becomes a hazard, the crew will cease loading and depart the flightline/hot cargo. Ensure that the Command Post notifies security forces that there will be an unattended aircraft with munitions. Unless immediate takeoff is a safer course of action, any taxiing aircraft with munitions aboard will return to hot cargo if lightning is declared within 5 nm. **(T-2)**

6.20.8. Aircraft taxiing to parking or hot cargo when lightning is declared within 5 nm should not expect a marshaller. The aircrew will hold in place or proceed to parking if clearance is assured. The aircrew may seek shelter but should remain in the aircraft or coordinate for ground transportation if it is the safer course of action. Time permitting, coordinate with Base Operations if the aircraft will be parked in a location other than one normally assigned. **(T-2)**

6.21. Aircrew Flight Equipment and Oxygen Requirements.

6.21.1. The PIC or designated representative will ensure appropriate serviceable protective clothing, aircrew flight equipment, survival equipment, and Dash 21 equipment for the entire mission are available prior to flight and all personnel are briefed or trained in their use prior to departing home station. **(T-2)**

6.21.1.1. Prior to departing home station and following enroute crew changes, the PIC or designated representative will review the AFTO Form 46, *Aircrew Flight Equipment*, to ensure all required equipment is onboard and required inspections have been completed. The PIC or designated crewmember will document and ensure missing aircrew flight equipment is annotated in both the AFTO Form 781A and AFTO Form 46. **(T-2)**

6.21.2. Oxygen. Minimum oxygen required onboard for takeoff is 15L for the forward system and 10L in the aft system. **Exception**: If accomplishing BAQ events only, the aircraft may be flown with only the 25L LOX system operable. If flying to a repair capable facility, the aircraft may be flown utilizing the 75L only procedures with at least 15L of LOX in the 75L system. **(T-2)** Crews will follow the procedures in the OXYGEN SYSTEM section of the flight manual. Crew is limited to 7 total regulators if using only the 25L system. All regulators may be used if using only 75L system (reference TO 1C-130(A)J-1 for regulator limitations based on altitude). In all cases, oxygen onboard must be sufficient to accomplish the planned flight from the Equal Time Point (ETP) to a suitable recovery. Aircrews will comply with AFMAN 11-202, Vol 3 oxygen guidance. **(T-2)** ***WARNING:*** The POK does not protect the wearer from smoke or fumes.

6.21.2.1. Pre-breathing. Execute IAW AFMAN 11-409, *High Altitude Airdrop Mission Support Program*. **(T-1)**

6.21.2.2. Crewmembers will accomplish a communications and operations check of their oxygen system prior to flight, which will remain connected and readily available when

occupying a primary crew position. Walk around bottles do not satisfy this requirement. **(T-2)**

6.21.2.3. For the purposes of oxygen requirements, consider MEPs as passengers. **(T-2)**

6.21.3. Life Rafts. Ensure sufficient wing well life rafts are onboard to accommodate all passengers and aircrew members on overwater flights. **(T-2)**

6.21.4. Life Preserver Units. For overwater flights, ensure a sufficient quantity of life preservers are onboard for all passengers and crewmembers. While overwater, life preserver units (LPU)s will be sized and readily available at the crewmember's station and worn whenever below 2,000 feet overwater (except for takeoff, approach, and landing). Crewmembers wearing a parachute or harness during air refueling overwater will also wear an LPU.

6.21.5. Anti-exposure suits. Anti-exposure suits will be available during overwater flights when-route of flight is beyond power off gliding distance from land and the water temperature is 60 degrees Fahrenheit (F) or below. **(T-2) Exception:** Anti-exposure suits are not required when only the approach or departure is flown over water. If the water temperature ranges between 51 degrees F and 60 degrees F, the unit or mission commander may waive or extend the anti- exposure suit requirement after consideration of all risk factors.

6.21.6. Parachutes. AC-130J aircraft will be configured with one parachute for each crewmember. Units will dictate use of parachutes during combat or acceptance flights. Each crewmember will fit a parachute and have it readily available prior to all weapons delivery, combat, contingency and FCF missions. Units will dictate use of parachutes during acceptance flights. **(T-2)**

6.21.7. Restraint Harness.

6.21.7.1. Personnel performing duties near an open door in-flight will preflight and wear a parachute or restraint harness. Wear a restraint harness during operations below 1,000 feet AGL. Fit the restraint harness and adjust the lifeline prior to takeoff time. **(T-2)** ***WARNING:*** Position one restraint harness forward and aft of FS 245 in event the crew entrance door must be inspected during flight. This harness must be sized and fitted by a flight deck crewmember prior to flight. **(T-2) Note:** Connect the hook to a point that will preclude the wearer from exiting the aircraft. **(T-2)**

6.21.8. Survival Kits/Vests. Configure all aircraft with one survival kit (ML-4) for each aircrew member for flights conducted beyond gliding distance of land. Survival vests may be used in lieu of survival kits if the mission will not be conducted beyond gliding distance of land. **(T-2)**

6.21.9. Helmets. All crewmembers will preflight and wear their helmets during contingency and combat missions. **(T-2) Note:** When conditions require personnel in the cargo compartment to wear protective headgear, the flight helmet will be worn with the chinstrap fastened. **(T-2) Note:** Crewmembers will make available their personal helmet and oxygen mask to an Aircrew Flight Equipment (AFE) facility for cleaning, maintenance, and communications testing every 30 days. **(T-2)**

6.21.9.1. All personnel aft of flight station (FS) 245 will wear flight helmets while any gun is configured for live-fire operations. Observers authorized to be onboard during live-fire

operations will wear flight helmets or similar government issued protective headgear while any gun is configured for live-fire. AGs will wear flight helmets while performing CLT installation/removal procedures in-flight. **(T-2)**

6.21.9.2. Eye Protection. All personnel aft of FS 617 should wear eye protection during any mission requiring doors to be open. **(T-2)**

6.21.10. Portable Oxygen Bottles. Crewmembers who do not have access to the aircraft oxygen system will have an oxygen source Emergency Escape Breathing Device/Protective Breathing Device (EEBD/PBE) or Emergency Passenger Oxygen System (EPOS) available for flight and within arm's reach for pressurized flights above FL 250. Prior to flight, visually inspect the EEBD/PBE/EPOS to ensure it contains an adequate supply of oxygen. Passengers and other non-crewmembers will have EPOS available for flights above FL 250. **(T-2)**

6.21.11. Decompression Sickness (DCS). For anyone thought to have symptoms of DCS, the following actions apply: **(T-2)**

6.21.11.1. As mission permits, declare an in-flight emergency, descend to as low a cabin altitude as practical, and land at the nearest suitable installation where medical assistance can be obtained. Clearly indicate the possibility of DCS so that medical personnel will be best prepared to treat affected individuals. **(T-2)**

6.21.11.2. Keep the person relaxed and as warm as possible and watch for potential symptoms in other crewmembers for the next 24 hours. **(T-2)**

6.22. Departure Briefing. The pilot making the takeoff will brief the crew in accordance with published AFSOC briefing guides. **(T-2)**

6.23. IFF/SIF Operations.

6.23.1. Use the IFF/SIF IAW **Table 6.4** **(T-2)** **Note:** Once set and transmitted, IFF/SIF modes 1, 2, and 3/A codes are unclassified and may be left in the transponder.

Table 6.4. Worldwide IFF Chart.

IFF Mode	NATO	United States Atlantic Command (LANTCOM) And North Pacific (NOPAC)	All Other Areas
1	IAW Allied Communications Publication (ACP) 160(D) *IFF/SIF Operational Procedures*, NATO directives, Special Instructions (SPINS)/Air Tasking Order (ATO)	IAW ACP 160(D), US Sup-1(C), NI 10-41, NI 10-15, NR 55-68, NR 55-2, SPINS/ATO	
2	IAW ACP 160(D), USAFER 60-17, NATO directives, SPINS/ATO	IAW ACP 160(D), U.S. Sup-1(C), and ANNEX A, SPINS/ATO	

3	As directed by ATC, SPINS/ATO	As directed by ATC, SPINS/ATO	As directed by ATC, otherwise IAW ACP 160(D), US Sup-1(C)
4	Keyed and On when required		

6.23.2. Conduct an in-flight check of the Mode 4 after takeoff where facilities are available. Do not delay takeoff nor cancel a mission for an inoperable Mode 4. **(T-2) Exception:** Aircrews will ensure they have an operable Mode 4 prior to departure if the aircraft will transit an area where safe passage procedures are implemented or when required for mission accomplishment. **(T-2)**

6.23.3. If Mode 4 fails in-flight, crews may continue to their intended destination if use is no longer required. If use is required, the aircraft will be landed, and repairs will be accomplished at the first repair facility. **(T-2)**

6.23.4. Mode S. Mode S equipped aircraft have the capability of assigning a unique default code that is associated with a specific aircraft registration as well as the flight identification that corresponds to the filed flight plan call sign.

6.23.4.1. Military aircraft have the ability to change the Mode S and Flight ID codes. Erroneous Mode S codes and/or Flight ID mismatch to filed aircraft identification degrade the safety and efficiency of. Inadvertent duplication of an address will seriously degrade or even disable enhanced traffic collision avoidance system (ETCAS) operability.

6.23.4.2. Aircrew and squadron operations staff must ensure that the assigned/unique Mode S address (default code) be loaded into the transponder correctly. Flight plan filed call signs must match exactly to the Flight ID inserted into the transponder. There will be neither leading zeros nor spaces/dashes ahead of or between the characters entered in the Flight ID. If the call sign is less than 7 characters, the inserted Flight ID will have spaces only at the end. Follow guidance IAW DoD FLIP General Planning. **(T-2)**

6.23.4.3. Ensure Mode S operation is IAW the aircraft flight manual. Due to its importance, anytime a Mode S code is entered, it will be verified by a second crewmember. **(T-2)**

6.24. Traffic Collision Avoidance System/Enhanced Traffic Collision Avoidance System (ETCAS) Operations.

6.24.1. Traffic Alerting and Collision Avoidance System. It is imperative to follow Resolution Advisories (RAs) to obtain aircraft separation computed by TCAS. Failure to follow the computed RA may increase the probability of a midair collision. Pilots who deviate from an ATC clearance in response to an RA must notify ATC of the deviation as soon as practical and promptly return to the ATC clearance when the traffic conflict is resolved or obtain a new clearance. **(T-2)**

6.24.2. Mission requirements may allow selection of traffic advisory (TA) only when operating from parallel runways, in the visual traffic pattern, air refueling, or in formation since the proximity to aircraft may result in unwarranted RAs. Excessive climb and descent rates could lead to inadvertent TA/RA. Reducing climb/descent rates near level off can limit inadvertent TCAS advisories. **(T-2)**

6.25. Navigational Aid Capability.

6.25.1. Reduced Vertical Separation Minimum Airspace. Airspace where RVSM is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. Crews will refer to FLIP AP/2. **(T-2)**

6.25.2. Required Navigation Performance (RNP) Airspace and Basic Area Navigation (BRNAV) RNP/BRNAV. Pilots will immediately notify ATC if any of the FLIP/International Civil Aviation Organization (ICAO) required equipment fails after entry into RNP or BRNAV airspace. **(T-1) Note:** Airspace and associated navigational aid equipment capability are rapidly evolving. Crews must maintain an in-depth knowledge of current FLIP requirements/policies communication and reporting procedures in the Flight Information Handbook.

6.26. Dropped Object Prevention. During aircraft exterior visual inspections, pay particular attention to surfaces, panels, and components which could potentially be dropped objects. If a dropped object is discovered and the mission is continued, the flight crew will: **(T-2)**

6.26.1. Ensure the write-up is entered in the AFTO Form 781A.

6.26.2. Notify the AFSOC Operations Center as soon as practical. Include route of flight, altitude, weather, and turbulence.

6.27. In-flight Emergency Procedures. Report deviations from directives that occur as a result of an emergency using guidance from AFMAN 11-202, Vol 3, and this publication. **(T-2)**

6.27.1. Notification of Controlling Agencies. When practical after completing the aircraft emergency action checklist and associated actions, furnish the controlling agency and appropriate CCC with a description and extent of the difficulty, assistance required, intentions, and any further pertinent information. **(T-2)**

6.27.1.1. The PIC may initiate a Conference Hotel when additional expertise is necessary to cope with emergencies or other conditions.

Table 6.5. Conference Hotel for All C-130 Variants.

Priority	Procedure	Contact
Primary	Call Lockheed Martin Technical Representative:	DSN: 838-5140 or Comm: (817) 777- 3060 Comm Alternate: (817) 935-5858
Alternate	Call Robins Command Post and ask to initiate a “Conference Hotel”	DSN: 497-2612 or Comm (478) 327-2612

6.27.2. Continued Flight with Engine Loss. A flight may proceed on three engines to its destination if two-engine capability exists, favorable operating conditions prevail enroute and at the point of intended landing, and a suitable alternate airfield is available at all times. If these conditions cannot be met, the flight will terminate at the nearest facility (preferably military) which, in the judgment of the PIC, offers safe and favorable operating conditions. **(T- 2)**

6.27.3. Fuel Jettisoning. Fuel will not be jettisoned except in combat, emergency conditions, or rescue missions requiring gross weight reduction. **(T-2)**

6.27.3.1. Advise ATC should it become necessary to jettison fuel. **(T-2)**

6.28. Need for Medical Assistance. When a person onboard the aircraft requires medical care, the PIC will inform the station of next intended landing in sufficient time so medical personnel may meet the aircraft. **(T-2)**

6.28.1. Suspected Laser Exposure. If exposed to a laser, the PIC will ensure appropriate command and control, intelligence, safety, and medical agencies are notified as soon as possible. Aircrew who suspect exposure to laser radiation from either friendly or hostile sources should report to the flight surgeon‘s office or nearest emergency room where individual can be examined by an ophthalmologist immediately upon landing. **(T-2)**

6.29. Flight Deck Congestion and Loose Objects.

6.29.1. Limit the number of persons on the flight deck to the minimum commensurate with mission requirements. At no time will the number of persons on the flight deck exceed 8. **(T- 2)**

6.29.2. Keep the flight deck area uncluttered and orderly for all flight and ground operations. Do not store on the flight deck any items not required for use or immediate reference in-flight. **(T-2)**

6.30. Passenger Guidance. DoD 4515.13-R, *Air Transportation Eligibility*, establishes criteria for passenger movement on DoD aircraft. It defines four categories of passenger travel: space available, aeromedical evacuation, orientation, and space required. DAFMAN 11-401 provides further guidance on orientation. Refer to these publications directly for details not addressed in this publication. In all cases, individuals will be manifested on a Passenger Manifest (i.e., DD Form 2131, *Passenger Manifest*). **(T-2)**

6.30.1. Space-available. AC-130Js are not configured for and will not be used for space available travel. **(T-2)**

6.30.2. Orientation. DAFMAN 11-401 contains specific details on the Air Force Orientation Flight Program. Document authorization by letter and manifest on an AF 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 DAFMAN 11-401 and AFSOC Sup. **(T-2)**

6.30.3. Restrictions.

6.30.3.1. For spouse orientation, comply with restrictions in DAFMAN 11-401 and AFSOC Supplement. Additionally, AAR and threat maneuvers are prohibited. **(T-2)**

6.30.3.2. For other orientation categories, both pilots must be fully qualified (does not apply to special qualification events not planned for the flight). AAR may be approved on a case-by-case basis by group commanders or COMAFSOF. 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. **(T-2)**

6.30.4. Public Affairs Travel. Defined as travel in the interest of adding to the public understanding of DoD activities. DAFMAN 11-401 contains specific details on the Air Force Public Affairs Flight Program. Document authorization by letter and manifest on a DD Form 2131. Requests for approval will include the mission profile and mission events to be accomplished. Forward requests through public affairs channels. **(T-2)**

6.30.4.1. Restrictions. Both pilots must be fully qualified in all sortie events. AAR may be approved on a case-by-case basis by group commanders or COMAFSOF. 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. **(T-2)**

6.30.5. Mission Essential Personnel. See DAFMAN 11-401 **(T-1)**

6.30.5.1. Restrictions. Both pilots must be fully qualified in the sortie type being flown unless exempted by DAFMAN 11-401. Simulated EPs as defined by 9.4.1 are prohibited. There are no restrictions on mission events. Passengers will be seated with belts fastened during threat maneuvers. PICs will ensure that mission essential personnel are briefed on the mission profile and events before flight. **Exception:** EPs required for the purposes of a FCF are authorized. Limit personnel to absolute minimum required. **(T-1)**

Section 6F—Departure

6.31. Engine Run-Up/Propulsion Checks. Request clearance from the ground or tower controller prior to an engine run. Advise controller when prop wash will cross the runway. If engine efficiency cannot be obtained IAW the aircraft flight manual, the aircraft will not be flown. **(T-2)**

6.31.1. At no time will an engine run-up be attempted (power levers out of the ground range) unless the aircraft is in an approved engine run-up site (per Base Operations/Fixed Base Operator) or the active runway. **(T-2) Note:** ATC clearance does not constitute a safe environment for an engine run-up.

6.31.2. Using the MDS flight manual danger areas figure, ensure the area behind the aircraft is clear before starting an engine run-up. **(T-2)** ***WARNING:*** Prop blast from engine run-ups/propulsion systems checks is hazardous to people, buildings, equipment, and other aircraft.

6.32. Deviations. The PM and CSO 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. CSO/WSOs will also use all resources available to back-up the pilot and report deviations. **(T-2)**

6.33. Flight Progress. Use all available navigational aids to maintain course centerline and positive fixing of the aircraft's position. **(T-2)**

6.34. In-flight Meals. The P and CP will not consume meals within 90 minutes of each other, before or during flight, if the meals were procured from the same vendor and consist of the same menu. **(T-2)**

Section 6G—Arrival

6.35. Crew Coordination. Before descent into unfamiliar areas, the pilots will review appropriate terrain charts to increase aircrew situational awareness of obstructions. Primary crewmembers will not be involved in duties other than aircraft operations, descent, and approach monitoring, and required checklist items from the initial descent point to landing. **(T-2)**

6.35.1. Flight Instrumentation Requirements.

6.35.1.1. Full flight instrumentation for a CAT I ILS and precision radar approach (PAR) includes a HUD or PFD at each station, and no shared Central Air Data Computer (CADC) or Inertial Navigation Unit (INU) attitude reference. **(T-2)**

6.35.1.2. Full flight instrumentation for a CAT II ILS includes an operational HUD in the PF position, a HUD, or PFD at the PM position and meeting the flight manual CAT II ILS criteria. **(T-2)**

6.35.1.3. Aircraft are limited to a DH/MDA based on a HAT of 300 feet and Runway Visual Range (RVR) 40 or 3/4 Statute Miles (SM) visibility (1,220 meters) with no RVR if full flight instrumentation is not operational. **(T-2)**

6.35.2. CAT II ILS Procedures. DH is based on radar altitude. Minimum HAT is 100 feet. Minimum RVR is 1,200. Maximum crosswind limitation is 10 knots. Crosswind of 15 knots may be used for training approaches (requires weather of 200 – ½ or greater). **(T-2)**

6.35.2.1. The following airfield and aircraft equipment must be operational (AFI 11-230, *Instrument Procedures*). **(T-2)**

6.35.2.1.1. Approach lights.

6.35.2.1.2. Runway centerline lighting.

6.35.2.1.3. High intensity runway lights or touchdown zone lights.

6.35.2.1.4. Approach end transmissometer.

6.35.2.1.5. ILS far field monitor.

6.35.2.1.6. Sequenced flashers.

6.35.2.2. Aircrews will not execute an IMC CAT II ILS to minimums unless both pilots are qualified and current in CAT II ILS. **(T-2)**

6.35.2.3. When performing CAT II ILS procedures on a CAT I ILS for training/evaluations, the DH is the HAT for the CAT I ILS. **(T-2) Note:** For Category II (CAT II) approaches, cross-check offside Radar Altimeter if not accomplished previously on approach (i.e., 1,000 AGL). **(T-2)**

6.35.2.4. Refer to AFMAN 11-202, Vol 3 regarding equipment failure and go-around criteria.

6.35.3. ILS Special Authorization (SA) CAT I Approach. CAT II qualified and current C-130J crews are authorized to fly SA Cat 1 Approaches to as low as 150 feet (50m) radar altimeter (RA) decision height (DH) and 1400 RVR (450m) at runways with reduced lighting (no touchdown zone or centerline lighting). Procedurally, the crew will fly a SA CAT I ILS approach the same as a CAT II ILS approach. **(T-1)** All CAT II limitations (crosswinds, autopilot status, required equipment, etc.) must be met. **(T-1)** If the crew receives a CAT II unsafe annunciation above 300 feet, they may elect to continue to the normal CAT I minimums to the same runway (no lower than 200 feet DH). If a CAT II unsafe annunciation is received below 300 feet, the crew will immediately commence a go-around, unless visual cues are sufficient to complete the approach to landing. (T-1) Use of the HUD to DH is mandatory. SA CAT II ILS approaches are not authorized.

6.35.4. Nondirectional Beacon (NDB) Procedures**.** The HUD alone is not sufficient for NDB approaches. A head-down display, which depicts a bearing pointer tuned to the NDB, must be used in conjunction with the HUD throughout the approach. NDB approaches may be flown during day, night, or IMC conditions after compliance with any airfield restrictions in GDSS2/ASRR. Pilots should consider backing up each approach with available navaids/GPS to include loading the NDB coordinates in the FMS. **(T-2)**

6.36. After Beginning an Enroute Descent. After starting an enroute descent and the weather is reported or observed to be below approach minimums comply with AFMAN 11-202, Vol 3. **Exception:** Do not continue a CAT II ILS if the weather is reported to be below CAT II minimums. **(T-2)**

6.36.1. The PM and CSO will monitor the approach and report any deviations from prescribed procedures. CSO/WSOs will also use all resources available to back-up the pilot and report deviations. **(T-2)**

Section 6H—Postflight

6.37. Aircraft Recovery Away from Main Operating Base. The PIC is responsible for ensuring the aircraft is turned to meet subsequent mission taskings, even when qualified maintenance specialists are unavailable. **(T-2)**

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

6.37.1.1. Parking and receiving.

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

6.37.1.3. Supervision of minor maintenance with local capability.

6.37.1.4. Minor configuration changes to meet mission tasking.

6.37.1.5. Securing the aircraft before entering crew rest.

6.37.1.6. Coordinating aircraft security requirements.

6.37.1.7. Documenting AFTO 781-series forms.

6.37.2. In all cases where aircrews must service the aircraft without qualified maintenance specialist assistance, comply with the appropriate maintenance TO **(T-2)**

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

6.38. Cockpit Voice Recorder (CVR). If involved in a mishap or incident, after landing and terminating the emergency, pull the CVR power circuit breaker (Electronic Circuit Breakers (ECB) #464). **(T-2)**

6.39. Clearwater Rinse Facility (Birdbath).

6.39.1. Crews should use a clearwater rinse facility (birdbath) after every flight in which the aircraft is flown over saltwater below 3,000 feet, including tactical approaches. Ensure

maintenance has approved bird bath prior to flight. Two or more takeoffs and/or landings, including touch-and-go landings, over saltwater requires a clearwater rinse after the last flight of the day per TO 1-1-691, *Cleaning and Corrosion Prevention and Control, Aerospace and Non-aerospace Equipment*. **Exception:** Aircraft equipped with Large Aircraft Infrared Countermeasures (LAIRCM) Small Laser Turret Assemblies (SLTA) will not utilize the bird bath with the turrets installed due to water intrusion problems. **(T-2)**

6.39.2. If a birdbath facility is unavailable make the following annotation in the AFTO Form 781A, "aircraft subjected to salt spray, birdbath unavailable." The following guidance will be used to maximize the effectiveness of the birdbath and to ensure safe operations. **(T-2)**

6.39.2.1. Ensure both sensors and the radar are off prior to entering the birdbath. **(T-2)**

6.39.2.2. The APU will remain off with door closed to prevent flameout and flooding of the APU compartment. **(T-2)**

6.39.2.3. Set flaps to 100%. Turn off and extend landing lights. **(T-2)**

6.39.2.4. Complete the "AFTER LANDING CHECKLIST" after rinse is completed, run engines at normal ground idle for a minimum of two minutes to aid in drying out engine nacelles. **(T-2)**

6.39.2.5. Review local procedures for birdbath operating guidelines. Each birdbath is unique in design and function and local procedures such as direction of entry, wing tip clearance criteria, and noise abatement concerns need to be reviewed prior to use. ***CAUTION:*** It is possible to experience overheat indications during or immediately following the birdbath due to water intrusion in overheat warning systems.

6.40. Support Agencies. The PIC or a designated representative will pass significant information to support agencies, such as weather, ATC, or base operations. The actual weather encountered should be compared to forecast weather, and this information provided to weather personnel to facilitate improved support. Debrief intelligence, when applicable. **(T-2)**

6.41. Crew Debriefing. The PIC will conduct a debriefing after each mission. **(T-2)** The debriefing will include all crewmembers so that common problems can be discussed and resolved. Crewmembers may be excused from the debrief at the discretion of the PIC.

6.42. Aircrew Notification Procedures. When transiting installations, the PIC will establish a point of contact with the CCC, base operations, or local airport manager. The PIC will be notified immediately in case of incident or emergency affecting the safety or security of the aircraft. **(T-2)**

6.43. Impoundment. If an aircraft is involved in a serious in-flight incident, the PIC should impound the aircraft immediately after landing and contact the controlling Command Center for further instructions.

6.43.1. Impoundment is the isolation or control of access to an aircraft or equipment item and applicable historical records so an intensified investigation can be completed.

6.43.2. If required, impound the aircraft IAW DAFI 21-101, **Chapter 9**. **(T-2)**

Section 6I—Miscellaneous Procedures

6.44. Customs, Immigration, and Agriculture Inspections.

6.44.1. Obtain Customs, Agriculture, and Public Health clearance, as required, prior to opening any doors, hatches, or windows, other than the crew entrance door, or enplaning and deplaning personnel. **(T-0)**

6.44.2. Proceed directly from the aircraft to Customs, Immigration, or Agricultural inspection for processing when required by the inspector.

6.44.3. US military aircraft are sovereign. When cleared to over-fly or land in foreign territory, it is US policy to assert that military aircraft are entitled to the privileges and immunities which customarily are accorded to warships. These privileges and immunities include, in the absence of stipulations to the contrary, exemption from duties and taxation; immunity from search, seizure, and inspections (including customs and safety inspections); or other exercise of jurisdiction by the host nation over the aircraft, personnel, equipment, or cargo onboard. USAF PICs will not authorize search, seizure, inspection, or similar exercises of jurisdiction enumerated above by foreign authorities except by direction of Headquarters (HQ) USAF or the American Embassy in the country concerned. **(T-0)**

6.44.3.1. The PIC will not permit the inspection of their aircraft by officials of any foreign government. If requested to do so, the PIC and crew will deny access and seek aid from the senior AFSOC or other USAF representative, US Embassy, or consulate within the host nation. Customs or other officials will be informed of the above policy and requested to confirm their request through their own government and with US Department of State representatives. If necessary, the aircraft will be sealed by the crew and the crew entered into crew rest and departure intentions will be canceled until resolution of the matter by appropriate authority. Inform command and control authorities by the fastest available means should this situation occur. When confronted with a search request by foreign authorities, aircrews should consider the following procedures: **(T-0)**

6.44.3.1.1. In most cases, search attempts may be stopped by a statement of the PIC to the foreign officials that the aircraft is sovereign and not subject to search without consent of HQ USAF or the chief of mission in the country concerned. This should be clearly conveyed in a polite manner so as not to offend foreign authorities who may honestly, but mistakenly, believe they have authority to search USAF aircraft.

6.44.3.1.2. If foreign authorities insist on conducting a search, the PIC must negotiate to delay the search until contact is made with the appropriate embassy. The PIC should unequivocally state that they have no authority to consent to the search and that they must relay the foreign request to these agencies for decision. The PIC should then notify these agencies of the foreign request by the most expeditious means available. Thereafter, PICs should follow instructions provided by the appropriate embassy and HQ USAF.

6.44.3.1.3. If foreign officials refuse to desist in their search request, the PIC should indicate that they would prefer to fly the aircraft elsewhere (provided fuel and mechanical considerations permit a safe departure) and request permission to do so.

6.44.3.1.4. If permission is refused and the foreign authorities insist on forcing their way onboard an aircraft, the PIC should state that they protest the course of action being pursued and that they intend to notify both the appropriate American Embassy and HQ USAF of the foreign action. The PIC should then allow the foreign agents onboard the aircraft, without physical resistance, and thereafter report the incident to HQ USAF and appropriate embassy as soon as possible.

6.44.3.1.5. In all instances, specific instructions may be briefed because of sensitive cargo or equipment. These instructions and applicable provisions of classified supplements to the foreign clearance guide should be followed where applicable.

6.45. Border Clearance.

6.45.1. Normal Operations:

6.45.1.1. Border Clearance Requirements. The requirements will be IAW the applicable Foreign Clearance Guide and DAFI 24-602V2,*Cargo Movement*. **(T-0)**

6.45.1.2. PIC Responsibility. Border clearance is the responsibility of the PIC, although many of the duties have been assigned to ground personnel and to the AG. The PIC will ensure:

6.45.1.2.1. Crewmembers and passengers possess current passports and valid visas if required. **(T-0)**

6.45.1.2.2. Crewmembers and passengers have current shot records or certificates of immunization. **(T-0)**

6.45.1.2.3. Cargo entry documents are in proper order. **(T-0)**

6.45.1.2.4. Departure or arrival to the US is through an air base where border clearance can be obtained. **(T-0)**

6.45.1.2.5. Border clearance for aircraft cargo, passengers, crew, and baggage, if required, is obtained before takeoff to a foreign area, or after arrival from a foreign area. **(T-0)**

6.45.1.2.6. Enroute to the US, the AG has distributed personal customs declarations to all passengers and crewmembers; has briefed passengers and crewmembers on customs regulations IAW **Chapter 13** of this publication; and has prepared and compiled CBP 7507, *General Declaration (Outward/Inward),* for the PIC's signature. **(T-0)**

6.45.1.2.7. Enroute to the US, the base of intended landing is notified of any change in estimated time of arrival (ETA), to ensure border clearance is accomplished as soon as possible after landing. **(T-0)**

6.45.1.2.8. A Permit to Proceed is obtained when the mission requires an aircraft, which has landed in the US for customs clearance to proceed to another US base to obtain border clearance. The permit delays customs inspection of cargo, passengers, and crew until arrival at the offload station, saving intermediate offloading and reloading normally required for customs inspection. The Permit to Proceed is valid only to the airport of next landing, where the border clearance must be completed, or a new permit obtained. Do not make intermediate stops unless required by an emergency situation or directed by AFSOC. **(T-0)**

6.45.1.2.9. When an aircraft lands for a US border clearance, a US Customs representative (if available) will meet the aircraft to obtain the required documents. Do not deplane passengers or crewmembers, except a scanner, unless necessary for safety. Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the US and all subsequent landings until crew, passengers, and cargo complete final border clearance. **(T-0)**

6.45.2. Exercise and Contingency Operations:

6.45.2.1. General. Certain missions, which do not transit normal ports of entry or exit, require special procedures to expedite compliance with customs, public health, immigration, and agricultural requirements. A joint memorandum of understanding establishes procedures and waivers.

6.45.2.2. Implementation. Traffic and border clearing agencies implement all or part of the agreement as necessary for each operation. Inspection and clearance may be accomplished at the CONUS onload or offload base instead of the normal air-point of entry, or at the foreign onload or offload base.

6.45.2.3. Customs Procedures.

6.45.2.3.1. Outbound. No requirement. Filing of CBP 7507 is waived.

6.45.2.3.2. Inbound. Prepare one copy of the following documents before arrival. **(T- 0)**

6.45.2.3.2.1. CBP 7507 (non-aircrew member list not required).

6.45.2.3.2.2. Cargo manifest.

6.45.2.3.2.2.1. One copy of US Customs Baggage Declaration Form for each passenger not under command of the troop commander, to include observers, support personnel, civilians, news reporters, and crewmembers.

6.45.2.3.2.2.2. Upon arrival at a CONUS offload base, a Customs representative (if available) meets the aircraft and accepts the troop commander's certificate with respect to troop baggage. Individual baggage declarations are not required. The troop commander should have inspected troop baggage. Troops debark under the observation of the Customs representative with only a spot check of articles and baggage. The Customs officer may elect to make a more extensive inspection.

6.45.2.3.2.3. For troops who are out of the country 140 days or more:

6.45.2.3.2.3.1. One copy of the US Customs Baggage Declaration Form for each passenger. This includes observers, support personnel, civilians, news media personnel, and crewmembers. Personnel may use DD Form 1854 or CF 6059B, *Customs Declaration*, when issued by the US Customs representative.

6.45.2.3.2.3.2. Upon arrival at a CONUS offload base, a Customs representative (if available) meets the aircraft and collects all declarations. Troops debark under the observation of the Customs representative who may make a discretionary examination of baggage.

6.45.2.4. Public Health Procedures:

6.45.2.4.1. The PIC ensures that all crewmembers and passengers are properly immunized. **(T-0)**

6.45.2.4.2. Spray the aircraft, if required by section 6.46. **(T-0)**

6.45.2.5. Immigration Procedures:

6.45.2.5.1. Outbound: No requirements.

6.45.2.5.2. Inbound: Submit one copy of CBP 7507 to the host-nation Immigration/Customs inspector. Refer to the Foreign Clearance Guide for any other required documents. **(T-0)**

6.46. Insect and Pest Control (Aircraft Spraying).

6.46.1. The PIC will ensure required spraying is accomplished when required by the Foreign Clearance Guide and certify the spraying on CBP 7507, or on forms provided by the country transited. **(T-0)**

6.46.2. Use insecticide, Aerosol D-Phenotrin-2%, National Stock Number (NSN) 6840-01-067-6674 (or equivalent), to spray the aircraft. Aircraft should never be sprayed with passengers onboard. The only exception is when mandated by the FCG. **(T-0)**

6.46.2.1. Aerosol normally is dispersed at a flow rate of 10 seconds per 1,000 cubic ft. Direct the nozzle toward the ceiling of the compartment or space being sprayed. Do not spray any plastic surface or allow the spray to wet it. **(T-0)**

6.46.2.2. Spray spaces inaccessible from within the aircraft after completely loading fuel, baggage, cargo, and passengers, including baggage compartments, wheel wells, and other similar spaces. **(T-0)** ***CAUTION:*** If the insecticide label directs disembarkation after use, spray prior to boarding crew or passengers. Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone onboard. **(T-0)**

6.46.2.3. Spray for 50 seconds unless longer periods are specified for the country being transited. **(T-0)**

6.46.2.4. When the crew discovers insect or rodent infestation of the aircraft while in-flight, notify the destination C3, base operations, or airport manager of the situation before landing so the proper authorities can meet the aircraft. **(T-0)**

6.46.2.5. Upon arrival, do not open cargo doors or hatches except to enplane officials required to inspect the aircraft for insect or rodent infestation. Do not onload or offload until the inspection is satisfactorily completed. **(T-0)** This procedure may be altered to satisfy mission or local requirements, as arranged by the base air terminal manager.

6.47. "Due Regard" Procedures. When a unit commander authorizes a mission to be flown in international airspace over the high seas and in-flight operational requirements conflict with ICAO rules and procedures, the PIC may make the decision to proceed using "due regard" procedures, IAW FLIP General Planning and AFMAN 11-202, Vol 3.

6.48. Hazardous Material Procedures. The term "hazardous material" as used in conjunction with airlift operations applies to the following classes and types of materials covered by Air Force Joint Instruction (AFJI) 11-204, *Operational Procedures for Aircraft Carrying Hazardous*

Materials, and includes any material which, because of its quantity, properties, or packaging, may endanger human life or property. Procedures in this paragraph apply whenever aircraft carry DoD Hazard Class/Division 1.1, 1.2, or 1.3 explosives, Department of Transportation (DOT) Class A and B poisons, etiological or biological research materials, radioactive materials requiring yellow III labels, and inert devices. Also included are DoD Hazard Class/Division 1.4 explosives, oxidizers, compressed gases, flammable solids and liquids, and corrosive liquids listed in AFMAN 24-604, *Preparing Hazardous Materials for Military Air Shipments*.

6.48.1. Briefing. Reference AFMAN 24-604. **(T-1)**

6.48.2. Cargo Documentation. Do not accept hazardous materials unless proper documentation, certification, and identification of cargo are provided. This includes transportation control number entered correctly on both the cargo manifest and the Shipper's Declaration for Dangerous Goods. **(T-1)**

6.48.2.1. Shipper's Declaration for Dangerous Goods prepared by the shipper utilizing guidance from AFMAN 24-604, , and AF Form 127, *Traffic Transfer Receipt*, will accompany the manifest, if required. **(T-1)**

6.48.3. Flight Planning. The PIC (unless specifically briefed otherwise):

6.48.3.1. Enters "Hazardous Cargo" and the mission number in the appropriate section of the flight plan. Use remarks section of DD Form 175, *Military Flight Plan*, and other information section of DD Form 1801, *DoD International Flight Plan*. **(T-1)**

6.48.3.2. Plans the flight to minimize over flying heavily populated or otherwise critical areas. **(T-1)**

6.48.3.3. Prepares a departure message. **(T-1)** The remarks section of the departure message should include the following:

6.48.3.3.1. DoT class and DoD hazard class or division, if applicable, of hazardous material onboard (include net weight of DoT Class A or B poisons and net explosive weight (NEW) of Class A or B explosives).

6.48.3.3.2. Request for special support; examples include isolated parking, security, and technical escort teams

6.48.3.3.3. Inert devices (when applicable).

6.48.3.4. If Estimated Time Enroute (ETE) is less than 1 hour, or if other circumstances preclude timely receipt at destination, notify base operations at the first intended landing by priority telephone of the ETA, PSN, hazard class, UN, NA, or ID number, NEW for Class 1 (explosives) and net quantity of chemical ammunition and toxic substances. **(T-1)**

6.48.4. Before Engine Start. Ensure placards are removed. Give the controlling agency parking location, approximate engine start time, and verify that the fire-fighting agency has the hazardous materials information. If not, request the following be relayed to the fire-fighting agency: **(T-1)**

6.48.4.1. DoT class of hazardous material onboard and the DoD hazard class or division for explosive material onboard.

6.48.4.2. Net Explosive Weight.

6.48.4.3. Request for isolated taxiing (if necessary).

6.48.4.4. Estimated Time of Departure (ETD).

6.48.5. Enroute. Normal procedures apply. Avoid flying over metropolitan or otherwise critical areas. **(T-1)**

6.48.6. Before Landing. Accomplish the following unless specifically prohibited by the theater commander or FLIP planning. **(T-1)**

6.48.6.1. Contact the base operations dispatcher, control tower, approach control, or other agency specified in FLIP at least 30 minutes (or as soon as practical) before ETA to announce that hazardous materials are onboard and to verify that the appropriate base support agencies have received the departure message. If not, transmit the mission number, ETA, and information listed in **Paragraph 6.48.3.4**.

6.48.6.2. If landing at a CONUS civil airport without a tower, give the above information to the nearest Federal Aviation Administration (FAA) flight service station.

6.48.6.3. Request the information be relayed immediately to base operations or the civil airport manager, crash or fire protection agency, and other support activities.

6.48.7. Parking:

6.48.7.1. DoD requires aircraft carrying DoD Hazard Class or Division 1.1, 1.2, explosives, DoT Class A poisons, and certain biological agents and munitions be parked in areas isolated from personnel. The PIC is responsible for ensuring cargo is correctly identified to the tower and ground control. When aircraft are not directed to an isolated area, identify the cargo again to tower or ground control. When identification is acknowledged, the host is solely responsible for selecting the parking area. Should host procedures be questionable, submit trip reports or hazard reports, as appropriate, to document such occurrences. **(T-1)**

6.48.7.2. The military host is responsible for placarding aircraft. For non-military installations, the briefing to the PIC will include placarding requirements and, if required, placards will be furnished at the onload base. The shipper must make prior arrangements with the airport manager for shipments of hazardous materials requiring placarding. The shipper is responsible for cargo identification, fire-fighting procedures, and isolated parking requirements. **(T-1)**

6.48.8. Unscheduled Landing Due to In-flight Emergency. Transmit unclassified information to the appropriate air traffic control facility as follows: **(T-1)**

6.48.8.1. Nature of emergency and intent to land.

6.48.8.2. Aircraft position and ETA.

6.48.8.3. Number of personnel and location in aircraft.

6.48.8.4. Fuel onboard.

6.48.8.5. That hazardous materials are onboard, location of the cargo, and applicable information listed in **paragraph 6.48.3.4**.

6.48.9. After Unscheduled Landing. Contact the AFSOC Operations Center or appropriate C2 agency concerned by telephone, HF radio, or message, giving arrival notice, hazardous materials' information, and other pertinent information as required. **(T-2)**

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance for aircraft security on ground and in-flight. AFSOC AC-130J aircraft are Protection Level "C" resources. This security priority designation applies to operational aircraft, wherever they are located, worldwide. Some aircraft contain equipment and documents that require protection per DoD 5200.1-R, *Information Security Program*.

7.2. Procedures. The PIC is ultimately responsible for the security of their aircraft when located away from US military installations. Air Force Joint Instruction (AFJI) 31-102, *Physical Security*, covers security arrangements when US Air Force aircraft are located on other DoD installations. Arrangements must be made to protect the aircraft during crew rest status at non-US protected locations. If US military security forces are not available, the US embassy assigned to that country must be consulted to ensure security arrangements are made. For missions involving a planning agency, the agency must coordinate with the PIC to ensure the planned security measures conform to mission requirements. The amount of security required will vary, depending on location and ground time. **(T-2)**

7.2.1. For non-permissive or uncertain environments, airfield and LZ security is the responsibility of the agency requesting the airlift. Crews will work with the agency requesting the airlift to ensure security meets the requirement for the mission. **(T-2)**

7.2.2. For permissive environments, PIC will receive a threat assessment and force protection capability evaluation briefing at home station prior to departure and receive updates enroute, if required. When landing at DoD component installation, the installation commander is responsible to provide adequate security for the aircraft. The PIC will determine if security is adequate. Planning agencies and PIC will use **Table 7.1** to help assess the risk to parked aircraft for planned overnight stops located at non-US military installation overseas and civilian airfields. **(T-2) Note:** Aircrews do possess the training to provide the appropriate security when present at the aircraft. For unscheduled or emergency landings at non-USAF installations, PIC will assess the aircraft security situation and take the following actions, if force protection capability appears insufficient: **(T-2)**

7.2.2.1. Aircrew surveillance. If the aircraft is not remaining overnight, aircrews are capable of maintaining appropriate aircraft security. The PIC will direct armed crewmembers to remain with the aircraft and maintain surveillance of aircraft entrances and activities in the aircraft vicinity. **(T-2)**

7.2.2.2. Area Patrol. Request area patrol coverage from local security forces to include back-up response forces. If local authorities request payment for this service, use Standard Form 44, *Purchase Order – Invoice Voucher*. **(T-2)**

7.2.2.3. Departure without Crew Rest. If local security forces are unacceptable or unavailable, the PIC may waive Flight Duty Period restrictions and depart as soon as possible for destination with adequate force protection. If unable to depart the location due to system malfunction, the aircrew must secure the aircraft to the best of their ability. In no case, will the entire crew leave the aircraft unattended. Crew rest requirements will be subordinate to aircraft security when the airframe may be at risk. The PIC should rotate a

security detail among the crew to provide for both aircraft protection and crew rest until relief is available. PIC will coordinate through home station channels to acquire additional security. **(T-2)**

7.2.3. Tailored Security Measures. Standard physical security measures may be impractical at times due to mission, terrain, climate, sociopolitical sensitivities, or other factors. For example, some countries don't allow armed security personnel. On other deployments, the mission may rely on maintaining a low profile and attracting as little attention as possible. At such locations, tailor security measures to meet unique requirements when necessary. As a minimum lock aircraft entry points and hatches. If it is not possible to lock aircraft, secure aircraft entry points and hatches in a manner to indicate unauthorized entry, i.e., taping hatch release handles or using seals. The PIC is the final authority for determining tailored security measures. Contact with US embassy personnel is required at locations where security agreements are not in existence. **(T-2)**

7.2.4. Ground security teams. Ground security teams may be considered to guard the aircraft for planned overnight stops. Teams may travel in MEP status and are responsible to the PIC at all times. The PIC will ensure security team members receive a mission briefing, aircraft egress, and passenger briefings, as appropriate. **(T-2)** The squadron commander is the final approval authority for the need of ground security teams for their aircraft and authority may be delegated no lower than the PIC. **(T-3)**

7.2.4.1. Ground security teams will comply with AFMAN 24-604 at all times when carrying weapons, ammo, and equipment onboard the aircraft. **(T-2)**

7.2.4.2. Due to the sensitivity of weapons in foreign countries, ground security teams will keep their weapons inside the aircraft and out of sight of foreign nationals, even if the FCG allows them to be carried outside the aircraft. If a destination requires weapons be carried outside the aircraft, the controlling MAJCOM must approve such action prior to deployment. **(T-2)**

7.2.5. Unauthorized entry. If, in the PIC's judgment, the aircraft needs to be locked and sealed as a measure to detect unauthorized entry:

7.2.5.1. Use the aircraft lock. **(T-2) Note:** The aircraft should be locked during all off-station missions remaining overnight.

7.2.5.2. If the aircraft lock is unavailable comply with **paragraph 7.3.2**. Close and seal the main crew entrance door or left troop door using a metal boxcar seal or other controllable device to identify forced entry. Wipe the immediate area around the seal clean to help investigate forced entry. If the seals are damaged or have been tampered with, notify the appropriate local authorities, the controlling agency, and inspect the aircraft thoroughly. **(T-2)**

7.2.5.3. Coordinate with the local base operations representative on procedures for servicing the aircraft while the crew is away. If a padlock is used, the key or combination will be left with base operations or the representative for servicing and maintenance personnel. **(T-2) Note:** At a temporary duty (TDY) location with munitions onboard, a crewmember or maintenance personnel will be at the aircraft at all times or the aircraft will be locked. If the aircraft is left unattended, the PIC will ensure the appropriate protection is provided by flightline security forces. **(T-2)**

7.2.6. Security awareness is crucial to effective mission accomplishment. Aircrews must always remain vigilant to their surroundings, especially at high threat, low security locations. During preflight activities, aircrews will inspect accessible areas, to include aircraft wheel-wells, air- conditioning compartments, and cargo compartment for unauthorized packages, personnel, or other unfamiliar devices. Report any suspicious items to host security forces. Aircrews will maintain a heightened security posture throughout all pre-takeoff activities. **(T- 2)**

7.3. Aircraft Security Risk Assessment Matrix. Planning agencies and the PIC will use **Table 7.1** to help assess the risk to parked aircraft in a permissive environment. This matrix will be used for planned overnight stops at non-US military installations overseas and civilian airfields. A cumulative score of less than 55 implies that normal unmanned aircraft security measures are adequate. A score of 55 to 90 implies moderate security risk. **(T-2)** Commander may consider additional security measures. If the cumulative score is greater than 90, commanders should consider deploying or contracting security personnel. The squadron commander or mission commander is the final approval authority for aircraft security issues. Authority may be delegated no lower than the PIC. **(T-3) Exception:** During unscheduled or emergency landings the PIC is the final approval authority for aircraft security. The PIC should contact the US Embassy or United States Defense Attaché Office for security assistance. **Note:** Normally, additional security for the aircraft is not required at military installation within a NATO country or US civilian airfields approved by the FAA/Traffic Advisory System.

Table 7.1. Aircraft Force Protection Risk Assessment Matrix.

Factors	0 Points	5 Points	10 Points	15 Points
The local terrorist threat is currently: (1)	Negligible	Low	Medium (3)	High (3)
The local mob violence threat is currently: (1)	Negligible	Low	Medium (3)	High (3)
Installation/airport security services are:	Provided by host military forces only	Provided by host military and contract security forces	Contract security forces only	Not available (3)
Host security forces control entry:	The flight line and installation/airport	To the flight line only	To the installation/ airport only	To neither the flight line nor the installation/ airport (3)
There is perimeter fencing or barriers around:	The flight line and installation/ airport	The flight line only	The installation/ airport only	Neither the flight line or the installation/ airport (3)
Host security forces will provide to guard the aircraft	An armed sentry	An unarmed sentry	Random security patrol coverage only	No sentry or Random patrol coverage (3)

Host security forces will security incidents involving the aircraft	Provide armed response to	Provide unarmed response to	Notify civilian authorities of	Notify the PIC of (3)
The aircraft will be parked:		Separate from host military and civilian aircraft	Among other host military aircraft only	Among civilian aircraft
The aircraft will illuminated during the hours of darkness (2)		Be adequately	Be marginally	Not be (3)
Total Points: 1. 1. Derive the local threat from valid intelligence sources only. 2. 2. "Adequate lighting" is equal to the illumination provided by one standard USAF light cart. 3. 3. If a security response team and security patrol is not present, commanders should consider employing or contracting security personnel.				

7.4. Protective Standards for Aircraft Carrying Distinguished Visitors. This paragraph applies specifically to aircraft transporting Distinguished Visitor (DV) Code 4 or above (reference FLIP General Planning 4-3 for DV codes). PICs are responsible for aircraft security at enroute stops. **(T-2)**

7.4.1. DoD Installations. Notify the base security forces 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. **(T-2)**

7.4.2. Non-DoD Installations. Contact the airport manager or installation commander to arrange for force protection. If available security is inadequate, purchase additional security using Standard Form 44. **(T-2)**

7.5. Arming of Crewmembers. Crewmembers will be armed IAW with AFI 31-117, *Arming and Use of Force by Air Force Personnel*. When directed, at least one crewmember each from the flight deck and cargo compartment will carry weapons. **(T-2)**

7.5.1. Issue. Before departing home station, authorized crewmembers will obtain weapons, ammunition, lock, and key. 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 enroute, transfer the weapon to another authorized crewmember, using AF Form 1297, *Temporary Issue Receipt*. **(T-2)**

7.5.2. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels/facilities if available. To transfer a loaded weapon to another crewmember, place the weapon on a flat surface. Do not use a hand-to-hand transfer. **(T-2)**

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 or passenger terminals, flight line cafeterias, and snack bars. **(T-2)**

7.5.4. Weapons Storage. Crewmembers will be armed before beginning preflight or onload duties. When no passengers are onboard and after a satisfactory stowaway check, weapons may be stored in the gun box in-flight. If no gun box is available retain weapon for the duration of the flight. Crewmembers will rearm before landing. Weapons need not be unloaded before being placed in the gun box. **(T-2)**

7.5.5. Crew Rest. During crew rest, store weapons in the most secure facility available, normally the base armory. If a weapons storage facility is unavailable or the country prohibits or restricts the entry of weapons, secure firearms, and ammunition in the gun box. **(T-2)**

7.5.5.1. Aircraft without a Gun Box. If an aircraft without a gun box must remain overnight at a location where a government-owned storage facility is unavailable, use the nearest acceptable facility. Acceptable storage facilities are US or Allied military services armories, US National Guard and Reserve armories, and US civil law enforcement armories. If none of these are available, or the PIC believes weapons security may be compromised, crewmembers may secure their weapons in their quarters, one crewmember will remain with the weapons at all times. In this case, turn the ammunition over to the PIC. **(T-2)**

7.6. General Anti-Hijacking Guidance. Aircrews must make every reasonable effort to resist an aircraft hijacking attempt, resistance may vary from dissuasion to direct physical confrontation, including the use of deadly force. Due to the sensitive nature of anti-hijacking procedures, crewmembers should reference AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking)(FOUO),* and the FIH for specific guidance. Aircrews will not release any information concerning those procedures or hijacking attempts. Anti-hijacking is a crew duty performed exclusively by aircrew personnel. The hijacking of an 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 onboard 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. Detection of potential hijackers before they board the aircraft is the best solution to the problem. **(T-2)**

7.6.1. Anti-hijacking inspections of space-required passengers may be conducted at the aircraft by the aircrew. Passengers (including MEPs) will not carry weapons and/or ammunition on their person or in hand-carried baggage onboard an aircraft. **(T-2) Exception:** Special agents/guards of the Secret Service or State Department, and other individuals specifically authorized to carry weapons with coordination of the PIC. In all cases the crew will be aware of location of weapons and ammunition. **(T-2)**

7.6.1.1. If individuals must clear their weapons before boarding the aircraft, and access to clearing barrel/facilities is limited, as a minimum, direct them to:

7.6.1.1.1. Move to a safe, clear area at least 50 ft from any aircraft, equipment, or personnel before un-holstering/un-slinging their weapons.

7.6.1.1.2. Clear their weapons IAW standard safety procedures.

7.6.1.2. Deadhead crewmembers will not retain custody of ammunition on an aircraft but will turn it into the troop commander or PIC. **(T-2) Exception:** During combat operations, personnel may carry unloaded weapons and ammunition onboard the aircraft. When the tactical situation dictates, personnel who might engage an enemy force immediately upon deplaning at the objective may carry loaded weapons aboard the aircraft at the discretion of the troop commander/team leader, and with the PIC's concurrence. Weapons will not be breached until clear of the aircraft. **(T-2)**

7.7. Specific Anti-Hijacking Guidance. It is imperative that all crewmembers are familiar with the ground and in-flight resistance actions, covert communications, and forced penetration of unfriendly airspace procedures in AFI 13-207,and the FIH. In the event of a hijacking, crewmembers must act immediately and resourcefully, without instruction, in order to counter the attacker successfully. **(T-2)**

Chapter 8

OPERATIONAL REPORTS AND FORMS

8.1. General. This chapter contains a description of applicable reports and forms. For assistance in completing safety forms contact the wing/group, unit, or local flight safety officer.

8.2. AF Form 457, *USAF Hazard Report.* Refer to AFI 91-202, *The USAF Mishap Prevention Program*. The USAF hazard reporting system provides a means for Air Force personnel to alert supervisors and commanders to hazardous conditions requiring prompt corrective action. A hazard is any condition, act, or circumstance that jeopardizes or may jeopardize the health and wellbeing of personnel, or which may result in loss, damage, or destruction of any weapons system, equipment, facility, or material resource.

8.3. AF Form 651, *Hazardous Air Traffic Report.* Refer to AFI 91-202, Attachment 3, Hazardous Air Traffic Report (HATR) Program.

8.3.1. The Air Force HATR program provides a means for personnel to report all near midair collisions and alleged hazardous air traffic conditions. Use information in HATRs only for mishap prevention. AFI 91-202 lists reportable incidents.

8.3.2. Procedures:

8.3.2.1. Make an airborne report of the hazardous condition to the nearest ATC agency (e.g., center, flight service station, control tower, or aeronautical radio station), and give the following information as appropriate: **(T-2)**

8.3.2.1.1. Identification or call sign.

8.3.2.1.2. Time and place (examples include radial/distance measuring equipment, and position relative to the airfield.).

8.3.2.1.3. Altitude or flight level.

8.3.2.1.4. Description of the other aircraft or vehicle.

8.3.2.1.5. Include a verbal statement as soon as possible after occurrence that a written HATR will be filed upon landing. **Note:** ATC agencies such as the FAA must know if an official report is being filed.

8.3.2.2. File the HATR as soon as possible (within 24 hours) using any available means of communication. Normally, it should be filed at the base operations office at the landing airport. If this is impractical and if communications permit, notify the safety office of the Air Force base where the condition occurred, the safety office at the home station, or as prescribed by the overseas MAJCOM. In any case, provide the safety office with all available information needed to prepare AF Form 651. Turn in the completed AF Form 651 to the wing/group safety office. **(T-2) Note:** HATRs are not privileged information and may be released outside the USAF.

8.3.3. Individuals submitting a HATR are granted immunity from disciplinary action provided:

8.3.3.1. Their violation was not deliberate.

8.3.3.2. They committed no criminal offense.

8.3.3.3. No mishap occurred.

8.3.3.4. They properly reported the incident using the above procedures.

8.4. AF Form 711B, *USAF Aircraft Mishap Report Worksheet.* Refer to DAFI 91-204.

8.4.1. Responsibilities. The PIC will notify the appropriate authorities of any mishap involving aircraft or crew. When notified, AFSOC units will initiate investigative and reporting actions using guidance in accordance with DAFI 91-204. **(T-2) Note:** Do not attempt to classify a mishap.

8.4.2. Reportable Mishaps:

8.4.2.1. Report damage to the aircraft, or injury to the crew or passengers; as well as any damage or injury to another organization's equipment or personnel resulting from the movements or actions of an aircraft or crew. **(T-2)**

8.4.2.2. Report the following occurrences: **(T-2)**

8.4.2.2.1. A physiological episode. A physiological reaction, near accident, or in-flight hazard due to medical or physiological reasons. **Note:** In the event of a physiological episode, all crewmembers and passengers involved will report to a flight surgeon as soon as practical and request that a Class E physiological episode be reported in Air Force Safety Automated System (AFSAS). Physiological episodes include the following:

8.4.2.2.1.1. Proven or suspected case of hypoxia.

8.4.2.2.1.2. Carbon monoxide poisoning or other toxic exposure.

8.4.2.2.1.3. Decompression sickness due to evolved gas (bends, chokes, neurocirculatory collapse), or severe reaction to trapped gas resulting in incapacitation.

8.4.2.2.1.4. Hyperventilation.

8.4.2.2.1.5. Spatial disorientation or distraction resulting in an unusual attitude.

8.4.2.2.1.6. Loss of consciousness from any cause.

8.4.2.2.1.7. Death by natural causes of any crewmember in-flight.

8.4.2.2.1.8. Unintentional loss of pressurization if cabin altitude is above FL180, regardless of effects on personnel.

8.4.2.2.1.9. Alcohol intoxication and hangover (crew only).

8.4.2.2.1.10. Illness (both acute and pre-existing), including food poisoning, dehydration, myocardial infarction, seizure, and so forth.

8.4.2.2.1.11. Exposure to toxic, noxious, or irritating materials such as smoke, fumes, or liquids.

8.4.2.2.2. In-flight flameout, engine failure, required engine shutdown, suspected engine power loss, or loss of thrust sufficient to preclude maintaining level flight above minimum enroute altitude (MEA). **Note:** Intentional shutdowns for training and FCF are excluded; however, report failure to restart, using the criteria above.

8.4.2.2.3. Un-commanded propeller reversal.

8.4.2.2.4. Flight control malfunction resulting in an unexpected or hazardous change of flight attitude, altitude, or heading.

8.4.2.2.5. Malfunction of landing gear when difficulty is experienced using emergency system or procedures.

8.4.2.2.6. In-flight loss of all pitot-static instrument indications or all gyro stabilized attitude or directional indications.

8.4.2.2.7. Spillage or leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores or cargo.

8.4.2.2.8. All cases of departure from intended takeoff or landing surface onto adjacent surfaces.

8.4.2.2.9. Any incident that does not meet established criteria for a reportable mishap but, in the judgment of the PIC, must be emphasized in the interest of flight safety.

8.5. Reports of Violations/Unusual Events or Circumstances. Violations identified in AFMAN 11- 202, Vol 3, and navigation errors (including overwater position errors exceeding 24 nm, border, and ATC violations) will be reported. **(T-2)**

8.5.1. Include the following: factual circumstances, investigation and analysis, findings and conclusions, recommendations, and actions taken. **(T-2)**

8.5.1.1. Attachments should include the following: notification of incident, crew orders, statements of crewmembers (if applicable), and documenting evidence (examples include logs and charts).

8.5.2. In addition to the information listed, the historical flight plan will be downloaded onto a floppy disk and turned into the C2 center or owning standardization and evaluation office. **(T-2)**

8.5.3. Send the original investigation report within 45 days to AFSOC Inspector General (AFSOC/IG). AFRC units receiving alleged violations will send the original investigation through channels to arrive at AFRC/IGI within 35 days. AFRC Inspector General Inspections (AFRC/IGI) will send the investigation report to AFSOC/IG within 45 days. **(T-2)**

8.5.4. The following Operations Report (OPREP)-3, Event or Incident Report, reporting procedures for all aircraft notified of navigational errors exceeding 24 nm will be reported under AFI 10-206, *Operational Reporting*. **(T-2)**

8.5.4.1. On notification of a navigational position error, the PIC (or agency receiving notification) documents the circumstances surrounding the incident (report content below) and ensures submission of an OPREP-3 report through C2 channels. **(T-2)**

8.5.4.2. Include the following: **(T-2)**

8.5.4.2.1. Name and location of unit submitting report, mission identification number, reference to related OPREPs-3, type of event (e.g., state "navigation position error"), date, time (Zulu), and location (e.g., air route traffic control center area).

8.5.4.2.2. Description of facts and circumstances. Include aircraft type and tail number, unit (wing/group or squadron assignment of crew), home base, route of flight, point of alleged deviation, and miles off course.

8.5.5. PICs must keep the appropriate agencies apprised of any unusual events or circumstances impacting their missions. Examples of reportable events include meaconing, intrusion, jamming, interference, fuel dumping, loss of multiple engines, hostile fire, injury to passengers or crewmembers. This list is not exhaustive. Some events may require the C2 agency to forward OPREP reports to higher headquarters. The old adage, "when in doubt, report it," applies. **(T-2)**

8.6. Petroleum, Oil, and Lubricants (POL) - Aviation Fuels Documentation. This section prescribes Aviation Petroleum, Oil, and Lubricants (AVPOL) procedures that ensure correct documentation, form and invoice processing, and program supervision. Reference DoDM 4140.25-M, *DoD Management of Bulk Petroleum*, *Natural Gas, and Coal*. Use the Multi-service Corporation (MSC) air card for the purchase of aviation fuel and ancillary ground services at commercial airports (and some military installations) worldwide. The air card is authorized for use by all US government aircraft, state, and local law enforcement aircraft, and some foreign government aircraft. All PICs should plan to use the platinum MSC card. In most cases, there will be no changes when refueling at non-Defense Energy Support Center (DESC) contract locations. The MSC card is accepted at approximately 4,800 locations worldwide. A list of all MSC-accepting merchants can be found at **https://www.airseacard.com.It** replaces the Standard Form (SF) 44, at locations that accept the MSC card. **(T-2)**

8.6.1. Responsibilities. Aircrew and maintenance personnel will be familiar with AVPOL procedures and documentation requirements of this chapter. Improper use of the MSC card could create financial liability for the purchaser. **(T-2)**

8.6.2. Refuel/defuel USAF aircraft at DoD locations whenever possible. If DoD service is not available, purchase fuel from other source(s) in the following priority: (**T-2)**

8.6.2.1. Defense Fuel Supply Center (DFSC) or Canadian into-plane contracts. **Note:** DoD FLIP enroute supplements identify locations with into-plane contracts.

8.6.2.2. Foreign government air forces.

8.6.3. AVPOL Forms Documentation and Procedures.

8.6.3.1. The DD Form 1898, *Fuel Sale Slip*, is the fuel transaction receipt used for purchases at other DoD locations, including DFSC into-plane contract locations. Log and place the DD Form 1898 inside the AF Form 664. The PIC or designated representative must complete this form. **(T-2) Note:** If the contractor insists on a unique invoice along with the DD Form 1898, annotate the vendor‘s invoice with “DUPLICATE DD Form 1898 ACCOMPLISHED”.

8.6.3.2. The AF Form 664, *Aircraft Fuels Documenting Log*, is a tool to log and store all AVPOL transaction forms. Record all off-station transactions on the front of the form and insert the original form inside the envelope. Turn in the AF Form 664, with supporting forms, to maintenance debriefing or as directed by local procedures. The PIC or designated representative must complete this form when appropriate. **(T-2)**

8.6.3.2.1. AF Form 664 Documentation Instructions: **Figure 8.1** is a block-by-block instruction for completing AF Form 664. The primary responsibility for proper form completion lies with the aircraft commander. This form will be filled out by the aircrew and maintenance for all off station refueling and air refueling. Aircrews should attempt to familiarize maintenance and FCCs with these instructions. All entries will be legible.

Figure 8.1. Example AF Form 664.

BLOCK:

MISSION DATES: Enter inclusive mission dates.

AIRCRAFT ORGANIZATION AND HOME STATION: Enter aircraft's wing and base of assignment.

AIRCRAFT PROCESSING COMMAND: Enter appropriate command (AFSOC)

AIRCRAFT MDS: Self-Explanatory

AIRCRAFT SERIAL NUMBER: Enter six-digit serial number

REFUELING DATE: Enter local date fuel or services were purchased

AIRFIELD NAME: Enter ICAO identifiers for airfield name. For air to air refueling missions, enter six-digit tanker serial number. Training flights where EMCON 3 or 4 procedures are being used, still obtain the tankers serial number. If operational requirements prohibit obtaining the - flight, obtain it before takeoff.

AIRFIELD ADDRESS: Enter airfield name and city, state, or country. For air to air refueling missions, enter tanker MDS, unit, and base of assignment.

TYPE OF FUEL: Enter type of fuel purchased. (examples include JetA-1 and JP-8).

QUANTITY OF FUEL: Enter quantity of fuel purchased. Do not alter quantity listed on receipt/ticket.

UNIT OF MEASURE: Enter unit of measure for fuel purchased. For purchases in foreign countries, be sure to enter the correct unit of measure. (examples include Liter, Pounds, and Dekaliters)

TYPE OF DOCUMENT: Enter the type of fuel receipt (examples include AF 1994, DD1898, AirCard, Vendor Receipt, and Cash). For air to air refueling, a

INVOICE NUMBER OF DOCUMENT: Enter document number. For air to air refueling leave blank.

8.6.3.3. The SF 44, may be used to purchase fuel, ground services, and/or other authorized products when no MSC card contract is in place.

8.6.3.3.1. SF 44 fuel purchases where Fixed Base Operator (FBO) agrees to invoice DESC for payment.

8.6.3.3.1.1. The aircrew must present the SF 44 as the purchase invoice when an FBO refuses to accept the MSC card. The aircrew must complete the SF 44 and attach it to the FBO vendor ticket/invoice when the FBO also declines use of the SF 44 and uses its own invoice/receipt. Fuel purchases must be documented on a separate SF 44 from ground services and other authorized products since the FBO must invoice DESC for the fuel and the customer for non-fuel product and services. **(T-2)**

8.6.3.3.1.2. Copies 1 and 2 of the SF 44 must be provided to the FBO. Copy 1 of the SF 44 and one copy of the FBO commercial invoice, if applicable, must be forwarded to the following address by the FBO to bill/invoice DESC: DESC-RRF, Building 1621-K, 2261 Hughes Avenue, Suite 128, Lackland AFB, Texas 78236. **(T-2)**

8.6.3.3.1.3. Copy 3 of the SF 44 and one copy of the FBO commercial invoice, if applicable, must be provided to the aircrew. Log and place a copy inside the AF Form 664. Aircrews must present all fuel purchase receipts to the designated aviation squadron Certifying Official and/or Accountable Official upon return to home station to enable timely validation and financial obligation processing into the Fuels Automated System. **(T-2)**

8.6.3.3.2. SF 44 fuel purchases where the FBO requires cash payment.

8.6.3.3.2.1. Cash fuel purchases are only authorized when either the DoD 4500.54G, DoD Foreign Clearance Guide, requires cash payment, or when FBO locations outside the United States and US Territories refuse MSC card and/or SF 44 invoicing processes. Aircrews required to pay cash for aviation fuel purchases must employ the following procedures: **(T-2) Note:** These procedures do not apply to non-fuel products or services.

8.6.3.3.2.1.1. The aircrew must obtain cash from a local DoD Finance source that is charged to an approved Treasury suspense account prior to home station departure. **(T-2)**

8.6.3.3.2.1.2. Aircrews must complete the SF 44 and obtain the FBO fuel vendor annotation in block 11 of the SF 44 to confirm total cash amount and also sign and date the SF 44 blocks 20 and 21. Log and place a copy inside the AF Form 664. Aircrew must return unused cash to their local DoD Finance source upon return to home station. Present the completed SF 44 (for non-fuel charges only) to the appropriate home station administrative personnel for processing (examples include the Wing Refueling Document Control Officer and Finance Office). **(T-2)**

8.6.3.3.3. SF 44 purchases of ground services and other approved products (not fuel).

8.6.3.3.3.1. Complete a separate SF 44 for non-fuel purchases. Provide the FBO copies 1 and 2 of the SF 44. The FBO must use copy 1 and one copy of the FBO commercial invoice, if applicable, to directly bill/invoice the purchasing organization. Block 9 of the SF 44 must reflect the organization name and address of the finance office responsible for payment to the FBO. The purchasing organization must make payment to the FBO upon receipt of the invoice from the FBO. Log and place a copy inside the AF Form 664. **(T-2)**

8.6.3.3.4. If the vendor presents their own form for signature and accepts the SF 44, write the statement "SF 44 Executed" on the vendor’s form. **(T-2)**

8.6.3.3.5. Turn in two copies of the SF 44 to the operations officer at home station. **(T-2)**

8.6.3.3.6. Present the aircraft identiplate for purchases at approved locations. Make certain the invoice includes date of transaction, grade of product, quantity issued/defueled, unit of measure, and signature of Air Force member who accepted product. If vendor also requires completed SF 44 write statement, "AF FORMS EXECUTED" on vendor's invoice. Log and place a copy inside the AF Form 664. **(T- 2)**

8.6.3.4. Purchasing Aviation Fuel in Canada. The DoD and Canadian Department of National Defense have signed a memorandum of understanding allowing DoD aircraft to use the DD Form 1896, *Jet Fuel Identiplate*, when refueling at Canadian airfields with a Canadian National Defense Contract (CNDC). Use the AIR for fuel purchases at Canadian airports without a CNDC, and for ground handling services at all Canadian airports. **(T-2)**

8.6.3.5. Use host country forms to effect purchases at foreign military airfields, including replacement-in-kind locations. Hand scribe information from aircraft identiplate on the local form. Log and place a copy inside the AF Form 664. **(T-2)**

8.6.3.6. AF Form 1994, *Fuels Issue/Defuel Document*, records fuel purchases at USAF bases using a valid DD Form 1896,. The PIC or designated representative must complete the form then log and place a copy inside the AF Form 664. **(T-2)**

8.6.3.7. AFTO Form 781H, records POL actions for particular airframe IAW applicable directives. The PIC or designated representative must complete the form and submit to maintenance debrief. **(T- 2)**

8.6.3.8. DD Form 1896, is the aircraft fuel and oil charge card.

8.6.3.9. The PIC will verify the AFTO Form 781H is completed and turned into maintenance debriefing following the mission. **(T-2)**

8.6.3.10. For off-station missions, the PIC will complete or verify accuracy of the SF 44, AF Form 664, AFTO Form 781H, DD Form 1898, and associated fuels receipts then place them in the AF Form 664 (use eight digits for all USAF aircraft tail number entries). The PIC will transmit all AF Form 664 information via phone, fax, or message if mission causes him/her to be off station past the last day of the month. **(T-2)**

8.7. Standard Form 44, *Purchase Order – Invoice Voucher.* Used to purchase ground fuels, oils, or services at non-DoD activities. When completed, log and place inside AF Form 664,. **(T-2)**

8.7.1. Use the SF 44 for vendor services/supplies only if contract vendors are not available or the contract vendor will not accept the aircraft identiplate. **(T-2)**

8.7.2. If the vendors require a signature on their form and a SF 44 has been used, write the statement "Standard Form 44 Executed" on the vendor's form. **(T-2)**

8.7.3. Return two copies of the SF 44 to the operations officer at home station. **(T-2)**

8.7.4. Purchases at Canadian into-plane locations will be documented using the local vendor's invoice. SF 44 will not be accomplished. Hand scribe the information from the aircraft identiplate to the vendor's invoice and complete a separate sheet with the information listed on the Aviation Issues to DoD and Non-DoD, Aircraft Refueling Tender Sheet. Log and place a copy inside the AF Form 664. **(T-2)**

8.7.5. Purchases at Shell International Trading Company (SITCO) Agreement locations require presenting the aircraft identiplate. The invoice must include the date of transaction, grade of the product, quantity issued or defueled, unit of measure, and signature of the Air Force representative. If the vendor also requires completion of a SF 44 in addition to their invoice, annotate on the vendor's invoice "AF FORMS EXECUTED". Log and place the documentation inside the AF Form 664. **(T-2)**

8.7.6. Purchases at non-contract commercial airfields are accomplished using the Standard Form 44. **(T-2)**

8.7.7. Purchases at foreign military airfields, including Replacement-in-Kind locations, the host country forms are used to record the purchase. Information from the aircraft identiplate should be hand scribed on the local form. Log and place a copy inside the AF Form 664. **(T- 2)**

Chapter 9

FLYING TRAINING GUIDANCE

9.1. General. This chapter outlines requirements and restrictions for training and evaluation missions. Refer to AFMAN 11-202, Vol 1, *Aircrew Training*, AFMAN 11-202, Vol 2, *Aircrew Standardization/Evaluation Program*, AFMAN 11-2AC-130J, Vol 1, and AFMAN 11-2AC-130J, Vol 2,for additional information.

9.2. Instructor/Flight Examiner Briefings. Before all training/evaluation missions, the PIC or instructors/flight examiners will brief their crew on the training/evaluation requirements, objectives, planned profiles, and seat changes. **(T-2)**

9.3. Debriefing. After all training flights, instructors will: **(T-2)**

9.3.1. Review and critique student performance. **(T-2)**

9.3.2. Review training requirements fulfilled for each student and aircrew member (all aircrew members should understand thoroughly what training was accomplished). **(T-2)**

9.3.3. Answer technical questions. **(T-2)**

9.3.4. Preview the objectives of the next mission. **(T-2)**

9.3.5. Complete all required documentation. **(T-2)**

9.4. Simulated Emergency Flight Procedures (EPs).

9.4.1. Preface all simulated emergencies with the word "simulated" and terminate simulated emergencies if an actual emergency arises. **(T-2)** Simulated EPs affecting aircraft controllability (i.e., engine shutdown, placing switches in other than their normal positions, or an abnormal configuration such as no flap landings or simulated engine failure) will only be accomplished during training, evaluation, or currency flights when an instructor pilot is in one of the pilot seats. **(T-2) Exception:** Instructor pilot candidates who occupy a pilot seat and are under the supervision of a flight examiner pilot, not in a pilot seat, may practice simulated emergency procedures during initial or requalification upgrade evaluations.

9.4.2. Instructor pilots will not retard one power lever to FLIGHT IDLE at less than V_{mca} (one-engine inoperative out of ground effect) and 300 feet AGL. **(T-2)**

9.4.3. Turns into the simulated inoperative engine(s) should be minimized. Such turns require a higher degree of pilot skill than with actual inoperative engines and must be smooth and coordinated. ***WARNING:*** Improper rudder or power application can lead to an immediate out-of-control condition where recovery may not be possible.

9.4.4. Simulated EPs affecting aircraft controllability (i.e., engine shutdown, placing switches in other than their normal positions, or an abnormal configuration such as no flap landings or simulated engine failure)are prohibited with passengers onboard. **(T-2)** Limit personnel to the absolute minimum required. **(T-2) Exception:** Simulated EPs required for the purposes of a functional check flight (FCF) are authorized. In this context, personnel onboard must be required for FCF mission accomplishment and limited to the absolute minimum required. **(T-2)**

9.4.5. Instructors will conduct simulated EPs utilizing guidance from AFMAN 11-202, Vol 3, and this publication. Instructors will use a realistic EP scenario and do not compound EPs.

(T-2) Limit simulated EPs to noncritical phases of flight when possible. Instructors will notify the controlling agency if a nonstandard traffic pattern or pattern requiring special sequencing is anticipated. **(T-2)**

9.5. Maneuver Restrictions. All the following practice maneuvers require an instructor or flight examiner pilot to be in one of the pilot seats unless otherwise specified.

9.5.1. Simulated Aborted Normal Takeoff. **(T-2)** Simulated aborted normal takeoffs are authorized during daylight VMC if the crosswind component is within the recommended zone of the flight manual takeoff crosswind chart. **(T-2)** Runway must be dry, hard-surfaced, and long enough to allow refusal and takeoff speeds to be equal. **(T-2)** Instructors will initiate the abort by stating "REJECT" before refusal speed. **(T-2)** Instructors will not practice aborts from touch-and-go or stop-and-go landings. **(T-2)**

9.5.2. No-Flap Landing. No flap landings may be performed in conjunction with a simulated engine(s) inoperative landing. Maximum gross weight is 120,000 pounds, and the crosswind component must be within the recommended zone of the landing crosswind chart. **(T-2)** Authorized in night VMC and day IMC if weather is at or above circling minimums. **(T-2)**

9.5.3. Go-around or Missed Approach. An instructor pilot is not required to be in one of the pilot seats for crews to execute a go-around or missed approach. Pilots will initiate practice instrument missed approaches no lower than the minimum altitude for the approach. **(T-2)** Pilots will initiate planned VFR go-arounds no lower than 100 feet AGL when practicing simulated emergencies. **(T-2) Exception:** For simulated engine-out go-around or missed approach, reference **paragraph 9.5.4**.

9.5.4. Simulated Engine-out Go-around or Missed Approach. Instructors will initiate simulated engine-out go- around at not lower than 200 feet AGL by stating, “Execute three engine go.” **(T-2)** Instructors will initiate simulated engine-out missed approach no lower than the minimum altitude for the approach. **(T-2)** If at any time a go-around using all available engines is required for safety of flight (termination of the simulated engine-out scenario), pilots will call, “Go-around.” **(T-2)** “Go-around” is a call to execute appropriate go-around procedures using all available engines.

9.5.5. Simulated Engine-out Landing. Instructors will simulate failure of the first engine not less than Vmca (one-engine inoperative, out of ground effect) and not less than 300 feet AGL. Authorized in daylight IMC (circling minimums for the approach being flown), or night (1,000-foot ceilings and 2 SM visibility or circling minimums, whichever is higher). **(T-2)** Pilots will use all 4 engines for touch- and- go takeoff. **(T-2)**

9.5.6. Unusual Attitudes and Spatial Disorientation. Authorized at no lower than 10,000 feet AGL in daylight VMC. **(T-2)**

9.5.7. Slow Flight. Pilots will fly at approach, threshold, and 1.2 times power off stall speed with gear down and flaps 0, 50, or 100%. **(T-2)** Do not exceed 15 degrees of bank. **(T-2)**

9.5.8. Practice Emergency Climb Procedure. Authorized in day/night VMC. **(T-2)** Minimum airspeed should not be less than charted obstacle clearance speed (0/50% Flap) +20 knots. An instructor or flight examiner pilot is not required for the accomplishment of this event.

9.6. Touch-and-go Landings. Touch-and-go landings may be performed on designated training, evaluation, or currency missions.

9.6.1. Except as specified in **paragraph 5.4** and **paragraph 5.5**., Touch-and-go landings may be performed by any current and qualified pilot from either the right or left seat.

9.6.2. Pilots will not perform touch-and-go landings when ceiling and visibility is less than 300 feet and 3/4 mile, or reported RVR is less than 40. **(T-2)** Pilots will not perform touch-and-go landings when the crosswind component is outside of the recommended zone of the TO 1C-130(A)J-1-1, *Performance Data Manual,* Crosswind Chart Landing. **(T-2)** Pilots will not perform touch-and-go landings when the crosswind component exceeds the maximum recommended crosswind for landing corrected for gross weight and RCR from the TO 1C-130(A)J-1-1 Maximum Recommended Crosswind for Landing chart. **(T-2)**

9.6.3. Touch-and-go landings are normally performed at flight idle. Pilots will brief the crew if performing a ground idle touch-and-go landing. **(T-2)** Pilots will not perform no-flap ground idle touch- and-go landings. **(T-2)**

9.6.4. Touch-and-go landings are not authorized when normal wake turbulence criteria is not met. **(T-2)** Touch-and-go landings are not authorized when intercepting or crossing the flight path of a large multi-engine jet during approach or landing. **(T-2)**

9.6.5. Minimum runway length for 50% flap flight idle touch-and-go landings is 5,000 feet. Minimum runway length for all other touch-and-go landings is 6,000 feet. **(T-2)**

9.7. Stop-and-go Landings.

9.7.1. Stop-and-go landings may be performed on designated training, evaluation, or currency missions.

9.7.1.1. Pilots will not perform stop-and-go landings when ceiling and visibility is less than 300 feet and 3/4 mile, or reported RVR is less than 40. **(T-2)** Pilots will not perform stop-and-go landings when the crosswind component exceeds the maximum recommended crosswind for landing corrected for gross weight and RCR from the TO 1C-130(A)J-1-1 Maximum Recommended Crosswind for Landing chart. **(T-2)**

9.7.1.2. Pilots will use minimum braking to stop when performing stop-and-go landings. **(T-2)**

9.7.1.3. Pilots will ensure the runway remaining for takeoff is greater than CFL when performing stop-and-go landings. **(T-2)**

9.7.2. Pilots will not perform stop-and-go landings in conjunction with no flap landings. **(T-2)**

9.8. Prohibited Maneuvers. The following maneuvers will not be practiced or demonstrated inflight:

9.8.1. Full stalls. **(T-2)**

9.8.2. Approach to stalls (except FCF). **(T-2)**

9.8.3. Rudder force reversals (fin stalls). **(T-2)**

9.8.4. Spins. **(T-2)**

9.8.5. Simulated runaway trim malfunction. **(T-2)**

9.8.6. Simulated hydraulic system loss by turning engine-driven hydraulic pumps off. **(T-2)**

9.8.7. Simulated two-engine approaches or landings. **(T-2)**

9.8.8. Simulated engine-out takeoffs. **(T-2)**

9.9. Simulated Instrument Flight. Simulated instrument flight may be flown and logged without use of a vision-restricting device. The use of a hood or other artificial vision-restricting device for any phase of flight is prohibited. **(T-2)**

9.10. Air-to-air Refueling Training Restrictions. During training missions, the override signal amplifier will not be used. **(T-2)**

Chapter 10

LOCAL OPERATING PROCEDURES

10.1. General. Units will publish local and/or unique unit operation procedures as a supplement to this chapter commencing with **paragraph 10.2**. The title will indicate the unit concerned (e.g., "10.2.1. XX Special Operations Squadron, Local Operating Procedures."). **(T-2)**

10.1.1. Procedures in this chapter will not duplicate, alter, amend or be less restrictive than those in this publication. **(T-2)**

10.1.2. After validation, send final copies to AFSOC/A3V. **(T-2)**

Chapter 11

NAVIGATION PROCEDURES

11.1. General. All AC-130J Pilots and CSO will use flight planning, navigation procedures and forms prescribed by this publication, as well as AFTTP 3.3 AC-130J. **(T-2)**

11.1.1. Definitions and Terminology:

11.1.1.1. Category I (CAT I) Route. Any route that does not meet the requirements of a CAT II route, including tactical navigation and overwater routes.

11.1.1.2. Category II (CAT II) Route. Any route on which the position of the aircraft can be accurately determined by the overhead crossing of a radio aid (NDB, VOR) or intersection of at least two radio aid radials (VOR, TACAN) or one radial (VOR, TACAN) and one DME at least once each hour.

11.1.1.3. Controlling Navigation Solution. The INAV aircraft position solution the navigation computer is using for enroute navigation. The SHIP SOLN, selected via the NAV SELECT page of the AMU, determines which INAV (1/2) will be used to steer the aircraft either manually or with the autopilot. **(T-2)**

11.1.1.4. First Suitable Airfield (FSAF) and Last Suitable Airfield (LSAF). Utilized in the equal time point (ETP) calculation. These are represented as the "First Nearest" and the "Last Nearest" airports in the ETP calculation in the PROGRESS pages of the CNI. They are airports closest to the coast out and coast in waypoints that meet applicable criteria for AC-130J operations. Forecast weather for the FSAF and LSAF must meet destination weather minimum filing requirements.

11.1.1.5. Equal Time Point (ETP). Geographic point along the route from which the flight time to the FSAF or the LSAF is equal.

11.1.1.6. Required Navigation Performance (RNP). RNP accuracy standards require an aircraft to remain within a specific number of nautical miles of its cleared course centerline for 95% of the duration of the flight. The associated track containment limit is twice the RNP value and represents the maximum limit of protected airspace. Airspace where RNP is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between-routes. Refer to FLIP Area Planning publications/charts to determine RNP airspace.

11.1.1.7. Minimum Navigation Performance Specifications (MNPS) Airspace. MNPS airspace exists in both the North Atlantic Region (NAT) and certain Canadian portions of the North American region. Refer to FLIP Area Planning publications/charts to determine MNPS airspace. The C-130J must comply with all MNPS equipment requirements when flying within the lateral dimensions of this airspace. Aircraft meeting the North Atlantic MNPS requirements also meet the Canadian MNPS requirements. Aircraft entering MNPS airspace are required to have two long range navigation systems (LRNS) capable of staying within 12.6 NM of cleared track for 95 percent of the flight. Gross navigation errors are those that exceed 24 NM from track center line. Prior to entering MNPS airspace, both

INSs must be fully operational to meet the MNPS requirement of having two fully serviceable LRNSs. In order to signify that a flight is approved to operate in NAT MNPS airspace, the letter "X" will be inserted within item 10 of the DD Form 1801 flight plan.

11.1.1.8. NAT Tracks. Contained within the North Atlantic MNPS airspace is an organized track system (NAT Tracks) between FL 285 and FL 420 to optimize air traffic flow between the North American and European continents. NAT tracks are designed based on meteorological data and are updated twice daily. When flying over the North Atlantic, crews should obtain a copy of the North Atlantic Tracks (NAT tracks) valid for their coast out time from the DoD NOTAM internet site.

11.1.1.9. Reduced Vertical Separation Minimum (RVSM) Airspace. This airspace requires special certification and exists to increase airspace capacity, safely, by reducing vertical separation from 2000‘ to 1000‘between suitably equipped aircraft. RVSM has been implemented in the CONUS, Europe, Africa, and Middle East. RVSM airspace typically extends from FL 290 through FL 410. Consult AP/1 and AP/2 for locations and lateral and vertical dimensions of this airspace. The AC-130J is not RVSM capable. Prior approval with ATC is required prior to operating in this airspace.

11.2. Mission Planning Procedures.

11.2.1. Forms. This volume contains information on the use of AF Forms 4116 and 4139. Computer Flight Plans (CFP) may be used in lieu of the AF Form 70, *Pilot's Flight Plan and Flight Log* and the flight plan portion of the AF Form 4116.

11.2.2. Mission/Route Planning. Aircrew will normally accomplish and verify mission planning while in a flight planning facility/base operations; the data is then loaded manually (or via the data transfer card) into the CNI. Pilots will also calculate and verify the required ramp fuel load. **(T-2)**

11.2.2.1. When practical, aircrew will plan the most direct routing possible or utilize wind optimized CFP routing to enhance fuel conservation.

11.2.2.2. Category I Routes. Accomplish flight planning using the AF Form 4116, or a Computer Flight Plan (CFP). Compute the required fuel load using the AF Form 4116 or AF Form 4139, . **(T-2)**

11.2.2.3. Category II Routes. Use the AF Form 70, AF Form 4116, or a CFP. Compute required fuel using the AF Form 4116, or AF Form 4139. **(T-2)** Not required in the local flying area. For local training sorties, a personal log may be used.

11.2.2.4. Provide a copy of the flight plan to the pilot. **(T-2)**

11.2.2.5. Fuel Planning. Required on all missions. Use AF Form 4116 or AF Form 4139. For tactical missions and local training sorties, a personal log may be used. Fuel requirements and calculations will be accomplished IAW AFMAN 11-202, Vol 3, AFSOC Sup 1, this manual, and appropriate performance TO Accomplish fuel-planning IAW TO 1C- 130(A)J-1-1 and TO 1C-130(A)J-1. **(T-2)** CFP enroute fuel may be used for fuel analysis in lieu of enroute fuel derived from the performance TO.

11.2.2.6. CSOs will compute an abort point along the AAR track where conditions will allow for a safe return to a refueling base with appropriate fuel reserves IAW AFMAN 11-202, Vol 3 and this manual. This will be used in the event AAR is unable to be completed.

11.2.2.7. Signature Block. If using AF Form 4116, or equivalent CFP, sign the form after completing the flight plan portion (or verifying the CFP) and completing the time and fuel analysis, wind factor, and Equal Time Point (ETP) data. The Navigator Signature block is found in Section II of the AF Form 4116.

11.2.2.8. Refer to **Chapter 12** to accomplish fuel planning.

11.2.2.9. Equal Time Point (ETP) Computations.

11.2.2.9.1. Equal Time Point Calculation. The ETP provides crews a basis for recovery airfield decision making when in-flight emergencies occur. Wind factor and ETP data computations are required on Category I routes or Category I route segments when the total time between the last suitable airfield and the FSAF is 5 hours or more. Suitable airfields are those normally within 100 NM of flight planned course centerline meeting weather, fuel, and C-130J runway requirements. In-flight refueling missions may require a separate ETP computation for each fuel analysis route segment, and the ETPs should be considered when planning the location of refueling tracks. Plan to have sufficient fuel at each EAR point to divert to a planned A/R abort base, in the event an in-flight refueling is not completed. Use a point abeam the AAR abort base as the LSAF or FSAF for wind factor computations, and ETP data. **Note:** Wind factor and ETP computations are not normally required for round robin missions. **Note:** Refer to **Chapter 6** of this manual for runway, taxiway, and airfield requirements.

11.2.2.9.2. ETP Computations. When required, the ETP section of the AF Form 4116 serves as worksheet and provides the formulas that will be used to manually calculate the ETP. Manual ETPs are mission-planned using flight-planned conditions. The manually calculated ETP will be plotted on the navigation chart during mission planning and applicable data transferred to the CNI Progress page 3/3 during preflight. CNI-computed ETPs are inaccurate on the ground because actual sensed winds are needed for the calculation. A computer-generated facsimile of the AF Form 4116 ETP section may be used.

11.2.2.9.3. LSAF/FSAF. To compute an ETP identify and record the LSAF, coast-out point, approximate midpoint (determined by distance), coast-in point, and FSAF. The coast-out point, approximate midpoint, and coast-in point are actual waypoints on the flight plan. For wind factor calculation purposes, the coast-out point must occur at or after initial level off.

11.2.2.9.4. Wind Factors. First and second half wind factors are computed between the coast-out point and coast-in point using the approximate midpoint as a division. Flight planned values for distance, time, and average flight planned true airspeed (TAS) will be used to calculate wind factors. If either first or last suitable airfields are more than 50 NM from the planned route, an alternate wind factor computation may be required. **Note:** For wind factor computation convenience, coast-out means level off, abeam or over LSAF, or closest planned checkpoint or radio aid within 100 NM of LSAF. Coast-in means abeam or over FSAF, closest planned checkpoint or radio aid within 100 NM of FSAF, descent point, or overhead destination. Calculate wind factors following **Figure 11.1**.

Figure 11.1. Wind Factor Calculation.

Average Ground Speed = Total Distance / Total Time.
Subtract the average flight planned true airspeed (TAS) from the average ground speed to obtain the wind factor.
WF = Average Ground Speed - Average TAS.

11.2.2.9.5. First Half (WF1). Compute the average ground speed between coast out point and the approximate mid-point between the LSAF and FSAF. Subtract flight-planned average TAS from the computed average ground speed to obtain the 1st half wind factor.

11.2.2.9.6. Second Half (WF2). Compute the average ground speed between the approximate mid-point and the coast in point. Subtract flight planned average TAS from the computed average ground speed to obtain the 2nd half wind factor.

11.2.2.9.7. Total Wind Factor. Total wind factor calculations are optional.

11.2.2.9.8. Compute the average ground speed between level off and overhead the destination or initial approach fix (IAF). Divide the total distance between the two points by the total time between the two points to determine the total wind factor average ground speed.

11.2.2.9.9. Equal Time Point Data. Emergency and in-flight fuel management decisions will be made relative to the ETPs. Use the following instructions to compute ETP data:

11.2.2.9.10. DISTANCE (LSAF TO FSAF). Enter the total distance (regardless of level off) from LSAF or abeam the LSAF along course from departure to or abeam the FSAF along course toward destination. The distance for ETP computations will be computed between the LSAF and FSAF, preferably within 50 NM of the planned track. For missions with a single or multiple in-flight refuelings, LSAFs and FSAFs may routinely exceed the 50 NM criteria and require multiple ETP computations incorporating air refueling abort bases.

11.2.2.9.11. The wind factors will be used in conjunction with the best range TAS for GSR and GSC to determine the ETP (NM) distance and ETP Time (T).

11.2.2.9.12. **Figure 11.2**. ETP formulas should be used: (Values given are for example only.)

Figure 11.2. ETP Formula.

ETP DIST=Distance from LSAF to ETP.

ETP=Time from ETP to LSAF & FSAF.

WF 1=First half wind factor (+20).

WF 2=Second half wind factor (+30).

DIST=distance between last and first suitable (2,000 NM).

TAS= Best Range TAS (290 Knots True Airspeed {KTAS}).

GSR=Ground speed to return (TAS-WF1).

GSC=Ground speed to continue (TAS+WF2).

ETP DIST = ((DIST) / (GSR + GSC)) * (GSR) = ((2,000) / (270 + 320)) * (270) = 915 NM.

ETP TIME = (ETP) / (GSR) = (915) / (270) = 3.39 HRS = 3 HRS + 23 MIN.

11.2.2.9.13. ETP is the distance from the LASF to the ETP and will be plotted and labeled on the navigation chart.

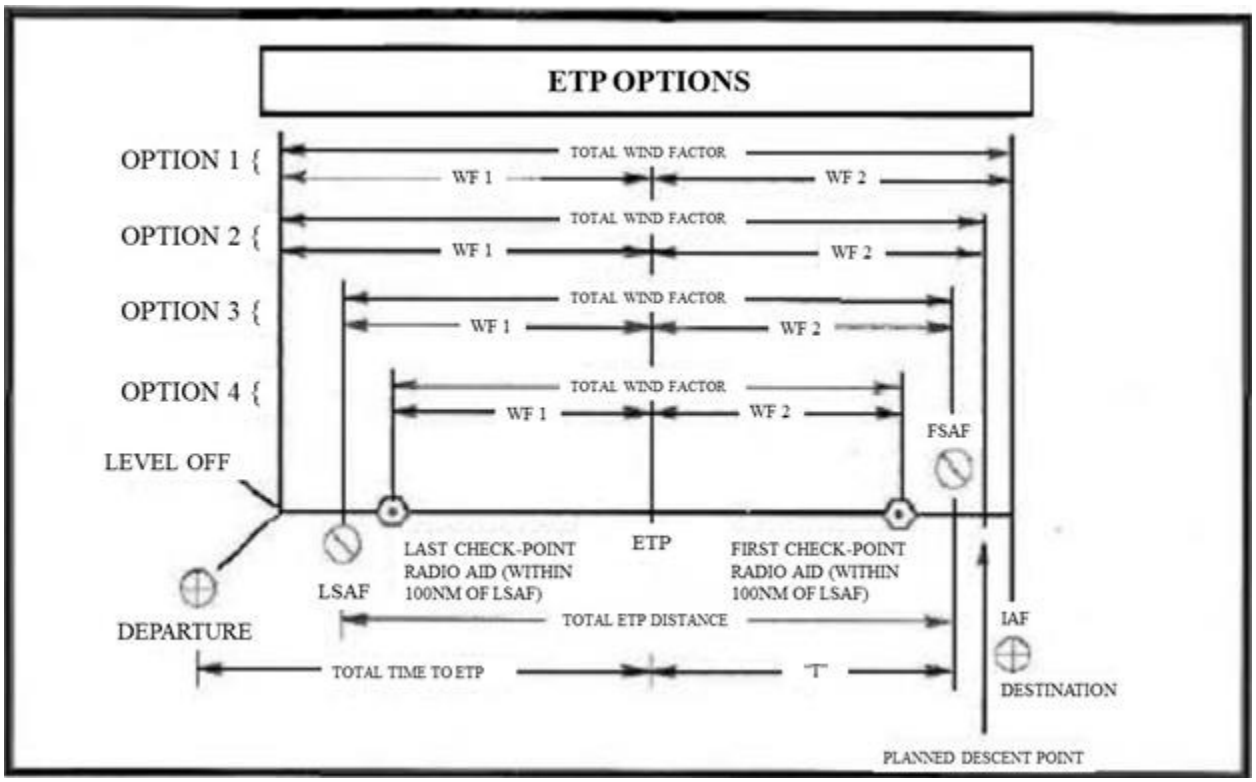
11.2.2.9.14. The ETP Time is the calculated enroute time from the ETP to the FSAF, and equal to the time from the ETP back to the LSAF. This time will be used for fuel calculations when information references ETP Time (T).

11.2.2.9.15. In-flight ETP Procedures. Recompute the manual ETP when the actual arrival over any reporting point prior to the ETP exceeds 15 minutes ahead or behind the flight planned ETA when the change is caused by erroneous wind information. If the change is caused by factors other than a change in the wind (i.e., slow TAS, deviations for weather, air traffic control vectors, or route changes), simply compute a new ETA to the ETP as the ETP itself will not have changed. In-flight fuel management decisions will be made relative to the ETPs.

11.2.2.9.16. Coast Out. Prior to coast out, the CNI-computed ETP will also be plotted on the chart.

11.2.2.9.17. CNI-MU. The CNI-MU FROM/TO pages may also be used in-flight to update times and distances to diversion bases along the route of flight. An accurate ground speed must be entered in order to obtain correct ETE calculations.

Figure 11.3. ETP Calculations.



11.3. Master Flight Plan and Master Plotting Chart.

11.3.1. One CFP and one plotting chart will be used as master copies for each flight utilizing CAT I procedures. Both will be labeled ”MASTER COPY” and will be referred to as Master Flight Plan (MFP) and Master Plotting Chart (MPC). **(T-2)**

11.3.2. MFP Usage. The MFP is maintained by the CSO and should be kept readily available to both pilots. It will be used to record the following in flight: **(T-2)**

11.3.2.1. All ATC clearances and changes to clearances.

11.3.2.2. The wind, temperature, altitude, fuels remaining, and the bearing/range between the INAV solutions over waypoints bordering and within CAT I Navigation airspace.

11.3.2.3. Any loss or degraded navigation/avionics equipment.

11.3.2.4. Compass deviation checks.

11.3.2.5. Oceanic Navigation Accuracy Check.

11.3.3. MFP Symbology. Use the following symbology to ensure that both pilots/CSO can easily determine which waypoints have been programmed into the CNI-MU, which programmed waypoints have been verified, and which waypoints have been transitioned in flight. **(T-2)**

11.3.3.1. Place a check-mark next to the waypoint to signify the waypoint has been entered into the CNI-MU and the course and distance have been verified.

11.3.3.2. Circle the checkmark to signify the coordinates, course, and distance in the CNI-MU have been verified by another crewmember.

11.3.3.3. Draw one diagonal line through the circled checkmark to signify the waypoint has been passed, reported, and all applicable annotations associated with waypoint passage have been completed.

11.3.3.4. Cross the first diagonal line with another to signify that the aircraft‘s position has been plotted on the MPC approximately 60 nm (10 to 15 minutes depending on groundspeed) after waypoint passage.

11.3.4. MPC Requirements

11.3.4.1. Maintain a plotting chart showing flight progress on all Category I routes and tactical missions. The following information will be shown on the chart: **(T-2)**

11.3.4.1.1. CSO’s name and coordinated universal date in the vicinity of departure or coast out point.

11.3.4.1.2. Chart number and chart edition will be annotated on the back of all stripped charts.

11.3.4.1.3. Check the Chart Updating Manual (CHUM) on all charts (examples include GNC and JNC). CHUM information is not required on high-level charts.

11.3.4.1.4. The flight plan centerlines and portions of ADIZ and FIR boundaries pertinent to the route.

11.3.4.1.5. Label reporting points with proper names or geographical coordinates.

11.3.4.1.6. Place the applicable portion of the “No Fly” line on all charts used for missions flown in the vicinity of unfriendly territory or other no-fly areas.

11.3.4.1.7. Prominently mark warning and restricted areas within 25 NM of planned course and 3000 feet of planned altitude on the chart (not required if a FLIP enroute chart with this information is immediately available and used).

11.3.4.1.8. Annotate airfields along the planned route which could serve as possible emergency landing areas. Consider the following factors when selecting emergency airfields: type aircraft, weather conditions, runway length, runway weight-bearing capacity, runway lighting, radio navigational aids, and proximity to planned flight path.

11.3.4.1.9. Annotate the calculated ETP along the route if ETP is required for the mission.

11.3.4.1.10. Annotate AAR abort point as described in **paragraph 11.2** if applicable for the mission.

11.3.5. MPC Usage. The use of a plotting chart is required on every route requiring CAT I Navigation. Use an appropriate Jet Navigation Chart-High Altitude (JNCA) or higher chart with Lambert Conformal Conic (LCC) projection. During mission planning, draw the course line representing the planned route of flight on the MPC and highlight the associated suitable emergency airfields. The PIC will verify this information and annotate the chart with his/her signature, date, and mission number/call sign. During flight, 10 to 15 minutes (depending on groundspeed) after each CAT I waypoint, the PM/CSO will mark position and then plot the

INS-only position on the MPC (using a dot surrounded by a triangle) and annotate the marked time and position coordinates adjacent to the plot. The PM/CSO should compare the plotted point to the course line. This procedure confirms that the navigation system is steering the airplane to the correct waypoint.

11.4. Pre-Flight Procedures.

11.4.1. Pre-flight procedures must include a UTC time check and resynchronization of the aircraft master clock, if necessary. Aircraft clock errors resulting in position report time errors can lead to an erosion of actual longitudinal separation between aircraft. Acceptable time standards that can be used include GPS (corrected to UTC), Naval Observatory Master Clock (DSN 762-1401/1069 or 560-6742), and WWV (2500, 5000, 10,000, 15,000, 20,000 Kilohertz {kHz}).

11.4.2. Pre-Flight Communications Check. A pre-flight check of the SATCOM (if equipped) and HF radios should be made to a suitable agency (operating authority, command post or ATC). At least one HF radio must be confirmed operational prior to coast out or the mission must be terminated.

11.4.3. Navigation Initialization and Solutions. Both the AUTONAV and manual GC alignment of the INSs result in the required navigation performance needed for RNP RNAV operation. The GPS positions may be used as initial positions as long as they agree within one-tenth of one minute. If GPS is not available, use precision parking coordinates or, as a last resort, obtain coordinates from an airfield diagram published in an approved instrument approach book. This position must be checked and verified by both pilots and recorded on the MFP. **(T-2)**

11.4.4. Communication/Navigation/Identification Management System (CNI-MS). In addition to **Chapter 5** requirements, when configuring for CAT I operations, both pilots will verify that the INAV Position Alert 1 is set to 4.0 miles and INAV Position Alert 2 is set to 8.0 miles on the CNI PROGRESS page. This will generate an INAV POS DIFFERENCE Advisory at 4.0 miles and an INAV POS MISCOMPARE Caution at 8.0 miles.

11.4.5. Loading the Route of Flight. Because CAT I routes usually involve the manual input of waypoints not found in the database, and often require aircraft maximum range capability, it is critical that both pilots and CSO work in sequence and independently to enter accurate route-of-flight data. It is not sufficient for one crewmember to simply observe another crewmember entering the data. The following steps will be completed by the pilots and CSO: **(T-2)**

11.4.5.1. The CSO or one of the pilots will:

11.4.5.1.1. Load the route of flight directly from the filed flight plan, MFP, or data transfer card into the CNI and verify both the magnetic course and the leg distance for each waypoint with the MFP. Loading the route directly from the filed flight plan may minimize pilot/controller clearance loop (misinterpretation) errors. Label waypoints so they can be readily identified for subsequent position reporting. If the courses differ by more than 2° or the distances differ by more than 2 NM, the pilot will resolve the discrepancy prior to flight. Completion of this step will be annotated with a check-mark next to the waypoint.

11.4.5.1.2. Using the LEGS pages, insert the forecast winds (if available) at each waypoint.

11.4.5.1.3. Verify the total distance to the destination on the CNI PROGRESS page. Any significant disparity (more than 25 NM to allow for SIDs/STARs and approaches) in the total distance between the CNI and MFP will require a recheck of the ramp position and waypoint coordinates.

11.4.5.2. The other pilot or CSO will verify the waypoint coordinates and course and distance information from the opposite side CNI to the MFP. Completion of this step will be annotated with the checkmark being circled on the MFP.

11.4.5.3. If the planned route of flight is a stored route or one loaded during a data transfer, verification of waypoint coordinates must still be accomplished by both pilots in the same manner.

11.5. Category (CAT) 1 Navigation Procedures.

11.5.1. This section provides general procedures and guidance for the operation of navigation systems on CAT I routes. For navigation system requirements, consider all oceanic airspace as MNPS airspace. Specific procedures for RNP RNAV airspace are addressed in subsequent sections.

11.5.2. Refer to **Chapter 4** for the navigation Minimum Equipment List (MEL) for CAT I and RNP RNAV operations.

11.5.3. Navigation System Accuracy Checks.

11.5.3.1. Ground. After leaving the ramp, perform the INS/INAV groundspeed check by stopping the aircraft and checking each pilot‘s groundspeed on the CNI-MUs or HDDs/HUDs. Groundspeeds in excess of one knot while the aircraft is stationary may indicate a faulty INS. **(T-2)**

11.5.3.2. Airborne. Determine INAV position accuracy by comparing it to enroute NAVAIDs. **(T-2)**

11.5.3.3. Compass Deviation Check. Perform a compass deviation check using both INSs and the standby compass prior to entering CAT I airspace. Perform subsequent checks after heading changes of 30° (or greater) or every 3 hours. Record the deviation in the appropriate block of the MFP. Apply this correction to headings to be flown whenever it is necessary to use the standby compass as the sole source for navigation. **(T-2)**

11.5.3.4. Oceanic Navigation Accuracy Check. Prior to coast-out, evaluate/compare the accuracy of all navigation solutions. In the event of discrepancies, greater than 4 NM, the crew should investigate the cause and determine if CAT I flight is feasible. Record this gross error check in the appropriate block of the MFP. If a pure INS position is determined to be more than 4 miles in error, an in-flight alignment (IFA) may be accomplished provided sufficient time is available prior to entering RNP RNAV or oceanic airspace. If coast-out is made at a radial/DME fix, the appropriate radial should be selected on the non-active CDI as a further check that the navigation system is tracking to the fix. **(T-2)**

11.5.4. Communications. In addition to guidance in **Chapter 5**, crews will accomplish the following:

11.5.4.1. Emergency Frequency Monitoring. In the interest of safety during oceanic and remote area operations (100 NM offshore), flights should maintain a listening watch on 121.5 and 243.0 Megahertz (MHz) and the VHF common frequency. **(T-2)**

11.5.4.2. BIU Backup. Ensure that one of the pilots place their transmission switch to an HF radio so that the crew can transmit on HF in case of BIU Backup. The other pilot should select VHF 2 for the same reason. VHF 1 will be available on the Get Home Control and crew can attempt to relay transmissions to other aircraft on 121.5 until within VHF range of ATC. **(T-2)**

11.5.5. Oceanic Clearance: If not received before take-off, the oceanic clearance should be obtained prior to the boundary of oceanic airspace IAW FLIP.

11.5.5.1. The clearance will be recorded on the MFP and reviewed by both pilots/CSO. If the oceanic clearance received is different from the planned clearance, use the following procedures: **(T-2)**

11.5.5.1.1. Record the new route on the MFP to include applicable updates to ETP data.

11.5.5.1.2. Enter the new waypoints into the CNI IAW the pre-flight procedures in this chapter.

11.5.5.1.3. Ensure fuel will still be sufficient to arrive at the destination waypoint with required reserves.

11.5.5.1.4. Mark out the old plotted track and draw the revised plot on the MPC.

11.5.5.1.5. In no case should this process simultaneously engage the attention of both pilots during flight.

11.5.6. Approaching Coast-out. Prior to coast-out and outside of RNP RNAV airspace it is permissible and recommended to use the EGI or GPS (INAV source in AUTO mode) as the INAV solution for both CNI-SPs if NAVAIDs are available for monitoring. Prior to losing NAVAID reception, the INAV solution that is not the controlling solution must be placed to INS. This ensures there is constant comparison of the controlling solution to an independent INS solution. Beginning at the coast-out waypoint and continuing through coast-in, CNI-MU bearing/range between INAV solutions should be recorded at each waypoint to provide a running record of INS drift relative to the controlling solution. **(T-2)**

11.5.7. IFF. Reset Mode 3A code to 2000, 30 minutes after entering Category I airspace.

11.5.8. MFP and MPC Procedures. **(T-2)**

11.5.8.1. After takeoff, record the takeoff time in the actual time of arrival (ATA) block of the departure airfield on the MFP. As soon as practical after takeoff, determine a revised Estimated Time of Arrival (ETA) for each line of the MFP using flight-planned leg times and the actual departure time.

11.5.8.2. Prior to waypoint transition, check the MFP magnetic course and distance to the next waypoint against the CNI-MU. The courses should be within 2º and the distances should agree within approximately 2 NM. Check and verify that the subsequent waypoint is properly programmed. Update ETAs to the next two waypoints.

11.5.8.3. Overhead the waypoint, confirm the ATA and determine the minutes ahead/behind by comparing it to the ETA. Record the CNI-MU bearing/range between INAV solutions to provide a running record of INS drift relative to the controlling solution. Record the actual fuel remaining above the flight-planned continuation fuel and write the difference between continuation fuel and actual fuel remaining in the EXCESS block of the MPF. See the in-flight fuel management section of **Chapter 12** for additional guidance and definitions.

11.5.8.4. Immediately after waypoint passage, and as soon as the aircraft has intercepted its new course, confirm that the aircraft is outbound on its flight planned magnetic course to the next waypoint and record the bearing/range between INAV solutions found on the INAV 1/3 page.

11.5.8.5. Record the actual in-flight conditions (altitude, wind, and static air temperature (SAT)) above the forecast conditions on the next line of the MFP. Update these conditions as well as fuel flow as needed on the PERF CRUISE and LEGS pages in the CNI-MU.

11.5.8.6. If required, complete a position report to the controlling agency IAW FIH procedures. The layout of the CNI PROGRESS page supports the format of the position report; however, ensure that ETAs passed to the controlling agency match the ETAs on the MFP. This will enable the pilots to determine if an ETA has changed from what was previously reported. If an ETA changes by more than 3 minutes, notify the controlling agency.

11.5.8.7. Draw a diagonal line through the waypoint on the MFP to indicate it has been passed, reported, and all applicable annotations associated with waypoint passage have been completed.

11.5.8.8. Approximately 60 nm (10 to 15 minutes depending on groundspeed) after waypoint passage, change INAV controlling solution to INS-only solution (will require disengaging NAV CAPT flight director guidance) and MARK the aircraft position. Switch back to the other INAV (EGI or GPS) and plot the INS-only position on the MPC. Record the mark time and position coordinates next to the plot. If the plotted position is not within 2 NM of the course centerline, check waypoint coordinates for accuracy, ensure the autopilot is tracking correctly in NAV mode, re-check the accuracy of the charted course-line, and re-check that the position was plotted correctly.

11.5.8.9. Cross the first diagonal on the MFP to indicate that the aircraft position has been plotted.

11.5.8.10. When the frequency of waypoints along CAT I route segments is greater than one every thirty minutes, full-line entries and plotting can be limited to a minimum of one every hour. Full-line entries with the corresponding position plot are required for every waypoint involving a change of heading over 20 degrees.

11.5.9. Routine Monitoring **(T-2)**

11.5.9.1. Because of the possibility of the autopilot disconnecting from the altitude/steering modes, regular checks of correct engagement with the navigation system should be made.

11.5.9.2. Crews should monitor aircraft performance and outside parameters, suspect potential problem areas, and review the performance manual if the following conditions are encountered:

11.5.9.2.1. The fuel remaining is less than the planned continuation fuel.

11.5.9.2.2. Any low calculated fuel CNI-MU advisory

11.5.9.2.3. ATA at any MFP fix is off by more than ± 5 minutes.

11.5.9.2.4. SAT differs by more than ± 5ºC from flight planned.

11.5.9.2.5. Actual winds differ by more than 30º or 15 knots from flight-planned.

11.5.9.2.6. Any ahead/behind time more than 10% of total planned enroute time to that point.

11.5.9.2.7. Hazardous meteorological conditions.

11.5.10. Approaching Landfall. Use the radar to help identify the coast-in position. When the aircraft is approaching the first landfall NAVAID, tune and identify the navigation facility and crosscheck the aircraft position. If coast-in is made at a radial/DME fix, the appropriate radial should be selected on the non-active CDI as a further check that the navigation system is tracking according to the current clearance. Once NAVAID reception is assured and flight is not being conducted in RNP RNAV airspace, all INAV solutions can be returned to AUTO. If entering BRNAV airspace, AUTOTUNE the NAVAIDS, select INS/RAD as the controlling solution, and place the other INAV solution in AUTO. Revert to CAT II procedures. Reset POS ALERT and IFF Mode 3 as appropriate. **(T-2)**

11.6. Special Certification Airspace Requirements and Procedures.

11.6.1. The GPS currently installed in the C-130J navigation suite does not meet FAA certification requirements for IFR navigation. AFMAN 11-202, Vol 3 allows the GPS to be used as a mission enhancement system for enroute instrument navigation, if it is used to update a self-contained navigation system, such as INS or mission computer, and is checked against other approved sources (in this case an RNP-10 certified INS). Therefore, on CAT II routes (not including operations in BRNAV airspace), the EGI or GPS can be used as the controlling solution for enroute instrument navigation if NAVAIDs are available for monitoring. The NAVAIDs must be operational and actively monitored. If deviations are observed, crews should revert to navigation via ground-based NAVAIDs. For operations over CAT I routes (not including operations in RNP-10 airspace), the EGI or GPS can be used as the controlling solution providing the pilot can monitor its performance using the offside INS as an independent navigation source. The EGI or GPS cannot be used as the controlling solution in BRNAV or RNP-10 airspace, even when using INS as the sole input source for the EGI. **(T-2)**

11.6.2. The C-130J is certified for RNP-10 and Basic RNAV (BRNAV)/RNP-5 airspace, but with operational time restrictions. These certifications are based on raw INS data.

11.6.2.1. RNP-10 airspace requires a track keeping accuracy of 10 NM for 95 % of the flight. The track containment limit is 20 NM. The C-130J navigation system has been certified to meet the requirements of RNP-10 airspace for up to 10 hours from the time the controlling INS was commanded to the NAV mode. The pure INS solution is the only certified navigation solution for flying in this airspace. Annotate the letter “R” in Block 10

of the DD Form 1801 or appropriate block of the ICAO flight plan to indicate RNP-10 certification.

11.6.2.2. BRNAV/RNP-5 airspace requires a track keeping accuracy of 5 NM for 95 percent of the flight. The track containment limit is 10 NM. Minimum equipment to operate in this airspace is one INS capable of updates. The INS/RAD or INS-only solution will be the controlling INAV solution in this airspace. The INS/RAD solution can be used without time restrictions if the solution is being updated from NAVAIDs. If the NAVAIDs become unreliable, either through radio failure or denial, the INS-only solution will still maintain BRNAV accuracy for 2.6 hours from the time the controlling INS was commanded to the NAV mode. If needed, an in-flight alignment may be used to restart the time-in-NAV of an INS prior to entry into this airspace. INS/RAD or INS-only solution will be selected prior to entering BRNAV airspace. The AUTOTUNE function of the CNI- MS must be enabled. BRNAV airspace currently exists throughout the European Region. Because BRNAV airspace exists only where NAVAID reception is available, CAT I procedures are not required. Annotate the letter "R" in Block 10 of the DD Form 1801 or appropriate block of the ICAO flight plan to indicate BRNAV certification.

11.6.3. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. While other C-130J variants are approved and the aircraft has the appropriate equipment the AC-130J has not been certified for RVSM operations.

11.7. Navigation Malfunctions and Failures.

11.7.1. Should INAV solutions noticeably separate and exceed 8 NM, determine, and use the INS solution considered most accurate by evaluating both INSs using available radio aids, ground mapping radar, and GPS. Highest validity should be given to positions referenced via radar. Next highest validity should be given to positions derived via radio aid fixing. When left to determine most probable position (MPP) via navigation solution comparisons, two agreeing INS positions are more valid than two agreeing GPSs; and two agreeing GPSs and one agreeing INS indicate a probable INS problem. Consider INS-radar/NAVAID, INS-INS, and INS-GPS position comparisons that are less than 4 NM difference to be valid and in agreement. Once the most accurate INS is determined, select it as the controlling solution. Update ETAs to ATC if required.

11.7.2. Situations may arise when crews cannot identify the faulty navigation system by simple comparison of positions between navigation solutions. Fly the aircraft halfway between the disagreeing INS solutions. Plot both CNI-SP solutions at least once every 30 minutes on the MPC, labeling the pilot CNI-SP navigation solution MPP1 and the co-pilot‘s MPP2. Continue to evaluate outputs from each INS and try to use plotted position information to identify adverse trends.

11.7.3. Malfunctions and Failures in MNPS Airspace:

11.7.3.1. Crews experiencing deterioration or failure of navigation equipment that reduces the capability to comply with MNPS prior to MNPS entry will return to a suitable airfield with a maintenance repair facility.

11.7.3.2. Crews experiencing deterioration or failure of navigation equipment after entry into MNPS airspace should immediately report the malfunction to the controlling agency and subsequent agencies throughout the route of flight. Once the aircraft has entered oceanic airspace, the PIC should continue to operate the aircraft IAW the Oceanic Clearance already received, appreciating that the reliability of the total navigation system has been significantly reduced. The PIC should also prepare a proposal to ATC with respect to the prevailing circumstances and consult with ATC as to the most suitable action.

11.7.3.3. If an aircraft in MNPS airspace is unable to continue flight IAW its ATC clearance for reasons such as severe turbulence, aircraft performance problems, or pressurization failure, a revised clearance should be obtained as soon as possible. If unable to obtain a new clearance, offset 30 NM from the assigned route by turning 90 degrees from track and maintain altitude if possible. Once offset 30 NM, climb, or descend to an altitude which differs from those normally used by 500 ft.

11.7.4. Malfunctions and failures in RNP-10 or BRNAV airspace:

11.7.4.1. Aircraft unable to maintain RNP-10 or BRNAV RNAV tolerances must advise controlling agency immediately and take appropriate coordinated action.

Chapter 12

FUEL PLANNING

12.1. General. A fuel plan is required for all flights except local area flights with established standard fuel loads. The CFP and TO 1C-130(A)J-1-1 are the primary method of fuel planning. All preflight planning must be verified with aircraft mission computer (MC) performance prior to departure. **(T-3)** Missions should be planned at altitudes, routes, and airspeeds to minimize fuel usage.

12.1.1. AC-130J Management. All AC-130J flight operations will use fuel planning and enroute fuel management procedures. **(T-2)**

12.1.2. **Note:** The flight planning computer configuration is approved by AFSOC and the Special Operations Mission Planning Office. Uncertified, untested, or beta versions of developing software will not be used for actual mission planning. **(T-2)**

12.2. Definitions. The following definitions apply to fuel planning in the AC-130J:

12.2.1. CAT I route: Any route that does not meet the requirements of a CAT II route, including tactical navigation and overwater routes.

12.2.2. Holding in Lieu of Fuel: Fuel required in lieu of filing an alternate to a remote or island destination.

12.2.3. Alternate Fuel: Fuel required from intended destination to alternate or most distant alternate when two are required.

12.2.4. Missed Approach Fuel: Fuel required for a missed approach at original intended destination.

12.2.5. Reserve Fuel: Usable fuel required to be carried to increase the total planned flight time IAW AFMAN 11-202V3_AFSOCSUP.

12.2.6. Minimum Landing Fuel: (Always required) If it is determined that the aircraft will land with less than this amount, a fuel emergency exists and ATC must be informed.

12.2.7. Identified Extra Fuel:

12.2.7.1. Wing Relieving Fuel: Extra fuel kept in the main tanks intended to counter wing bending moments and keep the aircraft within flight manual weight limitations.

12.2.7.2. Depressurization fuel: Extra fuel required to protect the aircraft and occupants in the event of a cabin depressurization followed by an extended diversion to an alternate airport at low altitude where fuel consumption is increased.

12.2.7.3. Weather Avoidance: Extra fuel carried if forecast thunderstorms are scattered or numerous along the route of flight.

12.2.7.4. Icing. Extra fuel carried is the route of flight has known or forecast icing conditions.

12.2.7.5. Tankered fuel. Extra fuel carried through a primary destination for use on a subsequent leg.

12.2.8. Required Ramp Fuel Load (RRFL): Minimum fuel required at engine start to complete tasked mission. This fuel should include enroute fuel, holding in-lieu (if required), alternate and missed approach fuel (if required), reserve fuel, minimum landing fuel and identified extra fuel.

12.2.9. Recovery Fuel: The minimum planned landing fuel at the intended destination. This is calculated by adding alternate and missed approach fuel (if required), reserve fuel, minimum landing fuel, and wing relieving fuel (if required).

12.3. Alternate Selection. Plan fuel to an alternate only when AFMAN 11-202, Vol 3, or AFMAN 11-2AC-130J, Vol 3, require the filing of an alternate.

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

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

12.3.3. When selecting an alternate, suitable military airfields are preferred if within 100 nm of destination.

12.4. Fuel Planning Profiles. Enroute cruise airspeed should be planned at a constant TAS IAW the performance manual. Missions planned using long range cruise provide little flexibility in the air when faced with actual fuel critical situations requiring the conservation of additional fuel. Divert profiles should be fully fuel planned and represent what will actually be flown. Altitudes should be no higher than the ATC cruise ceiling per the performance manual or fuel freezing temperature limitations, whichever is lower.

12.4.1. CFP Planning Profile. The AC-130J performance module of PFPS is certified to calculate accurate fuel planning information. Crews should use the C130JHI.frm or C130JHI.xls form when printing the CFP from the mission planning computer so both the route of flight and fuel planning information can be recorded. Use the fuel planning blocks on the top of the flight plan and **Figure 12.1** for fuel planning. **(T-3)** Pilots/CSO will ensure an accurate recovery fuel is input on the CFP Pre-mission/Configuration/Fuel screen so calculated Continuation Fuels used during in-flight fuel monitoring are valid. **(T-3)** When alternates are required, crews may need to accomplish and print two iterations of the flight plan to incorporate an accurate recovery fuel. For example: after the first calculation, pilots will extract the enroute fuel to the alternate from the last line of the flight plan and add this to the initial recovery fuel. A second flight plan will be calculated once the Pre- mission/Configuration/Fuel screen is updated with the correct recovery fuel. If an alternate is required, use the Turn-point/Additional Points screen to insert the designated airfield as a divert (DVT) type after the intended landing airfield. See **Figure 12.1** for a sample of a completed CFPS CFP.

12.4.2. AC-130J Mission Computer Profile. The AC-130J mission computer plans a complete climb, cruise, descent, approach, and landing profile based on the inserted LEGS DATA and PERF CLIMB, CRUISE, and DESCENT factors. Accurate leg fuels, as calculated by the MC, are dependent on pilots ensuring that airspeed, altitude, winds, temperature, and fuel flow are correctly represented for each leg of the route and updated/corrected as in-flight conditions change. Because the flight profile is more than a planning tool, pilots must use good judgment when inputting forecast/planned information versus actual performance and conditions. During

preflight and at each waypoint, the Fuel Onboard (FOB) for remaining legs will be compared against the flight planned continuation fuel to ensure there is sufficient fuel to continue the mission as planned in order to meet or exceed destination fuel requirements. **(T-3)** Once airborne, the FOB on the PERF INIT WEIGHT page is calculated (not sensed) using sensed fuel flow versus time. Update the FOB on the PERF INIT WEIGHT page to the amount indicated by the totalizer only when the totalizer amount is less than the calculated FOB. Use the most conservative of the FOB or totalizer readings when recording fuel remaining during in-flight fuel monitoring. The CNI will provide a FUEL QTY ERROR advisory when the PERF INIT WEIGHT FOB and totalizer readings differ by more than 2,500 lbs. for more than 10 minutes. Reserve Fuel (FIXED on PERF INIT WEIGHT) should be set to the recovery fuel value. Destination and alternate landing fuel can be obtained from the MC. Flight crews will use the MC to evaluate and verify destination landing fuel status after mission changes and reroutes and whenever a divert is required and/or extensive weather avoidance routing is required. **(T-3)**

12.5. Fuel Planning Procedures. Aircrew and mission planners will manage aviation fuel as a limited commodity and precious resource. **(T-2)** Fuel optimization will be considered throughout all phases of mission planning and execution. **(T-3)** Excessive ramp and recovery fuel adds to aircraft gross weight and increases fuel consumption. Do not ferry extra fuel beyond optimum requirements for safe mission accomplishment and training objectives. Aircrew and mission planners will optimize flight plans and flight routing for fuel efficiency. **(T-3)** In-flight procedures such as climb/descent profiles and power settings should also be considered for efficient fuel usage. Aircrew should employ aviation fuel optimization measures without compromising flight safety or jeopardizing mission/training accomplishment.

12.5.1. Routes should be planned at 300 KTAS (240 KTAS below 10,000 MSL), except for oceanic crossings. For oceanic crossings, routes should be planned at 280 KTAS or 270 KTAS, optimized for gross weight.

12.5.2. Holding in Lieu of Fuel. For remote or island destinations, holding is authorized in lieu of an alternate airport. In such situations, use 1+15 hrs at Four-Engine Maximum Endurance fuel at 10,000 ft MSL. (**T- 2)**

12.5.3. Alternate Fuel. Calculate alternate fuel at optimum cruise altitude using direct routing to the alternate at Long Range Cruise airspeed. This must include fuel for an approach.

12.5.4. Missed Approach Fuel. Calculate missed approach fuel when visibility only weather criteria is used to determine the suitability of the original destination.

12.5.5. Reserve Fuel. Fuel that will ensure the aircraft is carrying enough usable fuel on each flight to increase total planned flight time between refueling points by 10% (up to max of 45 minutes) or 20 minutes, whichever is greater at 10,000 ft Mean Sea Level (MSL) at max endurance. **(T-2)**

12.5.6. Wing Relieving Fuel. Calculate wing relieving fuel using the flight manual weight limitations chart for the aircrafts planned cargo load. Enter the chart with the aircraft empty weight and cargo weight, then read across to determine the fuel required to remain within limits. Add enough wing relieving fuel, if required, to ensure that recovery fuel does not fall below the fuel required to remain within limits. **(T-2)**

12.5.7. Depressurization Fuel. Calculate extra fuel burned from ETP to first suitable airfield, with 30 minutes of extra fuel at 10,000 feet. Calculate depressurization fuel at four-engine long range cruise at 10,000 feet MSL.

12.5.8. If minimum landing fuel, wing relieving fuel, depressurization fuel, high altitude burn (fuel burned from takeoff to ETP), and low altitude burn (ETP to FSAF) is less than required ramp fuel load, no extra depressurization fuel is required.

12.5.8.1. If minimum landing fuel, wing relieving fuel, depressurization fuel, high altitude burn (fuel burned from takeoff to ETP), and low altitude burn (ETP to FSAF) is greater than required ramp fuel load, then extra depressurization fuel is required.

12.5.9. Thunderstorm forecasts will be based on the DD Form 175-1 or equivalent. Where weather forecast conditions dictate, add the following fuel corrections:

12.5.9.1. At least 1,500 lbs if forecast thunderstorms are scattered or numerous along the route of flight. This amount can be increased if anticipated deviations dictate. **(T-2)**

12.5.9.2. 1,000 lbs if the route of flight has known or forecast icing conditions. **(T-2)**

12.5.10. Using all available planning tools, including advanced computer flight plan and guidance in this chapter, PICs will determine the RRFL.

12.5.11. Optimize fuel loads. Mission plan for the required ramp and recovery fuel. Ensure ramp fuel is correct upon arrival at aircraft. Depressurization Fuel. For Cat 1 routes, an additional 30 min of reserve fuel needs to be added to the reserve fuel component. This identified extra is for the event of loss of pressurization between the ETP and FSAF and will be computed at four engine long range cruise burn rate at 10,000ft. See **Figure 12.1** for additional information.

12.5.12. Minimize use of APUs. Use ground power units when practical.

12.5.13. Delay engine start time.

12.5.14. Minimize aircraft weight through optimized fuel loads and reduction of equipment not necessary to accomplish the mission.

12.5.15. Flight Plan Changes and Diversion. When mission requirements or ATC dictate a change to the planned mission or route, the fuel must be recalculated to ensure safe completion of the flight. **(T-2)** It is not practical to complete a new flight plan fuel log so the MC is the primary method of deciding if a mission change or reroute can be accommodated.

12.5.15.1. For an unplanned or directed enroute divert, the FROM/TO page, with an associated cruise ground speed, can be used to determine an estimated time enroute (ETE) destination fuel. Using a 4,500 lbs/hr or long range cruise speed from OPTIMAL CRZ 1/2 fuel burn, crews should be able to decide if the new routing is achievable without adverse effects on destination fuel. Do not accept a reroute that adversely depletes the destination reserve fuel as prescribed in this chapter.

12.5.15.2. If the enroute change does not affect the intended destination, then in-flight fuel monitoring will consist of comparing the MC predicted remaining fuel with flight plan continuation fuel at the next point common to the reroute and the original flight plan. After any route alteration, crews should actively monitor fuel state by recording the fuel

remaining values at abeam positions of the original flight plan and using the "Abeam" function of the INDEX/FIX INFO PAGE to cross-check fuel status.

12.5.16. Declare "Emergency Fuel" when it is determined that the aircraft will land with less than 3,000 lbs. **(T-2)**

12.5.17. Declare "Minimum Fuel" to ATC when it is determined that the aircraft will land with less than the calculated recovery fuel. **(T-2)** When recovery fuel is entered into the CNI-MU on the PERF INIT WEIGHT page under FIXED, the aircraft provides a LOW CALCULATED FUEL advisory when extra fuel is zero of less.

Figure 12.1. AC-130J Fuel Load Requirements.

1.ENROUTE FUEL	*STTO* A component of enroute fuel. Fuel required for start, taxi, and takeoff. Normally 800lbs. For known taxi delays or additional ground time in excess of 30 minutes, add 30 lbs/min. **(T-3)**		REQUIRED RAMP FUEL LOAD
	Climb A component of enroute fuel. Fuel required from takeoff through climb to initial cruise altitude. If a manual calculation is required, the applicable performance manual will be referenced. **(T-3)** Unless required for mission accomplishment plan to climb no higher than ATC Cruise Ceiling per the Performance Manual		
	Cruise A component of enroute fuel. Fuel required from TOC to overhead intended destination. If a manual calculation is required, the applicable performance manual will be used. **(T-3)** Include planned mission orbits (ex: SAR, EC-130J, Broadcast orbit, etc.)		
	Appr A component of enroute fuel. Fuel required for approach and landing from overhead destination. Normally 700lbs, which accounts for 1 instrument approach of no longer than 10 minutes. For longer approaches, follow on visual, and/or radar pattern work, compute fuel burn at 85 lbs/min. **(T-3)**		
2. HOLDING	If holding in lieu of filing an alternate, for a remote or island destination, use 1+15 hrs holding fuel at 10,000 ft MSL at Max Endurance		
3.ALTERNATE AND MAP	*Alternate* Fuel required from intended destination to alternate or most distant alternate when two are required. Flown at optimum cruise altitude using direct routing to the alternate at Long Range Cruise airspeed. This must include fuel for an approach	RECOVERY FUEL	
	Missed Approach Fuel for a missed approach at original intended destination. Entry only required when the visibility-only weather criteria is used to determine the suitability of the original destination. (2,000lbs)		
4. RESERVE	Ensure the aircraft is carrying enough usable fuel on each flight to increase total planned flight time between refueling points by 10% (up to max of 45 minutes) or 20 minutes, whichever is greater at 10,000 ft MSL at Max Endurance		
5. MIN LANDING	3,000 lbs. (Always required) If it is determined that the aircraft will land with less than this amount, a fuel emergency exists and ATC must be informed. This entry is separate from required reserve. **(T-3)**		
6. IDENTIFIED EXTRA	*Wing Relieving Fuel* Additional fuel kept in the main tanks intended to counter wing bending moments and keep the aircraft within flight manual weight limitations. Calculate Wing Relieving Fuel using the flight manual to ensure **10. RECOVERY FUEL** does not fall below the fuel required to remain within limits.		
	Depressurization Fuel Additional fuel burned from ETP to First Suitable Airfield, with 30 minutes of extra fuel burned at 10,000ft. Calculate using extra fuel burned at Four-Engine Long Range Cruise Fuel Flow at 10,000 ft MSL. Plan on burning all other fuel except **10. RECOVERY FUEL**.. (See Figure 12.4) If **5. MIN LANDING** + Wing Relieving Fuel + Depressurization Fuel (0+30) + High Altitude Burn (from takeoff to ETP) + Low Altitude Burn (from ETP to FSAF) is less than Required Ramp Fuel then no extra fuel is needed. If **5. MIN LANDING** + Wing Relieving Fuel + Depressurization Fuel (0+30) + High Altitude Burn (from takeoff to ETP) + Low Altitude Burn (from ETP to FSAF) is greater than Required Ramp Fuel, then extra fuel is required.		
	Weather Avoidance 1,500 lbs if forecast thunderstorms are scattered or numerous along the route of flight		
	Tankered Fuel Fuel for succeeding legs without refueling (only if required for next sortie (ERCC). If tankered fuel is not required, it may be included as **9. UNIDENTIFIED EXTRA**).		
	Icing		

	1,000 lbs if the route of flight has known or forecast icing conditions.
7. REQUIRED RAMP (RRFL)	Required Ramp Fuel Load (RRFL). Minimum fuel required at engine start to complete tasked mission. Calculate by adding **1. ENROUTE** , **2. HOLDING** , **3. ALTERNATE & MAP**, **4. RESERVE**, **5. MIN LANDING** and **6. IDENT EXTRA**
8. ACTUAL RAMP	Actual ramp fuel load.
9. UNIDENTIFIED EXTRA	Difference between **7. REQUIRED RAMP** and **8. ACTUAL RAMP**
10. RECOVERY FUEL	The minimum planned landing fuel at intended destination. This is the sum of the **3. ALTERNATE & MAP** **4. RESERVE**, **5. MIN LANDING**, and Wing Relieving Fuel (if required). This fuel is critical to calculating accurate Continuation Fuels for each leg; it must be updated in the Premission Configuration screen of the CFP. This value should be set in the CNI-MU on the PERF INIT WEIGHT page under FIXED (Defined in T.O. as "Reserve Fuel").

Figure 12.2. AC-130J Fuel Planning Worksheet.

	Ramp Gross Weight					
	Initial Cruise Altitude					
	Temp Deviation					
				Manual Flight Plan Calc for Enroute Fuel		
1	Enroute Fuel		1.1	STTO (norm 800 lbs)		
2	Enroute Reserve		1.2	Climb		
3	Alternate and MAP		1.3	Cruise (ETE*FF)	ETE FF	
4	Holding In-Lieu (2+00)		1.4	Approach (norm 700 lbs)		
5	Min Landing (3,000)		1.5	Enroute Fuel (1.1+1.2+1.3+1.4)		
6	Identified Extra			**Depressurization Fuel Planning**		
6.1	Wing Relieving Fuel					
6.2	Depressurization Fuel		A	Min Landing (3,000)		
6.3	Weather Avoidance		B	Depressurization Reserve (0+30)		
6.4	Tankered Fuel		C	Wing Relieving Fuel (if req'd)		
6.5	Icing		D	High Altitude Fuel Burn from takeoff to ETP		
7	Required Ramp Fuel Load (1+2+3+4+5+6)		E	Low Altitude Fuel Burn From ETP to FSAF, 10K MSL, LRC		
8	Actual Ramp		F	Total Required (A+B+C+D+E)		
9	Unidentified Extra (8-7)		G	Normal Mission Fuel (block 7)		
10	Recovery Fuel (3+4+5+6.1)		H	Depressurization Fuel (F minus G) Zero if negative, move to block 6.2		

12.6. Air to Air Refueling Fuel Planning Procedures. When the mission includes in-flight refueling (single or double A/R), crews should use the AFSOC Form 4139 in conjunction with the approved CFP to perform the fuel analysis. With the exception of those items identified on the Form 4139, all items are outlined in **Figure 12.1**. AC-130J Fuel Load Requirements.

12.6.1. Abort Fuel Planning. An abort base is required for all refueling tracks. The departure base may be used. The designated abort base must meet alternate airfield weather requirements IAW AFMAN 11-202, Vol 3. All route segments, which include an in-flight refueling, should be planned with sufficient fuel onboard to fly from the departure airfield or previous end air refueling point (EAR) to an EAR point, and if required, divert so as to arrive overhead the abort airfield with sufficient fuel to hold, accomplish a descent/approach and land with

required recovery fuel (Item 10) without receiving an on-load. **Note:** Air refueling divert entries and fuel on-loads should be entered in the EAR waypoint line.

12.6.2. If AAR is required, multiple iterations of the flight plan will need to be printed. A singular flight plan for every segment of the flight (i.e., “T/O to EAR #1 to DVT”, “ARIP #1 to EAR #1 to Dest”) will be needed. In order to get accurate continuation fuel on the CFP, use the following example. **(T-3)**

12.6.2.1. The initial segment flight plan will include all waypoints from takeoff through the Air-to-Air Refueling Exit Point (AREP), then routing to the A/R #1 Abort Base. **(T-3)**

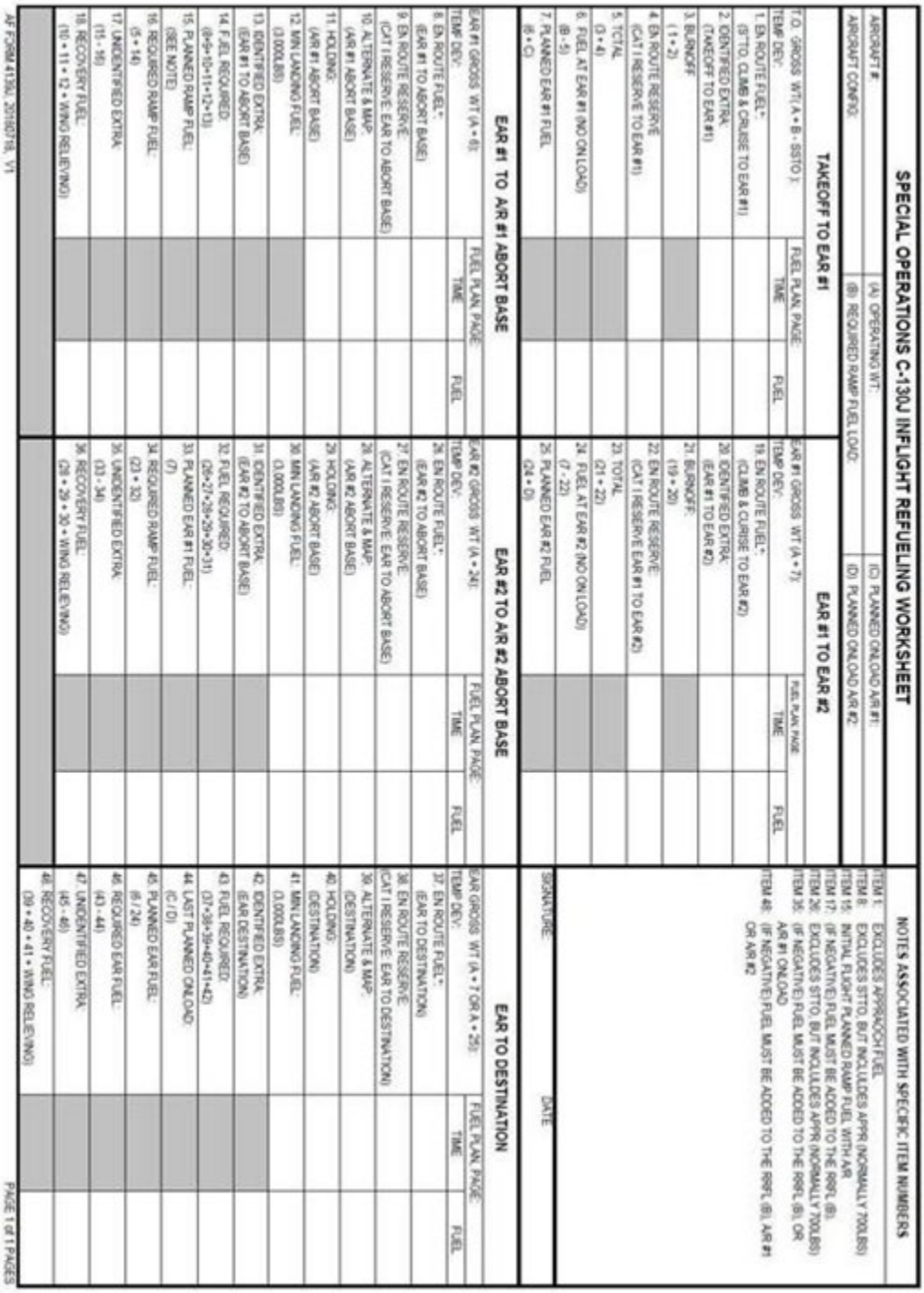
12.6.2.2. Do not include any tanker onloads on this flight plan.

12.6.2.3. Create a second flight plan starting with the Air-To-Air Refueling Initial Point (ARIP). This flight plan will include all waypoints from the ARIP through the destination. **(T-3)**

12.6.2.3.1. Include a tanker onload at the AREP.

12.6.2.4. Perform similar iterations if more than one AAR is required.

Figure 12.3. Inflight Refueling Worksheet.



SPECIAL OPERATIONS C-130J INFLIGHT REFUELING WORKSHEET

AIRCRAFT #:
(A) OPERATING WT:
(B) REQUIRED RAMP FUEL LOAD:
(C) PLANNED ONLOAD AR #1:
(D) PLANNED ONLOAD AR #2:
AIRCRAFT CONFIG:

NOTES ASSOCIATED WITH SPECIFIC ITEM NUMBERS

ITEM 1: EXCLUDES APPROACH FUEL
ITEM 8: EXCLUDES SITTO, BUT INCLUDES APPR (NORMALLY 700LBS)
ITEM 15: INITIAL FLIGHT PLANNED RAMP FUEL WITH AR
ITEM 17: (IF NEGATIVE) FUEL MUST BE ADDED TO THE RRFL (B)
ITEM 26: EXCLUDES SITTO, BUT INCLUDES APPR (NORMALLY 700LBS)
ITEM 35: (IF NEGATIVE) FUEL MUST BE ADDED TO THE RRFL (B), OR AR #1 ONLOAD
ITEM 48: (IF NEGATIVE) FUEL MUST BE ADDED TO THE RRFL (B), AR #1 OR AR #2

TAKEOFF TO EAR #1			EAR #1 TO EAR #2			
T.O. GROSS WT (A + B - SSTO):	FUEL PLAN. PAGE: TIME	FUEL	EAR #1 GROSS WT (A + 7):	FUEL PLAN. PAGE: TIME	FUEL	
TEMP DEV:			TEMP DEV:			
1. EN ROUTE FUEL*: (SITTO, CLIMB & CRUISE TO EAR #1)			19. EN ROUTE FUEL*: (CLIMB & CURISE TO EAR #2)			
2. IDENTIFIED EXTRA: (TAKEOFF TO EAR #1)			20. IDENTIFIED EXTRA: (EAR #1 TO EAR #2)			
3. BURNOFF (1 + 2)			21. BURNOFF: (19 + 20)			
4. EN ROUTE RESERVE (CAT I RESERVE TO EAR #1)			22. EN ROUTE RESERVE: (CAT I RESERVE EAR #1 TO EAR #2)			
5. TOTAL (3 + 4)			23. TOTAL (21 + 22)			
6. FUEL AT EAR #1 (NO ONLOAD) (B - 5)			24. FUEL AT EAR #2 (NO ONLOAD) (7 - 22)			
7. PLANNED EAR #1 FUEL (6 + C)			25. PLANNED EAR #2 FUEL (24 + D)			

EAR #1 TO AR #1 ABORT BASE			EAR #2 TO AR #2 ABORT BASE			EAR TO DESTINATION		
EAR #1 GROSS WT (A + 6):	FUEL PLAN. PAGE: TIME	FUEL	EAR #2 GROSS WT (A + 24):	FUEL PLAN. PAGE: TIME	FUEL	EAR GROSS WT (A + 7 OR A + 25):	FUEL PLAN. PAGE: TIME	FUEL
TEMP DEV:			TEMP DEV:			TEMP DEV:		
8. EN ROUTE FUEL*: (EAR #1 TO ABORT BASE)			26. EN ROUTE FUEL*: (EAR #2 TO ABORT BASE)			37. EN ROUTE FUEL*: (EAR TO DESTINATION)		
9. EN ROUTE RESERVE: (CAT I RESERVE: EAR TO ABORT BASE)			27. EN ROUTE RESERVE: (CAT I RESERVE: EAR TO ABORT BASE)			38. EN ROUTE RESERVE: (CAT I RESERVE: EAR TO DESTINATION)		
10. ALTERNATE & MAP: (AR #1 ABORT BASE)			28. ALTERNATE & MAP: (AR #2 ABORT BASE)			39. ALTERNATE & MAP: (DESTINATION)		
11. HOLDING: (AR #1 ABORT BASE)			29. HOLDING: (AR #2 ABORT BASE)			40. HOLDING: (DESTINATION)		
12. MIN LANDING FUEL: (3,000LBS)			30. MIN LANDING FUEL: (3,000LBS)			41. MIN LANDING FUEL: (3,000LBS)		
13. IDENTIFIED EXTRA: (EAR #1 TO ABORT BASE)			31. IDENTIFIED EXTRA: (EAR #2 TO ABORT BASE)			42. IDENTIFIED EXTRA: (EAR DESTINATION)		
14. FUEL REQUIRED: (6+9+10+11+12+13)			32. FUEL REQUIRED: (26+27+28+29+30+31)			43. FUEL REQUIRED: (37+38+39+40+41+42)		
15. PLANNED RAMP FUEL: (SEE NOTE)			33. PLANNED EAR #1 FUEL: (7)			44. LAST PLANNED ONLOAD: (C / D)		
16. REQUIRED RAMP FUEL: (5 + 14)			34. REQUIRED RAMP FUEL: (23 + 32)			45. PLANNED EAR FUEL: (6 / 24)		
17. UNIDENTIFIED EXTRA: (15 - 16)			35. UNIDENTIFIED EXTRA: (33 - 34)			46. REQUIRED EAR FUEL: (43 - 44)		
18. RECOVERY FUEL: (10 + 11 + 12 + WING RELIEVING)			36. RECOVERY FUEL: (28 + 29 + 30 + WING RELIEVING)			47. UNIDENTIFIED EXTRA: (45 - 46)		
						48. RECOVERY FUEL: (39 + 40 + 41 + WING RELIEVING)		

SIGNATURE: DATE

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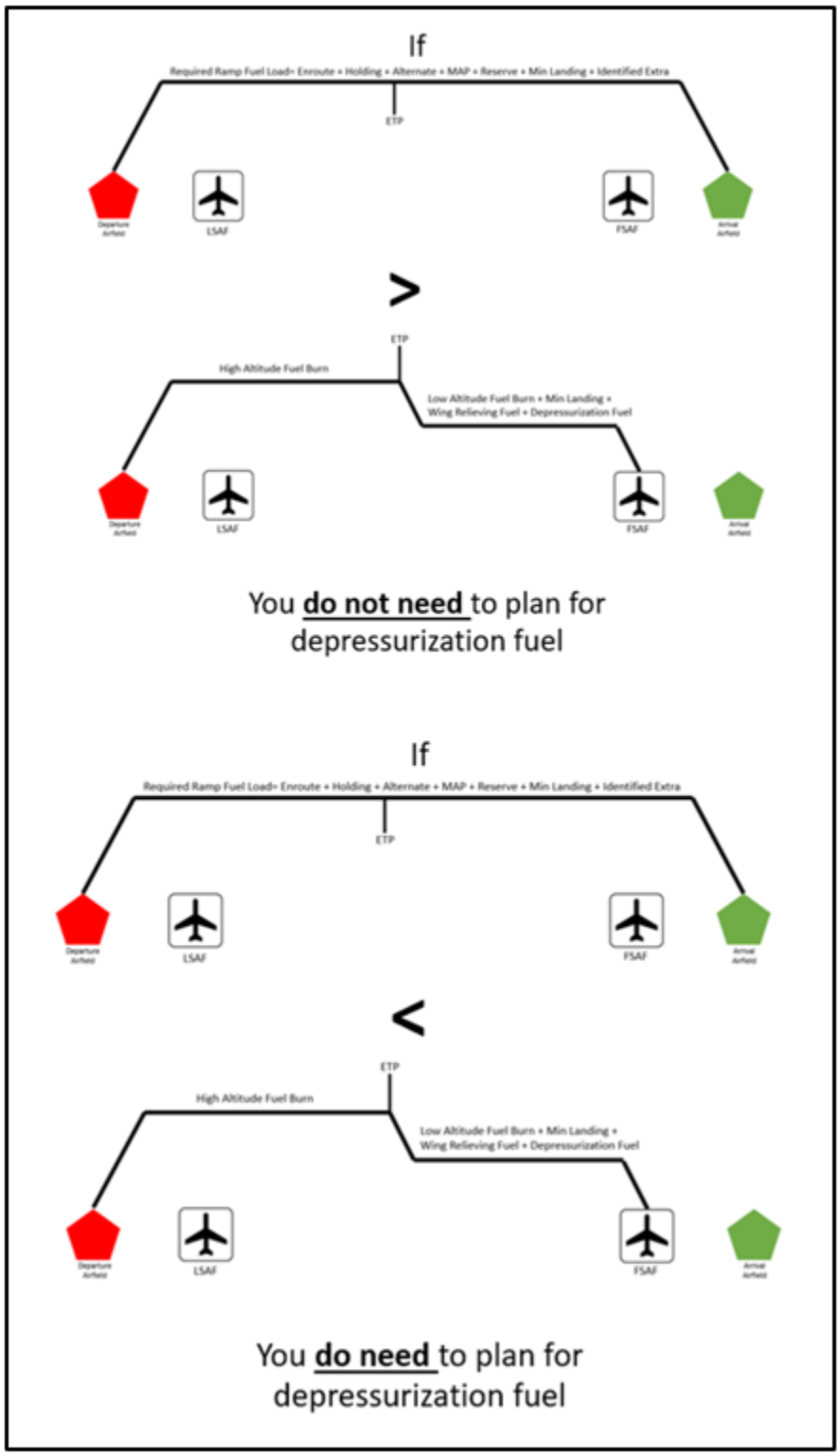
Figure 12.4. Depressurization Fuel.



Chapter 13

AERIAL GUNNER PROCEDURES

13.1. General. In addition to the duties established in applicable TOs and other directives, the AG will comply with the procedures and duties in this regulation. The PIC may assign other duties as necessary. The AG will: **(T-2)**

13.1.1. Conduct aircraft and weapon system pre-flights, plan loads; handle MEPs; supervise loading, tiedown, and offloading of ammunition, markers, flares, cargo, baggage, and mission equipment. When MX personnel are not available, may perform ground refueling. **(T-2)**

13.1.2. Perform scanner duties during flight in high threat environments. Identify threats directed toward the aircraft, operate defensive equipment, and direct defensive maneuvers when required. **(T-2)**

13.1.3. Possess a thorough knowledge of aircraft and weapon systems and component locations. Inform the crew of malfunctions and systems affected by battle damage. Assist with in-flight emergencies and accomplish recommended corrective actions to isolate malfunctions. **(T-2)**

13.2. Pre-flight Operations.

13.2.1. Prior to the crew briefing, AGs will: **(T-2)**

13.2.1.1. Acquire ammunition load for the mission to be flown and calculate NEW.

13.2.1.2. Coordinate individual duties to be performed prior to, during, and after the mission. On live-fire missions, AGs should review and assign duties from the amplified prestrike and poststrike checklists and applicable weapons malfunctions contained in TO 1C- 130(A)J-1.

13.2.2. 30mm and 105mm Gun safe and clearing procedures during ground operations. If either gun is not safe and clear upon initial inspection, cease any ongoing operations and return the gun to weapons/ammunition personnel. **(T-2)**

13.3. Ordnance Loading/Downloading.

13.3.1. Ordnance Loading/Downloading. Weapons/Ammunition personnel will normally perform ordnance loading/downloading. When required, qualified AGs (or unqualified AG under the supervision of a qualified Instructor AG) are the only crewmembers qualified to handle munitions. **(T-2)**

13.3.2. If required, AG will coordinate with munitions personnel for delivery to the aircraft. Only qualified personnel will assist in loading all munitions. Use appropriate checklists in TO 1C-130(A)J-1. **(T-2)**

13.3.3. Two Engine shutdown for ordnance loading/downloading checklist will be utilized when downloading spent casings. Brass only or combat aircraft parking area (CAPA) compliant download may be accomplished in normal parking with engines shutdown.

13.3.4. Maintenance operations and ordnance loading/downloading operations will not be performed simultaneously on the aircraft. **(T-3)** If approved, the PIC is responsible for deconflicting operations with maintenance and maintaining safety procedures.

13.3.5. The AG will ensure the area is clear of non-essential personnel before starting the ordnance loading/downloading and will continue to monitor the area while ordnance loading/downloading is in progress. Aircrew members not directly involved in the ordnance loading/downloading, aircraft crew chiefs, and quality assurance/safety inspectors may remain with the aircraft on a non-interference basis. **(T-2)**

13.3.5.1. Ammunition Rejection Criteria:

13.3.5.1.1. Any gap between fuze and projectile, fuze loose;

13.3.5.1.2. Fuze ogive (fuze windshield) damaged to extent shape is altered (**Note:** Loose windshield does not constitute a defect);

13.3.5.1.3. Projectile loose: Excessive lateral movement so projectile can be easily pulled from case by hand;

13.3.5.1.4. Missing or improper crimp. Crimp of cartridge case deformed or torn;

13.3.5.1.5. Projectile cracked;

13.3.5.1.6. Cuts on the rotating band across the full width of the band and below the surface of the projectile body;

13.3.5.1.7. Rust or corrosion to the stage of pitting on cases or rotating band (**Note:** 105MM cases may be discolored; these cases are discolored during manufacture and are not to be considered defective.);

13.3.5.1.8. Cartridge cases deeply dented (1/4 inch or more), split or cracked (105mm) Dents greater than 1/16 inch in depth or 1/4 inch in length, split or cracked (30mm);

13.3.5.1.9. Primer above flush, dented, damaged, or missing.

13.3.6. A 150 lb fire extinguisher will be positioned near the aircraft for loading/downloading of any ordnance. Aircraft chocks and ground wire will be installed prior to the start of any ordnance loading/downloading operations. **(T-2)**

13.3.7. At least one AG will remain in the aircraft during ordnance loading/downloading and one AG will remain on interphone during ammo upload/download with engines running. **(T- 2)**

13.3.8. Ordnance will not be removed from the storage containers until they are in place for loading. 30MM ammunition and CLTs will be transported to/from the aircraft in storage containers. **(T-2)**

13.3.9. For nighttime operations in permissive areas, the aircraft interior lights will be on and set to bright white. Cargo loading lights may be turned on and positioned to provide maximum lighting for the up/download operation. Ensure the position of the loading lights will not blind the ammunition trailer driver during approach to the aircraft. It is the responsibility of the Lead Gun to ensure adequate lighting is available to conduct up/download operations. **(T-2)**

13.3.10. The armament placard will be annotated to reflect quantity, type, and location for all internal munitions, or cleared, as applicable. **(T-2)**

13.3.11. Ensure a FOD check is accomplished under the aircraft and in the loading area when loading or downloading is complete. **(T-2)**

13.3.12. Two Engine Shutdown Procedures:

13.3.12.1. Normally the designated loadmaster will be in position to marshal in the munitions handling equipment and operate the 150lb fire extinguisher. The 30mm gunner will load the ammo in the 105mm rack. The 105mm gunner will be positioned in the right paratroop door to receive and inspect rounds. The lead gunner will be in a position to monitor the upload/download.

13.3.12.2. The aircraft commander will park the aircraft in the designated area, complete the Two-Engine Shutdown for Ordnance Loading/Downloading checklist, and give clearance to up/ download munitions to the lead gunner.

13.3.12.3. The lead gunner or designated representative will remain on headset during ordnance loading/downloading operations.

13.3.12.4. Prior to allowing the ammunition trailer to approach the right paratroop door the lead gunner will ensure all non-essential personnel are clear of the loading area, the gunners are in position, and the lead gunner is ready to begin loading.

13.3.12.5. The gunners will meet the munitions vehicle and perform handling and transfer of munitions and hand launched markers onboard the aircraft. To prevent damage to the aircraft, a gunner will be in position inside the aircraft to marshal each trailer into position.

13.3.12.6. The 105MM ammunition trailer will be positioned at the right paratroop door by munitions personnel. 105MM ammunition will be up/downloaded through the right paratroop door only. 105MM clearing rounds, 30mm ammunition, and marine markers may be up/downloaded through either the right paratroop door or the aft cargo ramp.

13.3.12.7. Ammunition will not be removed from the ammunition cans until the cans are in place for loading.

13.3.12.8. The lead gunner will inform the pilot that up/download is in progress when the first ammunition trailer is positioned at the aircraft.

13.3.12.9. The lead gunner or designated representative will ensure a foreign object check is accomplished under the aircraft and in the loading area when up/downloading is complete.

13.3.12.10. The lead gunner will not call munitions up/download complete until all ammunition has been up/downloaded and munitions handling equipment removed from the aircraft.

13.3.12.11. Accomplish the Engine Start after Ordnance Loading/Downloading checklist and resume normal operations.

13.3.13. Ordnance Accountability**.** A specified amount of ordnance will be delivered to the gunship prior to each live-fire mission. After the live-fire portion is complete, the lead gunner will ensure all weapons are safe and clear, and inspect all ammunition racks, containers, and compartments. Return live ordnance and empty casings to munitions personnel as mission requirements dictate.

13.3.13.1. Loaded aircraft off station where there are no munitions personnel may be downloaded/cross loaded due to mission requirements. Munitions will only be downloaded/cross loaded by qualified aircrew members. This procedure will only be

performed with the approval of the mission commander and under the supervision of the lead gunner.

13.3.13.2. The lead gunner will ensure all munitions have been expended and are free of explosives prior to returning to aircraft parking.

13.4. Ammunition Handling System (AHS) Loading/Downloading.

13.4.1. AG will inspect 30mm ammunition for serviceability and proper linking during ammunition loading, reject any unusable rounds and return to Weapons/Ammunition personnel as soon as practical. Ammunition loaded into the AHS by Weapons/Ammunition personnel does not require inspection by the AG, but will be monitored during live-fire for signs of un-serviceability and improper linking. **(T-2) CAUTION:** Un-serviceable and improperly linked ammunition may cause 30mm gun malfunctions/jams.

13.4.2. At no time will any object be passed over open 30mm ammunition cans containing live rounds. **(T-2)**

13.4.3. AGs should not load more than 270 rounds into a single ammunition bin and associated feed chute.

13.4.4. AGs will ensure that there is one empty 30mm ammunition canister with foam inside prior to flight. This ammunition canister will be used to stow any misfired or unserviceable 30mm ammunition. **(T-2)**

13.4.5. AGs may load rounds into the flexible feed chutes, but rounds will not be loaded into the hard chutes attached to the 30mm gun feeder or the gun until cleared by the PIC to put the gun on-line during the pre-strike checklist or AHS in-flight loading checklist. **(T-2) CAUTION:** When loading the upper feed of the 30mm gun, ensure the leading link of the 30mm ammunition has a properly seated round. If the leading link is empty remove the empty link prior to loading rounds into the feeder. **(T-2)**

13.4.6. AGs should not normally load dissimilar ammunition into a single ammunition bin.

13.5. In-flight Gun Operations.

13.5.1. AGs should make every effort to keep the area inside the dunnage corral around the 30mm gun clear of spent casings, links, and any other obstructions. An excessive amount of spent casings and links may cause a trainable gun mount failure.

13.5.2. Additional ammunition stowed on the floor will be secured unless actively re-loading and dunnage bags should be secured, when practical, as they become full. **(T-2)** ***WARNING****:* Do not stow full dunnage bags in a manner that they will obstruct the side emergency exit after landing. **(T-2)**

13.5.3. Ordnance Accountability. After the live-fire portion is complete, the AG will ensure all weapons are safe and clear and inspect all ammunition containers and the immediate vicinity of the gun to ensure all rounds are accounted for. **(T-2)**

13.5.3.1. Annotate in the aircraft forms with an “info note” that lists the number of rounds fired from the 30mm gun’s upper and lower feeds, 105mm gun, expended CLT positions, and expended wing stores positions. The number of misfired ordnance should also be annotated with an associated location. Initial and final rounds count for 30mm gun will be

annotated. Return live ordnance and empty casings to munitions personnel as mission requirements dictate. **(T-2)**

13.5.3.2. Linked 30mm ammunition may be left in the AHS provided no rounds extend past the flexible feed chutes into the hard chutes. Place all un-linked 30mm rounds, regardless of serviceability, in an empty ammunition can. If possible, place serviceable and unserviceable rounds in separate ammunition cans. Serviceable rounds may be re-linked and placed in AHS. **(T-2)**

13.5.4. Lanyard Firing. Lanyard firing of the 105MM has inherent risks with decreased safety margins. Lanyard firing may be utilized for specified employment situations when normal modes of fire are not available. The crew will thoroughly brief procedures prior to any lanyard firing. For pre-planned lanyard firing training, procedures will be reviewed during the pre-mission crew brief. ***WARNING:*** Failure to properly execute lanyard firing can result in loss of life or injury to ground personnel, and/or off range expenditure.

13.5.4.1. Specified Lanyard Fire Missions. Lanyard fire may be used for all contingency/combat missions and directed missions such as multi-lateral exercises, joint readiness exercises, and ORI. During training missions lanyard fire may be used, at the discretion of the aircraft commander, to meet syllabus requirements, familiarize crewmembers with procedures, or ensure crew proficiency. If lanyard fire is the only method available due to electrical firing malfunction, crews will fire the minimum number of rounds required to meet mission objectives and then return the weapon for maintenance.

13.5.4.2. If in the opinion of the lead gun this procedure cannot be safely accomplished, the lead gun will notify the pilot. The following factors should be considered, but are not limited to: crew experience levels, cargo compartment lighting, student training, other weapons malfunctions, air turbulence, and time available.

13.5.4.3. The 105MM gun will be minimum safe prior to attaching the lanyard. **(T-2)**

13.5.4.4. The lead gunner will ensure the following items and procedures in **paragraph 13.5.4.5** are briefed/accomplished prior to lanyard firing operations:

13.5.4.4.1. All calls will be made on MAIN interphone. If any crewmember identifies an unsafe condition, they will call “CEASE FIRE.”

13.5.4.4.2. The WSO/CSO will NOT depress the trigger at any time.

13.5.4.4.3. WSO/CSO Arm/Inhibit Switch will remain INHIBIT.

13.5.4.4.4. Aerial Gunner’s weapon enable switch will be set to SAFE.

13.5.4.5. Lanyard fire execution. After completion of the above steps proceed as follows:

13.5.4.5.1. Pilot: "Lead Gun, Pilot, configure Gun 2 for Lanyard Fire."

13.5.4.5.2. Guns: “Pilot, Lead Gun, Gun 2 configured for Lanyard Fire.”

13.5.4.5.3. WSO/CSO: “Crew, WSO, Gun 2, Trainable, Lanyard Fire, 105 round type, 090 (bearing), 350 meters (distance) from (nearest friendly ID), , WSO Ready”.

13.5.4.5.4. WSO/CSO (non-shooter): “Nearest NO STRIKE 320 (bearing), 400 meters (distance), CSO confirms”.

13.5.4.5.5. CP: “Co-pilot confirms”.

13.5.4.5.6. Guns: “Gun Ready, Round Type, Lanyard fire.” ***WARNING:*** The gun being lanyard-fired must be outside the pressure cut-out and within the trainable box before the “Ready, Ready, Pull” call is made. ***WARNING:*** Do not fire when gun is on or near the mechanical stops. **Note:** The gunner working the GCP will control gun operation and pull the 105MM lanyard.

13.5.4.5.7. Pilot: When on geometry, and inside the trainable box the Pilot will provide consent via a verbal “STABLE” call for the first round, subsequent “STABLE” calls may be made as required.

13.5.4.5.8. WSO/CSO: “Guns, WSO, Ready, Ready, Pull”.

13.5.4.5.9. After the first round the Gunners will state “Gun Ready” if the round type remains the same or “Gun Ready, Round Type” if the round type changes. The WSO/CSO will then state “Guns, WSO/CSO, Ready, Ready, Pull”. The pilot will state “Standby Gun 2” if at any time they need to apply a correction that will take the weapon outside of the trainable box, followed by “STABLE” when corrected.

13.5.4.5.10. Repeat procedure from Gun Ready call until engagement complete.

13.5.4.5.11. Upon completion of engagement WSO/CSO will state "Rounds complete, Gun 2 Safe and Fixed" at which time the gun will be returned to at least the min safe configuration.

13.5.4.6. Dual target attack is not authorized (except combat/contingency). **(T-2)**

13.6. Emergency Exits and Safety Aisles. Maintain emergency exits and safety aisles IAW appropriate configuration/mission planning guide. **(T-2)**

13.7. Cargo Loading/Downloading.

13.7.1. The AG is responsible for aircraft preflight; load planning; preparation of DD Form 365-4, operation of aircraft equipment; supervision and direction of loading, offloading, tiedown, and coordination with loading crew supervisor for checking the cargo against manifests. The AG is responsible for safe movement of cargo into and out of the aircraft.

13.7.2. Cargo will be loaded and restrained utilizing guidance from TO 1C-130(A)J-9, *Cargo Loading Manual*. **(T-2)**

13.7.3. At stations where aircraft tiedown equipment is exchanged, make every effort to ensure that a one-for-one exchange occurs. If this is not possible, the AG will inform the PIC of lost or missing equipment, make an AFTO Form 781 entry for the discrepancy and annotate missing items on the AFSOC Form 31, *Aircraft -21 Equipment Inventory.* **(T-2)**

13.8. Passenger Handling.

13.8.1. Space-available passengers will not be transported on AC-130 aircraft. **(T-2)**

13.8.2. Do not allow passengers to lounge on or tamper with equipment, cargo, or baggage. **(T-2)**

13.8.3. The AG will ensure MEPs are properly manifested on the DD Form 2131 or suitable substitute. Give one copy of the manifest to the PIC for filing with the flight plan and retain

sufficient copies for border clearance. The AG will complete anti-hijacking requirements. **(T- 2)**

13.9. Border Clearance. Customs, Immigration, and Agriculture require certain forms for border clearance. The AG will ensure that required forms are contained in the aircraft mission kit, distribute the forms to the crew and ensure their completion prior to landing, and deliver them to the proper persons. Also comply with the requirements of this publication. **(T-2)**

13.10. Weight and Balance. Accomplish weight and balance for the aircraft IAW TO 1-1B-50, *Aircraft Weight and Balance*, and this publication. A basic handbook of weight and balance, TO 1-1B-50*,* 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 and may not contain TO 1-1B-50 if a certified copy of Chart C provides the current basic weight, basic moment, and basic index. The binder will include, the applicable TO 1C-130(M)J-5, *Basic Weight Checklist and Loading Data*. Also maintain the appropriate Aircraft Configuration / Mission Planning Guide in each binder. **(T-2)**

13.10.1. Compute weight and balance by using the CNI-MU and also by the Chart E mathematical (moments) method IAW applicable *Configuration/Mission Planning* Instruction, and applicable TO 1C-130(M)J-5. **(T-2)**

13.10.2. 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. **(T-2)**

13.11. Pyrotechnics.

13.11.1. This section provides information in preparation for launching pyrotechnics. Reference: TO 11A10-25-7, *Work Package, Specialized Storage and Maintenance Procedures, Pyrotechnic Markers*, and TO 11A10-26-7, *Storage and Maintenance Procedures – Pyrotechnic Signals*.

13.11.2. Hazards. In general, pyrotechnics contain materials of a hazardous nature. Even though each of the ingredients in a pyrotechnic composition may be relatively stable within itself, it may react with one or more of the other materials to cause deterioration and create an even greater hazard. Pyrotechnics are more dangerous than many other types of ammunition because they are more easily activated. These items should not be handled roughly or exposed to moisture. When subjected to fire, most pyrotechnics burn with intense heat.

13.11.2.1. Toxic Hazards. Many chemicals used in pyrotechnic devices are poisonous if taken internally. This also applies to the residues of burned pyrotechnics. From the inhalation standpoint, the products of pyrotechnic devices and smoke generators present a serious problem. Although most of the smoke and fumes given off by pyrotechnics are considered nontoxic, heavy concentrations in closely confined spaces are dangerous and may be lethal, as they reduce the amount of available oxygen in the air.

13.11.2.2. Handling. Besides the hazardous basic compositions, pyrotechnics contain sensitive elements such as fuses, friction compositions, and primers. Pyrotechnics should be handled with care and protected against moisture, shock, friction, or heat. Care should be taken to avoid premature ignition or damage that may cause failure when fired. Boxes containing pyrotechnics should not be dropped or thrown. Protective or safety devices

should not be removed until just before use. Care should be taken to avoid damage to fiber cases and ripcords located outside the casing of flares. Pyrotechnics should be handled so as to avoid denting or deforming the barrel or case. Do not use pyrotechnics which are dented, deformed, cracked, broken, or have signs of advanced rust, or have shipping covers with an illegible lot number, manufacture date, or other required identifying information. Pyrotechnics will be handled only under the supervision of a competent, qualified person. Most pyrotechnics burn with intense heat; therefore, personnel should be adequately prepared to handle an emergency situation (e.g., heat resistant gloves and broom). **(T-2)**

13.11.3. Storage. Units which have a requirement for storing pyrotechnics will obtain a license from the host base. **(T-2)**

13.11.4. Issue Procedures. Pyrotechnics which have been issued for training purposes will be marked in bold capital letters with the word "TRAINING". These pyrotechnics will always be stored separately from operational stock within storage areas. **(T-2)**

13.11.5. Safety. All of the pyrotechnics described contain combustible chemicals which, when ignited, generate a flame or smoke (or combination of both) for a broad variety of purposes. These purposes include visual signaling, area or target illumination, and point marking. Most are intended to burn with intense heat.

13.11.5.1. Initiation Mechanism. Pyrotechnic devices normally are equipped with some type of safety pin, lock, or tape designed to prevent accidental activation of the initiation mechanism. Any pyrotechnic that shows sign of damage to safety features is considered unserviceable and must be carefully segregated for prompt disposition by EOD. **(T-2)**

13.11.5.2. Accidental Initiation. If a pyrotechnic device should be accidentally ignited, in all cases its functioning will result in a fire hazard. The gases generated by this combustion could present a serious toxic hazard. Signaling devices containing propellant charges create an extremely dangerous missile hazard if accidentally ignited.

13.11.5.3. Fighting Pyrotechnic Fires. Pyrotechnic compositions characteristically contain their own oxidants, and therefore do not depend upon atmospheric oxygen for combustion. For this reason, excluding air from a pyrotechnic fire usually is ineffective. Many pyrotechnic mixtures, particularly illuminating flare compositions, burn with intense heat up to 4,500 degrees F. Normally, available extinguishers are of little or no value in fires of this kind, and in addition, may produce toxic or poisonous gases. Crewmembers in immediate vicinity of pyrotechnics that have caught fire should work to remove the pyrotechnics from the immediate vicinity by any means necessary (e.g., Broom/broomstick and/or heat resistant gloves).

13.11.5.4. Safe Altitudes and Distances. Flares not entirely burned out and cooled when they land may ignite combustible material. Safe altitudes and distances depend upon the burning time, rate of descent, and drift of the flare. Such factors will be considered in determining minimum altitudes and distances of release. Signal flares are also a potential fire hazard when the parachute fails to support the signal properly. **(T-2)** ***CAUTION:*** Flares will not be launched over areas subject to fire except in an extreme emergency. If such an emergency exists, flares should be dropped from sufficient altitude to allow complete burnout before hitting the surface. **(T-2)**

13.11.5.5. Reporting Instructions. Prepare instructions for mishaps, accidents, and incidents IAW DAFI 91-204, *Safety Investigations and Reports*. Prepare unsatisfactory reports IAW TO 00-35D-54, *USAF Material Deficiency Reporting and Investigating System*. **(T-2)**

13.11.6. Launching Instructions. Gunship jettison locations are determined by the type of pyrotechnic launched.

13.11.6.1. Personnel launching pyrotechnics through open doors or hatches will wear a restraint harness (secured to the aircraft) or parachute and will have heat resistant gloves and a broom or wood stick readily available in case of fire. Nomex gloves will be worn when deploying pyrotechnics. **(T-2)**

13.11.7. Pyrotechnics Description and Operation:

13.11.7.1. MK-25 MOD 3; Marker, Location Marine:

13.11.7.1.1. Description. This marker was designed for day or night use for all surface reference point marking purposes. It emits white smoke and yellow flame for 13 to 18 minutes.

13.11.7.1.2. Operation. To activate the marker, the base plate must be rotated from the safe to the armed position to allow the battery cavity ports to be opened. The ports are opened by pressing the two brass colored port plugs into the battery cavity using the thumb and forefinger. A one-pound force is required for plug removal. This device is considered to be a sealed unit until its base plugs (one or both) have been pushed in. Do not push in the port plugs until immediately prior to jettisoning the mark. If a MK 25 must be retained inside the aircraft and the port plugs have not been pushed in, rotate the base plate to the safe position and return it to its package. The MK 25 will not be retained inside the aircraft after the port plugs have been pushed in. **(T-2)** ***WARNING:*** The nose end of this marker must be kept out of line with the body or with other personnel at all times. If marker is initiated, the nose plug is expelled with considerable force creating a missile hazard. **(T-2)**

13.11.7.1.3. Special Precautions. This marker may be converted for use in fresh water by adding one tablespoon of table salt through the base plugs. Only press in one port plug when adding salt. **(T-2)** ***WARNING:*** Personnel launching MK 25 markers with salt added will wear a helmet and adequate eye protection. **(T-2)** ***WARNING:*** Converted markers must be used after adding salt. They must not be returned to storage. If not used, they must be jettisoned in-flight, overwater. **(T-2)** ***WARNING****:* Be sure salt is not exposed to moisture before and during the conversion process, as moist salt may cause marker to ignite. **(T-2)** ***CAUTION****:* Packaged flares dropped in excess of 6 ft. or unpacked flares dropped in excess of 3 ft. must be considered unserviceable. **(T-2)** **Note:** Converted markers will not perform as reliably in fresh water as unconverted markers in sea water.

13.11.7.1.4. MK 25 Launch Preparation Procedures. Position two MK 25 markers near the jettison location. **(T-2)** ***WARNING:*** Do not remove more than 4 marks at a time from the storage container. **(T-2)** ***WARNING:*** There is no electrical interrupt in the battery of the MK 25. The battery may activate when exposed to salt laden moisture in the least amount (i.e., sweat, moist salt air). Do not push in the port plugs until

immediately prior to jettisoning the mark. The MK 25 will not be retained inside the aircraft after rotating the base plate from the SAFE position and pushing the port plugs in. **(T-2)** ***WARNING:*** Jettison MK 25 markers only from the following locations: available troop door, round jettison port or aft cargo door and/or ramp. At no time will any object be jettisoned out of any other location. **(T-2)**

13.11.8. All marks will be launched on command of the pilot flying using the procedures described in this publication **(T-2)**

13.12. Mission Equipment Requirements. The AG(s) will ensure the following equipment is aboard the aircraft when required for off-station missions.

13.12.1. Miscellaneous supplies. AGs will ensure that sufficient quantities of airsickness bags, earplugs, insecticide are carried as mission dictates. **(T-2)**

13.12.2. Miscellaneous equipment. AGs will ensure those items required by AFMAN 11-2AC- 130J, Vol 3 (or equivalent) are onboard for the mission(s) being conducted while off-station. **(T-2)**

13.13. Hostile Environment Operations. Remove all non-essential equipment from the aircraft prior to a combat mission. Hostile Environment Repair Procedures (HERP), tool kit requirements can be found in AFSOCM 11-201. If a combat or contingency situation makes prior coordination impractical or impossible, complete the necessary procedure and notify the approval authority at the earliest opportunity. **(T-2)**

13.14. Forms Management. In addition to the procedures in TO 00-20-1 and DAFMAN 11-401, the AG will assist the pilot in maintaining the AFTO Form 781. Verify the exceptional release is signed before flight and resigned, if necessary, at enroute stops. **(T-2)**

13.14.1. After each flight, ensure the number of discrepancies (if any), landings, flight duration time(s) are entered on the AFTO Form 781H. Review all AFTO Form 781A discrepancies and ensure symbols, date discovered, and clear, detailed entries are entered, and the discovered by blocks are signed for each discrepancy. **(T-2)**

13.14.2. IAW HFI 23-202, all off-station fuel purchases (to include ground refueling and in-flight refueling) will be logged on AFTO Form 781H and AF Form 664 if applicable. **(T-2)**

13.14.3. IAW AFMAN 23-110, Vol 1, the AG will record all in-flight transfers from C-130 tanker aircraft to any receiver aircraft on the AF Form 791. This form will also be accomplished for Forward Area Refueling Point (FARP) offloads and fuel jettison in excess of 1,000 lbs. Turn completed forms into maintenance debrief. Instructions for completing AF Form 791 can be found on the AFSOC/A3V SharePoint Website. **(T-2)**

Chapter 14

ELECTRONIC WARFARE AND DEFENSIVE PROCEDURES

14.1. General. In addition to the duties listed in the flight manual, other directives, and this publication, the PIC may assign other duties as necessary. The AC-130J CSO is primarily responsible for aircraft defense while on the flight deck by utilizing onboard systems to detect threats and defeat them with countermeasures and maneuvers. When the CSO is stationed at the MOP the PM will be primary to detect threats and calling for appropriate threat maneuvers. In addition, scanners will be utilized to detect visual threats to the aircraft to the maximum extent possible **(T-2)**

14.1.1. Mission Planning Equipment. The pilots and CSO must be capable of analyzing intelligence reports and utilizing their unit's primary mission planning system in order to plan a successful mission in a threat environment.

14.1.2. Mission Planning Factors. Detailed information on threat mission planning can be found in AFTTP 3-1 General Planning (S), *General Planning & Employment Considerations*; AFTTP 3-1 Threat Guide (S), *Threat Reference Guide and Countertactics*; and AC-130J CONEMP, *Tactical Employment.*

14.1.3. Mission Charts. The CSO will prepare mission charts IAW this publication (see **Chapter 17**). In addition, the charts will include the location and lethal threat range rings (shadow graphing as required) of all threat systems which could affect aircraft survivability or mission completion. **(T-2)**

14.2. ECM/AI Training.

14.2.1. For missions scheduled with Electronic Countermeasures (ECM) training. The Pilot or CSO will brief all applicable procedures, rules of engagement, and anticipated maneuvers. **(T-2)**

14.2.2. On training missions with Airborne Intercepts (AI) training. The CSO or pilots will brief all applicable procedures, rules of engagement, and anticipated maneuvers. **(T-2)**

14.2.3. Coordinate AI training IAW AFMAN 11-214, *Air Operations Rules and Procedures.*

14.2.4. For tactical training missions not involving ECM or AI training, a threat of the day will be briefed. **(T-2)**

14.3. In-flight Responsibilities.

14.3.1. The CSO will verify aircraft ECM and infrared countermeasure (IRCM) configuration is commensurate with the threat environment or the training scenario. Ensure appropriate databases/MDFs are loaded into all defensive systems, depending on geographical locations or electronic order of battle. See MDS specific technical orders and system handbooks located on the Electronic Combat Support Flight (ECSF) website (**http://ecsf.afsoc.af.smil.mil**) for most current system information.

14.3.2. The Any crewmember will notify and/or warn the crew if threats are encountered. **(T-2)**

14.3.3. The PM or CSO will direct defensive maneuvers and the PF will perform ECM/IRCM and maneuvers as appropriate. Brief/update ECM/IRCM effectiveness when it can be determined throughout defensive maneuvers. If a scanner detects a visual threat, they will direct the defensive maneuver as appropriate. **(T-2)**

14.3.4. The CSO/LM/PM will notify crew of defensive system malfunctions. The CSO/LM/PM will advise the crew of effect(s) on mission accomplishment and tactics. Keep crew updated on chaff/flare status. **(T-2)**

14.3.5. The CSO/PM will advise the crew upon entering/exiting the hostile environment. **(T-2)**

14.4. Defensive Panel Settings on AC-130J (For various environments).

14.4.1. See AFTTP 3-1.AC-130J and/or tactics bulletins for classified recommendations on flare and chaff programs and set-ups.

Chapter 15

SPECIAL OPERATIONS AIR REFUELING

15.1. General. Allied Tactical Publication (ATP)-56B. Air-to-Air Refueling, provides the basic guidance for refueling terminology and procedures. Crews will refer to the aircraft technical order for expanded receiver guidance and procedures. This provides expanded guidance for the receiver.

15.2. Guidance. The following policies apply to all air refueling conditions regardless of emission control or type of rendezvous:

15.2.1. AAR will only be accomplished by an AAR qualified pilot, or a pilot in training under the supervision of an instructor. Unqualified pilots, undergoing AAR training, must inform the tanker prior to completing any contacts and receive an acknowledgment. A trained CSO/AG or an unqualified CSO/AG under the supervision of an instructor is also required. **(T-2)**

15.2.2. Use manual boom latching procedures only during fuel emergencies and contingency operations. **Note:** Manual boom latching procedures are authorized for all AAR operations with the KC-10A if the tanker‘s independent disconnect system is operational. **(T-2)**

15.2.3. During aerial refueling missions, fuel will not be onloaded with an inoperative drain pump. **(T-2)**

15.2.4. Do not make any HF radio transmissions or electronic counter measures emissions during AAR operations. **Note:** LAIRCM may be left in OPERATE mode during AAR

15.3. Special Operations Procedures:

15.3.1. Lighting:

15.3.1.1. Tanker lighting:

15.3.1.1.1. Director lights-bright. **(T-2)**

15.3.1.1.2. Boom nozzle and boom marker lights – bright and on, respectively. **(T-2)**

15.3.1.1.3. Under wing illumination lights-bright. **(T-2)**

15.3.1.1.4. All lights will remain bright until the receiver is approaching the pre-contact position. At this time, director lights and under wing illumination lights will go to the normal refueling position and boom nozzle lights to low. Tail mounted flood light may be used in normal operation. All remaining lights will remain off, safety permitting. **(T-2)**

15.3.1.2. Receiver lighting:

15.3.1.2.1. Slipway lights – bright or as directed. **(T-2)**

15.3.1.2.2. Area lights – bright or as directed. **(T-2)**

15.3.1.2.3. IR rotating beacon/strobes-on or as directed. **(T-2)**

15.3.1.2.4. All other lights will be off, except position lights will be on for training missions. **(T-2)**

15.3.1.2.5. All lights will remain bright until the receiver visually acquires the tanker. At this time, slipway and area lights will be turned to normal night refueling setting. If no "TALLY HO" call is heard and a "JUDY" call is made, rotating beacon will be turned off at pre-contact. **(T-2)**

15.3.2. Rendezvous Procedures. Use enroute overtaking rendezvous. Both tanker and receiver will monitor primary air refueling frequency (secure) 30 minutes prior to the RZCT. Limit transmissions to those specified below unless operational requirements dictate otherwise. **(T-2)**

15.3.2.1. Tanker:

15.3.2.1.1. At the entry point, adjust airspeed to 275 knots indicated airspeed (KIAS) and ensure external lighting is set. **(T-2)**

15.3.2.1.2. Upon visual contact with the receiver and in a position to complete the rendezvous, the tanker boom operator will transmit "TALLY HO" on primary AAR frequency (secure). **(T-2)**

15.3.2.1.3. If "JUDY" is heard, tanker will slow to AAR speed and proceed down track. Tanker lead will acknowledge by turning the lower rotating beacon on then off (daylight, wing rock). During training and exercises, the tanker will also transmit the numeric part of their call sign and altitude (secure). They will switch to plain (non-secure) as the receiver approaches pre-contact. **(T-2)**

15.3.2.2. Receiver:

15.3.2.2.1. At the entry point, the receiver will be at the rendezvous altitude at 215 KIAS and ensure outside lighting is set. Plan to arrive at the Rendezvous Initial Point (RZIP) at the RZCT. **(T-2)**

15.3.2.2.2. Upon hearing the tanker call "TALLY HO," turn off the IR rotating beacon for 10 seconds (daylight, wing rock). During training and exercises, the receiver will also transmit the numeric part of their call sign and altitude on primary AAR frequency (secure). Approaching pre-contact, switch to plain (non-secure). **(T-2)**

15.3.2.2.3. Should the tanker pass the receiver and advance to a position in front of the receiver without calling "TALLY HO," and if the receiver is in position to complete the rendezvous, the receiver will transmit "JUDY" on the secure primary refueling frequency. The tanker will respond as described in **15.3.2.1.3**. **(T-2)**

15.3.2.2.4. The receiver then moves to the pre-contact position and switches to the primary refueling frequency (non-secure). **(T-2)**

15.3.3. Control Time Adjustment:

15.3.3.1. Revised ETA prior to RZIP. If tanker is notified of a revised receiver ETA prior to crossing the RZIP, the tanker will adjust timing to arrive at the RZIP at the revised RZCT. **(T-2)**

15.3.3.2. Revised ETA after RZIP. If notified after passing the RZIP, the tanker will delay at the Aerial Refueling Control Point (ARCP) or RZIP and adjust timing to make an enroute overtaking rendezvous at RZIP based on new RZCT. If the tanker is unable to make the timing at the RZIP they will rendezvous at the ARCP using the adjusted Aerial Refueling Control Time (ARCT). **(T-2)**

15.3.4. Post-Strike Rendezvous Procedures. For missions that do not have a firm RZCT/ARCT, a control time window will be established. This provides the tanker with a no earlier than/No Later Than (NLT) RZCT time for rendezvous. Tankers will arrive at the RZIP no later than the earliest possible control time. If there is no receiver, tanker will proceed to ARCP and hold using 2-minute legs, left-hand turns. The receiver, when enroute to AAR and NLT 10 minutes from the RZIP, will call the tanker (secure) with the revised RZCT. The tanker will adjust orbit to make an enroute overtaking rendezvous at the RZIP at the new control time. **(T-2)**

15.3.5. Completion of Refueling:

15.3.5.1. The tanker will plan to offload the pre-briefed transfer load. **(T-2)**

15.3.5.2. Upon transfer of the planned onload, the receiver will initiate a normal disconnect and close the UARRSI door. **(T-2)**

15.3.5.3. If more fuel is required, leave the UARRSI door open and return to the pre-contact position. **(T-2)**

15.3.6. Missed Rendezvous. If the rendezvous has not been made as planned, enter a left-hand holding pattern at the ARCP and use the following procedures to accomplish the rendezvous: **(T-2)**

15.3.6.1. Receiver Procedures for Missed Rendezvous:

15.3.6.1.1. On arrival at the ARCP, the receiver will enter a left-hand holding pattern, adjusting the first pattern so as to arrive back at the ARCP on an 8-minute multiple from the ARCT, the ―Rule of Eight. Example: A receiver is on time at the RZIP and arrives at the ARCP at the ARCT (0100Z) without hearing "TALLY HO" (secure) or seeing the tanker. The receiver enters holding, adjusting so as to arrive back at the ARCP at the ARCT plus 8 minutes (examples include 0108Z, 0116Z, and 0124Z). **(T- 2)**

15.3.6.1.2. Maintain 1,000 feet below the refueling altitude. **(T-2)**

15.3.6.1.3. Maintain 215 KIAS until entering holding at the ARCP, then as required. **(T-2)**

15.3.6.1.4. Upon hearing "TALLY HO" (secure), proceed down track and complete the rendezvous. **(T-2)**

15.3.6.1.5. If the receiver acquires the tanker and is in a position to complete the rendezvous, call "JUDY" (secure) and complete the rendezvous. **(T-2)**

15.3.6.2. Tanker Procedures for Missed Rendezvous:

15.3.6.2.1. The tanker enters a left-hand holding pattern upon arrival at the ARCP, adjusting holding to rendezvous with the receivers based on the rule of eight at the ARCP. Rendezvous equipment will not be turned on unless directed by receiver. **(T-2)**

15.3.6.2.2. Maintain refueling altitude.

15.3.6.2.3. Maintain 275 KIAS. **(T-2)**

15.3.6.2.4. Upon positively identifying the receiver, the tanker will maneuver for rendezvous and will call “TALLY HO” (secure) when ready for the receiver. If the receiver calls “JUDY” (secure), slow to refueling airspeed and proceed down track. **(T- 2)**

15.4. Breakaway Procedures.

15.4.1. Tanker. The tanker will flash the receiver director lights as the primary indication for a breakaway. The lower rotating beacon will be turned on as an additional signal. A radio call will be used as the last resort. When the tanker is ready to resume refueling the lower rotating beacon will be turned off. **(T-2)**

15.4.2. Receiver. Initiate a breakaway when conditions warrant. Resume refueling when the tanker is ready. **(T-2)**

Chapter 16

DIRECT SUPPORT OPERATOR PROCEDURES

16.1. General. General. This Chapter is for informational purposes only. For all regulatory guidance concerning Direct Support Operators (DSOs) refer to AFSOCI 11-2DSO, Vol 1, 2, or 3.

16.2. Mission Planning. DSOs will conduct pre-mission planning utilizing guidance from the following: AFTTP 3-1. General Planning (S), and AFTTP 3-1. Threat Guide (S),

16.2.1. The DSO, after coordinating with the supporting analyst and other appropriate agencies, will conduct mission planning with the aircrew for all combat mission scenarios. The DSO will brief expected scenario inputs based on the analytical data, as required. **(T-3)**

16.2.2. The DSO is responsible for coordinating with all appropriate agencies to obtain all required or anticipated mission planning, professional, and SILENT SHIELD equipment for the duration of the flight/deployment.

16.3. Augmentation. Some contingency operations may require operators from other units, or in some cases, non-aircrew personnel to provide tactical cryptologic support. In these cases, a mission-ready instructor-qualified DSO will fly as primary DSO and be responsible for DSO inputs. **(T-3)**

Chapter 17

AC-130J EMPLOYMENT

17.1. General. General. This chapter describes the specific equipment requirements, training restrictions, and regulatory guidance for AC-130J employment. This chapter is not a stand-alone reference and should be used in conjunction with the rest of this publication, the AFTTP series, and other directives. All crewmembers must actively participate in keeping tactics and publications up to date. Submit proposed publications and tactics changes to AFSOC/A3V IAW this publication. **(T- 2)**

17.1.1. Employment Decisions. The PIC is the decision authority on tactics and employment. They are responsible for risk assessment and mission execution. Select weapons and munitions prior to flight whenever possible. This is not intended to limit flexibility, but to reduce task loading in the employment area. **(T-2)**

17.1.2. Publications. Joint terminology will be used for mission planning and execution. Gunship crewmembers will have a working knowledge of the information contained in the following Joint Publications (JP) Library, Volume 3-series: JP 3-03, *Doctrine for Joint Interdiction Operations*; JP 3-09.1, *Joint Laser Designation Procedures*; JP 3-09.2, *Joint Tactics, Techniques, and Procedures for Ground Radar Beacon Operations* (J-Beacon*)*; JP 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support* (CAS); JP 3-10.1, *Joint Tactics, Techniques, and Procedures for Base Defense*.

17.1.3. The Joint Technical Coordinating Group for Munitions Effectiveness, Special Operations Working Group is used by the crew as a reference during mission planning for; target description, damage criteria, type of rounds to use, target vulnerability, hit/aim points, and weapons effectiveness.

17.1.4. Air Force Tactics Techniques and Procedures. The AFTTP 3-1 has several volumes for the different weapon systems and threats encountered by USAF aircrews. It gives information on general planning and employment considerations, threat reference and counter tactics, and individual weapon system employment guides.

17.1.5. AFTTP 3-1 Vol 1, *General Planning and Employment Consideration*. All aircrew will possess a working knowledge of Special Operations chapters found in Volume 1, AFTTP 3-1 Vol 2, *Threat Reference Guide and Considerations*, and the specific aircraft volume AFTTP 3- 1 AC-130, *Tactical Employment, AC-130*. **(T-2)**

17.1.6. Control of Classified Information and Materials**.** It is the responsibility of every crewmember to control the classified material they use. This includes maps/charts with target coordinates, friendly positions, battle lines, or threat positions drawn on them. Most imagery, target lists, Command Electronic Operating Instruction, SPINS, Rules of Engagement (ROE), and strike data are classified and must be controlled and handled as such. Imagery from the sensor systems that has been recorded must be handled IAW the aircraft security classification guide. **(T-2)**

17.2. Flight Deck Crew Duties.

17.2.1. Aerial Gunner. When scanning in a threat environment, the ALE-47 portable flare fire buttons will be held. The AG on the flight deck will be primary for fuel balance management and backed up by the CSO/Pilots. **(T-2)**

17.2.2. The following duties are divided between the CSO and Pilots: CNI-MU programming and updating, time control, mission planning, monitoring of fuel status (fuel should be checked at least once every 60 minutes), and communications with C2. The PIC will ensure all navigation/communication duties are clearly understood prior to flight. This includes assigning responses for particular equipment in the tactical checklists. Emphasis will be placed on all dual use controls (examples include CNI-MU, Radar, Fuel panel, and Refuel Control panel). **(T-2)**

17.2.3. Heads Down Displays (HDD). Precision strike package to glass modification makes HDD configuration variable dependent on mission type and phase of flight. Pilots and CSO will ensure HDDs are set to maximize situational awareness and best utilize available screen space. At a minimum, TAWS will have RWR overlay selected for threat situational awareness. **(T-2)**

17.2.4. Both pilots will have a means of verifying PGM engagement information displayed utilizing swing arm with strike client bar and PGW box and/or HDD PGW overlay for all engagements. Gun engagements should primarily be verified with the pilot side HUD and/or strike client bar/gun box.

17.2.5. The PM is primary for ATC and air stack communications.

17.2.6. The PIC is the final authority on tactical employment, weapons/fusing selection, and weapons release parameters.

17.3. Enroute Operations.

17.3.1. Altimeter Updates. The PM should perform an altimeter update within 20 nm of airfields and prior to glide slope intercept for IPRA's. Update locations will be briefed prior to flight as required and verbalized in-flight when conducted. **(T-2)**

17.3.2. GCAS. Normal mode will be used during enroute/CAS operations. **(T-2)**

17.3.3. ETCAS. Use the above, below, and normal settings as appropriate for the phase of flight and mission. The below setting should be used for tactical descents. Enhanced mode 3 can be utilized for locating a tanker during a rendezvous. **(T-2)**

17.4. RESEVERED FOR FUTURE USE.

17.5. Munitions. Information on specific munitions and targets is contained in AFTTP 3-3 AC-130J Combat Fundamentals and TO 1-1M-34*, Aircrew Weapons Delivery Manual (Nonnuclear)*.

17.5.1. Misfired Round Procedures.

17.5.1.1. 30MM misfired round procedures. Use this procedure anytime a 30 MM round is misfired. Immediately place misfired 30MM rounds in an empty ammunition storage container with foam inside and secure with lid. Crews may continue their mission and return to appropriate parking. Notify munitions/weapons personnel upon landing and conduct transfer. **(T-2)**

17.5.1.2. **Note:** Misfired rounds may be cycled through the gun and ejected into the dunnage corral. AG should monitor the dunnage corral for misfired rounds when practical.

17.5.2. Hot Gun/Jammed Gun Procedures. These procedures will be used any time a gun contains a round that cannot be removed in-flight. **(T-2)**

17.5.2.1. Hot Gun Procedures. If, in the opinion of the lead gun, any probability for an inadvertent firing exists and the gun cannot be mechanically and electronically safed, the live-fire will be terminated, and the following procedures will be used: **(T-2)**

17.5.2.1.1. If possible, remain overhead the live-fire range with the gun pointed in a safe direction until the gun has cooled to ambient temperature.

17.5.2.1.2. Notify appropriate controlling agencies of the hot gun condition and declare an emergency. **(T-2)**

17.5.2.1.3. Return to recovery airfield using approved hot gun routes and avoid bringing the guns to bear on any populated areas. **(T-2)**

17.5.2.1.3.1. If no hot gun recovery procedures are in place for nonlocal ranges, crews and/or off-station planners will coordinate with appropriate agencies (range control, recovery/divert airfields, airspace control, EOD, and airfield fire department) for hot gun recovery prior to departing for any off-station ordnance delivery missions. **(T-2)**

17.5.2.1.3.2. Crews/planners will plan to use hot gun recovery routes that keep guns pointed away from populated areas to the maximum extent possible. Park IAW airfield's designated hot gun/hot cargo areas. In the local area, follow the below procedures. **(T-2)**

17.5.2.1.4. Hot Gun parking will be IAW recovery airfield restrictions. Aircrew withdrawal distance is 400 ft. **(T-2)**

17.5.2.2. A 105MM round-case separation is not a hot gun situation. The projectile may remain in the barrel with the breach closed. During combat/contingency operations, crews may pressurize IAW normal procedures. If no attempt was made to fire, the case and propellant can be returned to the ASHS. Notify munitions/weapons personnel upon landing and conduct transfer.

17.5.2.2.1. When returning with the projectile in the barrel, use the applicable hot gun route to avoid overflight of populated areas. No touch and go landings are permitted and the aircraft must be returned to the appropriate parking area based on local regulations. Request command post notify maintenance and EOD to meet the aircraft.

17.5.2.3. Jammed Gun Procedures. If the lead gun determines that there is no probability of an inadvertent firing, the following procedures will be used: **(T-2)**

17.5.2.3.1. The PIC may elect to continue the live-fire. Dry fires and aerial refueling are not authorized. **(T-2) Exception:** Off station aircraft may conduct aerial refueling if mission requirements dictate.

17.5.2.3.2. The aircrew may execute a normal recovery to a full stop at recovery airfield. Multiple approaches or pilot pro are not authorized until the malfunction has been cleared. **(T-2)**

17.5.2.3.3. Off-station/out and back aircraft are authorized to return to the recovery airfield at the completion of their live-fire mission. Do not depart an airfield without the approval of the squadron commander or operations officer. **(T-2)**

17.5.2.3.4. Round Jettison Procedures. Units will coordinate with local range agencies to ensure procedures exist for any planned live fire. **(T-2)** If no hot gun recovery or round jettison procedures are in place for nonlocal ranges, crews and/or off-station planners will coordinate with appropriate agencies (range control, recovery/divert airfields, airspace control, EOD, and airfield fire department) for hot gun recovery prior to departing for any off-station ordnance delivery missions. **(T-2)** The procedures in this paragraph apply to training missions and will serve as a baseline for operations over established impact areas. They are intended for use in the absence of more specific local guidance or if safety dictates otherwise based on operational requirements. The OG/CC or equivalent with OPCON holds waiver authority for these procedures, as well as authority for local supplementary procedures.

17.5.2.3.4.1. These procedures are intended for use in VMC but may be used in the absence of IMC procedures if VMC cannot be maintained. Range-specific IMC procedures will be used if applicable. Jettison the round over the range in use or the nearest suitable impact area. In an emergency, jettison the round over an uninhabited area, immediately mark and relay the aircraft and round position to the applicable range controlling agency and C2 element (following procedures for an off-range expenditure).

17.5.2.3.4.2. Round jettison procedures will not be performed on training missions until all ground parties have departed the impact and ricochet areas. Standard round jettison altitude will be 3,000 feet AGL or IAW local range procedures. On water ranges, the normal firing orbit/altitude may be used for round jettison. Ensure the surface area is cleared by at least 5 nm.

17.5.2.3.4.3. Orbit the center of the impact area and attempt to keep the gun pointing in the center of the impact area until level at jettison altitude. Nominals will be updated during descent to maintain useful geometry. Once level at jettison altitude with the jettison area clear, the pilot will direct the crew to initiate round jettison procedures IAW the following subparagraphs and applicable local procedures.

17.5.2.3.4.4. The gunners will complete their emergency procedures up to, but not including, extracting the round.

17.5.2.3.4.5. The gun should remain trainable, slaved and tracking the center of the impact area during descent to maximize the chances of an inadvertent discharge impacting the center of the impact area. Once level and when directed, the WSO/CSO will fix the position of the respective gun. Rounds will be jettisoned through the jettison port or the right paratroop door. Crewmembers will wear appropriate restraining devices or parachutes when the paratroop door is open. The gunner jettisoning the round will state “ROUND AWAY” on call once the round exits the aircraft. The copilot will mark the aircraft/position at jettison, and the WSO/CSO will track the round to the surface and mark the impact point. ***WARNING***: At no time will an extracted round be retained in the aircraft for

another orbit.

17.5.3. Parking with Munitions. If required to park with munitions onboard, comply with distances in **Table 17.1**. These separation distances are the minimum required between explosives loaded aircraft and any inhabited building, civilian aircraft or civilian/joint use runway. All explosives loaded aircraft should be parked in an approved, properly sited aircraft parking location (i.e., hot cargo) if available. **(T-2)**

Table 17.1. Parking Restrictions with Munitions Onboard. (T-2)

MUNITION TYPE	CLASS	SEPARATION DISTANCE
AGM-176, AGM-114, GBU-69, 105mm HE/HF/TP, GBU-39	1.1	1,250 ft
30mm HEI	1.2.2	140 ft
M206/M211 Flares	1.3	75 ft (wingtip clearance)
30mm TP	1.4	75 ft

17.5.4. Emergency Procedures with Ammunition. Fire:

17.5.4.1. Notify PIC/Crew.

17.5.4.2. Notify fire department.

17.5.4.3. Fight fire and remove munitions, if possible. Note time fire envelops munitions.

17.5.4.4. All non-essential personnel will withdraw to 2,500 ft. Crewmembers fighting the fire will withdraw to 2,500 ft when fire envelops munitions, or after arrival of firefighters, whichever occurs first. If the NEW exceeds 500 lbs and any Class 1.1 munitions are onboard, non-essential personnel must withdraw to 4,000 ft.

17.5.4.5. For fire with only division 1.3 munitions (markers, flares, and 105mm clearing rounds) onboard, non-essential personnel must withdraw to 600 ft. **Note:** Withdraw distance requirements are contained in DESR 6055.09_AFMAN 91-201, *Explosive Safety Standards*.

17.6. Marker Flare Launching Procedures. All marks will be launched on command of the P/CP. **(T-2)**

17.6.1. Use the following procedures to launch any marker flares or illuminated targets:

17.6.1.1. PF: “Guns, P/CP, standby to launch marks.”

17.6.1.2. AG: “In-progress, Guns” – Ensure jettison port/paratroop door is open, and mark is prepared according to appropriate launch preparation procedures. Rotate base plate to ARMED at this time.

17.6.1.3. AG: “Standing by to launch marks” – Reply when ready to jettison mark.

17.6.1.4. PF: “Guns, P/CP, launch marks, now” – For MK 25, push in port plugs and jettison mark. **Note:** P/CP allow approximately 10 seconds for the AG to arm each MK 25.

17.6.1.5. AG: “Mark(s) away” – Mark(s) jettisoned. **Note:** MK 25 flares burn for approximately 13 minutes, if more flares are needed the CP and AG should pre-coordinate for further launches.

17.7. RESERVED FOR FUTURE USE.

17.8. Pre-Strike Coordination.

17.8.1. Order of Battle (OB) Analysis. The crew will coordinate with intelligence personnel to obtain a current and complete OB for the area of operations. Based on analysis of the OB, the CSO/pilots will ensure the planned route of flight minimizes aircraft exposure to the threat and the probability of detection.

17.8.2. Chart Preparation. Use 1:50,000 Topographical Line Maps (TLM) for all CAS objective areas when available; however, charts smaller than 1:250,000 should not be used. Grid lines must be clearly displayed for accurate point annotation.

17.8.3. Navigation. The CSO/PM is responsible for enroute and tactical navigation. CNI-MU will be primary for enroute navigation. Tactical navigation and situational awareness are best accomplished through combined use of Precision Strike Package (PSP) tools and the CNI-MU.

17.8.3.1. Brimstone and the CNI-MU will both normally be used within the tactical environment. The WSO/CSO will ensure the Brimstone airspace overlays and required target area charts and imagery are loaded onto each workstation. Workload permitting, the CSO/PM should enter relevant tactical navigation points into the CNI-MU throughout the mission.

17.8.3.2. In the event of Brimstone degradation, the CSO/PM will input tactical navigation points into the CNI-MU.

17.8.4. Laser usage. The AC-130J has capability for laser designation, range finding, and illuminating. All air-to-surface laser operations on-range will be IAW AFMAN 13-212 Vol 1, *Range Planning and Operations*, this publication, and local range procedures. Off-range laser emissions are authorized in accordance with AFMAN 11-214. The following paragraphs contain information discussing operation of the airborne Laser Designator/Rangefinder (LDR) and Laser Illuminator (LI) systems. **Note:** Aircrews will use J-Laser terminology when talking with air and ground forces. ***WARNING*:** Crewmembers will not use binoculars during any laser operations when weather is in close proximity to the aircraft. **(T-2)**

17.8.4.1. Laser Designator Rangefinder (LDR). The LDR operates in the 1.06μ wavelength. The LDR will only be fired in combat or on laser approved ranges. **(T-2)** ***WARNING*:** The WSO/CSO will notify the crew prior to firing the LDR. Ground parties, if present, will be notified prior to firing the LDR. **(T-2)** ***WARNING*:** The crew will avoid looking out of the aircraft during LDR operations. When cleared by the PIC, the WSO/CSO firing the LDR will state “LASER ON.” Upon termination of firing, the WSO/CSO will state “LASER OFF.”

17.8.4.2. Laser Rangefinder (LRF). The LRF operates in the 1.57μ wavelength. The LRF should be used to simulate the LDR during dry fire operations IAW AFMAN 11-214. Due to the gun fire control system (GFCS) requirement for an accurate elevation source, the WSO/CSO may fire the LRF frequently throughout the mission. The PIC will advise the WSO/CSO if it is unsafe to fire the LRF.

17.8.4.3. Dual Wavelength Laser Illuminator (DWLI). The DWLI can be selectively operated in a 0.53µ visible (overt) wavelength or a 0.86µ Near Infrared (NIR) (covert) wavelength. The DWLI is authorized for use in the 0.86µ NIR mode during live and dry fire operations IAW AFMAN 11-214. **(T-2)** When cleared by the PIC, the WSO/CSO firing the DWLI in 0.86µ mode will state "SPARKLE ON." Upon termination of firing, the WSO/CSO will state "SPARKLE OFF." Refer to local regulations and guidance for use of the DWLI in the 0.53µ mode. **(T-2)**

17.9. Air-to-Surface and Air-to-Air Training.

17.9.1. AFMAN 13-212 Vol 1, *Range Planning and Operations*, is the parent instruction for all AF ranges. Wings/Groups will publish range procedures for frequently used weapons ranges IAW AFMAN 13-212, Vol 1 and **Chapter 10** to this publication. If not using an AF range, gunship crews will use the component/Host Nation range procedures. **(T-2)**

17.9.2. AFMAN 11-214 describes minimum weather requirements for training. Air-to-surface minimum weather will be sufficient to allow the crew to visually observe the round to impact. **(T-2)**

17.9.3. VMC Range Clearing.

17.9.3.1. Visually clear the target area and weapon safety footprint areas on AF Class B and Class C ranges before live firing. **(T-2)**

17.9.3.2. Visually clear the target area and weapon footprint areas on non-AF ranges. **(T-2)**

17.9.3.3. The crew will contact the range controller to determine the ground parties' status and contact ground parties, as required, as a prerequisite to the WSO calling the range clear for live-fire operations. The WSO will coordinate with the CSO to ensure range clearance prior to stating, "Pilot, WSO is satisfied the range is clear" when complete. This signifies both the WSO/CSO have visually cleared the range and have confirmed status of ground parties with controlling agencies. **(T-2)**

17.9.3.4. Range Clearance. The PIC or copilot will call the range controller providing firing clearance and advise them of "going hot". The PIC will ensure all range restrictions have been met, proper clearance is attained, and the range is clear prior to directing the lead gun to put the guns on the line and/or use of the laser designator. **(T-2)**

17.9.3.5. Modify these procedures as necessary in order to comply with different ordnance delivery regulations/procedures at off-station locations.

17.10. Dry-fire Operations.

17.10.1. On sorties accomplishing both live and dry fire objectives, the PIC will notify the crew whether to accomplish live or dry fire actions during the target briefing of the Pre-Strike checklist. **(T-2)**

17.10.2. AGs will not forward rounds into the 30MM gun during dry fire operations. **(T-2)** During all dry fire operations, all calls to bring the gun online will be prefaced with "simulated".

17.10.3. Aircrew will complete the pre-strike checklist procedures defined in T.O. 1C-130(A)J-1 and this publication to simulate the 30MM and 105MM gun on the line. Ammunition will not be forwarded and must be pinned with the MANUAL SAFE HANDLE

(MSH) set to SAFE. The 105MM will have no rounds inserted and the breech block down. During the pre-strike checklist the lead gun will visually verify both guns are safe and clear prior to responding to the checklist. **(T-2)**

17.10.3.1. The guns should be made trainable when it is compatible with the training profile. CRM, training objectives and risk management are factors to consider when determining whether the guns should be made trainable during the dry fire (pressurized vs unpressurized). **(T-2)**

17.10.3.2. For unpressurized configurations, aircrew will adhere to the following in order to maintain safety of flight and proper system checks during simulated engagements:

17.10.3.2.1. For simulated gun engagements ONLY the Pilot's MASTER ARM and MOP gun CONTROL and TRAINABLE will be selected and Aerial Gunners will SLAVE the guns. The Pilot's GUN CONSENT and MOP INHIBIT/NORMAL switches will be simulated. The WSO/CSO will NOT depress the trigger and will instead verbalize "Rounds Away" to the crew. **(T-2)**

17.10.4. When working with ground teams utilizing BMS INDOC mode for simulated PGM engagements, PGM ARMED, PGW CONSENT, and the FIRE button should be utilized to provide enhanced training during PGM engagements.

17.11. Live-fire Operations.

17.11.1. ***WARNING:*** Any crewmember detecting an unsafe condition during live-fire will call "CEASE FIRE". Firing will not resume until the unsafe condition is corrected. **(T-2)**

17.11.2. Maintain a minimum of 1,000 ft altitude separation from the highest known trajectory during combined live-fire operations with ground artillery, mortar, or helicopter fire. **(T-2)**

17.11.3. Danger Close. JP 3-09.3, *Close Air Support (CAS),* defines danger close as the 0.1% probability of incapacitation (PI) based on Joint Munitions Effectiveness Manual (JMEM) data. AC-130J danger close distances are listed in AFTTP(I) 3-2.6, *JFIRE*. For targets inside the 0.1% PI, the ground commander or authorized controller (examples include fire support officer and team leader), must accept responsibility for risk to friendly forces IAW JP 3-09.3 by passing his/her initials or stating, "CLEARED DANGER CLOSE". If the mission is preplanned, the ground commander or designated representative should pre-brief acceptable minimum engagement distances.

17.11.4. Peacetime Restrictions. The following restrictions apply to all peacetime live-fire training missions. These restrictions do not apply anytime the ground forces commander (GFC) requests fire support under CJCSI 3121.10, *Standing Rules of Engagement for US Forces*.

17.11.4.1. A tweak will be completed for live-fire training with ground personnel. **(T-2)** Crews may perform sterile tweaks prior to live calls for fire, combat tweaks as a live call for fire, or check shots to validate a prior tweak, at a minimum of 750 meters from ground personnel, until impacts are verified to be within 5 mR of aimpoint.

17.11.4.1.1. Crews will select a tweak target a minimum of 750 meters away from all ground parties to compensate for untweaked system accuracy and fragmentation effects. **(T-2)** Once the tweak is complete and the fire control system has been verified accurate (impacts are within 5 mR of aim point), crews will fire no closer to ground parties than defined in JFIRE Table 101, Minimum Safe Distances. **(T-2)** No-fire

headings will be used when firing 105mm TP closer than 700 meters. **(T-2)** ***WARNING:*** During peacetime, never point a trainable gun at a friendly position cue/slave the sensor while the gun is trainable. Failure to heed this warning could cause injury or death to friendly forces if inadvertent gun firing should occur. **(T-2)** ***WARNING:*** Use of "Live" function while not actively tracking a target may result in inadvertent targeting of friendly forces. ***WARNING:*** The WSO/CSO will not engage automatic video tracking (AVT) while firing any weapon. **(T-2)**

17.11.4.1.2. If there has been a gun alignment or gun/sensor replacement, then increase distance from tweak target as much as possible during initial tweak while maintaining required range buffer.

17.11.4.1.3. For live PGM training with ground personnel, crews will test fire both 1.06μ laser designators prior to employing any laser guided PGMs. **(T-2)** Crews should conduct dry runs prior to releasing munitions, time and situation permitting. Crews will ensure no PGMs impact closer to ground parties than defined in JFIRE Table 101, Minimum Safe Distances. **(T-2)** If a published MSD does not exist for a specific munition, crews will seek HQ AFSOC A3V guidance prior to employment.

17.11.4.1.4. Crews may perform simulated PGM engagements with live gun engagement follow-up. When working with a ground party simulated PGM engagements followed by live gun engagements will be pre-briefed and clearance terminology defined prior to employment. Simulated PGM engagements during live fire operations will only occur on approved live fire targets. **(T-2)**

17.11.4.2. Ground Parties. The WSO/CSO will notify the ground party prior to use of the laser designator, prior to going hot, when tweak is complete, and when ready for calls for fire (if such training is desired). Simulated "Comm out" calls for fire may be performed but will be requested and briefed by the ground party prior to commencing and will be done at the discretion of the aircrew. If an actual comm out situation occurs, live fire will be terminated until communication is resumed, or ground personnel have departed the range. **(T-2)**

17.11.4.3. Unplanned Ground Parties. Face-to-face briefings are not required when performing live-fire training with qualified ground parties on local ranges. If no face-to-face briefing is accomplished, the ground party will brief the following information to the crew on the primary radio frequency prior to commencing live-fire training operations: Unit (if not already known), call sign(s), primary controller (if applicable), radio frequencies, ground party location, number of personnel, number of vehicles, types of marking devices, comm out procedures, ground party procedures for hot gun, verify that the range has been cleared, number and type of calls for fire or other training (if applicable). **(T-2)** The WSO/CSO will read back all information.

17.11.5. **105mm Boomer Procedures.** The pilot will direct the following procedures as soon as practical prior to leaving the live-fire range, if a 105mm gun gas explosion (boomer) occurs during live weapons delivery.

17.11.5.1. The WSO, CSO, and visual scanners will inspect as much of the aircraft as possible to locate any structural damage or open panels.

17.11.5.2. If the ground test valve access panel is open, two or more fasteners that hold the clamshell doors on the bottom of the engines are open on any of the engines or if at any time the crew suspects an open panel or non-standard configuration that may adversely impact the mission, even if the sensors cannot detect anything abnormal. The crew will complete the POST STRIKE checklist and fly to the closest practical field that can accept the aircraft based on configuration. While on the ground the lead gun will inspect for further damage. Close the panel and the mission may continue at the discretion of the PIC.

17.11.6. A trainable weapon check will be completed prior to any live fire operations.

17.12. Precision Guided Munitions (PGM) Employment.

17.12.1. PGM engagements are normally initiated by mission tasking, 5-line, or 9-line, depending on situation, munitions type, targeting method (coordinates vs laser guidance) and current TTPs. All available crewmembers should record engagement information as it is received.

17.12.1.1. Digitally Aided CAS (DA-CAS). When receiving a 5-Line or 9-Line via non-voice means (Link-16, mIRC, VMF, etc.), the crewmember tasked with monitoring that system will read the message to the crew on MAIN.

17.12.2. Both WSO and CSO will confirm the target.

17.12.2.1. WSO/CSO will confirm target weapon pairing, weaponeering, and nearest friendly position and NO STRIKE, as required. **Exception:** During multi-weapon engagements, crewmembers will assist the WSO/CSO in maintaining custody to the max extent possible.

17.12.3. Any crewmember recognizing an incorrect confirmation (friendly or target), or incorrect bearing/range will immediately advise the crew.

17.12.4. The WSO or CSO will conduct a weapons brief.

17.12.5. Unless otherwise coordinated, the initiation of the WSO or CSO weapons brief alerts the pilots they are prepared to initiate the engagement.

17.12.6. All switches will be returned to their pre-launch condition no earlier than prompted by BMS.

17.12.7. PGW TARGET COORDINATION: The intent for target coordination is to sync the MOP and Flight Deck SA in a manner to clearly communicate weapons data and attack parameters in order to achieve the desired effects. During this time the WSO or CSO will brief a gameplan that contains at a minimum: target description, number and type of weapons, desired run-in heading (if applicable), fuze type, reflectivity, attack guidance (LOFT/Direct/HOB etc.), PRF code, ripple interval, and GOALIE/post launch abort (PLA) plan, as well as the bearing and range to the nearest NO STRIKE (if applicable). If not already discussed, desired impact angle and altitude should be briefed as well.

17.12.7.1. GAMEPLAN example. “Crew, CSO, 2 AGM-114 R9Es, delay 6.9ms, direct, 1181, 8 second ripple, self-goalie, PLA south 50 meters. Nearest no strike XXX (bearing)/XXX (distance);” The FROST check (Fuzing, Reflectivity, On-Live, STARE, Target coordinates/elevation) will be completed and the weapons initialized prior

to the beginning of the PGW Weapons Brief. A goalie and PLA plan will be briefed prior to weapons release.

17.12.7.2. The Non-shooting WSO/CSO will confirm weapon set-up in Strike Client, verify PRFs are correct for both sensors, and ensure a valid GOALIE and PLA plan have been briefed.

17.12.7.3. The Co-pilot will confirm airspace, aircraft, and/or Fire Support Coordination Measure (FSCM) deconfliction and minimum safe or danger close distances (as required).

17.12.7.4. PGW WEAPONS BRIEF: The PGW weapons brief will be initiated once the weapon has completed initialization and indicates "AUR". The PGW weapons brief will flow as depicted below:

17.12.7.4.1. WSO/CSO: "Crew, CSO, (# and type(s) of weapons), target is 110 (bearing), 225 meters (distance) from (nearest friendly ID), PGM ARMED, CSO Ready".

17.12.7.4.2. WSO/CSO (non-shooter will confirm, if dual sensor engagement, this confirmation will skip to CP): "WSO confirms."

17.12.7.4.3. CP: "Co-Pilot confirms."

17.12.7.4.4. PF directs "IN" call. "Set MANUAL" (as required, directive to LM to change ALE-47 setting as required)

17.12.7.4.5. LM: Verbalize ALE-47 setting (as required)

17.12.7.4.6. **External:** WSO: "IN" (with heading/direction, as required).

17.12.7.4.7. WSO/CSO: "Armed, Live (as required), Lazing PRF (as required)".

17.12.7.4.8. **External:** JTAC "Cleared Hot/Cleared to Engage" or "Continue DRY" (as required).

17.12.7.4.9. PILOT: "Live (as required), Laser (as required), Clearance".

17.12.7.4.10. PILOT: "PGW Consent - ON".

17.12.7.4.11. WSO/CSO/Pilot: "(Parameters) Take your shot".

17.12.7.4.12. WSO/CSO: "Pickle" (initial press of PGM fire on HOTAS. Continue to hold until all munitions have released from aircraft or directed by non-shooter in case of malfunction).

17.12.7.4.13. **External:** WSO/CSO: "(#WEAPON AWAY)/(RIFLE # of munitions), (Time to Impact)".

17.12.7.4.14. **External:** WSO/CSO: "SPLASH/TIMEOUT, standby BDA".

17.12.7.4.15. LM returns ALE-47 switches to previous setting as required and verbalizes setting.

17.12.7.4.16. WSO/CSO: "PGM safe".

17.12.7.4.17. PILOT: "PGW Consent - OFF".

17.12.7.5. MULTI-WEAPON ENGAGEMENTS: Guns can be briefed at any time however, selecting trainable must occur below 200 KIAS **Exception:** The PIC's Master Arm switch may remain on.

17.13. Gun Weapon System (GWS) Employment.

17.13.1. Restrictions. Weather must be sufficient for the crew to observe round impact. **Exception:** Combat and Contingency operations utilizing approved IMC shooting procedures.

17.13.2. Gun engagements will normally be initiated by 5-line. All available crewmembers should record the information as it is received.

17.13.3. Both WSO and CSO will confirm the target.

17.13.3.1. WSO/CSO (non-shooter) will confirm target in relation to friendly position and nearest NO STRIKE, as required. **Exception:** During multi-weapon engagements, crewmembers will assist the WSO/CSO in maintaining custody to the max extent possible.

17.13.3.2. Any crewmember recognizing an incorrect confirmation (friendly or target), or incorrect bearing/range will immediately advise the crew.

17.13.4. The WSO or CSO shooting will conduct the weapons brief for gun weapon system employments, and accomplish a non-verbal WELT-C (Winds, Elevation, Laser, Tweak, Collateral) check.

17.13.5. The copilot will confirm airspace, aircraft, and/or fire support coordination measure (FSCM) deconfliction and minimum safe or danger close distances (as required).

17.13.6. GUN WEAPONS BRIEF: The Gun weapons brief will contain the station/gun combination, rate of fire (gun 1), round type (gun 2), target range and bearing from nearest friendly position,. Below is an example for both guns:

17.13.6.1. WSO/CSO: "Crew WSO, Gun 1 Trainable, Full, target is 180 (bearing), 330 meters (distance) from (nearest friendly ID), , WSO ready."

17.13.6.2. WSO/CSO (non-shooter will confirm, if dual sensor engagement, this confirmation will skip to CP): "Nearest NO STRIKE 050 (bearing), 350 meters (distance), CSO confirms."

17.13.6.3. CP: "Co-pilot Confirms".

17.13.6.4. PILOT: "Arm 1".

17.13.6.5. WSO/CSO: "1 is armed".

17.13.6.6. WSO/CSO: "1 is safe and fixed" (after completion of the gun engagement).

17.13.6.7. PILOT: "Gun Consent Off".

17.13.6.8. WSO/CSO: "Crew WSO, Gun 2 Trainable, HE, target is 195 (bearing), 200 meters (distance) from (nearest friendly ID), , WSO ready".

17.13.6.9. WSO/CSO (non-shooter): "Nearest NO STRIKE 050 (bearing), 350 meters (distance), CSO Confirms".

17.13.6.10. CP: "Co-pilot Confirms".

17.13.6.11. PILOT: "Arm 2".

17.13.6.12. WSO/CSO: “2 is armed”.

17.13.6.13. WSO/CSO: “2 is safe and fixed” (after completion of the gun engagement)

17.13.6.14. PILOT: “Gun Consent Off”.

17.13.6.15. If dual target attack (DTA) is to be utilized the WSO should start the gun weapons brief followed by the CSO. Each operator will brief their own gun/sensor pairing. If single sensor DTA is to be utilized the operator will brief gun 1 then gun 2, example:

17.13.6.15.1. WSO/CSO: “Crew, WSO, Gun 1, trainable, full (rate of fire), Gun 2, trainable, PROX (round type), 260 (bearing), 350 meters (distance) from (nearest friendly ID), , WSO ready.”

17.14. Laser Operations.

17.14.1. All crewmembers will be aware of the nominal ocular hazard distance (NOHD) associated with the MX-20 and MX-25 sensors.

17.14.2. The Laser Designator is operated when the switchable wavelength laser subsystem (SWLS) is configured in the 1.06μ wavelength. When the operator intends to fire the laser designator, the change from 1.57μ to 1.06μ will be verbalized over MAIN interphone.

17.14.3. The laser rangefinder (LRF) is operated when the SWLS is configured in the1.57μ wavelength. The normal operation of the LRF is to update target elevation to provide a more stable sensor and more accurate gun firing solution. Operators will ensure an accurate elevation source is selected prior to any gun engagement. Consideration should be given regarding firing the LRF in either MAUNAL or AUTO modes or utilizing DTED or a forced slant range. Operators will understand the advantages and limitations of each elevation source and LRF mode.

17.15. Multiple Weapon Engagements.

17.15.1. Multiple weapon engagements are normally initiated by 5-line or 9-line, with varying factors such as munitions types, targeting method(s), GPS vs laser guidance, and current TTPs. All available crewmembers should record engagement information as it is received.

17.15.2. Both WSO and CSO will brief their respective targets. The PM will confirm each target in relation to friendlies. Crewmembers will assist the WSO/CSO in maintaining custody to the max extent possible.

17.16. Delaying Weapon Release.

17.16.1. Any crewmember that observes a condition that may jeopardize safety when utilizing any weapon will call “CEASE FIRE” over the primary net. Upon hearing this call: the WSO or CSO selects inhibit for all weapons and the PIC turns the PGM and gun consent switches Off. After resolving the issues that led to a “CEASE FIRE” call, the crew will re-accomplish the weapons brief prior to continuing engagements.

17.16.2. If a crewmember observes a situation requiring a pause in gun engagement, they will call “CHECK FIRE” over the primary interphone net. Upon hearing this call, the WSO and/or CSO selects inhibit for the gun. The pilot will turn off gun consent.

17.17. Contingencies.

17.17.1. Pre-Launch Abort. If an external ABORT call is made prior to weapons release, the crew member monitoring the primary strike radio will state “ABORT, set switches safe” over MAIN interphone. WSO/CSO (shooter) will acknowledge and safe all switches. Crew will then acknowledge the ABORT call over the primary strike radio.

17.17.2. Post Launch Abort. If an external ABORT call is made after weapons release, the crew member monitoring the primary strike radio will state “ABORT, shift cold” over MAIN interphone. WSO/CSO (shooter) will acknowledge and execute pre-briefed PLA plan (as required). Crew will then acknowledge the ABORT call over the primary strike radio.

17.17.3. Post Launch Laser Malfunction. If any crewmember notices a laser designator malfunction after weapon release, that crew member will state “GOALIE, GOALIE, GOALIE” over MAIN interphone (internal goalie), or primary strike radio (external goalie). WSO/CSO (non-shooter) will execute the pre-briefed goalie plan and state “LASING, (PRF)”.

17.17.4. If the WSO/CSO depresses the trigger but Gun 1/2 does not fire:

17.17.4.1. WSO/CSO: “Pulse passed, no gun on 1/2, Gun 1/2 safe.”

17.17.4.2. The WSO/CSO will set the MOP arming panel to INHIBIT for the respective gun, and leave the gun selected and trainable to keep the gun pointed in a safe area until directed by the LG that it is safe to continue firing, or to safe and fix the gun.

17.17.4.3. AG: “Standby Gun 1/2.” Aerial gunner will diagnose and respond as follows:

17.17.4.4. If LG/AG did not observe any actuation of Gun 1/2, proceed as required:

17.17.4.4.1. AG: “Negative actuation, try again Gun 1/2.” **Note:** Subsequent actions for Gun 2 will be IAW TO 1C-130(A)J-1. The portion of the script remaining below only applies to Gun 1.

17.17.4.4.2. {Gun 1 Only} AG: “Recommend clear by fire, 1 round, upper/lower feed.”

17.17.4.4.3. {Gun 1 Only} WSO/CSO: “Clear by fire, 1 round upper/lower feed, 1 is armed.”

17.17.4.4.4. {Gun 1 Only} If the AG asses the malfunction was cleared, AG: “Gun 1 good.”

17.17.4.5. {Gun 1 Only} If the LG/AG assess Gun 1 did not fire due to the selected feed being WINCHESTER:

17.17.4.5.1. {Gun 1 Only} AG: “WINCHESTER upper/lower feed, switch to upper/lower, expect ghost round."

17.18. Post-Strike Coordination. Run the POSTSTRIKE checklist upon completion of strike operations or when transitioning between dry fire and live-fire operations. **Exception:** During Combat/Contingency operations crews may elect to delay the completion of the POSTSTRIKE checklist until tactically necessary.

17.19. Collateral Missions.

17.19.1. Strike Coordination and Reconnaissance. Refer to AFTTP 3-1 Vol 1, *General Planning Considerations,* and AFTTP 3-1.AC-130, *Tactical Employment, AC-130.* When working with ground parties, gunship crews will not give weapons release authority unless authority is delegated to the gunship.

17.19.2. Combat Search and Rescue (CSAR). Refer to JP 3-50, *Personnel Recovery*. The AC-130J should act as On-Scene Commander (OSC) until relieved.

17.20. Integrated Precision Radar Approach (IPRA). IPRA procedures are used to place the aircraft on final approach, properly configured, in a position to identify the landing area and complete a landing. IPRA procedures may be used for approaches to conventional airfields. Comply with local ATC restrictions and host nation agreements, as appropriate.

17.20.1. Weather minimums. All IPRAs must be conducted in VMC unless IMC operations are approved IAW 11-202 Vol 3. If approved, IMC SCA weather minimums will be no lower than 300 ft and 1 sm.

17.20.2. IMC Restrictions:

17.20.2.1. FOM of 4 or less on both Navigation Solutions.

17.20.2.2. Both Pilots must verify RPI or LZ coordinates.

17.20.2.3. Pos Alert 1 and Alert 2 must be set to .03 and .05 respectively.

17.20.2.4. No INAV POS MISCOMPARE / DIFFERENCE ACAWS.

17.20.2.5. SHIP SOLN INAV 2 must be selected for IPRA Approaches.

17.20.3. Landing.

17.20.3.1. The PM will visually scan the runway and verbalize any conditions preventing a safe landing.

17.20.3.2. The WSO will use their sensor to aid in visual acquisition of the runway and verbalize any conditions preventing a safe landing.

17.20.3.3. Do not descend below 300 ft until the runway environment is visually identified and confirmed by both pilots. ***CAUTION:*** The M1 sensor will be placed in the FORWARD or STOW position, and M2 sensor will placed in the STOW position prior to touchdown.

17.20.3.4. Go Around Procedures. Do not descend below the MDA until the runway is in sight. A go-around is required when the runway is not in sight at the MAP, or a safe landing cannot be made.

17.20.3.4.1. The PM will advise the PF upon arrival at the MAP and the PM will state the initial MSL altitude and heading required.

17.21. Self-Contained Approach (SCA).

17.21.1. SCA procedures may be used for approaches to all landing surfaces, and for either overt or covert airland operations. Comply with local ATC restrictions and host nation agreements, as appropriate.

17.21.2. Enroute Altitude. The altitude profile may consist of MSL altitudes, NVG altitudes, or any combination. In all cases, an MSL altitude profile will be planned. **(T-3)**

17.21.3. Weather minimums.

17.21.3.1. All SCAs must be conducted in VMC unless approved IAW **Chapter 15** of the AFMAN11-203V3 AFSOC Supplement. If approved, IMC SCA minimums will be no lower than 300 ft and 1 SM. **(T-2)**

17.21.3.2. For National Geospatial-Intelligence Agency (NGA)-published SCAs, use published minimums.

17.21.4. SCAs are flown to a Minimum Descent Altitude (MDA) and Missed Approach Point (MAP).

17.21.4.1. MDA. To compute MDA for VMC or approved IMC operations, add 300 ft to the Touchdown Zone Elevation (TDZE). **(T-2)**

17.21.4.2. MAP. The MAP should be 1 NM distance to go (DTG) on the CNI-MU.

17.21.5. A full SCA plate for the landing runway is required. Construct an approach plate for the landing runway using the AF FORM 4118, Approach Planning Tool software, or a OG/OGV approved planning form.

17.21.6. Approach Path and Glideslope Construction. Plan IMC SCAs with a 3° glide slope from enroute altitude unless terrain or obstacles dictate a different glideslope. Avoid using glideslopes greater than 5°. Plan initial VMC SCA glideslopes commensurate with terrain, obstructions, threats and aircraft limitations. Plan to intercept a 3° glide slope at or before the MDA.

17.21.7. Chart Preparation. Use the largest scale chart available from 10 NM inbound. A 1:50,000 chart is preferred, but in no case will it be larger than 1:250,000. Select position and altimeter update points and brief the position to the crew during route study. Chart construction will be IAW this chapter and include the following additional items: The Initial Point (IP), slowdown points, descent point, and the missed approach, departure, and go-around paths. Ensure update points for the mission computer and altimeter are annotated. It is of utmost importance to have sufficient, reliable position and altitude update points prior to the IP and final run-in. **(T-3)**

17.22. SCA Template Construction.

17.22.1. Use the most current sources for topographic point obstruction, and airfield information. Consider using radar reflectors, radar beacons, or existing airfield NAVAIDS to increase the reliability of the approach.

17.22.2. Enroute Altitude. In all cases, an MSL altitude profile will be planned. **(T-3)**

17.22.3. Straight-in SCAs. Draw the horizontal obstacle clearance template, depicted in **Figure 171,** on a 1:250,000 or larger scale chart, if available. The template begins 0.3 NM either side of LZ centerline at the touchdown point, extending outward to 1 NM either side of centerline at decent point or 3 NM, whichever is greater, from the touchdown point and then extended 1 NM beyond the planned descent point (for example, a 3.2 NM planned descent point requires a 4.2 NM long template). If the planned descent point is less than 2 NM from the touchdown zone, then the standard 3 NM template will not require extension. **(T-2) Note:**

These are minimum distances and may be increased. Consider such factors as the availability of radar targets, recent NAVAID performance and time of last system position/altitude update.

Figure 17.1. SCA Horizontal Obstacle Clearance Template.

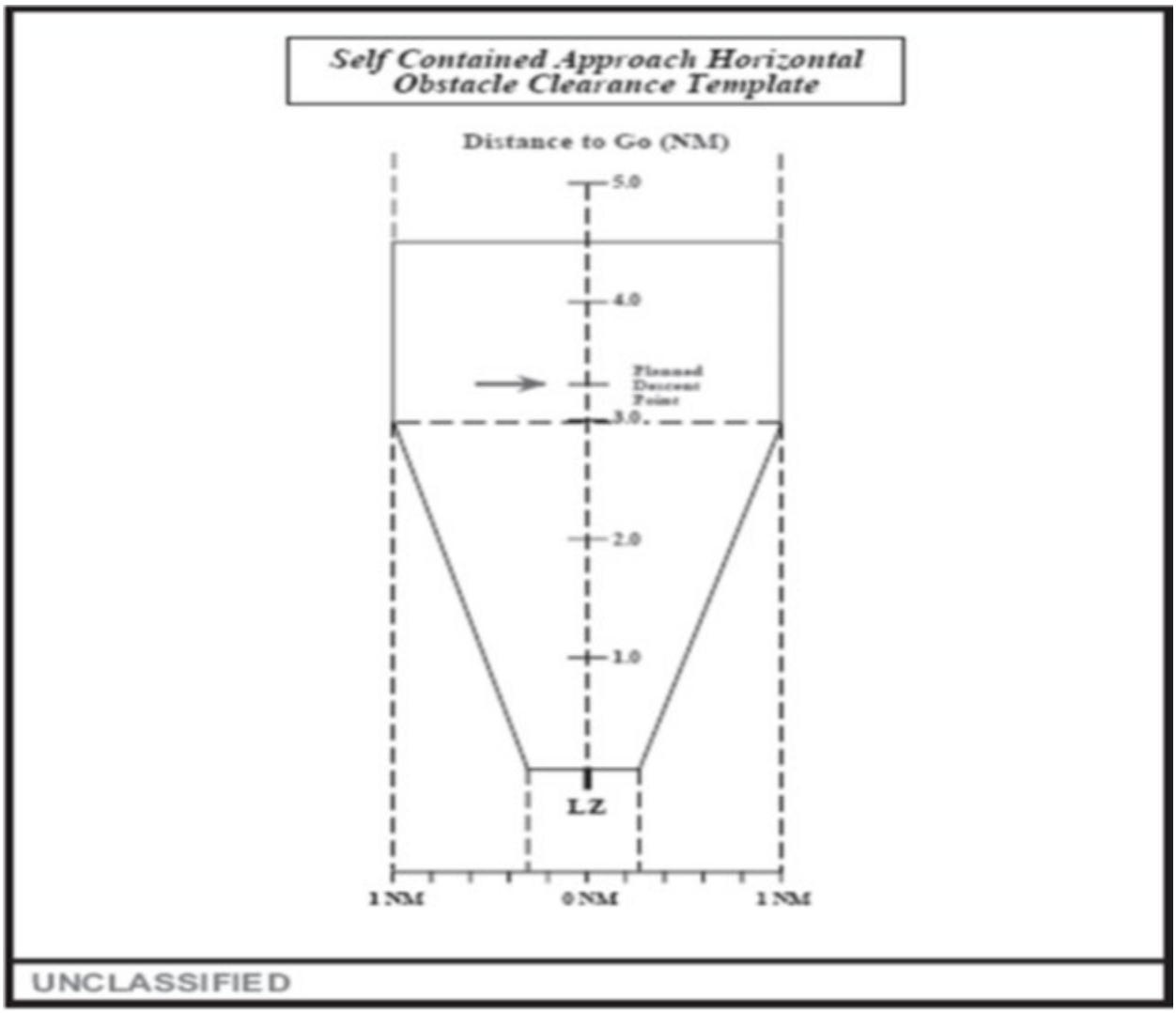


Figure 17.2. Turning SCA Horizontal Obstacle Clearance Template (Not to Scale) (1 of 2).

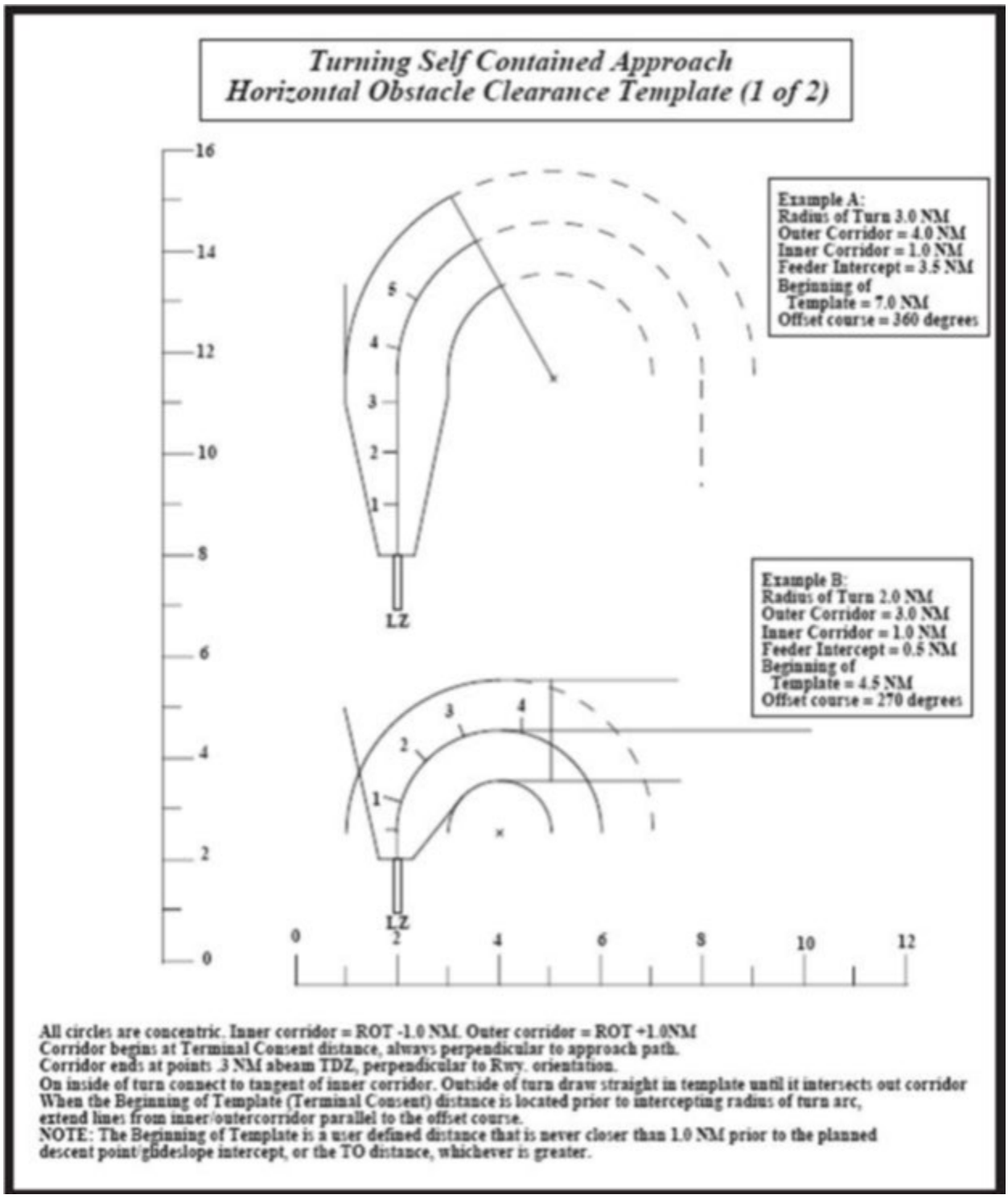
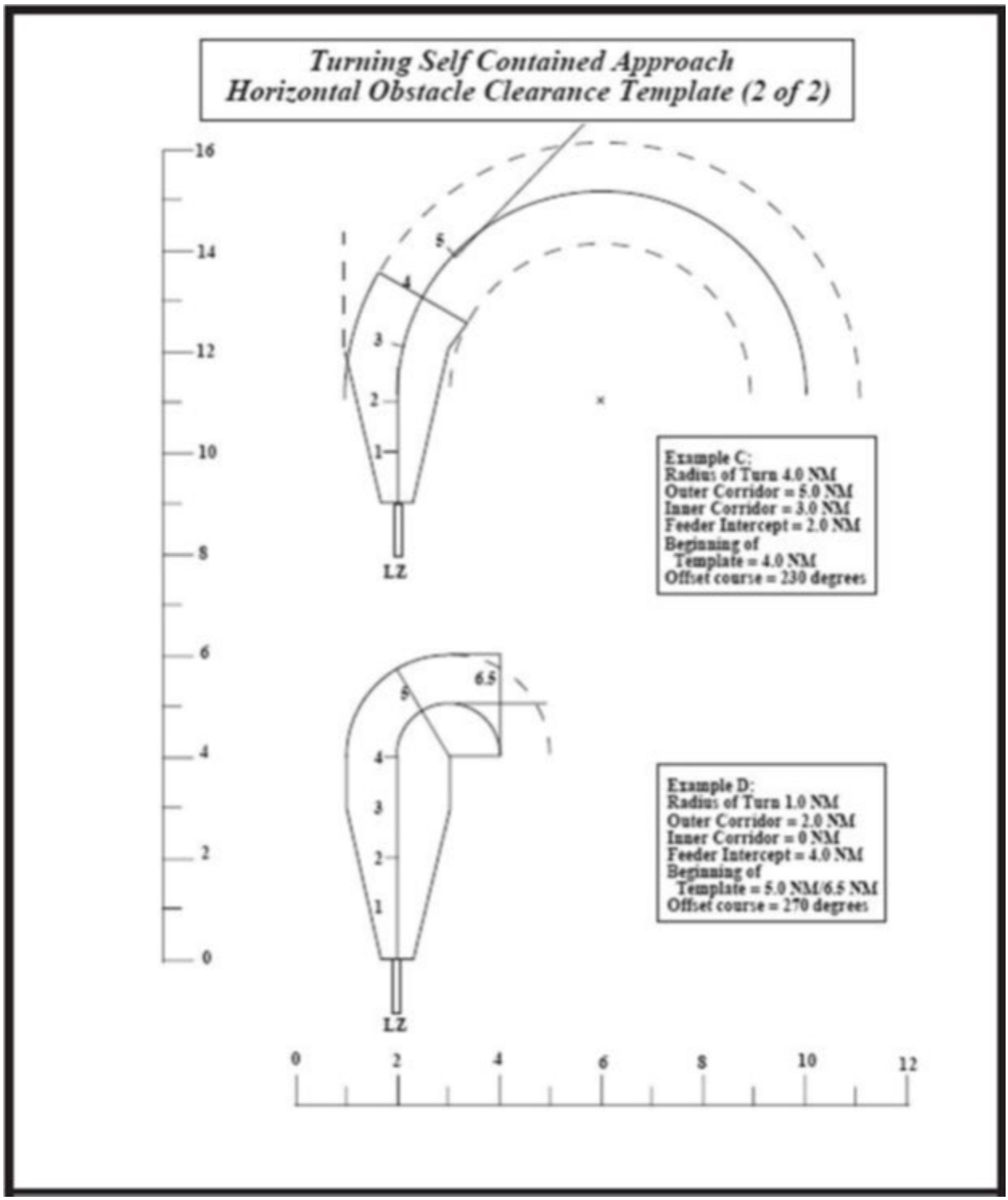


Figure 17.3. Turning SCA Horizontal Obstacle Clearance Template (Not to Scale) (2 of 2).



17.22.4. Turning and Circling SCAs. The obstacle template for a turning or circling SCA consists of a modified version of the straight-in template. Draw the turning SCA horizontal obstacle clearance template, depicted in **Figure 17.3**, on a 1:250,000 or larger scale chart if available. Draw the straight-in portion of the SCA template as if planning a straight-in SCA.

Select the feeder distance where the aircraft will intercept runway centerline. From the pre-planned radius intercepting the feeder distance draw an inner and outer corridor. For the outer corridor, draw a concentric circle with radius 1.0 NM greater than the planned radius of turn. For the inner corridor, draw a concentric circle with a radius 1.0 NM less than the planned radius of turn. Connect the inner and outer corridors with a line that is perpendicular to the approach path at the point 1 NM prior to glideslope intercept. When the glideslope intercept occurs prior to intercepting the turning path, draw lines parallel to the offset course tangent to the outer and inner corridors. When using a large radius with a short feeder distance, draw a tangent line from the inner corridor to the template 0.3 NM abeam the runway. See **Figure 17.3** example B.

17.22.5. Obstacle Clearance. The location of terrain and obstructions will dictate the glideslope and altitude profile used. Use the following procedures to analyze obstacles: **(T-3)**

17.22.5.1. SCA Vertical Template Construction. Starting at the touchdown zone, construct a glideslope using the desired gradient (feet/NM) to a point along the final approach course (or transition path, if applicable) where it intercepts the planned approach altitude (refer to **Figure 17.5**.). Annotate the glideslope MSL and AGL altitudes for each 0.5 NM distance-to-go increment out to the planned descent point.

17.22.5.2. Significant and Critical Obstacles. Using current large-scale charts, airfield diagrams, airfield sketches, approach plates, and imagery, locate significant obstacles within the boundary of the horizontal template. Significant obstacles are those within 300 feet of the desired glideslope. Determine the HAT for each obstacle by subtracting TDZE from the MSL elevation of the obstacle. For each obstacle, plot the along-course distance from touchdown and HAT on the critical obstacle graph as shown in **Figure 17.4**., Critical Obstacle Chart. An obstacle is considered critical if it falls above the reference line for the planned glideslope or its extension along the depicted baseline.

17.22.5.3. Draw the relative position of each critical obstacle on the template and annotate its distance-to-go, distance abeam final course centerline and height (AGL and MSL).

17.22.5.4. For each critical obstacle identified, preplan and brief a specific means of avoidance to be used during the approach. The following examples may be used separately or in combination:

17.22.5.4.1. Use of a steeper glideslope. Glideslopes exceeding 4° should be carefully considered due to the high rate of descent required.

17.22.5.4.2. Move the touchdown point further down the runway.

17.22.5.4.3. Increase MDA.

17.22.5.4.4. Establish an intermediate step-down altitude above the MDA at which the aircraft will level off until positive separation from the obstacle is assured. **(T-2)**

Figure 17.4. Critical Obstacle Chart.

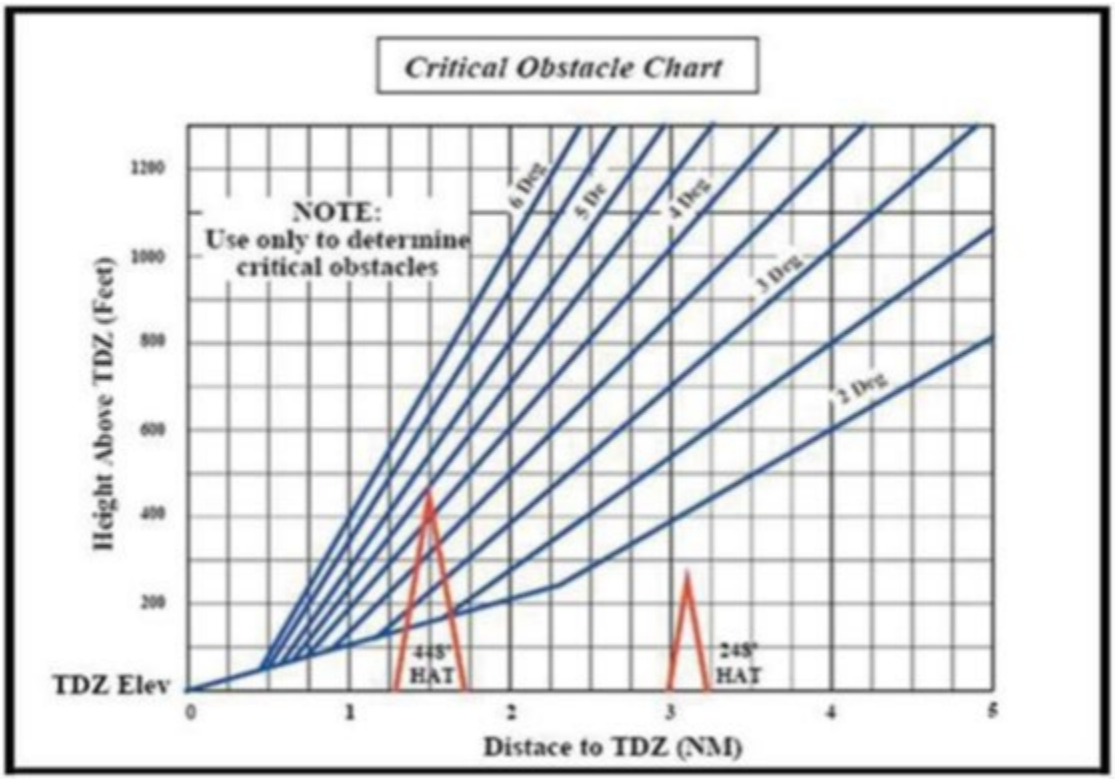
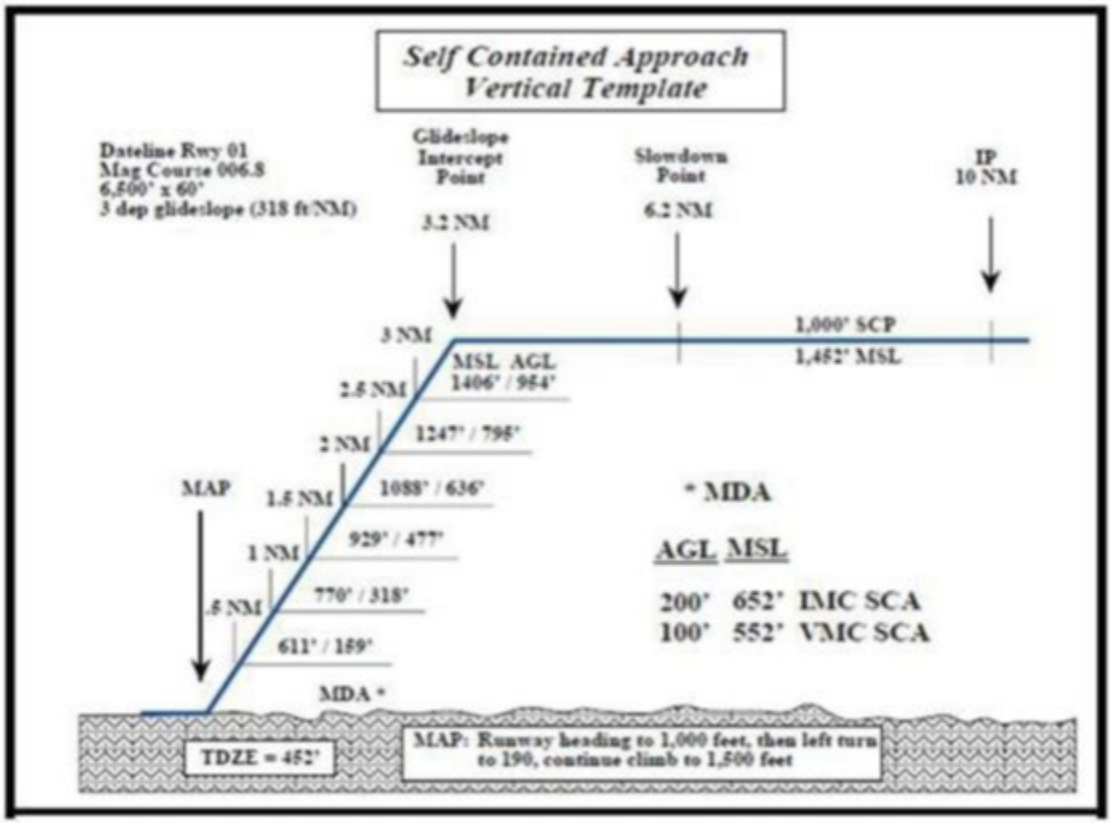


Figure 17.5. SCA Vertical Template.



17.22.6. Missed Approach and Departure. For planning, allow a minimum of 0.3 NM along track error and 0.3 NM cross-track error at the MAP. Assume IMC when choosing the missed approach/departure flight path. Construct a horizontal obstacle clearance template beginning at the MAP and incorporating the planned missed approach/departure flight path. Use TDZE as the MSL start point for the missed approach. If the terrain along this flight path (including the above errors) rises at a rate greater than 200 feet/NM, refer to the Performance Manual to verify that three-engine climb out will clear terrain. **(T-2)** Use the three-engine climb angle in place of glideslope.

17.22.6.1. The horizontal obstacle clearance template for climb out extends from the approach end of the runway out to 1.0 NM past level off at the initial escape enroute altitude. The lateral limits of the climb out template are the same as for the straight-in approach.

17.22.6.2. If any critical obstacles are identified, consider using turns during climb out to avoid them. Ensure that the three-engine climb path provides sufficient clearance from obstacles and terrain along the flight path.

17.23. SCA Procedures.

17.23.1. ARRIVAL BRIEFING GUIDE Checklist. The PF the SCA and CSO will brief the SCA. **(T-2)**

17.23.2. The PM will check the runway data during crew brief and confirm in CNI-MU using approved sources (the SCA plate, AF IMT 3822, AF Form 70 or FLIP approach plate). **(T-2)**

17.23.3. BEFORE LANDING Checklist. The PF will initiate the BEFORE LANDING checklist as required to ensure the aircraft is configured and the checklist is complete prior to glide slope intercept. **(T-2)**

17.23.4. The PM will normally set the RAD ALT to 250 feet (minimum setting). **(T-2)**

17.23.5. Glide Slope Intercept. The BEFORE LANDING checklist should be completed prior to glide slope intercept.

17.23.6. Required warnings and calls.

17.23.6.1. The CSO will give course corrections to intercept the final approach course prior to or at the IP. **(T-2)**

17.23.6.2. The PM will make mandatory calls IAW **Table 5.3** of this guidance. **(T-2)**

17.23.6.3. "Begin descent"; distance call at "2 NM" (from the landing zone); "missed approach point" (if other than approach end of runway); and "100 feet," "50 feet," "25 feet," and "10 feet" above touchdown. Additionally, the CSO will update the pilots on course, distance-to-go, and glide path profile no less than every 1 NM, beginning at glideslope intercept, until the "minimums" call. **(T-3)**

17.23.7. The CSO/PM will back up the flying pilot on the displays and confirm terrain clearance using all available means including Radar, RAD ALT, TAWS and visual identification. **(T-3)**

17.23.8. At the Initial Point:

17.23.8.1. The CSO will verify final course guidance accuracy. **(T-3)**

17.23.8.2. The CSO will confirm LZ alignment and give final headings as required. **(T-3)**

17.23.8.3. Maintain enroute profile until descent for landing.

17.23.9. Slowdown Procedures.

17.23.9.1. Slowdown points will be planned and briefed for tactical approaches. **(T-3)** The slowdown is normally initiated by a call from the CSO for SCAs. Pilots should initiate their own slowdowns for overhead and downwind approaches.

17.23.9.2. Maintain a minimum of threshold speed for the given flap configuration on final (approach speed for turning).

17.23.10. Glideslope Intercept.

17.23.10.1. Approaching glide slope intercept, the CSO will confirm the accuracy of the barometric altimeter setting by comparing actual AGL and MSL altitudes with those depicted on the SCA template.

17.23.10.2. The PF will begin descent upon CSO direction or following the flight director cue unless directed otherwise by the CSO. **(T-2)** ***WARNING:*** The CSO will verify that the aircraft position is inside the planned SCA obstacle template prior to initiating descent. **(T-2)**

17.23.10.3. The PM will back up the PF on the CNI-MU/instrument displays. **(T-2)**

17.23.10.4. At glideslope intercept, the CSO will state "begin descent" and should repeat the desired initial descent angle. The CSO will monitor course and glideslope deviations. **(T-3)** Report deviations greater than 50 feet vertically, or 50 yards horizontally, along with an advisory as to whether the aircraft is correcting to, paralleling, or diverging from course/glidepath. ***WARNING:*** The obstacle clearance procedures in this chapter are not applicable to NVG operations conducted in a visual pattern. The pilot must maintain visual contact with the LZ and with surrounding terrain in order to execute a successful approach. **(T-2)** ***WARNING:*** The PM and CSO must closely monitor radar altimeters to ensure accuracy of altimeter settings to prevent inadvertently flying below planned AGL minimums. **(T-2)** ***WARNING:*** Use of a 5° glideslope can cause descent rates in excess of 1,000 feet per minute.

17.23.10.5. The PM will set the appropriate minimum altitude in the REF SET panel.

17.23.11. Descent. Do not descend below MDA until the LZ is identified visually and confirmed by both pilots. Whoever identifies the LZ first will call out "ZONE IN SIGHT," its clock position, and any discrepancies noted (i.e., any lights out, etc.). Both pilots will then confirm the zone and cross-check the alignment for the proper heading. **(T-2)**

17.23.12. Landing.

17.23.12.1. The CSO and WSO will use the Low Power Color radar (LPCR) and a visual sensor respectively to aid in runway identification, and the PM will visually scan the runway and verbalize any conditions preventing a safe landing. **(T-2)**

17.23.12.2. Do not descend below MDA until the runway environment is visually identified and confirmed by both pilots. **(T-2)** ***CAUTION:*** M2 sensor will be stowed prior to touchdown. **(T-2)**

17.23.12.3. If an immediate landing is feasible and desired, the PF will announce intentions and maneuver to a VFR pattern. Maneuver the aircraft to be wings level and configured at a minimum of 300 feet AGL and 1 NM final for an SCA or visual approach. Pilots will call the landing zone "in sight" as they turn final and CSO will make standard altitude advisory calls on descent. **(T-3)**

17.23.13. Go-Around and Departure Procedures. ***CAUTION:*** Pilots are more susceptible to spatial disorientation during NVG go-arounds and departures.

17.23.13.1. If an immediate approach and landing are not feasible, state intentions, complete the After Takeoff Checklist and proceed as planned.

17.23.13.2. A go-around is required when the runway is not in sight at the MAP or a safe landing cannot be made. **(T-2)**

17.23.13.3. When executing a go-around or departure, the CSO will state the initial heading and "climb to XXX feet" or MSA and will call climbing altitudes as required for terrain clearance from 50 feet to level off. **(T-3)**

17.23.14. Loss of NVGs:

17.23.14.1. Before Landing. If the pilot or copilot loses use of their NVGs inside of 1 NM, perform a go-around.

17.23.14.2. After Takeoff. The PF should transfer aircraft control and continue the climb out. Consider transitioning to instruments or overt lighting.

17.23.14.3. On the Ground. The PF will determine whether to continue the landing rollout or takeoff roll as applicable. **(T-3)** The PM should be prepared to turn on overt lighting at the direction of the PIC in case of NVG failure during takeoff or landing roll.

17.24. Tactical Recoveries. 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 must be unpredictable. Comprehensive mission planning and knowledge of the threat location, density, and capability will dictate the specific tactics to be employed. Description of tactical approach procedures and considerations for selection are explained in the AFTTP 3-3. Crews must reference and comply with local procedures where the approaches will be performed. Crews should configure HDDs for maximum terrain avoidance. ***WARNING:*** Aircrew will conduct a thorough pre-brief of terrain and obstacles in any area where low altitude operations are performed. **(T-2)**

17.25. Formation Procedures General. Formation is defined as aircraft maneuvering with respect to a formation lead exercising mutual support for a common objective. For specific tactical formation employment reference AFTTP 3-1 and AFTTP 3-3 (or equivalent). This section prescribes basic formation procedures. They are a guideline, primarily designed to be used in VMC. IMC procedures are employed in extraordinary circumstances when IMC is encountered inadvertently or when the mission demands IMC penetration. All crewmembers conducting formation operations will be trained and certified on AF Form 4348.

17.25.1. Limit AC-130J formations to three aircraft.

17.25.2. Dissimilar Formations. Deployment operations may require different MDS AFSOC aircraft to fly together in formation. The AFSOC standard is the 2,000-foot visual trail. The minimum lateral spacing for different MDS aircraft will be 500 ft. If flight in visual conditions is not possible, use pre-briefed IMC procedures to provide separation between aircraft. The lead aircraft will direct wingmen to assume IMC spacing well prior to the formation entering the weather. For formation AAR use geometries and positioning described in ATP-56(B), *NATO Air-To-Air Refueling Procedures*. ***WARNING:*** When flying alternate formations, it may be necessary to modify inadvertent weather penetration procedures. For the purposes of formation procedures in this regulation, all AC-130 variants are considered a similar MDS. For all formation live-fire training involving more than one AC-130 variant, a face-to-face crew brief will be conducted and current TTPs will be reviewed. **(T-2)**

17.25.3. Command and Control. Clear lines of command must be established during formation flight. This does not prevent other formation members from suggesting a course of action. Personnel in the following roles will be identified during mission planning and will be annotated on the flight orders (unless noted otherwise):

17.25.3.1. Airborne Mission Commander (AMC). The individual responsible for the overall safe and effective employment of air assets. Required where mission complexity dictates. The AMC should not be a primary crewmember. When communicating to the rest of the formation as the airborne mission commander, use a unique callsign.

17.25.3.2. Formation Commander. Required on every formation mission. The designated commander of a formation of aircraft and responsible for successful completion of the formation's portion of the mission. Usually chosen from the PICs involved in the mission (usually the lead pilot). The pilot of the lead aircraft (if not the airborne mission commander) is empowered to conduct the mission as planned including any planned alternates and immediate actions necessary for formation safety. The airborne mission commander has the responsibility to direct all other changes to the mission. The formation commander works closely with the AMC (if one is utilized) to accomplish the overall mission. The formation commander is usually designated DMC in missions employing a dedicated AMC.

17.25.3.3. Deputy Mission Commander. Required on all missions employing a dedicated AMC, on all multi-element formation missions, and on all single-element formations of three aircraft or more. The DMC assumes command if conditions prevent the AMC from controlling the mission. The DMC may be a primary crewmember and is usually the Formation Commander on AMC controlled missions.

17.25.3.4. Formation Lead. The lead aircraft in a formation flight. Responsible for proper mission execution and other immediate action events during a formation flight.

17.25.4. Specified Times. The appointed mission commander determines the sequence of events and mission times based on requirements such as staff input, fuel requirements, user needs, taxi distances, and briefing requirements.

17.25.5. Pre-takeoff Procedures:

17.25.5.1. Taxi (formation taxi is optional). Minimum taxi interval is one aircraft length.

17.25.5.2. Runway Positioning. Aircraft alternate sides with nose to tail clearance. If feed-on method is used, subsequent aircraft move into takeoff position as preceding aircraft start takeoff roll. This method is used when runway length or gross weight demands the entire runway be used or maximum power be applied prior to brake release.

17.25.6. Takeoff:

17.25.6.1. Interval. Minimum takeoff interval between aircraft in VMC is 15 seconds. If the weather does not allow a VMC departure the formation will depart single ship, minimum one minute separation, and rejoin after VMC conditions are attained. If VMC cannot be attained, fly radar/TACAN in-trail.

17.25.6.2. Application of Power. To prevent damage to succeeding aircraft, do not advance power above flight idle until takeoff roll is started. Use a smooth application of power to achieve takeoff torque. If full power is required prior to brake release, ensure adequate separation or use feed-on method. Lead will pre-brief takeoff power settings.

17.25.6.3. Abort During Takeoff. If an aircraft aborts during takeoff roll, the CSO will immediately transmit on inter-plane frequency and the CP on primary ATC frequency (after completing emergency procedures requiring immediate action) the formation position and the word “Aborting” three times. For example, “Number 1 aborting, Number 1 aborting, Number 1 aborting”. The aborting aircraft will clear the runway as expeditiously and as safely as possible. Succeeding aircraft will hold until the runway is

clear. If takeoff run has already been started by succeeding aircraft, they will abort and clear the runway.

17.25.7. Enroute. In the ATC environment, all aircraft not in a standard formation (standard formation is defined as less than 1-mile horizontal separation and less than 100 ft vertical, IAW FAA) will be fully lighted as required by AFMAN 11-202, Vol 3.

17.25.7.1. At night, lead will announce unplanned airspeed changes of greater than 15 knots, unless briefed otherwise.

17.25.7.2. Aircraft aborting after assembly will notify lead and turn away from the formation and rejoin at the end or proceed to a suitable recovery field. Aircraft within flight will reposition as briefed.

17.25.8. Formation AAR

17.25.8.1. Weather Minimums. RV closure will not be continued inside 1 SM unless visual contact is established with the tanker. AAR will not be continued when in-flight visibility is deemed insufficient for AAR operations. Lead is responsible for weather avoidance during the RV until ½ nm from contact. Any aircraft in the formation may advise the formation of inclement weather on the refueling track.

17.25.8.2. Lead will direct the formation to either a right echelon or in-trail (IMC), stacked up 500 ft, prior to the entry point or rendezvous initial point (RVIP). Lead will call out the base altitude and occupy that altitude while maintaining 1,000 ft separation between the highest receiver and lowest tanker.

17.25.8.2.1. If visibility is 2 nm or greater. Wingmen maintain a loose visual, 300 ft nose- to-tail clearance and 170 ft lateral wingtip clearance until lead calls AAR complete. Lead will make this call on air refueling frequency when established in a loose visual position on the tanker's left wing. After lead calls AAR complete, number two is cleared to pre- contact. Number two calls AAR complete on air refueling frequency when established on lead's left wing. After number two AAR complete, number three is cleared to pre-contact. Number three will call AAR complete when established on lead's left side. ***WARNING:*** **Do not cross behind an aircraft in pre-contact/contact.**

17.25.9. Inadvertent Weather Penetration. Upon entering marginal VMC or IMC, the following procedures apply: ***WARNING:*** Inadvertent weather penetration procedures must be briefed. These procedures are designed for use from visual trail formation during straight and level flight with no more than 3 aircraft. It may be necessary to modify these procedures due to formation geometries, terrain, airspace restrictions, etc. Inadvertent weather penetration in mountainous terrain may be extremely hazardous. Mission planners must devise and brief procedures that best suit the situation. **(T-3) Note:** Inadvertent weather penetration procedures are for emergency use and do not constitute authority to violate AFMAN 11-202, Vol 3 or Federal Aviation Regulation. Exercising these procedures under actual weather conditions is a violation subject to appropriate action by the AF and FAA. Individual aircraft should maintain VFR if there is sufficient warning to take evasive action. Flight leads will take all practical measures to avoid entering controlled airspace without clearance. **(T-3)**

17.25.9.1. Wing aircraft immediately initiates a climbing turn as required for its position in the formation and gives "Call Sign, IMC Break" three times over the primary interplane radio. The lead aircraft responds with call sign, heading and base altitude. Base altitude will be as follows: MSA, if position is within the MSA corridor; or ESA, if not. **(T-3) Note:** During training and exercise operation, the IMC Break call will be made on a non-secure radio. Lead's response will be made on the same non-secure radio by the CSO/PM (unless briefed otherwise), and the response will be called twice to ensure all wingmen copied the heading and altitude. **(T-3)**

17.25.9.2. All aircraft turn navigation lights to bright and turn transponder modes 1 and 3 to normal (if the threat environment allows).

17.25.9.3. Lead aircraft uses power as required and climbs straight ahead at a base airspeed of 220 KCAS until reaching base altitude or VMC conditions, whichever occurs first. Upon reaching this altitude, maintain base airspeed of 220 KCAS. If lead is unable to climb at 220 KCAS, the aircraft commander will establish a new base airspeed and inform the formation over interplane frequency. **(T-3)**

17.25.9.4. The #2 aircraft immediately turns right 10° or more (if feasible), sets power as required and climbs at base airspeed minus 20 KCAS to base altitude plus 500 feet or VMC conditions, whichever occurs first. After 30 seconds, resume original heading. Upon reaching altitude, accelerate to base airspeed.

17.25.9.5. The #3 aircraft immediately turns left 10° or more (if feasible), sets power as required and climbs at base airspeed minus 40 KCAS to base altitude plus 1,000 feet or VMC conditions, whichever occurs first. After 30 seconds, resume original heading. Upon reaching altitude, accelerate to base airspeed.

17.25.9.6. If VMC conditions are encountered and can be maintained, rejoin the formation visually after obtaining permission from Lead. ***WARNING:*** The direction of turn for IMC breaks is based on a "no terrain" situation. Terrain, threats, or fluid trail position may dictate a direction of turn different from what your formation position calls for. Situational awareness is critical to terrain and threat avoidance when weather is inadvertently encountered. **Note:** If the altitude to which the formation is climbing is only several hundred feet above enroute altitude, a less aggressive climb profile (Vertical Velocity Indicator) may be appropriate. Remember, the climbing turn and speed differential are what get the desired separation and the amount of power set gives you the desired climb away from terrain. **Note:** All IMC maneuvering should be smooth and deliberate with reference to flight instruments to prevent spatial disorientation.

17.25.10. Preplanned Weather Penetration. These procedures enable weather penetration enroute to VMC objective area. They are designed to transition a formation from visual trail to Radar Trail prior to entering weather and permit continued formation flight in IMC. Using these procedures, it is possible to fly an IMC route segment at a preplanned safe altitude while still maintaining formation integrity.

17.25.10.1. On lead's signal, lead accelerates 20 KCAS, #2 maintains enroute airspeed, and #3 reduces sped 20 KCAS. The formation maintains this airspeed differential for 3 minutes, then resumes enroute airspeed. This should establish approximately 1 mile separation between aircraft. On the same signal, lead maintains/climbs to base altitude, #2

climbs at 1,000 feet per minute to base altitude plus 500, and #3 climbs at 1,000 per minute to base altitude plus 1,000 feet Base altitude will be as follows: MSA, if position is within the MSA corridor; ESA if outside the corridor, or an appropriate altitude for the current enroute environment. Depending on the environment, altitudes may be amended (i.e., base plus 100 feet, base plus 200 feet or all aircraft at co-altitude).

17.25.11. Assembly. The formation commander will brief how rejoins and position changes are to be accomplished in the VFR pattern. **(T-3)** If multiple formation recoveries are planned for the VFR pattern, it may be preferable to brief that rejoins in the pattern are directly to trail and for wingmen to call "in" when in position.

17.25.11.1. During visual trail formation, wingmen maintain position strictly by a visual reference to the preceding aircraft. Because of this, it is essential that lead maintain a stable reference platform by flying constant power settings as much as possible. Small climbs should be made by changing pitch and leaving power set. For climbs in excess of 500 feet, set power and adjust pitch as necessary to avoid obstacles. For descents in excess of 500 feet, set power not less than approximately 600 HP and adjust pitch to maintain the desired airspeed or rate of descent. Under normal circumstances, lead should avoid using flight idle or maximum power settings, since they may outperform the ability of the wing aircraft. Power Lever movement should be smooth and relatively slow to allow adjustments by wingmen. ***WARNING:*** Pilots must keep in mind the risks of overrunning the lead aircraft. Use all means to modify Lead of an overrun situation in order to avoid a collision.

17.25.11.2. During fluid trail formation, climbs and descents should be made much the same as visual trail. Small climbs should be made by changing pitch and leaving power set. For climbs in excess of 500 feet, set power and adjust pitch as necessary to avoid obstacles. Lead should use climb power minus one knob width to give wing aircraft a power advantage. For descents in excess of 500 feet, set power not less than approximately 1,000HP (1.5 knob) and adjust pitch to maintain the desired airspeed or rate of descent. Like visual trail, lead should be smooth with power changes; however, a greater range of high and low settings are available due to the spacing of the aircraft. The formation commander may brief alternate rates and power setting for fluid trail climbs and descents.

17.25.12. Aircraft lighting:

17.25.12.1. Departure and Recovery. Normal or reduced lighting is authorized IAW AFMAN 11-202, Vol 3.

17.25.12.2. Enroute. In the ATC environment, during other than actual combat operations, all aircraft not in a standard formation (standard formation is defined as less than 1-mile horizontal separation and less than 100 feet vertical, IAW FAA) will be fully lighted as required by AFMAN 11-202, Vol 3. **(T-2)**

17.25.12.3. Night Vision Goggles (NVGs). Refer to **Table 17.2** for exterior and interior light setting when using NVGs. The signal to transition to/from NVG lighting will be as briefed. **(T-2) Note:** When other than standard AFMAN 11-202, Vol 3, lighting is required due to mission constraints, **Table 17.3** provides a reference for light configurations and light signals to be used during formation and other tactical employment operations.

Table 17.2. Lighting Chart.

1. Day Formation. All aircraft will have lighting IAW AFMAN 11-202, Vol 3.
2. Night Formation without NVGs. All aircraft will have lighting IAW AFMAN 11-202, Vol 3.
3. Echelon Formation, Night, Using NVGs: a. Master Switch – COVERT, Covert/Formation – as required b. Navigation Lights – OFF c. Anti-Collision/Strobe Lights – OFF d. Leading Edge Lights – OFF e. UARRSI Lights – OFF
4. Fluid Trail: Same as item 3 except, spacing and illumination may require higher formation light setting.
Note: For training and exercise flight (with or without NVGs), the last aircraft in the formation will be lighted IAW AFMAN 11-202, Vol 3. At night aircraft may turn off the fuselage lights, to aid night vision. During training and exercise flights, all aircraft will have lighting IAW AFMAN 11-202, Vol 3, when not in fluid trail or echelon formation.
Note: Formations may vary lighting as necessary provided they maintain adequate visual identification of the formation.

Table 17.3. Dissimilar Formation Approval Authority.

	Approval Authority		
Dissimilar Formation with:	**OG/CC**	**COMAFSOF**	**AFSOC/A3**
Other MAJCOM C-130 variants	When specifically coordinated during the joint and/or combined exercise planning conference(s) and written into the Special Operations Group CONOP or the Exercise Order for Bilateral, Multilateral,	Approval authority is delegated for combat contingency operations.	Training events NOT specifically coordinated during the Joint and/or Combined exercise planning conference(s) and written into the Special Operations Group CONOP or the Exercise Order for Bilateral, Multilateral, Higher Headquarter-directed, JCET, OR
Other DOD Service Components C-130 variants			
FVEY* Partner Nations			

	Higher Headquarter-directed, JCET, OR JCS-directed exercises		JCS-directed exercises
Other Partner Nation C-130 variants	**N/A**		**X**
All Non-C-130 Aircraft**	**N/A**	**N/A**	**X**
*** A**ustralia, Canada, New Zealand, and the United Kingdom ** Fighter aircraft conducting fires integration does not constitute formation			

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

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DD Form 1801, *DoD International Flight Plan*

DD Form 2131, *Passenger Manifest*

DD Form 2133, *Joint Airlift Inspection Record*

DD Form 2992, *Medical Recommendation for Flying or Special Operational Duty*

DESC-I-31, *Purchase of Aviation Fuel and Services at Commercial Locations*

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

AF Form 72, *Air Report (AIREP)*

AF Form 457, *USAF Hazard Report*

AF Form 523, *USAF Authorization to Bear Firearms*

AF Form 651, *Hazardous Air Traffic Report (HATR)*

AF Form 711B**,** *USAF Aircraft Mishap Report Worksheet*

AF Form 791, *Aerial Tanker In-flight Issue Log*

AF Form 847, *Recommendation for Change of Publication*

AF Form 1297, *Temporary Issue Receipt*

AF Form 2282, *Statement of Adverse Effect – Use of Government Facilities*

AF Form 3823, *Drop Zone Survey*

AF Form 4051, *Low-level Flight Plan and Log*

AF Form 4108, *C-130 Fuel Log*

AF Form 4116, *C-130 Flight Plan Record*

AF Form 4122, *Airborne Radio Log*

AF Form 4123, *Airdrop Card*

AF Form 4139, *Special Operations C-130 Inflight Refueling Worksheet*

AF Form 4327A, *Crew Flight (FA) Authorization*

AFSOC Form 4139, *Special Operations C-130 In-flight Refueling Worksheet*

AFTO Form 46, *Aircrew Flight Equipment*

AFTO Form 781, *Aerospace Vehicle Flight Data Record*

AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document*

AFTO Form 781A, *Maintenance Discrepancy and Work Document*

AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance Document*

CBP Form 6059B, *Customs Declaration*,

CBP Form 7507, *General Declaration (Outward/Inward)*

CBP Form I-92, *Aircraft/Vessel Report*

Immigration Form I-94, *Arrival/Departure Record*

Standard Form 44, *Purchase Order- Invoice Voucher*

Abbreviations and Acronyms

AAR—Air-to-Air Refueling

AC—Aircraft Commander

ACAWS—Advisory Caution and Warning System

ACP—Allied Communications Publication

ADF—Automatic Direction-Finding System

ADIZ—Air Defense Identification Zone

ADS—Aerial Delivery System

AETC—Air Education Training Command

AF—Air Force

AFJI—Air Force Joint Instruction

AFMC—Air Force Material Command

AFRC—Air Force Reserve Command

AFSOC—Air Force Special Operations Command

AFTO—Air Force Technical Order

AFTTP—Air Force Tactics, Techniques, and Procedures

AGL—Above Ground Level

AHS—Ammunition Handling System

ALS—Approach Lighting System

ALT—Altitude

AMC—Airborne Mission Commander

AMU—Avionic Management Unit

ANG—Air National Guard

AOR—Area of Responsibility

APPR—Approach

APU—Auxiliary Power Unit

ARC—Air Reserve Component

AREP—Air Refueling Exit Point

ARIP—Air Refueling Initial Point

ASRR—Airfield Suitability and Restrictions Report

ATA—Actual Time of Arrival

ATC—Air Traffic Control

ATCS—Automatic Thrust Control System

ATO—Air Tasking Order

AVPOL—Aviation Petroleum, Oil, and Lubricants

BAQ—Basic Aircraft Qualified

BAU—Bus Adapter Unit

BFT—Blue Force Tracker

BMC—Basic Mission Capable

BRNAV—Basic Area Navigation

C2—Command and Control

CADC—Central Air Data Computer

CAT—Category

CBP—Customs Border Protection

CC—Commander

CCC—Command and Control Center

CCT—Combat Control Team

CF—Customs Form

CFL—Critical Field Length

CFP—Computer Flight Plan

CHK—Check

CHUM—Chart Updating Manual

CLT—Common Launch Tube

CMDS—Countermeasures Dispensing System

CNBP—Communication/Navigation/Breaker Panel

CNDC—Canadian National Defense Contract

CNI—Communication/Navigation/Identification

CNI-MU—Communication/Navigation/Identification Management Unit

COMAFSOF—Commander Air Force Special Operations Forces

COMSEC—Communications Security

CONUS—Continental United States

COP—Common Operating Picture

CP—Command Post

CRO—COMSEC Responsible Officer

CSO—Combat Systems Operator

CVR—Cockpit Voice Recorder

DA—Digital Autopilot

DA-CAS—Digitally Aided Close Air Support

DCS—Decompression Sickness

DD—Department of Defense Form

DFDR—Digital Flight Data Recorder

DFSC—Defense Fuel Supply Center

DH—Decision Height

DMC—Deputy Mission Commander

DME—Distance Measuring Equipment

DoD—Department of Defense

DOMOP—Domestic Operations

DOT—Department of Transportation

DSN—Defense Switched Network

DSR—Deployed Status Reports

DV—Distinguished Visitor

DVT—Divert

DWLI—Dual Wavelength Laser Illuminator

EAR—End Air Refueling

ECB—Electronic Circuit Breakers

ECM—Electronic Countermeasures

ECSF—Electronic Combat Support Flight

EGI—Embedded Global Positioning/Inertial Navigation System

EP—Evaluator Pilot

ER—Exceptional Release

ESTAT—Execution Status and Monitoring

ETA—Estimated Time of Arrival

ETB—Estimated Time in Blocks

ETCAS—Enhanced Traffic Collision Avoidance System

ETE—Estimated Time Enroute

ETP—Equal Time Point

FAA—Federal Aviation Administration

FADEC—Full Authority Digital Electronic Controls

FAF—Final Approach Fix

FBO—Fixed Base Operator

FCF—Functional Check Flight

FCG—Foreign Clearance Guide

FCIF—Flight Crew Information File

FD—Flight Director

FDP—Flight Duty Period

FIH—Flight Information Handbook

FL—Flight Level

FLIP—Flight Information Publications

FMP—Flight Manuals Program

FOB—Fuel Onboard

FOUO—For Official Use Only

FP—First Pilot

FSAF—First Suitable Airfield

G/A—Go-around

GCAS—Ground Collision Avoidance System

GDSS2—Global Decision Support System

GPS—Global Positioning System

GS—Ground Speed

GWS—Gun Weapon System

HAT—Height Above Touchdown

HATR—Hazardous Air Traffic Report

HDD—Heads Down Displays

HF—High Frequency

HQ—Headquarters

HUD—Heads Up Display

IAW—In Accordance With

ICAO—International Civil Aviation Organization

IFF—Identification Friend or Foe

IG—Inspector General

IGI—IG Inspections

ILS—Instrument Landing System

IMC—Instrument Meteorological Conditions

INAV—Integrated Navigation

INU—Inertial Navigation Unit

IP—Instructor Pilot

IR—Infrared

JAAAC—Joint Air Apportionment Allocation Conference

JCET—Joint Combined Exchange Training

JNCA—Jet Navigation Chart-High Altitude

kHz—Kilohertz

KIAS—Knots Indicated Air Speed

KTAS—Knots True Air Speed

LAIRCM—Large Aircraft Infrared Countermeasures

LANTCOM—United States Atlantic Command (USN)

LAT—Lateral Axis

LPU—Life Preserver Unit

LRNS—Long Range Navigation Systems

LSAF—Last Suitable Airfield

LSK—Line Select Key

LZ—Landing Zone

MAJCOM—Major Command

MAP—Missed Approach Point

MAF—Mobility Air Force

MC—Mission Computer

MDA—Minimum Descent Altitude

MDS—Mission Design Series

ME—Mission Essential

MEA—Minimum Enroute Altitude

MEL—Minimum Equipment List

MEP—Mission Essential Personnel

MFCD—Multifunction Control Display

MGT—Measured Gas Temperature

MHz—Megahertz

MIL—Military

MNPS—Minimum Navigation Performance Specifications

MOA—Memorandum of Agreements

MP—Mission Pilot

MPC—Master Plotting Chart

MSA—Minimum Safe Altitude

MSC—Multiservice Corporation

MSL—Mean Sea Level

MXG—Maintenance Group

NAT—North Atlantic Region

NATO—North Atlantic Treaty Organization

NAV—Navigation

NAVAID—Navigation Aid

NC—Noncurrent

NDB—Non-directional Beacon

NGB—National Guard Bureau

NOPAC—North Pacific

NOTAM—Notice to Airmen

NSN—National Stock Number

NVG—Night Vision Goggles

OAT—Outside Air Temperature

OCONUS—Outside Continental United States

OG—Operations Group

OPARS—Optimum Path Aircraft Routing System

OPCON—Operational Control

OPR—Office of Primary Responsibility

OPREP—Operations Report

ORM—Operational Risk Management

P—Pilot—PAR—Precision Radar Approach

PERF—Performance

PF—Pilot Flying

PFD—Primary Flight Display

PIC—Pilot in Command

PM—Pilot Monitoring

POL—Petroleum, Oil, and Lubricants

PSP—Pierced Steel Plank/Precision Strike Package

QTY—Quantity

RA—Resolution Advisories

RADALT—Radar Altimeter

RCR—Runway Condition Reading

REF—Reference

RNP—Required Navigation Performance

RPS—Regulated Power Supply System

RSC—Runway Surface Condition

RVR—Runway Visual Range

RVSM—Reduced Vertical Separation Minimums

SAR—Search and Rescue

SATCOM—Satellite Communication

SCA—Self-contained Approach

SF—Standard Form

SLTA—Small Laser Turret Assemblies

SM—Statute Miles

SOF—Special Operation Forces

SOFAPPS—Special Operations Forces Applications

SPINS—Special Instructions

STS—Special Tactics Squadron

SUA—Special Use Airspace

TA—Traffic Advisory

TACAN—Tactical Air Navigation

TAS—True Airspeed

TAWS—Terrain Awareness and Warning System

TBMCS—Theater Battle Management Core Systems

TCAS—Traffic Alert Collision Avoidance System

TO—Technical Order

TOLD—Takeoff and Landing Data

TR—Transformer Rectifier

TSOC—Theater Special Operations Commands

UARRSI—Universal Aerial Refueling Receptacle Slipway Installation

UHF—Ultra-high Frequency

UNQ—Unqualified

USAF—United States Air Force

USAFWS—United States Air Force Weapons School

USSOCOM—United States Special Operations Command

VFR—Visual Flight Rules

VHF—Very High Frequency

VMC—Visual Meteorological Conditions

VOR—VHF Omnidirectional range

WPS—Weapons Squadron

WX—Weather

Office Symbols

ADO—Assistant Director of Operations

AF/A3T—Air Force Aircrew Training

AFSOC/A3—Air Force Special Operations Command Director of Operations

AFSOC/A3V—Air Force Special Operations Command Standardizations and Evaluations

AFSOC/A4RX—Air Force Special Operations Command Plans and Integration

DO—Director of Operations

MAJCOM/A3—Major Command Director of Operations

OG/CC—Operations Group Commander

OG/OGV—Operations Group Standards and Evaluations

SQ/CC—Squadron Commander

Terms

Air-to-Air Refueling—Airborne fuel onload by receiver aircraft.

Air Refueling Control Point (ARCP)—The planned geographic point over which the receiver arrives in the precontact position with respect to the assigned tanker. For Helo AAR, the planned geographic point, or coordinates over which the tanker arrives abeam the receiver and assumes formation lead.

Air Refueling Control Time (ARCT)—The planned time that the receiver and tanker will arrive over the ARCP.

Air Reserve Components—Units of the Air Force Reserve Command (AFRC) or Air National Guard (ANG).

Airborne Mission Commander—The individual given the responsibility to accomplish part of the overall operation. When a formation is used to conduct the operation, this individual is in overall command of all formation aircraft.

Basic Proficiency—Crews or crewmembers qualified and current to fly the unit aircraft only on non-mission sorties.

Basic Mission Capable—Crews or crewmembers qualified and current to perform some portion of the unit mission, but who do not maintain mission ready status.

Border Clearance—Those clearances and inspections required to comply with federal, state, and local agricultural, customs, immigration, and immunization requirements.

Category I Route—Any route that does not meet the requirements of a category II route.

Category II Route—Any route on which the position of the aircraft can be accurately determined by the overhead crossing of a radio aid (NDB, VOR, TACAN) at least once each hour with positive course guidance between such radio aids.

Combat Control Team—A small task organized team of Air Force parachute and combat diver qualified personnel trained and equipped to rapidly establish and control drop, landing, and

extraction zone air traffic in austere or hostile conditions. They survey and establish terminal airheads as well as provide guidance to aircraft for airlift operations. They provide command and control, and conduct reconnaissance, surveillance, and survey assessments of potential objective airfields or assault zones. They also can perform limited weather observations and removal of obstacles or unexploded ordinance with demolitions.

Combat Offload—Method by which palletized cargo is offloaded without Materials Handling Equipment (MHE).

Command and Control Center (CCC)—An agency used by a commander to plan, direct, or control operations. Each CCC provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this, CCCs include the AFSOC Command Center, Air Mobility Command Center, Command Post (CP), Air Mobility Elements (AME), Airlift Coordination Centers (ACC), Combat Control Teams, AFRC Headquarters Command Post, NGB Field Support Center, and ARC wing or group operations centers and command posts.

Commander Air Force Special Operations Command (COMAFSOC)—The Commander of Air Force Special Operations Command.

Commander Air Force Special Operations Forces (COMAFSOF)—The commander designated by USCINCSOC for CONUS deployments or by TSOC commanders for overseas deployments, who is responsible for management of Air Force Special Operations Forces (AFSOF) within a theater, a geographic area, or a designated operation. The COMAFSOF is responsible to USCINCSOC for management of CONUS-deployed AFSOF or to the respective TSOC commander for management of AFSOF theater-assigned AFSOF and is responsible to COMAFSOC for monitoring and management of AFSOF operating within the specific area of responsibility.

Conference HOTEL—The name of the communication conference available to assist aircrews in coping with in-flight emergencies and conditions that require expertise in addition to that available onboard the aircraft.

Controlling Navigation Solution—The INAV aircraft position solution the navigation computer is using for enroute navigation. The SHIP SOLN, selected via the NAV SELECT page of the AMU, determines which INAV (1/2) will be used to steer the aircraft either manually or with the autopilot. **(T-2)**

Deadhead—Duty time accrued by crewmembers in a passenger or ACM status.

Element—A subdivision (normally 3 aircraft) flying in formation.

Equal Time Point (ETP)—The point along a route at which an aircraft may either proceed to the first suitable airport or return to the last suitable airport in the same amount of time based on all engines operating (see **Chapter 11**).

First Suitable Airfield (FSAF) and Last Suitable Airfield (LSAF)—Utilized in the equal time point (ETP) calculation. These are represented as the “First Nearest” and the “Last Nearest” airports in the ETP calculation in the PROGRESS pages of the CNI. They are airports closest to the coast out and coast in waypoints that meet applicable criteria for AC-130J operations. Forecast weather for the FSAF and LSAF must meet destination weather minimum filing requirements.

Hotel Mode—Hotel mode allows engine operation at low-speed ground idle with the propeller feathered. Propeller NP will be approximately 20 to 30%. This decreases the propeller wash at the cargo ramp for engine running onload/offload.

Hung Ordnance—Any ordnance or stores that fail to release, jettison, or fire and cannot be removed from the weapon prior to landing (ALE-40/47 chaff or flare squibs that fail to fire are not considered hung ordnance).

Initial Point (IP)—A point near drop zones or landing zones over which final course alterations are made to arrive at the specified zone.

Interfly—Intermixing of crewmembers from different units in the same aircrew or unit aircrews flying aircraft assigned to another unit.

Jammed Gun—A gun containing ammunition that cannot be cleared from the gun inflight, but can be rendered mechanically safe, no probability of inadvertent firing exists.

Live Ordnance—Combat type ordnance incorporating explosive or incendiary material to include flares.

Military Authority Assumes Responsibility for Separation of Aircraft—. A condition whereby the military services involved assume responsibility for separation between participating aircraft in the ATC system.

Minimum Navigation Performance Specifications (MNPS) Airspace—MNPS airspace exists in both the North Atlantic Region (NAT) and certain Canadian portions of the North American Region. Refer to FLIP Area Planning publications/charts to determine MNPS airspace. The C-130J must comply with all MNPS equipment requirements when flying within the lateral dimensions of this airspace. Aircraft meeting the North Atlantic MNPS requirements also meet the Canadian MNPS requirements. Aircraft entering MNPS airspace are required to have two Long Range Navigation Systems (LRNS) capable of staying within 12.6 NM of cleared track for 95 percent of the flight. Gross navigation errors are those that exceed 24 NM from track center line. Prior to entering MNPS airspace, both INSs must be fully operational to meet the MNPS requirement of having two fully serviceable LRNSs. In order to signify that a flight is approved to operate in NAT MNPS airspace, the letter “X” will be inserted within item 10 of the DD Form 1801 flight plan.

Minimum Safe Altitude (MSA)—MSA is an intermediate altitude that will provide terrain clearance in VMC or IMC.

Mission Capable—Crews or crewmembers qualified and current to perform some portion of the unit mission, but who do not maintain mission ready status.

Mission Essential Personnel (MEP)—Individuals who perform essential duties in support of a particular aircraft, aircrew, or mission.

Mission Ready—Crews or crewmembers fully qualified and current to perform the unit mission.

NAT Tracks—Contained within the North Atlantic MNPS airspace is an organized track system (NAT Tracks) between FL 285 and FL 420 to optimize air traffic flow between the North American and European continents. NAT tracks are designed based on meteorological data and are updated twice daily. When flying over the North Atlantic, crews should obtain a copy of the North Atlantic Tracks (NAT tracks) valid for their coast out time from the DoD NOTAM internet site.

Net Explosive Weight (NEW)—The actual weight in pounds of explosive mixtures or compounds, including the trinitrotoluene equivalent of energetic material, that is used in determination of explosive limits and explosive quantity data arcs. Also called NEW.

Night Vision Goggles—Self-contained, battery-operated devices that amplify light to enhance night vision.

Operating Weight—Basic aircraft weight plus weight of crewmembers, crew baggage, steward's equipment, emergency, and extra equipment.

Operational Control—Transferable command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions. Operational control does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training.

Required Navigation Performance (RNP)—RNP accuracy standards require an aircraft to remain within a specific number of nautical miles of its cleared course centerline for 95% of the duration of the flight. The associated track containment limit is twice the RNP value and represents the maximum limit of protected airspace. Airspace where RNP is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between-routes. Refer to FLIP Area Planning publications/charts to determine RNP airspace.

Reduced Vertical Separation Minimum (RVSM) Airspace—This airspace requires special certification and exists to increase airspace capacity, safely, by reducing vertical separation from 2000'to 1000'between suitably equipped aircraft. RVSM has been implemented in the CONUS, Europe, Africa, and Middle East. RVSM airspace typically extends from FL 290 through FL 410. Consult AP/1 and AP/2 for locations and lateral and vertical dimensions of this airspace. The AC-130J is not RVSM capable. Prior approval with ATC is required prior to operating in this airspace

Self-contained Approach—An approach conducted using self-contained, onboard navigation systems.

Special Tactics Squadron—Air Force special operations combat control and pararescue forces.

Supported Forces—Space-required passengers consisting of US and foreign military members who are onboard an AFSOC aircraft as an integral part of the mission being performed.

Supporting Forces—Space-required passengers consisting of US and foreign military members, DoD civilians, and US civilian employees under contract to the DoD, who directly support the mission or deployment of an AFSOC unit.

Tweak—A computation performed either manually or by fire control computer to correct for errors in weapon or sensor alignment and to solve for the ballistic wind. The purpose of performing a tweak is to cause ordnance to impact on target.