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Flying Operations

EC-130J—OPERATIONS PROCEDURES

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This instruction implements Air Force Instruction (AFI) 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, and AFI 11-202, Vol 3, *General Flight Rules*. It applies to all EC130J units, and it provides the most acceptable policies and procedures for most circumstances, but does not replace sound judgment. This instruction applies to the Air National Guard (ANG). This publication does not apply to Air Force Reserve Command (AFRC) units. Subordinate units may supplement this instruction in accordance with (IAW) **Paragraph 1.5**. This publication requires the collection and or maintenance of information protected by the Privacy Act of 1974 authorized by Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*. When personal information is collected, personnel will be provided with a Privacy Act Statement. The applicable Privacy Act System of Records Notice (SORN), F011 AF XO A, is available at **http://privacy.defense.gov/notices/usaf/**. The authority for maintenance of the Automated Records Management System (ARMS) is 37 U.S.C. 301a (Incentive Pay), Public Law 92-204, Section 715 (Appropriations Act for 1973), Public Laws 93-570 (Appropriation Act for 1974), 93-294 (Aviation Career Incentive Act of 1974), DoD Directive 7730.57 (Aviation Career Incentive Act of 1974 and Required Annual Report, February 5, 1976, with Changes 1 and 2); and E.O. 9397 (SSN) as amended by Executive Order 13478, Amendments to Executive Order 9397 Relating to Federal Agency Use of Social Security Numbers, November 18, 2008. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force (AF) Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through the appropriate functional's chain of command. Unless prescribed within this publication, requests for waivers must be submitted through chain of command to the OPR listed above for consideration and approval. Ensure that all records created as a result of processes prescribed in

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SUMMARY OF CHANGES

This publication has been substantially revised and aligned with the MC-130J regulation and must be completely reviewed. Reference to Commando Solo operations has been moved to **Attachment 5**. **Chapter 17** encompasses a majority of the tactical employment guidance. Night Vision Goggle (NVG) operations no longer reside in one chapter and are instead integrated within the appropriate sections. Tier requirements have been annotated.

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Chapter 1

GENRAL INFORMATION

1.1. General. This AFI provides operational guidelines and restrictions for EC-130J Commando Solo (CS) and Super J (SJ) operations. It is a compilation of information from all aircraft flight manuals, Flight Information Publications (FLIP) and other Air Force directives, and is an original source document for many areas. Basic source directives have precedence in the case of any conflicts, revisions, and matters of interpretation. For those areas where this AFI is the source document, waiver authority will be in accordance with applicable paragraph. For those areas where this AFI repeats information contained in other source documents, waiver authority will be in accordance with those source documents. This instruction is regulatory in nature and takes precedence over guidance in Air Force Tactics, Techniques, and Procedures (AFTTP). HQ AFSOC Standardization/Evaluation (HQ AFSOC/A3V) has overall responsibility for the administration of this volume. The NGB is considered a Major Command (MAJCOM) for the purpose of this AFI.

1.2. Applicability.

1.2.1. This AFI is applicable to all individuals/units operating EC-130J (Commando Solo), EC130J (Super J), as well as other EC-130J variants, and backup aircraft inventory (BAI) C130J operated by the flying unit.

1.2.2. This AFI will be used by all agencies involved in or supporting EC-130J (Commando Solo and Super J) operations. Copies will be current and available to planning staffs from headquarters to aircrew level. (T-2)

1.3. Key Definitions:

1.3.1. “Will” and “Shall” 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, etc., which may result in personal injury or loss of life if not carefully followed.

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

1.3.6. “**Note**” indicates operating procedures, techniques, etc., which are considered essential to emphasize.

1.3.7. See **Attachment 1**, Glossary of References and Supporting Information, for additional terms.

1.4. Deviations and Waivers. Do not deviate from the policies and guidance in this AFI except when the situation demands immediate action to ensure safety. 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 instruction 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 waiver, through channels to HQ AFSOC/A3 within 48 hours, followed by a written report, if requested. Unless otherwise indicated, HQ AFSOC/A3 is the waiver authority for operational procedure requirements contained in this volume. Request waivers through Standardization/Evaluation (Stan/Eval) and MAJCOM channels. (T-2)

1.4.1. Tier requirements refer to waiver authority based on level of risk.

1.4.1.1. "Tier 0" (T-0) requirements are reserved for requirements that non-compliance is determined and waived by respective non-Air Force authority.

1.4.1.2. "Tier 1" (T-1) requirements are reserved for requirements that non-compliance may put airman, mission, or program strongly at risk, and may only be waived by the MAJCOM/CC or delegate with concurrence of publication approver. When multiple MAJCOMs are affected, then T-1 is appropriate.

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

1.4.1.3. "Tier 2" (T-2) requirements are reserved for requirements that potentially put the mission at risk or potentially degrade the mission or program, and may only be waived by the MAJCOM/CC or delegate.

1.4.1.4. "Tier 3" (T-3) requirements are reserved for requirements that non-compliance has a remote risk of mission failure, and may be waived by the Wing/CC but no lower than the OG/CC.

1.4.2. AFSOC/A3 may delegate this authority to Commander Special Operations Air Forces (COMAFSOF) for operationally assigned SOF forces during contingency operations. If HQ AFSOC/A3 chooses to delegate waiver authority, it will be done in writing and will specify which portions of this instruction may be waived by the COMAFSOF.

1.4.2.1. When waiver authority is delegated, HQ AFSOC/A3V will receive a copy of all approved waivers.

1.5. Supplements. MAJCOM may supplement this volume according to AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure.* These supplements will not duplicate or be less restrictive than the provisions of this instruction. Forward MAJCOM supplements to HQ AFSOC/A3V and Air Force Flight Standards Agency (AFFSA)/XOF for approval before publication and provide HQ AFFSA/XOF one copy after publication. File supplements according to AFI 33-360, *Publications and Forms Management*. (T-2)

1.5.1. Local Operating Procedures. IAW **Chapter 10** of this instruction.

1.6. Requisitioning Procedures. Order this AFI through the servicing Publications Distribution Office. Unit commanders provide copies for all aircrew members and associated support personnel. This publication is available digitally on **www.epublishing.af.mil**.

1.7. Distribution. This instruction is published as one complete document and distributed as such. Unit commanders will assure distribution of this instruction to all crew members. (T-3)

1.8. Roles and Responsibilities. Refer to **Chapter 2** for roles and responsibilities.

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 (CC) informed of the current status of AFSOC forces while enabling the Wing or Group Commander to exercise control over day-to-day operations. This chapter contains Tier 1 requirements in the administrative control and state active duty sections; Tier 2 requirements in general, operational control, waiver and approval authority, administrative control, mission monitoring, designation of COMASOF, mission commander, pilot in command, airborne mission commander, deputy mission commander, and mission clearance decision sections. (T2)

2.2. Operational Control (OPCON). IAW USSOCOM Directive 10-1, COMAFSOC exercises command authority consistent with assignment of OPCON over all active and reserve Air Force SOF stationed in the CONUS, to include Air National Guard (Training Oversight (TOS) only IAW JP 1). OCONUS forces are apportioned OPCON IAW the Global Force Management Implementation Guidance (GFMIG), normally to the CCDR of the theater in which they reside. The CCDR will normally delegate OPCON to the Theater Special Operations Command (TSOC) for that theater. 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-close-hold missions through the command post supporting the wing or group. In the event that assigned forces undergo a Change in Operational Control (CHOP), responsibility for mission monitoring passes from the wing or group C2 facility to the gaining command. Changeover will be accomplished IAW the pertinent Operational Plan, Operational Order, or deployment or execution order. When ANG aircrews operate in a status other than Title 10, the members' state governor, typically through delineated authorities to their appointed Adjutant General (TAG), will control aircrews when executing Continental United States (CONUS) Domestic Operations (DOMOP) missions. The ANG Command Center may serve as the reporting agency for ANG aircraft supporting ANG missions. (T-2)

2.3. Waiver and Approval Authorities. (T-2)

2.3.1. Wg/CCs or equivalent hold waiver/approval authority for items normally authorized at or below wing level when their forces are employed in:

2.3.1.1. Deployments.

2.3.1.2. Air Apportionment Allocation Conference taskings.

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

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

2.3.1.5. Other specified missions as tasked via the SOF Air Tasking Order (ATO) in SOF applications.

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

2.3.1.7. Air Reserve Component (ARC) forces (under Title 10).

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

2.3.2. Operational waivers will be coordinated through Stan/Eval channels. Waiver requests will normally be the responsibility of the C2 agency with the operational control of the mission.

2.3.3. Wg/CC OPCON terminates when forces enter a TSOC/JSOAC AOR and picks up when forces exit a TSOC/JSOAC AOR.

2.4. ANG Forces OPCON/Administrative Control (ADCON).

2.4.1. OPCON (Title 10). When 193rd SOW forces are mobilized, AFSOC will normally exercise command authority consistent with assignment of OPCON over those forces until they are transferred with a specified command relationship of OPCON (CHOPed) to another Combatant Command. Deploying ANG members will be assigned to 201 Mission Support Squadron, Air National Guard Readiness Center (ANGRC), Andrews AFB, MD for ADCON, while COMAFSOC will retain specified ADCON IAW with the Memorandum of Agreement between the Commonwealth of Pennsylvania, the National Guard Bureau, and AFSOC. COMAFSOC will transfer specified ADCON authorities to the Commander of Air Force Forces (COMAFFOR) of the gaining CCMD IAW established Memoranda of Agreement. (T-1)

2.4.2. Control under USC Title 32. The Commonwealth of Pennsylvania (PA) Governor controls PA ANG forces, typically through the appointed TAG, when executing missions in Title 32 status. PA ANG Title 32 status extends to those members who are in PA Excepted State Technician status and Inactive Duty Status (Rescheduled) Unit Training Assemblies (UTA) or Additional Flight Training Periods (AFTP). Authority over forces made available to another state may be transferred to that state's governor IAW agreements between the states. PA ANG members operating in Title 32 status are subject to the PA Code of Military Justice (PCMJ). Members may be gained into Title 10 status at any time.

2.5. Mission Monitoring. 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. (T-2)

2.5.1. PIC or mission commander flight reporting duties: (T-3)

2.5.1.1. Stations With MAF C2 Agency. Aircrews will provide a "Thirty Minute" Out Call. Transmit a UHF or 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)

2.5.1.2. 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. (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. (T-3)

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

2.5.1.4. Reporting Agencies. See **Table 2.1**.

Table 2.1. Reporting Agencies.

AFSOC Operations Center		
Telephone	DSN	312-579-3290
	Commercial	850-884-3290
	Toll-Free	800-451-7705
	Regional Switched Digital Network (RSDN)	579-0212
FAX	DSN	312-579-5171
	Commercial	850-884-5171
E-mail	hq.afsoc.sdo@hurlburt.af.mil	
Secure E-mail	sdo@afsoc.af.smil.mil	
AFSOC Command Center		
Telephone	DSN	312-579-8900
	Commercial	850-884-8900
	Toll-Free	800-451-7705
E-mail	afsoc.cmd.ctr@hurlburt.af.mil	
Secure E-mail	afsoc.cmd.ctr@afsoc.af.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.CP.DL@hurlburt.af.mil	
Air National Guard Readiness Center (ANGRC) Command Center		
Telephone	DSN	312-858-6001
	Commercial	301-981-6001
	Toll-Free	800-548-5543
Fax	DSN	312-858-7505
	Commercial	301-981-7505
E-mail	commandcenter@ang.af.mil	
Secure E-mail	ang.a3yc@ang.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	
27 SOW		
Telephone	DSN	312-681-2253
	Commercial	505-784-2253
	Toll-Free	800-346-6679
	RSDN	299-5653
FAX	DSN	312-681-6406
	Commercial	505-784-6406
E-mail	27SOWCP@cannon.af.mil	
RAF Mildenhall (100 Air Refueling Wing) Command Post (CP)		
Telephone	DSN	314-238-2121
	Commercial	011 (00)44-207-499/894
Eglin AFB (96 Air Base Wing (ABW)) CP		
Telephone	DSN	312-875-4020
	Commercial	850-883-4020

Kadena AB (18 Wing) CP		
Telephone	DSN	315-634-8516/8405
	Commercial	011-(00)81-6117
919 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@eglin.af.mil	
Secure E-mail	919SOWCP@afmc.af.smil.mil	

2.6. Designation of a COMAFSOF. IAW AFI 51-604, *Appointment to and Assumption of Command* and AFI 10-410, *Operations Planning: Presentation of Air Force Special Operations Forces*, the COMAFSOF is appointed by COMAFSOC through G-Series orders specifying the individual by name and the geographic area of authority.

2.7. Mission Commander (MC). A mission commander will be designated when more than one aircraft or crew is deployed away from home station for training, exercises, or other operations. The mission commander will be rated, and should be a field grade officer. The mission or air mission commander (AMC) will not be a primary crew member for exercises, but may fly as a crew member on non-exercise related missions. Mission commander duties include, but are not limited to (T-2):

2.7.1. Briefing crews on local operating procedures.

2.7.2. 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.

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

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

2.7.5. Submitting timely reports on aircraft movements.

2.7.6. Ensuring security of aircraft and personnel meets the requirements of AFI 31-101, *Integrated Defense (FOUO).*

2.8. Pilot in Command Responsibilities and Authority. AF Form 4327A *Crew Flight Authorization (FA)* designates a Pilot in Command for all flights. PIC are (T-2):

2.8.1. In command of all persons on board the aircraft.

2.8.2. Responsible for the welfare of their aircrew members, Mission Essential Personnel (MEP), and the safe accomplishment of the mission.

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

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

2.8.5. The final authority for accepting a waiver affecting the crew or mission.

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

2.8.7. The PIC will coordinate with local maintenance for available support, and then report to AFSOC Combat Logistics Readiness Center (LRC): DSN 579-8925, (850)-884-8925 or 1800451-7705. When reporting, describe the problem, the assistance available (if any) and assistance required. Any time the aircraft experiences over a 2-hour maintenance delay the PIC will report to AFSOC LRC as soon as practical (regardless of the support being received from the deployed location).

2.9. Airborne Mission Commander (AMC). 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. The AMC will not be a primary crew member and should be on headset. (T-2)

2.10. Deputy Mission Commander (DMC). 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 crew member, and is usually the Formation Commander on AMC controlled missions. The DMC will not be on the same aircraft as the AMC. (T-2)

2.11. 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. 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. Another PIC and aircrew will not be alerted to take the same mission under the same conditions. (T-2)

2.11.1. Divert or Reroute Authorizations. 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. In the event of an emergency or weather related divert or reroute, the PIC must notify the controlling authority as soon as possible.

2.11.1.1. The controlling agency directing the diversion or rerouting is responsible for ensuring destination requirements or facilities are adequate for the aircraft and aircrew.

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

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

2.12. Civilian Law Enforcement Support. It is the policy of the Department of Defense to cooperate with civilian law enforcement officials to the maximum extent practicable. AFI 10801, *Defense Support of Civil Authorities (DSCA)*, incorporates the appropriate directive and

provides uniform 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 through the appropriate C2 channels.

Chapter 3

AIRCREW COMPLEMENT AND MANAGEMENT

3.1. Aircrew Qualification. Each person assigned as a primary crew member must be qualified or in training for qualification in that crew position, mission and Mission Design Series (MDS) aircraft. This chapter contains Tier 2 requirements in the aircrew qualification, interfly, intrafly and alert duty sections. (T-2) Tier 3 in the crew complement section. (T-3)

3.1.1. Basic aircraft qualification (F coded) crew members (i.e., FP and FL) may perform primary crew duties on any non-contingency sortie (including unilateral training, joint training and exercises) when receiving mission qualification training or evaluations, and only while under the supervision of a qualified instructor or flight examiner in their respective crew position.

3.1.2. Basic mission capable (M coded) crew members (i.e., MP, MW, MK, and ML) may perform primary crew duties on any unilateral training mission. For other missions, the unit commander must determine the readiness of each basic mission capable crew member to perform primary crew duties for specific mission tasking.

3.1.3. Non-current or unqualified (U coded) pilots (i.e., UP) may perform crew duties only on designated training or evaluation missions under the supervision of a qualified instructor or flight examiner pilot.

3.1.4. Other non-current or U-coded crew members (i.e., UP, UW, UL, and UK) may perform duties in their primary crew position on any sortie when under direct supervision of a qualified instructor or flight examiner in their respective crew position. In this case, the student crew member and the instructor or flight examiner fulfills the requirement for one primary position as specified in **Table 3.1** with the exception of UK. In this case, one instructor or flight examiner may supervise more than one UK.

3.1.5. Senior staff pilots or O-coded pilots (OP) who have completed a Senior Staff Familiarization course will occupy the left pilot seat only and be under direct Instructor Pilot (IP) supervision. These individuals will log OP for Flight Authorization Duty Code on the Air Force Technical Order (AFTO) Form 781, *ARMS Aircrew/Mission Flight Data Document*. Refer to **Paragraph 9.12** for additional restrictions.

3.1.6. A Weapon Systems Officer (WSO) is an Electronic Warfare Officer (EWO) qualified crew member. A WSO may be qualified as either an air-land Combat Systems Officer (CSO) and Mission Crew Commander (MCC) or a tactical airdrop CSO. A CSO or WSO is required per **Table 3.1**. A tactical airdrop qualified WSO or CSO is required for all airdrop and low level operations.

3.2. EC-130J (Super J) Crew Complement. The EC-130J (Super J) crew complement is specified in **Table 3.1**. Unit commanders may authorize reduced crew complements as noted in the table. The waiver authority for any additional crew complement reductions, down to the minimum crew complement specified in the aircraft flight manual, is the group commander or COMAFSOF. (T-3)

3.2.1. Augmented crews are required for missions planned to take longer than a basic Flight Duty Period (FDP). Augmenting aircrew members must be current, qualified, and mission

capable IAW AFI 11-2EC-130J, Vol 1, *EC-130J Aircrew Training*. In those situations requiring augmentation, the crew must be augmented from the start of the duty period.

3.2.2. With the exception of the Combat Mission Sortie (CMS), all events accomplished with a reduced crew complement can be logged as long as the applicable event criteria in AFI 112EC130, Vol 1, are met.

Table 3.1. EC-130J (Super J) Crew Compliment.

Crew Position	**Non-Operational Sorties**		**Operational Missions**	
	Basic Crew	**Augmented Crew**	**Basic Crew**	**Augmented Crew**
Aircraft Commander (AC)	1	2 [1]	1	2 [1]
Pilot	1	1	1	1
CSO [2]	0-1 [2]	0-2 [2]	1	2
Loadmaster	1-2 [3,4,5]	2	2	3

Notes:

1. AC: Both AC must be qualified in all phases of the mission to be accomplished. Transfer of PIC duties between qualified AC will be briefed to the crew.

2. CSO: Either a CSO or air-land WSO will occupy the CSO crew position as noted. A CSO or air-land WSO is not required for Functional Check Flight, airlift, or pilot proficiency sorties. For augmented aircrew, the operations group commander (OG/CC) (or designated representative) will determine the number of tactical (TAC) CSO(s)/Airland WSO(s) required depending on mission profile and complexity. (T-3)

3. Loadmaster: Two loadmasters are required if more than 40 passengers are scheduled to be carried (except during unit moves or contingencies). Both crew members must remain in the cargo compartment, one forward and one aft for takeoffs and landings.

4 At squadron commander (Sq/CC) discretion, an IL and student fulfills the two loadmaster requirement to drop unilateral training heavy equipment loads without Electronic Parachute Jettison System (EPJS).

5 Only one loadmaster is required for tactical missions if any of the situations below apply:

a) Personnel or door bundle (less than 100 lbs) drops using only one paratroop door.

b) High altitude (up to 13,000 feet mean sea level (MSL)) non-static line personnel are dropped from the ramp and door or, only one paratroop door is opened.

c) CDS airdrops, including Tri-Wall Aerial Delivery System (TRIADS).

d) Dropping only Standard Airdrop Training Bundles (SATBs).

e) A no-drop (dry pass) is planned.

f) Unilateral heavy equipment training loads utilizing the EPJS.

3.3. Additional Crew members (ACM). See AFI 11-401, *Aviation Management*, MAJCOM Supplement.

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. Reference AFI 11-401, *Aviation Management*, and MAJCOM Supplement. (T-2)

3.4.1. HQ AFSOC/A4RX and National Guard Bureau (NGB)/A4MY maintains current Memorandum of Agreements (MOA) between AFSOC, AFRC, ANG, 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.

3.4.1.2. The operational squadron will prepare and sign the flight authorizations.

3.4.1.3. As a minimum, crew member(s) will be Basic Aircraft Qualified (BAQ) in the MDS aircraft and model, as well as systems or configuration required to fly the aircraft and/or mission.

3.4.1.4. Aircrew will follow operational procedures defined in AFI 11-2EC-130J, Vol 3, *EC130J Operations Procedures*, AFTTP 3-1.E/MC-130J, *Tactical Employment E/MC-130J (Classified)* and 33.E/MC-130J, *Combat Aircraft Fundamentals E/MC-130J*, and the applicable Technical Order (s) (TO) for the MDS.

3.4.1.5. A flight and ground mishap reporting responsibility will be handled IAW AFI 91-204, *Safety Investigations and Reports*.

3.4.2. Waiver Authority.

3.4.2.1. With a valid MOA IAW AFI 11-401, group commander or COMAFSOF is the approval authority for interfly on AFSOC aircraft under their control.

3.4.2.2. No MOA/Expired MOA. The interfly of aircrew members from different MAJCOMs or the interfly of active duty and ANG aircrews require approval from each MAJCOM/A3 and the NGB/A3, as applicable.

3.4.2.3. Contingency operations must be approved by HQ AFSOC/A3, the respective MAJCOM/A3, and NGB/A3.

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 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. Crew members must be under instructor supervision if not current and qualified in the MDS.

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 within the normal syllabi.

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. (T-2)

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

3.5.2. As a minimum, crews will be qualified in the MDS-aircraft and model, as well as systems or configuration required to fly the aircraft and/or mission.

3.5.3. Aircrew will follow operational procedures defined in AFI 11-2EC-130J, Vol 3, AFTTP 31.E/MC-130J and AFTTP 3-3.E/MC-130J, and the applicable TO for the MDS. EC-130J aircrews flying C130J aircraft will follow AFI 11-2EC-130J, Vol 1, Vol 2, *EC-130J Evaluation Criteria* and the applicable TO for the MDS.

3.6. Orientation Flights and Incentive Flights. Refer to DoD 4515.13-R, *Air Transportation Eligibility*, AFI 11-401, *Aviation Management*, and the appropriate MAJCOM supplement.

3.7. Alert Duty. Alert personnel are those required to be on duty for the prompt execution of a mission. Alert crews will be readily available in a location that allows the crew to meet the required time to launch from notification. Suitable facilities include adequate sleeping accommodations for the entire crew. Publish flight authorizations for the alert crew to cover the entire alert tour. See AFI 11-202, Vol 3, *General Flight Rules*, and MAJCOM Supplement for alert procedures. (T-2)

3.8. Flight Duty Period and Crew Rest Restrictions. See AFI 11-202, Vol 3, *General Flight Rules*, and MAJCOM Supplement.

3.8.1. Crew Chiefs/MEP. The crew chief is responsible to the Aircraft Commander. The aircraft commander will determine how long the Crew Chief /MEP can safely perform aircraft recovery actions. The Crew Chief/MEP must have the opportunity to sleep 8 hours uninterrupted within each 24 hour period, reference AFI 21-101, *Aircraft and Equipment Maintenance Management Policy* for additional guidance.

3.9. Counter-Fatigue Management Program. See AFI 11-202, Vol 3, *General Flight Rules*, and MAJCOM Supplement.

Chapter 4

AIRCRAFT OPERATING GUIDLELINES AND RESTRICTIONS

4.1. Objective. The objective of the aircraft maintenance team is to provide an aircraft for launch with all equipment operational Fully Mission Capable (FMC). However, under specific circumstances, some missions can be safely operated without all equipment being operational. The final responsibility regarding equipment required for a mission rests with the PIC. If one crew accepts an aircraft to operate a mission or mission segment without an item or system, this acceptance does not commit that crew, or a different crew, 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 the item will be repaired or replaced prior to departure. This chapter contains Tier 2 requirements in sections relating to MEL, waiver protocol, landing gear system, and soft panel operations. **Tables 4.3** Communications, **4.5** Equipment, **4.6** Fire Protection, **4.7** Flight Controls, **4.11** Indicating/Recording System, **4.13** Lights, **4.14** Navigation, **4.15** Oxygen, **4.17** System Integration and Display, and **4.19** Doors contain Tier 2 requirements as well. Tier 3 requirements are contained in the one-time flight section as well as **Table 4.21** Powerplant.

4.2. Policy. 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 (i.e., revised departure times, fuel requirements, maintenance requirements, etc.), 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) Policy. The MEL is a pre-launch document that lists the minimum equipment/systems 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. (T-2)

4.3.1. The PIC shall account for the possibility of additional failures during continued operation with inoperative systems or components. 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 unless specifically exempted by mission requirements/directives.

4.3.3. PIC operating with waiver(s) for degraded equipment shall coordinate mission requirements (revised departure times, fuel requirements, and maintenance requirements).

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 deviations (without waiver) to OG/CC within 48 hours, if requested.

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

4.4.1. MAJCOM/A3 is the MEL waiver authority for mission continuation. Initiate the request with MAJCOM C2 agency.

4.4.1.1. While on ANG directed missions, NGB/A3 delegates MEL waiver authority to the Unit OG/CC (or equivalent).

4.4.2. The waiver request will include:

4.4.2.1. Reason for the request.

4.4.2.2. Individual crew member 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. An aircraft may be released for a one-time flight with a condition that might be hazardous for continued use, provided the aircraft is airworthy for one flight to a repair station. Refer to TO 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures,* for downgrade authority and procedures.

4.6.1. One-time flight approval authority is OG/CC or equivalent-level commander with OPCON for MEL listed items. The 193 SOW Maintenance Group (MXG)/CC (or designated official), the senior maintenance officer, or the on-site chief of an AFMC repair team must first authorize the release. The PIC concurrence is required before the aircraft can be flown. (T-3)

4.6.1.1. Any One-time flight request not listed in the MEL additionally requires MAJCOM/A3 approval. (T-2)

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. The MEL, included in **Table 4.8** along with the following paragraphs, provides guidelines for degraded fuel system operations under most circumstances.

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

4.7.1.1. Fuel transfer into a main tank with an inoperative indicator may be accomplished during contingency or emergency fuel need situations. All transfers, under these conditions, require more than one crew member to monitor and coordinate the transfer.

4.7.1.2. A reliable source of known quantity transferred must be available. This source can be either the internal aircraft operating fuel quantity indicators or in-flight refueling tanker fuel on load data.

4.7.1.2.1. Begin crossfeed operation when the symmetrically opposite quantity indicator has decreased to 1,500 pounds (inboards) and 2,500 pounds (outboards).

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.

4.7.1.4. Maintain symmetrical engine fuel flow.

4.7.1.5. Plan to land with a minimum of 6,000 pounds calculated main tank fuel.

4.7.1.6. 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:

4.7.1.6.1. Check pressure with each pump in the external tank. If no pressure is obtained, the tank is verified empty.

4.7.1.6.2. If pressure is obtained, ground transfer the fuel from the external tank. Defuel the external tank if unable to ground transfer.

4.7.1.6.3. When unable to verify an external tank is empty prior to engine start, place the tank on cross-feed until no pressure is obtained. This will be completed prior to takeoff.

4.7.1.6.4. Maintain symmetrical tanks within 1,000 pounds at all times. 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). 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.

4.8. Landing Gear System. If a landing gear system or position indicator malfunction is encountered, only a full stop landing will be made. The discrepancy will be corrected prior to the next flight. **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 en route stops are authorized. (T-2)

4.9. Navigation Systems. Refer to the navigation systems performance requirements as outlined in **Table 4.14**, **Chapter 11** of this instruction, and applicable sections of the Flight Information Planning document for the route structures and intended areas of operation.

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, PIC must consider the increased workload associated with using soft panels.

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.

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 (such as APU, bleed air, landing gear, etc.), do not apply bleed air or hydraulics until hard panel functionality can be determined.

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 (i.e., "APU PNL FAULT", "DEF SYS PNL FAULT", etc.) 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 selfexplanatory.

4.10.2.5. If it is determined that the hard panel has not recovered, at the PIC's discretion, the mission may continue to a station supporting a repair capability, including en route stops. Do not reselect the hard panel. If a flight must continue under the control of two or more soft panels, a waiver is required. (T-2)

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 logistics personnel for required maintenance actions. Annotate that soft panel operation is selected in the aircraft maintenance forms with a thorough description of the equipment failure/discrepancy. (T-2)

4.11. MEL Table Definitions/Column Identifiers.

4.11.1. Installed – Number of components or systems installed.

4.11.1.1. 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.

4.11.1.2. Although the indications on each pilot's Heads Down Displays (HDD) 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.

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

4.11.2.1. 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. For essential flight data (heading, altitude, airspeed, attitude and when required, navigation data), the pilot's and copilot's displays must have independent sources.

4.11.3. Remarks and Exceptions. Some technical information and procedures are contained in this column. This is not all-inclusive; crew members shall refer to the flight manual and other directives for procedures, techniques, limitations, etc. **Note:** Common sense and good judgment must be used by all when determining minimum equipment requirements, to preclude adverse operational impact or excessive maintenance support requirements. In those instances where lack of replacement parts or qualified personnel would cause a mission delay, the aircraft may continue operations as described in the MEL. **Note:** For certain failures in this section, a "^" following a system item indicates that there may be Special Mission Equipment (SME) remarks or exceptions pertaining to that item in **Attachment 5** of this regulation. The MCC will advise the PIC about the impact that the SME failures have upon specific mission accomplishment. The PIC will decide whether to have the inoperative SME repaired or perform the mission without the inoperative equipment.

Table 4.1. Air Conditioning and Pressurization.

System Item	Installed	Required	Remarks or Exceptions
Air Conditioning System	2	1	One may be inoperative provided: (1) Cross-flow valve is operative, (2) Associated Flow Control Valve is verified CLOSED, (3) Consideration is given to the type mission, fuel quantity, and required cruise altitude and oxygen quantity.

System Item	Installed	Required	Remarks or Exceptions
	2	0	Both may be inoperative provided: (1) Both Flow Control Valves are verified CLOSED, (2) Aircraft is operated unpressurized, (3) Auxiliary Vent Valves are operative for ventilation and (4) Consideration is given to required cruise altitude, fuel quantity, outside air temperature (OAT) and oxygen quantity. **Note:** Pressurization and both air conditioning systems may be needed if passengers or patients are carried. If a system fails, flight to a destination with repair capability (including enroute stops) may be accomplished (coordinate with the medical crew director (MCD) when patients are carried). Passengers and patients will be briefed on the possibility that discomfort may be encountered.
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) Respective Manual Temperature Control System is operative, OR (2) Respective Air Conditioning System is considered inoperative, and (3) Temperature control is not required.
b. BA/ECS Channels	2	1	**Note:** Loss of the 2nd 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

System Item	Installed	Required	Remarks or Exceptions
			operative and the valve is manually positioned to Cargo Compartment 100% open.
e. Flow Control and Shut Off Valve			
(1) Cargo Compartment Air Conditioning System	1	0	May be inoperative provided: (1) Divider Valve operative (2) Right Wing Isolation Valve is operative (3) ECS Cross-flow Valve is operative
(2) Flight Station Air-Conditioning System	1	0	May be inoperative provided: (1) Divider Valve operative (2) Left Wing Isolation Valve is operative (3) ECS Cross-Flow Valve is operative
f. Temperature Control Valve	2	0	May be inoperative provided: (1) Valve is failed in the normal temperature range OR (2) Air Conditioning System is considered inoperative.
g. Duct Overheat Temperature Sensor	2	0	May be inoperative provided associated Air Conditioning System is considered inoperative
Auxiliary Vent Valve, Flight Deck	1	1	
Auxiliary Vent Valve, Cargo Compartment	1	0	Super J
Avionics Cooling System			
a. Avionics Cooling Fans	2	1	
b. Cargo Compartment	2	1	
c. Overhead Console Cooling Fans	2	1	If both fail in flight, damage to head's up display (HUD) may occur. Use primary flight display (PFD) as required. If HUD is stowed, pull the associated electronic circuit breaker (ECB) to prevent damage from

System Item	Installed	Required	Remarks or Exceptions
			heat.
Cargo Under floor Heat System	1	0	May be inoperative provided consideration is given to OAT and the number of passengers/additional crew members on board.
Pressurization System			
a. Automatic Pressure Control System	1	1	One channel may be inoperative
	1	0	May be completely inoperative provided: (1) Manual Pressurization System is operative, AND (2) Consideration is given to the additional crew workload caused by using Manual Pressurization, OR (3) Aircraft is operated unpressurized, and (4) Consideration is given to required cruise altitude, fuel/oxygen quantity, and OAT
(1) CONST ALT Mode	1	0	May be inoperative provided consideration is given to the type mission to be flown (e.g., AE).
b. Emergency Depressurization Handle	1	0	May be inoperative provided: (1) Aircraft is operated unpressurized and (2) Consideration is given to required cruise altitude, fuel/oxygen quantity, and OAT.
c. Emergency Depressurization Switch	1	0	May be inoperative provided: (1) Control is available through the associated soft panel, OR (2) Aircraft is operated unpressurized, and (3) Consideration is given to required cruise altitude, fuel/oxygen quantity, and OAT.
d. Manual Pressurization Control System	1	0	May be inoperative provided: (1) Automatic Pressurization System is operative OR (2) Aircraft is operated unpressurized, (3) Consideration is given to required cruise

System Item	Installed	Required	Remarks or Exceptions
			altitude, fuel/oxygen quantity, and OAT.
e. Outflow Valve	1	0	May be inoperative provided: (1) Valve is manually positioned to full open (2) Pressurization Mode Select Switch is positioned to NO PRESS, (3) Aircraft is operated unpressurized, and (4) Consideration is given to required cruise altitude, fuel/oxygen quantity, and OAT.
f. Safety Valve	1	0	May be inoperative provided: (1) Outflow Valve is manually positioned to full open (2) Aircraft is operated unpressurized, and (3) Consideration is given to required cruise altitude, fuel/oxygen quantity, and OAT
g. Indications (Cabin Altitude, Cabin Rate of Climb, Differential Pressure)	1	0	Must have: Soft Panel OR (2) Cabin Altitude or Differential Pressure indication OR (3) Aircraft is operated unpressurized **Note:** If differential pressure is the only indication, reference the chart in TO 1C-130(E)J-1, *Flight Manual, USAF Series EC-130J Aircraft*, section 14.
h. LDG/ CONST ALT Indicator	1	0	May be inoperative provided: Indicator is operative on the associated soft panel. OR (2) The CONST ALT mode is not used, and (3) Depressurize the aircraft after landing.

Table 4.2. Auto Flight.

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

System Item	Installed	Required	Remarks or Exceptions
Digital Autopilot System	2	0	May be inoperative provided: (1) Associated autopilot is not essential for performance of mission requirements, and (2) If both autopilots are inoperative, give consideration to reduced crew duty day.
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. 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 REF/MODE panel does not disengage the autopilot. The one exception is deselecting 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) Associated DA/FD Navigation (NAV) and Approach (APPR) Modes (except integrated navigation (INAV)) are considered inoperative (2) Associated Course Arrow and indication is considered inoperative (except in INAV Mode) (3) Departure/route/approach to destination (and alternate, if applicable) does not require use of VHF Omni-directional range(VOR)/Instrument Landing System (ILS)/Marker Beacon (MB) or Tactical Air Navigation (TACAN).

System Item	Installed	Required	Remarks or Exceptions
d. Go-around (G/A) Switch	2	0	Consider go-around implications.
e. Heading Knob	2	0	May be inoperative provided: (1) Associated DA/FD HDG Mode is considered inoperative (2) Associated Heading Marker is considered inoperative.
f. Lateral Axis (LAT) OFF Switch	1	0	May be inoperative provided the Autopilot Lateral Mode is considered inoperative.
g. Pitch Axis (PITCH) OFF Switch	1	0	May be inoperative provided the Autopilot Pitch 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) Autopilot Pitch Attitude Hold Mode is operative, OR (2) Autopilot Pitch Mode is considered inoperative, and (3) Autopilot Pitch OFF Switch is positioned to OFF.
i. Pitch Synchronization (SYN) Switch	2	0	
j. Reference Mode (REF/MODE) Panel	2 2	1 0	One time flight authorized to repair facility, including enroute stops. With both inoperative, a one-time VFR flight is authorized to a repair facility, including enroute stops.
(1) ALT SEL Switch	2	0	May be inoperative provided: (1) Associated Altitude Alert System is considered inoperative, and (2) Associated DA/FD Altitude Select (SEL) Mode is considered inoperative, and (3) Ground Collision Avoidance System (GCAS) is serviceable. **Note:** An altitude alerting system is

System Item	Installed	Required	Remarks or Exceptions
			required for operation in RVSM airspace.
(2) BARO SET Switch	2	1	Use the Avionics Management Unit-Primary Flight Display to set both the pilot and copilot sides. **Note:** Both Air Data Computer (ADC)s are required to change both altimeter settings (required for RVSM airspace)
(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 co-pilot 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) Autopilot Roll Attitude Hold Mode is operative, OR (2) Autopilot Lateral Mode is considered inoperative (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 HUD or HDD PFD at affected location

System Item	Installed	Required	Remarks or Exceptions
b. Reference Set Panel Display	2	0	May be inoperative provided: (1) Individual Reference Annunciations and Markers (e.g., HUD, PFD cards, lines on tapes, carets) are operative, OR (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.

Table 4.3. Communications.

System Item	Installed	Required	Remarks or Exceptions
Control Wheel Hush Switch	2	0	
Control Wheel Microphone Switch	2	1	BIU Backup Mode requires one operative switch.
Flight Station Speaker	2	1	Bus Interface Unit (BIU) Backup Mode requires one operative speaker.
Get Home Radio Panel	1	0	One time flight is authorized to a repair facility.
Identification Friend or Foe (IFF) System	1	1	If self-test fails, you may takeoff if the IFF was operational on the previous mission. Aircraft will not depart with an IFF known to be inoperative. **Exception**: Formations must have at least one operational IFF per element. (T-2) **Note:** An altitude reporting transponder is required for operation in RVSM airspace. **Note:** Mode IV is not required for flights that originate in and will remain inside the inner boundaries of all domestic & coastal Air Defense Identification Zone(s) (ADIZ) surrounding the CONUS.
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

System Item	Installed	Required	Remarks or Exceptions
			can be conducted.
UHF/VHF Radios	4	2	May be inoperative unless essential for performance of mission, route or Air Traffic Control requirements provided: (1) UHF No. 1 or VHF No. 1 is operative, and (2) At least one additional UHF or VHF Radio is operative.
HF Radios	2	0	1 required for long range communications. Consider mission impact
Digital Intercommunication System (ICS)			
a. Headset Interface Unit	8	As required	An operative unit must be available for each required crew member, including spotters. Super J:
	8	As required	One required for each crew member and spotter.
b. ICS Control Panels	8	As required	An operative unit must be available for each required crew member, including spotters. Super J:
	8	As required	One required for each crew member and spotter.
c. ICS Monitor Panels	4	1	Three may be inoperative provided an operative unit is available for a flight deck crew member.

Table 4.4. Electrical System.

System Item	Installed	Required	Remarks or Exceptions
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. The generator will be removed and the generator mount padded before flight.
Batteries	2	2	
Direct Current (DC) Voltmeter	1	1	

System Item	Installed	Required	Remarks or Exceptions
Electrical Control Panel	1	0	May be inoperative provided control is available through the associated soft panel.
Electronic Circuit Breaker Unit	13	13	
Indications (System Status Display)			
a. Loadmeter Indications	5	5	
b. Voltmeter Indication, Alternating Current (AC)	5	5	
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	3	One TR may be inoperative for flight to a repair facility including enroute stops.
Special Systems Power Dist. Panel (CS)	1	0	Consider mission impact.

Table 4.5. Equipment.

System Item	Installed	Required	Remarks or Exceptions
Aerial Delivery System (ADS)			
a. Aerial Delivery Control Panel	1	0	May be inoperative provided: (1) Control is available through associated

System Item	Installed	Required	Remarks or Exceptions
			Soft Panel, OR (2) Airdrop operations will not be conducted.
Multifunction Control Display (MFCD)	1	0	May be inoperative provided Heavy Equipment airdrop or combat offload operations will not be conducted. **Exception**: May be inoperative for Heavy Equipment airdrop or combat offload during contingency operations if operational needs outweigh the risk of operating without the MFCD.
Pallet Lock Control Unit (PLCU)	7	0	May be inoperative provided Heavy Equipment airdrop or combat offload operations will not be conducted. The MFCD must be operational. (T-2)
Winch	1	0	Consider mission impact.

Table 4.6. Fire Protection.

System Item	Installed	Required	Remarks or Exceptions
APU Fire Control Handle Lights	1	1	
APU Fire Detection Loop	2	1	
Bleed Air Overheat Detection Sensors	14	7	One loop in each zone may be inoperative.
Engine/APU Fire Extinguisher Bottle	2	2	
Engine Fire Control Handle Lights	4	4	
Engine Fire Detection Loop	8	4	One loop in each zone may be inoperative.
Fire and Overheat Detector System (FODS) Controller Channels	2	1	
Smoke Detector	4	1	The under flight deck detector must be operational. (T-2)

Table 4.7. Flight Controls.

System Item	Installed	Required	Remarks or Exceptions

System Item	Installed	Required	Remarks or Exceptions
Aileron Trim Indicator	1	0	Flight to a destination with repair capability, including enroute stops, may be made. The trim tab position must be visually verified prior to flight.
Aileron Trim System	1	1	
Elevator Trim Indicator	1	0	Flight to a destination with repair capability, including enroute stops, may be made. The trim tab position must be visually verified prior to flight.
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 (AMU)	1	1	
Flap Position Indicator Gauge	1	0	May be inoperative provided Flap Position Indicator (AMU) is operative.
Rudder System Direct Reading Pressure Gauge	2	0	
Rudder Trim Indicator	1	0	Flight to a destination with repair capability, including enroute stops, may be made. The trim tab position must be visually verified prior to flight.
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. (T-2)
a. Angle of Attack Sensor	2	1	

Table 4.8. Fuel.

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.

System Item	Installed	Required	Remarks or Exceptions
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) Applicable Flight Manual Limitations and Procedures are observed, (2) Main Tank Transfer Pumps are operative and, (3) ECBs for inoperative Main Tank Boost Pump are strapped opened.
Crossfeed Manifold Fuel Pressure Indication	1	0	May be inoperative provided indication is available through the associated Soft Panel.
Crossfeed Valve	4	0	May be inoperative provided: (1) Associated Fuel Level Control Valve is operative, (2) Affected Valve is secured CLOSED, and (3) Main Tank Transfer Pumps are operative. (4) Cross-ship Separation Valve is operative. **Note:** Valve must be manually closed if failed open or ECBs opened if valve is failed closed.
Cross-ship Separation Valve	3 3	2 0	Two required for in-flight refueling missions. May be inoperative provided valve(s) is/are electrically disconnected and secured OPEN.
Fuel Control Panel	1	0	May be inoperative provided control is available through the associated Soft Panel. Consideration should be given to the addition to crew work load caused by using the soft panel.
Fuel Dump Valve	2	1	May be inoperative provided the valve is secured CLOSED.

System Item	Installed	Required	Remarks or Exceptions
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 refueling.
b. Fuel Level Control Valve, Main Tank	6	0	All may be inoperative provided: (1) Valve is not required for ground or in-flight refueling. (2) All Main Tank Transfer Pumps are operative. (3) All Main Tank Cross feed Valves are operative. (4) Cross-ship Separation Valves are operative. **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			**Note:** Although the fuel quantity indications can be displayed on multiple HDD System Status Displays as well as on the hard panel, 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.

System Item	Installed	Required	Remarks or Exceptions
a. Auxiliary Tank	2	1	One may be inoperative provided: (1) All Fuel Flow Indicators are operative, (2) Associated Fuel Transfer Pump is operative, (3) All other Fuel Quantity Indicators for tanks with fuel on the same side of the Cross-ship Valve are operative, and (4) Fuel quantity in the associated tank is verified by an accepted procedure before each takeoff (magnetic sight gauge).
	2	0	May be inoperative provided associated Fuel Tanks are verified EMPTY.
b. External Tank (if installed)	2	1	One may be inoperative provided: (1) All Fuel Flow Indicators are operative, (2) At least one associated Fuel Transfer Pump is operative, (3) All other Fuel Quantity Indicators for tanks with fuel on the same side of the Cross-Ship Valve are operative, and (4) Fuel quantity in the associated tank is verified by an accepted procedure before each takeoff (dipstick).
	2	0	May be inoperative provided associated Fuel Tanks are verified EMPTY.
c. Main Tank	4	3	One may be inoperative provided: (1) All Fuel Flow Indicators are operative, (2) Associated Fuel Boost Pump is operative, (3) All other Fuel Quantity Indicators for tanks with fuel on the same side of the Cross-ship Valve are operative, and (4) Fuel quantity in the associated tank is verified by an accepted procedure before each takeoff (dipstick).
d. Totalizer	1	0	

System Item	Installed	Required	Remarks or Exceptions
Fuel Quantity Preset Switch	6/8	0	
Refuel Drain Pump	1	0	May be inoperative provided the manifold is manually drained and in-flight refueling will not occur.
Single Point Refuel Valve	1	0	May be inoperative provided alternate refueling procedures can be used. In-flight refueling is allowed for fuel emergencies and contingencies.
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 (if installed)	4 4	2 0	One pump in each tank may be inoperative provided ECBs for inoperative External Tank Transfer Pump are opened. Both pumps in each tank may be inoperative provided: (1) ECBs for inoperative pumps are open, and (2) Both tanks are empty.
c. Transfer Pump, Main Tank	4	0	May be inoperative provided ECBs for inoperative transfer pump(s) are open and the respective Main Tank Boost Pump is operative. Consider mission impact for Forward Area Refueling Point (FARP) Operations.

Table 4.9. Hydraulic Systems.

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	

System Item	Installed	Required	Remarks or Exceptions
b. Engine Hydraulic Pump	4	4	
c. Hand Pump, Auxiliary	1	0	May be inoperative provided no in-flight refueling is required and the electrical auxiliary pump is operative.
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.

System Item	Installed	Required	Remarks or Exceptions
Angle of Attack (AOA) Sensor Anti-ice System	2	1	May be inoperative provided AOA sensor is considered inoperative.
Ice Detector	2	0	Both may be inoperative provided: (1) Wing Leading Edge Lights are operative, OR (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.
NESA Windshield Heat System	2	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions. Flight manual restrictions apply.
Pitot Heat System	2	1	May be inoperative provided associated pitot static system is considered

System Item	Installed	Required	Remarks or Exceptions
			inoperative.
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	May be inoperative provided aircraft is not operated in precipitation on the ground.
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. Indicating/Recording Systems.

System Item	Installed	Required	Remarks or Exceptions
Advisory Caution and Warning System (ACAWS)	1	1	
Cockpit Voice Recorder (CVR)	1	1	**Note:** All components must be operative for the CVR to be considered operative except as listed below. (T-2)
a. Underwater Acoustic Locator Beacon (on CVR)	1	1	May be inoperative provided flight profile does not include extended over water segment.
Digital Flight Data Recorder (DFDR)	1	1	**Note:** All components must be operative for the DFDR to be considered operative except as listed below. (T-2)
a. Underwater Acoustic Locator Beacon (on DFDR)	1	1	May be inoperative provided flight profile does not include extended over water segment.

Table 4.12. Landing Gear And Brakes.

System Item	Installed	Required	Remarks or Exceptions

System Item	Installed	Required	Remarks or Exceptions
Anti-Skid System	1	0	May be inoperative provided: (1) Anti-Skid System ECBs are opened, and (2) Flight Manual Performance limitations are applied, and (3) Shall be repaired at first capable repair facility. (4) Maximum Effort and Touch–and-Go operations not allowed.
Brake Pressure Indication			
a. Emergency Brake Pressure Indication	1	0	May be inoperative provided the Auxiliary System Pressure 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.
Main Landing Gear System	1	1	**Note:** All components must be operative for the Main Landing Gear System to be considered operative except as listed below.
Main Landing Gear Door	2	0	May be inoperative provided: (1) Inoperative door is removed. (2) Comply with TO 1C-130(E)J-1 restrictions.
Nose Landing Gear Door	2	0	May be inoperative provided: (1) Inoperative door is removed. (2) Comply with TO 1C-130(E)J-1 restrictions.

Table 4.13. Lights.

System Item	Installed	Required	Remarks or Exceptions
Exterior Lighting			
a. Landing Light, Visible	2	1	Visible lights: One landing light may be inoperative provided taxi light on that side is operative.
b. Landing Light, Infrared (IR)	2	0	IR lights: May be inoperative if not required for mission execution.
c. Landing Light Motor	2	0	May be inoperative provided: (1) Landing Light(s) with inoperative motor is fully retracted, Landing Light(s) is considered inoperative. OR (2) If extended Appropriate Airspeed Limitations are observed, and Landing Light(s) is considered inoperative unless fully extended.
d. Navigation Light	6	3	For night operations, the left and right wingtip Nav lights must be operational in addition to one of the white lights on the tail cone. (T-2)
e. Anti-Collision (Strobe) Light	2	0	May continue to first stop where repairs can be made.
f. Taxi Light	2	0	Both may be inoperative provided landing lights are operative.
g. Wing Leading Edge Lights	2	0	May be inoperative at night provided: (1) Ice Detectors are operative, OR (2) Aircraft is not operated in known/forecast icing.
h. Wing Tip Taxi Lights	2	0	May be inoperative provided aircraft is not taxied in congested areas at night without adequate lighting for obstacle clearance.
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.

System Item	Installed	Required	Remarks or Exceptions
a. Copilot Displays Light Circuit	1	1	
b. Lamp Test Circuit	1	1	

Table 4.14. Navigation.

System Item	Installed	Required	Remarks or Exceptions
Air Data Computer (ADC)	2	1	**Note:** Both must be operative for operation in RVSM airspace. (T-2)
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 the ADF to be considered operative.
Cursor System	2	0	May be inoperative unless required to accomplish mission objectives.
Digital Mapping System	1	0	May be inoperative unless required to accomplish mission objectives. Consideration should be given to the terrain, required altitudes, route peculiarities, visibility, the crew‘s experience with the route and whether the mission is conducted during daylight or at night.
Terrain Awareness and Warning System (TAWS)	1	0	May be inoperative unless required to accomplish mission objectives. Consideration should be given to the terrain, required altitudes, route peculiarities, visibility, the crew‘s experience with the route and whether the mission is conducted during daylight hours or at night.
Embedded Global Positioning/Inertial Navigation System (EGI)	2	1	May be inoperative provided: (1) Overwater (out of navigation aid (NAVAID) range) or basic area navigation (BRNAV) flight will not be conducted, (2) Consult FLIP for airspace restrictions. **Note:** All components must be operative for the EGI to be considered operative except as listed below.

System Item	Installed	Required	Remarks or Exceptions
Global Positioning System (GPS)	2	0	**Note:** With GPS inoperative, the In-flight Alignment capability will not be available.
Ground Collision Avoidance System (GCAS)	1	0	May be inoperative provided passengers/troops will not be carried. Consideration should be given to tactical operations and crew experience.
Inertial Navigation Unit	2	2	Both must be functional to meet requirement of redundant heading, altitude, and airspeed information. (T-2)
Radar, Low Power Color	1	0	Required if thunderstorms or hazardous conditions (to include heavy rain and wind shear) that can be detected by airborne radar are forecast or exist along route of flight. Consider operational mission impacts. **Notes:** Refer to **Table 17.1** for additional mission information and restrictions. Must be operational for all self contained approach (SCA) approaches except independent precision radar approach(s) (IPRA). (T-2)
a. Control Panel	2	0	May be inoperative provided: (1) Control is available through the associated Soft Panel, and (2) Modes other than the Map or Weather (WX) Modes are not essential to accomplish mission objectives. (3) Consider operational mission impacts.
Radar Altimeter (RA)	2	1	One may be inoperative provided category (CAT) II ILS approaches will not be flown.
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	

System Item	Installed	Required	Remarks or Exceptions
Tactical Air Navigation (TACAN)	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) TCAS is deactivated and secured, and (2) TCAS is not necessary for compliance with ATC requirements. (3) Passengers/troops will not be carried. (T-2)
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 the VHF Navigation System to be considered operative.

Table 4.15. Oxygen.

System Item	Installed	Required	Remarks or Exceptions
Liquid Oxygen System	1	1	Super J: Oxygen on board for takeoff must be sufficient to accomplish the flight plan route from the equal time point (ETP), or most distant point to the first suitable airfield. Minimum for takeoff of no less than 5 liters.
Oxygen Regulators	10	3	All crew member occupied positions must have an operable regulator. All Mission Crew must have oxygen available. (T-2)

Table 4.16. Pneumatic.

System Item	Installed	Required	Remarks or Exceptions
Bleed Air Augmenter Valve	4	3	One may be inoperative provided: (1) Affected valve is CLOSED, (2) All Nacelle Shut Off Valves are operative.

System Item	Installed	Required	Remarks or Exceptions
		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) Affected valve is OPEN, (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) Affected valve is OPEN, and (2) Divider Valve is operative.

Table 4.17. System Integration and Display.

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 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. (T-2)
Bus Adapter Unit (BAU) 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.

System Item	Installed	Required	Remarks or Exceptions
Communication/ Navigation/ Identification Management Unit (CNI-MU)	3	2	**Note:** All components must be operative for the CNI-MU to be considered operative except as listed below. **Note:** One may be inoperative unless required for mission accomplishment.
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 (HDD)	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 & #6)	2	0	Consider mission impact.
Heads Up Display (HUD)	2	1	One may be inoperative provided both HDD's on the affected side are fully operational. (T-2)

System Item	Installed	Required	Remarks or Exceptions
	2	0	Both may be inoperative provided: (1) All four HDDs are operative (including operative independent PFD in the pilot and copilot positions), and (2) Forecast weather at destination is at or above CAT I approach minimums. **Note:** Both HUD's are required for NVG airland operations.
a. HUD Control Panel	2	0	May be inoperative provided the associated HUD is considered inoperative.
b. HUD Declutter Switch, (Control Wheel)	2	0	
Mission Computer	2	2	

Table 4.18. Auxiliary Power Unit (APU).

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

Table 4.19. Doors.

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 will not take-off with a malfunctioning ramp lock system, with cargo on the ramp. Aircraft may continue to destination if ramp locks malfunction in-flight. Repair lock malfunction or remove cargo from ramp prior to continuing flight operations. Do not pressurize the airplane if the ramp locks fail to lock. Unpressurized flight, with no cargo on the ramp, may be performed with a cargo ramp lock malfunction when mission requirements dictate. (T-2)
a. Ramp Locks	10	9	One may be inoperative provided: (1) All remaining latches are operative, (2) Ramp Lock Warning System is operative, (3) No cargo is carried on the ramp, (4) Ramp is verified CLOSED and LATCHED before each departure, and (5) Cabin differential pressure is limited to 5 IN. HG.
Cargo Door and Ramp Indicators			
a. Ramp/Door FULL Light	1	0	May be inoperative provided: (1) MFCD "RAMP & DOOR FULL OPEN" ACAWS message can be used, OR (2) Ramp position airdrop light (aft cargo comp.) is operative.
b. Ramp Position Airdrop Light	1	0	May be inoperative provided: MFCD "RAMP & DOOR FULL OPEN" ACAWS message can be used, OR Ramp/Door FULL Light (flight station) is operative.

System Item	Installed	Required	Remarks or Exceptions
c. Ramp Warning Light	1	0	May be inoperative provided: (1) ACAWS RAMP OPEN PRESSURIZED and RAMP OPEN 250 messages are operative, OR (2) Ramp is verified CLOSED and LATCHED before each departure, OR (3) Aircraft is operated unpressurized.
Cargo Door and Ramp Sensors			
a. ADS Arm Position Switches	2	0	May be inoperative provided the Aerial Delivery System is considered inoperative.
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	2	0	May be inoperative provided: affected Door is secured CLOSED and Latched, AND the exit is not required to meet minimum emergency exits per number of passengers carried.
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 4.20. Propellers.

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	

System Item	Installed	Required	Remarks or Exceptions
Propeller Synchrophasing	1	0	

Table 4.21. Powerplant.

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. (T-3)
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 electronics control (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	

System Item	Installed	Required	Remarks or Exceptions
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) LOI 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	
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 Take-Off procedures are carried out. All eight engine FADECs must be serviceable for auto shutdown to be operative. ATCS will be degraded.
Nacelle Interface Unit (NIU)	4	4	

Table 4.22. In-Flight Refueling System.

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 override signal amplifier will not be used for training flights. Refer to training restrictions in **Chapter 9** of this instruction.

Table 4.23. Defensive Systems and Situational Awareness Equipment.

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.

System Item	Installed	Required	Remarks or Exceptions
Missile Warning System	1	0	Consider mission impact. Check SPINS.
Radar Warning Receiver	1	0	Consider mission impact. Check SPINS.

Chapter 5

GENERAL OPERATING PROCEDURES

5.1. Pre-Mission.

5.1.1. Aircrew Uniforms.

5.1.1.1. See AFI 11-301, Vol 1, *Aircrew Flight Equipment (AFE) Program*, for minimum aircrew clothing requirements. All crew members will have nomex gloves in their possession. When the Foreign Clearance Guide (FCG) requires civilian attire, dress conservatively.

5.1.1.2. It is recommended that primary crew members wear nomex gloves during engine start, takeoff, landing, and combat operations.

5.1.1.3. Crew members will remove rings before performing aircrew duties. (T-3)

5.1.2. Personal Requirements.

5.1.2.1. Passport. Crew members possessing a valid military passport will carry it on all active duty missions. **Exception**: Unit commanders may authorize newly assigned personnel who have applied for, but not yet received, a passport to act as crew members on missions not scheduled to transit locations where passports are required. (T-3)

5.1.2.2. Shot Record. Aircrew members will ensure they meet immunization requirements for the mission. (T-3)

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

5.1.2.4. Identification Tags. Crew members will wear two identification tags around the neck or carry them in a flight suit pocket on all flights. (T-3)

5.1.2.5. Restricted Area Badges. Carry the restricted area badge on all missions (except actual combat missions). Display the badge only in designated restricted areas. (T-3)

5.1.2.6. Tool and Airdrop Kits. A tool kit will be on board the aircraft for all flights. One loadmaster airdrop kit will also be aboard the aircraft for aerial delivery missions. Units will identify tool kit contents and inventory. (T-3)

5.1.2.7. Hostile Environment Repair Kit. Refer to AFSOC Command Manual (AFSOCM) 11201, *Hostile Environmental Repair Procedures*.

5.1.2.8. Carry a headset, helmet and oxygen mask, and operable night vision googles (NVG) compatible flashlight on all flights. A reflective belt or suitable substitute will be worn on flight lines during hours of darkness or periods of reduced visibility. Aircrew will ensure that all professional equipment is removed from the aircraft after the mission is complete. If an item is lost, an AFTO Form 781, *Aerospace Vehicle Flight Data Record,* entry will be documented. (T3)

5.1.2.9. Crew members will not wear wigs, hairpieces, rings, ornaments, or earrings in the aircraft or on the flight line. **Exception:** Crew members may wear plain elastic hair fasteners and/or pins, clips, or barrettes providing they do not interfere with the wearing of headsets, or the donning of oxygen equipment. They will be accounted for before and after flight. (T-3)

5.1.3. Aircrew Publications Requirements.

5.1.3.1. PIC will ensure the publications specified in **Table 5.1** are current and available on the aircraft for all missions. Each individual aircrew member will ensure they have a current crew position checklist as required in **Table 5.1**. Units may specify additional publications in their local supplement. The use of electronic flight manuals in flight is authorized upon issue. Primary crew members should carry their respective crew position aircrew guide (ACG) on all missions. (T-3)

Table 5.1. Aircrew Publications.

Publication	**Aircrew**
Pilot/Combat Systems Operator Flight Crew Checklist	Pilot/Combat Systems Operator
Loadmasters Flight Crew Checklist	Loadmaster
Mission Crew Commander Flight Crew Checklist	Mission Crew Commander
Electronic Communications Systems (ECS) *Operator Flight Crew Checklist*	Electronic Communications Systems Operator
AFI 11-202, Vol 3, *General Flight Rules,* w/AFSOC supplement	On Aircraft
AFI 11-2EC-130J, Vol 3, *EC-130J Operating Procedures*	On Aircraft
TO 1C-130J-1, *Flight Manual*	On Aircraft
TO 1C-130J-1-1, *Flight Manual Performance Data*	On Aircraft
TO 1C-130J-1-4, *Communications/Navigation/Identification-Management System (CNI-MS) Operator Manual*	On Aircraft
ATP-56(B), *NATO Air-to-Air Refueling Procedures*	On Aircraft
AFTTP 3-3.E/MC-130J *Combat Aircraft Fundamentals E/MC-130J*	On Aircraft
AFI 13-217, *Drop Zone and Landing Zone Operations*	On Aircraft (Super J)

Publication	Aircrew
AFI 11-231, *Computed Air Release Point Procedures*	On Aircraft (Super J) *(airdrop qualified only)*
TO 1C-130J-9, *Cargo Loading Manual*	On Aircraft (Super J)
TO 1C-130J-9CL-1, *Cargo Loading Checklist USAF Series C-130J Aircraft*	Loadmaster
TO 1C-130J-5-2, *Load Data Manual*	On Aircraft (Super J)
TO 1C-130J-43 (series -2 / -3 / -4 and -5)	ECS carry-on kit (mission sorties only)
AFSOC Command Manual (AFSOCM) 11-201, *Hostile Environment Repair Procedures*	On Aircraft

5.1.4. 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. Obtain timely intelligence updates prior to entering a specific area of operations (AOR). In theater, aircrews should receive intelligence updates on initial arrival at a forward operating location (FOL), or en route 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-3)

5.2. Pre-Departure.

5.2.1. Flight Crew Information File (FCIF).

5.2.1.1. Review Volume I, Part A, of the Flight Crew Information File (FCIF) before all missions. (T-3)

5.2.1.2. If material has been added to the FCIF since the last review, enter the latest FCIF item number, date, and initials on the AF Form 4121, *FCIF Currency Record,* or approved electronic equivalent (Patriot Excalibur (PEX), etc.). (T-3)

5.2.1.2.1. Crew members delinquent in FCIF and joining a mission en route will receive an FCIF update from their primary aircrew member counterpart on that mission. Instructor pilots flying with general officers are responsible for briefing appropriate FCIF items. (T-3)

5.2.1.2.2. Crew members that do not have a unit FCIF card or approved electronic equivalent (not assigned or attached to the unit) will certify FCIF review by entering the last FCIF number and their initials beside their name on the file copy of the flight authorization or the orders. (T3)

5.2.1.2.3. OGV Read File (ORF). Group Standardization and Evaluation (OGV) is the OPR for the OGV Read File. Items in OGV Read File may include local procedures and emphasis items (non-safety of flight related). Crews will follow procedures as outlined above in **Paragraph 5.2.1.2.2**. (T-3)

5.2.2. Aircraft Mission Kits. Units will maintain one mission kit per aircraft. 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 designated representative will ensure a current mission kit is on board the aircraft. The kit will contain, but is not limited to, the items listed in **Table 5.2**. Current Operations will maintain this kit and issue to the crew. Mission kits will include the following items: (T-2)

Table 5.2. Aircraft Mission Kit (T-2).

Publications	
AFJI 11-204	*Operational Procedures for Aircraft Carrying Hazardous Materials*
ASRR	*Airfield Suitability and Restriction Report*
Air Mobility Command (AMC) Handbook 11-214	*AMC Aircrew Hazardous Materials Handbook*
AMC Aircrew Border Clearance Guide	
Forms	
Department of Defense (DD) Forms	
DD Form 1385	*Cargo Manifest*
DD Form 1801	*DoD International Flight Plan*
DD Form 1854	*US Customs Accompanied Baggage Declaration*
DD Form 2131	*Passenger Manifest*
Air Force Forms	
AF Form 15	*Air Force Invoice*
AF Form 72	*Air Report (AIREP)*
AF Form 315	*USAF AvFuels Invoice*
AF Form 457	*USAF Hazard Report*
AF Form 651	*Hazardous Air Traffic Report (HATR)*
AF Form 711B	*USAF Mishap Report*
AF Form 1297	*Temporary Issue Receipt*
AF Form 3211	*Customer Comments*
AF Form 4075	*Aircraft Load Data Worksheet*
AF Form 4138	*EC-130 Flight Plan and Navigation Log*
AF Form 4139	*Special Operations C-130 In-flight Refueling Worksheet*
AF Form 791	*Aerial Tanker In-flight Issue Log*

5.2.3. Route Navigation Kits. A route navigation kit is built by either unit current operations or deploying aircrew. The route navigation kit will stay with the aircraft until returns to

home station. Kits will contain sufficient quantities of material to cover the planned mission and global operations as required. The minimum contents of route navigation kits are in **Table 5.3**. (T-2)

5.2.3.1. On local unit training sorties, local area navigation kits may be used in lieu of route navigation kits in **Table 5.3**. Contents of these kits will be determined by the unit. (T-3)

Table 5.3. Route Navigation Kit Contents (Items applicable to area of operation) (T-2).

Item (Applicable to Area of Operations)	Quantity Required
FLIP Planning (GP, AP/1, AP/2, AP/3, AP/4)	1
FLIP IFR Supplement	2
FLIP Flight Information Handbook (FIH)	2
FLIP En Route Charts (High and Low)	2
FLIP Area Charts (Terminal)	2
FLIP Instrument Approach Procedures (High and Low)	3*
Standard Instrument Departures (SIDs)	3*
Event or Incident Report (OPREP)-3 Report Format	1
Maps and Charts	As Required
FLIP Visual Flight Rule (VFR) Supplement	1
* Two required when a CSO is not part of the crew. **Note:** Units may modify the kit to carry only FLIP documents for the theater in which the mission will operate.	

5.2.4. Flight Plan/Data Verification. (T-2)

5.2.4.1. Computer Flight Plan(s) (CFP): CFP are the official sources of performance, navigation, and climatic data, including en route wind information. If stand-alone computer based plans are used, each mission segment should utilize best wind data available. Use only AFSOC validated CFP. (T-2)

5.2.4.1.1. Use CFP 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. (T-3)

5.2.4.1.2. Verify CFP 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-3)

5.2.4.1.2.1. Latitude/longitude from current FLIP. (T-3)

5.2.4.1.2.2. Bearing/distance from a flight plan. (T-3)

5.2.4.1.2.3. Ground Based NAVAIDs. (T-3)

5.2.4.2. When conducting Drop Zone (DZ)/Landing Zone (LZ) operations, both pilots or one pilot and CSO will verify CNI-MU computed air release point (CARP)/LZ information with a valid DZ/LZ survey. Refer to AFI 13-217, *Drop Zone and Landing Zone Operations*, for DZ/LZ survey information/requirements/applicability. (T-2)

5.2.5. COMMUNICATIONS SECURITY (COMSEC) and Classified Material. Obtain and safeguard current COMSEC and other classified/keying material required for the mission. Carry authenticators and IFF Mode IV codes, when flying into an ADIZ, participating in exercises, on overseas missions, deployments, and when specified in operation plans. (T-2)

5.2.5.1. 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. Base/squadron COMSEC Responsible Officer (CRO) is the point of contact for current training requirements. (T-2)

5.2.5.2. Command and Control Center (CCC) will provide temporary storage for COMSEC/classified materials during ground time at en route stops. Issue and turn-in of COMSEC is normally a function of the squadron CRO. (T-3)

5.2.5.2.1. Remove classified/sensitive information (such as secure voice/(high performance waveform (HPW), IFF, mission information) stored in all aircraft systems. (T-2)

5.2.5.3. In the event of an emergency, destroy classified material and equipment prior to crash landing or bailout, if possible. (T-2)

5.2.6. Briefing Requirements. Refer to the appropriate 193d SOW briefing guides for content. Crew members will not fly unless they attend the crew briefings for their mission. **Exception:** When pre-mission requirements dictate, PIC may excuse certain crew members from the briefing. The PIC will ensure that those personnel receive a face-to-face briefing prior to engine start. (T-3)

5.2.7. Call Signs. Use the Voice Call Sign Listing or as specified in mission directives/tasking for all missions except local area training missions. Use squadron or wing static call signs as directed for local area training missions. (T-3)

5.2.7.1. Aeromedical Evacuation. Preface normal call sign with "AIR EVAC" when patients are on board. (T-2)

5.2.7.2. 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)

5.2.8. Departure/Arrival Planning. Comply with AFI 11-202, Vol 3, *General Flight Rules*, and AFMAN 11-217, Vol 1, *Instrument Flight Procedures*. If using a flight plan furnished by another agency, the PIC and CSO will verify routes and flight altitudes to ensure proper terrain clearance. (T-2)

5.2.9. Takeoff and Landing Data (TOLD) Verification Requirement. (T-2)

5.2.9.1. To verify CNI TOLD, both pilots will cross-check CNI TOLD INIT entries. (T-3)

5.2.9.2. 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) **Note:** CNI TOLD Takeoff Page 3/4 (Wedge Obstacle) defaults to the minimum 4 and 3 Engine Climb gradients to IAW AFI 11202, Vol 3, *General Flight Rules*. (T-2)

5.2.10. Adverse Weather Procedures. (T-2)

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

5.2.10.1.1. Anytime windshear may be encountered on departure or approach, it is recommended that aircrews select weather mode on one NAV RADAR display and windshear mode on another NAV RADAR display. (T-2)

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

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

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

5.2.10.2.2. Freezing precipitation, snow, freezing fog (consider equivalent to moderate icing), or temperatures near 0° Celsius (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: (T-2)

5.2.10.2.2.1. Aircrews will only use de-ice and anti-ice fluids listed in their respective flight manual. 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-3)

5.2.10.2.2.2. 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. (T-3)

5.2.10.2.2.3. In all cases, PICs will ensure a visual inspection of the aircraft is completed within 5 minutes of departure. (T-3)

5.2.10.3. Do not fly directly above (within 2,000 feet) thunderstorms or cumulonimbus clouds. If unable to clear thunderstorms or cumulonimbus clouds by at least 2000 feet vertically, avoid them by at least: : (T-2)

5.2.10.3.1. 20 nautical miles (nm) at or above flight level (FL) 230. (T-3)

5.2.10.3.2. 10 nm below FL 230. (T-3)

5.2.10.3.3. 5 nm for tactical low-level operations. Avoid gust fronts and winds preceding a rapidly moving thunderstorm. ***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 11-203, Vol 1, *Weather for Aircrews.*

5.2.10.4. 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. It should never be considered a normal avoidance procedure. When relying exclusively on ground-based radar for weather avoidance, and the ground controller is unable to provide avoidance instructions, attempt to maintain VMC by: (T-3)

5.2.10.4.1. Changing routing. (T-3)

5.2.10.4.2. Diverting to alternate. (T-3)

5.2.10.4.3. Declaring an emergency and requesting priority assistance. (T-3)

5.2.10.4.4. Use extreme caution when flying into an area of known or forecast moderate or greater mountain wave turbulence. (T-3)

5.3. Pre-Flight.

5.3.1. 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 policy on ORM is contained in AFI 90-802, *Risk Management*. PIC will accomplish ORM worksheets IAW AFSOC/MAJCOM and local guidance as part of preflight activities. (T-2)

5.3.1.1. Flying units will develop a local ORM program to include personal ORM risk assessment for all missions. (T-3)

5.3.1.2. The PIC will ensure an ORM risk assessment is accomplished by all crew members as part of pre-flight activities. (T-3)

5.3.2. AFTO Forms 781, *Aerospace Vehicle Flight Data Record*.

5.3.2.1. Review AFTO Form 781 series before applying power to the aircraft or operating aircraft systems. An exceptional/conditional release must be signed before flight. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the exceptional/conditional release. If one of these individuals is not available, the PIC may sign the exceptional/conditional release. When a release is signed by the PIC, it is effective only for those flights in which the releasing PIC participates as an aircrew member. Ensure the DD Form 1896, *Jet Fuel Identiplate*, and AIR card are aboard the aircraft. (T-3)

5.3.2.2. One-Time Flights. An aircraft may be released for a one-time flight with a condition that might be hazardous for continued use, provided the aircraft is airworthy for one flight to a repair station. Refer to TO 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*, for downgrade authority and procedures.

5.3.2.2.1. One-time flight approval authority is OG/CC or equivalent-level commander with operational control (OPCON) for items listed in the MEL. (T-3) Any one-time flight request not listed in the MEL requires MAJCOM/A3 approval. (T-2) The PIC concurrence is required before the aircraft can be flown. (T-3)

5.3.3. Authority to Clear a Red X. Pilots 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 AC may obtain authorization to clear the Red X from the

home station MXG/CC or designated representative, in accordance with TO 00-20-1**. Exception:** See **Chapter 10**, Local Operating Procedures, for additional guidance on clearing Red X(s).

5.3.3.1. At en route stations, loadmasters 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.

5.3.4. Dash One Preflight Inspection Requirements. The aircrew Dash One preflight inspection, once completed, is valid for 72 hours provided the aircraft is sealed.

5.3.4.1. 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-3)

5.3.4.2. Except to prepare for operational readiness exercise (ORE), operational readiness inspection (ORI), combined unit inspection (CUI) 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.

5.3.4.2.1. The following guidelines apply to aircrew assigned to preflight and/or seal aircraft. A crew will not preflight more than 4 aircraft in a 12-hour period. Refer to crew rest/flight duty period guidance in AFI 11-202, Vol 3, *General Flight Rules*. Aircrews performing preflight duties will be afforded 12 hours rest between preflight shifts.

5.3.4.2.2. Duties Not Including Flying (DNIF) current and qualified crew members may accomplish pre-flights with the concurrence of the flight surgeon. It is the responsibility of the crew member to know his/her duty limitations. Crew members should have the flight surgeon document the AF Form 1042, *Medical Recommendations for Flying or Special Operations Duty,* appropriately IAW with AFI 48-123, *Medical Examinations and Standards.*

5.3.5. Alert Aircraft Procedures. Maintain aircraft on alert status as follows: (T-3)

5.3.5.1. Park the aircraft in a designated alert parking area to expedite taxi and takeoff. (T-3)

5.3.5.2. Aircraft preflight times and aircraft preflight validity period, should follow the guidance in TO 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedure.*

5.3.5.3. The alert aircraft may be flown for purposes other than actual alert missions provided the following conditions are met:

5.3.5.3.1. Ensure sufficient fuel remains on board to meet alert commitments.

5.3.5.3.2. Maintain communications with the primary controlling agency.

5.3.5.3.3. 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.

5.3.5.4. A DD Form 365-4, *Weight and Balance Clearance, Form F*, will be prepared for the alert aircraft. Alert crews are authorized to load TOLD using the worst weather conditions expected for the alert period. Use the TOLD for alert scrambles. If the alert aircraft is flown for other reasons, use TOLD for the existing weather conditions.

5.3.5.5. If the alert aircraft is changed to a different pre-flighted/sealed aircraft, or an alert crew change occurs and the same aircraft remains on alert, the preflight or alert crew will, as a minimum, apply power to the aircraft and check the following systems (as applicable): (T-3)

5.3.5.5.1. AFTO Form 781, *Aerospace Vehicle Flight Data Record*.

5.3.5.5.2. Interior and exterior for proper configuration and special equipment. (T-3)

5.3.5.5.3. Fuel quantity. (T-3)

5.3.5.5.4. Survival and emergency equipment. (T-3)

5.3.5.5.5. Navigation and communication equipment. (T-3)

5.3.5.5.6. Liquid oxygen quantity. (T-3)

5.3.5.5.7. Hydraulic reservoirs and accumulator charges. (T-3)

5.3.5.5.8. Publications. (T-3)

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

5.3.5.7. Once the aircraft is accepted for alert, the loadmaster will ensure an entry is made in the AFTO Form 781H, *Aerospace Vehicle Flight Report and Maintenance Document*, stating as a minimum, the date and time the aircraft was pre-flighted.

5.3.5.8. Alert aircraft are off limits to all personnel except alert crew members. No maintenance may be performed on the aircraft without the approval of the unit/mission commander. Upon receiving orders to launch, the crew is required to check the area in which maintenance was performed prior to flight. (T-3)

5.3.6. Aircraft Servicing and Ground Operations.

5.3.6.1. Aircraft Refueling. Fuel purchases are accomplished IAW AFI 23-201, *Fuels Management*. Crew members 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 and the mission would be delayed. Crew members may augment maintenance refueling teams at en route stops. (T-3)

5.3.6.1.1. Off Station Refueling Operations. A minimum of one aircrew member must be present during refueling to verify the accuracy of the fuel sale data. AFMAN 23-110CD, *Air Force Supply Systems Electronic Publishing Library*, requires the aircrew to obtain the fuel receipt after refueling at a non-Air Force location and verify the accuracy of the date, quantity, type, and tail number. (T-2)

5.3.6.1.2. Upon returning to home station the aircrew will pass to maintenance (MX) or the document control officer any and all fuel receipts for the trip. (T-3)

5.3.6.1.3. During mission planning, the aircrew will incorporate a refueling plan (if required) by obtaining Defense Energy Support Center (DESC) Into-Plane Vendor locations and applicable prices in order to refuel at the most economical locations. Aircrew will use an Into-Plane contract merchant when one is reasonably available. (T-2)

5.3.6.1.3.1. A complete list of Into-Plane contract locations can be found at the Defense Logistics Agency (DLA) web page; **http://www.airseacard.com**/.

5.3.6.2. Concurrent Ground Operations. Simultaneous aircraft refueling/defueling and cargo loading or maintenance operations is authorized in accordance with AFI 21-101, *Aircraft and Equipment Maintenance Management*, TO 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding*, MDS Specific Technical Orders, and any established local procedures.

5.3.6.3. Liquid Oxygen (LOX) Servicing. Under no conditions are crew members allowed to service liquid oxygen. (T-2)

5.3.6.4. Forward Area Refueling Point Operations. Refer to AFI 11235, *Forward Area Refueling Point (FARP) Operations.*

5.3.6.5. Fire Protection and Crash Rescue. See AFI 13-217, *Drop Zone and Landing Zone Operations*, and any AFSOC/MAJCOM specific guidance for specific Fire Fighting and Rescue requirements.

5.3.6.5.1. 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.

5.3.6.5.2. A fire guard is required for all engine starts except normal APU starts. The loadmaster or ground controller may act as fire guard.

5.3.6.6. Aircrew/Maintenance Engine Runs. Mixed aircrew/maintenance engine runs will not normally be accomplished. If conducted, review and use the maintenance TO procedures. The cargo door and ramp will be closed for all engine run-up's above flight idle. (T-3)

5.3.7. Aircrew Flight Equipment and Oxygen Requirements.

5.3.7.1. 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-3)

5.3.7.1.1. Prior to departing home station and following en route crew changes, the PIC or designated representative will review the AFTO Form 46, *Prepositioned Aircrew Flight Equipment*, to ensure all required equipment is on board and required inspections have been completed. The PIC or designated crew member will document and ensure missing aircrew flight equipment is annotated in both the AFTO Form 781, *Aerospace Vehicle Flight Data Record*, and AFTO Form 46, *Prepositioned Life Support Equipment*.

5.3.7.2. Oxygen. Oxygen on board for takeoff must be sufficient to accomplish the flight plan route from the ETP, or most distant point to the first suitable airfield. Minimum for takeoff of no less than 5 liters (Super J). (T-2) ***WARNING:*** The passenger oxygen kit (POK) does not protect the wearer from smoke or fumes.

5.3.7.2.1. All crew members will accomplish a communications and operations check of their oxygen system prior to flight, which will remain connected and readily available. Walk around bottles do not satisfy this requirement. (T-3)

5.3.7.2.1.1. For primary crew members and instructors/evaluators performing duties not seated in their primary duty station, utilizing a helmet, will perform a communications and oxygen check of the mask and will remain connected to the aircraft oxygen system. (T-3)

5.3.7.2.1.2. For the purposes of oxygen requirements, consider Mission Essential Personnel (MEP) as Passengers.

5.3.7.2.2. Aircrews are authorized to operate aircraft unpressurized above 10,000 ft. MSL without supplemental oxygen IAW AFI 11-202, Vol 3, *General Flight Rules*, and AFSOC Supplement.

5.3.7.3. Life Rafts. Ensure sufficient wing well life rafts are onboard to accommodate all passengers and aircrew members on overwater flights. (T-3)

5.3.7.4. Life Preserver Units. For overwater flights, ensure a sufficient quantity of life preservers are onboard for all passengers and crew members. (T-3) While overwater, life preserver units (LPU) will be sized and readily available at the crew member's station, and worn whenever below 2,000 feet overwater (except for takeoff, approach, and landing). (T-3) Crew members wearing a parachute or harness during air refueling overwater will also wear a LPU. (T-3) For overwater missions carrying children and infants, ensure the appropriate number and types of LPUs are onboard. (T-3) **Note:** Parachutists' will provide their own LPUs. (T-3) The flying unit will ensure the supported unit is aware when route of flight requires the use of LPUs. (T-3) **Note:** Infil/Exfil and parachutist operations may preclude immediate issuing of aircraft LPUs to user personnel. In this case ensure sufficient LPUs are onboard for all personnel.

5.3.7.5. 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° Fahrenheit (F) or below. (T-3) **Exception:** Anti-exposure suits are not required when only the approach or departure is flown over water. If the water temperature ranges between 51° F and 60° F, the unit or mission commander may waive or extend the anti-exposure suit requirement after consideration of all risk factors. (T-3)

5.3.7.6. Parachutes. EC-130J aircraft will be configured with one parachute for each crew member. Units will dictate use of parachutes during combat or acceptance flights. (T-3)

5.3.7.6.1. The standard parachutes load for the EC-130J (Slick) is 8.

5.3.7.6.2. Aircrew Flight Equipment will verify the number of crew members from Current Operations prior to departing for the aircraft to conduct their Aircrew Flight Equipment preflight. (T-3)

5.3.7.7. Restraint Harness.

5.3.7.7.1. 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 above ground level (AGL). Fit the restraint harness and adjust the lifeline prior to takeoff time. (T-3) ***WARNING:*** Position one restraint harness forward and aft of fight station (FS) 245 in event the crew entrance door must be inspected during flight. (T-3) **Note:** Connect the hook to a point that will preclude the wearer from exiting the aircraft. (T-3) Connect the lifeline when at or anticipating moving aft of flight station FS 737.

5.3.7.7.2. The restraint harness lifeline may be attached to an unused, pre-flighted anchor cable that has an anchor cable stop positioned and taped at FS 737. Do not connect the lifeline to an anchor cable that has a parachute static line(s) attached to it for an airdrop.

5.3.7.8. Survival Kits/Vests. All AFSOC C-130 aircraft will be configured with one survival kit (ML-4) for each aircrew member for flights conducted beyond gliding distance of land. (T-3) Survival vests may be used in lieu of survival kits if the mission will not be conducted beyond gliding distance of land.

5.3.7.9. Helmets. All crew members will preflight and wear their helmets during contingency and combat missions. (T-3) As a minimum, helmets will be worn between the combat entry and combat exit checklists and as directed by the mission commander. (T-3)

5.3.7.9.1. Mobile crew members in the cargo compartment will wear helmets during the following flight conditions: (T-3)

5.3.7.9.1.1. During all actual airdrop operations from the Twenty-Minute Warning through the completion of the airdrop checklist. **Exception:** Helmet is not required for Standard Airdrop Training Bundles (SATB)/HALO personnel drops (when no oxygen is required or door bundles are used). (T-3) ***WARNING:*** Personnel in the cargo compartment will not be seated under the anchor cables or static line retriever cables that are rigged for use unless cargo compartment configuration or mission requirements dictate otherwise. In that event, protective headgear will be worn. Personnel will not position themselves directly under the center anchor cable supports (Aframes, FS 737) during personnel or equipment airdrops requiring the use of the anchor cable. **Note:** When conditions require personnel in the cargo compartment to wear protective headgear, the flight helmet will be worn with the chinstrap fastened. (T-3)

5.3.7.9.2. Eye Protection. All personnel aft of FS 617 should wear eye protection during any mission requiring doors to be open.

5.3.7.10. Life Support Equipment Documentation. Life support will accomplish a thorough aircraft preflight inspection prior to each mission. (T-3) Local training missions only require a preflight inspection prior to the first flight of the day. (T-3)

5.3.7.10.1. The AC or designated representative will ensure appropriate serviceable protective clothing, life support, survival, and Dash 21 equipment for the entire

mission are on board the aircraft prior to departing home station. (T-3) Prior to departing home station and following en route crew changes, review the AFTO Form 46, *Propositioned Life Support Equipment*, to ensure all required equipment is on board and required inspections have been completed.

5.3.7.10.2. Crew members discovering equipment missing will make an entry in the AFTO Form 781. (T-3)

5.4. Departure Briefing. The pilot making the takeoff will brief the crew in accordance with published AFSOC briefing guides. (T-3)

5.4.1. On Time Takeoffs. Mission departures are normally considered on time if the aircraft is airborne within 15 minutes of the scheduled takeoff time.

5.4.2. Early Departures. Early departures are authorized to prevent a delay due to weather, ATC restrictions, airfield or aircraft operational limitations, to adjust mission flow during a large-scale operation, or if approved through C2 channels provided the impact on local and downrange facilities and crew duty is evaluated.

5.4.3. Air-to-Air (AAR) and Mission Requirements. Scheduled takeoff time may be adjusted as necessary to meet the AAR rendezvous control time or mission on-station time. Notify C2 agency of any deviations affecting the control or on-station time. (T-3)

5.5. En Route.

5.5.1. IFF/selective identification feature (SIF) Operations. (T-3)

5.5.1.1. Use the IFF/SIF in accordance with **Table 5.4**. **Note:** Once set and transmitted, IFF/SIF modes 1, 2, and 3/A codes are unclassified and may be left in the transponder. (T-3)

Table 5.4. 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, *IFF/SIF Operational Procedures* USAFER 60-17, NATO directives, SPINS/ATO	IAW ACP 160, US Sup-1(C), NI 10-41, NI 10-15, NR 55-68, NR 55-2, SPINS/ATO	

IFF Mode	NATO	United States Atlantic Command (LANTCOM) and North Pacific (NOPAC)	All Other Areas
2	IAW ACP 160, USAFER 60-17, NATO directives, SPINS/ATO	IAW ACP 160, US 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, US Sup-1(C)
4	Keyed and On when required		

5.5.1.2. Conduct an in-flight check of the Mode 4 after takeoff where facilities are available. (T3) Do not delay takeoff nor cancel a mission for an inoperable Mode 4. (T-3) **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-3)

5.5.1.3. 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 repaired at the first repair facility. (T-2)

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

5.5.2.1. Traffic Alerting and Collision Avoidance System. It is imperative to follow Resolution Advisories (RA) 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 shall 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-1)

5.5.2.2. 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.

5.5.3. Navigational Aid Capability.

5.5.3.1. 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.

5.5.3.2. 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. **Note:** Airspace and associated navigational aid equipment capability are rapidly evolving. Crews must maintain an in-depth knowledge of current FLIP requirements/policies. (T-3)

5.5.4. Communications Policy: The Air Force does not give a promise of confidentiality to aircrews regarding their recorded aircraft crew communications. Crew members are expected to maintain a high degree of cockpit professionalism and crew coordination at all times.

5.5.4.1. Aircraft Interphone. Primary crew members will monitor Voice Operated Transmitter (VOX) and interphone during all phases of flight. (T-3) Crew members will advise the pilot flying (PF) before checking off interphone and when back on headset. (T-3)

5.5.4.1.1. Do not discuss classified information on the interphone during radio transmissions. (T-3) Crew members will ensure personnel on headset or within listening distance are cleared prior to discussing classified information over interphone. (T-3)

5.5.4.1.2. Non-aircrew members may monitor interphone or radio transmissions only when specifically approved by the PIC. The PIC will brief communications policy to these personnel prior to flight. (T-3) The PIC must ensure no one monitors classified information for which they are not cleared or transmits classified information over the radios. (T-3)

5.5.4.1.3. Loadmaster(s) LM may clear off interphone with PIC's approval after acknowledgement of the 20 minute warning. After completing the 20 minute checklist items, the primary LM will remain on interphone throughout completion of the checklist. (T-3)

5.5.4.1.4. Sterile Cockpit. Limit conversation to that essential for crew coordination and mission accomplishment during critical phases of flight to include: taxi, takeoff, approach, landing, aerial refueling and any flight below 3,000 AGL. (T-3)

5.5.4.2. Command Radios:

5.5.4.2.1. The pilot (or designated crew member) will inform the crew which radio is primary. (T-3)

5.5.4.2.2. The pilot monitoring (PM) normally makes all ATC radio calls.

5.5.4.2.3. Both pilots will monitor guard emergency frequencies to the maximum extent possible. (T-3)

5.5.4.2.4. All crew members will monitor the primary radio unless specifically directed to do otherwise by the PIC or subsequent chapters of this instruction. The PIC will designate crew members required to monitor the HF and/or satellite communications (SATCOM) radio. (T-3)

5.5.4.2.4.1. In terminal areas, all crew members (if able) will monitor the primary ATC radio unless directed otherwise. (T-3) A crew member will be designated to monitor C2 frequencies on the inbound and outbound legs. (T-3)

5.5.4.2.4.2. During emergencies, monitor simultaneous UHF and VHF transmissions, if able, when operating in a terminal area under radar control. (T-3)

5.5.4.2.5. One of the pilots or CSO will record and read back all ATC clearances. (T-3) This may be disregarded when ATC instructions require immediate execution or when such action interferes with timely completion of more important duties.

5.5.4.3. Communication Reports. Comply with mandatory communication and reporting procedures in the Flight Information Handbook.

5.5.4.4. The Federal Communications Commission (FCC) prohibits the use of unauthorized frequencies for interplane, HAVE QUICK, or SECURE VOICE training.

5.5.5. In-Flight Emergency Procedures. Report deviations from directives that occur as a result of an emergency, in accordance with AFI 11-202, Vol 3, *General Flight Rules,* and this instruction.

5.5.5.1. Notification of Controlling Agencies. When practical after completing the aircraft emergency action checklist and associated actions, furnish the controlling agency and appropriate CCC a description and extent of the difficulty, assistance required, intentions, and any further pertinent information.

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

5.5.5.2. Continued Flight with Engine Loss. A flight may proceed on three engines to its destination if two-engine capability exists, favorable operating conditions prevail en route 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-3)

5.5.6. Fuel Jettison Procedures.

5.5.6.1. Fuel Jettisoning. Fuel will not be jettisoned except in combat, emergency conditions, or rescue missions requiring gross weight reduction. (T-3)

5.5.6.1.1. Aircraft commanders should elect to burn down fuel versus jettison, unless safety of flight dictates an immediate jettison (as determined by the PIC). (T-3) Except in the case of an emergency, before jettisoning fuel, notify the appropriate ATC or flight service facility of intentions, altitude, and location. (T-3) If available, the PIC will use designated jettison areas, except when safety of flight would be compromised. (T-3)

5.5.6.1.2. For training missions, the OG/CC may approve fuel jettison when an urgent operational requirement exists to expedite recovery of the aircraft and all alternatives have been exhausted. (T-3)

5.5.6.1.3. For missions tasked by higher headquarters authority, the tasking C2 agency (AFSOC Operations Center (AOC), Combined Air Operations Center (CAOC), COMAFSOF) may authorize fuel jettison when an urgent operational requirement dictates immediate recovery/reconstitution of the aircraft and/or aircrew.

(T-2) The tasking C2 agency may provide fuel jettison instructions in the operational order (OPORD), mission directive, SPINS, etc. (T-2)

5.5.6.2. Advise ATC should it become necessary to jettison fuel. (T-3)

5.5.6.3. OG/CCs will establish jettison areas and procedures to minimize the impact of fuel jettisoning. (T-3) Ideally, establish jettison areas at altitudes above 20,000 feet AGL, off published airways, avoiding urban areas, agricultural regions, and water supply sources. Avoid circling descents. Initiate AF Form 813, *Request for Environmental Impact Analysis*, and submit it to the base environmental coordinator. (T3)

5.5.6.4. Fuel Jettison. All jettisons will be followed up with a detailed report filed by the PIC immediately after landing. Use AF Form 457, *USAF Hazard Report.* Reference AFI 91-202, for procedures to prepare an AF Form 457. Submit AF Form 457 through unit OGV to AFSOC Stan/Eval. Unit OGV will retain the AF Form 457 for 6 months. (T-3)

5.5.6.4.1. AF Form 457. 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 well-being of personnel, or which may result in loss, damage, or destruction of any weapons system, equipment, facility, or material resource.

5.5.7. Need for Medical Assistance. When a person on board 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-3)

5.5.7.1. 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. (T-3) 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.

5.5.8. In-Flight Meals. The pilot and copilot will not consume meals within 90 minutes of each other before or during flight, if the meals consist of the same menu and were procured from the same vendor. (T-3)

5.6. Arrival.

5.6.1. Arrival. Before descent into unfamiliar areas, the pilots and CSO will review appropriate terrain charts to increase aircrew situational awareness of obstructions. (T-3) Primary crew members 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-3)

5.6.1.1. Flight Instrumentation Requirements.

5.6.1.1.1. 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.

5.6.1.1.2. 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.

5.6.1.1.3. Aircraft are limited to a Decision Height (DH)/Minimum Descent Altitude (MDA) based on a Height Above Touchdown (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.

5.6.1.2. ILS Precision Runway Monitor (PRM) Approaches. Both pilots must be certified to conduct an ILS PRM approach. (T-2) Comply with the following operational procedures:

5.6.1.2.1. Two operational VHF communication radios are required. (T-2)

5.6.1.2.2. The approach must be briefed as an ILS/PRM approach. (T-2)

5.6.1.2.3. If unable to accept an ILS PRM approach clearance, contact the Federal Aviation Administration (FAA) Air Traffic Control System Command Center (ATCSCC) at 1-800-333-4286 prior to departure time to obtain a pre-coordinated arrival time. (T-2) Pilots who arrive at a PRM airport unable to accept PRM approach clearance, who did not contact ATC prior to departure, should expect an ATC directed divert to a non-PRM airport.

5.6.1.2.4. All breakouts from the approach shall be hand flown. (T-2) Autopilots shall be disengaged when a breakout is directed. (T-2)

5.6.1.3. 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 feet ceiling and 1/2 mile visibility or greater). (T-2)

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

5.6.1.3.1.1. Approach lights. (T-2)

5.6.1.3.1.2. Runway centerline lighting. (T-2)

5.6.1.3.1.3. High intensity runway lights or touchdown zone lights. (T-2)

5.6.1.3.1.4. Approach end transmissometer. (T-2)

5.6.1.3.1.5. ILS far field monitor. (T-2)

5.6.1.3.1.6. Sequenced flashers. (T-2)

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

5.6.1.3.3. 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).

5.6.1.3.4. Refer to AFI 11-217, Vol 1, *Instrument Flight Procedures,* regarding equipment failure and go-around criteria.

5.6.1.4. 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.

5.6.2. After Beginning an En route Descent. IAW AFI 11-202, Vol 3. **Exception:** Do not continue a CAT II ILS if the weather is reported to be below CAT II minimums.

5.6.2.1. The PM and CSO will monitor the approach and report any deviations from prescribed procedures. (T-3)

5.6.2.2. Crew members will confine their activities to aircraft operation, descent and approach monitoring and checklist accomplishment from the initial descent point to block in. (T-3)

5.6.3. Cold Weather Altimeter Setting Procedures. Apply cold weather altimeter corrections for non-tactical situations in accordance with AFI 11-202, Vol 3, and the Flight Information Handbook. For tactical applications see **Chapter 17**.

5.6.4. Maintenance. Complete the AFTO Form 781, *Aerospace Vehicle Flight Data Record*, after each flight.

5.6.4.1. Immediately after arrival, the PIC and any crew position documenting a maintenance discrepancy will debrief maintenance personnel on the status of the aircraft and subsystems and discrepancies entered into the AFTO Form 781A document. (T-3) At stations where there is no AFSOC maintenance and maintenance support is required, the PIC will ensure a thorough debrief is provided to the controlling CCC prior to entering crew rest. (T-3)

5.6.4.2. Ensure flight time, landings, aircraft condition, and fuel onloaded/offloaded during refueling operations is entered in the AFTO Form 781H.

5.6.4.3. Exceedance. The aircrew will document any known exceedances in the AFTO 781A. The aircraft is considered grounded and must be returned back to maintenance for inspection and/or repair as required. (T-3)

5.6.5. Aircraft Recovery Away from Main Operating Base. The PIC is responsible for ensuring the aircraft is turned to meet subsequent mission tasking, even when qualified maintenance specialists are unavailable. (T-3)

5.6.5.1. The PIC is responsible for the recovery items including: (T-3)

5.6.5.1.1. Parking and receiving. (T-3)

5.6.5.1.2. Aircraft servicing, including Aircraft Ground Equipment (AGE) usage. (T-3)

5.6.5.1.3. Supervision of minor maintenance within local capability. (T-3)

5.6.5.1.4. Minor configuration changes to meet mission tasking. (T-3)

5.6.5.1.5. Securing the aircraft before entering crew rest. (T-3)

5.6.5.1.6. Coordinating aircraft security requirements. (T-3)

5.6.5.1.7. Documenting AFTO 781-series forms. (T-3)

5.6.5.2. In all cases where aircrews must service the aircraft without qualified maintenance specialist assistance, comply with the appropriate maintenance TO.

5.6.6. Cockpit Voice Recorder (CVR). If involved in a mishap or incident, after landing and terminating the emergency, pull the CVR power circuit breaker (ECB #464). (T-3)

5.6.7. Clear Water Rinse Facility (Birdbath).

5.6.7.1. Crews should use a clear water rinse facility (birdbath) after every flight in which the aircraft is flown over saltwater below 3,000 feet, including tactical approaches. (T-3) Two or more takeoffs and/or landings, including touch-and-go landings, over saltwater requires a clear water rinse after the last flight of the day per TO 1-1-691, *Cleaning and Corrosion Prevention and Control, Aerospace and Non-Aerospace Equipment*.

5.6.7.2. 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-3)

5.6.7.2.1. Ensure sensors such as the radar are off prior to entering the birdbath. (T-3) ***CAUTION:*** The APU will remain off with door closed to prevent flameout and flooding of the APU compartment. (T-3)

5.6.7.2.2. Set flaps to 100%. Turn off and extend landing lights. (T-3)

5.6.7.2.3. Complete the "AFTER LANDING CHECKLIST" after rinse is completed, run the engines at normal ground idle for a minimum of two minutes to aid in drying out engine nacelles. (T-3)

5.6.7.2.4. Review local procedures for birdbath operating guidelines. (T-3) 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. ***CAUTION:*** Due to water intrusion problems, aircraft equipped with Large Aircraft Infrared Countermeasures (LAIRCM) Small Laser Transmitter Assembly (SLTA) will not use the birdbath with the turrets installed. (T-3)

5.6.8. Support Agencies. The PIC or a designated representative will pass significant information to support agencies, such as weather, ATC, or base operations. (T-3) 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-3)

5.6.9. Crew Debriefing. The PIC will conduct a debriefing after each mission. (T-3) The debriefing will include all applicable crew members so that common problems can be

discussed and resolved. (T-3) Crew members may be excused from the debrief at the discretion of the PIC. (T-3)

5.6.10. Aircrew Notification Procedures. When transiting installations, the PIC will establish a point of contact with the CCC, base operations, or local airport manager. (T-3) The PIC will be notified immediately in case of incident or emergency affecting the safety or security of the aircraft. (T-3)

5.7. Miscellaneous.

5.7.1. Cockpit/Mission Congestion and Loose Objects. Limit the number of persons on the flight deck to the minimum commensurate with mission requirements. (T-3) At no time will this exceed six. (T-3)

5.7.1.1. Store only items required for use or immediate reference in-flight on the flight deck. (T3) Additional items, to include personal pubs bags, will be secured in the cargo compartment. (T-3) All items will be secured prior to passing the combat entry point until passing the combat exit point. (T-3)

5.7.1.2. Do not place any item (checklist, chart, etc.), on the center pedestal in a position that covers or hides from view any switch or light. (T-3) Do not place any item behind the power levers. (T-3)

5.7.2. Dropped Objects. 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-3)

5.7.2.1. Ensure a write-up is entered in the AFTO Form 781A. (T-3)

5.7.2.2. Notify the MAJCOM Command Center as soon as practical. Include route of flight, altitude, and weather conditions (i.e., turbulence, etc.). (T-3)

5.7.3. Impoundment. If an aircraft is involved in a serious in-flight incident, the PIC should impound the aircraft immediately after landing and contact the AFSOC Command Center or controlling agency for further instructions. (T-2)

5.7.4. Narcotics. Crew members will ensure narcotics and other unauthorized items are not smuggled onboard the aircraft. (T-3) Maintain narcotics that are part of official medical kits in accordance with appropriate directives.

5.7.5. 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 in accordance with AFI 11-202, Vol 3, *General Flight Rules*, and FLIP general planning (GP).

5.7.6. Sensitive Mission Operations. Certain missions require special flight planning procedures or deceptive measures. Use of these procedures will be directed by mission operating directives, MAJCOM/CC operations orders, or other tasking orders. Modification to normal procedures will be fully briefed to aircrews prior to execution of the operation. All missions of this type requiring coordination with non-AFSOC agencies must be approved by MAJCOM/CC or the COMAFSOF/COMAFFOR prior to execution. (T-2) The planning agency tasked with the mission will provide the aircrew with the following information:

5.7.6.1. Departure procedures.

5.7.6.2. En route procedures to include tracks, Altitude Reservation(s) (ALTRV), Military Assumes Responsibility for Separation of Aircraft, tanker rendezvous, and emergency divert procedures.

5.7.6.3. Arrival procedures.

5.7.6.4. All communications requirements.

5.7.7. Passenger Restrictions. DoD 4515.13-R, *Air Transportation Eligibility*, establishes criteria for passenger movement on DoD aircraft. It defines five categories of passenger travel: space-available, aeromedical evacuation, orientation, public affairs, and space-required. AFI 11401, *Aviation Management*, provides further guidance on orientation and public affairs travel. Refer to these publications directly for details not addressed in this instruction. In all cases, passengers will be manifested on a DD Form 2131.

5.7.7.1. Space-Available. Authorized passengers, processed through the passenger terminal, may occupy surplus seats on DoD aircraft after all space-required passengers have been accommodated. Required documentation is listed in DoD 4515.13-R. Group commanders or COMAFSOF may approve space-available travel on AFSOC EC-130J aircraft after careful consideration of mission requirements and sensitivities. (T-3)

5.7.7.1.1. Restrictions. Both pilots must be fully qualified. Group commanders or COMAFSOF may approve AAR on a case-by-case basis. (T-3) All other mission events and simulated emergency procedure(s) (EP) are prohibited. (T-2)

5.7.7.2. Aeromedical Evacuation. Defined as the movement of patients by air. Specific guidance on eligibility and documentation is contained in DoD 4515.13-R. Commander, United States Transportation Command (USTRANSCOM) is the single manager for policy and procedure.

5.7.7.2.1. Restrictions. If tasked to conduct aeromedical evacuation, both pilots must be fully qualified. AAR may be performed if required for mission accomplishment after coordination with tasking authority. All other mission events and simulated EPs are prohibited.

5.7.7.3. Orientation. There are four categories of orientation flight (refer to AFI 11-401): incentive flights, Distinguished Visitor (DV) flights, familiarization flights, and spouse orientation flights. Document authorization by letter and DD Form 2131. Requests for approval will include the mission profile and events to be accomplished. (T-2)

5.7.7.3.1. Restrictions:

5.7.7.3.1.1. For spouse orientation, comply with restrictions in AFI 11-401. Threat maneuvers are prohibited.

5.7.7.3.1.2. For other orientation categories, both pilots must be fully qualified. Group commanders or COMAFSOF may approve/authorize all mission events on a case-by-case basis. Passengers will be seated with belts fastened during threat maneuvers. (T-3) Simulated EPs are prohibited. (T-2)

5.7.7.4. Public Affairs Travel. Defined as travel in the interest of adding to the public understanding of DoD activities. AFI 11-401 contains specific details on the Air Force

Public Affairs Flight Program. Document authorization by letter and manifest on DD Form 2131. Requests for approval will include the mission profile and events to be accomplished. (T-2) Forward requests through public affairs channels.

5.7.7.4.1. Restrictions. Both pilots must be fully qualified. Group commanders or COMAFSOF may approve/authorize all mission events on a case-by-case basis. (T-3) Simulated EPs are prohibited. Passengers will be seated with belts fastened during threat maneuvers.

5.7.7.5. Space-Required. DoD 4515.13-R lists several categories of passengers who are authorized official travel on DoD aircraft. Apply the space-available processing, approval, and restrictions to all space-required categories with the following exceptions:

5.7.7.5.1. Supported Forces. A sub-category of space-required passenger defined by this instruction as US and foreign military personnel who are an integral part of the mission being performed. Approval is assumed by the mission tasking. Manifest on DD Form 2131.

5.7.7.5.1.1. Restrictions. Both pilots must be fully qualified (unless excepted by AFI 11-401). Simulated EPs are prohibited. There are no restrictions on mission events. Passengers will be seated and secured during threat maneuvers. The PIC will ensure supported forces are briefed on the mission profile and events before flight. (T-3)

5.7.7.5.2. Mission Essential Personnel. A sub-category of space-required passenger defined by AFI 11-401, AFSOCSUP, and this instruction. Off-station travel is documented by travel orders. A letter of authorization from the group commander or COMAFSOF will document local flights. (T-3) Deployed squadron or mission commanders may approve squadron-assigned personnel, or maintenance personnel required for mission accomplishment. 18 FLTS/CC is the approval authority for supporting forces in conjunction with test missions. When frequent local flights are necessary, commanders may issue annual authorizations by name or Air Force Specialty Code (AFSC), as appropriate. (T-3) When using this option, the PIC will ensure that all restrictions in the following paragraph are complied with for each individual mission. (T-2)

5.7.7.5.2.1. Both pilots must be fully qualified (unless specified otherwise by AFI 11-401). Simulated EPs are prohibited. **Exceptions:** EP required for the purposes of a Functional Check Flight (FCF) are authorized. Limit personnel to absolute minimum required. There are no restrictions on mission events. Passengers will be seated and secured during threat maneuvers. (T-3) The PIC will ensure supporting forces are briefed on the mission profile and events before flight. (T-3)

5.7.8. Cargo Documentation. Proper cargo documentation will accompany each load.

5.7.8.1. The cargo manifest and DD Form 1384 (interpreted punch card deck or manual form), and special handling documents as applicable, will be delivered to the aircraft before departure. The manifest will be one of the following:

5.7.8.1.1. Computer printed product.

5.7.8.1.2. 80/80 (Offline Manifest) listing.

5.7.8.1.3. DD Form 1385, *Cargo Manifest.*

5.7.8.1.4. DD Form 2130-2, *C-130 A/B/E/H Load Plan*. This form is designed for use during exercises, wartime, and contingency operations.

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

5.7.8.3. Shipper's Declaration for Dangerous Goods prepared by the shipper in accordance with AFMAN 24-204(I), *Preparing Hazardous Materials for Military Air Shipments*, and AF Form 127, *Traffic Transfer Receipt*, will accompany the manifest, if required.

5.7.9. Airlifting Hazardous Cargo Material Procedures. The term "hazardous material" includes substances or materials that are capable of posing an unreasonable risk to health, safety, and property when transported and has been so designated by this manual. May also be referred to as hazardous cargo or dangerous goods. **Note:** For identification, listing, and rules pertaining to hazardous WASTE, refer to Title 40 Code of Federal Regulations (CFR), Parts 260-263, *Protection of Environment*, established by the US Environmental Protection Agency. Hazardous materials are assigned hazard classes. The category of hazard assigned to a hazardous material based on defining criteria. Hazard classes are: explosives (Class 1), compressed gases (Class 2), flammable liquids (Class 3), flammable solids (Class 4), oxidizers and organic peroxides (Class 5), poisons and infectious substances (etiologic agents) (Class 6), radioactive materials (Class 7), corrosive materials (Class 8), and miscellaneous dangerous goods (Class 9).

5.7.9.1. 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.

5.7.9.1.1. Shipper's Declaration for Dangerous Goods prepared by the shipper in accordance with AFMAN 24-204(I), *Preparing Hazardous Materials for Military Air Shipments*, and AF Form 127, *Traffic Transfer Receipt*, will accompany the manifest, if required.

5.7.9.2. Aircrew Responsibilities.

5.7.9.3. As a minimum, the PIC and/or designated crew member must be briefed at the base of departure concerning onboard hazardous materials, including the following information: (T-3)

5.7.9.3.1. Proper Shipping Name (PSN), Hazard Class or Division and United Nations (UN), North American (NA), or Identification Number (ID) number.

5.7.9.3.2. Quantity of each hazard class by gross weight.

5.7.9.3.3. The Net Explosive Weight (NEW) for Division 1.1 through 1.3 explosives.

5.7.9.3.4. Total net quantity of any toxic chemical ammunition or highly toxic substances.

5.7.9.3.5. Location on aircraft.

5.7.9.3.6. Passenger restrictions.

5.7.9.3.7. Smoking restrictions.

5.7.9.3.8. Special requirements, i.e., couriers, protective equipment, etc.

5.7.9.3.9. Cargo being carried under Department of Transportation (DoT) exemptions, Certificate of Equivalency (COE), a Competent Authority Approval CAA or a waiver.

5.7.9.3.10. If any of the above is omitted, request it before accepting cargo. Check air cargo manifest (and attached Shipper's Declarations) before signing.

5.7.9.4. Border Clearance and Diplomatic (DIP) Clearances.

5.7.9.4.1. Aircrews are required to check the FCG for DIP Clearance requirements prior to departure on international flights transporting Hazardous Materials. If DIP Clearance is required the crew will verify that clearance has been granted prior to departure. (T-3)

5.7.9.5. Flight plans will be annotated "Hazardous Cargo" when any amount of the following is transported: (T-3)

5.7.9.5.1. Division 1.1 through 1.3 explosives.

5.7.9.5.2. Toxic chemical ammunition (Compatibility Group K).

5.7.9.5.3. Highly toxic substances.

5.7.9.5.4. Division 6.2 infectious substances which require technical escorts and/or special protective equipment.

5.7.9.5.5. Nuclear weapons.

5.7.9.5.6. Class 7 Radioactive Material (Yellow III label).

5.7.9.5.7. All other hazardous materials, except Class 9 and other regulated materials for domestic transport only (ORM-D) when aggregate gross weight exceeds 1,000 pounds (454 kgs).

5.7.9.6. Departure/Arrival Notifications.

5.7.9.6.1. Prior to departure, verify airfield controlling agency. (T-3)

5.7.9.6.2. Forward hazardous materials information to emergency response agencies. (T-3)

5.7.9.6.3. Include hazardous materials information in the departure message, if required. (T-3)

5.7.9.6.4. If ETA is less than 1 hour, or other circumstances preclude message receipt at destination, provide hazardous information by priority telephone. (T-3)

5.7.9.6.5. At least 30 minutes prior to ETA, check with destination to verify that hazardous material notification information, if required, was received. (T-3)

5.7.9.6.6. If not, unless prohibited by the theater commander or FLIP planning, contact controlling agency at destination and provide as a minimum:

5.7.9.6.6.1. PSN.

5.7.9.6.6.2. Hazard class.

5.7.9.6.6.3. UN, NA, or ID number.

5.7.9.6.6.4. NEW for Class 1 (Explosives).

5.7.9.6.6.5. Net quantity of chemical ammunition and toxic substances.

5.7.9.7. Aircraft Parking.

5.7.9.7.1. Parking of aircraft carrying hazardous materials is the responsibility of the host airfield.

5.7.9.7.2. The following is provided for information only:

5.7.9.7.2.1. Aircraft transporting Division 1.1 and 1.2 explosives, nuclear weapons, and Hazardous Materials requiring a Special Assignment Air Mission, i.e., Toxic Chemical Ammunition, are normally parked at remote (HOT) spots.

5.7.9.7.2.2. Divisions 1.3/1.4 explosives may or may not require "HOT" spot parking depending on quantity of explosives.

5.7.9.7.2.3. Transit aircraft with explosives, when cargo is not handled, may be parked at isolated locations other than "HOT" spots.

5.7.9.7.2.4. Other hazardous materials normally do not require remote or isolated parking.

5.7.9.7.2.5. Military installations are responsible for proper placarding of aircraft.

5.7.10. Hazardous Medical Equipment.

5.7.10.1. Nonstandard equipment possessed by medical facilities that use AFSOC air evacuation services should be regarded as potentially hazardous. Two types of equipment are of major concern:

5.7.10.1.1. Electronic medical equipment produces Electro-magnetic Interference (EMI) which is commonly beyond the limits specified by Military Standard (STD) 461A and 462, and therefore can interfere with aircraft communication and navigational equipment.

5.7.10.1.2. Therapeutic oxygen systems present an increased hazard of fire or explosion. A potential hazard is the inadvertent disruption of the cylinder neck, manifold, or regulator resulting in explosion and propulsion of the container or accessories.

5.7.10.2. For nonstandard electronic medical equipment, take the following precautions: (T-3)

5.7.10.2.1. Medical personnel must inform the PIC when nonstandard electronic medical equipment is brought on board the aircraft. (T-3)

5.7.10.2.2. The PIC must be informed of the anticipated period of use of the equipment during the mission. (T-3)

5.7.10.2.3. The PIC must be alert for any interference with aircraft communications or navigation equipment during periods of use of this equipment. (T-3)

5.7.10.2.4. When continuous use of the equipment is required throughout the duration of the mission, flight must be restricted to VFR conditions. (T-3) Furthermore, exercise additional caution on night VFR missions to ensure there are no adverse effects on navigational equipment. (T-3)

5.7.10.3. For nonstandard oxygen equipment, take the following precautions:

5.7.10.3.1. All compressed oxygen equipment with exposed, unprotected cylinder neck, manifold, or regulator must be completely secured from all movement in its longitudinal and lateral axis. (T-3)

5.7.10.3.2. Medical personnel must continually monitor the operation of the equipment to detect possible malfunction during exposure to altitude. (T-3)

5.7.10.4. Mission Impaired Capability/Awaiting Parts (MICAP), Very Very Important Parts (VVIP), sensitive cargo, courier materials, and registered mail moving within the normal airlift system are receipted at the on and offload stations using the air cargo manifest. For unit moves operated in accordance with Defense Transportation Regulation (DTR), Part III, Mobility, classified or sensitive cargo movement is normally manifested utilizing the DD Form 2130-2, Cargo Manifest or similar automated product such as Computer Aided Load Manifesting (CALM) or Automated Air Load Planning System (AALPS), and will normally be accompanied by a unit courier. However, if classified/sensitive unit cargo is offered without an accompanying courier, the DD Form 1907.

5.7.10.4.1. Defense Courier Service (DCS) couriers coordinating with the PIC are authorized to designate officer or enlisted, (E-5 and above) crew members on military aircraft as couriers to escort and safeguard courier material when other qualified personnel are not available. Qualified passengers, if carried, are designated before designating crew members. The following restrictions apply:

5.7.10.4.1.1. Primary crew members will not be designated couriers without the consent of the PIC. (T-3)

5.7.10.4.1.2. Crew members on aircraft scheduled to make an extended en route stop at a location where DCS couriers cannot provide en route support will not be designated as couriers. (T-3)

5.7.10.4.2. During stops at en route locations supported by DCS stations, DCS couriers are required to meet designated couriers, guard and protect the material. (T-3)

5.7.10.4.2.1. During unscheduled en route stops crew members may place courier material in temporary custody of the following agencies in descending order of priority.

5.7.10.4.2.1.1. DCS courier.

5.7.10.4.2.1.2. TOP SECRET control officer of the US armed forces.

5.7.10.4.2.1.3. US Department of State Diplomatic Courier.

5.7.10.4.2.1.4. US Department of State activity.

5.7.10.4.2.1.5. US military guards.

5.7.10.4.2.1.6. US DoD civilian guards.

5.7.10.4.3. If unable to follow the itinerary to the destination of the courier material, or material is lost, stolen, or otherwise compromised, report circumstances to the nearest Defense Courier Station and notify the local US military commander or US Government activity. (T-2)

5.7.10.4.4. Life or death urgency shipments consist of biological or other medical supplies of such urgency that human life is dependent upon immediate receipt. Shipments will be manifested separately and the manifest annotated with the words LIFE OR DEATH URGENCY. All shipments will be handled on a hand-to-hand receipt basis, using either the air cargo manifest or the DD Form 1907, for unit moves. The PIC will be briefed on the urgency of the shipment and be made the custodian during flight. (T-3)

5.7.11. Border Clearance.

5.7.11.1. Normal Operations:

5.7.11.1.1. Border Clearance Responsibility. The responsibility will be IAW the applicable Foreign Clearance Guide and AFI 24-203, *Preparation and Movement of Air Force Cargo*.

5.7.11.1.2. PIC Responsibility. Border clearance is the responsibility of the PIC, although many of the duties have been assigned to ground personnel and to the loadmaster. (T-3) The PIC will ensure: (T-3)

5.7.11.1.3. Crew members and passengers possess current passports and valid visas, if required. (T-3)

5.7.11.1.4. Crew members and passengers have current shot records or certificates of immunization. (T-3)

5.7.11.1.5. Cargo entry documents are in proper order. (T-3)

5.7.11.1.6. Departure or arrival to the US is through a port of entry where border clearance can be obtained. (T-3)

5.7.11.1.7. 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-3)

5.7.11.1.8. Aircraft spraying is accomplished, if required (see **Paragraph 5.7.17**). (T-3)

5.7.11.1.9. En route to the US, the loadmaster has distributed personal customs declarations to all passengers and crew members; has briefed passengers and crew

members on customs regulations; and has prepared and compiled necessary border clearance forms for the PIC's signature. (T-3)

5.7.11.1.10. En route to the US, the base of intended landing is notified of any change in ETA, to ensure border clearance is accomplished as soon as possible after landing. (T-3)

5.7.11.1.11. 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 or NGB. (T-3)

5.7.11.1.12. When an aircraft lands for a US border clearance, a US Customs representative normally meets the aircraft to obtain the required documents. Do not deplane passengers or crew members, except a scanner, unless necessary for safety. (T-3) Do not unload until approved by customs and agriculture personnel or their designated representatives. (T-3) This procedure applies to the initial landing in the US and all subsequent landings until crew, passengers, and cargo complete final border clearance.

5.7.11.2. Exercise and Contingency Operations.

5.7.11.2.1. 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.

5.7.11.2.2. 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 on-load or offload base instead of the normal port of entry, or at the foreign on-load or offload base.

5.7.12. US Customs Procedures.

5.7.12.1. Outbound. No requirements.

5.7.12.2. Inbound. Prepare one copy of the following documents before arrival.

5.7.12.2.1. Customs and Border Protection (CBP) Form 7507, *General Declaration (Outward/Inward),* (passenger list not required)

5.7.12.2.2. Cargo manifest.

5.7.12.2.3. For troops out of country less than 140 days.

5.7.12.2.3.1. Troop commander's certificate from examination of troop baggage.

5.7.12.2.3.2. One copy of DD Form 1854 or Customs Form (CF) 6059B, *Customs Declaration*, for each passenger not under command of the troop commander, to include observers, support personnel, civilians, news reporters,

and crew members.

5.7.12.2.3.3. Upon arrival at a CONUS offload base, a Customs representative 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.

5.7.12.2.4. For troops out of the country 140 days or more.

5.7.12.2.4.1. One copy of DD Form 1854, *US Customs Baggage Declaration*, or CF 6059B, *Customs Declaration*, for each passenger. This includes observers, support personnel, civilians, news media personnel, and crew members.

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

5.7.13. Immigration Procedures.

5.7.13.1. Outbound. No requirements.

5.7.13.2. Inbound. Submit the following to the Immigration inspector.

5.7.13.2.1. One copy of CBP 7507, *General Declaration (Outward/Inward).*

5.7.14. Customs, Immigration and Agricultural Inspections.

5.7.14.1. 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.

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

5.7.14.3. US military aircraft are sovereign territory. When cleared to overfly 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 on board. The PIC will not authorize search, seizure, inspection or similar exercises of jurisdiction enumerated above by foreign authorities except by direction of HQ USAF or the American Embassy in the country concerned. (T-3)

5.7.14.3.1. The PIC will not permit the inspection of their aircraft by officials of any foreign government. If requested to submit to these actions, the PIC and crew will deny access to the aircraft and seek aid from the senior AFSOC (or other USAF) representative in the US Embassy or Consulate within the host nation. (T-2) 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 crew will seal the aircraft, enter into crew rest, and departure intentions will be canceled until resolution of the matter by the appropriate authority. Inform C2 authorities by the fastest available means should this situation occur. (T3)

5.7.14.3.2. When confronted with a search request by foreign authorities, aircrews should consider the following procedures:

5.7.14.3.2.1. In most cases, search attempts may be stopped by a statement 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 that may honestly, but mistakenly, believe they have authority to search USAF aircraft.

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

5.7.14.3.2.3. 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.

5.7.14.3.2.4. If permission is refused and the foreign authorities insist on forcing their way on board 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.

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

5.7.15. Military Customs Pre-Clearance Inspection Program:

5.7.15.1. The military customs program outlined in Defense Travel Regulation (DTR) 4500.9-R Part 5, Chapter 506, was developed to assist the DoD and other US Government agencies in the control of narcotics, contraband, and prohibited agricultural products, and to expedite entry of DoD personnel and material into the customs territory of the United States.

5.7.15.2. Military Customs Inspectors will accomplish this inspection immediately prior to departure and may conduct more than one preclearance inspection on CONUS-bound aircraft. When security considerations necessitate deviation from this policy, mission

planners must coordinate with the appropriate agency to ensure the mission is not jeopardized.

5.7.16. Insect and Pest Control (Aircraft Spraying).

5.7.16.1. The PIC will ensure required spraying is accomplished (if applicable), and certify the spraying on required forms. (T-3)

5.7.16.2. Aerosol normally is dispersed at a flow rate of 10 seconds per 1,000 cubic feet. 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-3)

5.7.16.3. 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-3)

5.7.16.4. Spray the cabin, cockpit, and other spaces accessible from within the aircraft after the crew is on board and after closing all doors, windows, hatches, and ventilation openings. (T-3) ***CAUTION:*** If the insecticide label directs disembarkation after use, spray prior to boarding crew or passengers. (T-3) Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone on board.

5.7.16.5. Spray for 50 seconds unless longer periods are specified for the country being transited. (T-3)

5.7.16.5.1. When spraying is required, use insecticide, aerosol d-phenothrin-2 percent, National Stock Number (NSN) 6840-01-067-6674 (or equivalent), to spray the aircraft. Wear leather or Nomex gloves while spraying. (T-3)

5.7.16.6. When seeing any insect or rodent infestation of the aircraft in-flight, notify the destination CCC, base operations, or airport manager of the situation before landing so the proper authorities can meet the aircraft. (T-3)

5.7.16.7. Upon arrival, do not open cargo doors or hatches except to enplane officials inspecting the aircraft for insect or rodent infestation. Do not on-load or offload until the inspection is satisfactorily completed. (T-3) This procedure may be altered to satisfy mission or local requirements, as arranged by the base air terminal manager.

5.7.17. Ordnance Procedures. Conduct the following procedures after the live firing of chaff/flares or the crew suspects aircraft battle damage: (T-3)

5.7.17.1. After landing, taxi to the de-arm area or another suitable safe location to check for hung ordnance. (T-3)

5.7.17.2. The loadmaster or another qualified crew member will de-plane the aircraft and check all chaff/flare dispensers for hung ordnance or damage. (T-3) **Note:** ALE-47 flare squibs that fail to fire are not considered hung ordnance.

5.7.17.3. If hung ordnance is found, identified by a protruding or partially ejected flare cartridge, the aircraft will remain in a de-arm area until Explosive Ordnance Disposal (EOD) personnel meet the aircraft. (T-3) The aircraft must remain in the designated safe area until EOD personnel can clear all hung ordnance. (T-3)

5.7.17.4. If hung ordnance is not found, the aircraft can proceed to the parking location.

5.7.18. Bird/Wildlife Aircraft Strike Hazard (BASH) Programs. BASH programs are centralized unit efforts that provide information cross-feed, hazard identification, and a consolidated course of action. As a minimum, unit commanders must implement the following procedures: (T-3)

5.7.18.1. Ensure compliance with the following Bird Watch condition restrictions. (T-3)

5.7.18.1.1. Bird Watch Condition Low - No operating restrictions. (T-3)

5.7.18.1.2. Bird Watch Condition Moderate - Initial takeoffs and final landings allowed only when departure and arrival routes will avoid bird activity. (T-3) Local IFR/VFR traffic pattern activity is prohibited.

5.7.18.1.3. Bird Watch Condition Severe - All takeoffs and landings are prohibited. Waiver authority is local OG/CC or equivalent. (T-3) Parent MAJCOM/A3 waiver is required to operate at airfields not controlled by the Mobility Air Forces (MAF). (T-2)

5.7.18.2. Commanders establish Phase II of the BASH program during increased periods of migratory bird activity. Schedulers shall make every effort to not schedule takeoffs, landings, and low-levels from one hour before to one hour after sunrise and sunset during the Phase II period. (T-3) Publish significant bird hazards in FLIP Area Planning (AP) and the IFR Supplement along with the associated airfield operating hour restrictions and avoidance instructions.

5.7.18.3. When operating at airfields where no BASH program exists, a PIC has the authority to delay takeoffs and arrivals due to bird condition after coordinating with the appropriate C2 authority.

5.7.18.4. Consider bird migratory patterns during the en route portion of the mission to help minimize the potential of an in-flight bird strike. (T-3) The Bird Avoidance Model (BAM) on HQ AFSC/SEF website contains BASH information including regionalized CONUS bird migration patterns, Portable Flight Planning System (PFPS) software overlay, and the latest news. The Avian Hazard Advisory System (AHAS) website is another source for real time bird hazard information. See AFPAM 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques*, for additional information.

5.7.18.5. Following a bird strike, aircrews should land as soon as conditions permit, or as practicable, to have the aircraft inspected by qualified maintenance personnel. Bird strike damage cannot be accurately assessed in-flight, and undetected damage may result in a complex airborne emergency; only qualified maintenance personnel, on the ground, can make reliable damage assessments.

5.7.19. Functional Check Flights and Acceptance Check Flights (ACF). FCF and ACF will be accomplished IAW TO 1-1-300, *Functional Check Flights and Maintenance Operational Checks*, TO 1C-130J-6CF-1, *Acceptance or Functional Check Flight Procedures*, and AFI 21101, *Aircraft and Equipment Maintenance Management*. Crews should only perform tasks or functions contained in specific technical order guidance. If requested to perform a non-standard function, PICs should contact their OG/CC to see if an FCF applies.

5.7.19.1. FCF Restrictions. See TO 1-1-300 and AFI 21-101.

5.7.19.1.1. The OG/CC is responsible for the wing FCF program. Publish additional guidance in local supplement to this instruction. (T-3) The OG/CC may authorize a partial FCF to check only those systems disturbed by maintenance, an inspection or modification.

5.7.19.1.2. Conduct check flights within the designated check flight airspace of the base from which the flight was launched except when the flight must be conducted under specific conditions, not compatible with local conditions and area restrictions. (T-3)

5.7.19.1.3. The decision to approve a combined FCF and ferry flight is the responsibility of the HQ AFSOC/A3. (T-2)

5.7.19.1.4. The OG/CC will only certify highly experienced instructors as FCF crew members. (T-3) The OG/CC, or deployed equivalent, may authorize temporary waivers to FCF aircrew qualification when operationally necessary. The OG/CC will determine FCF crew complement after a thorough ORM assessment for that specific FCF flight. (T-3)

5.7.19.1.5. Ideally, conduct FCFs in daylight, VMC. Operations Group Commander (OG/CC) may authorize a flight under a combination of VMC and IMC. Begin the flight in VMC. If the aircraft and all systems are operating properly, the crew may proceed IFR through IMC to VFR on Top for the altitude phase of the flight. (T-3)

5.7.19.1.6. If a malfunction occurs during a FCF, the Maintenance Group Commander (MXG/CC) may subsequently release the aircraft for flight providing the malfunction is not related to the condition generating the FCF, and the original condition operationally checked normal. (T-3)

5.7.19.1.7. Only FCF crews shall perform high-speed taxi checks. Perform checks IAW the flight manual and maintenance technical orders. Prepare the aircraft with minimum fuel necessary to accomplish the check to limit brake/tire wear, (ensure fuel on board will permit a safe return to base should the aircraft unexpectedly become airborne) and turn on the anti-skid system. The PIC will calculate takeoff data for the highest speed planned and ensure runway available allows sufficient stopping distance for existing conditions without exceeding normal brake energy limits. (T-2)

Chapter 6

AIRLAND OPERATIONS

6.1. Aircraft Maximum Gross Weight Policy. Normally the aircraft gross weight will not exceed 164,000 pounds for all EC-130J. Waiver authority for operations above those specified and up to 175,000 pounds is the MAJCOM/A3. (T-2) Reference **Chapter 9** for additional gross weight limitations associated with aircrew training.

6.2. Checklists. Aircrews must be familiar with notes, warnings, and cautions without direct reference to TO. (T-3)

6.2.1. The only pages (or inserts) authorized in checklist binders are C-130 series TO aircrew checklists, AFSOC approved checklists, briefing guides, and unit approved information guides. Units may construct locally approved in-flight guides using AF Form 4124, *Flight Crew Information Guide*.

6.2.2. Any personal notes on checklists, briefings, or information guides must be current and written in pencil. (T-3)

6.3. Duty Station. One of the pilots may be out of their seat for brief periods to meet physiological needs. (T-3) With both pilots in their seats, the PIC may authorize rest periods for one pilot occupying a primary duty station in accordance with Controlled Cockpit Rest guidance in AFI 11-202, Vol 3. All other crew positions are authorized rest periods with approval from the PIC and in accordance with AFI 11-202, Vol 3. Only one pilot may be absent from their duty station at a time. (T-3) All aircrew members will notify the PIC prior to departing assigned primary duty station. (T-3)

6.4. Flight Deck Entry. PICs may authorize passengers and observers access to the flight station during takeoff, climb, en-route, air refueling, descent, and landing only if seats with seatbelts are available. Passengers and observers will not be permitted access to the flight deck crew positions regardless of availability (T-3) During takeoff and landing, observers will be seated in a seat approved for use during takeoff and landing with appropriate safety belts and shoulder harnesses fastened. (T-3) In all cases, sufficient oxygen sources must be available to meet the requirements of AFI 11-202, Vol 3, applicable supplement.

6.5. Takeoff and Landing Policy.

6.5.1. The PIC will occupy the left seat for all takeoffs and landings. (T-3) A certified Instructor Pilot may act as PIC from either seat.

6.5.2. The left seat pilot will land during aircraft emergencies. (T-3) A certified Instructor Pilot may takeoff or land from either seat under any condition.

6.5.3. A MP or FP may take off and land from either seat.

6.5.4. A MP will takeoff/land from the left seat under the following conditions: (T-3)

6.5.4.1. During maximum effort or substandard airfield operations. (T-3)

6.5.4.2. Pilots in “Instructor Pilot” upgrade training may take off and land from the right seat under the supervision of an Instructor Pilot during maximum effort or substandard airfield operations. (T-3)

6.5.4.3. During missions operating in areas of hostile activity. For units operating in defined combat zones, OG/CC or deployed Mission Commander may authorize landings from the right seat at specific airfields. (T-3)

6.5.4.4. At airfields that require any waiver approval. **Exception:** Non-DoD approach waivers. (T-3)

6.5.4.5. At certification airfields specified in the HQ Air Mobility Command Airfield Suitability and Restrictions Report (ASRR) via GDSS. (T-3)

6.5.4.6. PICs who possess less than 100 hours in command in the C-130 aircraft since initial upgrade will make all takeoffs and landings when the right seat is occupied by a Copilot (CP) or FP under any of the following conditions (T-2):

6.5.4.6.1. Ceiling/visibility less than 300 feet and/or RVR 40 (3/4 sm visibility). (T-2)

6.5.4.6.2. RCR less than 12. (T-2)

6.5.4.6.3. Crosswind component greater than 15 knots. (T-2)

6.5.4.7. Pilots may takeoff and land utilizing NVD without a CSO on board the aircraft provided they are not required for mission events.

6.6. Copilot Landing Policy. Except as specified in **Paragraph 6.5**, and provided no patients or DV4 or higher are on board, copilots may takeoff or land:

6.6.1. From either seat if an instructor pilot or evaluator pilot occupies the other seat.

6.6.2. Current and qualified co-pilots may accomplish NVG takeoffs and landings (non-maximum effort) from the right seat provided the pilot occupying the left seat is current and qualified for NVG takeoffs and landings.

6.7. Landing Gear and Flap Operation.

6.7.1. The PM will operate the landing gear, landing, and taxi lights. (T-3) Actuate the landing gear only after the command of the PF (T-3) Prior to actuation of the landing gear, the PM will acknowledge the command by repeating it. (T-3)

6.7.2. PM operate the flaps only after the command of the PF (T-3) Prior to operating the flaps, acknowledge the PF command by repeating it. (T-3)

6.8. Use of Outside Observers. Available crew members will assist in clearing during taxi operations, and any time the aircraft is below 10,000 feet MSL as crew duties permit. (T-3)

6.9. Seat Belts. Crew members occupying the Pilot (P) and CP positions will have seat belts fastened from engine start through shutdown, except as outlined in **Paragraph 6.3** and the following: (T-3)

6.9.1. All occupants will be seated with their seat belts fastened during taxi, takeoff, and landing unless crew duties dictate otherwise. **Exception:** Evaluators, instructors, mission commanders, crew members performing scanner duties, outside observers during taxi, loadmasters and medical personnel performing required duties; however, those individuals will have a designated seat (spot for combat loading procedures) and required restraint available. (T-3)

6.9.2. Provide a safety belt for all occupants over 2 years of age. Occupants will fasten seat belts securely when turbulence is encountered or anticipated, or in areas of forecast clear air turbulence. (T-3)

6.9.3. Floor loading is authorized to support dedicated unconventional forces and foreign counterparts during operations, exercises, and training. This procedure will not be used in lieu of providing normal seating when available. **Exception:** Group commander (COMAFSOF for contingency operations) may authorize Rapid Infil/Exfil procedures and floor loading with non-SOF personnel. (T-3)

6.9.4. While performing scanner duties, loadmasters or authorized scanners, may use the paratroop door seats (non-crashworthy) during combat, contingency missions, or while participating in training missions. Loadmasters or authorized scanners using paratroop door seats (non-crashworthy) will restrain themselves by use of the riggers belt and retention lanyard and will have an assigned seat.

6.10. Aircraft Lighting. For non-tactical operations refer to AFI 11-202, Vol 3, and AFSOC supplement. Use landing lights at night in unlighted areas. Use taxi lights in-flight any time the landing gear is extended unless reflections cause pilot distractions.

6.10.1. NVG Lighting. Follow the exterior lighting guidance outlined in AFTTP 33.E/MC130J for all NVG training situations. Lights-out (or Covert Lighting) operations during peacetime will be conducted IAW AFI 11-202, Vol 3 and AFSOC supplement.

6.10.2. Cargo compartment lighting will be dictated by the tactical situation and will be coordinated between the mission commander/PIC and loadmaster(s). (T-3) Cargo compartment emergencies may require overt lighting on full bright. The nature of the emergency and the tactical situation will dictate what level of lighting is used, and whether the loadmaster continues the use of NVGs.

6.11. Portable Electronic Devices. Refer to AFI 11-202, Vol 3, and MAJCOM Supp. A listing of AFSOC approved portable electronic devices is maintained by HQ AFSOC/A3V.

6.12. Advisory Calls. The PF will announce changes to the level of automation, flight director and autopilot mode selections, and mode transitions, (e.g., “Autopilot engaged”, “Altitude Hold”, “Autothrottles”, “Nav-Capture”, etc.) and/or when circumstances require deviating from normal procedures. (T-3) The PM will make all advisory calls except those designated for other crew members. (T-3) Mandatory advisory calls are as follows. (T-3)

Table 6.1. Takeoff.

PHASE OF FLIGHT	PF	PM
Takeoff – prior to Refusal Speed		“Reject” [1]
At Refusal Speed		“Go” [2]
At Rotation Speed		“Rotate”
Note 1. Prior to Refusal Speed, any crew member noting a safety of flight condition/malfunction will state “Reject” and give a brief description of the malfunction.		

Note 2. If refusal speed equals takeoff speed, “Go” is not required.

Table 6.2. Climb Out and Descent.

PHASE OF FLIGHT	PF	PM
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”
Note 1. All crew positions who can change the altimeter setting will state the new setting.		

Table 6.3. Non-Precision Approach.

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

Table 6.4. Precision Approach.

PHASE OF FLIGHT	PF	PM
100 feet above FAF/GSI altitude and DH	“100 Above”	“100 Above"
At DH with:		
Approach lights in sight (CAT 1 ILS)	“Continuing”	“Continue” [1]
PHASE OF FLIGHT	**PF**	**PM**
Runway environment in sight	“Landing”	“Land”
Neither in sight	“Going Around”	“Go-around”
Note 1. With weather at CAT 1 minimums on a CAT 1 ILS, the pilot may only see the initial portion of the Approach Lighting System (ALS). The pilot may continue to 100 HAT but may		

not descend below 100 feet above touchdown zone elevation using the ALS as a reference unless the red termination bars or the red side row bars are also visible and identifiable.

6.12.1. Deviations:

6.12.1.1. 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-3)

6.12.1.2. Any crew member 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-3) Deviations from prescribed procedures will also be announced. (T-3)

6.13. Stabilized Approach Philosophy. Unstable approaches are primary contributors to numerous military and civilian mishaps. Stabilized approaches are essential for the safe operation of aircraft and are mandatory. This criteria defines specific parameters that mitigate the risk during this critical phase of flight. This philosophy requires aircrew to take immediate corrective actions to stabilize the approach when outside designated parameters.

6.13.1. The following criteria apply to all non-tactical approaches: (T-3)

6.13.1.1. At FAF/glide slope (GS) intercept (IMC):

6.13.1.1.1. Airspeed is -10/+20 knots of computed approach speed for aircraft configuration.

6.13.1.1.2. Aircraft is in a landing configuration.

6.13.1.1.3. Sink rate is no greater than 1500 feet per minute (FPM).

6.13.1.1.4. All briefings and checklists are complete.

6.13.1.1.5. If these criteria are not met by FAF/GS (IMC), the PM will announce the deviation.

6.13.1.2. At minimums (IMC)/1 mile final (VMC):

6.13.1.2.1. Airspeed is -10/+10 knots of computed approach speed for aircraft configuration.

6.13.1.2.2. Aircraft is in a landing configuration.

6.13.1.2.3. Sink rate is no greater 1,000 FPM.

6.13.1.2.4. If these criteria are not met by minimums (IMC)/1 mile final (VMC) for all non-tactical approaches, the PM will announce "Go-Around." (T-3) The PF will execute a missed approach. (T-3) **Note:** Tactical approaches/VFR patterns the PF is required to brief the maneuver parameters prior to execution. (T-3)

6.14. Wind Limitations. Maximum crosswind limits are in accordance with aircraft TO limitations. Remain within the “Recommended” or “Caution” areas of the crosswind charts for normal takeoffs and landings. All maximum effort operations and simulated engine out landings must fall within the “Recommended” area unless otherwise approved by the Group Commander/COMAFSOF (for contingency operations). (T-3)

6.15. 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 6.5** are estimates based on operational experience and should be used only as a guide.

Table 6.5. RCR Values for other than Concrete Surfaces.

TYPE SURFACE	RCR (DRY)	RCR (WET)
Asphalt	23	12
Aluminum Matting	20	10
M8A1/With Antiskid Pierced Steel Plank (PSP)	20	8
M8A1/Without Antiskid (PSP)	13	3
Clay/Crushed Rock/Coral	16	5

6.15.1. Limit EC-130J operations into and out of slush or water covered runways to a covering of one inch. (T-3) This number is based on performance charts where an RSC of 10 is equal to one inch of slush or water. Performance data where more than one inch of slush or water is present may not be accurate.

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

6.17. Landing Zone (LZ) Markings. LZ markings may vary depending upon the supporting agency (refer to AFI 13-217, *Drop Zone and Landing Zone Operations*). The markings to be used must be firmly established during mission planning and included in the aircrew briefing. (T-3)

6.18. Aircraft Rescue Fire Fighting Requirements (ARFF). ARFF requirements at nonUSAF active flying bases are as follows:

6.18.1. Up to four takeoffs and landings within 7 consecutive days may be accomplished at a LZ or airfield without ARFF. This is an airfield restriction. Each Unit should track totals at airfields under their control. If totals are not tracked at airfields owned/controlled by other agencies, Wing/Group current operations will track to ensure the restriction is not exceeded for assigned aircraft. (T-3)

6.18.2. For more frequent operations at an LZ or airfield, refer to AFPAM 32-2004, *Aircraft Fire Protection for Exercises and Contingency Response Operations*, to calculate ARFF requirements. **Note:** Non-USAF ARFF vehicles may be used if the agent and pumping capabilities are equivalent.

6.18.3. Waivers to the ARFF requirements will be considered on a case-by-case basis. Required information for waiver request can be found in AFPAM 32-2004. (T-2)

6.19. Crew Resource Management (CRM).

6.19.1. “Time Out" is the common assertive statement for use by all crew members. The use of "Time Out" will:

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

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

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

6.19.2. As soon as possible after a "Time Out" has been called, the aircrew will take the following actions: (T-3)

6.19.2.1. Safety permitting, stabilize the aircraft and ensure terrain clearance. (T-3)

6.19.2.2. The initiating crew member will voice their concerns to the crew. (T-3)

6.19.2.3. The PIC will provide all other crew members with the opportunity to voice inputs relative to the stated concerns. (T-3)

6.19.2.4. After considering all inputs, the PIC will direct the aircrew to continue the current course of action or direct a new course of action. (T-3)

6.19.3. Fuel Panel. The fuel panel is considered a “verification panel”. The PM/LM/CSO should advise the PF before operating the panel (i.e., priming, cross-feeding, tank-to-engine, transferring, non-standard 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.

6.19.4. Critical Action Coordination.

6.19.4.1. Flight critical/irreversible actions should always be confirmed by two crew members. 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, and dumping fuel. The crew member performing the action points to the affected switch/handle and verbally seeks confirmation from a second crew member (i.e., “CONFIRM NUMBER ONE”). The crew member confirming the action looks at the affected switch/handle and acknowledges (i.e., “NUMBER ONE CONFIRMED”).

6.19.4.2. 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 if a greater emergency arises.

6.20. Automation. Aircraft automation will not command crew actions. The automated systems will recommend/perform actions and the crew will determine/verify the proper course of action.

6.20.1. The PF will determine the most desirable level of automation for a given situation. (T3)

6.20.2. If the Automatic Flight Control System (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. (T-3)

6.20.3. Crews will follow the guidance below, except for cruise flight (above 10,000 ft): (T-3)

6.20.3.1. The PF will fly the aircraft and maintain a dedicated head-up lookout. If the PF intends to be head-down, aircraft control shall be transferred to the PM, who will remain head-up. (T-3)

6.20.3.2. Any crew member that observes both pilots head-down at the same time shall alert the PF without delay. (T-3)

6.20.3.3. 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". (T-3) The PF will verbally acknowledge this call. (T-3) The PM will verbalize "Head-Up" after completion of duties. (T3) The PF will then update the PM on current status as required. (T-3)

6.20.4. 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/CSO must verify the data and both pilots will monitor the aircraft for the appropriate response. (T-3)

6.20.4.1. **Table 6 6** and **Table 6.7** provide standard actions for both pilots during Automated and Manual flight.

6.20.4.2. 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.

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

Table 6.6. Automated Flight.

	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, CAPS)	- Select desired mode - Announce mode status	- Verify and acknowledge
LATERAL FLIGHT		
Direct To/Intercept course To/Route Modification (2)	- 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

	PF	PM
VERTICAL FLIGHT		
Climb/Descent clearance	- Verify and acknowledge	- Set new FL/altitude reference
Note: 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. 2. CSO will be primary for this function if on board.		

Table 6.7. Manual Flight.

	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, CAPS)	- Select desired mode - Announce mode status	- Verify and acknowledge
LATERAL FLIGHT		
Direct To/Intercept course To/Route Modification (2)	- Verify route modification - Direct the PM to execute	- Modify route as directed - Execute when directed
Radar Vector/Heading Change	- Verify and acknowledge	- Set new FL/altitude reference - State setting
VERTICAL FLIGHT		
Climb/Descent clearance	- Verify and acknowledge setting	- Set new FL/altitude reference
Note: 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. 2. CSO will be primary for this function if on board.		

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

6.21.1. 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. (T-3) Continue the climb until a safe altitude is reached or until exiting the alert envelope. (T-3) With terrain and obstacles clearly in sight, the PF will call terrain/obstacle in sight, state intentions and visually remain clear of terrain/obstacles. (T-3) 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. ***WARNING:*** Do not delay pull-up for diagnosis of the low-altitude warning.

6.21.2. 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 AC‘s discretion, may be used for any tactical operation.

6.22. Radar Altimeter.

6.22.1. Instrument Approaches.

6.22.1.1. Precision Approaches.

6.22.1.1.1. Set RAD ALT reference to HAT minus 50 feet. (T-3)

6.22.1.1.2. CAT II ILS. Set published Radar Altimeter minimums. (T-3)

6.22.1.2. Non-Precision Approaches. Setting the RAD ALT 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 RAD ALT to a higher setting than prescribed may result in premature/unexpected Altitude-Altitude advisories and prevent the GCAS Minimums alert.

6.22.1.2.1. Straight-In Approaches. Normally set RAD ALT reference to 250 feet (minimum setting).

6.22.1.2.2. Circling Approaches. Normally set RAD ALT reference to 300 feet (minimum setting).

6.22.1.3. When established on a published approach in IMC, or at night when terrain clearance cannot be assured, and an Altitude-Altitude special alert is heard, initiate an immediate Go-Around. (T-3) Once terrain clearance is confirmed, resume normal operations. In day VMC, the aircrew will evaluate the alert and determine the appropriate course of action (continue the approach or go-around). (T-3)

6.23. Runway and Taxiway Requirements. Use normal takeoff and landing procedures whenever practical. (T-3) Normally, takeoffs will be initiated from the beginning of the approved usable portion of the runway. Intersection takeoffs may be made at the discretion of the PIC provided the operating environment (i.e., gross weight, obstructions, climb criteria, weather, etc.) allows for a safe takeoff and departure. Do not use runways less than 3,000 feet during peace-time Normal and Max Effort Operations. (T-3) Minimum runway width is 80 feet (60 feet for max effort). Minimum taxiway width is 30 feet. The MAJCOM/A3 may waive runway length & taxiway/runway width requirements. (T-2) CNI TOLD computations must be based on the runway remaining. (T-3) 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.

6.23.1. Use of wheel brakes: Any time wheel brakes are used on landing rollout greater than that defined in the Dash 1 as a "partial brake landing", the PIC will ensure the BRAKE COOLING CHARTS (Dash 1-1) 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)/ Adjusted Minimum Field Length Maximum Effort Take Off (AMFLMETO)/Minimum Field Length Maximum Effort Take Off (MFLMETO) using an RCR of 2. For operational missions, the squadron/mission commander may waive both the brake cooling times and CFL/AMFLMETO/MFLMETO. (T-3)

6.23.2. Normal Operations:

6.23.2.1. Takeoff. Minimum runway length is critical field length.

6.23.2.2. Normal takeoffs shall not be made when refusal speed is less than ground minimum control speed (V_{mcg}). In this condition the PIC will either: (T-3)

6.23.2.2.1. Download cargo or fuel. (T-3)

6.23.2.2.2. Wait until weather conditions improve. (T-3)

6.23.2.2.3. Use maximum effort procedures. (T-3)

6.23.2.3. Three-Engine Takeoffs. An actual engine-out takeoff requires HQ AFSOC/A3 (COMAFSOF for contingency operations) waiver. (T-2)

6.23.2.4. 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 (2 OB HGI; 2 IB REV in the Performance Manual), and maximum anti-skid braking.

6.23.2.4.1. 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.

6.23.2.5. Touch and Go landings. Minimum runway length is listed in **Table 6.8** for touch and go landings.

6.23.3. Short Field Operations.

6.23.3.1. Use Maximum Effort procedures when conditions (runway dimensions and/or obstacles) or directives require their use. Runway widths less than 80 feet require a maximum effort qualified crew (i.e., 10,000 foot runway that is 65 feet wide requires a maximum effort qualified crew). All maximum effort operations must fall in the "Recommended" area of the wind limitations charts unless otherwise approved by the Squadron Commander. (T-3)

6.23.3.2. Use of non-hard surfaced runways or taxiways requires Group Commander (COMAFSOF for contingency operations) approval. **Note:** Make an AFTO 781A entry when landings to non-hard surfaced runways are accomplished. (T-3)

6.23.3.3. Maximum Effort Takeoff. Max effort qualified Aircraft Commanders will use maximum effort takeoff procedures if available runway length is less than CFL.

6.23.3.4. Runway length. Max effort qualified Aircraft Commanders may use MFLMETO with Squadron Commander or COMAFSOF approval if mission necessity dictates. Aircrew will use AMFLMETO when runway length is available. (T-3) ***WARNING:*** Aircraft performance and obstacle clearance is predicated on obtaining and then maintaining max effort obstacle clearance speed as quickly as possible. Aircraft performance below obstacle clearance speed may not allow safe clearance of obstacles. **Note:** When obstacles are a factor, use actual Maximum Effort Rotation Speed (VR_{max}) and climb out at Maximum Effort Obstacle Clearance speed. (T-3) MAX EFF Max Gross weight displayed on Takeoff Page 3/4 (Wedge Obstacles) & Takeoff Page 4/4 (Point Obstacles) are only valid for the Max Effort Predicted Climb-Out flight profile. Because the Performance Manual does not contain an Adjusted Max Effort Climb-Out profile, aircrews cannot evaluate the obstacle clearance data (i.e., Maximum Adjusted Max Effort Takeoff Gross Weights limited by a Gradient or an Obstacle). **Note:** Simulated obstacle clearance height will not exceed 50 feet. (T-3)

6.23.3.5. Acceleration Check Time. An acceleration check time is required when refusal speed is less than rotation speed. (T-3) An Acceleration Time Check should also be computed when, in the opinion of the AC, a critical condition exists (heavy gross weight (GW), high pressure altitude (PA), obstacles, RSC, etc.).

6.23.3.6. Minimum rotation speed is Adjusted Maximum Effort Rotation Speed (VR_{max}). **Exception:** Squadron Commander or COMAFSOF may approve the use of VR_{max} if mission necessity dictates. (T-3)

6.23.4. Maximum Effort Landing: Use maximum effort landing procedures whenever the runway available for landing is less than that required for a normal landing. Plan the touchdown within the first 500 feet of usable runway. (T-3)

6.23.4.1. Minimum runway length for maximum effort landing is maximum effort landing ground roll plus 500 feet. If the zone is unmarked, minimum runway length is maximum effort ground roll plus 1,000 feet. Group Commanders (COMAFSOF for contingency operations) may approve unmarked 500 foot zones. (T-3)

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

6.23.5. NVG Operations:

6.23.5.1. On blacked out runways, a go-around point will be identified to all crew members prior to execution. (T-3)

Table 6.8. EC-130J (Super J) Normal Operations and Maximum Effort Operations (T-2).

Type of Maneuver/Restriction	**Runway Length**
Min Runway Length (Peace Time Ops)	3,000 feet [1]
Normal/Max Effort Takeoff	CFL (2)/AMFLMETO [3]
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 [4]
Max Effort Landing Distance	Landing Ground Roll + 500 feet [5, 6, 7, 8]
Minimum Runway Width	
Normal Operations	80 feet(25 meters) [1]
Max Effort Operations	60 feet(19 meters) [1]
Minimum Taxiway Width	
Normal/Max Effort Operations	30 Feet(9 Meters) [1]

Notes:

1. MAJCOM/A3 may waive runway length/width and taxiway width requirements. (T-2)

2. Use maximum effort takeoff procedures if available runway length is less than CFL.

3. Minimum runway length for maximum effort operations is the ADJUSTED MFLMETO. Squadron Commander may approve the use of MFLMETO not corrected for minimum controllable airspeed (V_{MCA}) and VMU3 if mission necessity dictates.

4. 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. 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.

5. Use maximum effort landing procedures whenever the runway available for landing is less than that required for a normal landing with outboard engines in high speed ground idle (HSGI) and inboard engines in Max Reverse (2OB HGI; 2IB REV in the performance manual) and max anti-skid braking. Plan the touchdown within the first 500 feet of usable runway.

6. Minimum runway length using max effort procedures is ground roll plus 500 feet if a 500 foot touchdown zone is clearly marked on the runway. If the touchdown zone is greater than 500 feet, or unmarked, minimum runway length is ground roll plus 1,000 feet.

7. LZ markings may vary depending upon the supporting agency (refer to AFI 13-217, *Drop Zone and Landing Zone Operations*). Markings being used will be established during mission planning and included in the aircrew briefing.

8. On non-marked (AMP-4) runways, a go-around point will be identified to all crew members prior to execution.

6.24. Airfield Requirements.

6.24.1. On runways partially covered with snow or ice, takeoff computations will be based on the reported RSC or RCR for the cleared portion of the runway. A minimum of 40 feet either side of centerline should be cleared (30 feet for maximum effort operations). If 40 feet

either side of centerline is not cleared (30 feet for max effort ops), computations will be based on the non-cleared portion. (T-2)

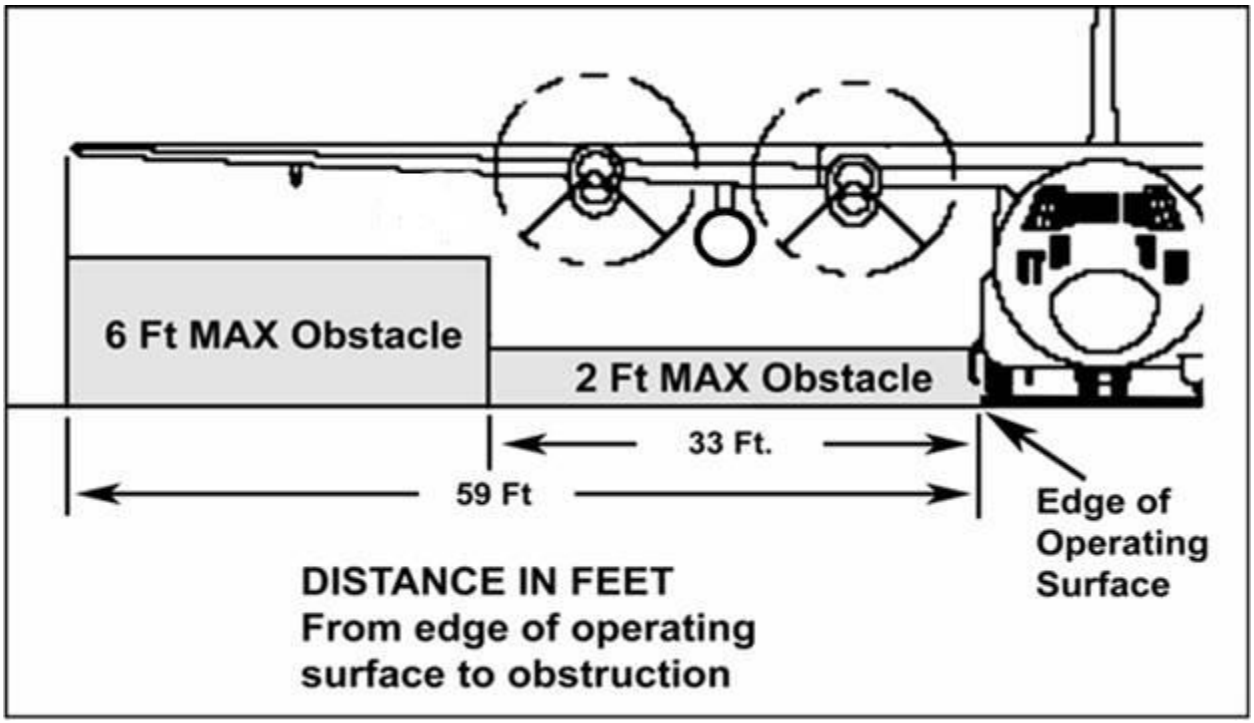
6.24.2. Aircraft Taxi and Taxi Obstruction Clearance Criteria and Foreign Object Damage (FOD) Avoidance.

6.24.2.1. Do not taxi an aircraft within 25 feet of obstructions without wing walkers monitoring the clearance between aircraft and obstruction. (T-3) With wing walkers, avoid taxi obstructions by at least 10 feet. (T-3) **Exception**: IAW AFI 11-218, *Aircraft Operations and Movement on the Ground*, aircraft may taxi into or out of a marked parking spot without marshallers/wing walkers at home station along fixed taxi lines which have been measured to ensure a minimum of 10 feet clearance from any permanent obstruction. Adjacent aircraft are considered a permanent obstruction provided the aircraft is parked properly in its designated spot and not moving. AGE and vehicles are considered a permanent obstruction provided it is parked entirely within a designated area. Areas will be designated by permanent markings such as painted boxes or lines on the ramp or another suitable means.

6.24.2.2. When taxi clearance is doubtful, use one or more wing walkers. (T-3) If wing walkers are unavailable, the PIC will deplane one or more crew members to maintain obstruction clearance and provide marshaling using AFI 11-218 signals. Use wing walkers, deplaned crew members, or a crew member on interphone positioned at the paratroop door(s) or ramp to act as an observer while maneuvering on narrow taxiways. During night taxi operations, marshallers and wing walkers will have an illuminated wand in each hand. Observers should be in a position to see wing walkers at all times (through door or windows) and communicate with the pilot.

6.24.2.3. Pilots must ensure clearance of any known obstructions that penetrate the shaded area in **Figure 6.1**. (T-3)

Figure 6.1. Taxi Obstruction Clearance Criteria.



6.24.2.4. FOD Avoidance. Make every effort to minimize the potential for FOD. Crews should:

6.24.2.4.1. Carefully review airfield layout during mission planning. Be familiar with taxi routes, turn requirements, and areas for potential FOD. (T-3)

6.24.2.4.2. Use Low-Speed Ground Idle when practical. Minimize power settings during all taxi operations. (T-3)

6.24.2.5. Reverse Taxi: The PIC will coordinate reverse taxi directions and signals to be used with the loadmaster and marshaller (when available). (T-3) Prior to commencing reverse operations: (T-3)

6.24.2.5.1. Secure all cargo and ensure all passengers are seated with seatbelts fastened. (T-3)

6.24.2.5.2. Open the cargo door and lower the ramp to approximately 12 inches above horizontal. (T-3)

6.24.2.5.3. The loadmaster will position himself on the aircraft ramp to direct reverse taxi, report any hazards, and to provide the pilot with timely interphone instructions on turns, distance remaining, conditions of the maneuvering area, and stopping point. (T-3)

6.24.2.5.4. If four or more 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-3)

6.24.2.6. Do not taxi within 25 feet of an obstacle nor stop less than 25 feet from an obstruction even if using a wing walker. (T-3)

6.24.2.7. During night reverse taxi operations, the pilot and loadmaster will ensure that the visibility in the taxi area is sufficient to conduct safe taxi operations. (T-3)

6.24.3. Takeoff and Landing Obstruction Clearance Criteria. (T-3)

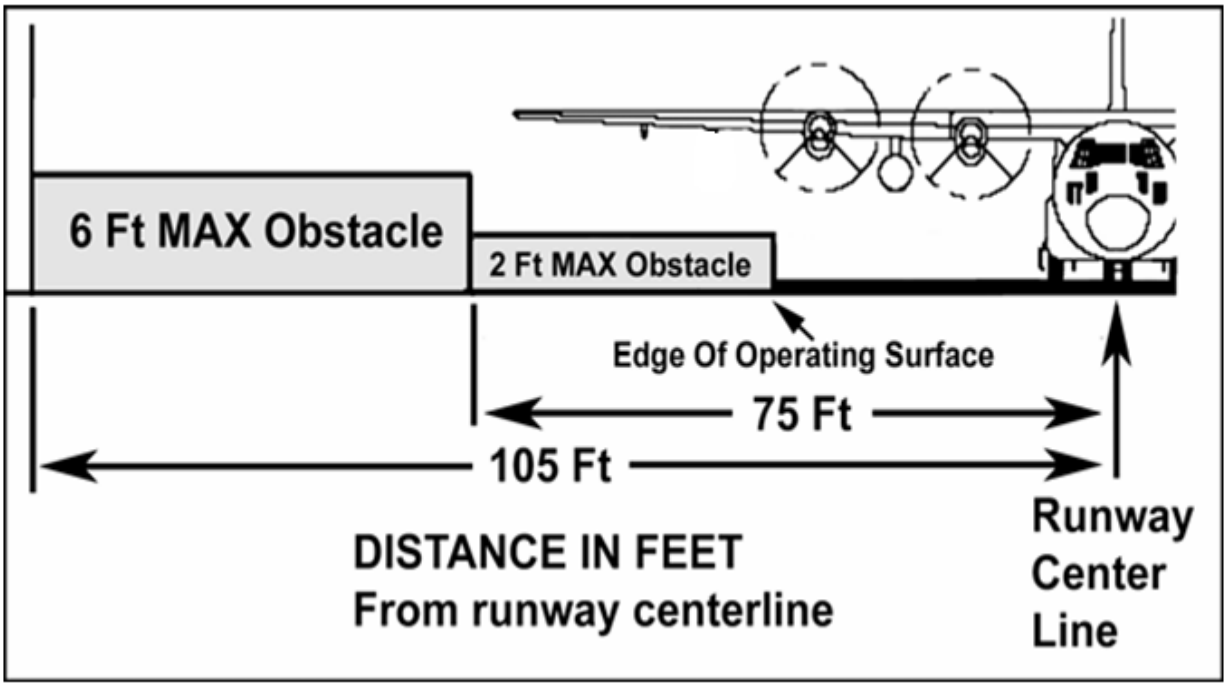
6.24.3.1. PICs will not make an approach or landing into an airfield requiring certification by the ASRR unless they have previously operated into that airfield as a pilot, copilot, or observer and reviewed the airfield certification briefing and audiovisual program within the time periods allotted by the ASRR.

6.24.3.2. An airfield is considered suitable for C-130 operations when:

6.24.3.3. No obstructions penetrate into the shaded area of **Figure 6.2**. This ensures obstruction clearance only if the aircraft is maintained within 35 feet of runway centerline and the angle of bank does not exceed 5°.

6.24.3.4. When an obstruction penetrates the shaded area of **Figure 6.2**, 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 6.2. Takeoff and Landing Clearance Criteria.



6.24.4. Arresting Cables.

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

6.24.4.2. Do not takeoff or land over an approach end cable that has been reported as slack, loose, or improperly rigged by Notice to Airmen (NOTAM), Automatic Terminal Information Service (ATIS), or ATC.

6.24.4.3. Operations are authorized on runways where BAK-12 systems are installed, with an eight point cable tie-down system, without regard to the Dash-One Caution. When operating from runways equipped with other types of systems, or if it is unknown if the BAK-12 system includes eight point tie-downs, aircrews should recognize the increased risk of damage to the aircraft.

6.25. Three-Engine Takeoffs. Actual engine-out takeoffs require MAJCOM/A3 (COMAFSOF for contingency operations) waiver. (T-3)

6.26. 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. Aircrews 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.

6.27. Engines Running Onload or Offload (ERO). Do not use ERO procedures when explosive cargo (hazard class 1.1-1.4) is involved unless authorized by the Joint Airborne/Air Transportability Training (JA/ATT) or exercise operation order or contingency air tasking orders. **Exception:** Small arms ammunition hazard class 1.4S may be on/offloaded using ERO procedures providing the total NEW does not exceed airfield restrictions at the assigned on/offload location.

6.27.1. 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-3)

6.27.2. General Procedures:

6.27.2.1. The PIC will brief crew members on the intended ERO operation, emphasizing specific crew member duties. (T-3)

6.27.2.2. The parking brake will be set and one pilot will monitor brakes, interphone and radio. (T-3)

6.27.2.3. Operate engines in ground idle (low speed, if applicable). (T-3) If conditions warrant, open air deflector doors and lower flaps to further reduce propeller blast.

6.27.2.4. Turn wing leading edge lights on during night EROs. (T-3) Taxi lights may be used at the discretion of the pilot.

6.27.2.5. Complete passenger and cargo manifests, crew lists and DD Form 365-4, *Weight and Balance Clearance Form F,* for the subsequent sortie. **Note:** DD Form 365-4 is not required for the subsequent sortie if the aircraft will depart empty.

6.27.2.6. Resume taxi after the LM has verbally acknowledged the aircraft is ready to taxi. (T3)

6.27.2.7. Do not onload or offload through two different doors simultaneously. ***WARNING:*** Due to the hazards involved (i.e., propeller blast, proximity to engines and

propellers, lack of paratroop door steps, etc.), only hand transferable items of cargo may be on/offloaded through the paratroop doors during EROs.

6.27.3. Personnel onload and offload through the crew entrance door. (T-3)

6.27.3.1. The pilot will give clearance to open the crew entrance door. (T-3)

6.27.3.2. During on/offload, station a crew member (normally the LM) on interphone (cord held taut) approximately 25 ft and at a 45-degree angle from the aircraft axis. (T-3)

6.27.3.3. Brief deplaning personnel to remain forward of the interphone cord. (T-3)

6.27.4. Personnel or cargo on/offload through the aft cargo door and ramp. (T-3)

6.27.4.1. After the aircraft has slowed to taxi speed, the LM may remove all tie-downs except one forward and one aft restraint. Remove remaining restraints only after the aircraft is stopped and vehicle drivers are in place. (T-3) Drivers will not release vehicle parking brakes until all restraints are removed and cleared to proceed by the LM. (T-3)

6.27.4.2. Upon clearance from the pilot, open the aft cargo door and lower the ramp to horizontal. (T-3)

6.27.4.3. The LM will direct all on/offload operations using pre-briefed signals. (T-3) Passengers will be escorted by a crew member when enplaning or deplaning. (T-3)

6.27.4.4. Other qualified LM may direct the operation, if available, but the crew loadmaster retains overall responsibility for the operation.

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance for aircraft security on ground and in-flight. 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, Vol 1-4, and AFI 31-401, *Information Security Program Management*.

7.2. Procedures. The PIC is ultimately responsible for the security of their aircraft when located away from US military installations. 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. Crew will work with the agency requesting the airlift to ensure security meets the requirement for the mission. (T-3)

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. (T-3) 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. (T-3) For planed overnight stops located at non-US military installations overseas and civilian airfields mission planners will work with SF, Air Force Office of Special Investigation (AFOSI) Special Mission Branch (SMB) and the Threat Working group (TWG) to identify when security and/or Counter Intelligence/Force Protection measures (CI/FP) are recommended to support exercises, training missions, contingency operations and small/large scale deployments. Normally the minimum members of the threat working group will be Security Forces, Intelligence, OSI and Medical. Planning agencies will follow guidance in AFSOCI 31-100, *Special Operations Security Forces Deployment Planning and Operations*. (T2)

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 crew members 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 AF Form 15, *USAF Invoice.*

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 a 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. (T-3) Crew rest requirements will be subordinate to aircraft security when the airframe may be at risk. (T-3) 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. (T2)

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. Plan IAW AFSOCI 31100, *Special Operations Security Forces Deployment Planning and Operations.* The mission commander (MC) must approve tailored security at deployed locations and the respective Air Operations Center (AOC) must be notified as soon as possible. (T-3) As a minimum, lock aircraft entry points and hatches. (T-3) 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. Contact with US Embassy personnel is required at locations where security agreements are not in existence.

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-3) 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 24-204(I) at all times when carrying weapons, ammo and equipment onboard the aircraft.

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. **Note:** The aircraft should be locked during all off-station missions remaining overnight. (T-3)

7.2.5.2. If the aircraft lock is unavailable, secure the hatches and doors in a manner that will indicate unauthorized entry. For example, tape inside hatch release handles to the airframe, so that entry pulls the tape loose. 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-3)

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-3)

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 pre-flight 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. (T-3) Report any suspicious items to host security forces. (T-3) Aircrews will maintain a heightened security posture throughout all pre-takeoff activities. (T-3)

7.3. AFSOC SOF-Fly Away Security Teams (FAST) and Aircraft Security Recommendation Matrix. AFSOCI 31-100 has outlined planning processes and provided a matrix to aid the TWG in making a force protection recommendation. Planning agencies and the TWG will use this matrix 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. The squadron commander or mission commander is the final approval authority for aircraft security issues. (T-3) Authority may be delegated no lower than the PIC. (T-3) **Exception:** For unscheduled or emergency landings at unplanned airfields, the PIC will assess the aircraft security situation. (T-3) If the aircrew is not capable of providing adequate security, the PIC will request/coordinate security through available channels (US Embassy or United States Defense Attaché Office (USDAO)) and notify the respective AOC as soon as possible. (T-3) **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/Transportation Security Agency (TSA).

7.4. Protective Standards for Aircraft Carrying Distinguished Visitors. This paragraph applies specifically to aircraft transporting DV Code 4 or above. PIC are responsible for aircraft security at en route stops. (T-3)

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. (T-3) If the installation is unable to comply, arrange for the best protection available. (T-3)

7.4.2. Non-DoD Installations. Contact the airport manager or installation commander to arrange for force protection. (T-3) If available security is inadequate, purchase additional security using AF Form 15.

7.5. Arming of Crew members. Crew Members will be armed IAW with AFI 31-117, *Arming and Use of Force by Air Force Personnel*, and AFMAN 31-229, *USAF Weapons Handling Manual*. When directed, at least one crew member each from the flight deck and cargo compartment will carry weapons.

7.5.1. Issue. Before departing home station, authorized crew members will obtain weapons, ammunition, lock, and key. (T-3) Crew members must present a current AF Form 523, *USAF Authorization to Bear Firearms*, to be issued a weapon. Crew members will be reissued the same weapon until the mission terminates at home station. (T-3) If an armed crew member must leave the crew en route, transfer the weapon to another authorized crew member, using AF Form 1297, *Temporary Issue Receipt*.

7.5.2. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels/facilities if available. (T-3) To transfer a loaded weapon to another crew member, place the weapon on a flat surface. (T-3) Do not use a hand-to-hand transfer. (T-3)

7.5.3. Wearing of Weapons. Wear weapons in a holster, concealed at all times to protect the identity of armed crew members. (T-3) Do not wear weapons off the flight line, except to and from the unit operations center, armories, and other facilities associated with aircrew activities such as base operations, fleet service, cargo or passenger terminals, flight line cafeterias, snack bars, etc. (T-3)

7.5.4. Weapons Storage. Crew members will be armed before beginning preflight or on-load duties. (T-3) When no passengers are on board 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. Crew members will rearm before landing. (T-3) Weapons need not be unloaded before being placed in the gun box.

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.

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, crew members may secure their weapons in their quarters, one crew member will remain with the weapons at all times. In this case, turn the ammunition over to the PIC. (T-3)

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, crew members should reference AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking) For Official Use Only (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 on board and the aircraft is ready for flight. Hijackers cannot be dealt with as ordinary criminals. Some are mentally disturbed, emotionally unstable individuals for whom the threat of death is not a deterrent, but a stimulus to crime. Delay tactics have been most successful in saving lives and property. Detection of potential hijackers before they board the aircraft is the best solution to the problem.

7.6.1. Acceptance of Passengers. The host station passenger processing and manifesting facility should conduct anti-hijacking inspections. Do not board passengers unless the PIC is fully satisfied with these inspections. (T-3) **Exception:** Supporting/supported forces may be anti-hijack inspected at the aircraft by the aircrew.

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

7.6.1.2. Contingency and exercise movements. During contingencies in support of combat operations and exercises involving the movement of large numbers of personnel, the supported unit should manifest passengers and perform anti-hijacking inspections.

7.6.2. Arms and Ammunition. Passengers (including MEP) will not carry weapons and/or ammunition on their person or in hand-carried baggage on board an aircraft. **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-3)

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

7.6.2.1.1. Move to a safe, clear area at least 50 feet from any aircraft, equipment, or personnel before un-holstering/un-slinging their weapons. (T-3)

7.6.2.1.2. Clear their weapons in accordance with standard safety procedures. (T-3)

7.6.2.2. Troops and deadhead crew members will not retain custody of ammunition on an aircraft but will turn it in to the troop commander or PIC. **Exception**: During combat operations, troops may carry unloaded weapons and ammunition on board the aircraft. When the tactical situation dictates, personnel who will 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, with the PIC's concurrence. Weapons will not be breached until clear of the aircraft. (T-3)

7.7. Specific Anti-Hijacking Guidance. It is imperative that all crew members 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, crew members must act immediately and resourcefully, without instruction, in order to counter the attacker successfully.

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 US Air Force 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 well-being 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, *The US Air Force Mishap Prevention Program*, Attachment 3.

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 HATR reports only for mishap prevention.

8.3.2. Procedures:

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

8.3.2.1.1. Identification or call sign.

8.3.2.1.2. Time and place (radial/DME, position relative to the airfield, etc.).

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 report will be filed upon landing. **Note:** ATC agencies (e.g., FAA, etc.) 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, *Hazardous Air Traffic Report*. Turn in a completed copy of AF Form 651 to the wing/group safety office. **Note:** HATR reports 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 AFI 91-204, *Safety Investigations and Reports*.

8.4.1. Responsibilities. Notify the appropriate authorities of any mishap involving aircraft or crew. When notified, AFSOC units will initiate investigative and reporting actions in accordance with AFI 91-204. **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.

8.4.2.2. Report the following occurrences:

8.4.2.2.1. A physiological episode. A physiological reaction, near accident, or hazard in-flight due to medical or physiological reasons. **Note:** In the event of a physiological episode, all crew members and passengers involved will report to a flight surgeon as soon as practical. Reportable incidents include:

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 (e.g., 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 crew member 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 En route 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 pilot-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 which does not meet the established criteria for a reportable mishap but, in the judgment of the PIC, needs to be emphasized in the interest of flight safety. (T-3)

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

8.5.1. Include the following: factual circumstances, investigation and analysis, findings and conclusions, recommendations, and actions taken. (T-3)

8.5.1.1. Attachments should include; notification of incident, Crew orders, statement of crew members (if applicable), and documenting evidence (logs, charts, etc.).

8.5.2. In addition to the information listed, the historical flight plan will be downloaded onto a floppy disk and turned in to the C2 center or owning standardization and evaluation office. (T3)

8.5.3. The following 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*:

8.5.3.1. 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-3)

8.5.3.2. Include the following: (T-3)

8.5.3.2.1. 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 (ARTCC) area). (T-3)

8.5.3.2.2. 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. (T-3)

8.5.3.2.3. PICs must keep the appropriate agencies apprised of any unusual events or circumstances impacting their missions. (T-3) Examples of reportable events include meaconing, jamming, intrusion, interception, fuel dumping, loss of multiple engines, hostile fire, injury to passengers or crew members, etc. 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-3)

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 DoD 4140.25M, *DoD Management of Bulk Petroleum Products* and AFI 11-253, *Managing Off-Station Purchases of Aviation Fuel and Ground Services.* 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, *Purchase Order-Invoice-Voucher*, at locations that accept the MSC card.

8.6.1. Responsibilities. Aircrew and maintenance personnel will be familiar with AvPOL procedures and documentation requirements of this chapter. (T-3) Improper use of the MSC card could create financial liability for the purchaser.

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:

8.6.2.1. Defense Fuel Supply Center (DFSC) or Canadian into-plane contracts. **Note:** DoD FLIP en route 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, *Energy 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, *Aircraft Fuels Documentation Log*. (T-3) The PIC or designated representative shall complete this form. (T-3) **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. (T-3)

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. (T-3) The PIC or designated representative shall complete this form when appropriate. (T-3)

8.6.3.3. The SF 44, *Purchase Order-Invoice-Voucher*, 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 shall present the SF 44 as the purchase invoice when an FBO refuses to accept the MSC card. (T-3) The aircrew shall 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 shall 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.

8.6.3.3.1.2. Copies 1 and 2 of the SF 44 shall be provided to the FBO. (T-3) Copy 1 of the SF 44 and one copy of the FBO commercial invoice, if applicable, shall 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.

8.6.3.3.1.3. Copy 3 of the SF 44 and one copy of the FBO commercial invoice, if applicable, shall be provided to the aircrew. (T-3) Log and place a copy inside the AF Form 664. Aircrews shall 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 (FAS). (T-3)

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 shall employ the following procedures. (T-3) **Note:** These procedures do not apply to non-fuel products or services:

8.6.3.3.2.1.1. The aircrew shall obtain cash from a local DoD Finance source that is charged to an approved Treasury suspense account prior to home station departure. (T-3)

8.6.3.3.2.1.2. Aircrews shall 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 shall return unused cash to their local DoD Finance source upon return to home station. Present the completed SF 44 (for nonfuel charges only) to the appropriate home station administrative personnel for processing (e.g., Wing Refueling Document Control Officer, Finance Office, etc.).

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. (T-3) Provide the FBO copies 1 and 2 of the SF 44. The FBO shall 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 shall reflect the organization name and address of the finance office responsible for payment to the FBO. The purchasing organization shall make payment to the FBO upon receipt of the invoice from the FBO. Log and place a copy inside the AF Form 664.

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-3)

8.6.3.3.5. Turn in two copies of the SF 44 to the operations officer at home station.

8.6.3.3.6. Present the aircraft identaplate for purchases at approved locations. (T-3) 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. (T-3) 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.

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 Identaplate*, 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.

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 identaplate on the local form. Log and place a copy inside the AF Form 664.

8.6.3.6. AF Form 1994, *Fuels Issue/Defuel Document*, records fuel purchases at USAF bases using a valid DD Form 1896, *Jet Fuel Identaplate*. The PIC or designated representative shall complete the form then log and place a copy inside the AF Form 664.

8.6.3.7. AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance Document*, records POL actions for particular airframe IAW applicable directives. The PIC or designated representative shall complete the form and submit to maintenance debrief. (T-3)

8.6.3.8. DD Form 1896, *Jet Fuel Identaplate*, is the aircraft fuel and oil charge card.

8.6.3.9. The PIC will verify the AFTO Form 781H is completed and turned in to maintenance debriefing following the mission. (T-3)

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-3)

8.7. AF Form 15, *United States Air Force Invoice*. Used to purchase ground fuels, oils, or services at non-DoD activities. When completed, log and place inside AF Form 664, *Aircraft Fuels/Documentation Log*.

8.7.1. Use the AF Form 15 for vendor services/supplies only if contract vendors are not available or the contract vendor will not accept the aircraft identaplate.

8.7.2. If the vendors require a signature on their form and an AF Form 15 has been used, write the statement "AF Form 15 Executed" on the vendor's form. (T-3)

8.7.3. Return two copies of the AF Form 15 to the operations officer at home station. (T-3)

8.7.4. Purchases at Canadian into-plane locations will be documented using the local vendor's invoice. AF Form 15 or 315 will not be accomplished. Hand scribe the information from the aircraft identaplate 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.

8.7.5. Purchases at Shell International Trading Company (SITCO) Agreement locations require presenting the aircraft identaplate. 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 an AF Form 15 or 315 in addition to their invoice, annotate on the vendor's invoice "AF FORMS EXECUTED." Log and place the documentation inside the AF Form 664.

8.7.6. Purchases at non-contract commercial airfields are accomplished using the AF Form 15.

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 identaplate should be hand scribed on the local form. Log and place a copy inside the AF Form 664.

8.8. AF Form 853, *Bird Strike Report.* Submit this report upon notification of a bird strike via aircraft.

8.9. DD Form 1748-2, *Airdrop Malfunction Report (Personnel-Cargo)*. The DD Form 1748-2 is a tool to document any airdrop malfunction IAW AFJI 13-210(I), *Joint Airdrop Inspection Records, Malfunction/Incident Investigations, and Activity Reporting*. Consistent with safety, immediately report off-Drop Zone (DZ) drops/extractions to the controlling agency and proper safety channels. PIC or designated representative shall complete DD Form 1748-2 before entering crew rest. (T-3) **Exception:** If a malfunction is due to a failure of the static-line retriever or container delivery system (CDS) remote timer system, the mission may be continued provided the 80 pound (lb) tie on the knife did not break, and the knife did not nick the gate. Use opposite static line retriever and manually activated the retriever switch at FS 245 or perform a manual gate cut. (T-3) The DD Form 1748-2 is not required, but a write-up in the AFTO 781A is required. (T-3)

Chapter 9

FLYING TRAINING POLICY

9.1. General. This chapter outlines requirements and restrictions for training and evaluation missions. See AFI 11-202, Vol 1, *Aircrew Training*, AFI 11-202, Vol 2, *Aircrew Standardization/Evaluation Program*, AFI 11-2EC-130J, Vol 1, *EC-130J Aircrew Training*, AFI 11-2EC-130J, Vol 2, *EC-130J Aircrew Evaluation Criteria*, as well as MAJCOM supplements 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-3)

9.3. Debriefing. Review and assess overall training performed. Each student or crew member should thoroughly understand what training has been accomplished. All required documentation should be completed as expeditiously as possible.

9.4. Simulated Emergency Flight Procedure(s) (EP).

9.4.1. Simulate EP (engine shutdown, placing switches in other than their normal positions, or an abnormal configuration such as no flap landings or simulated engine failure) only during training, evaluation, or currency flights when an instructor or flight examiner pilot is in one of the pilot seats. (T-3) 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. Preface all simulated emergencies with the word "simulated" and terminate simulated emergencies if an actual emergency arises. (T-3)

9.4.1.1. Do not conduct simulated engine-out training when a fuel indication system failure exists.

9.4.2. One power lever may be retarded to FLIGHT IDLE at not less than V_{MCA1} (one-engine inoperative, out of ground effect) not less than 300 feet AGL.

9.4.3. Turns into the simulated inoperative engine 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 are prohibited with passengers on board unless such personnel are required for mission accomplishment, such as FCF and test missions. Limit personnel to the absolute minimum required.

9.4.5. Conduct simulated EPs in accordance with AFI 11-202, Vol 3, **Chapter 5**, and this instruction. Use a realistic EP scenario and do not compound EP. Limit simulated EPs to noncritical phases of flight when possible. Notify the controlling agency if a nonstandard traffic pattern or pattern requiring special sequencing is anticipated. (T-3)

9.5. Maneuver Restrictions. All the following maneuvers discussed in **Paragraph 9.5** require an instructor or flight examiner pilot unless otherwise specified.

9.5.1. Aborted Normal Takeoff. Authorized during daylight. Crosswind component must be within the recommended zone of the flight manual takeoff crosswind chart. Runway must be dry, hard-surfaced, and long enough to allow refusal and takeoff speeds to be equal. Initiate the abort by stating "REJECT" before refusal speed. Do not practice aborts from touch-and-go or stop-and-go landings. If actual engine shutdown due to a simulated malfunction is to be practiced, it must be pre-briefed. (T-3)

9.5.2. Max Effort Procedures.

9.5.2.1. Aborted Takeoff. Authorized during daylight. Crosswind component must be within the recommended zone of the flight manual takeoff crosswind chart. Runway must be dry, hard-surfaced, and long enough to allow refusal and takeoff speeds to be equal. Simulate a runway length less than critical field length. Initiate the abort by stating "REJECT" at or below a refusal speed based on simulated runway length. Comply with flight manual brake cooling restrictions. Do not shutdown an engine due to a simulated malfunction. Do not practice aborted max effort takeoffs from stop-and-go landings. (T-3)

9.5.2.2. Max Effort Landings. The maximum gross weight for a Max Effort Landing in EC130J (SJ) should not exceed 130,000 pounds during training sorties. Aircrew will comply with the Primary and Secondary Fuel Management limitations (Airspeed and Gravity limits). (T3)

9.5.3. Actual Engine Shutdown and Air start. One engine may be shutdown at not lower than 2,500 feet AGL in daylight VMC.

9.5.4. No-Flap Landing. Authorized in conjunction with a simulated engine inoperative landing. Maximum gross weight is 120,000 pounds, and the crosswind component must be within the recommended zone of the landing crosswind chart. Authorized in night VMC and day IMC if weather is at or above circling minimums.

9.5.5. Go-Around or Missed Approach. Initiate VFR go-arounds no lower than 100 feet AGL when practicing simulated emergencies other than simulated engine failures. Initiate practice instrument missed approaches no lower than the minimum altitude for the approach. **Note:** Instructor/flight examiner pilot is not required.

9.5.6. Simulated Engine-Out Go-Around or Missed Approach. Initiate simulated engine-out goaround at not lower than 200 feet AGL. Initiate simulated engine-out missed approach no lower than the minimum altitude for the approach.

9.5.7. Simulated Engine-Out Landing. Simulate failure of the first engine not less than V_{MCA1} (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). Use all 4 engines for touch-and-go takeoff. (T-3)

9.5.8. Unusual Attitudes and Spatial Disorientation. Authorized at not lower than 10,000 feet AGL in daylight VMC.

9.5.9. Slow Flight. Fly at approach, threshold, and 1.2 times power off stall speed with gear down and flaps 0, 50, or 100%. Do not exceed 15° of bank. (T-3)

9.5.10. Practice Emergency Climb Procedure. Authorized in day/night VMC. 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.

9.5.11. Tactical Maneuvers.

9.5.11.1. The maximum gross weight for practice tactics maneuvers is 145,000 lbs. (T-3)

9.5.11.2. Aircrew participating in a formal tactics school (example: Advanced Airlift Tactics Training Center (AATTC), St Joe), with a qualified course instructor onboard, are authorized 300 ft AGL or as limited by course or airspace requirements, whichever is more restrictive. (T2)

9.6. Touch-and-Go Landings. Authorized on designated training, evaluation or currency missions.

9.6.1. Touch-and-go landings may be performed by:

9.6.1.1. Instructor pilots, instructor pilot candidates on initial or requalification instructor evaluations, or flight examiner pilots in either pilot seat.

9.6.1.2. Any pilot from either seat provided an instructor pilot, instructor pilot candidate on initial or requalification instructor evaluation, or flight examiner pilot is in the other seat.

9.6.1.3. If the PIC is touch-and-go certified, any pilot may conduct flight idle touch-and-go landings. NVG touch-and-go landings may be performed by current and NVG landing qualified pilots.

9.6.2. Touch-and-go landings are authorized when crosswind component corrected for RCR is within the recommended zone of the landing crosswind chart. Ceiling and visibility must be at least 300 feet and 3/4-mile or 300 feet and RVR 40. (T-2)

9.6.2.1. Do not accomplish touch-and-go landings on ice covered runways. (T-3)

9.6.3. Touch-and-go landings are normally performed at flight idle. Brief the crew if performing a ground idle touch-and-go landing. Do not perform no-flap ground idle touch-and-go landings.

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

9.6.5. Minimum runway length for 50% flap flight idle touch-and-go landings is 5,000 feet. (T3) Minimum runway length for all other touch-and-go landings is 6,000 feet. (T-3)

9.7. Stop-and-Go Landings.

9.7.1. Authorized only on EC-130J (SJ) designated training, evaluation, or currency missions. Any EC-130J qualified pilot may perform stop-and-go landings if:

9.7.1.1. The crosswind component corrected for RCR is within the recommended zone of the landing crosswind chart. Ceiling and visibility must be at least 300 feet and 3/4-mile or 300 feet and RVR 40.

9.7.1.2. Minimum braking is used to stop.

9.7.1.3. The runway remaining for takeoff is greater than CFL.

9.7.2. Stop-and-Go Landings are not authorized:

9.7.2.1. In conjunction with no-flap landings.

9.7.2.2. When normal wake turbulence criteria is not met, or when intercepting or crossing the flight path of a large multi-engine jet during approach or landing.

9.8. Maximum Effort.

9.8.1. Minimum runway length is 3,000 feet or IAW **Paragraph 5.24.2** and **5.24.3**, whichever is greater.

9.8.2. Takeoff speed will be Adjusted Max Effort Rotation Speed (AMAX). Squadron commanders may approve the use of actual max effort speeds (takeoff and obstacle clearance) on a case-by-case basis during training. (T-3)

9.8.3. Simulated obstacle clearance height will not exceed 50 feet. (T-3)

9.9. Prohibited Maneuvers. All TO 1C-130(E)J-1 and the following maneuvers or procedures are prohibited in the aircraft and may only be practiced in a weapon system trainer. (T-2)

9.9.1. Full stalls. (T-3)

9.9.2. Approach to stalls (except FCF). (T-3)

9.9.3. Rudder force reversals (fin stalls). (T-3)

9.9.4. Spins. (T-3)

9.9.5. Simulated runaway trim malfunctions. (T-3)

9.9.6. Simulated hydraulic system loss by turning engine-driven hydraulic pumps off. (T-3)

9.9.7. Simulated two-engine approaches or landings. (T-3)

9.9.8. Simulated engine-out takeoffs. (T-3)

9.10. Landing Restrictions with Airdrop Loads. Pilot proficiency/multiple/assault landings will not be accomplished with non-unilateral airdrop loads onboard the aircraft (i.e., Combat Rubber Raiding Craft (CRRC), Bike Bundles, and Rigging Alternate Method Zodiac (RAMZ) in order to prevent damage to actual loads. (T-3) If landings are accomplished with training loads (i.e., SATB, 55 gallon drum CDS loads, concrete blocks) on the aircraft, the loadmaster will re-inspect the load prior to airdrop. (T-3) If any damage is noted on the honeycomb, skid board, ties, lashings, etc., the load will be returned to Aerial Delivery. (T-3) Training loads may remain onboard during assault landings and may be dropped after they are re-inspected by the loadmaster prior to the airdrop. The intent is not to negatively impact training, but at the same time, minimize assault landings with training loads on board.

9.11. 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.

9.12. Air-to-Air Refueling Training Restrictions. During training missions the override signal amplifier will not be used. (T-3)

9.13. Senior Staff Officers Policy. Senior staff members (pilots only) or O-coded pilots who have completed the C-130J Senior Staff Familiarization course will occupy the left pilot seat only and be under direct IP supervision. (T-3) Pilots flying under indoctrination status will not control the aircraft during: (T-3)

9.13.1. Takeoff, landing, or instrument approaches when the weather is below 1500/3. (T-3)

9.13.2. In-Flight Refueling (receiver only). (T-3)

9.13.3. Tactical Low-Level. (T-3)

9.13.4. In-flight emergencies (actual or simulated). (T-3)

Chapter 10

LOCAL OPERATING PROCEDURES

10.1. General.

10.1.1. EC-130J flying units will develop a supplement to this chapter for local operating procedures, as applicable to this instruction.

10.1.2. The supplement should not duplicate and will not be less restrictive than the provisions of this or any other publication without prior authorization from the appropriate MAJCOM. (T2)

10.1.3. The supplement will be distributed to the MAJCOM, as applicable.

Chapter 11

NAVIGATION PROCEDURES

11.1. General.

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 controlling EGI (INAV) navigation solution the mission computer is using for en route navigation. The SHIP SOLN, selected via the NAV SELECT page of the AMU, determines which will be used to steer the aircraft either manually or with the autopilot.

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 C-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% 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, *DoD International 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 2,000' to 1,000' 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.

11.2. Mission Planning Procedures.

11.2.1. 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-3)

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. Computer Flight Plan (CFP). Optimized routing with applied forecast winds can be obtained from advanced computer flight plan (ACFP) (USAF) or optimum path routing system (OPARS) United States Navy (USN). ACFP 4.0 can produce a .rte file that PFPS can recognize and open. Use initial ATC cruise ceiling for the enroute altitude when not restricted by fuel temperature freezing limits. (T-3) Update actual flight level winds using the N-PFPS WX utility if necessary. (T-3)

11.2.2.3. Verify the CFP for route definition and accuracy, paying particular attention to adherence with over flight clearances. (T-3)

11.2.2.4. Refer to **Chapter 12** to accomplish fuel planning.

11.2.3. Equal Time Point (ETP) Computations.

11.2.3.1. Refer to **Chapter 12** for ETP Computations. The ETP provides crews a tool for recovery airfield decision-making when in-flight emergencies occur. ETP computations are required on CAT I routes when the total time between the LSAF and FSAF is 5 hours or more. (T-3) ETPs must be annotated and plotted on the MPC and MFP prior to the coast-out waypoint. (T-3) Computer programs which use similar algorithms as the manual computation may be used. Enter ETP information into the CNI PROGRESS page during preflight. CNI-computed ETPs only become accurate upon reaching the PERF CRUISE altitude. CNI-computed ETPs can be obtained for different airspeeds (i.e., 260 KTAS for a 3-engine scenario).

11.2.3.2. The blocks provided on top of the C130J PFPS CFP should be used to record information needed by the CNI to compute an ETP. These blocks and provided formulas also serve as a worksheet for crews to do the manual ETP computation. The ACFP flight plan has information on the bottom of the flight plan for manual ETP calculations (See **Figure 11.3** and **Figure 11.4** for sample CFP). If using the computer programs or the CNI, annotate applicable information on the Master Flight Plan (MFP). If the CNI is used, annotate—CNI in the master flight plan blocks for which the CNI does not present a number.

11.2.3.3. To compute a manual ETP:

11.2.3.3.1. Identify and record the LSAF, coast-out point, approximate midpoint of the CAT I portion, coast-in point, and FSAF. The coast-out point, approximate midpoint, and coast-in point are actual waypoints on the flight plan. The coast-out point for ETP purposes must occur after initial level-off. (T-3)

11.2.3.3.2. Determine and record the distance from the LSAF to the FSAF (entering the two airfields and approximate midpoint into PFPS is an easy way to do this). (T-3)

11.2.3.3.3. Determine and record the average groundspeed (GS) for the first-half (coast-out to midpoint) and second-half (midpoint to coast-in) of the CAT I portion. (T-3) Divide the respective en-route distance by the en-route time to/from the midpoint to determine accurate average GS.

11.2.3.3.4. Calculate a wind factor (WF1 & WF2) for each half by subtracting the flight-planned average TAS from the averaged GS. (T-3) If a tailwind is experienced the WF will be positive. If a headwind is experienced the WF will be negative.

11.2.3.3.5. Use the provided formulas to compute the time it takes to fly from the ETP to the FSAF. (T-3) Use this time and the second-half-averaged GS to calculate a distance from the FSAF that the ETP occurs. Note: The ETP will always occur upwind of the geographic midpoint. Refer to **Table 11.1**.

Table 11.1. ETP.

TIME in hours (ETP-FSAF) = DISTANCE (LSAF-FSAF)
(WF2 – WF1) + 2TAS
DISTANCE (ETP-FSAF) = TIME (ETP-FSAF) * GS (2nd half)

11.2.3.3.6. The INDEX FROM/TO and PROGRESS pages may also be utilized in flight to update times and distances to diversion bases along the route of flight. An accurate GS must be entered in order to obtain correct ETE 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 MFP and Master Plotting Chart (MPC).

11.3.2. MFP Usage. The MFP is normally maintained by the CSO or PM but should be kept readily available to both pilots. It will be used to record the following in flight:

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.

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 check-mark to signify the coordinates, course and distance in the CNI-MU have been verified by another crew member.

11.3.3.3. Draw one diagonal line through the circled check-mark 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 Usage. The use of a plotting chart is required on every route requiring CAT I Navigation. (T-3) Use an appropriate Jet Navigation Chart-High Altitude (JNCA) or higher chart with Lambert Conformal Conic (LCC) projection. (T-3) During mission planning, draw the course line representing the planned route of flight on the MPC and highlight the associated suitable emergency airfields, A/R abort bases and associated divert airfields, ETP, LSAF and FSAF. (T-3) The PIC will verify this information and annotate the chart with his/her signature, date, and mission number/call sign. (T-3) 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. (T-3) 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 Coordinated Universal Time (UTC) time check and resynchronization of the aircraft master clock, if necessary. (T-3) 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 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. (T-3)

11.4.3. Navigation Initialization and Solutions. Both the AUTONAV and manual gyro compass (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-3)

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. (T-3) 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 crew member to simply observe another crew member entering the data. The following steps will be completed by the pilots and CSO: (T-3)

11.4.5.1. The CSO or one of the pilots will: (T-3)

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. (T-3) 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. (T-3) 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. (T-3)

11.4.5.1.2. Using the LEGS pages, insert the forecast winds (if available) at each waypoint. (T3)

11.4.5.1.3. Verify the total distance to the destination on the CNI PROGRESS page. (T-3) Any significant disparity (more than 25 nm to allow for SIDs/Standard Terminal Arrival Route(s) (STAR) 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. (T-3) Completion of this step will be annotated with the check-mark being circled on the MFP. (T-3)

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/CSO in the same manner. (T-3)

11.5. CAT I 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-MU or HDD/HUD. Groundspeeds in excess of 1 knot while the aircraft is stationary may indicate a faulty INS. (T3)

11.5.3.2. Airborne. Determine INAV position accuracy by comparing it to en route NAVAID. (T-3)

11.5.3.3. Compass Deviation Check. Perform a compass deviation check using both INS and the standby compass prior to entering CAT I airspace. (T-3) Perform subsequent checks after heading changes of 30° (or greater) or every 3 hours. (T-3) Record the deviation in the appropriate block of the MFP. (T-3) Apply this correction to headings to be flown whenever it is necessary to use the standby compass as the sole source for navigation. (T-3)

11.5.3.4. Oceanic Navigation Accuracy Check. Prior to coast-out, evaluate/compare the accuracy of all navigation solutions. (T-3) 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. (T-3) 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.

11.5.4. Communications. In addition to guidance in **Chapter 5**, crews will accomplish the following: (T-3)

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 MHz and the VHF common frequency. (T-3)

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. (T-3) 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.

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. (T-3) If the oceanic clearance received is different from the planned clearance, use the following procedures: (T-3)

11.5.5.1.1. Record the new route on the MFP to include applicable updates to ETP data. (T-3)

11.5.5.1.2. Enter the new waypoints into the CNI in accordance with the pre-flight procedures in this chapter. (T-3)

11.5.5.1.3. Ensure fuel will still be sufficient to arrive at the destination waypoint with required reserves. (T-3)

11.5.5.1.4. Mark out the old plotted track and draw the revised plot on the MPC. (T-3)

11.5.5.1.5. In no case should this process simultaneously engage the attention of both pilots during flight. (T-3)

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-SP if NAVAID are available for monitoring. Prior to losing NAVAID reception, the INAV solution that is not the controlling solution must be placed to INS. (T-3) 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.

11.5.7. IFF. Reset Mode 3A code to 2000, 30 minutes after entering Category I airspace. (T-3)

11.5.8. MFP and MPC Procedures.

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. (T-3) 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. (T-3)

11.5.8.2. Prior to waypoint transition, check the MFP magnetic course and distance to the next waypoint against the CNI-MU. (T-3) 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. (T-3) Update ETA to the next two waypoints. (T-3)

11.5.8.3. Overhead the waypoint, confirm the ATA and determine the minutes ahead/behind by comparing it to the ETA. (T-3) Record the CNI-MU bearing/range

between INAV solutions to provide a running record of INS drift relative to the controlling solution. (T-3) 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. (T-3) 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. (T-3)

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. (T-3) Update these conditions as well as fuel flow as needed on the PERF CRUISE and LEGS pages in the CNI-MU. (T-3)

11.5.8.6. If required, complete a position report to the controlling agency in accordance with 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. (T-3) 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. (T-3)

11.5.8.8. Approximately 60 nm (10 to 15 minutes depending on groundspeed) after waypoint passage, MARK the aircraft position and plot the INS-only position on the MPC. (T-3) Record the mark time and position coordinates next to the plot. (T-3) If the plotted position is not within 2 nm of the course center-line, 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. (T-3)

11.5.8.9. Cross the first diagonal on the MFP to indicate that the aircraft position has been plotted. (T-3)

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°. (T-3)

11.5.9. Routine Monitoring.

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 that 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 ± 5º C 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 en route 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. (T-3) When the aircraft is approaching the first landfall NAVAID, tune and identify the navigation facility and crosscheck the aircraft position. (T-3) 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. (T-3) Revert to CAT II procedures. (T-3) Reset POS ALERT and IFF Mode 3 as appropriate. (T-3)

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. AFI 11-202, Vol 3, allows the GPS to be used as a mission enhancement system for en route 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 en route instrument navigation if NAVAIDs are available for monitoring. The NAVAIDs must be operational and actively monitored. (T-3) 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.

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% 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. (T-3) 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 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. (T-3) Pilots will refer to FLIP AP/2 and the following for RVSM requirements:

11.6.3.1. Both primary altimeters, at least one autopilot, the altitude advisory system, and the transponder, must be fully operational. (T-3) The AC will request a new clearance to avoid this airspace should any of this equipment fail. (T-3)

11.6.3.2. Have the autopilot engaged during level cruise, except when circumstances such as the need to re-trim the aircraft or turbulence require disengagement. (T-3)

11.6.3.3. Crosscheck the altimeters before or immediately upon coast out. (T-3) Record readings of both altimeters. (T-3)

11.6.3.4. Continuously crosscheck the primary altimeters to ensure they agree ± 200 feet. (T-3)

11.6.3.5. Limit climb and descent rates to 1,000 feet per minute when operating near other aircraft to reduce potential TCAS advisories. (T-3)

11.6.3.6. Immediately notify ATC if any of the required equipment fails after entry into RVSM airspace and coordinate a plan of action. (T-3)

11.6.3.7. Document in the aircraft forms malfunctions or failures of RVSM required equipment. (T-3)

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 INS 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 in accordance with 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 in accordance with 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° 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.

Figure 11.1. MPC w/out AAR Example.

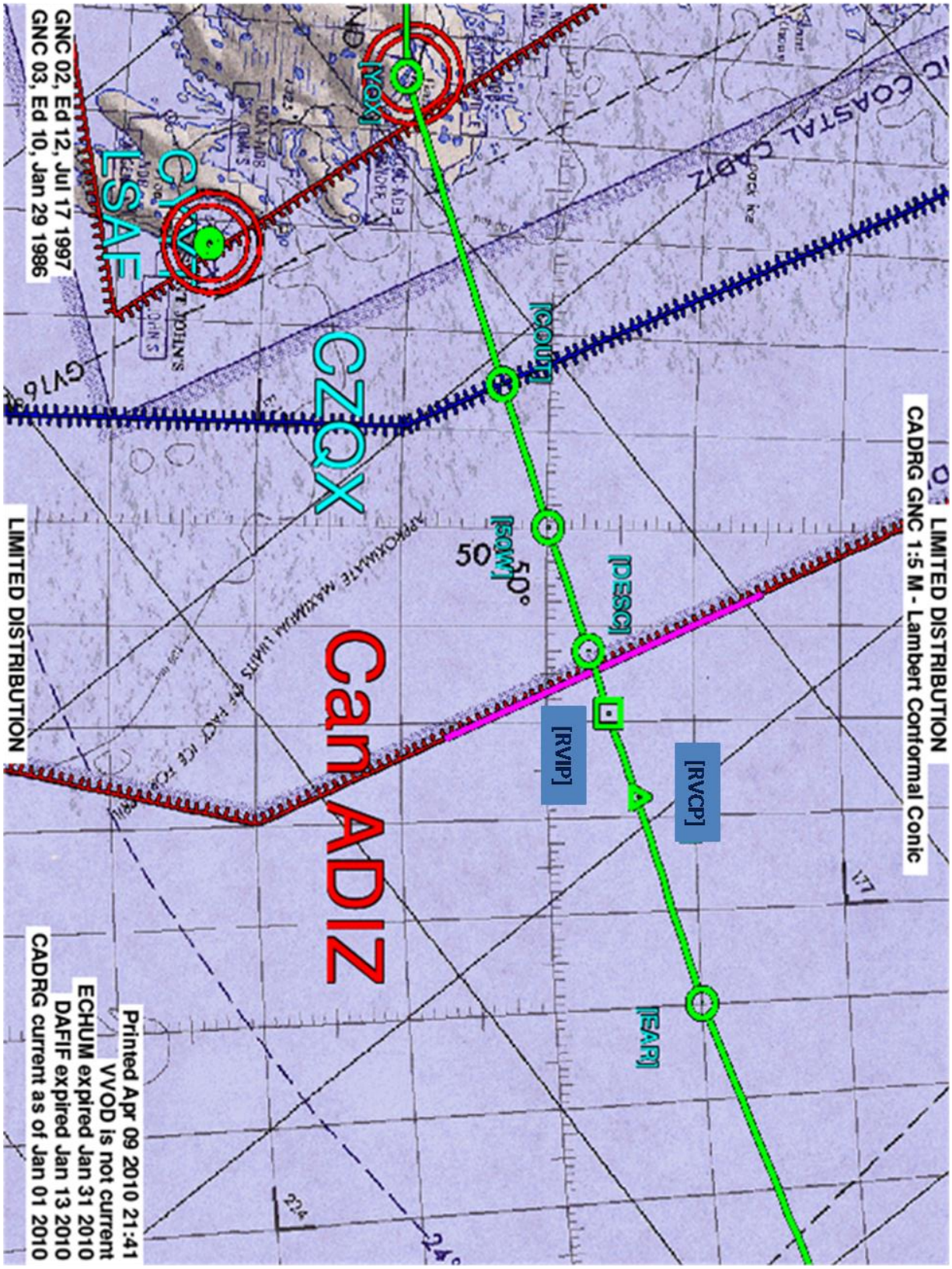


Figure 11.2. MPC w/AAR Example.

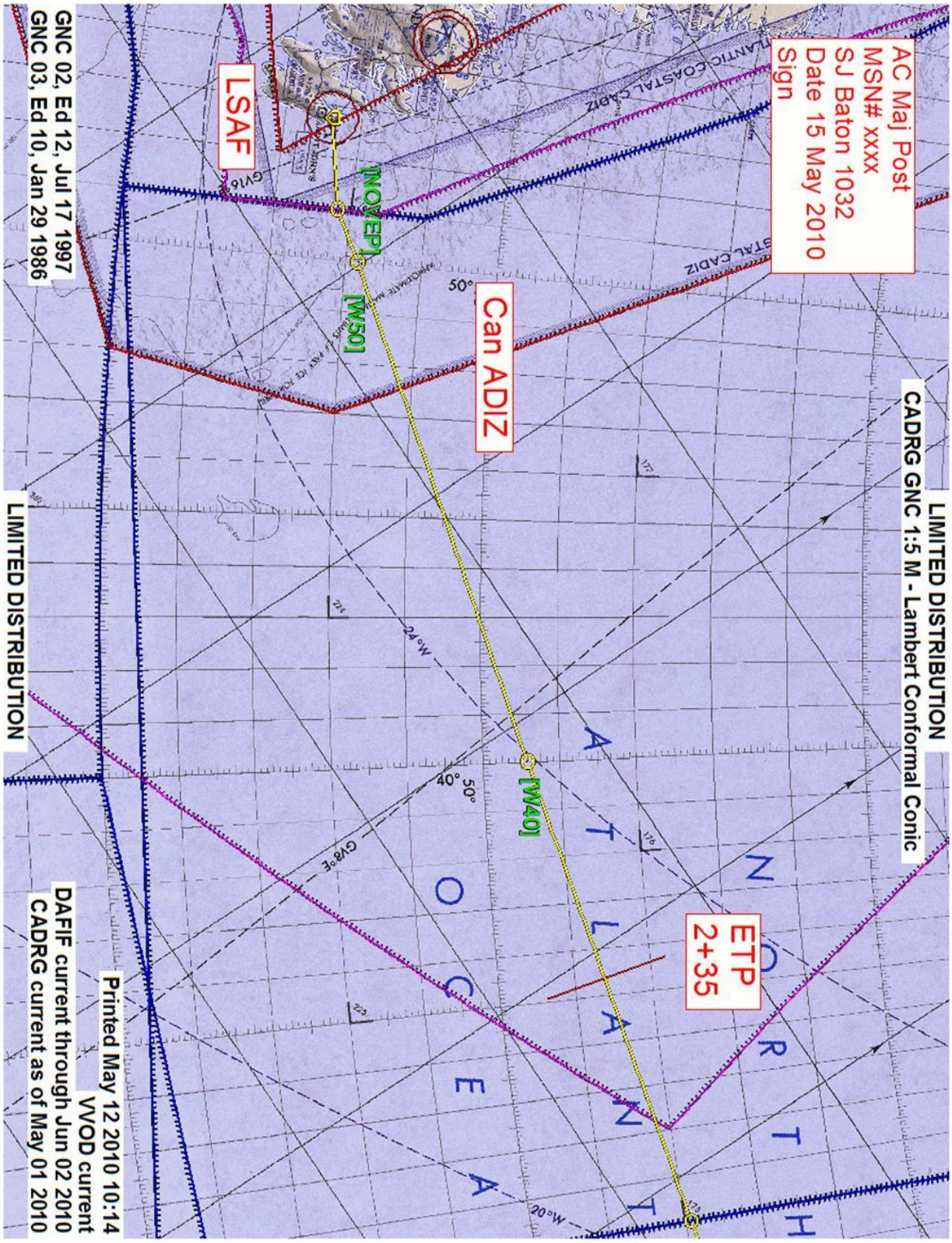


Figure 11.3. Master Flight Plan (Preflight) (CYYT-EGUN (w/out AAR)).

CFPS Verion 4.1 FLIGHT PLAN for the EC130J (Supe
Route: X:\Common Drive\01_Routes\PERSONAL

MASTER

Date Flt Plan Printed: 201005110825

ROUTE DATE: 11 MAY 10	INIT ALIGNMENT:	ACFT TYPE and #: EC-130J (SJ) 1933	BASIC WT: 86500	1. FUEL BURN: 26066 (INC STTO & HOLDING)	6. INDENT EXTRA: OFFCOURSE 45min 1.8 // ICLIMB 1hr 0.5
DAFIF DATE: 6 MAY 10	(N)S: 47 37.12	DRAG INDEX: 0.00	CARGO WT: 0	2. RESERVE: (127min) TFF: 3.9/hr 1.8	7. ACTUAL FUEL: 42.0
CALL SIGN: BATON 53	(W)E: 052 45.15	EXCESS FUEL: ACTUAL O/H FUEL-BLK 10	OPERATING WT: 86.5	3. ALTERNATE: 3.2	8. REQ FUEL (1+2+3+4+5+6) 37.4
	P HDG / MAG / CP HDG	17.9 - 9.2 = 8.7	RAMP FUEL: 42000	4. APPROACH: 0.0 or ~~0.7~~	9. UNIDENT EXTRA: 4.6
Pilot: CHARBS	NAV CHECK: / /	INAV DELTA:	RAMP WT: 128500	5. LANDING 4.0	10. REQ O/H FUEL (3+4+5+HOLDING) 9.2
			T/O GROSS WT: (-.8) 127.7		

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
	CYYT/A ST JOHNS INTL		N 47 37.12 W052 45.15	461M +0C 19.6W	258/038 0	* 017 017 357	* 0 0		+00 +00	1500		2050 05+55	41200	8.7	32.5		
CZQX ✓	NOVEP/W NOVEP		N 47 49.73 W051 00.00	25000M +5C 19.4W	270/030 -1	* 100 099 080	* 72 72	* 210 310 340	+17 +17	1517		1978 05+38	4043 39443	8.7	30.7		
✓			N 48 10.00 W050 00.00	25000M +5C 20.3W	270/030 -3	* 082 080 063	* 45 117	* 210 310 336	+08 +25	1525		1933 05+30	4039 38901	8.7	30.2		
✓			N 49 30.00 W045 00.00	25000M +4C 19.7W	270/030 -2	* 086 084 066	* 214 331	* 210 310 337	+38 01+03	1603		1719 04+52	4023 36351	8.7	27.7		
✓			N 50 35.00 W040 00.00	25000M +4C 18.6W	270/030 -2	* 089 087 069	* 204 535	* 210 310 338	+36 01+40	1640		1515 04+16	3996 33939	8.7	25.2		
✓			N 51 25.00 W035 00.00	25000M +4C 17.1W	270/030 -2	* 092 090 073	* 196 731	* 210 310 339	+35 02+14	1714		1319 03+41	3972 31640	8.7	22.9		
EGGX ✓			N 52 05.00 W030 00.00	25000M +3C 15.3W	240/090 5	* 093 098 076	* 191 922	* 210 310 396	+29 02+43	1743		1128 03+12	3952 29735	8.7	21.0		
✓			N 52 40.00 W025 00.00	25000M +3C 13.4W	240/090 5	* 093 097 077	* 187 1109	* 210 310 395	+28 03+12	1812		941 02+44	3936 27870	8.7	19.2		
✓			N 53 00.00 W020 00.00	25000M +3C 11.3W	240/090 6	* 095 101 082	* 183 1292	* 211 310 392	+28 03+40	1840		758 02+16	3919 26040	8.7	17.3		
EISN ✓	MALOT/W MALOT		N 53 00.00 W015 00.00	25000M +2C 8.1W	240/090 8	* 099 107 088	* 181 1473	* 211 310 387	+28 04+08	1908		577 01+47	3902 24211	8.7	15.5		
✓	BURAK BURAK		N 53 00.00 W012 00.00	25000M +2C 7.7W	240/090 8	* 097 105 089	* 109 1582	* 211 310 386	+17 04+25	1925		468 01+30	3888 23115	8.7	14.4		

193 SOW FORM 4138

Figure 11.4. Master Flight Plan (Preflight) (CYYT-EGUN (w/out AAR)).

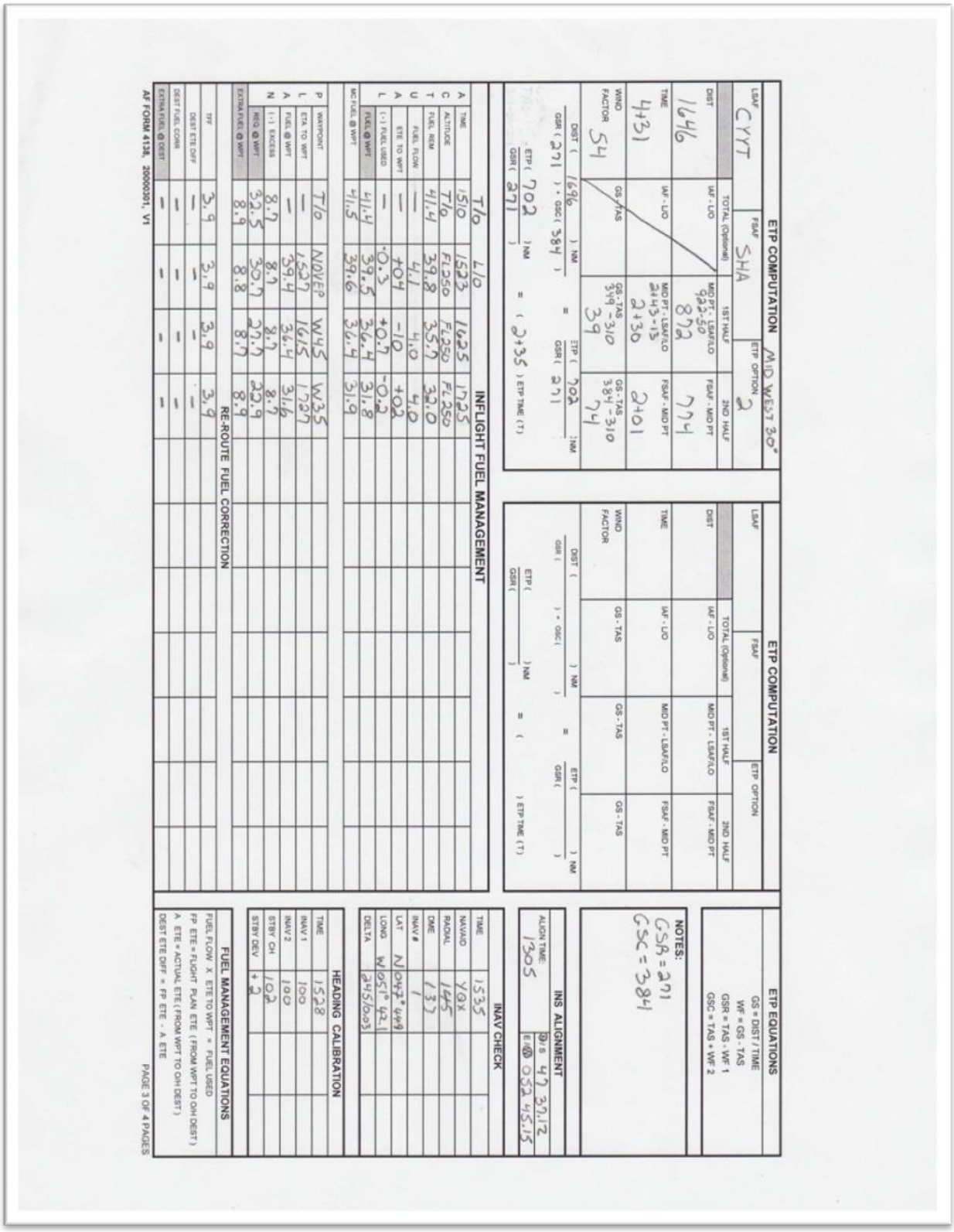
Route: X:\Common Drive\01_Routes\PERSONAL

Date Flt Plan Printed: 201005110825

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ T	FOB/ INAV DELTA	EXTRA FUEL +/-
	SHA UL9 SHANNON	080X 113.30	N 52 43.26 W008 53.11	25000M +2C 5.9W	270/040 1	* 105 106 097	* 115 1696	* 211 310 350	+20 04+44	1944		354 01+11	3878 21845	8.7	13.1		
	ABAGU UL9 ABAGU		N 52 30.20 W007 38.80	25000M +2C 5.6W	270/040 2	* 112 114 106	* 47 1743	* 211 310 348	+08 04+53	1953		307 01+03	3870 21321	8.7	12.6		
	DIMUS UL9 DIMUS		N 52 14.38 W006 15.08	25000M +2C 5.0W	270/040 2	* 112 114 107	* 54 1797	* 211 310 348	+09 05+02	2002		253 +53	3866 20725	8.7	12.0		
EGGT	SLANY UL9 SLANY		N 52 09.52 W005 50.53	25000M +2C 4.8W	270/040 2	* 113 115 108	* 16 1813	* 211 310 348	+03 05+05	2005		237 +51	3863 20549	8.7	11.8		
	STU UL9 STRUMBLE	078X 113.10	N 51 59.68 W005 02.42	25000M +2C 3.7W	270/040 2	* 113 115 108	* 31 1844	* 211 310 348	+05 05+10	2010		206 +45	3861 20202	8.7	11.5		
	HON HONILEY	083Y 113.65	N 52 21.40 W001 39.82	25000M +2C 2.4W	270/040 -1	* 082 081 079	* 127 1971	* 211 310 349	+22 05+32	2032		79 +24	3854 18804	8.7	10.1		
	EBOTO UP155 EBOTO		N 52 21.55 W000 41.67	25000M +2C 2.8W	270/040 0	* 092 092 089	* 36 2006	* 211 310 350	+06 05+38	2038		44 +17	3847 18412	8.7	9.7		
	BANTO UP155 BANTO		N 52 21.47 W000 13.95	25000M +2C 2.6W	270/040 0	* 093 093 090	* 17 2023	* 211 310 350	+03 05+41	2041		27 +15	3845 18225	8.7	9.5		
	SIVDA UP155 SIVDA		N 52 21.37 E000 01.78	25000M +1C 2.5W	270/040 0	* 093 093 090	* 10 2033	* 211 310 350	+02 05+42	2042		17 +13	3844 18119	8.7	9.4		
	MLD/T MILDENHALL	106X	N 52 21.80 E000 29.30	25000M +1C 1.6W	270/040 0	* 091 091 088	* 17 2050	* 211 310 350	+03 05+45	2045		0 +10	3843 17934	8.7	9.2		
DVT LINE	EGPK/A PRESTWICK		N 55 30.57 W004 35.20	20000M +1C 4.2W		* 320	* 261	270 270	00+58				DIVERT FUEL - 3345		* FUEL O/H DIVERT *		
	EGUN/A MILDENHALL		N 52 21.72 E000 29.18	33M +0C 1.6W	270/040 6	* 222 228 221	* 0 2050	*	+10 05+55	2055		0 +00	15934	8.7	7.2		

193 SOW FORM 4138

Figure 11.5. AF Form 4138 (Example) (CYYT-EGUN (w/out AAR)).



ETP COMPUTATION — MID WEST 30°

LBAF	CYYT	FBAF	SHA
ETP OPTION	2		
DIST	1646	TOTAL (Optional)	IAF - LIO
1ST HALF	922-50 872	MID PT - LBAF/LIO	
2ND HALF	774	FBAF - MID PT	
TIME	4+31	IAF - LIO	
MID PT - LBAF/LIO	2+45-15 2+30		
FBAF - MID PT	2+01		
WIND FACTOR	54	GS - TAS	
GS - TAS	349-310 39		
GS - TAS	384-310 74		
DIST (1646) NM / GSR (271) + GSC (384)	=	ETP (702) NM / GSR (271)	
ETP (702) NM / GSR (271)	= (2+35) ETP TIME (T)		

ETP COMPUTATION

LBAF		FBAF	
ETP OPTION			
DIST		TOTAL (Optional)	IAF - LIO
1ST HALF	MID PT - LBAF/LIO		
2ND HALF	FBAF - MID PT		
TIME	IAF - LIO		
MID PT - LBAF/LIO			
FBAF - MID PT			
WIND FACTOR	GS - TAS		
GS - TAS			
GS - TAS			
DIST ( ) NM / GSR ( ) + GSC ( )	=	ETP ( ) NM / GSR ( )	
ETP ( ) NM / GSR ( )	= ( ) ETP TIME (T)		

ETP EQUATIONS

GS = DIST / TIME
WF = GS - TAS
GSR = TAS + WF 1
GSC = TAS + WF 2

NOTES:
GSR = 271
GSC = 384

INS ALIGNMENT

ALIGN TIME: 1305	Bis 47 30.12 / E(W) 052 45.15

INFLIGHT FUEL MANAGEMENT

A	TIME	T/O	1510	1523	1625	1723					
C	ALTITUDE	T/O	FL250	FL250	FL250	FL250					
T	FUEL REM	41.4	39.8	39.7	35.7	32.0					
U	FUEL FLOW	—	4.1	4.0	4.0	4.0					
A	ETE TO WPT	—	+04	-10	+02						
L	(-) FUEL USED	—	-0.3	+0.7	-0.2						
	FUEL @ WPT	41.4	39.5	36.4	31.8						
	MC FUEL @ WPT	41.5	39.6	36.4	31.9						
P	WAYPOINT	T/O	NOVEP	W45	W35						
L	ETA TO WPT	—	1527	1615	1727						
A	FUEL @ WPT	—	39.4	36.4	31.6						
N	(-) EXCESS		8.7	8.7	8.7						
	REQ @ WPT		32.5	30.7	22.9						
	EXTRA FUEL @ WPT		8.9	8.8	8.7	8.9					

RE-ROUTE FUEL CORRECTION

TFF		3.9	3.9	3.9	3.9						
DEST ETE DIFF		—	—	—	—						
DEST FUEL CORR		—	—	—	—						
EXTRA FUEL @ DEST		—	—	—	—						

INAV CHECK

TIME	1535										
NAVAID	YQX										
RADIAL	145										
DME	137										
INAV#	1										
LAT	N047° 49										
LONG	W051° 42.1										
DELTA	245/003										

HEADING CALIBRATION

TIME	1528										
INAV 1	100										
INAV 2	100										
STBY CH	102										
STBY DEV	+ 2										

FUEL MANAGEMENT EQUATIONS

FUEL FLOW X ETE TO WPT = FUEL USED
FP ETE = FLIGHT PLAN ETE (FROM WPT TO OH DEST)
A ETE = ACTUAL ETE (FROM WPT TO OH DEST)
DEST ETE DIFF = FP ETE - A ETE

AF FORM 4138, 20000301, V1

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Figure 11.6. Master Flight Plan (Executed) Symbology.

CFPS Verion 4.1 FLIGHT PLAN for the EC130J (Supe
Route: X:\Common Drive\01_Routes\PERSONAL

MASTER

Date Flt Plan Printed: 201005110825

ROUTE DATE: 11 MAY 10	INIT ALIGNMENT:	ACFT TYPE and #: EC-130J (SJ) 1933	BASIC WT: 86500	1. FUEL BURN: 26066 (INC STTO & HOLDING)	6. INDENT EXTRA: OFFCOURSE 45min 1.8 // ICING 1hr 0.5
DAFIF DATE: 6 MAY 10	(N)S: 47 37.12 (W)E: 052 45.15	DRAG INDEX: 0.00	CARGO WT: 0	2. RESERVE: (127min) TFF: 3.9/hr 1.8	7. ACTUAL FUEL: 42.0
CALL SIGN: BATON 53	P HDG / MAG / CP HDG 100 / 131 / 100	EXCESS FUEL: ACTUAL O/H FUEL-BLK 10 17.9 - 9.2 = 8.7	OPERATING WT: 86.5	3. ALTERNATE: 3.2	8. REQ FUEL (1+2+3+4+5+6) 37.4
			RAMP FUEL: 42000	4. APPROACH: 0.0 or ~~0.7~~	9. UNIDENT EXTRA: 4.6
Pilot: CHARBS	NAV CHECK: YQX 145/133	INAV DELTA: 245/003	RAMP WT: 128500	5. LANDING 4.0	10. REQ O/H FUEL (3+4+5+HOLDING) 9.2
			T/O GROSS WT: (-.8) 127.7		

(4.1)

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
✓	CYYT/A ST JOHNS INTL		N 47 37.12 W052 45.15	461M +0C 19.6W	258/038 0	* 017 017 357	* 0 0	*	+00 +00	1500 1510	1510	2050 05+55	41200	8.7	32.5		
6ZQX ✓	NOVEP/W NOVEP		N 47 49.73 W051 00.00	25000M +5C 19.4W	270/030 -1	* 100 099 080	* 72 72	* 210 310 340	+17 +17	1517 1527	1528	1978 05+38	4043 39443	8.7	30.7	39.5 245/.05	8.8
✓			N 48 10.00 W050 00.00	25000M +5C 20.3W	270/030 -3	* 082 080 063	* 45 117	* 210 310 336	+08 +25	1525 1536	1537	1933 05+30	4039 38901	8.7	30.2	38.7 246/.06	8.5
✓			N 49 30.00 W045 00.00	25000M +4C 19.7W	270/030 -2	* 086 084 066	* 214 331	* 210 310 337	+38 01+03	1603 1615	1615	1719 04+52	4023 36351	8.7	27.7	36.2 245/.05	8.5
✓			N 50 35.00 W040 00.00	25000M +4C 18.6W	270/030 -2	* 089 087 069	* 204 535	* 210 310 338	+36 01+40	1640 1651	1652	1515 04+16	3996 33939	8.7	25.2	33.8 247/.06	8.6
✓			N 51 25.00 W035 00.00	25000M +4C 17.1W	270/030 -2	* 092 090 073	* 196 731	* 210 310 339	+35 02+14	1714 1727	1727	1319 03+41	3972 31640	8.7	22.9	31.7 248/.04	8.8
EGGX ✓			N 52 05.00 W030 00.00	25000M +3C 15.3W	240/090 5	* 093 098 076	* 191 922	* 210 310 396	+29 02+43	1743 1756		1128 03+12	3952 29735	8.7	21.0		
✓			N 52 40.00 W025 00.00	25000M +3C 13.4W	240/090 5	* 093 097 077	* 187 1109	* 210 310 395	+28 03+12	1812		941 02+44	3936 27870	8.7	19.2		
✓			N 53 00.00 W020 00.00	25000M +3C 11.3W	240/090 6	* 095 101 082	* 183 1292	* 211 310 392	+28 03+40	1840		758 02+16	3919 26040	8.7	17.3		
EISN ✓	MALOT/W MALOT		N 53 00.00 W015 00.00	25000M +2C 8.1W	240/090 8	* 099 107 088	* 181 1473	* 211 310 387	+28 04+08	1908		577 01+47	3902 24211	8.7	15.5		
✓	BURAK BURAK		N 53 00.00 W012 00.00	25000M +2C 7.7W	240/090 8	* 097 105 089	* 109 1582	* 211 310 386	+17 04+25	1955		468 01+30	3888 23115	8.7	14.4		

193 SOW FORM 4138

Figure 11.7. Master Flight Plan (Executed) Symbology.

Route: X:\Common Drive\01_Routes\PERSONAL

Date Flt Plan Printed: 201005110825

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ T	FOB/ INAV DELTA	EXTRA FUEL +/-
	SHA UL9 SHANNON	080X 113.30	N 52 43.26 W008 53.11	25000M +2C 5.9W	270/040 1	105 106 097	115 1696	211 310 350	+20 04+44	1944		354 01+11	3878 21845	8.7	13.1		
	ABAGU UL9 ABAGU		N 52 30.20 W007 38.80	25000M +2C 5.6W	270/040 2	112 114 106	47 1743	211 310 348	+08 04+53	1953		307 01+03	3870 21321	8.7	12.6		
	DIMUS UL9 DIMUS		N 52 14.38 W006 15.08	25000M +2C 5.0W	270/040 2	112 114 107	54 1797	211 310 348	+09 05+02	2002		253 +53	3866 20725	8.7	12.0		
EGGT	SLANY UL9 SLANY		N 52 09.52 W005 50.53	25000M +2C 4.8W	270/040 2	113 115 108	16 1813	211 310 348	+03 05+05	2005		237 +51	3863 20549	8.7	11.8		
	STU UL9 STRUMBLE	078X 113.10	N 51 59.68 W005 02.42	25000M +2C 3.7W	270/040 2	113 115 108	31 1844	211 310 348	+05 05+10	2010		206 +45	3861 20202	8.7	11.5		
	HON HONILEY	083Y 113.65	N 52 21.40 W001 39.82	25000M +2C 2.4W	270/040 -1	082 081 079	127 1971	211 310 349	+22 05+32	2032		79 +24	3854 18804	8.7	10.1		
	EBOTO UP155 EBOTO		N 52 21.55 W000 41.67	25000M +2C 2.8W	270/040 0	092 092 089	36 2006	211 310 350	+06 05+38	2038		44 +17	3847 18412	8.7	9.7		
	BANTO UP155 BANTO		N 52 21.47 W000 13.95	25000M +2C 2.6W	270/040 0	093 093 090	17 2023	211 310 350	+03 05+41	2041		27 +15	3845 18225	8.7	9.5		
	SIVDA UP155 SIVDA		N 52 21.37 E000 01.78	25000M +1C 2.5W	270/040 0	093 093 090	10 2033	211 310 350	+02 05+42	2042		17 +13	3844 18119	8.7	9.4		
	MLD/T MILDENHALL	106X	N 52 21.80 E000 29.30	25000M +1C 1.6W	270/040 0	091 091 088	17 2050	211 310 350	+03 05+45	2045		0 +10	3843 17934	8.7	9.2		
DVT LINE	EGPK/A PRESTWICK		N 55 30.57 W004 35.20	20000M +1C 4.2W		320	261	270 270	00+58				DIVERT FUEL - 3345		* FUEL O/H DIVERT *		
	EGUN/A MILDENHALL		N 52 21.72 E000 29.18	33M +0C 1.6W	270/040 6	222 228 221	0 2050		+10 05+55	2055		0 +00	15934	8.7	7.2		

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Chapter 12

FUEL PLANNING

12.1. General. A fuel plan is required for all flights except local area flights with established standard fuel loads. (T-3) The Computer Flight Planning Software (CFPS) Computer Flight Plan (CFP) and TO 1C-130J-1-1 are the primary method of fuel planning. All preflight planning must be verified with aircraft MC performance prior to departure. (T-3) Missions should be planned at altitudes, routes, and airspeeds to minimize fuel usage.

12.1.1. EC-130J Management. All EC-130J flight operations will use fuel planning and en route fuel management procedures. (T-3)

12.1.2. Forms. This chapter contains instructions for completion of the fuel planning and in-flight fuel management sections of the AF Form 4138, *EC-130 Flight Plan and Navigation Log*, AF Form 4139, *Special Operations C-130 CS In-Flight Refueling Worksheet*, and AF Form 70, *Pilot's Flight Plan and Flight Log*. CFP forms may be used in lieu of fuel planning portion of the AF Form 4138 or AF Form 70; using formats approved by the unit Stan/Eval.

12.1.3. CFPS. The CSO and/or pilots will verify the accuracy of the CFP and should complete an AF Form 4138, AF Form 4139, or AF Form 70 to verify all fuel and reserve requirements prior to flight. (T-3) Calculate cruise fuel using Range Summary data. (T-3) **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)

12.1.4. Overhead Requirements. Crews will always flight plan to overhead destination at the final en route cruise altitude. (T-3) Unless specified otherwise, overhead the destination/AAR abort airfield is defined as a terminal NAVAID/fix within 25 nm of or overhead the destination/AAR abort airfield. For fuel planning purposes, this will preclude adding approach fuel when an en route descent is planned and flown. When planning to initiate a complete approach from overhead destination at cruise altitude, a 700-pound approach fuel entry is required per **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.1.5. ATC Cruise Ceiling. Use TO 1-C-130J-1-1, 4 engine, normal bleed ATC Cruise Ceiling charts to determine the cruise altitude ceiling for computer-generated flight plans. **Note:** Use initial ATC cruise ceiling for the en route altitude unless restricted by fuel freezing limitations. (T-3) See TO 1C-130(E)J-1 for fuel temperature freezing limitations.

12.1.6. Fuel Reserves. Calculate fuel reserves IAW AFI 11-202, Vol 3, using Terminal Fuel Flow (TFF).

12.1.7. Planning Factors.

12.1.7.1. Use fuel planning factors as outlined in **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components, to calculate and/or verify fuel loads.

12.1.7.2. 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.

12.1.7.2.1. Calculate Wing Relieving Fuel using the flight manual weight limitations chart for the aircraft‘s planned cargo load. (T-3) Enter the chart with the aircraft empty weight and cargo weight, and 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.

12.1.7.2.2. All missions flying low-level will initially takeoff with main tanks full to reduce the effects of wing up-bending and increase the center wing box service life. (T-3) Reduced takeoff fuel in the main tanks can decrease the center wing box service life as much as 47%.

12.2. Alternate and In-Flight Refueling Abort Fuel Planning.

12.2.1. Destination Alternate Selection and Fuel Planning Requirements. When an alternate is required, EC-130J aircrews will plan to be overhead the destination airfield with sufficient fuel to proceed to the furthest alternate, hold at the alternate accomplish a descent/approach and land with a minimum of 4,000 pounds. (T-3) **Note:** Ensure alternates are entered on the last en route cruise line prior to your destination. (T-2)

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

12.2.1.2. If two alternates are required, use the two closest suitable airfields meeting AFI 11202, Vol 3, weather criteria and fuel plan to the more distant of the two.

12.2.1.3. When selecting an alternate, suitable military airfields are preferred if within 75 nm of destination.

12.2.2. In-Flight Refueling Abort Base Fuel Planning Requirements. 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 a minimum of 4,000 pounds of fuel (IAW **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components, requirements) without receiving an on-load. **Note:** Air refueling divert entries and fuel on-loads should be entered in the EAR waypoint line.

12.2.3. Destination Alternate or In-Flight Refueling Abort Planning Factors. Normally, the destination alternate or in-flight refueling abort profile is based on direct routing at 260 KTAS at 10,000 feet for alternates within 200 nm of the destination airfield/EAR point, and FL 210 or FL 220 at Long Range Cruise (LRC) speed for alternates beyond 200 nm. Calculate alternate/abort fuel by using the divert (DVT) feature of CFPS. (T-3) The divert fuel will not be calculated into the fuel plan, but will be printed on the CFP with the calculated fuel required. (T3)

12.2.3.1. Identified extra fuel will be added for the following: (T-3)

12.2.3.1.1. When fuel availability is limited or not available at en route stops.

12.2.3.1.2. For known holding delays in excess of standard.

12.2.3.1.3. For anticipated off course weather avoidance or air traffic control vectors.

12.2.3.1.4. Known or forecast icing.

12.2.3.1.5. Insufficient NAVAIDS at destination.

12.2.3.1.6. Pressurization loss with passengers onboard.

12.3. Computer Flight Planned Fuel Analysis. AF Form 4138 fuel analysis blocks may be reproduced in the computer flight plan printed format. Additionally, AF Form 4138, AF Form 4139, and AF Form 70 fuel analysis may be accomplished using en route fuel and terminal fuel flow data derived from computer generated flight plans. **Note:** When fuel analysis is accomplished using a computer flight planning system, use the fuel flow from the last applicable route segment for calculations requiring a terminal fuel flow value as outlined in **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.3.1. Computer generated fuel planning. With the exception of those items explained in this paragraph, all items required for computer generated fuel analysis are explained in the Fuel Load Components chart as outlined in **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.3.1.1. Cruise profiles. To ensure the accuracy of computer generated fuel analysis, CFPs must include accurate route, altitude, airspeed, wind, temperature deviation, drag index, fuel load and aircraft gross weight information. (T-3)

12.3.1.2. When planning route segments which include an in-flight refueling, accomplish computer generated fuel planning using the flight planned altitude profile from takeoff to overhead destination. (T-3)

12.3.1.3. Drag Index. The unit Stan/Eval will designate drag index values, associated with variant configurations of assigned aircraft, to use for computer generated fuel analysis data. (T3)

Figure 12.1. AF Form 4138 and AF Form 4139, Fuel Load Components.

1. EN ROUTE		Fuel for flight time from departure or EAR to EAR or overhead destination at cruise altitude (including time for planned climbs, mission delays, or recovery when applicable).	FLIGHT PLANNED FUEL LOAD	REQUIRED RAMP FUEL LOAD
2. EN ROUTE RESERVE		10% of the total flight time up to 45 minutes or 20 minutes, whichever is greater. For EC-130 mission orbit delays, include 10% flight time for only the flight time returning from the mission delay area. Compute at terminal fuel flow.		
3. ALTERNATE AND MISSED APPROACH		**Alternate:** Fuel for flight time from overhead destination or EAR abort airfield to alternate, or most distant alternate when two are required. CFPS generated or compute at terminal fuel flow. Add 10% reserve when the time to an alternate exceeds 1 + 30. Entry required whenever an alternate must be filed. **Missed Approach:** 2000 pounds. Entry required if the destination is below ceiling minimums, but above visibility minimums for the planned destination approach.	REQ OVERHEAD DEST	
4. HOLDING		Entry always required. Normally 2000 pounds. When an alternate is not available or for locations in Alaska or at latitudes greater than 59 degrees North or South, use 3500 pounds. Alternately, crews may compute holding fuel using terminal fuel flow for 30 / 45 minutes respectively.		
5. APPROACH AND LANDING		**Approach fuel:** 700 pounds. Entry not required when an enroute descent to final approach is planned. **Minimum landing fuel:** 4000 pounds. Entry always required. Do not include minimum landing fuel in BURNOFF.		
6. IDENTIFIED EXTRA	PRESSURIZATION LOSS	Additional fuel for pressure loss at ETP - used when pressurized, carrying passengers, and aicraft oxygen is not available to the passengers. Compute at 1000 pounds per hour for time from the ETP to FSAFor LSAF using ETP ("T") time. If the computed fuel required for pressurization loss is less than Reserve (item 2) plus holding (item 4), then no additional entry required. If computed fuel exceeds the combined reserve fuel (item 2) and holding (item 4), add only the difference here.		
	STORED FUEL	Ramp fuel for succeeding legs without refueling.		
	OFF-COURSE MANEUVERS	Fuel for anticipated off-course maneuvering for terrain clearance, thunderstorm avoidance, ATC requirements. Compute at 60 pounds per minute for departure, 40 pounds per minute for en route fuel.		
	ICING	500 pounds for each hour of anticipated icing.		
	COMMANDO SOLO LOITER	Add 200 lbs per hour for time spent at loiter speed for Commando Solo mission execution Entry only required for Commando Solo aircraft.		
	KNOWN DELAYS OR HOLDING	Fuel for anticipated or planned delays or excess holding time. Compute at terminal fuel flow. EC-130 mission orbit delay fuel is normally included in en route fuel (item 1).		
	INSUFFICIENT OR UNRELIABLE NAVAIDS	1000 pounds maximum. Add for insufficient or unreliable NAVAIDS at destination.		
7. STTO		Fuel for Start Engines, Taxi and Takeoff. Normally 800 pounds. For known taxi delays or additional engine-running ground time in excess of 30 minutes, add an additional 30 pounds per minute.		
8. UNIDENTIFIED EXTRA		Difference between required ramp and actual ramp fuel. Normally, should not exceed 2000 pounds for fuel conservation purposes.		
9. REQUIRED OVER DESTINATION		Total of items 3 (alternate or missed approach), item 4 (holding), and item 5 (approach and landing). Entry will never be less than 6000 pounds.		
10. BURNOFF		Total en route fuel (item 1), plus STTO (item 7), plus identified extra fuel (item 6) except stored fuel, plus 800 pounds approach fuel when required. Entry optional.		

12.4. Fuel Analysis. When the mission does not include in-flight refueling, crews will perform fuel analysis using the top portion of the approved CFPS Flight and Fuel Plan (without AAR) (193 SOW Form 4138). When an in-flight refueling (single or double A/R) is planned, crews will use the AF Form 4139 in conjunction with the approved CFPS Flight and Fuel Plan (193 SOW SINGLE/DOUBLE A/R Form 4138) to perform the fuel analysis. With the exception of those items explained in this chapter, all items required for computer generated Form 4138 fuel analysis are explained in the Fuel Load Components chart as outlined in **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.5. Fuel Analysis (without AAR) (193 SOW 4138). See **Figure 12.2** and **Figure 12.3**, for an example of a CFPS Flight and Fuel Analysis (without AAR) (193 SOW 4138) from CYYT to EGUN.

12.5.1. T/O GROSS WT. Subtract 800 for Start Taxi and take off from RAMP WT.

12.5.2. RESERVE (Block 2). Calculate at terminal fuel flow (TFF) for ten percent of the total flight time (not to exceed 45 minutes), or 20 minutes whichever is greater, for flights that do not include an in-flight refueling. **Note:** If 10% of your total flight time exceeds 45 minutes (i.e., 48 minutes), use 45 minutes. If 10% of your total flight time is less than 20 minutes (i.e., 15 minutes), use 20 minutes.

12.5.3. ALTERNATE (Block 3). Plan alternate fuel using CFPS generated fuel data for the desired altitude and airspeed profile or calculate using TFF procedures.

12.5.4. APPROACH (Block 4). Normally enter 0.0 lbs when an en route descent will be accomplished at the destination. When planning to accomplish an approach from overhead destination at a cruise or intermediate altitude, a 700-pound approach fuel entry is required. Refer to **Paragraph 12.1.5** for additional information. **Note:** The Approach (APCH) feature in CFPS will be used to enter the required holding fuel (2,000 or 3,500 lbs) on the final destination line of the CFPS flight plan; not for entering the approach fuel (0.0 or 700 lbs).

12.5.5. INDENT EXTRA (Block 6). The identified extras used IAW **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components

12.5.6. ACTUAL FUEL (Block 7). Use the fuel planned for on-load on the ramp.

12.5.7. REQ FUEL (Block 8). Add blocks 1+2+3+4+5+6 to get fuel required to legally fly the mission.

12.5.8. UNIDENT EXTRA (Block 9). Subtract Block 8 from Block 7 to get unidentified extra fuel. Unidentified extra fuel must be 0 or greater to be legal to fly the mission.

12.5.9. REQ O/H FUEL (Block 10). Add Blocks 3+4+5+ holding fuel to get required fuel overhead the destination.

12.5.10. EXCESS FUEL. Subtract Fuel over the destination (fuel remain at the waypoint line above the destination on the CFP) from REQ O/H FUEL (Block 10).

Figure 12.2. CFPS Flight and Fuel Plan (Without AAR) (193 SOW Form 4138).

CFPS Verion 4.1 FLIGHT PLAN for the EC130J (Supe
Route: X:\Common Drive\01_Routes\PERSONAL

MASTER

Date Flt Plan Printed: 201005110825

ROUTE DATE: 11 MAY 10	INIT ALIGNMENT: N/S:	ACFT TYPE and #: EC-130J (SJ) 1933	BASIC WT: 86500	1. FUEL BURN: 26066 (INC STTO & HOLDING)	6. INDENT EXTRA: OFFCOURSE 45min 1.8 // ICING 1hr 0.5
DAFIF DATE: 6 MAY 10	W/E:	DRAG INDEX: 0.00	CARGO WT: 0	2. RESERVE: (127min) TFF: 3.9/hr 1.8	7. ACTUAL FUEL: 42.0
CALL SIGN: BATON 53	P HDG / MAG / CP HDG / /	EXCESS FUEL: ACTUAL O/H FUEL-BLK 10 17.9 - 9.2 = 8.7	OPERATING WT: 86.5	3. ALTERNATE: 3.2	8. REQ FUEL (1+2+3+4+5+6) 37.4
			RAMP FUEL: 42000	4. APPROACH: 0.0 or ~~0.7~~	9. UNIDENT EXTRA: 4.6
Pilot: CHARES	NAV CHECK:	INAV DELTA:	RAMP WT: 128500	5. LANDING 4.0	10. REQ O/H FUEL (3+4+5+HOLDING) 9.2
			T/O GROSS WT: (-.8) 127.7		

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
	CYYT/A ST JOHNS INTL		N 47 37.12 W052 45.15	461M +0C 19.6W	258/038 0	017 017 357	0 0		+00 +00			2050 05+55	41200	8.7	32.5		
CZQX	NOVEP/W NOVEP		N 47 49.73 W051 00.00	25000M +5C 19.4W	270/030 -1	100 099 080	72 72	210 310 340	+17 +17			1978 05+38	4043 39443	8.7	30.7		
			N 48 10.00 W050 00.00	25000M +5C 20.3W	270/030 -3	082 080 063	45 117	210 310 336	+08 +25			1933 05+30	4039 38901	8.7	30.2		
			N 49 30.00 W045 00.00	25000M +4C 19.7W	270/030 -2	086 084 066	214 331	210 310 337	+38 01+03			1719 04+52	4023 36351	8.7	27.7		
			N 50 35.00 W040 00.00	25000M +4C 18.6W	270/030 -2	089 087 069	204 535	210 310 338	+36 01+40			1515 04+16	3996 33939	8.7	25.2		
			N 51 25.00 W035 00.00	25000M +4C 17.1W	270/030 -2	092 090 073	196 731	210 310 339	+35 02+14			1319 03+41	3972 31640	8.7	22.9		
EGGX			N 52 05.00 W030 00.00	25000M +3C 15.3W	240/090 5	093 098 076	191 922	210 310 396	+29 02+43			1128 03+12	3952 29735	8.7	21.0		
			N 52 40.00 W025 00.00	25000M +3C 13.4W	240/090 5	093 097 077	187 1109	210 310 395	+28 03+12			941 02+44	3936 27870	8.7	19.2		
			N 53 00.00 W020 00.00	25000M +3C 11.3W	240/090 6	095 101 082	183 1292	211 310 392	+28 03+40			758 02+16	3919 26040	8.7	17.3		
EISN	MALOT/W MALOT		N 53 00.00 W015 00.00	25000M +2C 8.1W	240/090 8	099 107 088	181 1473	211 310 387	+28 04+08			577 01+47	3902 24211	8.7	15.5		
	BURAK BURAK		N 53 00.00 W012 00.00	25000M +2C 7.7W	240/090 8	097 105 089	109 1582	211 310 386	+17 04+25			468 01+30	3888 23115	8.7	14.4		

193 SOW FORM 4138

Figure 12.3. CFPS Flight and Fuel Plan (Without AAR) (193 SOW Form 4138).

Route: X:\Common Drive\01_Routes\PERSONAL

Date Flt Plan Printed: 201005110825

AR FIR RMKS	IDENT FIX	RTE	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ T	FOB/ INAV DELTA	EXTRA FUEL +/-
	SHA	UL9	080X	N 52 43.26	25000M	270/040	* 105	* 115	* 211	+20			354	3878				
	SHANNON		113.30	W008 53.11	+2C	1	106	1696	310	04+44			01+11	21845	8.7	13.1		
					5.9W		097		350									
	ABAGU	UL9		N 52 30.20	25000M	270/040	* 112	* 47	* 211	+08			307	3870				
	ABAGU			W007 38.80	+2C	2	114	1743	310	04+53			01+03	21321	8.7	12.6		
					5.6W		106		348									
	DIMUS	UL9		N 52 14.38	25000M	270/040	* 112	* 54	* 211	+09			253	3866				
	DIMUS			W006 15.08	+2C	2	114	1797	310	05+02			+53	20725	8.7	12.0		
					5.0W		107		348									
EGGT	SLANY	UL9		N 52 09.52	25000M	270/040	* 113	* 16	* 211	+03			237	3863				
	SLANY			W005 50.53	+2C	2	115	1813	310	05+05			+51	20549	8.7	11.8		
					4.8W		108		348									
	STU	UL9	078X	N 51 59.68	25000M	270/040	* 113	* 31	* 211	+05			206	3861				
	STRUMBLE		113.10	W005 02.42	+2C	2	115	1844	310	05+10			+45	20202	8.7	11.5		
					3.7W		108		348									
	HON		083Y	N 52 21.40	25000M	270/040	* 082	* 127	* 211	+22			79	3854				
	HONILEY		113.65	W001 39.82	+2C	-1	081	1971	310	05+32			+24	18804	8.7	10.1		
					2.4W		079		349									
	EBOTO	UP155		N 52 21.55	25000M	270/040	* 092	* 36	* 211	+06			44	3847				
	EBOTO			W000 41.67	+2C	0	092	2006	310	05+38			+17	18412	8.7	9.7		
					2.8W		089		350									
	BANTO	UP155		N 52 21.47	25000M	270/040	* 093	* 17	* 211	+03			27	3845				
	BANTO			W000 13.95	+2C	0	093	2023	310	05+41			+15	18225	8.7	9.5		
					2.6W		090		350									
	SIVDA	UP155		N 52 21.37	25000M	270/040	* 093	* 10	* 211	+02			17	3844				
	SIVDA			E000 01.78	+1C	0	093	2033	310	05+42			+13	18119	8.7	9.4		
					2.5W		090		350									
	MLD/T		106X	N 52 21.80	25000M	270/040	* 091	* 17	* 211	+03			0	3843				
	MILDENHALL			E000 29.30	+1C	0	091	2050	310	05+45			+10	17934	8.7	9.2		
					1.6W		088		350									
	DVT			N 55 30.57	20000M		* 320	* 261	* 270	00+58				DIVERT FUEL		* FUEL O/H DIVERT *		
	LINE			W004 35.20	+1C				270					- 3345				
	EGPK/A				4.2W													
	PRESTWICK																	
	EGUN/A			N 52 21.72	33M	270/040	* 222	* 0	*	+10			0					
	MILDENHALL			E000 29.18	+0C	6	228	2050		05+55			+00	15934	8.7	7.2		
					1.6W		221											

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12.6. Fuel Analysis (Single In-Flight Refueling) AF Form 4139. The AF Form 4139 is applicable to both single and double in-flight refueling planning. The EAR #1 TO EAR #2 and

EAR #2 TO A/R #2 ABORT BASE sections of this form are not applicable to single in-flight refueling planning. All items are self-explanatory except as noted below. See **Figure 12.4** through **12.7**. CFPS Flight and Fuel Plan (Single A/R) (193 SOW SINGLE A/R Form 4138) and **Figure 12.8**, AF Form 4139, *Fuel Plan (Single in-Flight Refueling)*, for an example of fuel analysis for a mission from KMDT to ETAR.

12.6.1. AF Form 4139 (Single In-Flight Refueling) entries:

12.6.1.1. Item A, OPERATING WEIGHT, is the basic aircraft operating weight plus the cargo/pax weight. **Note:** Ensure the aircraft gross weight does not exceed allowable limits for either ground or air refueling operations, without proper waiver authority.

12.6.2. TAKEOFF TO EAR #1 Section:

12.6.2.1. EN ROUTE (item 1). Time and fuel from TAKEOFF to EAR #1. Calculate en route fuel from T/O to EAR using the flight planned cruise profile from takeoff to the EAR point.

12.6.2.2. STTO (Start, Taxi and Takeoff) (Item 2). Always use 800 lbs.

12.6.2.3. IDENTIFIED EXTRA (item 3). IAW with **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.6.2.4. RESERVE (item 5). 10% of the total flight time from takeoff to end air refueling, 45 minutes maximum. Reserves are calculated using the EAR terminal fuel flow.

12.6.2.5. TOTAL (Item 6). Burn off + Reserves.

12.6.2.6. FUEL AT EAR #1 (No On-load) B-6, (item 7). Fuel remaining at the EAR #1, does not include the in-flight A/R on-load.

12.6.2.7. PLANNED EAR #1 FUEL (item 8). Planned fuel at EAR #1 including the planned fuel on-load.

12.6.3. EAR #1 TO A/R #1 ABORT BASE Section:

12.6.3.1. Complete in the event of an unsuccessful fuel transfer. 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 AFI 11-202, Vol 3.

12.6.3.2. EN ROUTE (item 9). Time and fuel from EAR to the abort base.

12.6.3.3. RESERVE (item 10). 10% of the total flight time from EAR to abort base. The combined total for item 5 plus item 10 should not exceed 45 minutes. If the combined total exceeds 45 minutes, add only the balance for a total of 45 minutes in this block. Likewise, if the total for items 5 plus 10 is not at least 20 minutes, use a value in item 10 to bring the total to a minimum of 20 minutes.

12.6.3.4. A/R #1 ABORT ALTERNATE (item 11). Optional entry. If an abort alternate is required, another CFP is required to calculate the fuel and time to the A/R abort alternate.

12.6.3.5. HOLDING (item 12). Normally 2,000 pounds, except when an alternate is not available, or locations in Alaska, or at latitudes greater than 59° North or South, use

3,500 pounds. Alternately, may compute this using terminal fuel flow for 30/45 minutes respectively.

12.6.3.6. PLANNED RAMP FUEL (item 16). Must be sufficient to meet the requirements of (item 17, required ramp fuel) and the requirements of Section V fuel planning.

12.6.3.7. REQUIRED RAMP FUEL (item 17). Fuel required from departure to the end air refueling point and continue to the A/R abort base with required reserves, in the event of an unsuccessful fuel transfer during the A/R. Includes fuel required to fly the entire air refueling track without a successful fuel transfer.

12.6.3.8. UNIDENTIFIED EXTRA (item 18). Does not need to meet the normal requirement (not to exceed 2,000 pounds), since item 8 (Planned EAR #1 Fuel) must be sufficient to meet EAR to Destination section fuel requirements. If unidentified extra fuel is excessive, consideration should be given to reducing the proposed ramp fuel and increasing the proposed A/R on-load if possible. To have a legal flight, unidentified extra fuel must be 0 or greater.

12.6.4. EAR #1 TO EAR #2. Not applicable to single in-flight refueling missions.

12.6.5. EAR #2 TO A/R #2 ABORT BASE. Not applicable to single in-flight refueling missions.

12.6.6. EAR TO DESTINATION section:

12.6.6.1. Items separated by a diagonal (/) in this section are applicable to both single and double in-flight refueling missions. The item letter or number prior to the diagonal (/) applies to single in-flight refueling planning.

12.6.6.2. EN ROUTE (item 38). Time and fuel from end air refueling to overhead final destination. Use the planned cruise profile for fuel calculations.

12.6.6.3. RESERVE (item 39). 10% of the total flight time from EAR #2 to destination, not to exceed 45 minutes or 20 minutes whichever is greater. **Note:** If ten percent of your total flight time exceeds 45 minutes (i.e., 48 minutes), use 45 minutes. If 10% of your total flight time is less than 20 minutes (i.e., 15 minutes), use 20 minutes.

12.6.6.4. HOLDING (item 41). Normally 2,000 pounds, except when an alternate is not available, or locations in Alaska, or at latitudes greater than 59° North or South, use 3,500 pounds. Alternately, may compute this using terminal fuel flow for 30/45 minutes respectively. **Note:** The Approach (APCH) feature in CFPS is used to enter the required holding fuel (2,000 or 3,500 lbs) on the final destination line of the CFPS flight plan; not for entering the approach fuel (0.0 or 700 lbs).

12.6.6.5. APPROACH / LANDING (Block 42). Normally, only enter 4,000 lbs landing fuel when an en route descent will be accomplished at the destination. When planning to accomplish an approach from overhead destination at a cruise or intermediate altitude, 4,000 lbs landing fuel plus a 700-pound approach fuel entry is required (i.e. 4,700 lbs). Refer to **Paragraph 12.1.5** for additional information.

12.6.6.6. REQUIRED EAR TO DEST (item 44). This is the actual fuel, including reserves, required at the EAR point to fly to the destination. Do not exceed the aircraft maximum gross weight limit established in the applicable flight manual.

12.6.6.7. REQUIRED FUEL AT EAR (PRIOR TO ON-LOAD) (item 47). The difference between the required EAR to destination fuel (item 44) and planned fuel on-load from the tanker (item 45).

12.6.6.8. UNIDENTIFIED EXTRA (Item 48). Subtract required fuel at EAR (prior to on-load) (item 47) from the planned fuel at EAR (item 46). This value equals the extra fuel carried or additional fuel required (if negative) from the EAR to Destination. When negative, additional fuel must be added to ramp fuel, planned A/R on-load from the tanker, or in some situations may require moving the air refueling track or adding a second refueling.

Figure 12.4. CFPS Flight and Fuel Plan (Single A/R) (193 SOW SINGLE A/R Form 4138).

CFPS Verion 4.1 FLIGHT PLAN for the EC130J (Super J)
Route: X:\Common Drive\01_Routes\PERSONAL

Master

Date Flt Plan Printed: 201005101304

ROUTE DATE: 10 MAY 10	ACFT #: 99-1933	BASIC WT: 86500	COMPUTED EXCESS FOR AF FORM 4138 INFLIGHT FUEL MANAGEMENT			
DAFIF DATE: 8 APR 10	DRAG INDEX: 0.00	CARGO WT: 25000	TAKEOFF TO EAR	TAKEOFF TO A/R ABORT	EAR TO DESTINATION	
INIT ALIGNMENT:	P HDG / MAG / CP HDG	OPERATING WT: 111.5	CFPS EAR FUEL: (NO ONLOAD) 19.4	CFPS O/H DIVERT: (NO ONLOAD) 14.1	CPFS O/H DEST: 14.0	
N/S		RAMP FUEL: 42000				
W/E	NAV CHECK:	RAMP WT: 153500	AF FORM 4139 ITEM 47: - 14.1	AF FORM 4139 ITEM 19: - 6.0	AF FORM 4139 ITEM 49: - 6.9	
PILOT: Charbs	INAV DELTA:	T/O GROSS WT: 152.7	EXCESS 5.3	EXCESS 8.1	EXCESS 7.1	

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
	KMDT/A HARRISBURG IN		N 40 11.59 W076 45.76	310M +0C 11.3W	0	128 128 117	0 0		+00 +00			3481 11+40	41200	5.3	35.9		
	MAALS MAALS		N 40 19.31 W076 16.18	14290M +0C 11.6W	0	083 083 071	24 24	N/A N/A N/A	+07 +07			3457 11+32	8084 40198	5.3	34.9		
	SUZIE J80 SUZIE		N 40 27.20 W075 58.37	19555M +0C 11.8W	0	072 072 060	16 40	N/A N/A N/A	+04 +12			3441 11+28	6459 39739	5.3	34.4		
	ETX J80 EAST TEXAS	039X 110.20	N 40 34.86 W075 41.05	23041M +0C 12.1W	0	072 072 060	15 55	N/A N/A N/A	+04 +16			3426 11+24	5773 39369	5.3	34.1		
	ELIOT J80 ELIOT		N 40 49.11 W075 07.81	25000M +0C 12.5W	0	073 073 061	29 84	212 310 310	+06 +22			3397 11+18	4424 38867	5.3	33.6		
	SAX J80 SPARTA	104X 115.70	N 41 04.05 W074 32.30	25000M +0C 12.9W	0	074 074 061	31 115	212 310 310	+06 +28			3366 11+12	4418 38428	5.3	33.1		
	GANDE J80 GANDE		N 41 30.61 W073 48.87	25000M +0C 13.5W	0	064 064 051	42 157	212 310 310	+08 +36			3324 11+04	4409 37829	5.3	32.5		
	BIGGO J80 BIGGO		N 41 57.35 W073 04.08	25000M +0C 14.0W	0	065 065 051	43 200	212 310 310	+08 +44			3281 10+56	4399 37220	5.3	31.5		
	BAF J80 BARNES	077X 113.00	N 42 09.72 W072 42.97	25000M +0C 14.3W	0	066 066 052	20 220	212 310 310	+04 +48			3261 10+52	4391 36937	5.3	31.6		
	BGR J80 BANGOR	095X 114.80	N 44 50.51 W068 52.44	25000M +0C 16.9W	0	062 062 046	232 452	212 310 310	+45 01+33			3029 10+07	4361 33668	5.3	28.4		
	TOPPS J581 TOPPS		N 45 20.41 W067 44.32	25000M +0C 17.7W	0	075 075 058	57 509	212 310 310	+11 01+44			2972 09+56	4328 32875	5.3	27.6		

193 SOW SINGLE A/R FORM 4138

Figure 12.5. CFPS Flight and Fuel Plan (Single A/R) (193 SOW SINGLE A/R Form 4138).

Route: X:\Common Drive\01_Routes\PERSONAL — Date Flt Plan Printed: 201005101304

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
CZQM	YFC52 J581 YFC/R261052	077X 113.00	N 45 27.38 W067 29.15	25000M +0C 17.8W	0	* 075 075 057	* 13 522	* 212 310 310	+02 01+46			2960 09+53	4320 32697	5.3	27.4		
	YFC J581 FREDERICTON	077X 113.00	N 45 53.72 W066 25.13	25000M +0C 18.2W	0	* 077 077 060	* 52 574	* 212 310 310	+10 01+56			2908 09+43	4312 31973	5.3	26.7		
	YGR J581 GRINDSTONE	057X 112.00	N 47 25.82 W061 46.44	25000M +0C 19.7W	0	* 083 083 064	* 213 787	* 212 310 310	+41 02+38			2695 09+02	4283 29032	5.3	23.7		
	YJT J581 STEPHENVILLE	078X 113.10	N 48 34.95 W058 40.15	25000M +0C 20.4W	0	* 081 081 061	* 143 929	* 212 310 310	+28 03+05			2552 08+35	4245 27075	5.3	21.8		
	YQX J581 GANDER	074X 112.70	N 48 53.98 W054 32.09	25000M +0C 20.4W	0	* 104 104 083	* 165 1095	* 212 310 310	+32 03+37			2386 08+03	4214 24828	5.3	19.5		
COAS	KOBEV/W KOBEV		N 49 40.17 W051 28.02	25000M +0C 20.3W	0	* 089 089 069	* 129 1224	* 212 310 310	+25 04+02			2257 07+38	4186 23085	5.3	17.8		
ST DESC	50 WEST		N 50 00.00 W050 00.00	25000M +0C 20.2W	0	* 091 091 071	* 60 1284	* 212 310 310	+12 04+14			2197 07+26	4168 22274	5.3	17.0		
RVIP	RVIP		N 50 25.00 W048 04.00	9000M +0C 19.9W	0	* 092 092 072	* 79 1363	* N/A N/A N/A	+16 04+30			2118 07+10	1304 21511	5.3	16.2		
RVCP	RVCP		N 50 36.00 W047 11.00	9000M +0C 19.6W	0	* 092 092 072	* 36 1398	* 215 245 245	+09 04+39			2083 07+01	4288 20888	5.3	15.6		
	45 WEST EAR		N 51 00.00 W045 00.00	10000M +0C 19.4W	0	* 093 093 074	* 87 1485	* 210 243 243	+21 05+00			1996 06+40	4136 19416	5.3	14.1		
A/R DVT	CFPS Fuel Onload: 22584		EAR FUEL-R (NO ONLOAD) - DVT FUEL = OH DVT							EAR FUEL-R (NO ONLOAD) + PLANNED ONLOAD = EAR FUEL WITH ONLOAD 19.4+22.6 = 42.0				ONLOAD + 22.6 / 42.0		DIVERT FUEL - 5308 / O/H DIVERT 14.1	
	CYYT/A ST JOHNS INT		N 47 37.12 W052 45.15	22000M +0C 19.6W		* 259	* 366	* 282 282	01+19								
	.onload 22584 lbs		N 51 00.00 W045 00.00	10000M +0C 19.4W	0	* 093 093 074	* 0 1485	* 210 243 243	+00 05+00			1996 06+40	4136 42000	7.1	34.9		
	40 WEST		N 52 00.00 W040 00.00	25000M +0C 18.3W	0	* 091 091 073	* 197 1682	* 212 310 310	+42 05+42			1800 05+58	4434 38500	7.1	31.4		
SHAN EGGX	30 WEST		N 53 00.00 W030 00.00	25000M +0C 14.8W	0	* 097 097 081	* 371 2053	* 212 310 310	01+12 06+54			1428 04+46	4371 33265	7.1	26.2		

193 SOW SINGLE A/R FORM 4138

Figure 12.6. CFPS Flight and Fuel Plan (Single A/R) (193 SOW SINGLE A/R Form 4138).

Route: X:\Common Drive\01_Routes\PERSONAL

Date Flt Plan Printed: 201005101304

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
	20 WEST		N 53 15.00 W020 00.00	25000M +0C 10.6W	0	* 100 100 088	* 361 2414	* 212 310 310	01+10 08+03			1067 03+36	4287 28266	7.1	21.2		
	MALOT MALOT		N 53 00.00 W015 00.00	25000M +0C 8.4W	0	* 104 104 095	* 181 2596	* 212 310 310	+35 08+39			885 03+01	4230 25792	7.1	18.7		
	BURAK UL9 BURAK		N 53 00.00 W012 00.00	25000M +0C 7.1W	0	* 097 097 090	* 109 2704	* 212 310 310	+21 09+00			777 02+40	4201 24318	7.1	17.2		
	UNBEG UL9 UNBEG		N 52 48.30 W009 43.80	25000M +0C 6.1W	0	* 104 104 098	* 83 2788	* 212 310 310	+16 09+16			693 02+24	4183 23194	7.1	16.1		
	SHA UL9 SHANNON	080X 113.30	N 52 43.26 W008 53.11	25000M +0C 5.7W	0	* 105 105 099	* 31 2819	* 212 310 310	+06 09+22			662 02+18	4172 22774	7.1	15.7		
	ABAGU UL9 ABAGU		N 52 30.20 W007 38.80	25000M +0C 5.1W	0	* 111 111 106	* 47 2866	* 212 310 310	+09 09+31			615 02+09	4165 22141	7.1	15.0		
	ROPED UL9 ROPED		N 52 18.50 W006 36.28	25000M +0C 4.6W	0	* 112 112 107	* 40 2906	* 212 310 310	+08 09+39			575 02+01	4156 21604	7.1	14.5		
	DIMUS UL9 DIMUS		N 52 14.38 W006 15.08	25000M +0C 4.5W	0	* 112 112 108	* 14 2920	* 212 310 310	+03 09+41			561 01+58	4151 21421	7.1	14.3		
LOND EGTT	SLANY UL9 SLANY		N 52 09.52 W005 50.53	25000M +0C 4.3W	0	* 112 112 108	* 16 2936	* 212 310 310	+03 09+44			545 01+55	4149 21209	7.1	14.1		
	STU UL9 STRUMBLE	078X 113.10	N 51 59.68 W005 02.42	25000M +0C 3.7W	0	* 112 112 108	* 31 2967	* 212 310 310	+06 09+50			514 01+49	4144 20791	7.1	13.7		
	DIKAS UL9 DIKAS		N 51 46.62 W003 15.55	25000M +0C 3.2W	0	* 104 104 101	* 67 3034	* 212 310 310	+13 10+04			447 01+36	4135 19891	7.1	12.6		
	BASET UL9 BASET		N 51 33.83 W001 42.60	25000M +0C 2.6W	0	* 105 105 102	* 59 3094	* 212 310 310	+11 10+15			387 01+25	4124 19103	7.1	12.0		
	KENET UL9 LON/E277037	083X 113.60	N 51 31.23 W001 27.30	25000M +0C 2.5W	0	* 107 107 105	* 10 3104	* 212 310 310	+02 10+17			378 01+23	4118 18971	7.1	11.9		
	CPT UL9 COMPTON	090Y 114.35	N 51 29.50 W001 13.18	25000M +0C 2.1W	0	* 103 103 101	* 9 3113	* 212 310 310	+02 10+19			369 01+21	4116 18852	7.1	11.8		
	NORRY UL9 BNN/E239026	084Y 113.75	N 51 28.78 W001 07.40	25000M +0C 2.3W	0	* 103 103 101	* 4 3116	* 212 310 310	+01 10+19			365 01+20	4115 18803	7.1	11.7		

193 SOW SINGLE A/R FORM 4138

Figure 12.7. CFPS Flight and Fuel Plan (Single A/R) (193 SOW SINGLE A/R Form 4138).

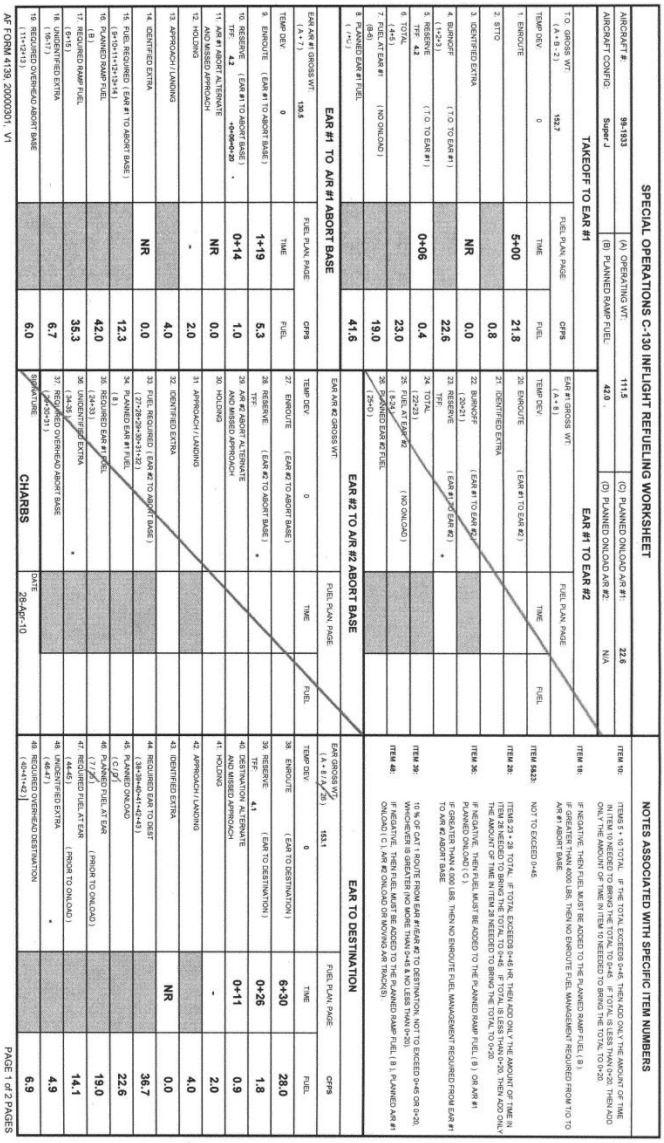
Route: X:\Common Drive\01_Routes\PERSONAL

Date Flt Plan Printed: 201005101304

AR FIR RMKS	IDENT RTE FIX	TAC VOR	LAT LON	ALT TD VAR	W/V DCA	MC MH TC	ZD TD	IAS TAS GS	ZT TT	ETA RETA	ATA	TDR TTR	F-FLOW FUEL-R	EXCESS FUEL	FUEL REQ AT WPT	FOB/ INAV DELTA	EXTRA FUEL +/-
	LINDY UL9 CPT/E105007	090Y 114.35	N 51 28.23 W001 02.95	25000M +0C 2.3W	0	103 103 101	3 3119	212 310 310	+01 10+20			362 01+20	4115 18765	7.1	11.7		
	BIG UL9 BIGGIN	098X 115.10	N 51 19.85 E000 02.09	25000M +0C 1.6W	0	103 103 102	42 3161	212 310 310	+08 10+28			320 01+12	4111 18214	7.1	11.1		
	DVR UL9 DOVER	096Y 114.95	N 51 09.75 E001 21.55	25000M +0C 1.1W	0	103 103 101	51 3212	212 310 310	+10 10+38			270 01+02	4103 17540	7.1	10.4		
BRUS EBUR	KONAN UL9 KONAN		N 51 07.85 E002 00.00	25000M +0C 1.2W	0	095 095 094	24 3236	212 310 310	+05 10+43			245 +57	4097 17219	7.1	10.1		
	KOK UL607 KOKSY	092X 114.50	N 51 05.68 E002 39.10	25000M +0C 0.7W	0	096 096 095	25 3261	212 310 310	+05 10+47			220 +53	4093 16892	7.1	9.8		
	BFS TG1 FLORENNES	052X	N 50 14.48 E004 39.18	25000M +0C 0.1E	0	124 124 124	92 3353	212 310 310	+18 11+05			128 +35	4084 15680	7.1	8.6		
RHEI EDUU	NTM16 TG1 NTM/R283016	100X 115.30	N 50 04.51 E006 07.71	25000M +0C 0.3E	0	100 100 100	58 3410	212 310 310	+11 11+16			71 +24	4072 14921	7.1	7.8		
	NTM TG1 NATTENHEIM	100X 115.30	N 50 00.95 E006 31.91	25000M +0C 0.6E	0	102 102 103	16 3426	212 310 310	+03 11+19			55 +20	4067 14711	7.1	7.6		
	RMS/T RAMSTEIN	081X	N 49 26.08 E007 35.14	25000M +0C 1.0E	0	129 129 130	54 3480	212 310 310	+10 11+30			1 +10	4061 14005	7.1	6.9		
A/R DVT	CFPS			EAR FUEL-R (NO ONLOAD) - DVT FUEL = OH DVT						EAR FUEL-R (NO ONLOAD) + PLANNED ONLOAD = EAR FUEL WITH ONLOAD				ONLOAD + N/A		DIVERT FUEL - 880	
	EDDF/A FRANKFURT MA		N 50 01.59 E008 32.59	10000M +0C 1.2E		045	51	260 260	00+11					N/A		O/H DIVERT 6.0	
	ETAR/A RAMSTEIN AB		N 49 26.17 E007 36.39	781M +0C 1.0E	0	083 083 084	1 3481		+10 11+40			0 +00	12005				

193 SOW SINGLE A/R FORM 4138

Figure 12.8. AF Form 4139, Fuel Plan (Single AAR).



SPECIAL OPERATIONS C-130 INFLIGHT REFUELING WORKSHEET

AIRCRAFT #	99-1933	(A) OPERATING WT:	111.5
AIRCRAFT CONFIG:	Super J	(B) PLANNED RAMP FUEL:	42.0
(C) PLANNED ONLOAD A/R #1:	22.6	(D) PLANNED ONLOAD A/R #2:	N/A

TAKEOFF TO EAR #1			EAR #1 TO EAR #2		
T.O. GROSS WT: (A+B-2)	152.7	FUEL PLAN. PAGE	EAR #1 GROSS WT: (A+B)		FUEL PLAN. PAGE
TEMP DEV	0	TIME	TEMP DEV		TIME
1. ENROUTE		5+00	20. ENROUTE	(EAR #1 TO EAR #2)	
2. ETTO		21.8	21. IDENTIFIED EXTRA		
3. IDENTIFIED EXTRA		NR	22. BURNOFF (1+2+3)	(EAR #1 TO EAR #2)	
4. BURNOFF (1+2+3)	(T.O. TO EAR #1)	22.6	23. RESERVE TFF: 4.2	(EAR #1 TO EAR #2)	*
5. RESERVE TFF: 4.2	(T.O. TO EAR #1)	0+06	24. TOTAL (22+23)		
6. TOTAL (4+5)		0.4	25. FUEL AT EAR #2 (B-6)	(NO ONLOAD)	
7. FUEL AT EAR #1 (B-6)	(NO ONLOAD)	23.0	26. PLANNED EAR #2 FUEL (25+0)		
8. PLANNED EAR #1 FUEL (7+C)		19.0			
		41.6			

EAR #1 TO A/R #1 ABORT BASE			EAR #2 TO A/R #2 ABORT BASE		
EAR A/R #1 GROSS WT: (A+7)	130.6	CFPS	EAR A/R #2 GROSS WT:	0	CFPS
TEMP DEV	0	FUEL PLAN. PAGE	TEMP DEV		FUEL PLAN. PAGE
9. ENROUTE (EAR #1 TO ABORT BASE)		TIME	27. ENROUTE (EAR #2 TO ABORT BASE)		TIME
10. RESERVE TFF: 4.2 (EAR #1 TO ABORT BASE)	+0+0+0+20	1+19	28. RESERVE TFF: (EAR #2 TO ABORT BASE)	*	
11. A/R #1 ABORT ALTERNATE AND MISSED APPROACH	*	5.3	29. A/R #2 ABORT ALTERNATE AND MISSED APPROACH		
12. HOLDING		0+14	30. HOLDING		
13. APPROACH / LANDING		1.0	31. APPROACH / LANDING		
14. IDENTIFIED EXTRA		NR	32. IDENTIFIED EXTRA		
15. FUEL REQUIRED (EAR #1 TO ABORT BASE) (9+10+11+12+13+14)		4.0	33. FUEL REQUIRED (EAR #2 TO ABORT BASE) (27+28+29+30+31+32)		
16. PLANNED RAMP FUEL (B)		0.0	34. PLANNED EAR #1 FUEL (8)		
17. REQUIRED RAMP FUEL (15-16)		12.3	35. REQUIRED EAR #2 FUEL (34+33)		
18. UNIDENTIFIED EXTRA (16-17)		42.0	36. UNIDENTIFIED EXTRA (35-33)		
19. REQUIRED OVERHEAD ABORT BASE (11+12+13)		35.3	37. REQUIRED OVERHEAD ABORT BASE (29+30+31)	*	
		6.7	SIGNATURE	CHARBS	DATE 26-Apr-10
		6.0			

EAR TO DESTINATION			
EAR GROSS WT: (A+B1/A/B2)	153.1	FUEL PLAN. PAGE	CFPS
TEMP DEV	0	TIME	FUEL
38. ENROUTE	(EAR TO DESTINATION)	6+30	28.0
39. RESERVE TFF: 4.1	(EAR TO DESTINATION)	0+26	1.8
40. DESTINATION ALTERNATE AND MISSED APPROACH		0+11	0.9
41. HOLDING		-	2.0
42. APPROACH / LANDING			4.0
43. IDENTIFIED EXTRA		NR	0.0
44. REQUIRED EAR TO DEST (38+39+40+41+42+43)			36.7
45. PLANNED ONLOAD (C)			22.6
46. PLANNED FUEL AT EAR (7/J)	(PRIOR TO ONLOAD)		19.0
47. REQUIRED FUEL AT EAR (44-45)	(PRIOR TO ONLOAD)		14.1
48. UNIDENTIFIED EXTRA (46-47)		*	4.9
49. REQUIRED OVERHEAD DESTINATION (40+41+42)			6.9

NOTES ASSOCIATED WITH SPECIFIC ITEM NUMBERS

ITEM 10: ITEMS 5 + 10 TOTAL. IF THE TOTAL EXCEEDS 0+45, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 10 NEEDED TO BRING THE TOTAL TO 0+45. IF TOTAL IS LESS THAN 0+20, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 10 NEEDED TO BRING THE TOTAL TO 0+20.

ITEM 18: IF NEGATIVE, THEN FUEL MUST BE ADDED TO THE PLANNED RAMP FUEL (B). IF GREATER THAN 4000 LBS, THEN NO ENROUTE FUEL MANAGEMENT REQUIRED FROM TIO TO A/R #1 ABORT BASE.

ITEM 0&23: NOT TO EXCEED 0+45.

ITEM 20: ITEMS 23 + 28 TOTAL. IF TOTAL EXCEEDS 0+45 HR, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 20 NEEDED TO BRING THE TOTAL TO 0+45. IF TOTAL IS LESS THAN 0+20, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 20 NEEDED TO BRING THE TOTAL TO 0+20.

ITEM 26: IF NEGATIVE, THEN FUEL MUST BE ADDED TO THE PLANNED RAMP FUEL (B) OR AR #1 PLANNED ONLOAD (C). IF GREATER THAN 4,000 LBS, THEN NO ENROUTE FUEL MANAGEMENT REQUIRED FROM EAR #1 TO A/R #2 ABORT BASE.

ITEM 39: 11% OF CAPT (ROUTE FROM MAP #1 EAR #2 TO DESTINATION, NOT TO EXCEED 0+45 OR 0+20, WHICHEVER IS GREATER) (NO ONLOAD, NO EAR #2 ONLOAD)

ITEM 46: IF NEGATIVE, THEN FUEL MUST BE ADDED TO THE PLANNED RAMP FUEL (B), PLANNED A/R #1 ONLOAD (C), A/R #2 ONLOAD OR MOVING A/R TRACK(S).

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12.7. Fuel Analysis (Double In-flight Refueling) AF Form 4139. The AF Form 4139 is applicable to both single and double in-flight refueling planning. All sections of this form are applicable to double in-flight refueling planning. All items are self-explanatory except as noted below. See **Figure 12.9**, AF Form 4139, *Fuel Plan (Double In-Flight Refueling)*, as an example of a double in-flight refueling fuel plan.

12.7.1. AF Form 4139 (Double In-Flight Refueling) entries:

12.7.1.1. Item A, OPERATING WEIGHT, is the basic aircraft operating weight plus the cargo/pax weight. **Note:** Ensure the aircraft gross weight does not exceed allowable limits for either ground or air refueling operations, without proper waiver authority IAW AFI 112EC130J, Vol 3.

12.7.2. TAKEOFF TO EAR #1 Section:

12.7.2.1. EN ROUTE (item 1). Time and fuel from TAKEOFF to EAR #1. Calculate en route fuel from T/O to EAR #1 using the flight planned cruise profile from takeoff to the EAR point.

12.7.2.2. IDENTIFIED EXTRA (item 3). IAW with **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.7.2.3. RESERVE (item 5). 10% of the total flight time from TAKEOFF TO EAR #1 not to exceed 45 minutes.

12.7.2.4. TOTAL (item 6). Total fuel required from TAKEOFF TO EAR #1. Does not include abort base fuel requirements.

12.7.2.5. FUEL AT EAR #1, no on-load (item 7). Fuel remaining at the EAR point. This item does not include the in-flight refueling on-load for A/R #1.

12.7.2.6. PLANNED EAR #1 FUEL (item 8). Fuel at EAR #1 including the planned fuel on-load. This fuel quantity must be sufficient to meet the fuel requirements of EAR #2 to A/R #2 Abort Base, Section, item 35, and EAR To Destination Section, item 47 (Required fuel at EAR #2 prior to on-load).

12.7.3. EAR #1 TO A/R #1 ABORT BASE Section:

12.7.3.1. Completed in the event of an unsuccessful fuel transfer for A/R #1. 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.

12.7.3.2. EN ROUTE (item 9). Time from and fuel from EAR #1 to the abort base. An abort base is required for all refueling tracks. Departure base may be used. Abort base must meet alternate airfield weather requirements.

12.7.3.3. RESERVE (item 10). 10% of the total flight time from EAR #1 to the abort base #1. The combined total for item 5 plus item 10 should not exceed 45 minutes. If the combined total exceeds 45 minutes, add only the balance for a total of 45 minutes in this block. Likewise if the total for items 5 plus 10 is not at least 20 minutes, use a value in item 10 to bring the total to a minimum of 20 minutes.

12.7.3.4. A/R #1 ABORT ALTERNATE (item 11). Optional entry. If an abort alternate is required, another CFP is required to calculate the fuel and time to the A/R abort alternate.

12.7.3.5. HOLDING (item 12). Normally 2,000 pounds, except when an alternate is not available, or locations in Alaska, or at latitudes greater than 59° North or South, use 3,500 pounds. Alternately, may compute this using terminal fuel flow for 30/45 minutes respectively.

12.7.3.6. PLANNED RAMP FUEL (item 16). Must be sufficient to meet the requirements of (item 17, required ramp fuel). Also refer to **Paragraphs 12.7.5.5** and **12.7.6.3**.

12.7.3.7. REQUIRED RAMP FUEL (item 17). This only considers the fuel required from departure to the end air refueling point and continue to the A/R abort base with

required reserves, in the event of an unsuccessful fuel transfer during the A/R. It includes fuel required to fly the entire air refueling track without a successful fuel transfer. It does not consider the planned ramp fuel needed to complete the fuel requirements to the A/R #2 abort base or the destination.

12.7.3.8. UNIDENTIFIED EXTRA (item 18). Does not need to meet the normal requirement (not to exceed 2,000 pounds), since item 8 (planned EAR #1 fuel) must be sufficient meet EAR #2 and A/R #2 Abort Base fuel requirements. If unidentified extra fuel is excessive, consideration should be given to reducing the proposed ramp fuel and increasing the proposed A/R on-load, if possible.

12.7.4. EAR #1 TO EAR #2 Section:

12.7.4.1. EN ROUTE (item 20). Time and fuel from EAR #1 to EAR #2. Use the planned cruise profile for fuel calculations.

12.7.4.2. IDENTIFIED EXTRA (item 21), IAW with **Figure 12.1**, AF Form 4138 and AF Form 4139, Fuel Load Components.

12.7.4.3. RESERVE (item 23). 10% of the total flight time from EAR #1 to EAR #2, not to exceed 45 minutes.

12.7.4.4. FUEL AT EAR #2, NO ON-LOAD (item 25). The planned fuel at EAR #1 minus the fuel required to fly from EAR #1 to EAR #2. This calculated fuel quantity is compared to the required fuel at EAR #2 prior to on-load (block number 47) to confirm sufficient fuel planned through EAR #2.

12.7.4.5. PLANNED EAR #2 FUEL (item 26). Do not exceed the aircraft maximum gross weight limit established in the applicable flight manual. End A/R aircraft gross weights greater than 155,000 pounds (SJ) will require waiver authority IAW AFI 11-2EC-130J, Vol 3, or MAJCOM waiver guidance.

12.7.5. EAR # 2 TO A/R #2 ABORT BASE Section:

12.7.5.1. Completed in the event of unsuccessful fuel transfer for A/R #2. An abort base is required for all refueling tracks. The designated abort base must meet alternate airfield weather requirements. This section is similar to the calculations for EAR #1 to A/R #1 Abort Base.

12.7.5.2. EN ROUTE (item 27). Time and fuel from EAR #2 to the abort base. An abort base is required for all refueling tracks.

12.7.5.3. RESERVE (item 28). 10% of the total flight time from EAR #2 to Abort Base #2. Combined total for item 23 plus item 28 should not exceed 45 minutes. If the combined total exceeds 45 minutes, add only the balance for a total of 45 minutes in this block. Likewise if the total for items 23 plus 28 is not at least 20 minutes, use a value in item 28 to bring the total to a minimum of 20 minutes. **Note:** Entry only required when the flight time from the EAR #2 to A/R #2 Abort Base exceeds 2 hours.

12.7.5.4. PLANNED EAR #1 FUEL (item 34). Must be sufficient to meet the requirements of item 35 (REQUIRED EAR #1 FUEL) to satisfy the A/R #2 Abort Base fuel requirements in the event fuel is not on-loaded during A/R #2.

12.7.5.5. UNIDENTIFIED EXTRA (item 36). Does not need to meet the normal requirement (not to exceed 2000 pounds), since item 26 (planned EAR #2 fuel) must be sufficient meet EAR #2 to destination and A/R #2 Abort Base fuel requirements in the event of no on-load. If unidentified extra fuel is excessive, consideration should be given to reducing the proposed PLANNED EAR #1 fuel (item 8) and increasing the proposed A/R #2 on-load, if possible. When negative, additional fuel must be either, added to the ramp fuel, available from the tanker on A/R #1, or in some situations may require moving one or both of the air-refueling tracks.

12.7.6. EAR to DESTINATION Section:

12.7.6.1. Items separated by a diagonal (/) in this section are applicable to both single and double in-flight refueling missions. The item letter or number after to the diagonal (/) applies to double in-flight refueling planning. Use the planned cruise profile for fuel calculations.

12.7.6.2. RESERVE (item 39). 10% of the total flight time from EAR #2 to destination, not to exceed 45 minutes or 20 minutes whichever is greater. **Note:** If ten percent of your total flight time exceeds 45 minutes (i.e., 48 minutes), use 45 minutes. If 10% of your total flight time is less than 20 minutes (i.e., 15 minutes), use 20 minutes.

12.7.6.3. UNIDENTIFIED EXTRA (item 48). This calculation assumes the planned fuel on-load has been received. Subtract fuel required at EAR #2 prior to on-load (item 47) from the planned fuel at EAR #2 prior to on-load (item 46). This value equals the extra fuel carried or additional fuel required (if negative) at the destination. When negative, additional fuel must be either, added to the ramp fuel, available from the tanker, or in some situations may require moving one or both of the air-refueling tracks.

Figure 12.9. AF Form 4139, Fuel Plan (Double AAR).

SPECIAL OPERATIONS C-130 INFLIGHT REFUELING WORKSHEET

AIRCRAFT #:	1934	(A) OPERATING WT:	110.0	(C) PLANNED ONLOAD A/R #1:	20.0
AIRCRAFT CONFIG:	CS	(B) PLANNED RAMP FUEL:	42.0	(D) PLANNED ONLOAD A/R #2:	25.0

TAKEOFF TO EAR #1

T.O. GROSS WT: (A + B - 2) 151.2	FUEL PLAN, PAGE:	CFPS
TEMP DEV: 0	TIME	FUEL
1. ENROUTE	7+09	30.5
2. STTO		0.8
3. IDENTIFIED EXTRA		0.0
4. BURNOFF (1+2+3) (T.O. TO EAR #1)		31.3
5. RESERVE TFF: 4.0 (T.O. TO EAR #1)	0+24	1.6
6. TOTAL (4+5)		32.9
7. FUEL AT EAR #1 (B-6) (NO ONLOAD)		9.1
8. PLANNED EAR #1 FUEL (7+C)		29.1

EAR #1 TO EAR #2

EAR #1 GROSS WT: (A + 8) 139.1	FUEL PLAN, PAGE:	CFPS
TEMP DEV: 0	TIME	FUEL
20. ENROUTE (EAR #1 TO EAR #2)	3+24	14.3
21. IDENTIFIED EXTRA		0.0
22. BURNOFF (20+21) (EAR #1 TO EAR #2)		14.3
23. RESERVE TFF: 4.1 (EAR #1 TO EAR #2) *	0+07	0.5
24. TOTAL (22+23)		14.8
25. FUEL AT EAR #2 (B-24) (NO ONLOAD)		14.3
26. PLANNED EAR #2 FUEL (25+D)		39.3

EAR #1 TO A/R #1 ABORT BASE

EAR A/R #1 GROSS WT: (A + 7) 119.1	FUEL PLAN, PAGE:	CFPS
TEMP DEV: 0	TIME	FUEL
9. ENROUTE (EAR #1 TO ABORT BASE)	0+33	2.4
10. RESERVE TFF: 4.0 * (EAR #1 TO ABORT BASE)	0+09	0.6
11. A/R #1 ABORT ALTERNATE AND MISSED APPROACH	N/R	0.0
12. HOLDING		2.0
13. APPROACH / LANDING		4.0
14. IDENTIFIED EXTRA		0.0
15. FUEL REQUIRED (9+10+11+12+13+14) (EAR #1 TO ABORT BASE)		9.0
16. PLANNED RAMP FUEL (B)		42.0
17. REQUIRED RAMP FUEL (6+15)		41.9
18. UNIDENTIFIED EXTRA (16-17)		0.1
19. REQUIRED OVERHEAD ABORT BASE (11+12+13)		6.0

EAR #2 TO A/R #2 ABORT BASE

EAR A/R #2 GROSS WT: (A + 25) 124.3	FUEL PLAN, PAGE:	CFPS
TEMP DEV: 0	TIME	FUEL
27. ENROUTE (EAR #2 TO ABORT BASE)	1+21	5.5
28. RESERVE: TFF: 4.1 (EAR #2 TO ABORT BASE) +07=20min *	0+13	0.9
29. A/R #2 ABORT ALTERNATE AND MISSED APPROACH	N/R	0.0
30. HOLDING		2.0
31. APPROACH / LANDING		4.0
32. IDENTIFIED EXTRA		0.0
33. FUEL REQUIRED (27+28+29+30+31+32) (EAR #2 TO ABORT BASE)		12.4
34. PLANNED EAR #1 FUEL (8)		29.1
35. REQUIRED EAR #1 FUEL (24+33)		27.2
36. UNIDENTIFIED EXTRA (34-35) *		1.9
37. REQUIRED OVERHEAD ABORT BASE (29+30+31)		6.0

SIGNATURE: Maj Post DATE 28-Apr-10

NOTES ASSOCIATED WITH SPECIFIC ITEM NUMBERS

ITEM 10: ITEMS 5 + 10 TOTAL: IF THE TOTAL EXCEEDS 0+45, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 10 NEEDED TO BRING THE TOTAL TO 0+45. IF TOTAL IS LESS THAN 0+20, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 10 NEEEDED TO BRING THE TOTAL TO 0+20.

ITEM 18: IF NEGATIVE, THEN FUEL MUST BE ADDED TO THE PLANNED RAMP FUEL (B).
IF GREATER THAN 4000 LBS, THEN NO ENROUTE FUEL MANAGEMENT REQUIRED FROM T/O TO A/R #1 ABORT BASE.

ITEM 5&23: NOT TO EXCEED 0+45.

ITEM 28: ITEMS 23 + 28 TOTAL: IF TOTAL EXCEEDS 0+45 HR, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 28 NEEDED TO BRING THE TOTAL TO 0+45. IF TOTAL IS LESS THAN 0+20, THEN ADD ONLY THE AMOUNT OF TIME IN ITEM 28 NEEEDED TO BRING THE TOTAL TO 0+20.

ITEM 36: IF NEGATIVE, THEN FUEL MUST BE ADDED TO THE PLANNED RAMP FUEL (B) OR A/R #1 PLANNED ONLOAD (C).
IF GREATER THAN 4,000 LBS, THEN NO ENROUTE FUEL MANAGEMENT REQUIRED FROM EAR #1 TO A/R #2 ABORT BASE.

ITEM 39: 10 % OF CAT 1 ROUTE FROM EAR #1/EAR #2 TO DESTINATION, NOT TO EXCEED 0+45 OR 0+20, WHICHEVER IS GREATER (NO MORE THAN 0+45 & NO LESS THAN 0+20).

ITEM 48: IF NEGATIVE, THEN FUEL MUST BE ADDED TO THE PLANNED RAMP FUEL (B), PLANNED A/R #1 ONLOAD (C), A/R #2 ONLOAD OR MOVING A/R TRACK(S).

EAR TO DESTINATION

EAR GROSS WT: (A + 8 / A + 26) 149.3	FUEL PLAN, PAGE:	CFPS
TEMP DEV: 0	TIME	FUEL
38. ENROUTE (EAR TO DESTINATION)	7+01	29.4
39. RESERVE: TFF: 3.9 (EAR TO DESTINATION)	0+42	2.7
40. DESTINATION ALTERNATE AND MISSED APPROACH	0+10	0.7
41. HOLDING		2.0
42. APPROACH / LANDING		4.0
43. IDENTIFIED EXTRA		0.0
44. REQUIRED EAR TO DEST (38+39+40+41+42+43)		38.8
45. PLANNED ONLOAD (C / D)		25.0
46. PLANNED FUEL AT EAR (7 / 25) (PRIOR TO ONLOAD)		14.3
47. REQUIRED FUEL AT EAR (44-45) (PRIOR TO ONLOAD)		13.8
48. UNIDENTIFIED EXTRA (46-47) *		0.5
49. REQUIRED OVERHEAD DESTINATION (40+41+42)		6.7

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Chapter 13

LOADMASTER PROCEDURES

13.1. General. Loadmasters are responsible for all duties described in Technical Orders, Air Force Instructions, and any other regulatory guidance that applies to their crew position. The PIC may assign other duties as necessary to aid in ensuring mission success. (T-3)

13.2. Specific Duties. In addition to the responsibilities listed above, the loadmaster is responsible for, supervises, performs, and/or participates in the following: (T-3)

13.2.1. Responsible for: load planning, verifying proper aircraft configuration, aircraft preflight, operation of aircraft equipment, weight and balance computations, the safe movement of cargo and personnel into and out of the aircraft, ensuring proper tie-down of cargo/equipment, handling of troops/passengers, and verifying cargo/passengers against required documentation. (T-3) Additionally, the loadmaster is responsible to remain in the cargo compartment with passengers on board and during takeoffs and landings with either cargo or passengers on board. (T-3)

13.2.2. Supervises the loading, tie-down, offloading of cargo, baggage, and mission equipment. (T-3)

13.2.3. Performs: cargo compartment anti-hijacking duties IAW **Chapter 7** and/or as directed by the PIC; scanner duties during air refueling, formations, and on flights conducted in high threat environments; perform hot refueling supervisor and/or panel operator duties during hot refueling/FARP operations. (T-3)

13.2.4. Participates in: the aerial delivery of equipment, supplies, and personnel, to include manually assisting the exit of door bundles (i.e., Container Ramp Load (CRL), RAMZ, Bike Bundles, etc.), from the ramp and door/paratroop door(s). (T-3) Additionally the loadmaster, when required, will participate in the loading, tie-down, and offloading of cargo/equipment as mission dictates. (T-3)

13.2.5. The loadmaster shall be thoroughly familiar with the normal and emergency airplane capabilities, associated airplane systems, all aerial delivery systems, and shall be able to accomplish airplane emergency procedures. (T-3)

13.2.6. Multiple Loadmaster CRM. To ensure good CRM, when more than one loadmaster is on board the aircraft the primary loadmaster will assume overall responsibility for completion of all checklists and ensure no confusion exists about what duties have been or need to be accomplished. (T-3) This will be accomplished by conducting a coordinated loadmaster brief. (T-3)

13.3. Aircraft Servicing. Loadmasters are normally not required to refuel or defuel aircraft; however, the loadmaster is qualified and authorized to accomplish these duties when maintenance personnel are not available. If ground support personnel are not available, the loadmaster will act as the refueling supervisor and the PIC will designate other crew members to assist the loadmaster. (T-3) Use the appropriate checklist during all refueling and defueling operations.

13.3.1. Concurrent Ground Operations. The PIC and Concurrent Servicing Supervisor (CSS) shall ensure aircrew members and servicing personnel accomplish concurrent servicing (CS) in accordance with TO 00-25-172 and servicing technical orders.

13.3.1.1. Simultaneous fuel and oxygen servicing is not authorized. (T-3)

13.3.1.2. Winching of rolling stock and non-spark producing (i.e., wooden) pallets is authorized. Driving vehicles equipped with spark arresters is authorized during fuel servicing. When loading vehicles without spark arresters, the vehicles must be either completely inside the cargo compartment, or outside of the established fuel servicing safety zone, before fuel servicing lines can be pressurized. (T-3) **Exception:** Diesel and turbo-charged (without waste gates) gasoline-powered vehicles can be on-loaded or offloaded without having to stop fuel flow.

13.3.2. Hot Refueling. Hot refueling (refueling with aircraft engines running) will only be conducted by crews that have been authorized and certified according to AFI 11-235, *Forward Area Refueling Point (FARP) Operations*.

13.4. Preparation for NVG Operations.

13.4.1. Ensure blackout curtains are installed and functional as required. (T-3)

13.4.2. Check external IR lights for proper operation and possible bleed-through as required. (T-3)

13.5. Flight monitoring. The loadmaster as mission requirements allow, will monitor all applicable aircraft systems during all phases of flight and ground operations. (T-3) Notify the PIC of all abnormal indications and take appropriate action. (T-3)

13.6. Forms Management. In addition to the procedures in TO 00-20-1 and AFI 11-401, *Aviation Management*, the loadmaster will assist the pilot in maintaining the AFTO Form 781. Verify the exceptional release is signed before flight and resigned, if necessary, at en route stops.

13.6.1. After each flight, ensure the number of discrepancies (if any), landings, flight duration time(s), etc., 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.

13.6.2. All off-station fuel purchases (to include FARP and in-flight refueling) will be logged on AFTO Form 781H and AF Form 664 if applicable.

13.6.3. IAW AFMAN 23-110, Vol 1, *USAF Supply Manual, Part 3*, the loadmaster will record all fuel transfers on the AF Form 791, *Aerial Tanker In-Flight Issue Log*, for 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 HQ AFSOC/A3V SharePoint Website.

13.7. Hostile Environment Operations. Remove all non-essential equipment from the aircraft prior to a combat mission. (T-3) Hostile Environment Repair Procedures (HERP), tool kit requirements can be found in AFSOCM 11-201, *Hostile Environment Repair Procedures*. 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-3)

13.8. Additional Aircraft Loadmaster Responsibilities:

13.8.1. Normally all air freight, fleet service, and servicing personnel are authorized to perform assigned duties in all AFSOC aircraft when escorted by an authorized individual. Air freight personnel are responsible for completion of cargo documentation, palletizing, and movement of cargo to and from the aircraft. They will advise the loadmaster of destination, size, weight, and type of cargo (classified, hazardous, etc.), to permit proper positioning; coordinate traffic activities that may affect loading and offloading; and assign sufficient air freight loading personnel for cargo handling. Air freight personnel are responsible for safe positioning of material handling equipment and cargo to and from the aircraft. Air freight personnel under the direction of the loadmaster, prepare the aircraft for loading or stowing loading equipment if the aircraft is not to be reloaded, tie-down, and physically offload cargo. If cargo, aircraft equipment, or aircraft structure are damaged during loading or offloading, or if loading personnel are injured, the loadmaster will notify the PIC, command post, or terminal operations officer. (T-3)

13.8.2. At locations with no air terminal or traffic personnel, the shipper assumes responsibilities of air freight personnel described in **Paragraph 13.8.1**.

13.9. Emergency Exits and Safety Aisles. Maintain emergency exits and safety aisles in accordance with this AFI's applicable addenda.

13.10. Air Cargo Restraint Criteria. Restrain cargo in accordance with TO 1C-130J-9, *Cargo Loading Manual*, and AFTTP 3-3.E/MC-130J, during Infil/Exfil operations.

13.11. Mission Equipment Requirements. The loadmaster(s) will ensure the following equipment is aboard the aircraft when required for off-station missions. (T-3) **Note:** Units should specify additional mission equipment requirements in **Chapter 10** of this regulation. Additionally, units may add to contents of the kits described below.

13.11.1. Aerial delivery kits. The aerial delivery will include sufficient quantities of: 550 cord, 80 lb (1/4"cotton tape), #5 (ticket 8/7) cord, both IR and overt chemical lights, cloth backed tape, masking tape, and 0.032 diameter steel safety wire.

13.11.1.1. CDS Kit. Units will determine contents of this kit. However, it will contain a minimum of four Van Zelm ratchets and sufficient quantities of items to conduct drops at each pulley location.

13.11.1.2. Buffer stop assembly as required.

13.11.2. Blackout kit/Rapids kit. The kit will include a minimum of: sufficient quantities/sizes of IR and overt chemical lights, cloth backed tape, blackout covers, a sufficient quantity of 1,000 lb nylon, and 10K straps.

13.11.3. Canary Slides. If canary slides are not available, deploy with four auxiliary ground loading ramps per aircraft (Some specific missions may require five per aircraft).

13.11.4. Miscellaneous supplies. Loadmasters will ensure that sufficient quantities of airsickness bags, earplugs, insecticide, etc., are carried as mission dictates.

13.11.5. Miscellaneous equipment. Loadmaster will ensure those items required by AFI 112MC/EC130J, Vol 3, Addenda A are on board for the mission(s) being conducted while off-station.

13.11.6. FARP cords. If FARP operations are anticipated two FARP communications cords IAW AFI 11-235.

13.11.7. Static line airdrop equipment. Two complete TPRS.

13.11.8. MFF equipment kit. Communication white board/paper with marker, oxygen hose extensions. Additional communication cords, oxygen walk around bottles and restraint harnesses as needed.

13.11.9. Joint Precision Airdrop System (JPADS) equipment list. Dropsondes, oxygen hose extensions (40 ft), communication cords, restraint harnesses as required.

13.11.10. Leaflet airdrop kit. Units will determine contents of this kit. However, it will contain a minimum of four Van Zelm ratchets and sufficient quantities of items to conduct drops.

13.12. Channel Cargo and Passenger Missions.

13.12.1. Channel Cargo. AFSOC aircraft do not routinely airlift channel cargo; however, if so tasked, contact the Air Terminal Operations Center (ATOC), Airlift Control Element (ALCE), or air freight/passenger service to obtain the cargo and passenger breakdown and assist in planning of proposed load. If required, security requirements for the cargo/passengers being carried will be briefed to the loadmaster during the initial load briefing at ATOC. At stations where aircraft tie-down equipment is exchanged, make every effort to ensure that a one-for-one exchange occurs. If this is not possible, the loadmaster will inform the PIC of lost or missing equipment and annotate missing items on the aircraft Dash 21 Equipment Inventory, refer to AFTO Form 781.

13.12.2. Passenger Missions.

13.12.2.1. AFSOC aircraft will not normally be tasked to support Air Mobility Command passenger missions, nor will passengers be manifested or loaded aboard AFSOC aircraft without the prior approval of the PIC/Mission Commander.

13.12.2.2. Prior to releasing seats, ensure terminal operations passenger handling personnel are aware that passenger comfort latrine facilities are extremely limited, and of the possibility of an in-flight diversion. (T-3)

13.13. Passenger Handling. The loadmaster is the key figure concerning good passenger relations. Be aware of the doubts and fears that may arise in the minds for passengers and anticipate their questions and actions.

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

13.13.2. Do not allow passengers to lounge on or tamper with equipment, cargo, or baggage. Ensure passengers are not allowed access to checked baggage. (T-3)

13.13.3. Ensure that classified equipment remains covered during the entire mission when passengers are onboard and ensure passengers are denied access to this equipment. (T-3)

13.14. Troop Movements. Most personnel carried aboard AFSOC aircraft are aboard to perform a specific mission. Every effort should be made to advise them of mission progress and deviations. The troop commander will be identified prior to boarding.

13.14.1. Determine if the troop commander has any special requirements prior to departure, and advise the PIC of these requirements, if appropriate. (T-3)

13.14.2. Determine if specific communications requirements exist and coordinate these requirements with the PIC. (T-3)

13.14.3. Determine if there is a need for the troops to perform any type of in-flight rigging. (T3) Ensure the aircraft is loaded to accommodate in-flight rigging if required. (T-3) Inform the PIC prior to in-flight rigging. (T-3) If turbulence is anticipated, the PIC should inform the loadmaster as much in advance as possible.

13.14.4. Ensure that troops do not have access to aircraft classified equipment during the mission. (T-3) If troops require access to classified equipment, the requirement should be made known to the PIC prior to the mission.

13.14.5. Passenger Combat Loading. Floor loading is authorized to support dedicated unconventional forces and foreign counterparts during operations, exercises, and training. Standard seating configurations listed in applicable addenda should be used, if practical. **Exception:** Group commander (COMAFSOF for contingency operations) may authorize Rapid Infil/Exfil procedures and floor loading with non-SOF personnel. **Note:** This procedure will not be used in lieu of providing normal seating when available. ***WARNING*:** During passenger combat loading, the loadmaster will ensure all occupants are provided restraint IAW AFTTP 33.E/MC-130J. At no time shall the number of combat-loaded personnel exceed five across per row. (T-3) The loadmaster shall not exceed the aircraft's maximum allowable gross weight or center of gravity limitations. (T-3) Adult passenger weight shall not be calculated at less than 175 pounds per person. (T-3)

13.14.6. All personnel in the cargo compartment will be seated and secured except those crew members having valid duties to perform. (T-3)

13.14.7. Combat Loading. Combat loading is comprised of three types of operations: combat offload, passenger combat loading, and infil/exfil.

13.14.8. Combat Offload Training. No special authorization is required for combat offload training using unilateral training loads.

13.15. Supporting/Supported Forces Procedures. The loadmaster will ensure forces are properly manifested as passengers. (T-3) Give one copy of the manifest to the PIC for filing and retain sufficient copies for border clearance. (T-3) The loadmaster will ensure completion of anti-hijacking requirements for forces in accordance with AFI 13-207, *Preventing and Resisting Aircraft Piracy (FOUO)*, and this instruction.

13.16. Border Clearance. Customs, Immigration, and Agriculture require certain forms for border clearance. The loadmaster will ensure that required forms are contained in the aircraft mission kit. (T-3) Distribute the forms to the crew and ensure their completion prior to landing; deliver them to the proper persons. (T-3) Also comply with the requirements of this instruction.

13.17. Weight and Balance. Accomplish weight and balance computation for the aircraft in accordance with TO 1-1B-50, *Weight and Balance*. A basic handbook of weight and balance

containing current aircraft status is maintained by the unit possessing the aircraft. A supplemental weight and balance handbook for each aircraft is stored on board. This is a binder containing a certified copy of Chart C providing the current basic weight and moment, and will also include the applicable TO 1C-130(X)J-5, and AFI 11-2EC/MC-130, Vol 3, Addenda A, *EC/MC-130J Operation Configuration/Mission Planning*. Sufficient blank copies of DD Form 3654 for the anticipated mission(s) will be onboard prior to flight.

13.17.1. Compute weight and balance either using the Chart E mathematical (moments) method, approved Automated Form F (AFF) software or direct data copy from the aircraft CNI-MU. (T3) Compute DD Form 365-4 in accordance with this AFI's applicable addenda. Two copies will be produced, one will remain onboard until mission termination, make every attempt to leave a copy with air terminal/maintenance personnel remaining on the ground.

13.17.2. Presently AFF software does not accommodate AFSOC specific airframes. If used, Center of Gravity limits for takeoff and landing must be physically checked against TO 1C130(X)J-5. (T-3) Estimated landing fuel function will also be used as software does not support AAR and present AFSOC fuel burn rates. These items will be annotated in the additional remarks block of the AAF. (T-3)

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

13.17.4. Ensure correct data entered into CNI-MU weight and balance pages. (T-3)

13.18. Fuel Weight Computation. To compute takeoff fuel weight entered on the DD Form 365-4, read directly from the fuel totalizer gauge or fuels payload page on the CNIMU for total fuel weight. Compute limiting wing fuel computations using the charts in the appropriate flight manual, this AFI applicable addenda or AFF software.

13.19. Off Load Operations. Refer to **Attachment 2** of this instruction.

13.20. Onload Operations. Refer to **Attachment 2** of this instruction.

13.21. Rapid Infiltration / Exfiltration ("Rapids"). Refer to **Attachment 2** of this instruction.

Chapter 14

ELECTRONIC WARFARE PROCEDURES COMBAT SYSTEMS OPERATOR (CSO)

14.1. General. In addition to the duties listed in the flight manual, other directives, and this instruction, the PIC may assign other duties as necessary. The EC-130J CSO is primarily responsible for aircraft defense by denying the enemy effective use of the electromagnetic spectrum.

14.1.1. Mission Planning Equipment. Pilots and CSO must be capable of using their unit's primary computerized mission planning system, as well as basic radar coverage formulas, graphs, and nomograms. (T-3)

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 Guide*, and AFTTP 3-1.E/MC-130J (S), *Tactical Employment E/MC-130J*.

14.1.3. Mission Charts. The CSO will prepare mission charts IAW this publication (see **Chapter 11**). (T-3) 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-3)

14.1.3.1. For missions scheduled with Electronic Countermeasures (ECM) training. The CSO or Pilot will brief all applicable procedures, rules of engagement, and anticipated maneuvers. (T-3)

14.1.3.2. On training missions with Airborne Intercepts (AI) training. The CSO or Pilot will brief all applicable procedures, rules of engagement, and anticipated maneuvers. (T-3)

14.1.3.2.1. Coordinate AI training IAW AFI 11-214, *Air Operations Rules and Procedures.*

14.1.3.3. For missions not involving ECM or AI training, a threat of the day will be briefed. (T3)

14.2. Not Used.

14.3. In-Flight Responsibilities.

14.3.1. CSO or Pilot will verify aircraft electronic warfare configuration. (T-3) Aircraft Electronic Support Measures ECM, Infrared Countermeasures and chaff and flare configuration will be commensurate with the threat. (T-3) Ensure appropriate databases/MDFs are loaded into all defensive systems, depending on geographical locations or electronic order of battle. (T3) See MDS specific technical orders and system handbooks located on the Electronic Combat Support Flight (ECSF) website (**https://ecsf.afsoc.af.smil.mil**) for most current system information.

14.3.2. During the low-level portion of the mission, immediately following the leg briefing, the CSO will brief the anticipated threats and aircraft deviations prior to a threat leg. (T-3)

14.3.3. The CSO or Pilot will notify and/or warn the crew if threats are encountered. (T-3)

14.3.4. The CSO or Pilot will direct defensive maneuvers and perform ECM as appropriate. (T3) Brief/update ECM effectiveness when it can be determined throughout defensive maneuvers. (T-3)

14.3.5. The CSO or Pilot will notify crew of defensive system malfunctions and affect(s) on mission accomplishment and tactics. (T-3) Keep crew updated on chaff/flare status. (T-3)

14.3.6. The CSO will advise the crew upon exiting the hostile environment (i.e., combat exit point). (T-3)

Chapter 15

COMMUNICATIONS

15.1. General. The PIC is responsible for insuring the proper programming, management, operation and in-flight troubleshooting of communications, navigation, IFF/SIF and specialized mission equipment. (T-3) In addition to the duties listed in the flight manual, other applicable technical orders, and this instruction, the PIC may assign other duties to the crew as necessary. This chapter provides guidance on crew procedures for all missions and completion of applicable forms.

15.1.1. The crew will tune, configure, operate and troubleshoot voice and data communications systems and manage communications nets to support mission requirements; recommend and make required communications changes; compile and transmit required in-flight and position reports to appropriate facilities; and coordinate, obtain, use, and control COMSEC/Transmission Security material and equipment. (T-3)

15.1.2. Frequencies and Call Signs. The crew will review the Air Tasking Order prior to each flight when deployed or during exercise participation; additionally, review at a minimum Special Instructions (SPINS) **Chapters 2**, **3**, and **7**. (T-3) Use current FLIPS, IFGs, and other documents and publications for frequency use as required, which may be obtained at the following (**https://www1.nga.mil/ProductsServices/Aeronautical/FlightInfoPubs/Pages/default.aspx**). Obtain emergency airfield information from the CSO and identify communications and available services at the designated emergency airfields. (T-3) Obtain aircraft type(s) and call signs for all aerial refueling operations; check IFGs and applicable DoD FLIP Area Planning Publications for A/R track information as required. (T-3) Be prepared to brief crew on mission communications. (T-3) **Note:** **Figure 15.1-Figure 15.5** contain listings of commonly used frequencies, including search and rescue, citizen band, and the AN/ARC-222 International Maritime Channel preset.

15.1.3. Communications Threat Planning: When deployed or during exercise participation, the crew will obtain information on enemy systems that can effect communications, navigation, and IFF equipment in the mission area. (T-3) **Note:** HAVE QUICK II and SINGGARS anti-jam capability is not secure and will not be used for classified transmissions unless in conjunction with a secure voice system.

15.1.4. Special Use Airspace: When planned flying in Warning Areas, Military Operating Areas, Restricted Areas, or ATC assigned working areas, the crew will contact the controlling station during mission planning and confirm timing, scheduled activity and communication procedures to the extent possible. (T-3) The PIC will brief any conflicts or issues that could affect the mission. (T-3)

15.1.5. COMSEC: The PIC will insure the crew reviews the COMSEC Call Out or other applicable documents as soon as possible to insure the correct materials are available or ordered in time for the mission. (T-3) Maintain positive control of all COMSEC material IAW with instructions, supplements and Operating Instruction(s) (OI) once issued. Document safe inventory, complete daily destruction, and issue current COMSEC material IAW COMSEC instructions, supplements and Operating Instructions as required. The PIC

will insure the appropriate crew member is assigned responsibility for the security of classified mission documents and software for equipment as required or directed. (T-3)

15.2. Communications Procedures.

15.2.1. Communication Checks. Communication checks will be made during preflight, en route and post flight will be in accordance with ACP 121(I), *Communications Instructions*. It is the responsibility of the crew to be aware of OPSEC requirements prior to making any communication checks. (T-3)

15.2.2. Frequency Monitoring. The PIC will insure a crew member is always monitoring the C2 frequency. (T-3)

15.2.3. Joint Spectrum Interference Resolution (JSIR) Reports. EMI can be caused by enemy, neutral, friendly, or natural sources, the primary difference between hostile and no hostile EMI is intention. The crew will report any hostile interference experienced while supporting joint operations in accordance with Joint Task Force or Combatant Command procedures (see SPINS). (T-3) When EMI is suspected to be non-intentional, file reports through the unit frequency manager. Refer to DoD FIH Section B for JSIR report procedures and AFI 10-707, *Spectrum Interference Resolution Program* for additional JSIR program information.

15.2.4. Execution Checklist. An execution checklist may be used on certain flights. If used, annotate times in the appropriate blocks. If the execution checklist is unclassified, it may be attached to the radio log in lieu of duplicate log entries. If the execution checklist is classified, do not attach it to the radio log unless the radio log is also classified.

15.3. AF Form 4122, *Airborne Radio Log*, Procedures. The AF Form 4122 may be completed electronically or by hand. When completed manually, it should be filled out using non-erasable type ink. The form should be completed as follows:

15.3.1. Log Heading: Complete the entire log heading on the first page. Headings of subsequent pages need only contain call sign, date, page number, mission, and operator name(s).

15.3.1.1. Date. Enter the current Zulu date.

15.3.1.2. Tactical Call Sign. Enter the tactical/mission call sign. If not applicable, enter N/A. If entry of a tactical/mission call sign by itself would make the log classified, enter N/A.

15.3.1.3. ATC Call Sign. Enter the normal ATC voice call sign.

15.3.1.4. Mission or Route. Enter point of departure and destination if other than departure point. Plain language, FAA, or ICAO identifiers may be used. LOCAL may be used for training missions originating and terminating at home station. If the departure or destination is classified, use the mission code name.

15.3.1.5. Tail Number. Enter the aircraft tail number, not the aircraft serial number.

15.3.1.6. Squadron. Enter unit to which the aircraft is assigned.

15.3.1.7. Personnel on Board. Enter the total number of souls on board (crew members and passengers).

15.3.1.8. Takeoff. Enter Zulu time for takeoff (AFTO Form 781).

15.3.1.9. Land. Enter Zulu time for landing (AFTO Form 781).

15.3.1.10. Total Time. Enter the total flight time (AFTO Form 781).

15.3.1.11. Page __ of __ Pages. Enter the page number. Each sheet of paper, front and back, is considered one page.

15.3.1.12. PIC. Enter the Pilot in Commands rank and last name.

15.3.1.13. Operator. Enter rank and last name of the recorder(s).

15.3.2. Time. Enter the GMT (Zulu) time the transmission is completed and acknowledged. For events that warrant noting, but no transmission is completed, enter the time you make the log entry.

15.3.3. To/From. If you are initiating the call, enter the station called in the upper left portion of this block followed by a slant bar (/). If you are called, place the slant bar near the middle of the block and the call sign of the calling station in the right lower portion of this block. Enter NOTE for all notes or comments not involving a radio transmission.

15.3.4. Frequency:

15.3.4.1. Enter the radio frequency used for HF, VHF, and UHF calls unless the frequency is classified. Use the assigned designator for classified frequencies. Unclassified designators, if assigned, may also be used.

15.3.4.2. Enter SATCOM for all calls made over the SATCOM system.

15.3.4.3. Enter LOG for all notes or comments that do not involve a radio transmission.

15.3.5. Message/Remarks:

15.3.5.1. The first entry will be the statement "ON WATCH" followed by the aircrew's signature. The last entry will be the statement "OFF WATCH" followed by the aircrew's signature.

15.3.5.2. Aircrew may exchange watch by using ON WATCH/OFF WATCH entries. The crew member on watch at the end of the radio day will make an entry indicating the end of the current radio day and a separate entry for the start of the new radio day. The end of the radio day (midnight Zulu) is designated 2400Z, and 0001Z is the beginning of the new radio day. Radio log entries will read "2400 NOTE LOG End RADAY" and "0001 NOTE LOG Begin RADAY."

15.3.6. Abbreviations and operating signals (ACP 131), FLIP abbreviations and other aeronautical related abbreviations may be used in radio log entries. Use brackets, ( ), to enclose important information, simulated transmissions, transmission summaries, or any other information necessary in the log, but not actually transmitted over the radios. Otherwise, enter sent or received information verbatim.

15.4. Entry Corrections. Entry corrections may be made electronically or manually. Electronic and manual corrections may be made to the same document as required.

15.4.1. Electronic Corrections. Electronic corrections may be made as required at any time before mission completion.

15.4.2. Manual Corrections. Make manual corrections to the form by lining out the incorrect portion and initialing at the end of the lined out portion. Enter the correct information immediately after the lined out portion.

Figure 15.1. Search and Rescue Frequencies.

Frequency	Usage	Mode[1]	Authority
251.9 MHz	Operational and Training	V	Regulatory Flexibility Act (RFA)[2]
252.8 MHz	Operational and Training	V	RFA
259.0 MHz	Operational and Training	V	RFA
381.0 MHz	Operational and Training	V	RFA
46.85 MHz	Operational and Training	V	RFA

Notes:

1. Modes are V for voice, carrier wave (CW) for International Morse Code, and frequency modulation (FM) for VHF FM.

2. The USAF RFA list is the authority for the use of these frequencies.

Figure 15.2. Distress and Emergency Frequencies.

Frequency	Usage	Mode[1]	Authority
2.182 MHz [5]	Aero/Maritime Survival Craft	V	
2.670 MHz	USCG Emergency Coordination	V	
3.0235 MHz	International Scene of Action SAR	V	
4.835 MHz	AF Crash Boats (General)	V, CW	
5.680 MHz	Int'l Scene of Action SAR	V	
5.717 MHz	Canadian MACS SAR	C	Canadian IFR Supp
8.364 MHz	For use internationally by Survival Craft Stations	CW	
121.5 MHz	Int'l Aeronautical Emergency	V	
123.1 MHz	NATO/ICAO Scene of Action	V	
138.45 MHz	Aerospace Rescue and Recovery Service (ARRS) Scene of Action	V	
138.78 MHz	Scene of Action	V	
156.8 MHz	Maritime Mobile VHF Radio-Telephone Service As A Distress,	FM	

Frequency	Usage	Mode[1]	Authority
	Safety, and Calling (Channel 16)		
243.0 MHz	Int'l Aeronautical Emergency	V	
282.8 MHz	Int'l Scene of Action SAR	V	
Note: 1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.			

Figure 15.3. Air/Ship/Air Calling Frequencies.

Frequency	Usage	Mode[1]	Authority
4.182 MHz	May be used by any aircraft to communicate with stations (ships) in the maritime mobile service.	V	RR 1178
6.273 MHz		V	RR 1178
8.364 MHz		CW	RR 1178
12.546 MHz		V	RR 1178
16.728 MHz		V	RR 1178
22.245 MHz		V	RR 1178
Note: 1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.			

Figure 15.4. Citizen Band (CB) Conversion Table 1

Channel	MHz	Channel	MHz	Channel	MHz	Channel	MHz
1	26.965	11	27.085	21	27.215	31	27.315
2	26.975	12	27.105	22	27.225	32	27.325
3	26.985	13	27.115	23	27.235	33	27.335
4	27.005	14	27.125	24	27.245	34	27.345
5	27.015	15	27.135	25	27.255	35	27.355
6	27.025	16	27.155	26	27.265	36	27.365
7	27.035	17	27.165	27	27.275	37	27.375
8	27.055	18	27.175	28	27.285	38	27.385
9	27.065	19	27.185	29	27.295	39	27.395
10	27.075	20	27.025	30	27.305	40	27.405
Note: 1. In order to be on the correct frequency, ensure HF equipment is set to AM, not Upper Side Band (USB).							

Figure 15.5. International Preset Maritime Channels.

Channel	Frequency	Use/Ship/Shore

Channel	Frequency		Use/Ship/Shore
1	156.050	**160.650**	Public Correspondence, Port Ops, Ship Movement
2	**156.100**	**160.700**	Public Correspondence, Port Ops, Ship Movement
3	**156.150**	**160.750**	Public Correspondence, Port Ops, Ship Movement
4	**156.200**	**160.800**	Public Correspondence, Port Ops, Ship Movement
5	156.250	**160.850**	Public Correspondence, Port Ops, Ship Movement
6	156.300		Safety (Inter-ship) ship - to - aircraft during rescue
7	156.350	**160.950**	Public Correspondence, Port Ops, Ship Movement
8	156.400		Commercial (Inter-ship)
9	156.450		Port Ops, Inter-ship, Ship Movement
10	156.500		Port Ops, Inter-ship, Ship Movement
11	156.550		Port Ops, Ship Movement
12	156.600		Port Ops, Ship Movement
13	156.650		Port Ops, Inter-ship, Ship Movement
14	156.700		Port Ops (Inter-ship/Ship-to-coast), Ship Movement
15	156.750		Port Ops, Inter-ship, Ship Movement
16	**156.800**		**Distress, Safety And Calling**
17	156.850		Port Ops, Inter-ship, Ship Movement
18	156.900	**161.500**	Port Ops, Ship Movement
19	156.950	**161.550**	Port Ops, Ship Movement
20	157.000	161.600	Port Ops, Ship Movement
21	157.050	**161.650**	Port Ops, Ship Movement
22	157.100	**161.700**	Port Ops, Ship Movement
23	157.150	**161.750**	Public Correspondence
24	157.200	161.800	Public Correspondence (Ship-to-coast)
25	157.250	161.850	Public Correspondence (Ship-to-coast)
26	157.300	161.900	Public Correspondence (Ship-to-coast)
27	157.350	161.950	Public Correspondence (Ship-to-coast)
28	157.400	162.000	Public Correspondence (Ship-to-coast)
60	**156.025**	**160.675**	Public Correspondence, Port Ops, Ship Movement
61	**156.075**	**160.675**	Public Correspondence, Port Ops, Ship Movement
62	**156.125**	**160.725**	Public Correspondence, Port Ops, Ship Movement

Channel	Frequency		Use/Ship/Shore
63	156.175	**160.775**	Public Correspondence, Port Ops, Ship Movement
64	**156.225**	**160.825**	Public Correspondence, Port Ops, Ship Movement
65	156.275	**160.875**	Public Correspondence, Port Ops, Ship Movement
66	156.325	**160.925**	Public Correspondence, Port Ops, Ship Movement
67	156.375		Inter-ship, Port Ops, Ship Movement
68	156.425		Port Ops, Ship Movement
69	156.475		Inter-ship, Port Ops, Ship Movement
70	156.525		Digital Selective Calling (DSC)
71	156.575		Port Ops, Ship Movement
72	156.625		None Commercial/Non-commercial (Inter-ship)
73	156.675		Inter-ship, Port Ops, Ship Movement
74	156.725		Port Ops, Ship Movement
75	156.775		
76	156.825		
77	156.875		Inter-ship
78	156.925	**161.525**	Public Correspondence, Port Ops, Ship Movement
79	156.975	**161.575**	Port Ops, Ship Movement
80	157.025	**161.625**	Port Ops, Ship Movement
81	157.075	161.675	Public Correspondence, Port Ops, Ship Movement
82	157.125	**161.725**	Public Correspondence, Port Ops, Ship Movement
83	157.175	**161.775**	Public Correspondence, Port Ops, Ship Movement

Note: Transmissions on frequencies or channels in **BOLD** are not allowed within US territorial waters, but are allowed on the high seas and most other countries.

Note: No shore frequency listed indicates that the frequency is the same as that used on ships.

Chapter 16

DIRECT SUPPORT OPERATOR PROCEDURES

16.1. General. This volume establishes procedures for AFSOC Direct Support Operator(s) (DSO) for employment of EC-130J aircraft. In addition to the duties listed in applicable technical orders, directives, and this instruction, the PIC may assign other duties as necessary. The DSO is primarily responsible for providing inputs to enhance aircrew situational awareness. Refer to AFSOCI 11-2DSO, Vol 1-3.

16.2. Mission Planning Factors.

16.2.1. Mission Planning. Detailed information on mission planning can be found in AFTTP 31.General Planning (S). *General Planning and Employment Considerations*, AFTTP 31.Threat Guide (S). *Threat Reference Guide and Considerations*, AFTTP 3-1.E/MC130J, *Tactical Employment E/MC-130J* (S) and AFTTP 3-3.E/MC-130J, *Combat Aircraft Fundamentals E/MC-130J* (U).

16.2.2. The DSO, after coordinating with the supporting analyst and other appropriate agencies, will conduct mission planning with the aircrew of all combat mission scenarios. (T-3) The DSO will brief expected scenario inputs based on the analytical data, as required. (T-3)

16.2.3. 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. (T-3) The DSO will ensure all equipment is inventoried and inspected prior to flight/deployment. (T-3)

16.3. Preflight/In-Flight Responsibilities. The DSO will: (T-3)

16.3.1. Brief the crew on the Joint Threat Warning System (JTWS) configuration and anticipated inputs. (T-3)

16.3.2. Ensure the crew is aware of JTWS capabilities and limitations, as well as operational security considerations. (T-3)

16.3.3. Monitor situational awareness information and relay pertinent information to the crew. (T-3)

16.3.4. Advise the crew of any change in the status of mission equipment. (T-3)

16.3.5. The DSO is responsible for knowing approximate aircraft location, altitude, and intentions at all times. (T-3)

16.4. Communications Procedures. When missions require the DSO to communicate, they will obtain proper frequencies, time hack, schedules, and call signs prior to flight. Depending on the nature of the mission and the communications, the DSO will keep the crew updated on any pertinent information and will coordinate with the PIC for authorization to transmit. (T-3) On EC130J aircraft, the DSO will coordinate with the crew during mission planning regarding interphone connectivity. (T-3)

16.5. Post Mission. In addition to appropriate debriefs, the DSO will also ensure: (T-3)

16.5.1. Equipment write-ups are passed on to maintenance. (T-3)

16.5.2. Post mission Technical Summary inputs are provided to the supporting analyst. (T-3)

16.5.3. Provide information to their units summarizing mission events, as required. (T-3)

16.6. Augmentation. Some contingency operations may require operators from other units, or in some cases, non-aircrew personnel to provide tactical crypto logic support. In these cases, a mission-ready instructor-qualified DSO will fly as primary DSO, and be responsible for DSO inputs.

Chapter 17

TACTICAL EMPLOYMENT PROCEDURES

17.1. General. This chapter describes the specific equipment requirements, training restrictions, and regulatory guidance for employment procedures for the EC-130J. It is not a stand-alone reference and should be used in conjunction with AFTTP 3-3.E/MC-130J. In the case of any conflicts with AFTTP 3-3.E/MC-130J, this AFI takes precedence.

17.2. Crew Duties.

17.2.1. Pilot Flying maintains contour altitude and ensures terrain clearance. Responsible for time control once within one minute of the Time Over Target (TOT)/Time Of Arrival (TOA). (T-3)

17.2.2. Pilot Monitoring: Responsible for backing up the PF, runs all checklists once airborne unless delegated to another crew member, primary for communications with ATC. Assists the CSO with maintaining proper flight path, acquiring controlling terrain, and identifying the objective area, monitors aircraft instruments and cross-checks aircraft altitude and terrain clearance using NVG, TAWS, radar scope interpretation, and the radar altimeter. (T-3) Secondary for communications with range control, combat control teams, landing zone personnel, provides non-secure communications IAW Command Electronic Order of Information (CEOI).

17.2.3. Combat Systems Operator: Primary for terrain and climb/descent advisories to the pilots, turn point briefs and time warnings, aids in maintaining desired flight path via all available resources, programs and monitors the ECM gear, radio communication with command and control agencies, drop zone control, and other ground parties during mission events, provides secure communications IAW CEOI. (T-3)

17.2.4. Loadmaster: Responsible for rear quadrant visual threat detection. (T-3) The ALE-47 portable flare fire buttons will be held when in a threat environment. (T-3) Additional duties are located in the Loadmaster Procedures chapter of this AFI.

17.2.5. The following duties are divided between all crew positions. CNI-MU programming and updating, time control, mission planning, and monitoring of fuel status (fuel should be checked at least once every 60 minutes), communications with C2. Ensure COMSEC keying materials and devices and other required COMSEC documents are available. Advise the PIC of all mission communications requirements. (T-3) Review the mission CEOI and execution checklists and assists aircraft and mission commander in tracking scenario developments. (T-3) Key all secure equipment and makes operational checks of all communications equipment. Determine and coordinate frequencies, call signs, and timing for communications systems checks. (T-3) The PIC will ensure all navigation/communication duties are clearly understood prior to flight. (T-3)

17.2.6. Heads Down Displays (HDD). The standard HDD configuration for tactical flying will be radar on 1, 4, and (5 or 6) with the full channel dedicated to a Ground Map Mode. (T-3) The crew member who is primary for navigation will be responsible for the ranges on the different sensors to help support the PF. (T-3) HDDs 2 and 3 will be set to Digi-Map and TAWS respectively. (T-3) At a minimum, TAWS will have radar warning receiver

(RWR) overlay selected when required for threat situational awareness. (T-3) Deviations from this standard configuration will be determined by the PIC. (T-3)

17.3. Aircraft Preparation. Non-essential equipment should be removed prior to combat missions.

17.4. Survival and Protective Equipment. All personnel will wear the survival and protective gear provided during hostile environment operations or as directed by the mission commander or SPINs. (T-3) Such equipment, if available, may include, but is not limited to the following: flak vest, LPU, survival vest and kit, parachute/harness (chute readily available), and protective headgear.

17.5. In-Flight Use of Laptop Computers. EMI certified laptop computers and software, such as PFPS or Falcon View are allowed in-flight IAW AFI 11-202, Vol 3, and their use is highly encouraged. These systems do not replace existing navigation equipment, must not be used as the sole means of navigation; each user must have a back-up chart immediately available in case use of the system is denied.

17.6. Equipment Requirements. Table 17.1, Tactical Operations, lists the minimum equipment required for various mission events. Aircrew experience level and the mission scenario may dictate additional equipment requirements than those listed.

Table 17.1. Tactical Operations.

Event	Navigation Solution	APN-241	Radar Altimeter
Day Low-Level (LL) [1]	1 x INU		1
NVG/IMC LL [1]	1 x INU	X [2, 3]	1
Night VMC LL (non-NVG)	1 x INU	X [2]	1
NVG SCA	1 x INU		1
IMC SCA	EGI FOM 2 or better OR 1 x INU	X [2, 4]	1
AMP-4 Landing		X[2]	
Airdrop Operations	1 x EGI[5]		

Notes: (T-3)

1. If aircraft do not possess the minimum equipment listed, they are restricted to flying MSA.

2. Either Map or Mono-Pulse Ground Mode (MGM) mode must be operational.

3. If the Low Power Color Radar (APN-241) is inoperable, crews may fly NVG LL (VMC) over flat and rolling (non-mountainous) terrain.

4. Operable Low Power Color Radar (APN-241) not required with EGI FOM 2 or better.

5. Minimum of 1 x EGI navigation solution required for mission computer-directed airdrops (FOM 4 or greater requires an update).

17.7. Mission Planning. All pilots and CSOs will conduct a route study prior to any low-level operations. (T-3) The route study will emphasize NVG limitations and performance factors and their impact on terrain and obstacle clearance. (T-3)

17.7.1. En Route Planning. Crews should fly tactical missions at the highest altitude commensurate with the threat(s) environment. During training, greater weather or altitude minimums may be dictated by FLIP, ICAO procedures, or training considerations.

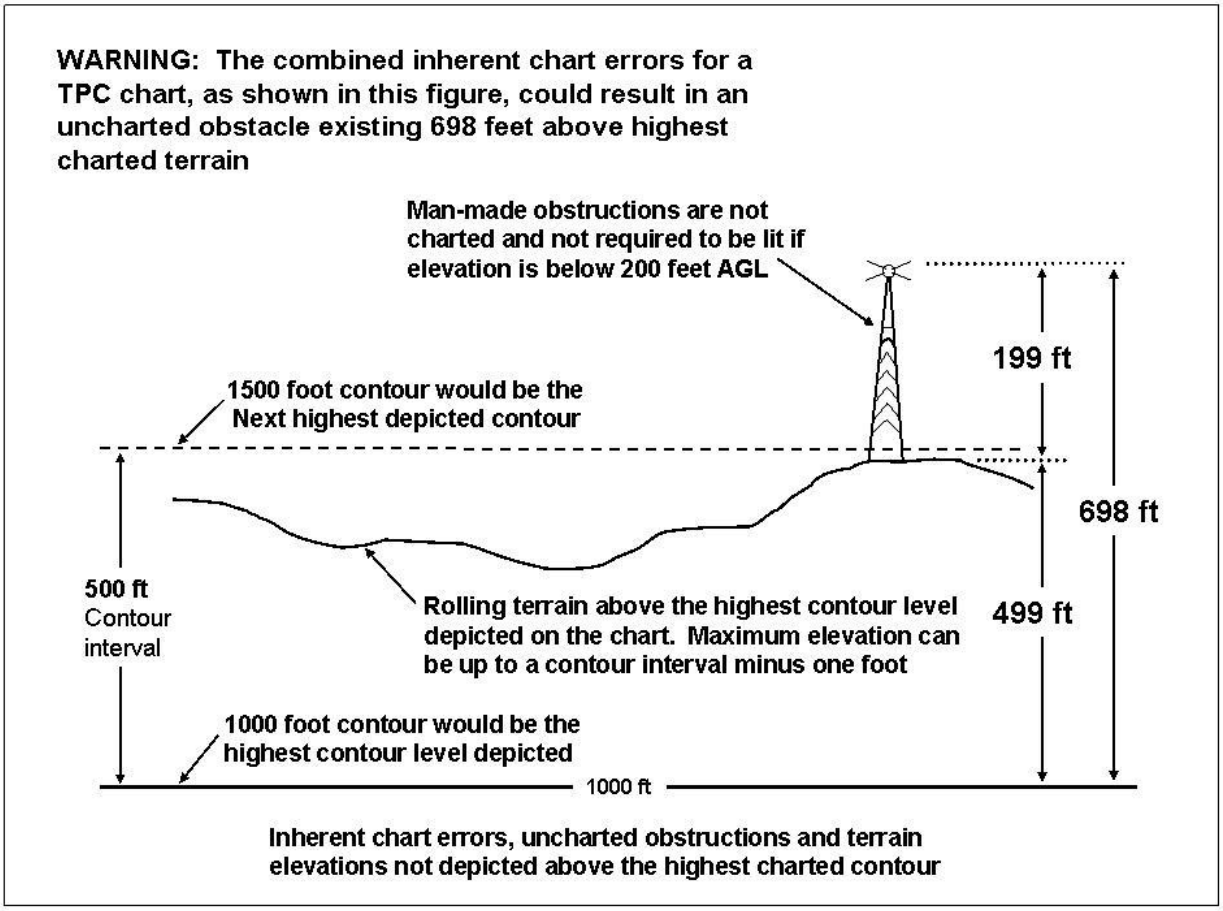
17.7.2. Mountainous terrain is defined in AFI 11-202, Vol 3.

17.7.3. Threat analysis. Refer to AFTTP 3-1, *General Planning* and AFTTP 3-1, *Threat Guide* for in-depth information of threat system capabilities and limitations, as well as threat employment techniques.

17.7.4. Mission employment. Refer to AFTTP 3-1/3 E/MC-130J for detailed information on EC130J tactical techniques and procedures.

17.7.5. Chart requirements. Planned low-level routes will be drawn on a 1:500,000 (TPC) or larger scale chart. (T-3) Use a 1:250,000 (JOG) or larger scale chart for the objective area, unless not available or of an inferior quality to a TPC. (T-3) Every effort must be made to minimize chart clutter. If electronic charts are used, a backup paper chart, prepared IAW chart requirements, must be immediately available for each crew member using electronic charts. (T3) ***WARNING*:** Aeronautical charts do not depict man-made obstacles less than 200 feet AGL or a change in terrain until it exceeds the chart contour interval. The worst situation would occur if a 199-foot tower sat on terrain with an elevation just below the next higher contour. For a 1:500,000 (TPC) with a contour interval of 500 feet, this results in an uncharted obstacle existing 698 feet above charted terrain. Additionally, the highest spot elevation on any given leg may not be the highest terrain as in the case of gradually rising elevations. Planners must ensure accurate terrain analysis evaluates both spot elevations and the highest contour level. (T-3) ***CAUTION*:** Some charts may depict terrain and obstacle altitudes in meters versus feet (e.g., JOG and TLM charts in some areas of the world). **Note:** If an NVG route (any terrain condition) has been planned using a JOG and elevations and altitudes are verified, the route may be flown with reference to a TPC.

Figure 17.1. Inherent Chart Error.



17.7.5.1. Color copies and laminated charts are acceptable provided the contour and contrast remain intact and the chart is used for preflight route study and the flight. If laminated charts are used, the crew will ensure that the laminate does not degrade the quality or readability of the chart and that all data remains intact. (T-3)

17.7.5.2. The chart series, scale, and edition will be annotated on the chart. (T-3) The current Chart Updating Manual (CHUM) review date will also be annotated on the chart. (T-3)

17.7.5.3. Place the emergency safe altitude (ESA) in bold numbers on the chart. (T-3) When multiple ESAs are used, or when strip charts are used, the ESA will be annotated on each chart segment. (T-3) Place a double box around the obstacle or terrain that defines each ESA. (T-3)

17.7.5.4. For each leg, place a box around the obstacle or terrain that defines the MSA. MSA, magnetic course, and leg distance will be annotated on the chart for each leg. (T-3)

17.7.5.5. Operational Advisory Arrows are optional on pilot charts.

17.7.5.6. When transitioning from one chart to another, allow a sufficient route overlap.

17.7.5.7. The pilot and copilot may share a single low-level chart during flight. If this option is used, both the pilot and copilot must participate in pre-mission route analysis using the single chart. (T-3)

17.7.5.8. Order of Battle. In an exercise or actual combat situation, it is required to depict threat information directly on the navigational route chart. (T-3) Inclusion of threat capabilities may classify the chart. **Note:** Classify charts depending on information sources and methods used to obtain this data (required only if classification is Confidential or higher).

17.7.5.9. Start climb points will be computed during planning, annotated on all charts, and briefed during route study for all significant climbs when there is a terrain differential of 1,500 feet or greater over 3 nm or less. (T-3) Operating at high density altitudes may yield even less performance. Assume the aircraft will be at the lowest possible point within the corridor and compute climbs from there.

17.8. Preparation for NVG Operations.

17.8.1. Required Equipment. (T-3)

17.8.1.1. NVGs. Each crew member will preflight their NVGs prior to flight. (T-3) Due to the HUD illumination, F4949G-series or newer generation NVGs are required. (T-3) The PIC must ensure there is one spare set of pre-flighted NVGs. (T-3) When the mission requires the loadmasters to use NVGs, a spare set will be available for their use. (T-3)

17.8.1.1.1. Required NVG Visual Acuity. Aircrew will use an approved testing device. (T-3) The Hoffman ANV-20/20 tester minimum visual acuity for high-light resolution is 20/30, low-light is 20/35. (T-3) If prescribed acuity is not obtained, the NVGs must be verified by AFE personnel. (T-3) If the NVGs pass, they are acceptable for flight.

17.8.1.2. NVG Compatible Light Source. Each crew member must ensure they have a NVG compatible light source. (T-3)

17.8.1.3. Ensure exterior lights are set IAW AFI 11-202, Vol 3.

17.8.1.4. Aircraft black out kit. (T-3)

17.9. Low-Level Operations. ***WARNING:*** The CSO or PM must continually keep the PF apprised of flight progress and anticipated terrain elevations, obstructions, climb points, and descent points. (T-3)

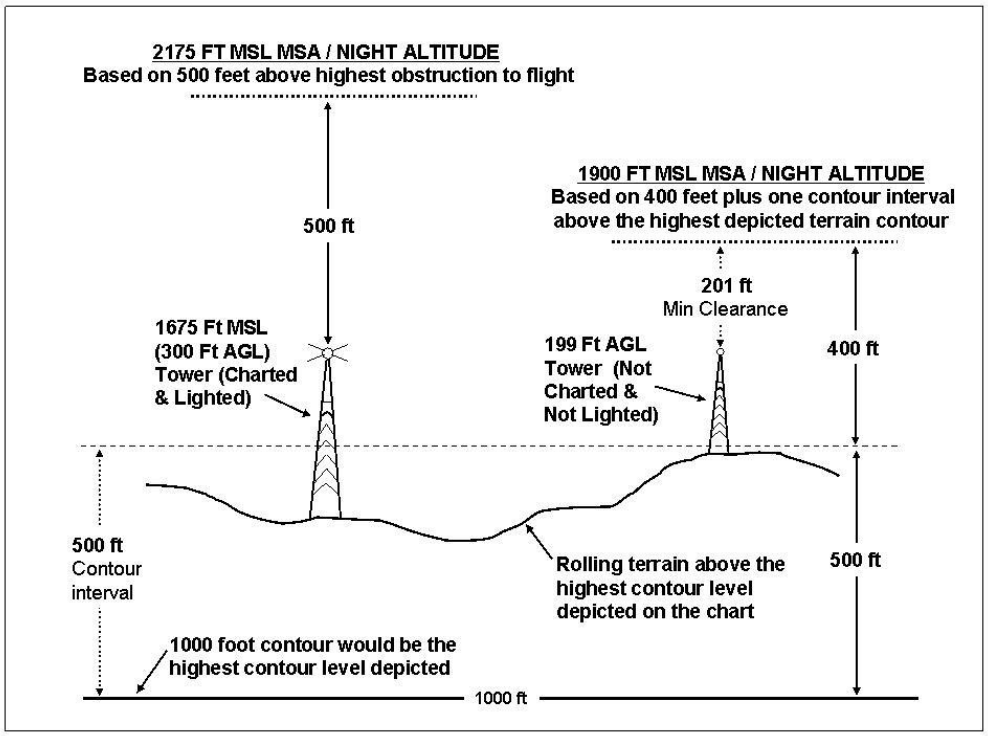
17.9.1. Emergency Safe Altitude. ESA is an altitude that will provide positive terrain clearance in IMC during situations that require the exiting of the low-level environment. To compute ESA, add 1,000 feet (2,000 feet in mountainous terrain) to the highest obstacle or terrain feature within 10 nm of route centerline or intended flight path (whichever is greater), rounded to the next 100-foot increment. (T-3) Use of area ESAs is recommended whenever possible; however, a single ESA is sufficient when there are no significant changes in topography. ESA will be annotated on all flight charts. (T-3)

17.9.2. Minimum Safe Altitude (MSA). MSA is an initial VFR altitude that provides additional terrain and obstacle clearance while the aircrew analyzes situations that require

interruption of low-level operations (route disorientation and equipment malfunctions or when either pilot must leave the seat during low-level operations, etc.). Plan MSA at an indicated altitude of 500 feet above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation), or 400 feet plus one chart contour interval above the highest depicted terrain contour, whichever is highest, within 3 nm of route centerline to include turn radius. (T-3) An MSA will be computed for each leg, route segment, or entire low-level route. (T-3) See **Figure 17.2**.

17.9.3. Route Planning. Low-level flights will be planned using tactical corridors. Tactical corridors should be planned as wide as possible, to provide maximum situational awareness and flexibility. The standard width for a tactical corridor is 3 nm. Tactical corridor width can vary from 1 nm minimum either side of centerline, to as wide as desired (10 nm either side is the max recommended). Corridors do not have to be symmetrical, but must be annotated when different from the standard. (T-3) As a rule of thumb, tactical corridors should be wide over flat terrain and narrow in mountainous terrain.

Figure 17.2. Minimum Safe Altitude.



17.9.4. Low-Level Weather Requirements. In accordance with AFI 11-202, Vol 3. During training operations, higher weather or altitude minimums may be dictated by FLIP, ICAO procedures, or training considerations. Higher minimum visibility may be required to identify and clear obstacles.

17.9.5. Missions planned when the lunar illumination is forecast to be less than .8 millilux/10% effective illumination during the mission require an additional level of ORM. (T-3) The squadron CC/DO or designated representative will be made aware of the ORM

assessment and risk mitigation conducted for missions planned to be flown in low illumination conditions. (T3)

17.9.6. Low-Level Altitudes.

17.9.6.1. Day VMC Low-Level Altitude. Fly no lower than 300 feet AGL modified contour altitude above the terrain using visual references and radar altimeter. (T-3)

17.9.6.1.1. In addition to restrictions in AFI 11-202, Vol 3, specific country or theater of operations publications, and FLIP area planning, routes will not be planned or flown below 500 feet AGL unless: host nation rules specifically allow such VFR operations, routes or training areas have been environmentally assessed and surveyed for 300-foot AGL operations. **Note:** This restriction does not apply to one-time-use routes. Consult FLIP AP/1B for published Military Training Route (MTR) restrictions.

17.9.6.2. NVG Low-Level Altitude. The minimum altitude is 300 foot AGL (non-mountainous) and 500 foot AGL (mountainous terrain). (T-2) Higher altitudes should be flown if terrain-masked.

17.9.6.3. Non-NVG Low-Level Altitude. Fly no lower than Minimum Safe Altitude. (T-2) Fly with reference to the pressure altimeter, using the radar altimeter as a backup.

17.9.6.4. Man-Made Obstacles. All man-made obstacles must be avoided by 1 nm laterally, or 500 feet vertically, unless visually identified. (T-3) This applies for both day and night flights, and also includes obstacles outside of the planned tactical corridor. **Note:** If the planned altitude for a leg is more than 500 feet above a man-made obstacle, this obstacle is not a factor. When flying at 500 feet AGL or below, all obstacles are a factor.

17.9.6.5. IMC Low-Level Altitude. Fly no lower than 1,000 feet (2,000 feet in mountainous terrain) above the highest obstruction to flight (man-made obstruction, terrain feature, or spot elevation) within 5 nm of route centerline. (T-2) Round this altitude to the next 100-foot increment.

17.9.6.5.1. Minimum altitudes for IFR operations within published MTRs in US sovereign airspace will be the computed leg MSA unless a higher altitude is required by FLIP AP/1B.

17.9.6.5.2. Flying portions of planned flights in IMC may be necessary to accomplish mission objectives; however, due to aircraft equipment limitations, operational employment in a low-level environment should be considered a last resort. The PIC and CSO must consider the terrain and the accuracy of the altimeter setting before IMC profiles are attempted. (T-3)

17.9.7. Climb to MSA when either pilot must leave the seat or loses NVGs during low-level flight. (T-3) **Exception:** If performing a planned seat swap for training with an instructor pilot in the seat, climb to a safe altitude.

17.9.8. Altimeter settings. Use the best available altimeter setting. (T-3) It is vital that aircrews accurately update all altimeters prior to low-level/objective areas. When a current local altimeter setting is not available, or a reliable altimeter update (ALT UPDATE) cannot be accomplished, use the lowest forecast altimeter setting. (T-3)

17.9.8.1. An ALT UPDATE derived aircraft altimeter setting should only be used outside ATC controlled environments. An ALT UPDATE should be performed prior to all airdrops or landings. Obtain an ALT UPDATE as close to the objective area and as near the objective altitude as possible. Use sound judgment when updating aircraft altimeters and cross-check elevations and new settings with all available information.

17.9.8.1.1. If a valid GPS position is available (FOM 2 or better), the PM will update the aircraft altimeter setting to equal the GPS altitude once established on drop altitude (for airdrops) or the final ingress altitude (for SCA). (T-3) For SCA ingress altitudes greater than 1,000 above the threshold elevation, use the forecasted lowest altimeter setting. (T-3)

17.9.8.1.2. If a valid GPS altitude is unavailable (FOM 3 or greater), the CSO will update the pressure altimeter by recording the current altimeter setting, AGL altitude from the radar altimeter, and the MSL altitude from the pressure altimeter over a known elevation and computing a new setting or use the minimum altimeter setting for the objective area. (T-3) This works well when flying over a body of water, or flat terrain. Ensure that the radar altimeter is fully operational and use sound judgment when updating aircraft altimeters. (T-3) ***WARNING:*** Obtaining an ALT UPDATE at a significantly higher or lower altitude than the target can induce substantial altimeter error. Use extreme caution when updating the pressure altimeter to a higher setting, as lower absolute altitudes will result. (T-3)

17.9.8.1.3. Apply cold weather altimeter corrections to any non-GPS derived barometric altitude (MSA, ESA, reference altitude, drop altitude, SCA backup altitudes, SCA minimums, etc.), used during low-level operations when the outside air temperature is below 32° F/0° C. (T-3)

17.10. Low-Level Emergency Procedures.

17.10.1. Crew Disorientation. Threat permitting, when a crew becomes disoriented on a low-level mission, start a climb to ESA. (T-3) Continue the climb until the ESA is reached or a positive fix is obtained. (T-3) After obtaining a positive fix, descend and resume low-level operations. (T-3) The CSO/PM will cross-check timing and adjust as necessary. (T-3)

17.10.2. Spatial Disorientation. The PM will be ready to immediately take control of the aircraft if the flying pilot experiences spatial disorientation. (T-3) Start a climb to at least MSA until the pilot experiencing the problem is ready to resume PF duties. (T-3)

17.10.3. Inoperative NVGs. In the event of an NVG malfunction, start a climb to at least MSA until the pilot experiencing the problem is ready to resume their duties. (T-3)

17.10.4. Aircraft System Failure. Begin a climb to MSA when a known or suspected malfunction prevents continued safe low-level operations. (T-3)

17.10.5. Emergency Climb. Consider this procedure in cases of (but not limited to): certain equipment malfunctions, spatial disorientation, inadvertent weather penetration, critically low aircraft altitude and/or airspeed, and/or loss of situational awareness during low-level operations. Any crew member may initiate this procedure by stating "Emergency Climb." If required/called for, execute the procedure as soon as possible. (T-3) **Table 17.2** lists the steps for the Emergency Climb procedure.

Table 17.2. Emergency Climb Procedure (T-3).

1. Announce "emergency climb" to the crew over interphone.
2. Execute the 1C-130(E)J-1 Wind Shear Procedures.
3. Close ramp and door (if open).
4. Turn away (with consideration for stall margin) from terrain if feasible. If not possible, climb straight ahead for the maximum climb angle.
5. The PM will monitor and call airspeed as appropriate. Pilots must monitor stall caret.
6. The CSO will state an MSA or ESA as appropriate, monitor terrain (via radar, chart, etc.) and "clear of terrain" when above all critical terrain.
7. When clear of all terrain, adjust pitch, power, and airspeed for a normal climb out and level off.
WARNING: If impact with terrain is imminent, use 100% flaps, 10 knots above the stall caret and crash the aircraft straight ahead.

17.11. Radar Altimeter Usage.

17.11.1. Set radar altimeter no lower than 20% below the planned en route altitude. (T-3) Depending on required altitude profile, illumination, and proficiency, a higher radar altimeter setting may be appropriate.

17.11.2. The PF will make an immediate correction any time the system provides an "altitude" annunciation. (T-3) **Note:** Regardless of the radar altimeter setting you use, do not wait for an annunciation to begin a correction.

17.12. Defensive Maneuvers and Equipment.

17.12.1. Practice Combat Maneuvers. All crew members will be pre-briefed and advised of the time period/portion of the flight when practice threat maneuvers will be executed. (T-3) Crew coordination is essential in avoiding injury to crew members during practice threat maneuvers.

17.12.2. Expendables/ECM Training. Conduct all expendables training IAW CJCSM 3212.02C, *Performing Electronic Attack In The United States And Canada For Tests, Training, And Exercises*, AFI 11214, *Air Operations Rules and Procedures*, AFI 10706, *Electronic Warfare (EW) Operations*, AFI 13212, *Range Planning and Operations*, and applicable host nation directives. Dispense only when approved by the controlling agency IAW agency procedures and restrictions. When over open-water, do not drop expendables below 500 feet AGL or within 3 nm of any surface vessel, platform, or landmass. (T-3) WARNING: Practicing defensive threat maneuvering does not constitute authority to deviate from limitations in the flight manual or this instruction.

17.13. Degraded Systems Training (DST). DST is used to prepare crews to accomplish the mission simulating certain pieces of equipment inoperative (or intentionally turned off for emission control). On non-local routes, designate leg segments during the route brief. (T-3) The following restrictions and procedures are designed to maximize training and safety. (T-3)

17.13.1. Restrictions: (T-3)

17.13.1.1. Visibility must be 5 sm in mountainous terrain. (T-3)

17.13.1.2. One radar altimeter must be operational. (T-3)

17.13.1.3. Mission instructor or evaluator must be in either the pilot or CSO position. (T-3)

17.13.1.4. One HDD at any crew position must be selected and monitored by an instructor (P/CSO) for DST of the navigation system. (T-3)

17.13.1.5. PICs will brief the following items: (T-3)

17.13.1.5.1. Equipment simulated inoperative. (T-3)

17.13.1.5.2. Aircrew coordination. (T-3)

17.13.1.5.3. Disorientation and emergency procedures. (T-3)

17.14. Self-Contained Approach(s) (SCA).

17.14.1. Planning.

17.14.1.1. SCA procedures may be used for approaches to conventional airfields and assault zones, and for either overt or NVG airland operations. Comply with local ATC restrictions and host nation agreements, as appropriate.

17.14.2. En Route Altitude. The altitude profile may consist of MSL altitudes, NVG altitudes, or any combination. In all cases, an MSL altitude profile will be planned.

17.14.3. Weather minimums.

17.14.3.1. SCA must be conducted in VMC unless HQ MAJCOM/A3V (or delegated approval authority) approves IMC operations. (T-2) If approved, IMC SCA weather minimums will be no lower than 300 feet and 1. (T2)

17.14.4. Minimum Descent Altitude. To compute MDA for VMC operations, add a minimum of 100 feet to the Touchdown Zone Elevation (TDZE). (T-3) For approved IMC SCA operations, add a minimum of 300 feet to the TDZE. (T-3)

17.14.5. Missed Approach Point (MAP). The MAP is at zero distance to go on the mission computer or as required for obstacle clearance on the SCA plate at MDA.

17.14.6. A full SCA Plate for landing runway is required. (T-2) Construct an approach plate for the landing runway using the AF Form 4118, *Self-Contained Approach (SCA) Planning Form*, computer Approach Planning Tool (APT), or an OGV approved planning form.

17.14.7. Approach Path and Glideslope Construction. Plan IMC SCAs with a 3° glideslope from en route altitude unless terrain or obstructions dictate a different glideslope. (T-3) Avoid using glideslopes greater than 5°. (T-3) Plan initial VMC SCA glideslopes commensurate with terrain, obstructions, threat, and aircraft limitations. (T-3) Plan to intercept a 3° glideslope at or before the MDA. (T-3)

17.14.8. Chart Preparation. Use the largest scale chart available from 10 nm inbound. (T-3) 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. (T-3) Chart construction will be IAW this chapter and include the following additional items: The 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.

17.15. SCA Template Construction.

17.15.1. Use the most current sources for topographic point obstruction, and airfield information. (T-3) Consider using radar reflectors, radar beacons, or existing airfield NAVAIDS to increase the reliability of the approach.

17.15.2. En Route Altitude. In all cases, an MSL altitude profile will be planned. (T-3)

17.15.3. Obstacle Clearance. The location of terrain and obstructions will dictate the glideslope and altitude profile used. (T-3) Use the following procedures to analyze obstacles: (T-3)

17.15.4. Straight-In SCA. Draw the horizontal obstacle clearance template, depicted in **Figure 17.3** on a 1:250,000 or larger scale chart, if available. (T-3) 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 3 nm from the touchdown point. The template will encompass all terrain 1 nm either side of centerline from the planned descent point extending to 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. Refer to **Figure 17.4**, SCA Horizontal Obstruction Template. **Note:** These are minimum distances and may be increased. Consider such factors as the availability of radar or EO/IR targets, recent NAVAID performance, and time of last computer update.

Figure 17.3. SCA Horizontal Obstruction Clearance Template.

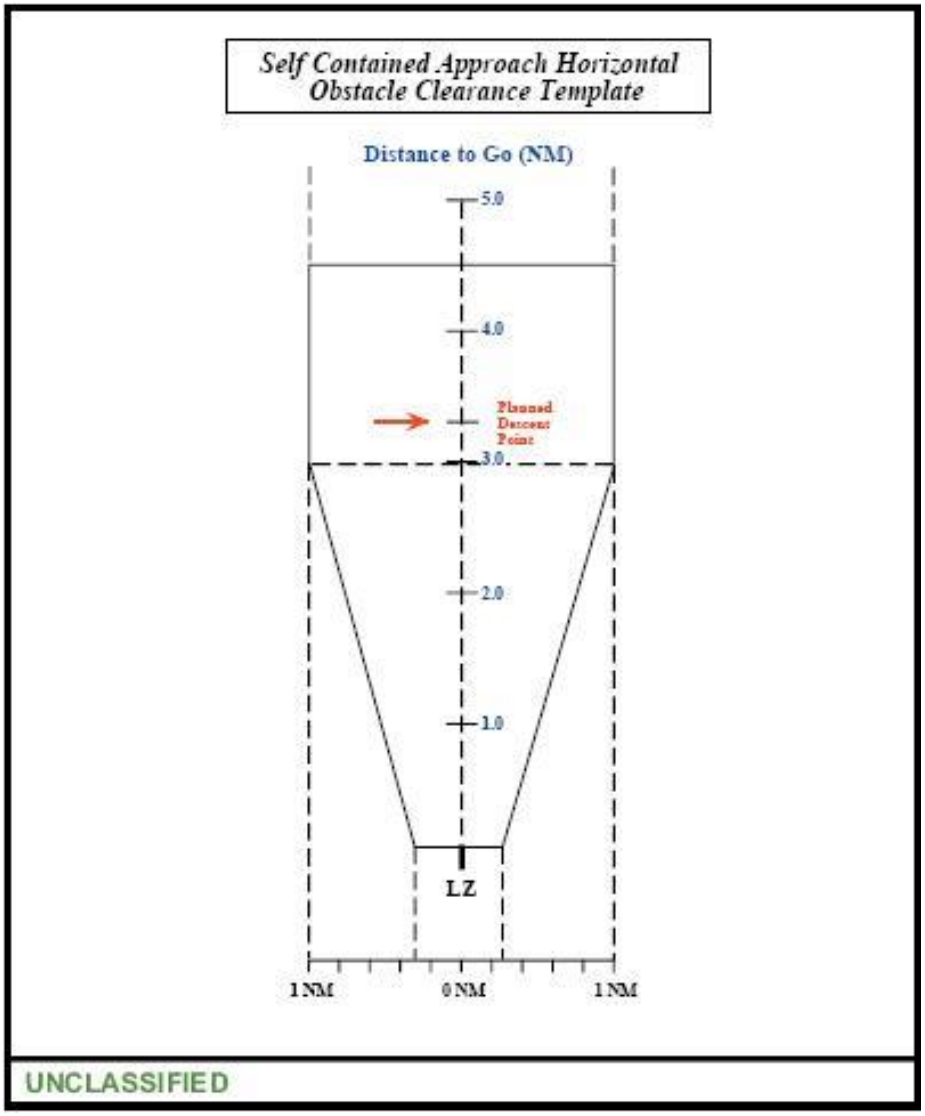


Figure 17.4. Turning SCA Horizontal Obstruction Clearance Template (Note: Not to scale) (1of 2).

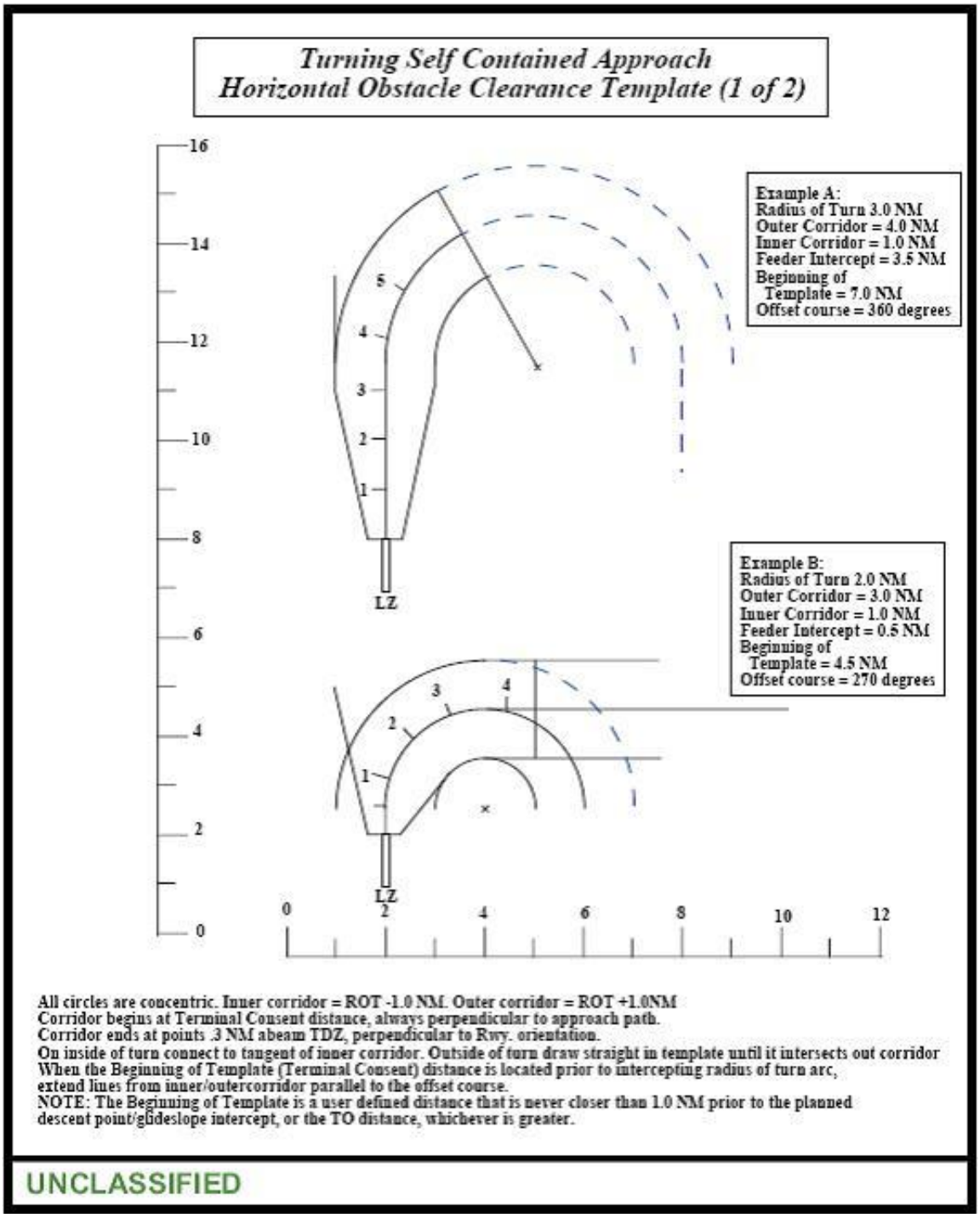
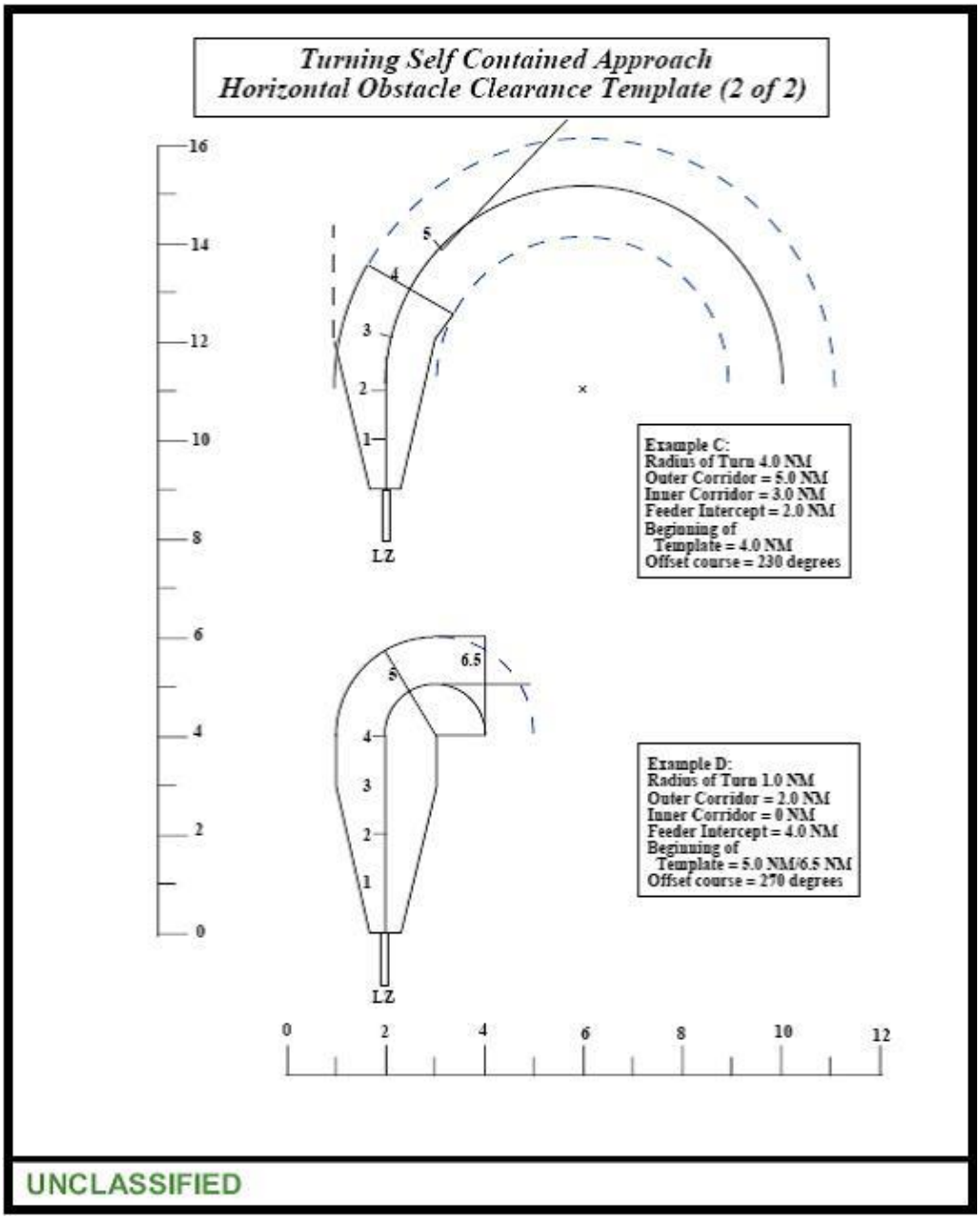


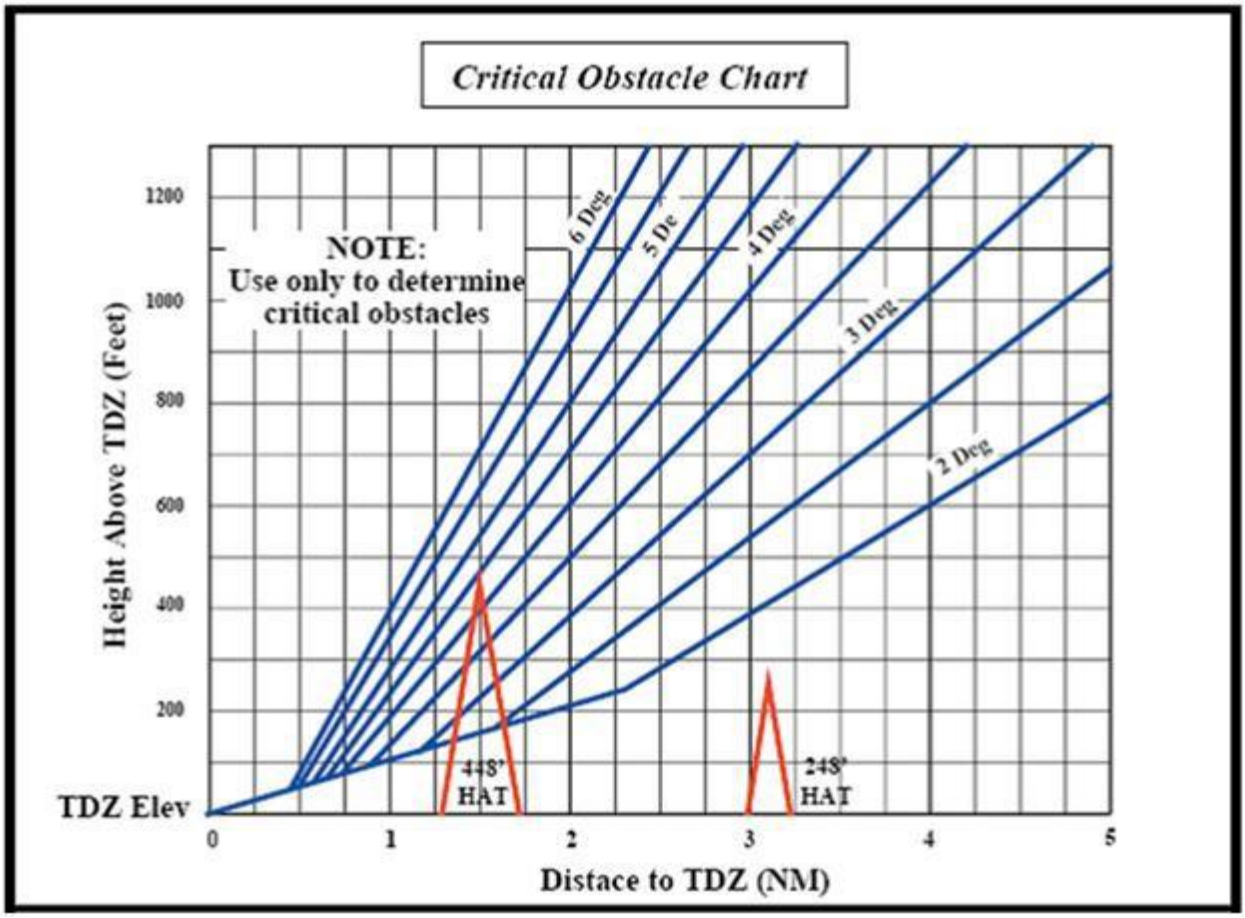
Figure 17.5. Turning SCA Horizontal Obstruction Clearance Template (Note Not to scale) (2 of 2).



17.15.5. Turning and Circling SCA. 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 17.5**, on a 1:250,000 or larger scale chart if available. (T-3) 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 17.2** example B. (T-3)

Figure 17.6. Critical Obstacle Chart.



17.15.6. 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 17.6**, 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. (T-3)

17.15.7. For each critical obstacle identified, preplan and brief a specific means of avoidance to be used during the approach. (T-3) The following examples may be used separately or in combination:

17.15.7.1. Use a steeper glideslope. Glideslopes exceeding 4° should be carefully considered due to the high rate of descent required.

17.15.7.2. Move the touchdown point further down the runway.

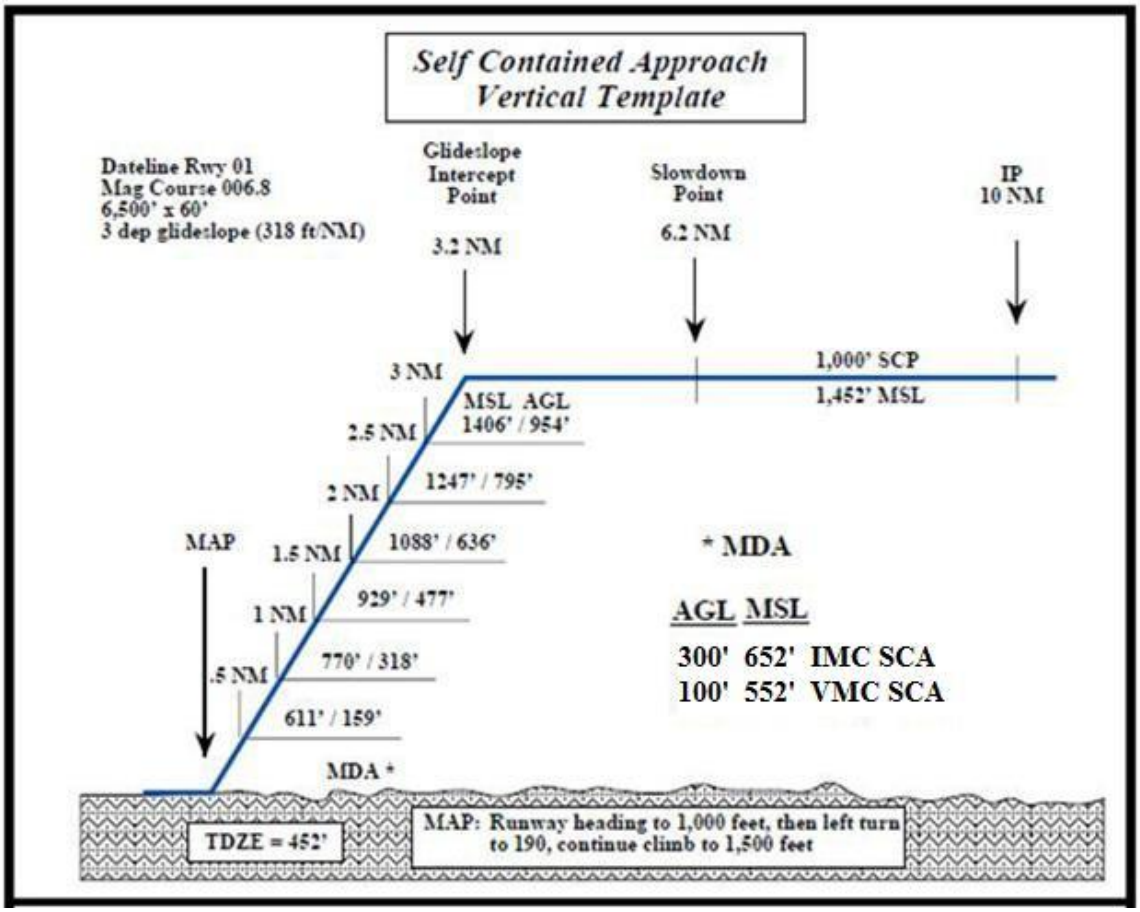
17.15.7.3. Increase MDA.

17.15.7.4. Establish an intermediate step-down altitude above the MDA at which the aircraft will level off until positive separation from the obstacle is assured.

17.15.7.5. Change the approach to the opposite end of the runway, to a crossing runway, parallel runway, etc.

17.15.8. 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. (T-3)

Figure 17.7. SCA Vertical Template.



17.15.9. 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).

17.15.10. 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. Use the three-engine climb angle in place of glideslope (refer to **Figure 17.8** formula below). (T-3)

Figure 17.8. Angle of Climb (Chart).

Angle of Climb = Rate of Climb (ft/min) x ground speed (knots)

17.15.11. 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 en route altitude. The lateral limits of the climb out template are the same as for the straight-in approach.

17.15.12. 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.

17.16. Approach Execution.

17.16.1. The Infil/Exfil checklist is recommended for all SCA, with both pilots monitoring system/CSO guidance. When the mission, local ATC restrictions, and host nation agreements allow use of covert lights, mark the runway as depicted in AFI 13-217, *Drop Zone and Landing Zone Operations*.

17.16.1.1. General. Depending on the type of landing, the pilot will select either overt or covert lighting. If the PF requires lights to acquire the LZ he may call for "wing tip lights", "taxi lights", or "landing lights". Each pilot will ensure both NVG batteries are operational during the Infil/Exfil checklist. (T-3)

17.16.1.2. Instrument approaches using Infil/Exfil checklist. When the tactical situation dictates flying an instrument approach while utilizing the Infil/Exfil checklist, ensure all briefing items from the approach checklist are covered. **Note:** During NVG operations, an NVG landing qualified pilot (non-instructor) may takeoff and land from the right seat provided an NVG landing qualified pilot is in the left seat and normal (non-assault) procedures are used. In this case, either pilot may fly the SCA, with the other pilot accomplishing the landing and subsequent takeoff. Refer to **Chapter 9** for touch-and- go restrictions. Instructor pilots may fly both the SCA and landing for demonstration purposes. During day operations or overt night operations to lit runways, either pilot may fly the SCA and landing.

17.16.2. Aircraft lighting will be as briefed/directed by ground parties for authentication purposes. The use of covert lighting will be thoroughly briefed in respect to threat, runway environment and authentication procedures.

17.17. SCA and INFIL/EXFIL Crew Actions. Note: Use the following procedures regardless of whether the INFIL/EXFIL or APPROACH and normal BEFORE LANDING checklists are used. (T-3)

17.17.1. Required warnings and calls.

17.17.1.1. "20 minute warning", "10 minute warning"; "30 seconds to slowdown"; "slowdown"; distance call at "2 nm" (from the landing zone); "begin decent"; "missed

approach point" (if other than approach end of runway); and "100 ft", "50 ft", "25 ft" and "10 ft" above touchdown. Additionally, the CSO will update the pilots on course, distance-to-go, and glide path profile every 1 nm until 3 nm to go, then every 1/2 nm until the "minimums" call. (T-3)

17.17.1.2. The PF will determine and brief what additional time warnings (with user coordination) and calls are required for the mission to be flown. The PF and CSO will brief the SCA using the appropriate aircrew mission briefing guide. (T-3)

17.17.2. The PM will determine the most accurate altimeter setting for the LZ using all available sources including GPS, weather forecasts, ground station reporting and altitude calibration, as available. The PF and CSO will confirm what altimeter setting will be used for the landing. (T3)

17.17.3. The PM will back up the flying pilot on the displays and confirm terrain clearance using all available means possible. Both the PF and PM will clear for obstacles and other traffic. (T-3)

17.17.4. At the Initial Point (IP).

17.17.4.1. The CSO will verify final course guidance accuracy. (T-3)

17.17.4.2. The CSO will confirm LZ alignment with the APN-241 (LPCR) and give final headings as required. (T-3)

17.17.4.3. Maintain en route profile until descent for landing. (T-3)

17.17.5. Slowdown Procedures.

17.17.5.1. Slowdown should be initiated approximately 3 nm prior to the planned glide slope intercept point. The CSO should initiate the slowdown.

17.17.5.2. Slowdown points will be planned and briefed for tactical approaches. (T-3) Pilots should initiate their own slowdowns for overhead and downwind approaches.

17.17.5.3. Initiate the Before Landing Checklist at the Slowdown call. Slow to prebriefed speed at this planned point. Ensure 100 percent flaps (if used) are set prior to reaching threshold speed. (T-3)

17.17.5.4. Do not slow to threshold speed until established on final for both straight-in and turning SCAs. For turning SCAs, maintain approach speed in the turn. (T-3) ***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.

17.17.6. Glide slope Intercept.

17.17.6.1. The pilot flying will begin descent upon CSO direction or following the flight director cue (IPRA) unless directed otherwise by the CSO. (T-3) ***WARNING:*** The pilot monitoring and CSO must closely monitor radar altimeters to ensure accuracy of altimeter settings to prevent inadvertently flying below planned AGL minimums. (T-3)

17.17.6.2. At glide slope intercept, the CSO will state "Begin Descent" and should repeat the desired initial descent angle. The CSO will monitor course and glide slope deviation using a PFD display. Report deviations greater than 50 ft vertically, or 50 yards

horizontally, along with an advisory as to whether the aircraft is correcting to, paralleling, or diverging from course/glide path. (T-3)

17.17.7. Setting Radar Altimeters. Radar altimeters should be set no lower than 50 feet below decision height or height above touchdown. (T-3)

17.17.8. Set the MDA in the Ref Set panel.

17.17.9. Descent. Do not descend below MDA until the LZ environment is identified visually and confirmed by both pilots. Whoever identifies the LZ first will call out "ZONE IN SIGHT", and any discrepancies noted (i.e., any lights out, etc.). The other pilot will then confirm the zone and call out its clock position, then cross-check the alignment for the proper heading. (T-3) ***WARNING:*** Use of a 5° glide slope can cause descent rates in excess of 1,000 feet per minute. ***WARNING:*** In no case will a descent below 300 feet AGL be initiated prior to 2 nm to touchdown.

17.17.10. The CSO will use the APN-241 (LPCR) to verify the runway has been correctly identified after completing the final position update. (T-3)

17.17.11. After Landing. **Note:** During INFIL/EXFIL procedures, the pilot may pre-brief the opening of the ramp and door upon reversing of the engines. Opening of the ramp and door initiates the "On The Runway Checklist". (T-3)

17.17.11.1. The copilot and CSO will assist the pilot in locating the offload/onload point and clearing for other aircraft and obstructions once taxi speed is reached. (T-3)

17.17.11.2. Use overt/covert taxi and landing lights to the minimum extent required to maintain visual references. (T-3)

17.17.12. Takeoff.

17.17.12.1. The "On The Runway Checklist" for INFIL/EXFIL is automatically initiated when the pilot clears the ramp and door. Complete the "On The Runway Checklist" prior to takeoff. (T-3)

17.17.13. Go-Around and Departure Procedures.

17.17.13.1. For SCA's and tactical operations, when executing a go-around or departure, the CSO will state: "100", "200", "300" feet then direct an initial heading/course and altitude. During a go-around initiate the Go-around Checklist. (T-3) ***CAUTION:*** Pilots are more susceptible to spatial disorientation during NVG go-arounds and departures.

17.17.13.2. If an immediate approach and landing are not feasible complete the After Takeoff Checklist. (T-3)

17.17.14. Loss of NVGs:

17.17.14.1. Before Landing. If the pilot or copilot loses use of their NVGs inside of 1 nm, perform a go-around. (T-3)

17.17.14.2. After Takeoff. The PF should transfer aircraft control and continue the climb to enroute altitude.

17.17.14.3. 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.

17.18. Random Tactical Approaches.

17.18.1. Tactical Random Approaches. MP(s), without a low level qualified crew, will fly no lower than MSA outside the aerodrome protected circling airspace. (T-3) Within the protected circling airspace, fly no lower than appropriate category circling MDA/HAA. (T-3)

17.18.2. Minimum Intermediate Altitude. Defined as 300 feet above the highest obstacle within 2 nm either side of course centerline. It may extend to no more than 20 nm from the objective (LZ/DZ) and no less than 1nm prior to the planned level off point. This altitude is used in conjunction with the Drop High and Approach High profiles. Lateral defensive maneuvers should be minimized do the proximity of higher terrain 2 nm from centerline.

17.18.3. EC-130J Minimum Altitude. Defined as 500 feet above the highest obstacle within 1 nm either side of course centerline rounded up to the next hundred feet of altitude. It may extend to no more than 10 nm from the objective (LZ/DZ) and no less than 1 nm prior to the planned level off point and will extend 1 nm past the objective (LZ/DZ). When operating at this altitude crews should only exercise vertical defensive maneuvers until at or above the Minimum Intermediate Altitude.

17.19. Airdrop Operations.

17.19.1. Airdrop General.

17.19.1.1. Each CSO performing an airdrop will compute a CARP/HARP. (T-3)

17.19.1.1.1. The CSO will plot and brief the CARP/HARP location on a drop zone mosaic. Drop Zone mosaic will be annotated with run-in course, CARP/HARP location, load type/weight/chute, visual references (as required), red light location, 10-second location, ballistic winds, drop safety box, escape/racetrack, and all other requirements outlined in AFI 11-231.

17.19.1.2. Airdrops will normally be system directed drops backed up by the pilots and CSO.

17.19.1.3. Airdrops may be conducted in IMC and VMC. For detailed information on DZ sizes, markings, types, and weather and wind limits, refer to AFI 13-217, *Drop Zone and Landing Zone Operations*. For information on aerial delivery airspeeds and altitudes, refer to AFI 11-231, *Computed Air Release Point Procedures*.

17.19.1.4. Airdrop Kits. The loadmaster will refer to **Loadmaster Procedures** Chapter of this regulation**.**

17.19.1.5. Specific in-flight visual signals, verbal signals, and interphone procedures between the jumpmaster and loadmaster are coordinated during the jumpmaster briefing.

17.19.1.6. Required Navigation Accuracy. The navigation accuracy required for a given mission will vary depending on the type of mission and other considerations. For airdrops, to provide an early indication of degraded navigation accuracy, set the POS ALERT(s) at 0.03 nm (~ 55 yards; FOM 2) and 0.05 nm (~ 110 yards; FOM 4).

Normally, airdrop accuracy requirements (300 yd Computed Air Probability) are met if the ship solution FOM is less than or equal to 4 and no POS ALERTs are indicated. If these conditions are not met, further action (radar or visual cross-check/update) is necessary to verify/improve navigation accuracy prior to performing airdrops.

17.19.1.7. Minimum en route time from takeoff to time over release point will be sufficient to safely accomplish all required checklists. For airdrop involving personnel, the jumpmaster must approve en route time of less than 25 minutes.

17.19.1.8. Jumpmaster directed (JMD) Directed Procedures. JMD personnel airdrops require Group/CC approval. (T-3) For JMD drops, the jumpmasters' parent service/user accepts all responsibility for the accuracy of the drop plus any potential injury/damage to equipment. **Note:** For HARP operations if jumpmaster's solution falls within the CNI-MU drive circle then the airdrop is not considered a jumpmaster directed airdrop. CNI-MU safety factor will not exceed 80%, and approach/safety factor will be not less than 1,000 feet. (T-3)

17.19.1.8.1. During JMD, the jumpmaster determines the release point (RP) mathematically or by wind drift indicator. The jumpmaster directs the aircraft to the RP using steering commands to the aircrew. CSOs will accomplish CARP or HARP calculations to back up the computations and in-flight directions given by the jumpmaster. (T-3) The following conditions apply: (T-3)

17.19.1.8.2. Prior to completing the Run-In checks, the loadmaster permits the jumpmaster access to the door to begin "spotting procedures". The slowdown should be adjusted to allow the jumpmaster to begin spotting procedures not less than two minutes out. The jumpmaster visually relays steering signals to the loadmaster, who verbally relays these signals to the pilot. The jumpmaster may spot from the aircraft ramp or a paratroop door.

17.19.1.8.3. Upon entering the leading edge of the updated LAR (or as coordinated with the Jumpmaster), the PM turns on the green light to indicate clearance for the jumpmaster to make a final decision as to the exact exit point. Jumpers may exit on the jumpmaster's direction while the green light is illuminated. The red light is turned on at the end of the CSO's computed usable DZ distance (or green light time IAW AFI 13-217, AFSOC Supp) or when the last jumper or load exits, whichever occurs first. No jumpers should exit after the red light is turned on.

17.19.1.8.4. JMD releases will not be mixed with any other type of airdrop method, i.e., general mobile radio service (GMRS), verbally initiated release system (VIRS), or standard CARP drops. (T-3) If JMD drop procedures are called for, the crew will follow the jumpmaster's instructions, while adhering to normal safety concerns. (T-3) Should the crew believe the drop would occur outside of safe parameters, they will call "no drop" and ensure the red light is illuminated.

17.19.2. Airdrop Planning.

17.19.2.1. Crews will not perform airdrops using parachutes for which AFI 11-231, *Computed Air Release Point Procedures*, does not list ballistics unless the user provides ballistic data or K factor that has been verified by HQ AFSOC/A3V. This does not apply

to formal test missions where the purpose of the test is to derive ballistic data for a specific load. (T-2)

17.19.2.2. The PIC and the CSO will review the DZ survey during mission planning. (T-3)

17.19.2.3. When airdropping military free fall (MFF) personnel, coordinate the following with the jumpmaster: forecast local altimeter setting at the planned drop zone; en route flying time from takeoff to airdrop, and jumpmaster's plan to calculate and set the cypress automatic actuation device (AAD), if used. (T-3)

17.19.2.4. Oxygen requirements will be per AFI 11-409, *High Altitude Airdrop Mission Support Program*, and AFI 11-202, Vol 3.

17.19.3. Airdrop Communications Procedures.

17.19.3.1. During airdrop, after acknowledgement of the 20minute warning and donning of the helmet, loadmasters may clear off interphone, with the PIC approval, to facilitate movement around large platforms or CDS loads. The CSO will accomplish the brief associated with the 20minute warning. (T-3) After completing the required 20minute checklist items, the primary loadmaster will remain on interphone throughout the remainder of the airdrop. (T-3)

17.19.3.2. Training Operations. Radio transmissions with the DZ are limited to those required for safety of flight considerations or factors affecting airborne force employment. (T-3) This includes ATC directions, range clearance, unsafe surface conditions or mission changes. When the mission dictates radio silence, transmission of wind information and range or drop clearance is not required. Radio silence procedures will be coordinated prior to mission execution. (T-3)

17.19.3.3. Drop clearance is normally inherent with mission clearance to unmanned DZ. The aircrew observing the proper briefed authentication confirms drop clearance in VMC.

17.19.3.4. In IMC, drop clearance is confirmed via radio call or beacon acquisition.

17.19.3.5. In VMC, a no-drop or mission cancellation is communicated by the absence of prebriefed markings (visual or electronic), jumbled block letter, observation of the block letter X, or red smoke, light, or flare or as briefed. In IMC, a no-drop or mission cancellation is communicated by an authenticated radio transmission or absence of the beacon.

17.19.3.6. During flight for an MFF airdrop, the jumpmaster will receive an update of the local altimeter setting for the planned drop zone (if available) from the aircrew at the 10 minute warning. (T-3) The jumpmaster will reconfirm this setting with the aircrew. (T-3)

17.19.4. Ramp and Door and Paratroop Door Operations.

17.19.4.1. Clearance to Open. The PF may direct ramp and door opening anytime after the sixminute advisory for personnel drops or as mission dictates for non-personnel drops. Consider added drag, power available, climb requirements, built up areas, airdrop rigging, and the possibility of dropped objects when the door is opened. ***WARNING*:**

Do not open the ramp and door to accomplish SATB/simulated airdrops with loads rigged with an extraction parachute in the bomb rack. If the actual airdrop loads cannot be dropped, the extraction parachute will be removed from the bomb rack and secured forward of the load. (T-3)

17.19.4.2. Loadmaster-Jumpmaster Control. When the aircraft is in its final airdrop configuration, the primary loadmaster may relinquish control of the paratroop doors/ramp and door to the jumpmaster (no later than 2 minutes prior for JMD drops). The loadmasters will then take a position on the cargo ramp in such a manner as to provide maximum maneuverability for jumpmasters and safety personnel to perform their duties. (T-3) For ramp and cargo door exits, the loadmaster(s) will take a position to prevent interference with exiting jumpers. (T-3) Upon seeing the red light illuminate, the primary loadmaster will notify the jumpmasters or safety personnel of the red light condition. (T-3) The loadmaster will take no further action to stop any of the remaining parachutists. (T-3) The loadmasters will count (if possible) any parachutists that exit the aircraft after the red light has illuminated. Control of the paratroop doors/ramp and door will revert back to the loadmasters after all parachutists have exited or remaining parachutists have been stopped by the jumpmaster or safety and cleared from the door area. (T3) For multiple passes (racetracks), after assuming control of the paratroop doors/ramp and door from the jumpmaster, the loadmasters will maintain control of the doors until completion of subsequent checklists. (T-3) ***WARNING*:** During personnel airdrops, the loadmasters will not position themselves directly under the aft anchor cable supports (A-Frame, FS 737). (T-3) ***WARNING*:** Ensure all personnel aft of FS 737 are secured to the aircraft or have a static line connected prior to opening the ramp and door. (T-3) HALO/ HAHO personnel must be configured and ready to jump. (T-3)

17.19.4.3. Multiple Passes (Racetracks). When performing multiple equipment airdrops across the same DZ, all airdrop checklists will be accomplished. (T-3) When performing multiple personnel drops across the same DZ, checklists may resume at the 6 minute warning assuming no airdrop parameters or aircraft configuration changes are made from the previous drop. Ensure the loadmaster has adequate time to complete all checklist items before the drop. (T-3) **Exception:** During non JMD (pilot directed) airdrops, the checklist may be initiated at a point commensurate with the available time and type of drop. This will be coordinated at the Pilot-Loadmaster/Jumpmaster/Troop Commander Briefing. When airdrop parameters or aircraft configuration changes are made between drops, all checklists will be accomplished. (T-3) Airdrop time advisories and checklists may be compressed, except for the one minute warning. Doors may remain open at the discretion of the PF.

17.19.4.4. Tailgate Drops. The following restrictions apply: (T-3)

17.19.4.4.1. Rig both anchor cables and both static line retrievers prior to takeoff (if applicable). (T-3)

17.19.4.4.2. Use one anchor cable for each pass and limit each pass to a maximum of 20 static lines. (T-3)

17.19.4.4.3. Use the opposite anchor cable if another pass is required. (T-3)

17.19.4.4.4. Retrieve static lines and deployment bags prior to each additional pass. (T-3)

17.19.5. Airdrop Execution.

17.19.5.1. System/Visual Airdrops. The primary method for aerial delivery is automatic release at the computer derived release point. (T-3) Visual Airdrops are not authorized (does not apply to JMD airdrops). (T-3)

17.19.5.2. CSOs will update the jumpmaster in-flight on actual wind information and any changes to the crew's preflight computed CARP/HARP location. The crew will also update the jumpmaster with the local altimeter setting for the planned drop zone (if available) at the 10minute warning. The jumpmaster will reconfirm this setting with the aircrew. (T-3)

17.19.5.3. Approved computer-aided (CARP and HARP) programs may be used, but the CSO must verify the results.

17.19.5.4. The CSO will verify the actual number and type of parachutes, load weights, sequence of delivery, and position of loads in the aircraft. (T-3) Recalculate CARP/HARP if actual conditions differ from the preplanned configuration. (T-3) ***WARNING:*** Military CYPRES AADs require both a descent below 1,500 feet AGL and 115 feet per second (6900 vvi) descent rate threshold before it will deploy the reserve parachute. Jumpmasters will program the CYPRES in flight if en route time exceeds one hour to the drop zone, and require an accurate local altimeter setting to do so. A programmed altimeter setting significantly different from the actual local altimeter can result in unintended deployment of the reserve canopy or failure to deploy when needed, endangering MFF personnel. Use of auto-pressurization can also cause activation of the CYPRES AAD just after take-off in certain situations.

17.19.5.5. Safety Device. Provide safety personnel with parachutes carried on board the aircraft. (T-3) They may use a restraint harness at their discretion, if available. Provide a restraint harness to other personnel required to be mobile in the cargo compartment. (T-3)

17.19.5.6. A DD Form 1748, *Joint Airdrop Inspection Record*, will be accomplished prior to all equipment airdrops. Completion, retention, and disposition of the form will be in accordance with the Air Force Joint Instruction (AFJI) 13-210, *Joint Airdrop Inspection Records, Malfunction/Incident Investigations, and Activity Reporting*, as supplemented. **Exception:** A-7A and A-21 containers rigged for door bundles. The aerial delivery unit supporting movement of equipment and supplies will ensure current publications are available to the loadmaster to ensure standardization of joint inspections. (T-3) Aerial delivery units supporting AFSOC unilateral airdrop training will provide copies of required publications. (T-3)

17.19.5.7. In-Flight Rigging Procedures. In-flight rigging is a safe procedure if accomplished under a controlled situation. Accomplish in-flight rigging only when the safety of the personnel required to be mobile in the cargo compartment is not jeopardized. (T-3) The aircraft may have to change altitude. Use the following procedures on airdrop missions that require in-flight rigging: (T-3)

17.19.5.7.1. Two loadmasters are required, except for SATB. At least one loadmaster will remain on interphone at all times. (T-3)

17.19.5.7.2. The use of the pendulum release system is optional for SATBs.

17.19.5.7.3. Make an in-flight check of the rigged items using the DD Form 1748, *Joint Airdrop Inspection Record*.

17.19.5.8. Airspeed adjustments should be completed prior to slowdown. ***WARNING:*** For personnel airdrops, the pilot must be aware of paratroopers standing in the back and avoid drastic pitch, bank and power changes after the Six Minute Advisory. (T-3) Use of auto throttles may cause drastic speed changes resulting in an unstable platform.

17.19.5.9. For paratroop door drops. The PM opens the air deflector doors upon slowing below 150 knots indicated air speed (KIAS). Once air deflector doors are called open, this automatically clears the LM to open the paratroop doors.

17.19.6. IMC Drop.

17.19.6.1. Drop Altitude. Plan minimum IMC drop altitudes at MSA or as specified in AFI 11231, *Computed Air Release Point Procedures*, whichever is higher.

17.19.6.2. As defined in Federal Aviation Regulation (FAR) Exemption 4371L operations must be conducted at 500 feet above the highest obstacles within 3 nm of the course to be flown over mountainous or other areas. (T-1) **Note:** Crews may segment drop corridor MSAs as mission requirements dictate.

17.19.6.2.1. DZ Entry Point. The point where an aircraft may safely begin descent from IFR en route altitude or a segmented altitude to IMC drop altitude.

17.19.6.2.2. DZ Exit Point. A fixed point on the DZ escape flight path centerline where each aircraft will be at minimum IFR en route altitude. (T-3) Normally, calculate the exit point based on a 1,000 feet per minute (FPM) climb at 140 KIAS. (T-3) Analyze 3-engine climb performance and ensure obstacle clearance at pre-airdrop gross weight. (T-3) If unable to clear all obstacles on 3engines, adjust the DZ exit point based on 3-engine climb capability. (T-3) This point will be a minimum of 4 nm track distance from the trailing edge of the DZ. (T-3) ***WARNING*:** Analyze pre-drop gross weight to determine if obstructions can be cleared on 3engines from DZ entry through DZ exit. (T-3) If obstructions cannot be cleared reduce aircraft gross weight, revise run-in and/or escape course, or increase drop altitude.

17.19.7. No-Drop Decisions.

17.19.7.1. Prior to the 1 minute warning (2 min for high altitude combination drops), notify the PIC when any condition exists that could jeopardize a safe drop. (T-3)

17.19.7.2. After the 1 minute warning (2 min for high altitude combination drops), any crew member observing a condition that would jeopardize a safe drop will transmit "No-drop" on the interphone. (T-3)

17.19.7.3. For heavy equipment (HE) airdrops any multifunction control display (MFCD) ACAWS occurring after the 1 minute warning time advisory, the loadmaster will call a “Nodrop”. (T-3)

17.19.7.4. A “No-drop” will be called if all checklists through the 1 minute warning are not completed prior to the “Standby Drogue” advisory for HE towplate drops or by the “5 Second” call for all other drops. (T-3)

17.19.7.4.1. The PM, CSO, and LM will acknowledge the "No-drop" call. (T-3) The PM will place the Computer Drop switch to “Manual” to prevent automatic release of the load. The PF will immediately instruct the crew to follow the appropriate procedures. (T-3)

17.19.7.4.2. If a no-drop is called after the load restraint is removed and a racetrack is not planned, reapply the load restraint. (T-3)

17.19.7.5. Stopping a drop in progress. Any crew member recognizing an unsafe condition during an airdrop will state "red light". (T-3) The PM will turn on the red light to signal the airdrop termination. (T-3)

17.19.7.6. On personnel airdrops where surface winds are unknown, (such as unmanned DZs) advise the jumpmaster and Army airborne mission commander when drop altitude winds exceed 30 knots (KTS). (T-3) In this instance, the decision to drop is at user's discretion.

17.19.8. Departure from DZ (Escape). The CSO will call “red light” at the expiration of the “green light” time. (T-3) When the LM calls “bags in”, immediately begin the escape maneuver. (T-3) Do not exceed 140 KIAS until the static lines are retrieved to preclude entanglement. (T-3) During combat, static lines that cannot be retrieved will be cut so that doors can be closed. (T-3) Close all doors, raise flaps, and accelerate to en route airspeed. (T3) It is imperative that the aircraft be configured for high speed evasive maneuvers. Therefore, after the static lines have been retrieved or cut, the doors and air deflectors closed, and flaps raised, the remainder of the post-drop checklist may be deferred to a more convenient time while returning to the recovery base. ***WARNING*:** Coordination between the PF and Loadmaster should be accomplished prior to the airdrop to prevent injury of aircrew in the back of the aircraft once the power levers are advanced to max power for the escape.

17.19.9. Static Line Retrieval. Loadmasters should allow a few moments for static lines to wrap together before retrieving static lines. Designated aircrew members will retrieve static lines as soon as possible after parachutist or bundle exit is completed or exiting is suspended. (T-3) During combat, static lines that cannot be retrieved will be cut so doors can be closed. (T-3) If the static line retriever fails, static lines will be manually retrieved using a tie-down strap as follows. (T-3) **Note:** A maximum of ten static lines may be retrieved manually per paratroop door. (T-3) A maximum of 20 static lines per cable may be retrieved with a static line retriever winch. (T-3)

17.19.9.1. Static Line Retriever alternate recovery procedures:

17.19.9.2. The following procedures will be used when the Static Line Retrieval System is unavailable. (T-3)

17.19.9.2.1. Paratroop Door.

17.19.9.2.1.1. Secure the hook end of a cargo strap to a point far enough forward in the cargo compartment to allow static lines to completely enter the aircraft. (T-

3)

17.19.9.2.1.2. Insert the other end of the cargo strap from the bottom up, making a "U" around the static lines. (T-3)

17.19.9.2.1.3. Pull the strap forward to retrieve the static lines into the aircraft. (T-3) Loadmasters may require assistance to pull the strap forward.

17.19.9.2.2. Ramp and Door.

17.19.9.2.2.1. If the static line retriever fails following a combination/tailgate drop, use the Prusik Knot as described below. (T-3) Refer to **Figure 17.9**, Prusik Knot.

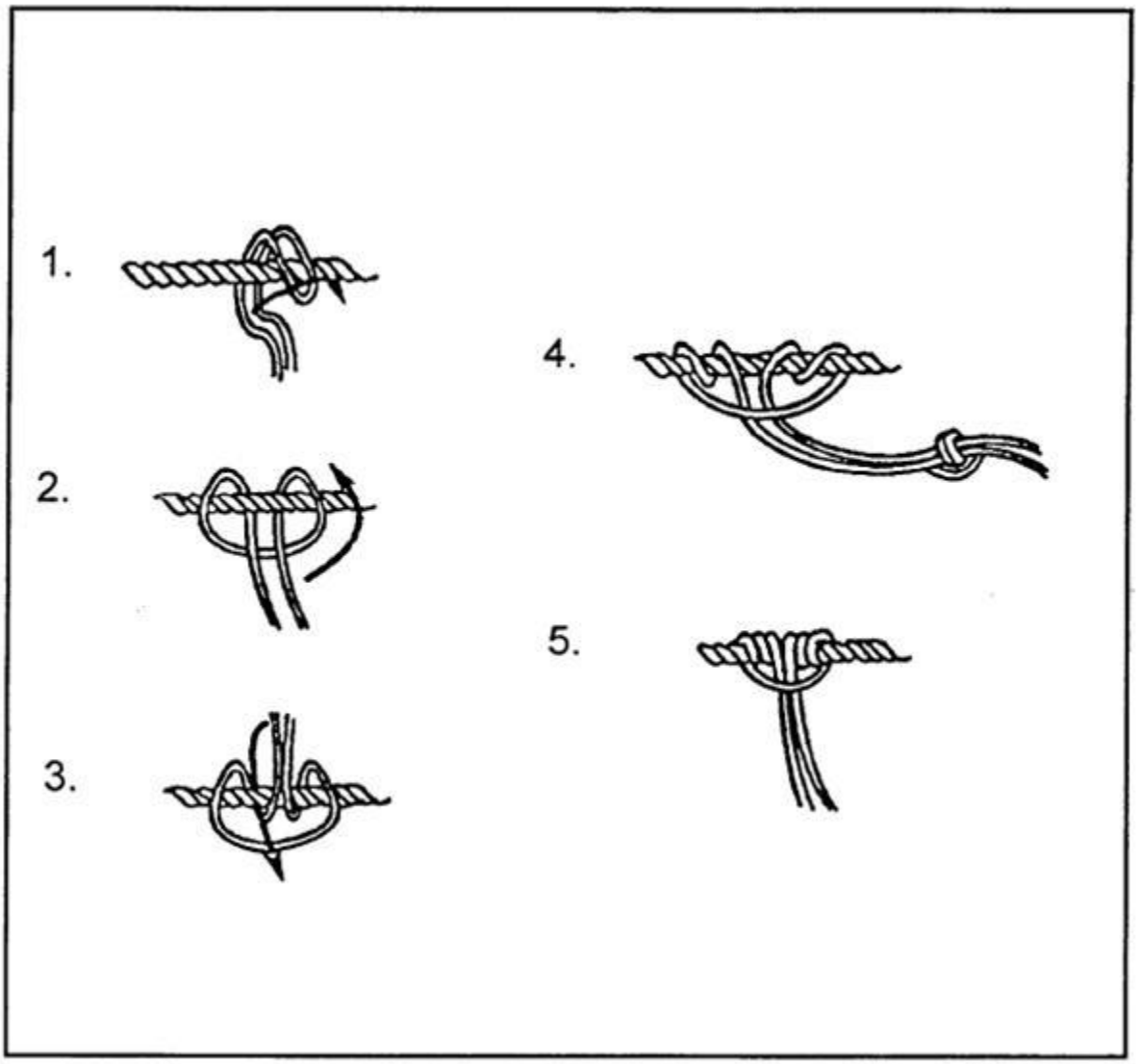
17.19.9.2.2.2. Take a 30 inch piece of 1/2-inch tubular nylon cord that is tied in a loop. (T-3) Loop the cord around the static line retriever cable as shown in the figure. (T-3) Use a minimum of three wraps around the retriever cable to ensure locking of the 1/2-inch tubular nylon cord. (T-3)

17.19.9.2.2.3. Pull to tighten the knot around the retriever winch cable to prevent slipping. (T3) Attach the hook end of a 5,000 pound strap into the loop's end and pull in the static lines. (T-3) The 1/2-inch tubular nylon cord will remain locked in place under tension. (T-3)

17.19.9.2.2.4. More than one 1/2 -inch tubular nylon cord may be attached to the winch cable using the Prusik Knot to facilitate static line retrieval. The Prusik Knot may be adjusted up or down the cable as required. The knot will not slip as long as it is wrapped tightly with a minimum of three turns (more wraps equal more friction), and tension is applied.

17.19.9.2.2.5. To prevent cutting the 1/2-inch tubular nylon cord with the hook on the 5,000 pound strap, a carabineer may be attached to the 1/2-inch tubular nylon cord loop and the hook attached to carabineer.

Figure 17.9. Prusik Knot.



17.19.10. Airdrop Malfunction and Emergencies. Specific emergency procedures for each type airdrop are located in the TO 1C-130(E)J-1 checklists or the appropriate MAJCOM approved guidance. After all appropriate emergency actions are complete, accomplish the Completion of Drop (COD) checklist. (T-3) **Note:** Prior to stations time, the pilot will ensure all crew members have reviewed the emergency procedures for the proposed airdrop. (T-3) The aircrew will conduct detailed emergency briefings. (T-3) Loadmasters will brief visual and verbal signals and establish coordinated tasks for their crew position prior to the first airdrop warning. (T-3)

17.19.11. Combination Drops. Combination drops are when parachutists exit after the airdrop load. The item requiring the highest altitude will determine the drop altitude. (T-3)

17.19.11.1. Restrictions. A maximum of 20 personnel static lines may be deployed on each pass and only one anchor cable will be used for these static lines. (T-3) Static lines

for equipment will be attached to opposite anchor cables and must be rigged for breakaway. (T-3) **Exception:** When airdrop loads are rigged with pilot chutes packed in T-10 bags, they will be attached to the same anchor cable as personnel. (T-3) Maximum static lines per cable are 20. (T-3) Static lines will be retrieved after each pass.

17.19.11.2. Procedures. In addition to the equipment CARP, the CSO will compute a personnel CARP down track from the equipment release point using the computed exit time for the equipment drop as the interval between the equipment and personnel CARP. (T-3) Use the same airspeed and altitude as for the equipment for this computation. (T-3) If the computed release point will result in any jumper landing within 150 yards of any boundary of the DZ, inform the jumpmaster. (T-3) Release the equipment at the equipment CARP, followed by the parachutists when the door is clear. (T-3) **Exception:** For door and ramp bundles, use release points as specified in **Paragraph 17.19.17.2.3**.

17.19.12. Low-Altitude Airdrops. For detailed information, refer to AFTTP 3-3.E/MC-130J. Refer to the expanded checklist for normal and emergency airdrop procedures.

17.19.13. Personnel Drops.

17.19.13.1. Aircraft Configuration. The loadmaster will ensure the configuration of the anchor cables and seats are consistent with the number of personnel to be airdropped. (T-3) During aircraft preflight, the loadmaster will ensure that all seats have a serviceable retaining strap attached. (T-3) Fit seats without a serviceable retaining strap with a suitable length of type III nylon, premeasured for sufficient length to secure the seat in a raised position to the seat back support frame. (T-3) For single pass drops, ensure that parachutists have secured all seats (as required) and no part of the seat protrudes into the aisle. (T-3) On multiple passes, the number of parachutists to be dropped on that pass determines the number of seats raised. (T-3) Troop seats will be raised and secured, or lowered, as required, by personnel under the supervision and instruction of the loadmaster. (T-3) Floor loading is authorized in accordance with **Chapter 6**.

17.19.13.2. Aircraft Emergency During Personnel Airdrop. When an aircraft emergency occurs during or after the time the parachutists stand and hookup, the following procedures will apply: (T-3)

17.19.13.2.1. Under acceptable conditions when parachutists' bailout is required, maintain an acceptable altitude and attitude for the parachutists to evacuate the aircraft. (T-3) The minimum acceptable altitude is as briefed. (T-3) If the jump airspeed will be in excess of 150 KIAS/Knots Calibrated Air Speed (KCAS), advise the parachutists of the airspeed and altitude. (T-3) Order evacuation of the aircraft by giving the pre-briefed bailout emergency signals. (T-3)

17.19.13.2.1.1. Minimum emergency bail-out altitude for free-fall parachutists is 2,000 feet AGL. (T-3)

17.19.13.2.2. When conditions are not acceptable for parachutists' bailout or a drop is aborted for other reasons, the following procedures apply: (T-3)

17.19.13.2.2.1. The red light will be turned "ON" and will remain on until exit doors are closed. (T-3)

17.19.13.2.2.2. The PF will advise the loadmaster, who in turn will advise the

jumpmaster to have the parachutists unhook, take their seats, and fasten safety belts. (T-3)

17.19.14. Container Delivery System. Container delivery system is designed to airdrop A-22/A-23, A-7, A-21, double A-22/A-23 containers and loads rigged on combat expendable platforms. The weight of each container and type parachute used should be IAW TO 13C7-series/Field Manual 10-501 and USSOCOM 350-series rigging manuals.

17.19.14.1. CDS rigging procedures. Utilize rigging procedures outlined in TO 1C130J9. The following describes the types of CDS releases that may be used on AFSOC EC130J aircraft.

17.19.14.2. Normal System Release. A normal system release utilizes the static line retriever and guillotine knife to cut/release the CDS gate. When using this method, the loadmaster may assist the release by pulling down sharply on the static line retriever winch cable.

17.19.14.3. Manual Gate Cut. A manual gate cut is defined as using a knife or V blade type knife to cut/release the CDS gate for all single stick container drops. Loads rigged with type XXVI/VIII nylon not exceeding 5,000 may be manually cut using these procedures.

17.19.14.4. Combat Cut. A combat cut is defined as using a knife or V blade type knife to cut the CDS gate regardless of amount, weight, and configuration of CDS on board. It is used only when authorized as part of specific exercise operations order or plan, contingencies, or by COMAFSOF. (T-3)

17.19.15. CDS/CRRC/RAMZ Specific Procedures: ***WARNING*:** The aircraft tends to pitch up as the load exits the aircraft. This pitch must be anticipated and controlled to allow no more than 2 or 3°additional pitch. (T-3) Do not over control to the point that negative gravity G forces are encountered. (T-3)

17.19.15.1. Escape. Departing the DZ, set flaps to 50%, accelerate to en route airspeed, climb or descend as briefed and perform the completion of drop checklist. (T-3) Flaps may be called up at the discretion of the PF in lieu of going to 50%.

17.19.15.2. Combat Rubber Raiding Craft Drop. CRRCs may be dropped in a stacked configuration allowing up to four CRRCs to be dropped on a single pass. One CRRC platform can be dropped using the standard CDS or container recovery system (CRS) checklist. When two CRRC platforms are dropped on a single pass, use the CDS checklist. (T-3) Two CRRC platforms with up to 18 personnel or one CRRC platform with up to 19 personnel can be airdropped on one pass. Rigged IAW TO 13C7-51. If aircraft gross weight exceeds 120,000 pounds, use 140 KIAS/KCAS CDS/CRS flap setting chart. (T-3) **Exception:** For combination drops above 120,000 pounds use 130 KIAS/KCAS and 130 KCAS flap setting chart. (T-3)

17.19.15.2.1. Emergency Procedures. Use CDS airdrop emergency procedures.

17.19.15.2.2. Training and Exercises. One or more recovery boats will be in position to recover platforms, parachutes, and personnel. (T-3) The boat should be displaced 400 yards or more from the DZ axis. The CSO or PM can confirm the release point and offset distance visually or by using radar returns.

17.19.15.2.3. DZ Axis. If possible, the DZ axis will be into the drop altitude wind (± 30°) when the wind is 5 knots or greater. The jumpmaster will be advised if this cannot be done.

17.19.15.2.4. Backup Drop Platform. The raiding party exits when the pilot chute deploys. In operational employments, a second platform may be carried as a backup in case the main chute fails following pilot chute deployment. Backup platform release point and aircrew or raiding party communication and procedures will be coordinated prior to the mission. Procedures and tactics will also be coordinated for airdrop of a second platform and party, if applicable.

17.19.15.2.5. The following will apply when dropping two CRRC platforms on one pass: (T-3)

17.19.15.2.5.1. The forward release gate must be manually cut by the loadmaster. (T-3)

17.19.15.2.5.2. The second loadmaster must be positioned in the paratroop door prior to completion of the ten-minute warning. (T-3)

17.19.15.2.5.3. NVG are required for the airdrop of two CRRC platforms on one pass at night. (T-3)

17.19.15.3. Rigging Alternate Method Zodiac. The RAMZ consists of a deflated Zodiac F470 combat rubber raiding craft. The RAMZ engine is configured in a plywood box and secured in a standard A-22 container using two T-10 parachutes. When rigged, the RAMZ package weighs between 600 and 1,000 pounds.

17.19.15.3.1. Emergency Procedures. Follow either the CDS emergency procedures or fouled parachutist procedures.

17.19.15.3.2. Aircraft Preparation. Aircraft preparation will be in accordance with 1C-130J-9. The RAMZ package will be delivered rigged and prepared for loading. The loadmaster is responsible for aircraft rigging, attaching the static line, and securing the package. (T-3) When the bundle is used in conjunction with SAR operations, it is not uncommon for the Special Tactics Squadron (STS) or Pararescue Jumper (PJ) team to require the flexibility to determine method of deployment (static line or MFF) after they determine weather conditions at the recovery site. In this case, the loadmaster should prepare the aircraft to allow for either option and complete all bundle rigging with the exception of static line attachment. In-flight prior to the 20 minute warning, the team along with the crew will determine the method of deployment. (T3) At this point, the loadmaster will attach the static line to the appropriate anchor cable and comply with In-Flight Rigging Procedures. (T-3) The package is rigged and dropped using normal CDS combination procedures, or rigged on the ramp using ramp bundle procedures.

17.19.15.3.3. Deployment. Checklist items up to and including the six-minute advisory may be accomplished prior to identifying the target. Accomplish the slowdown using normal slowdown procedures. (T-3)

17.19.15.3.4. DZ Axis. If possible, the DZ axis will be into the wind (± 30°) for MFF drops if drop altitude wind is 5 knots or greater. The jumpmaster will be

advised when this cannot be complied with. Release for static line deployments can be either into the wind or downwind.

17.19.15.3.5. Release Point. The CSO determines the release point. (T-3) If the bundle is rigged using ramp bundle procedures the loadmaster will manually cut the RAMZ bundle loose which will signal the jumpers they are clear to jump. (T-3) MFF jumpers will exit approximately 6 seconds after load release. Static line jumpers will exit immediately after the load release. (T-3) ***WARNING*:** MFF jumpers will not exit until RAMZ static lines have been retrieved. (T-3)

17.19.16. Heavy Equipment Drops (HE). Only equipment rigged in accordance with TO 13C7 series and Field Manual 10-500 series or USSOCOM 350-series rigging manuals will be airdropped. Nonstandard equipment and loads require specific instructions and waivers from HQ AFSOC/A3V prior to airdrop. (T-2)

17.19.17. Door Bundle. A7A or A-21 containers weighing up to 500 pounds are referred to as door bundles and may be dropped through the paratroop door or ramp and door using the personnel airdrop checklist. Door bundles may be dropped independently or in conjunction with personnel. Bundle airdrops are limited to one bundle per paratroop door. When dropped with personnel, the bundle will be the first object to exit the aircraft. (T-3) The maximum bundle size in inches is 66 (height) x 48 (width) x 30 (length) for paratroop door loads. (T-3) Joint airdrop inspection (JAI) is not required for door bundles.

17.19.17.1. Paratroop Doors (Personnel Checklist). Remove restraint and position the bundle in the paratroop doors prior to completion of the Run-In checklist. (T-3) Ensure door bundles are not equipped with breakaway static lines. (T-3)

17.19.17.2. Ramp and Door:

17.19.17.2.1. Door Bundle (Personnel Checklist). Door bundles dropped off the ramp and door will be equipped with breakaway static lines in accordance with TO 13C7-1-11, or with parachutes packed in T-10 bags. Door bundles dropped from the ramp and door that exceed the weight or dimensions specified in **Paragraph 17.19.17** will be equipped with a skid board compatible with the intermediate roller conveyors.

17.19.17.2.2. Ramp Bundle (Personnel or CDS Checklist). Load dimensions will be in accordance with above referenced directives. The total rigged weight of the load will not exceed 2,335 lbs. Ramp bundles will be rigged in accordance with TO 13C7-1-11, Field Manual 10-500, and USSOCOM 350-series directives and dropped as on-the-ramp loads. Remove vertical and aft restraint at the 10-minute warning. (T-3) Remove forward restraint prior to the completion of the Run-In checklist. (T-3) The loads will be released by the loadmaster and may be followed by parachutists. (T-3) These procedures can be accomplished from either side of the cargo ramp or from centerline. Specific aircraft preparations and rigging procedures are contained in TO 1C-130J-9.

17.19.17.2.3. Release Point. When door/ramp bundles are dropped with personnel, compute a personnel CARP. (T-3) Compute an additional CARP for the door bundle and plot the vectors from the personnel release point to ensure it will impact within the DZ boundaries. (T-3) Release the bundle at the personnel CARP, followed by the parachutists when the door is clear. (T-3) An alternate procedure is to add the

exit time of the bundle to the personnel CARP, and release the bundle at this point, followed by the jumpers. If this method is used, the crew must coordinate with the user to ensure the load lands at the desired location. When a door bundle is the only object being dropped, base the release on the CARP for the bundle. (T-3)

17.19.17.3. Only equipment rigged in accordance with TO 13C7-series and Field Manual 10500 series or USSOCOM 350-series rigging manuals, properly marked with accurate weights and shipper's declarations will be airdropped. Nonstandard equipment and loads require specific instructions and waivers from HQ AFSOC/A3V. (T-2)

17.19.18. Joint Precision Airdrop System Procedures.

17.19.18.1. The term JPADS refers to GPS-guided equipment, Improved Container Delivery System (I-CDS) and MFF airdrops that utilize the JPADS Mission Planner (JPADS-MP) system.

17.19.18.2. JPADS Restrictions. Wind data derived from the JPADS four dimensional wind model is suitable for mission use, but the JPADS-MP does not calculate MFF HARP correctly. AFSOC crews will not use JPADS-MP as the sole source for personnel MFF HARP calculations until authorized. (T-3) Aircrews will use sound judgment and evaluate the dropsonde derived winds, forecasted winds, and preflight HARP location before conducting MFF operations. (T-3)

17.19.18.3. JPADS certified aircrews are authorized to use the JPADS-MP laptop and software (a stand-alone system) to calculate release points for JPADS operations.

17.19.18.3.1. MFF airdrops only, aircrews can input dropsonde collected winds into onboard airdrop systems, utilize the Air Force Weather Agency forecast/model during mission planning, and incorporate dropsonde collected winds when calculating HARP in AFSOC approved airdrop planning software for personnel.

17.19.18.3.2. The collected winds may be entered into the wind/temperature summary layer for use in HARP calculation. **Note:** JPADS winds are collected in magnetic or true so winds may require conversion to true before entry into mission computers.

17.19.18.4. JPADS certified crews are authorized JPADS airdrop operations in VMC and IMC above 3,000 feet AGL without the use of a Radar Beacon or Ground Radar Aerial Delivery System (GRADS).

17.19.18.5. Drop zone size criteria during contingency operations are at the discretion of the user. Ultimately, the user accepts responsibility for the accuracy and the condition of these airdrop loads.

17.19.18.6. The planned release point for actual JPADS training airdrops must be executed within the lateral and vertical limits of a restricted area. (T-3)

17.19.18.7. During the dropsonde release, use of zero flaps at speeds between 170–180 KIAS is required to preclude dropsonde tail strikes. (T-3) Loadmasters should release the dropsondes from the corners of the cargo ramp.

17.19.18.8. Surface Wind Limits. Surface wind limitations are unrestricted for dropsonde operations, 18 knots for Firefly, Screamer, and Dragonfly and as published for all other parachutes.

17.19.18.9. Altitude Restrictions. (T-3)

17.19.18.9.1. I-CDS/JPADS: Maximum altitude 25,000 ft MSL. (T-3)

17.19.18.9.2. SCREAMER minimum drop altitude is 8,000 ft AGL. (T-3)

17.19.18.9.3. FIREFLY minimum drop altitude is 5,000 ft AGL. (T-3)

17.19.18.9.4. Dropsonde minimum drop altitude is 3,000 ft AGL. (T-3)

17.19.18.10. For all training drops the dropsonde will be planned to land in the intended impact/drop area using the release point determined by the JPADS-MP. (T-3) The planned release point will be programmed in the CNI-MU into the mission computer as a normal (non-drop) leg. (T-3) Aircraft position will be confirmed either by GPS with a Figure(s) of Merit (FOM) of 3 or better or via aircraft sensor updates. (T-3)

17.19.18.11. Equipment Drops. CSO will program the planned release point into the mission computer as a normal (non-drop) leg. (T-3) Aircraft position will be confirmed either by GPS with a FOM of 3 or better or via aircraft sensor updates. (T-3) For non-GPS guided drops CSOs will validate the JPADS-MP release point via normal CARP procedures. (T-3)

17.19.18.11.1. A drop leg may be used with SONDE derived winds for unguided JPADS equipment drops where parachute ballistic data is listed in accordance with AFI 11-231, *Computed Air Release Point Procedures*. Aircrew will ensure that the aircraft calculated release point falls within the JPADS mission planner calculated LAR. (T-3)

17.19.19. Low Cost Aerial Delivery System (LCADS): The Low Cost Aerial Delivery System is a one-time use, stand-alone airdrop system consisting of a modular suite of low cost airdrop items, and be comprised of parachutes, containers, platforms, and other air items configured for low-velocity, high-velocity, and free fall-drop aerial delivery of loads.

17.19.20. Low Cost Aerial Delivery System-Low Velocity (LCADS-LV). Use CDS airdrop checklists and flap settings. (T-3)

17.19.20.1. LCADS-LV Ballistics. LCADS-LV will be dropped using the ballistics IAW AFI 11-231 or published Air Transportability Test Loading Agency (ATTLA) memorandum. Exit times will be IAW AFI 11-231, *Computed Air Release Point Procedures*.

17.19.20.1.1. Drop Zone Size. The drop zone size will be IAW AFI 13-217, *Drop Zone and Landing Zone Operations*. The minimum reliable drop altitude is 1,000 feet AGL (drops below 800 feet AGL pose a significant risk of failure or damage). The maximum drop altitude is 13,000 feet MSL (drops above 10,000 feet MSL are restricted to a maximum of 1,700 lbs suspended weight). (T-3)

17.19.20.2. Low Cost Aerial Delivery System-High Velocity (LCADS-HV). Use CDS airdrop checklists and flap settings. (T-3)

17.19.20.2.1. LCADS-HV is not authorized for training use. LCADS-HV is authorized for contingency missions and developmental/Developmental Test and Evaluation/(OT&E) missions.

17.19.20.2.2. For JPADS qualified crews, LCADS-HV is currently included in the JPADS mission planner. When using the JPADS mission planner to compute an I-CDS release point and utilizing LCADS-HV parachutes, ensure the chute type selected is "LCADSHV". (T-3)

17.19.20.2.3. Minimum reliable drop altitude is 3,000 feet AGL. IAW AFI 13-217, **Paragraph 2.3**, drop altitudes below 3,000 AGL may be required due to contingency/wartime operations. If supported and supporting forces commanders require a drop altitude lower than 3,000 feet AGL, the drop altitude will be no lower than 1,800 feet AGL. (T-3) This absolute minimum drop altitude is based on historical success rates and recommendations by ballistics experts at NATICK.

17.19.20.2.4. Maximum drop altitude is 25,000 feet MSL. (T-3)

17.19.20.3. Low Cost Aerial Delivery System-Low-Altitude (LCLA). Use CDS airdrop checklists and 50% flap setting. (T-3)

17.19.20.3.1. LCLA is one of the Army's low cost airdrop systems. LCLA was designed to provide very low-altitude aerial resupply using small fixed wing and rotary wing aircraft. LCLA is similar to the low cost airdrop system in that it is new low cost equipment, but LCLA does not have the same airdrop parameters as low velocity (LCADS-LV) or high velocity (LCADS-HV). LCLA was designed to provide very low-altitude (150 - 300 feet AGL) aerial resupply using small fixed-wing and rotary-wing aircraft. LCLA parachutes are compatible with A-7A/Low cost polypropylene straps, and A-21 containers. Containers may be rigged with a single parachute or with clusters of up to three parachutes.

17.19.20.3.2. Aircrews are authorized to conduct LCLA airdrops during exercises, unilateral training, and contingency operations.

17.19.20.3.3. All AFSOC C-130J variants will conduct LCLA airdrops at 130 KIAS using personnel/container ramp load checklist procedures. (T-3) (**Exceptions:** 1. Use 50% flaps for all LCLA drops. (T-2) Position anchor cable stops at FS 803. (T-3)

17.19.20.3.4. Surface wind limits for LCLA drops is 18 KTS. Surface wind above this limit is at the discretion of supported unit commander.

17.19.20.3.5. LCLA drop altitude will be no lower than 150 feet AGL during the day. (T-3) The minimum night drop altitude is 300 feet. (T-3) Descent to drop altitude will begin no earlier than the IP. Situation permitting, notify the user if airdropping above the expected LCLA altitude range (150-300 feet AGL).

17.19.20.3.6. If the ramp cannot accommodate the number or weight of bundles to be dropped in one pass, rig and drop from the cargo floor using standard CDS checklists and rigging procedures. (T-3) Use the LCLA ballistic data from section 4A with the CDS exit times listed in AFI 11231. Manual gate release is authorized.

17.20. Receiver Air-to-Air Refueling. Conduct IAW TO 1C-130(E)J-1 and ATP-56(B).

17.20.1. Communication. Unless directed otherwise by a specific exercise operations order/plan, or during contingencies, communication capability between tankers and receivers will be maintained during all normal rendezvous and air refueling operations. (T-3) Voice transmissions will be IAW the emission control option used. ***CAUTION:*** Air refueling operations will not be conducted when radio communications capability between the tanker and receiver is lost, except during emergency fuel situation. (T-3) If radio communications are lost, or unreadable between the boom operator and receiver pilot, contacts will not be attempted. (T-3)

17.20.2. Use manual boom latching procedures only during fuel emergencies and contingency operations. (T-3) **Exception:** Manual boom latching procedures are authorized for all refueling operations with the KC-10 if the tanker's independent disconnect system is operational.

17.20.3. Altitude Reservations (ALTRV). Whenever practical, refueling operations are done on tracks or anchor areas published in the DoD FLIP. ALTRVs are used when certain missions or operational considerations may require air refueling operations in areas not published in FLIP. For specific ALTRV procedures, refer to FLIP and FAA Special Military Operations 7610.4H, 3.

17.20.4. Special Operations Air Refueling (SOAR) Procedures. Refer to AFTTP 33.E/MC130J for specific procedures.

Chapter 18

LEAFLET AIRDROP

18.1. General. Leaflet airdrops are accomplished in both hostile and permissive environments.

18.2. Mission Description. Mission requirements vary widely depending on the volume of leaflets airdropped, leaflet packaging, and the altitude of the airdrop. Loads will normally not exceed 25,000 pounds. Drop altitudes may vary from 500 ft AGL to the aircraft service ceiling. Leaflet drops require the movement of boxes of various weights from throughout the cargo compartment via intermediate rollers (if required) to the ramp area for dispersal off the ramp. If specific mission requirements dictate deviation from information contained in this publication, modify procedures to meet specific requirements. **Note:** All airdrops conducted above FL250 require a waiver to AFI 11-202, Vol 3. Long duration high altitude drops will require the aircraft remain open. Consider outside air temperature and clothing requirements prior to step. (T-2)

18.3. Equipment. In addition to normal aircraft equipment, the following items may be required to perform leaflet drops:

18.3.1. Parachutes or restraining harnesses must be available for use by all personnel working in the cargo compartment. (T-3) Normally six are required.

18.3.2. A portable oxygen console with a minimum of four regulators and output hoses with sufficient length to reach throughout the entire cargo compartment must be available for high altitude airdrops (above 10,000 feet).

18.3.3. An interval timer is desirable (alternating red and green jump lights may serve for sequencing the drops).

18.4. Aircraft Configuration. Determine if leaflets are floor loaded (on aircraft dual rail intermediate conveyors) or are configured on pallets. Based on how the leaflets are prepared and the volume of leaflets to airdrop, there are several possible configurations.

18.4.1. Palletized Loads. Preload large volumes of leaflets on pallets and load as palletized cargo. Resources permitting, this is the recommended procedure for large volumes of leaflets.

18.4.1.1. Use modified pallets with warehouse rollers attached to the top of the pallets in two sticks.

18.4.1.2. Stack the leaflet boxes on the pallets in two sticks and secure them to the pallets before loading aircraft.

18.4.1.3. In addition to the modified pallets, provide a bridge to span the gap between the last floor pallet and the ramp pallet.

18.4.1.3.1. Construct the bridge so the rollers on it are the same height as the rollers on top of the pallets when loaded on the aircraft dual rails (EC-130J).

18.4.1.3.2. Install the bridge after the ramp is lowered to the airdrop position and before completion of the slowdown or 3-minute checklist.

18.4.2. Floor Loads. Leaflets may also be loaded directly on the aircraft intermediate conveyors, if available. Employ this procedure for smaller loads of leaflets or when the equipment mentioned above is not available.

18.4.2.1. Individual boxes have to be hand loaded and each group of boxes individually secured using aircraft tie-down equipment.

18.4.2.2. Configure the aircraft IAW the applicable volume and addenda.

18.4.2.2.1. Recommend the intermediate conveyors be moved inboard to the high speed configuration if size of the load permits.

18.4.2.2.2. If the intermediate conveyors must remain in the outboard configuration, exercise care during loading to ensure the individual boxes contact two intermediate rollers. The boxes may not roll or may be damaged if loaded on only one roller conveyor.

18.4.2.2.2.1. If the intermediate conveyors must remain in the outboard configuration, consider using CDS skid boards or sheets of plywood as skids under the leaflet boxes.

18.4.2.2.2.2. If using this option, secure each skid of leaflets individually using aircraft tie-down equipment.

18.4.2.2.2.3. Drift each skid back to the ramp hinge during the airdrop, exercising caution not to let the skid board exit the aircraft.

18.4.2.2.2.4. Secure the empty skids against the side wall until the airdrop is completed.

18.5. Preparation for Loading. Complete applicable portions of the appropriate TO 1C-130J-9 checklists as follows:

18.5.1. Cargo Loading Preparation.

18.5.2. Cargo Loading (Palletized/Floor Load).

18.5.3. General Airplane Preparation for Ramp and Door Airdrop/Extraction.

18.5.4. Anchor Cables. Rig one anchor cable on each side of the aircraft.

18.5.4.1. Attach the aft latch of each anchor cable to the inboard U-bolt on the aft anchor cable support on each side of the airplane.

18.5.4.2. Position the anchor cable stops to the very forward or aft end of the cable, or remove and stow the stops, unless they are used as stops for the restraint harness restraint strap.

18.5.4.3. Attach the forward latch to the center U-bolts on the forward anchor cable support.

18.5.4.3.1. If the center U-bolts are not accessible because of aircraft configuration, attach the forward latch to the outboard U-bolts.

18.5.4.3.2. If connecting the forward latch to the outboard U-bolts, leave additional slack in the cable to allow anchor cable installation in the outboard location on the A-frame during the airdrop.

18.5.4.3.3. Lower the center anchor cable supports and lock them in the vertical position with the tubular supports. Do not connect the anchor cable to the A-frame during rigging. The cable may block the cargo door from properly opening and closing.

18.5.4.3.4. The aft anchor cable support arm micro switches should be isolated so that the cargo ramp will operate with the anchor cables lowered.

18.5.4.3.4.1. Isolate the micro switches by securing them back with 1/4-inch cotton webbing or gutted Type III nylon.

18.5.4.3.4.2. Test the ramp for operation with the micro switches secured and the anchor cables lowered to ensure the ties were properly installed.

18.5.5. Static Line Retrievers. Suspend oxygen hoses from static line retriever cables for high altitude missions (not required if airdropping below 10,000 feet MSL).

18.5.5.1. Unwind static line retriever cable(s).

18.5.5.2. Install quick disconnects on the aft end of cable(s).

18.5.5.3. Secure the quick disconnects to the inboard side of the A-frame with two turns of 1/4inch cotton webbing. Make this tie approximately 18 inches above the anchor cable attaching point. If the static line retriever is inadvertently rewound, the tie will break and will prevent damage to the A-frame or static line retriever.

18.5.5.4. Remove all slack from static line retriever cables.

18.5.6. Oxygen Hoses and Interphone Cord. Tape or tie extended oxygen hoses and interphone cords together and suspend from static line retriever cables with G-13 clevis or suitable substitute.

18.5.6.1. Ensure that approximately 12 G-13 clevises or suitable substitutes are available to tie oxygen hoses to the static line retriever cable(s).

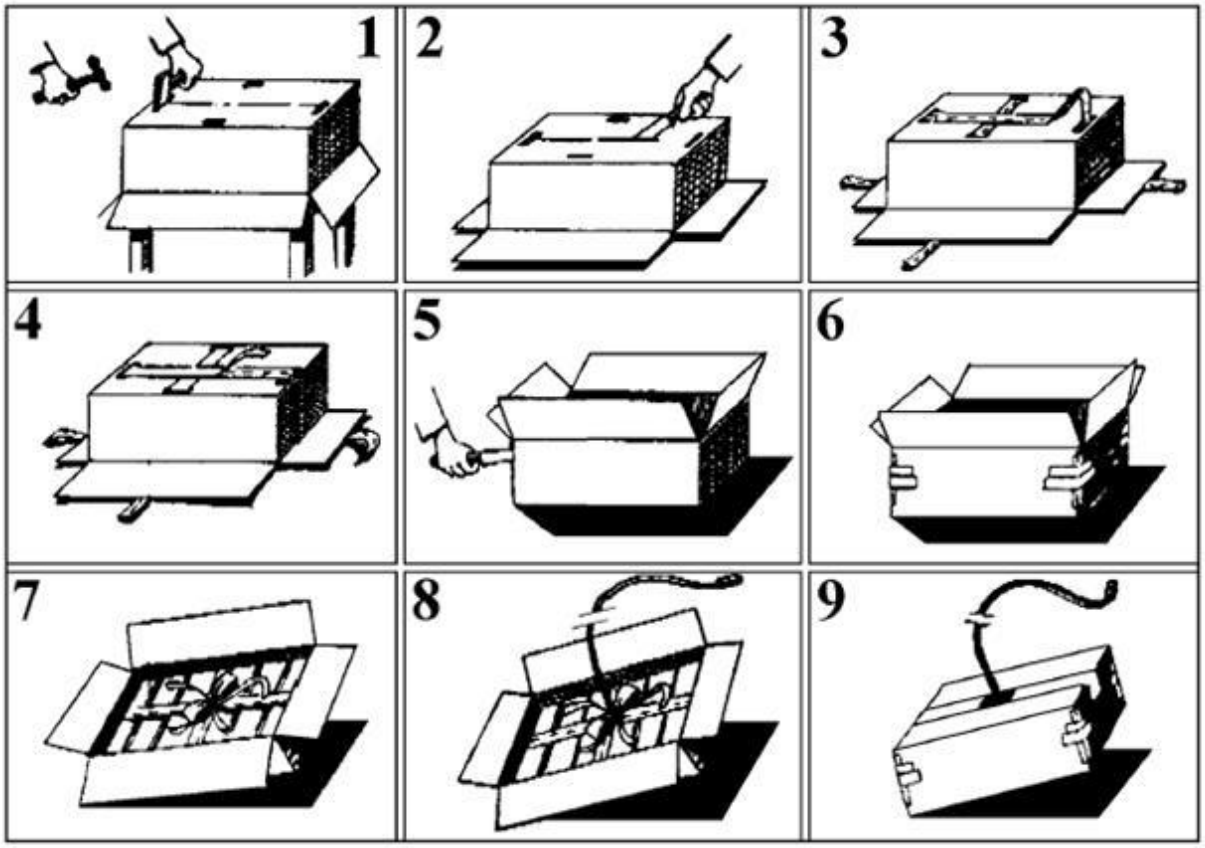
18.5.6.2. Recommend the kicker use the oxygen regulator and interphone cord aft of the left paratroop door. Route the cord and hose up and over the overhead structural beams, and back down next to the overhead ADS release. This technique keeps the hose and cord off the floor preventing them from becoming tangled or damaged. It also keeps it out of the kicker's way while kicking boxes and retrieving static lines.

18.6. Securing Boxes. Secure five boxes on the ramp for airdrop. If loading preloaded pallets, two sticks of five boxes each, are secured on the ramp pallet.

18.7. Connecting Static Lines. Connect static lines to the anchor cable aft of the A-frame.

18.8. Restraint Strapping. Place a single length of Type III nylon, as final restraint, over the stick of boxes. The cargo restraint strap over the boxes on the ramp is removed at the 1-minute warning. The Type III nylon final restraint is cut at the release point.

Figure 18.1. Leaflet Box Rigging Procedures.



18.9. Leaflet Box Rigging Procedures. Rigging boxes for high-altitude static line dissemination.

18.9.1. Using a punch, cut four holes approximately 2 1/2 inches by 3/4 inches as indicated in **Figure 21.1**. If a punch is not available, a knife can be used. When using a punch, the box must first be placed upon an object slightly deeper and smaller than the box so that a hard surface is provided when striking the punch.

18.9.2. Cut through the box from one hole to another as illustrated in **Figure 21.1**.

18.9.3. Place a 2-inch wide length of webbing through the holes. The length of webbing depends upon the size of the box, but must be long enough to tie after the box has been filled with leaflets.

18.9.4. Place a 3 or 4-inch strip of masking tape over the 2-inch wide webbing.

18.9.5. Cut all four corners of the box from the top to about 3/4 of the way down (or less).

18.9.6. Again using masking tape, tape one strip up the cut portion and two across, as illustrated.

18.9.7. After filling the box with leaflets, tie the two strips of webbing.

18.9.8. Attach one end of the static line to the webbing ties. The length of the static line depends upon the type of aircraft, but it is normally about 15 feet long. The box is rolled out

of the aircraft and as the container comes to the end of the static line, the sides of the box split. In effect, it is turned inside out. The leaflets fall away followed by the empty box.

18.9.9. This is one method, and may not be the method suited for your mission. Other variations do exist; however, this is the most universal and least complex.

18.10. Preparation for Airdrop. After takeoff, take the following actions before starting the leaflet airdrop checklist.

18.10.1. Tape all ramp control panel switches, except the auxiliary pump and ramp switch.

18.10.2. Lower anchor cables and connect them to the outboard side of the anchor cable supports.

18.10.3. Safety tie the aft anchor cable support micro switches.

18.10.4. Position/don emergency equipment and survival gear.

18.10.5. Begin Leaflet Airdrop checklist.

18.11. Aircrew Procedures. Under normal circumstances the crew required for leaflet operations consists of a tactical crew plus two Physiological Technician(s) (PT) (for high altitude airdrops) and three additional crew members to act as feeders. The senior loadmaster will assign specific positions for activity in the cargo compartment. (T-3)

18.11.1. Drop Configuration/Maneuvering. Base configuration on desired coverage and airframe airspeed limitations. (T-3) All personnel should be constantly aware of the possibility of an emergency break upon encountering a threat.

18.11.1.1. Flaps. Flaps are normally set at 50% and flap settings should not be changed during the drop unless the loadmaster is notified. **Note:** At very high altitudes, the aircraft may not be able to maintain drop airspeed with 50% flaps. Under these conditions, use an intermediate flap setting that allows for aircraft performance and also produces an acceptable deck angle for the drop. A flap setting near 20% gives the best aircraft wing performance while providing high rudder boost for controllability.

18.12. Static Lines. To increase speed of closing the ramp if a hostile threat is detected and to prevent damage to the aircraft, the static lines should be stowed after each box goes out. Do this if the interval between boxes permits safe operation. Static lines may be cut in an emergency.

Chapter 19

SEARCH AND RESCUE PROCEDURES

19.1. General. Most searches are part of an effort to save life; therefore, make every effort to complete the search as rapidly and efficiently as possible. A thorough scan of the search area and accurate navigation significantly increase the probability of detection. Reactions to sightings must be timely and accurate. This section outlines operational procedures for conducting effective searches in the C-130 aircraft. Refer to the *International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) Volumes I/II* for additional information.

19.1.1. **Search and Rescue Satellite-Aided Tracking (SARSAT).** SARSAT is an international satellite system for SAR. It consists of a constellation of seven satellites in low earth orbit, 5 geostationary satellites and a network of earth stations, which provide distress alert and location information to appropriate rescue authorities anywhere in the world for users in distress. The SARSAT satellites detect beacons broadcasting on 406.025 Megahertz (MHz). The current SARSAT system consists of 64 Local User Terminals (LUT) and 26 Mission Control Centers in 32 countries, including 12 in the United States. SARSAT coverage on 406 MHz is world-wide. The Rescue Coordination Center (RCC) at Langley AFB, VA, maintains one deployable LUT (camper sized, air transportable van) to provide contingency coverage.

Table 19.1. Search and Rescue Frequencies.

Frequency	Usage	Mode[1]	Authority
251.9 MHz	Operational and Training	V	RFA [2]
252.8 MHz	Operational and Training	V	RFA
259.0 MHz	Operational and Training	V	RFA
381.0 MHz	Operational and Training	V	RFA
46.85 MHz	Operational and Training	V	RFA

Notes:

1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.
2. The USAF RFA list is the authority for the use of these frequencies.

Table 19.2. Distress and Emergency Frequencies.

Frequency	Usage	Mode [1]	Authority
2.182 MHz	Aero/Maritime Survival Craft	V	
2.670 MHz	USCG Emergency Coordination	V	
3.0235 MHz	International Scene of Action SAR	V	
4.835 MHz	AF Crash Boats (General)	V, CW	

Frequency	Usage	Mode [1]	Authority
5.680 MHz	Int'l Scene of Action SAR	V	
5.717 MHz	Canadian MAMSS SAR	C	Canadian IFR Supp
8.364 MHz	For use internationally by Survival Craft Stations	CW	
121.5 MHz	Int'l Aeronautical Emergency	V	
123.1 MHz	NATO/ICAO Scene of Action	V	
138.45 MHz	ARRS Scene of Action	V	
138.78 MHz	Scene of Action	V	
156.8 MHz	Maritime Mobile VHF Radio-Telephone Service As A Distress, Safety, and Calling (Channel 16)	FM	
243.0 MHz	Int'l Aeronautical Emergency	V	
282.8 MHz	Int'l Scene of Action SAR	V	
Note: 1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.			

Figure 19.1. Lost Airplane Fixing Procedures.

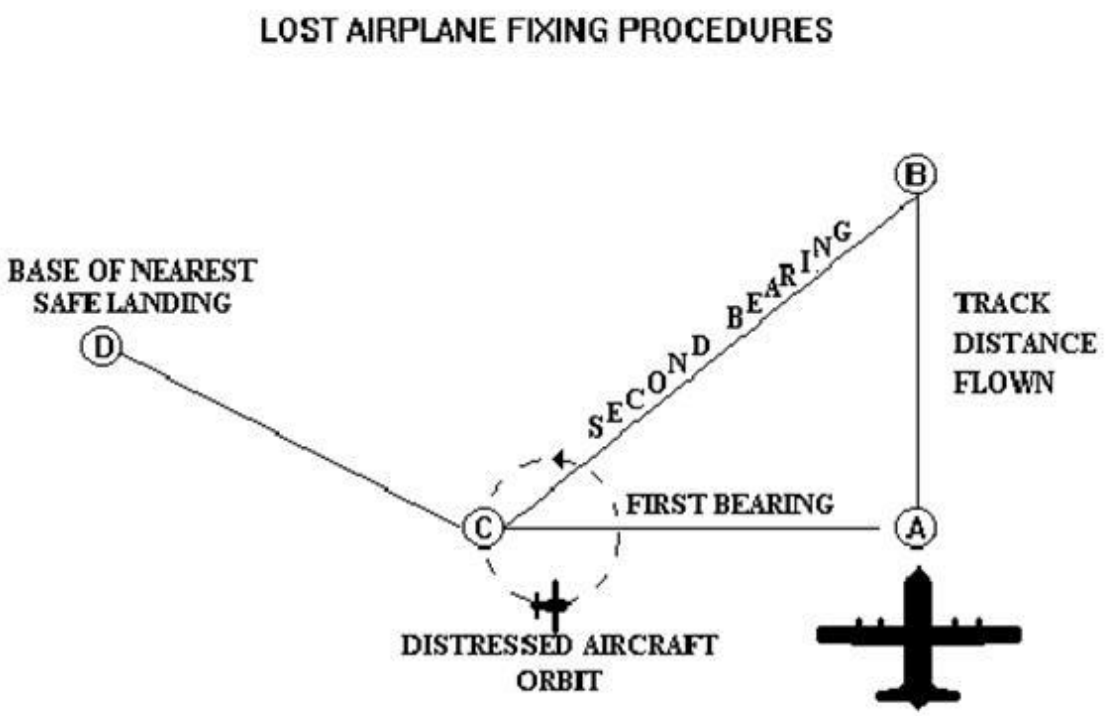


Table 19.3. Sweep Width For Visual Search in Nautical Miles.

	Life Rafts				**Small Boats (Less Than 30 Feet)**					**Small Boats (30 To 60 Feet)**				
Search Altitude X100 Ft==>	0	5	10	20	0	5	10	20	30	0	5	10	20	30
1 nm VIS	0.5	0.5	0.5	--	0.5	0.5	0.5	--	--	0.5	0.5	0.5	--	--
3 nm VIS	1.0	1.2	1.2	1.0	2.5	2.4	2.3	1.8	0.4	3.5	3.0	2.7	1.8	0.4
5 nm VIS	1.4	1.6	1.6	2.7	2.7	2.7	2.7	3.2	3.3	4.2	4.2	4.2	4.2	3.3
10 nm VIS	1.8	1.8	2.1	3.6	3.9	4.0	4.2	4.5	5.8	6.5	6.2	6.2	6.2	6.5
15 nm VIS	1.9	1.9	2.6	3.6	5.2	5.3	5.5	6.7	7.0	8.5	8.5	8.4	8.4	8.3
20 nm VIS	2.0	2.1	2.8	3.6	5.3	5.6	6.2	6.8	7.1	8.6	8.8	9.0	9.1	8.9
30 nm VIS	2.2	2.3	2.9	3.6	5.5	6.2	7.0	7.0	7.1	8.7	9.5	10.4	10.1	9.7

Table 19.4. Whitecap Correction Factors.

Wind (Knots)	**0**	**10**	**15**	**20**	**25**	**30**	**40**
Rafts	0.8	1.0	0.9	0.7	0.5	0.2	0.1
Small Boats	0.9	1.0	1.1	1.0	0.9	0.7	0.2
Dye Marker	0.9	1.0	1.0	0.9	0.6	0.4	0.2
Smoke	0.8	1.0	0.8	0.6	0.4	0.2	0.1

Table 19.5. Cloud Cover Factors.

Percent Cloud Cover	0	10	20	30	40	50	60	70	80	90	100
Cloud Cover Factor	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.7

Table 19.6. Expected Detection Range for Visual Aids (30 Miles Visibility).

Daytime		**Night Time**	
Dye Marker	4 Miles (Reduced to nil in heavy seas)	Float Light	20 Miles
Mirror	8 Miles	Mk 13 Flare	23 Miles
Orange Smoke	12 Miles (greatly reduced in high winds)	Very Light	24 Miles
White Smoke	16 Miles (greatly reduced in high winds)		

19.2. Search Altitude (Table 19 7). Select an optimum search altitude based upon the object of search, weather in the search area, electronic or visual location aids used, and any other known factor, which would affect the search altitude. Generally, the lower the search altitude, the better the chance of seeing an object, provided the altitude is not so low that the aircraft speed becomes detrimental. During preliminary searches, the altitude will be higher to detect possible signals at greater distances.

19.3. Search Procedures.

19.3.1. Rescue missions often involve commitment based upon calculated risks. Give full consideration to all safety factors. (T-3) Timely reaction to all search missions is essential to the safety of personnel or equipment. Do not jeopardize safety by inadequate preparation or short cuts to expedite takeoff, or arrival at search areas. Aircrews will comply with all other applicable technical orders and Air Force Instructions, which govern their duties: (T-2)

19.3.1.1. Accomplish complete pre-departure flight planning except for scramble missions. (T3) On scramble missions, complete essential flight planning prior to and shortly after takeoff. (T3)

19.3.1.2. Use in-flight procedures in accordance with the appropriate theater of operation flight regulations. (T3)

19.3.1.2.1. Aircraft will maintain vertical and horizontal separation in the search area. (T3) This is critical when several aircraft are searching within close proximity.

Table 19.7. Recommended Search Altitudes.

Recommended Altitudes Over Water	**Expected Target**
500 feet and below	Survivor without raft or dye marker.
500 feet to 1,000 feet	Survivor in raft without dye marker or signaling device.
1,000 feet to 2,500 feet	Survivor has dye marker.
1,000 feet to 3,000 feet	Survivor has signaling device or radar reflector.
2,000 feet to 3,000 feet	Expecting to find wreckage during initial phase of the mission.
2,000 feet	During night overwater.
Recommended Altitudes Over Land	
1,000 feet	Survivors of an aircraft incident over level terrain with little foliage.
500 feet	Survivors of an aircraft incident over level terrain with heavy foliage.
500 feet to 1,000 feet	Survivors of an incident in mountainous terrain.
2,000 feet	Expecting to find wreckage.
2,000 feet	Over land at night.

Recommended Altitude For Electronic Beacons	
8,000 feet or higher	

19.3.1.2.2. Transmit operation normal (position) reports as required by the controlling agency. (T3)

19.3.2. The following general instructions apply to all search missions: (T3)

19.3.2.1. Brief crew members that did not attend the operations briefing on the purpose of the mission. (T3)

19.3.2.2. Scanners who are not aircrew members will receive a briefing on the search objective. (T3)

19.3.2.3. The PIC will supervise and coordinate activities of crew members during preparation for search, as follows: (T3)

19.3.2.3.1. Plan the search with the CSO. (T3)

19.3.2.3.2. Discuss with all crew members scanning procedures. (T3)

19.3.2.3.3. Discuss with the CSO and copilot the procedures for making search pattern turns. (T3)

19.3.2.3.4. Discuss the radio communication procedures with the CSO and copilot. (T3)

19.3.2.3.5. Discuss the preparation of flares, sea dyes, and smoke signals for deployment with the loadmaster. (T3)

19.3.2.3.6. Discuss the preparation of personnel and equipment for airborne delivery with the loadmaster and pararescuemen. (T3) Ensure all crew members are thoroughly familiar with the checklists to be used for various airborne delivery options. (T3)

19.3.2.4. The PIC will coordinate crew member activities during prosecution of the search by: (T3)

19.3.2.4.1. Ensuring completion of the Search Checklist prior to commencing any low-level search. (T3)

19.3.2.4.2. Alerting the scanners to begin scanning when approaching the search area. (T3)

19.3.2.4.3. Directing crew members to put on their LPUs prior to descending below 2,000 feet overwater. (T3)

19.3.2.4.4. Checking with crew members to ensure all equipment and personnel are ready for action in the event of a sighting. (T3)

19.3.2.4.5. Making periodic checks of fuel remaining to ensure sufficient fuel remains for return to home station. (T3)

19.3.2.5. Report all deviations from assigned search procedures to the on-scene commander or mission commander. (T3)

19.3.2.6. Thoroughly investigate sightings and report findings immediately. Initiate recovery action or assistance when the survivors are located and inform appropriate agencies of the progress. (T3)

19.3.2.7. The CSO will: (T3)

19.3.2.7.1. Maintain an accurate record of area searched. (T3)

19.3.2.7.2. Direct the aircraft to ensure proper coverage of the search area. (T3)

19.3.2.7.3. Continually cross-check headings, drift, time, airspeed, and altitude to maintain the best possible search coverage. (T3)

19.3.2.7.4. Use a large-scale chart when searching over land to ensure terrain and obstacle clearance. Use a search pattern graph as a suitable reference while searching overwater. (T3)

19.3.2.7.5. Record sighting information on log and plot position on navigation chart. (T3)

19.3.2.7.6. Monitor equipment during radar and electronic searches. (T3)

19.3.2.7.7. Debrief controlling agency with an accurate depiction of any areas searched. (T3)

19.3.2.7.8. When other aircraft are involved, track and assign search areas for other aircraft. (T3)

19.3.2.8. The PIC will insure radio communications are maintained with other search aircraft and the controlling agency. (T3)

19.3.2.9. The loadmaster will assume supervision of the scanners and will schedule rotation and rest periods. Scanners should be rotated every 30 to 45 minutes of scanning and rested after two hours, if enough scanners are available. (T3)

19.3.2.10. All crew members will assist with the scanning duties when possible. (T3)

19.3.2.11. When a search is completed with negative results, consider searching the area again. Normally, position subsequent search legs between or 45° to the previous search legs. This procedure, in effect, results in smaller track spacing.

19.3.3. In the search area: (T3)

19.3.3.1. Descend to search altitude (**Table 19.7**). (T3)

19.3.3.2. Have CSO obtain the wind at search altitude (T3) o visually cover the area thoroughly, slow the airspeed during search patterns (refer to the Aircraft Performance Manual). (T3)

19.3.3.3. Notify ATC of arrival on scene and estimated endurance. (T3)

19.3.3.4. Vector other aircraft to the scene. (T3)

19.3.3.5. Use radar (some life rafts carry reflectors). (T3)

19.3.3.6. Assume on-scene command until relieved by another duly appointed SAR aircraft. (T3) As other aircraft arrive, do the following: (T3)

19.3.3.6.1. Establish contact on channels other than Guard. (T3)

19.3.3.6.2. Obtain aircraft type identification, endurance, and rescue capability. (T3)

19.3.3.6.3. Assign altimeter setting, frequencies, search areas, patterns, and altitude separation. (T3)

19.3.3.7. If leaving the search area because of lack of fuel, assign another aircraft as on-scene commander. (T3)

19.3.4. Determine an accurate wind prior to and throughout the search. (T3) Use **Table 19.9** to estimate wind velocity near the surface.

19.3.5. When flying search patterns, turns must be accurate and uniform as possible. The following procedures are provided to assist the aircrew in making precise turns:

19.3.5.1. Fly the aircraft on autopilot when possible.

19.3.5.2. Prior to starting the pattern, the CSO will brief the crew on the direction and rate of turn and the turn command procedure used.

19.3.5.3. Normally, all turns are standard rate (3° per second) unless track spacing is less in distance than the diameter of a standard turn at a given speed. In this situation, continue turn to 180° and adjust turn rate as required to remain within the pattern.

Table 19.8. Sector Search Pattern Computation.

	Sector Search Computation								
	Track Spacing								
		1-0/t/T	**2**-0/t/T	**3**-0/t/T	**4**-0/t/T	**6**-0/t/T	**8**-0/t/T	**10**-0/t/T	**15**-0/t/T
Search Radius	5	6/21/1/6	12/23/0.8	18/25/0.6	25/27/0.5				
	10	3/20/5.4	6/21/3.0	9/22/2.0	12/23/1.6	18/25/1.2	25/27/0.8		
	15	2/20/12.0	4/20/6.2	6/21/4.6	8/22/3.6	12/23/2.6	15/24/2.0	20/26/1.6	
	20	1.5/19/21	3/20/11.2	4.5/21/7.6	6/21/5.8	9/22/4.2	12/23/3.4	15/24/2.8	24/27/1.8
	25		2.5/20/16.2	3.5/20/11.0	5/21/8/6	7.5/21/6.0	9.5/22/5.0	12/23/4.0	18/25/2.8
	30			3/20/16.6	4/20/11.8	6/21/8.8	8/22/6.8	10/22/5.8	15/24/4.0
	40				3/20/22.0	4.5/21/15.2	6/21/11.8	7.5/21/9.8	11/23/7.4
		0 = Degrees to add to 90°							
		t = First turn correction (deduct 11 seconds for successive turns)							
		T = Total time to complete search							

Table 19.9. Wind and Sea Prediction Chart.

Wind Velocity In Kts.	Height Of Waves In Ft.	Beaufort Number	Sea Indications
Calm	0	0	Like a mirror.
1-3	1/2	1	Ripples with the appearance of scales.
4-6	1	2	Small wavelets, crests have glassy appearance.
7-10	2	3	Large wavelets, crests begin to break: scattered whitecaps.
11-16	5	4	Small waves, becoming longer. Fairly frequent white caps.
17-21	10	5	Moderate waves, taking a pronounced long form; many whitecaps.
22-27	15	6	Large waves begin to form; white foam crests more extensive; some spray.
28-33	20	7	Sea heaps up, white foam from breaking waves blown in streaks along direction of waves.
34-40	25	8	Moderately high waves of greater length; crests break into spindrift; foam blown in well-marked streaks in direction of wind.
41-47	30	9	High waves, dense streaks of foam; sea begins to roll; spray affects visibility.
48-55	35	10	Very high waves with overhanging crests; foam in great patches blown in dense white streaks. Whole surface of sea takes on a white appearance. Visibility affected.

19.3.5.4. Drop available emergency equipment and/or personnel, if required. If survivors are in life jackets, make attempts as soon as possible to furnish them with life rafts or other survival equipment and signaling devices.

19.3.5.5. Direct potential rescue or recovery vessels and other aircraft to the scene by radio or visual signals. Radio and visual signals you may use to direct a vessel to the scene to include:

19.3.5.6. Radio message to the vessel.

19.3.5.6.1. ADF to take bearings on a vessel's Low Frequency or Medium Frequency (MF) transmissions.

19.3.5.6.2. VHF or UHF direction finder to take bearings of VHF or UHF transmissions.

19.3.5.6.3. Radar and IFF.

19.3.5.6.4. Signal light.

19.3.5.6.5. Dropping message containers.

19.3.5.6.6. Pyrotechnic flares.

19.3.5.6.7. When radio communications are not possible, establish self-identification, then indicate location of the target by:

19.3.5.6.7.1. Circling the vessel at least once at low-altitude.

19.3.5.6.7.2. Flying across the bow of the vessel at least once, and rocking wings at the same time.

19.3.5.6.7.3. Sending a message by signal light or dropping a message, if possible.

19.3.5.6.7.4. Heading in the direction of the target. Repeat this procedure until the vessel acknowledges by following the aircraft, or indicates that it is unable to comply by hoisting the International Flag, November (the International Flag, November, is a blue and white checkerboard). Crossing the wake of the vessel close astern at a low-altitude means that the service of the vessel to which the signal is directed is no longer required.

19.3.5.7. In daytime, use any of the following means to inform survivors they have been sighted:

19.3.5.7.1. Fly low over survivors with landing lights on.

19.3.5.7.2. Blink a signal light in the direction of survivors.

19.3.5.7.3. Drop two marker signals a few seconds apart.

19.3.5.8. Aircrews sighting survivors at night should:

19.3.5.8.1. Mark the position by dropping marker smoke or strobe lights with floatation collars.

19.3.5.8.2. Request assistance from other search aircraft or ships.

19.3.5.8.2.1. If a rescue vessel arrives in the area, direct it to the scene by giving the target position in relation to the float light. Drop parachute flares to assist the rescue or recovery vessel in sighting the target.

19.3.5.8.2.2. If the objective has not been located, but its position is fairly well established, drop two strobe lights or datum marker buoys to outline the limits of the search area, the most probable position of target being halfway between the lights. Start the search from one light to the other, dropping parachute flares for illumination.

19.3.5.8.2.3. If no surface vessel is available, but two aircraft are on-scene, have one aircraft fly over the area at 3,000 feet dropping flares at 2 or 3-mile intervals.

Station the other aircraft 3 miles behind the illuminating aircraft, slightly upwind at 500 feet to search.

19.4. Departing Search Area.

19.4.1. Notify ATC and the appropriate SAR agency on-scene, SAR aircraft, Rescue Coordination Center, etc. (T3)

19.4.2. If other search aircraft have not arrived, reconfirm position, and advise survivors when further assistance will arrive, if known. (T3)

19.5. Rescue Airdrops. Rescue airdrops of rescue equipment allow rapid deployment of Sea Rescue Kits, pyrotechnics, emergency equipment, etc., in an unplanned and rapidly changing environment. An example would be dropping a Sea Rescue Kit to a helicopter that ditched during helicopter air refueling. Specific patterns are Sea Rescue Kit deployments and Para-bundle and Freefall equipment drops.

19.5.1. The pilot will always brief the pattern and delivery to be flown. (T3)

19.5.1.1. As a minimum, brief the type of equipment to be delivered, delivery method (pattern shape, relationship to wind, etc.), altitudes, airspeeds, commands to be used, and required actions for malfunctions. (T3)

19.5.2. Sea Rescue Kit Deployment. The Sea Rescue Kit is designed to meet conditions, which require aerial delivery of emergency floatation and survival gear. The kit is dropped free-fall and abeam during a crosswind pass over the target. When correctly dropped, a straight line is formed on the water with an inflated raft at each end. After delivery, the two rafts with their high freeboard will begin to drift downwind until retarded by the partially submerged supply containers. Thus, when the kit is properly deployed, wind conditions will cause the kit to form a "U", partially encircling the target.

19.5.2.1. Surface wind will affect the kit and target in varying amounts in proportion to the area exposed above the water and displacement below the water. The kit will drift faster than nearly all-seagoing vessels (outboards, cabin cruisers, trawlers, heavy displacement deep draft vessels, and 1 man life rafts) but slower than a 6, 7, or 20-man raft. If a kit drifts faster, it will be delivered upwind. If the target drifts faster, the kit will be delivered downwind. When the surface wind is less than 15 knots, the delivery pass will be offset approximately 50 feet. (T3) Distance will be increased 25 feet for each 10 knots in excess of the 15-knot base. (T3) **Exception:** Downwind kit drops will always be offset approximately 50 feet. (T3) Do not correct for wind. (T3)

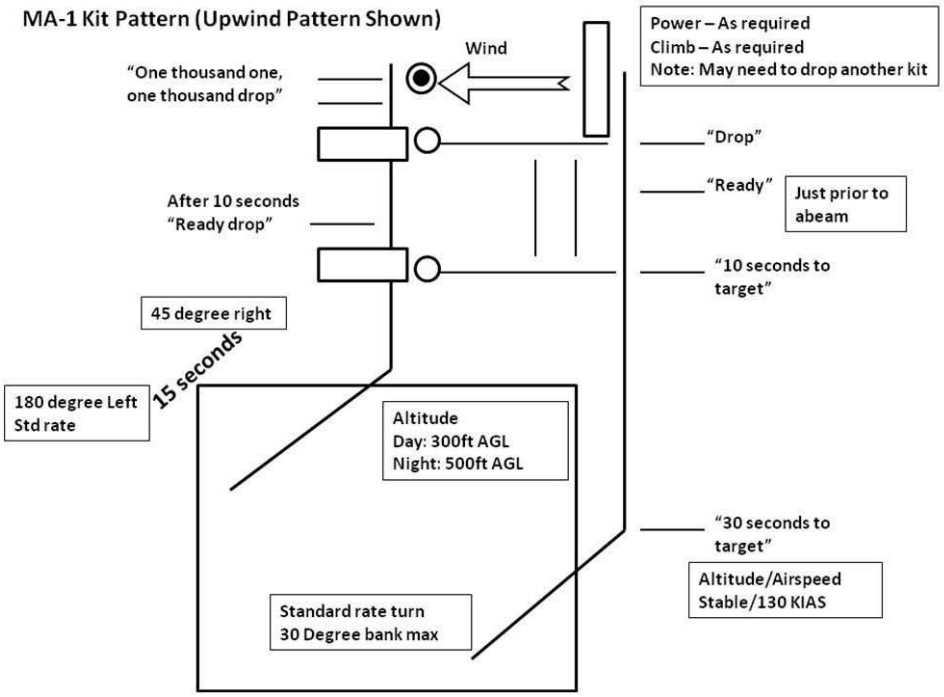
19.5.2.2. When deploying a Sea Rescue Kit in high winds, the kit may be deployed with the rafts deflated to improve drop accuracy. See **Paragraph 19.11.2** for special rigging instructions.

19.5.2.3. Pyrotechnics may be useful in determining wind strength and direction, and maintaining pattern orientation.

19.5.2.4. Standard Sea Rescue Kit Pattern Procedures (**Figure 19.10**).

19.5.2.4.1. Maneuver the aircraft onto a flight path that is crosswind and approximately 50 feet from the target on the side opposite to that of the intended kit delivery. (T3) Maintain drop altitude and airspeed. (T3)

Figure 19.2. Standard Sea Rescue Kit Pattern.



19.5.2.4.2. When abeam the target, begin the count (use seconds). Two seconds past the target, release a smoke marker (if available). The PF will count over interphone, "One thousand one, one thousand drop". On the command of "drop", the loadmaster will manually launch a smoke marker. (T3)

19.5.2.4.3. Maintain heading for 10 seconds and drop second timing signal (if available). Turn 45° to the right and hold that heading for 15 seconds. Make a 180° left-hand standard rate turn. Adjust turn to final so as to pass upwind or downwind of the target (as required for the delivery). Distance will vary with the type of target and wind velocity. Rolling out, the pilot will notify the crew: "30 seconds to target". (T3)

19.5.2.4.4. Approximately 10 seconds from the smoke marker, the pilot will notify crew: "10 seconds". Just prior to abeam the smoke marker, the PF will command "Ready", and then abeam the marker, "Drop". (T3) **Note:** Aircraft without marker signals should fly the pattern as described and attempt to drop the kit 4 seconds prior to the target.

19.5.2.5. CSO Assistance for Sea Rescue Kits. The CSO can assist the pilot by the use of onboard systems. The CSO will advise the pilot when the aircraft approaches the final delivery track.

19.5.2.5.1. The CSO should set up the CNI-MU as follows: (T3)

19.5.2.5.1.1. During the flight plan programming portion of the preflight, the CSO should load two dummy waypoints that will later serve as the IP and target. (The target will be the location of the survivor or position to which the kit will be delivered.). **Note:** This step will save time in-flight by eliminating the need to

modify the flight plan sequence.

19.5.2.5.1.2. As the aircraft flies over the target on the initial pass, the CSO will mark this position and store it. (T3) The wind (e.g., 180/015) should be noted and recorded at this time. The onboard system will allow the CSO to direct the pilot perpendicular to the wind on the final run-in to the target.

19.5.2.5.1.3. Go to the plan page. (T3) Call up the dummy waypoint that was initially designated the target and re-designate it as the mark point (stored target position). Verify this waypoint. (T3)

19.5.2.5.1.4. Go to the preceding waypoint and re-designate it as the mark point. (T3)

19.5.2.5.1.5. Define an IP using a range and bearing from the original mark point and save it as the waypoint prior to the target. (T3) Use a bearing that is the reciprocal of the desired run-in heading (e.g., 090/270°) and a range of 5 to 10 nm and verify. (T3) The pilot must confirm the final run-in heading before the CSO can load the bearing. (T3) **Note:** Keep in mind that the target will drift. This is basically a visual maneuver; the navigation systems are used as a backup. The pilot should make every attempt to keep the target in sight.

19.5.2.5.1.6. The pilot will use the system to help maintain situational awareness and line up on the target for the delivery pass. During the run-in, the pilot will offset upwind or downwind as necessary (see **Paragraph 19.10.2.1**). (T3)

19.5.3. Para-Bundle and Freefall Deployment:

19.5.3.1. When practical, use a racetrack pattern with the drop heading into the wind for equipment drops. However, circumstances may dictate a modified pattern. Equipment may be dropped from the paratroop doors or the aft cargo door and ramp. The first bundle dropped is, in effect, a spotter bundle. Therefore, it should be the least critical to the survivors. Water deliveries must consider wind, drift, and sea state. (T3) ***WARNING:*** The delivery of equipment, no matter how vital, must never endanger the lives of the receivers. (T3)

19.5.3.2. Equipment deliveries to land drop zones should be planned to impact within 50 yards of the target. Water deliveries should be planned to impact within 5 yards of the target or within a 45 sector centered on the drift line for 100 yards. In any case, deliveries should never be in excess of 5 yards up-drift of the target.

19.5.3.3. Pilot Procedures. Pilots are responsible for determining the mode of deployment; drop location, and type pattern to be flown. (T3) They must ensure the loadmaster is aware of the desired point of impact (PI). (T3) When the situation permits, the pilot will make an observation pass over the drop zone. Final freefall altitude will be no lower than 150 feet AGL. (T3) Final para-bundle altitude should be no lower than 300 feet AGL. Minimum altitude for all night airdrops is 500 feet AGL. (T3) WARNING: Keep turns below 300 feet AGL to a minimum. (T3)

19.5.3.3.1. Aircraft altitude, attitude, course, and airspeed should be established by 30 seconds to target and no later than 10 seconds to target. The pilot will keep the crew apprised of their position in the pattern. (T3) As a minimum, on final the pilot

will state "30 seconds to target", then "10 seconds". (T3) Once the loadmaster spots the target, he will state, "Target in sight" and provide the pilot with course corrections if time permits. (T3)

19.5.3.4. Loadmaster Procedures. Loadmasters must understand the location of the desired PI. (T3) When looking for the target, the loadmaster will use either paratroop door. (T3) If the PI is difficult to spot, ask the pilot to give a countdown to the PI on the run in.

19.5.3.4.1. The loadmaster will hook up the restraint harness as described in **Chapter 6**. (T3) The jump platform will be extended and the air deflector doors opened. (T3) The loadmaster may align the aircraft for the airdrop by sighting down the edge of the jump platform to the drop zone and steering the aircraft with standard calls of “Steady”, “Right, (number of) degrees”, or “Left, (number of) degrees”. **Note:** If the loadmaster places their head on the jump platform to sight and align the aircraft, they should place their head toward the forward edge for para-bundle airdrops, and move their head aft for freefall airdrops and to compensate for higher altitudes.

19.5.3.4.2. Bundle dimensions for paratroop door drops, including the parachute, must not exceed 48 by 30 by 66 inches. (T3) Bundles in excess of 100 pounds require a second pusher and those between 350-500 pounds require two additional pushers. (T3) For equipment to be delivered from the paratroop door, attach the static line (if used) to tie-down ring 26-B or 26-F. (T3) Secure equipment until it is ready for delivery. (T3)

19.5.3.4.3. If equipment cannot be delivered from the paratroop door, the loadmaster may prepare and position the equipment on the ramp for delivery, and use another thoroughly briefed crew member to release the equipment. The equipment will be secured until ready for delivery. (T3) For equipment to be delivered from the ramp, attach the static line (if used) to a tie-down ring in row 30. (T3)

19.5.3.4.4. The loadmaster will normally spot the target 8 seconds prior to the release point, and give the preparatory command "Ready" and the deployment command of "Drop". After each delivery, the loadmaster will report status of drop (load clear or status) and impact point whenever possible.

19.5.3.5. Equipment Delivery in Forested Areas. Due to the possibility of equipment hang up in trees, consideration should be given to attaching drop lines to equipment intended to be delivered by parachute. The drop line needs to be long enough to allow the chute to hang up in treetops, and still permit ground forces to recover the equipment. In addition to the drop lines now in use by units (local design and manufacture), consider the possibility of using equipment already maintained on the aircraft, such as Sea Rescue Kit buoyant rope (210 feet long). Drop lines will be secured to the parachute riser snaps/connectors and equipment package "D/V rings" with carabiners or equivalent. (T3) The drop line will be assembled into accordion "S" folds, secured with retainer bands, and attached to the equipment package. (T3) **Note:** Final approach altitude should be adjusted to compensate for tree height, but never less than 150 feet above the treetops.

19.5.3.6. Pattern for Night Aerial Delivery. NVGs may be used for night operations. Aircrews will accomplish the Combat Entry checklist to configure the aircraft for NVG operations. (T3)

19.5.3.7. Night Delivery. Equipment to be delivered at night will have marker lights attached. (T3) For water drops, attach the light by securing a double 5-foot length of type III nylon (550/cord) to the marker light, then attach the other end to the equipment. (T3) Stabilize the light to the equipment with type number 5 cord. (T3) Pass the parachute static line under the type number 5 cord to ensure light breakaway when deployed. (T3) For land drops, chemlites are recommended. Attach chemlites securely to prevent detachment.

19.6. Sea Rescue Kit.

19.6.1. The Sea Rescue Kit consists of five bundles:

19.6.1.1. The two end bundles (1 and 5) contain either a 6, 7, or 20 man raft. Bundles 2 and 4 contain emergency radios and bundle 3 contains medical gear.

19.6.1.2. The total weight of all five bundles is 232 lbs for a MA-1 kit and 311 lbs for a MA-2 kit.

19.6.1.3. Each bundle is connected by 210 feet of buoyant rope.

19.6.1.4. The kit is deployed manually off the cargo ramp.

19.6.2. Rigging Sequence.

19.6.2.1. Rigging sequence will be as shown in **Figure 19.11**. (T3)

19.6.2.2. During in-flight rigging, the cargo ramp and door will remain closed. (T3) Attach a tie-down strap across the kit to prevent movement. (T3)

19.6.2.3. Unsnap the inflation lanyard protection flap of container #1 (raft), marked 1 of 5 and leave open. (T3) Remove enough lanyard from the retaining loops to allow the snap fastener (yellow) to be fastened to ramp tie-down fitting 30F. (T3)

19.6.2.4. Remove enough buoyant rope from container #1 to allow the rope fastener (red) to be connected to the D-ring (red) of container #2, marked 2 of 5. (T3)

19.6.2.5. Remove enough buoyant rope from container #2 to allow the rope fastener (green) to be connected to the D-ring (green) of the container #3, marked 3 of 5. (T3)

19.6.2.6. Remove enough buoyant rope from container #3 to allow the snap fastener (blue) to be connected to the D-ring (blue) of container #4, marked 4 of 5. (T3)

19.6.2.7. Remove enough buoyant rope from container #4 to allow the rope snap fastener (white) to be connected to the lanyard loop of container #5, marked 5 of 5. (T3)

19.6.2.8. Unsnap the inflation lanyard protector flap on container #5 and leave open. (T3) Remove enough lanyard from the retaining loops to allow the snap fastener (yellow) to be fastened to the ramp tie-down ring 30B. (T3) **Note:** In high winds, the kit may be deployed with the rafts deflated to improve drop accuracy. If this procedure is necessary, the life raft inflation lanyard should be shortened and red streamers attached with the words "PULL TO INFLATE" on the streamers to facilitate inflation by the

survivors. Detailed kit assembly, operation, and service instructions are contained in TO 14S-1-102-21, *Organizational Maintenance Instruction with Parts Breakdown, Multi-Place Life Raft & Preservers, LPU-6/P, LPU-10/P, LPU-3/P, MB-1, A-A-50652 Life Preservers, MA1,MA-2 Sea Rescue Kits, and LRU-1/P, P-2B, 20-Man VPLR, and 25 Man Life Raft Assembly*.

19.6.3. Rigging of Lights on Sea Rescue Kits for Night Airdrops:

19.6.3.1. Lights are attached to containers 1, 3, and 5 (Refer to **Figure 19.12** for procedures). The loadmaster will inspect the lights for proper function prior to installation. (T3)

19.6.4. Airdropping a Sea Rescue Kit in Support of SAR:

19.6.4.1. Aircrews will use the Search Checklist. (T3)

19.6.4.2. The loadmaster will deploy the kit manually when the pilot states "Drop". (T3) **Note:** When delivering the Sea Rescue Kit manually, the loadmaster will deliver all kits starting with the number 1 container. (T3) The desired interval is 0.7 seconds between the containers, and all five containers must be delivered within 3.3 seconds to prevent line breakage and/or damage to the kit.

19.6.4.3. Any delay by the loadmaster after the pilot states "Drop" might cause the kit to land long.

19.6.4.4. The loadmaster will use a restraint harness with the lifeline attached to a tie-down ring no further aft than FS 737, or anchor cable with an anchor cable stop positioned at FS 737. (T3) The restraint harness lifeline will be adjusted to allow movement to FS 835. **Note:** The loadmaster will ensure all checklist items are completed, maintain control of bundles, monitor, and re-rig any loose straps/static lines or equipment that may come undone due to wind blast. (T3)

Figure 19.3. Sea Rescue Kit Rigging Sequence.

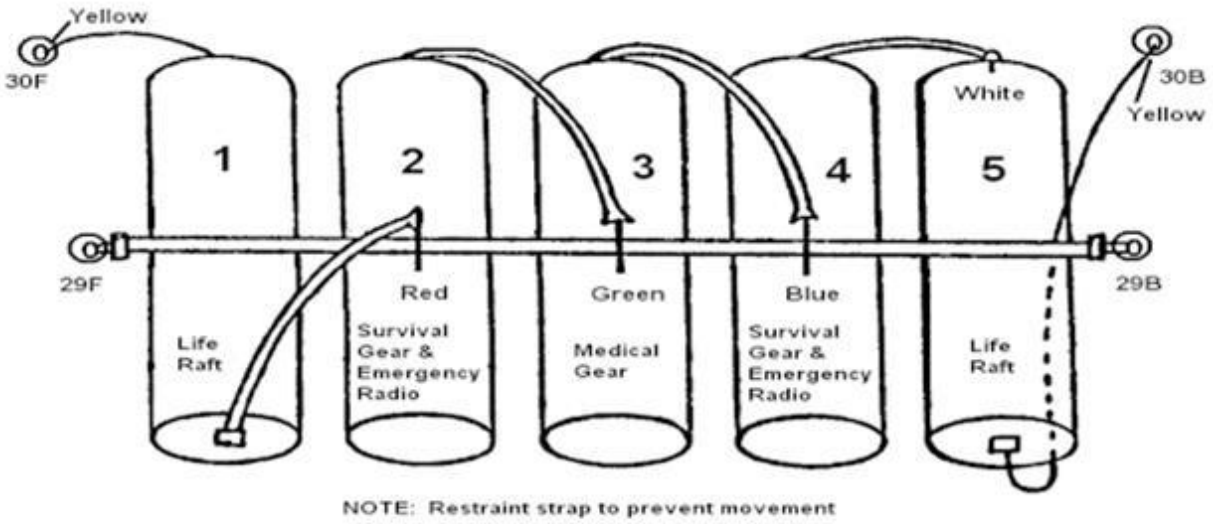
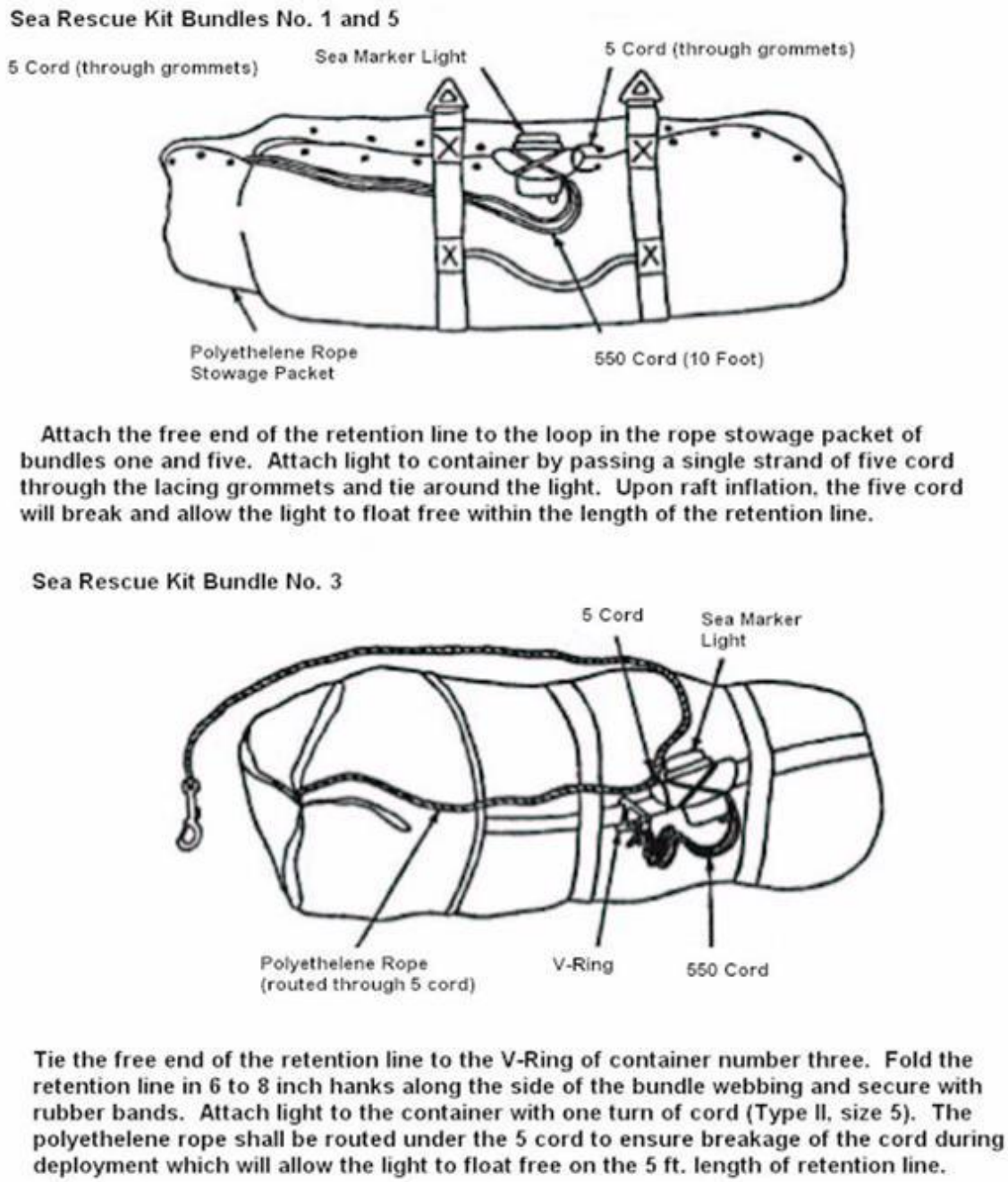


Figure 19.4. Sea Rescue Kit, Light Rigging.



19.7. Pyrotechnics:

19.7.1. General. This section provides information in preparation for launching pyrotechnics. Refer to TO 11A10-24-7, TO 11A10-26-7, TO 11A10-27-7, and TO 11A10-28-7.

19.7.2. 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.

19.7.2.1. Toxic Hazards. Many chemicals used in pyrotechnic devices are poisonous if taken internally. This also applies to the residues of burned pyrotechnics. From an 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 non-toxic, heavy concentrations in closely confined spaces are dangerous and may be lethal, for they reduce the amount of available oxygen in the air.

19.7.3. 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 rip cords 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 that are dented, deformed, cracked, broken, or have signs of advanced rust, looped closing, 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 mission qualified aircrew or an AFE instructor . (T3) Most pyrotechnics burn with intense heat; therefore, personnel should be adequately prepared to handle an emergency situation (e.g., heat resistant gloves and broom).

19.7.4. Storage. Units that have a requirement for storing pyrotechnics will obtain a license from the host base. (T3)

19.7.5. Issue Procedures. Pyrotechnics that have been issued for training purposes will be marked in bold capital letters with the word TRAINING. (T3) These pyrotechnics will always be stored separately from operational stock within storage areas. (T3)

19.7.6. 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.

19.7.6.1. 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 which shows sign of damage to safety features is considered unserviceable and must be carefully segregated for prompt disposition by Explosive Ordinance Disposal (EOD). (T3)

19.7.6.2. 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.

19.7.6.3. 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° F. Normally, available extinguishers are of little or no value in fires of this kind, and in addition, may produce toxic or poisonous gases.

19.7.6.4. 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. ***CAUTION:*** Flares will not be launched over areas subject to fire except in an extreme emergency. (T3) If such an emergency exists, flares should be dropped from sufficient altitude to allow complete burnout before hitting the surface.

19.7.6.5. Reporting Instructions. Prepare instructions for mishaps, accidents, and incidents in accordance with AFI 91-204, *Safety Investigations and Reports*. Prepare unsatisfactory reports in accordance with TO 00-35D-54, *USAF Deficiency Reporting and Investigating System.*

19.7.7. Pyrotechnics Launching:

19.7.7.1. Personnel launching pyrotechnics through open doors or hatches will wear a restraint harness or parachute, and will have armored or heat resistant gloves and a broom or wood stick readily available in case of fire. (T3) Wearing nomex gloves when deploying pyrotechnics is recommended. When manually launching parachute flares from the aircraft, only the cargo ramp will be opened unless the mission dictates otherwise. (T3) (This is to assist in eliminating pyrotechnics missile hazard).

19.7.7.2. The aircraft will be prepared for flare jettison prior to handling any pyrotechnic. (T3) Only the cargo ramp will be opened unless mission requirements dictate otherwise. All parachute flares hand-launched from the ramp will use a 10-foot lanyard (Refer to **Figure 19.13**). (T3) The flare will be hand-launched upon command of the PIC or designated crew member. (T3) ***CAUTION:*** Personnel launching flares will ensure the lanyard system is clear of extremities and equipment before launching. (T3) Excess lanyard should be accordion folded and held against the body of the flare or taped with paper tape.

19.7.8. Pyrotechnics Description and Operation:

19.7.8.1. LUU-2/B, 2A/B; Flare, Aircraft Parachute:

19.7.8.1.1. Description. The LUU-2/B, 2A/B is an air-launched parachute flare. It is 36 inches long, 4.875 inches in diameter and rated as providing 2-million candlepower illumination for approximately 300 seconds (5 minutes). Some uses are illumination of areas for crash landing, ditching, landing, target, dropping of supplies, hovering of rescue aircraft, etc.

19.7.8.1.2. Operation. Remove the flare from shipping container and set desired feet of fall in flare timer end cap. A setting of 500 feet represents a time delay of 6.3

seconds. A launch altitude of 3,000 feet AGL is recommended and will provide a light at 2,500 feet AGL. The flare descends approximately 2,500 feet during burning and will burn out and dump at ground level. The snap hook in the lanyard package of the flare shipping container may be used for the flare attaching end. The 10-foot lanyard secured to a tie-down ring near the aft end of the ramp will be attached to the lanyard or to the timer dial knob. Upon launch signal, toss the flare overboard from the rear of the ramp, or floor jettison port with ignition end out first (ignition end is opposite from the timer end cap). A force of 30 to 35 pounds is required to extract the timer dial knob and drogue cover strip. The knob and cover strip will remain with the static line. Retrieve the static line and remove the timer dial knob from the snap hook. Stow the timer dial knob until mission is over; then dispose of all residue.

19.7.8.2. LUU-4B; Flare, Aircraft Parachute:

19.7.8.2.1. Description. The LUU-4/B is an air launched parachute flare. It is 25.5 inches long, 4.875 inches in diameter, and rated as providing 1.6-million candlepower illumination for approximately 180 seconds (3 minutes). Uses are the same as the LUU-2/B, 2A/B.

19.7.8.2.2. Operation. The flare altitude should be planned so as that burnout occurs approximately 300 feet AGL over water and higher over land. Recommend maximum deployment airspeed of 200 KIAS/KCAS due to possible failure of the parachute system. Manual launch procedures are the same as LUU-2/B procedures.

19.7.8.3. LUU-2/B, LUU-2A/B, LUU-4/B Emergency Procedures:

19.7.8.3.1. Premature timer release/ignition in aircraft or storage container: Nylon cord - Cut; Container - Taped; Pilot - Notified. ***WARNING:*** In the event the timer end cap is separated from the flare, do not pull on the nylon cord or the parachute. An approximate 50-pound pull on one of the suspension cables of the parachute will cause the flare to ignite. Return the flare to the shipping container and turn flare over to EOD at mission completion. (T3)

19.7.8.3.2. Pre-Ignition of Flare: Jettison flare or container immediately; Pilot-notified. (T3) ***WARNING:*** In the event of flare ignition, an attempt will be made to jettison the flare. (T3) In event of candle ignition, intense light, heat, and lethal gas will be experienced. Adequate respiratory, eye, and hand protection will be sought as soon as emergency permits. Flare suppression will be attempted as a last resort. (T3)

19.7.8.3.3. Flare breakaway fails to release: Static line - Cut; Pilot - Notified. (T3) ***WARNING:*** Packaged aircraft parachute flares dropped in excess of 3 feet or unpackaged flares dropped in excess of 1 foot shall be considered unserviceable.

19.7.8.4. MK-6 MOD 3; Signal, Smoke, and Illumination, Aircraft:

19.7.8.4.1. Description. This signal marker provides long burning (approximately 40 minutes) surface smoke and illumination for day or night use. It is used to mark sightings at sea, make sea evaluations, marking a sea lane for night water landing, and to simulate targets for the firing of weapons. It may be used to provide smoke on land surfaces if a fire hazard does not exist.

19.7.8.4.2. Operation. Prior to launching the signal marker, remove the adhesive tape covering the pull ring. (T3) ***WARNING:*** The smoke signal has a 90 second ignition delay and must be launched immediately after the igniter has been actuated. (T3) ***WARNING:*** Packaged signal markers dropped in excess of 10 feet or unpackaged signals dropped in excess of 5 feet shall be considered unserviceable, and reported to OO-ALC/MMWR, Hill AFB, UT 84056-5609. (T3) ***WARNING:*** Do not prepare more than 2 marks at a time, and do not remove more than 4 marks at a time from the storage container in-flight. (T3) **Note:** Do not remove the four square patches of adhesive tape covering the metal caps in the holes from which flame and smoke issue after ignition of the candle. (T3) At the time the signal is launched, the pull-type igniter is actuated by hand.

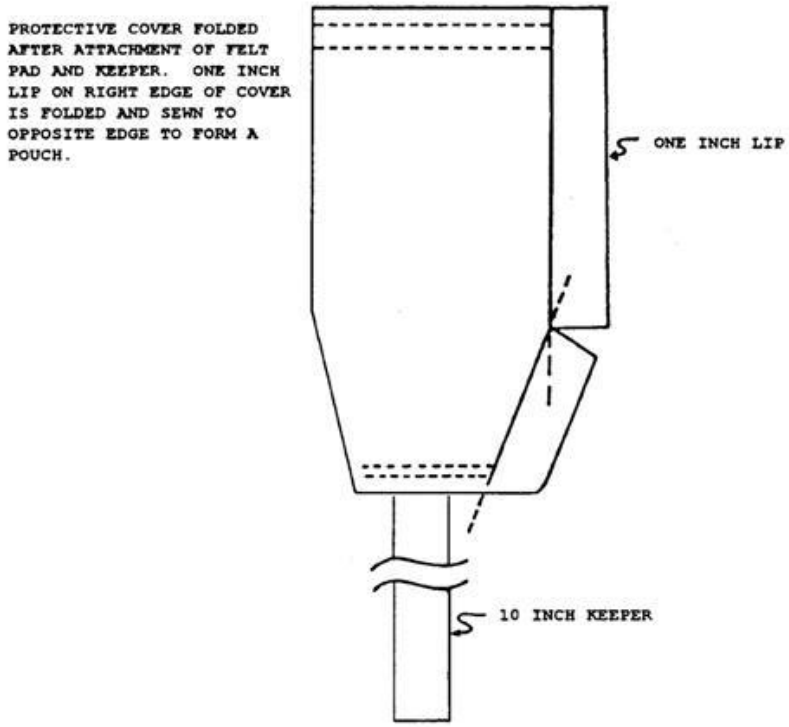
19.7.8.5. MK-25 MOD 3; Marker, Location Marine:

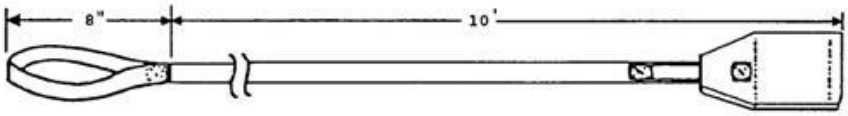
19.7.8.5.1. Description. This marker was designed for day or night use for all surface reference point marking purposes that call for smoke and flame in the 13 to 18 minute range.

19.7.8.5.2. 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. Open the ports 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 either or both base plugs have been pushed in. ***WARNING:*** The MK-25 must not be returned to storage with the base plugs pushed in. (T3) The nose end of this marker must be kept out of line with the body or with other personnel at all times. (T3) If marker is initiated, the nose plug is expelled with considerable force creating a missile hazard.

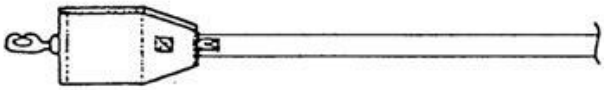
19.7.8.5.3. Special Precautions. This marker may be converted for use in fresh water by adding 1/2 or 3/4 ounces of table salt or two salt tablets through the base plugs. ***WARNING:*** Converted markers must be used after adding salt. (T3) They must not be returned to storage. (T3) If not used, they must be jettisoned in flight, over water. (T3) ***CAUTION:*** Be sure salt is not exposed to moisture before and during the conversion process, as moist salt may cause marker to ignite. (T3) ***CAUTION:*** Packaged flares dropped in excess of 6 feet or unpackaged flares dropped in excess of 3 feet shall be considered unserviceable. (T3) Report to OO-ALC/MMWR, Hill AFB, UT 840565609. (T3) **Note:** Converted markers will not perform as reliably in fresh water as unconverted markers in seawater.

Figure 19.5. Rescue Lanyard.





10 FOOT LANYARD WITH PROTECTIVE COVER EXTENDED



LANYARD WITH PROTECTIVE COVER RETRACTED EXPOSING SNAP HOOK FOR ATTACHMENT OF FLARE LANYARD

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

Attachment 1

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Abbreviations and Acronyms

AAD—Automatic Actuation Device

AALPS—Automated Air Load Planning System

AAR—Air-to-air Refueling

AATTC—Advanced Airlift Tactics Training Center

ABW—Air Base Wing

AC—Aircraft Commander or Alternating Current

ACAWS—Advisory Caution and Warning System

ACC—Air Combat Command or Airlift Coordination Centers

ACF—Acceptance Check Flights

ACFP—Advanced Computer Flight Plan

ACG—Aircrew Guide

ACM—Additional Crew Members

ACO—Air Space Control Order

ACP—Allied Communications Publication

ADC—Air Data Computer

ADCON—Administrative Control

ADIZ—Air Defense Identification Zone

ADF—Automatic Direction Finding

ADIZ—Air Defense Identification Zone

ADS—Aerial Delivery System

AETC—Air Education Training Command

AF—Air Force

AFCS—Automatic Flight Control System

AFF—Automated Form F

AFFSA—Air Force Flight Standards Agency

AFI—Air Force Instruction

AFJI—Air Force Joint Instruction

AFMAN—Air Force Manual

AFMC—Air Force Material Command

AFOSI—Air Force Office of Special Investigation

AFPD—Air Force Policy Directive

AFRC—Air Force Reserve Command

AFRIMS—Air Force Records Information Management System

AFTP—Additional Flight Training Periods

AGE—Aerospace Ground Equipment

AGL—Above Ground Level

AHAS—Avian Hazard Advisory System

AI—Airborne Intercepts

AIMS—Airlift Implementation and Monitoring System

AIREP—Air Report

ALCE—Airlift Control Element

ALS—Approach Lighting System

ALT—Altitude

ALTRV—Altitude Reservation

AMAX—Adjusted Max Effort Rotation Speed

AMC—Air Mobility Command or Airborne Mission Commander

AME—Air Mobility Elements

AMFLMETO—Adjusted Minimum Field Length Maximum Effort Take Off

AMU—Avionic Management Unit

ANG—Air National Guard

ANGRC—Air National Guard Readiness Center

AOA—Angle of Attack

AOC—Air Operations Center or AFSOC Operations Center

AOR—Area of Responsibility

AP—Area Planning

APCH—Approach

APPR—Approach

APT—Approach Planning Tool

APU—Auxiliary Power Unit

A/R—Aerial Refueling or As Required

ARC—Air Reserve Component

ARCP—Air Refueling Control Point

ARCT—Air Refueling Control Time

AFSC—Air Force Specialty Code

AFSOC—Air Force Special Operations Command

AFTO—Air Force Technical Order

AFTTP—Air Force Tactics, Techniques, and Procedures

ARFF—Aircraft Rescue Fire-fighting Requirements

ARMS—Automated Records Management System

ARRS—Aerospace Rescue and Recovery Service

ARTTC—Air Route Traffic Control Center

ASRR—Airfield Suitability and Restrictions Report

A/T—Autothrottle

ATA—Actual Time of Arrival

ATC—Air Traffic Control

ATCS—Automatic Thrust Control System

ATCSCC—Air Traffic Control System Command Center

ATIS—Automatic Terminal Information Service

ATM—Air Traffic Management

ATO—Air Tasking Order

ATOC—Air Terminal Operations Center

ATTLA—Air Transportation Test Loading Agency

AVPOL—Aviation Petroleum, Oil, and Lubricants

AWL—Above Wing Level

BAI—Backup Aircraft Inventory

BAM—Bird Avoidance Model

BAQ—Basic Aircraft Qualified

BASH—Bird/Wildlife Aircraft Strike Hazard

BAU—Bus Adapter Unit

BFT—Blue Force Tracker

BIU—Bus Interface Unit

BRNAV—Basic Area Navigation

C—Celsius

C2—Command and Control

CADC—Central Air Data Computer

CADRG—Compressed Arc Digitized Raster Graphics

CALM—Computer Aided Load Manifesting

CAOC—Combined Air Operations Center

CARP—Computed Air Release Point

CAT—Category

CBP—Customs and Border Protection

CC—Commander

CCA—Competent Authority Approval

CCC—Command and Control Center

CCT—Combat Control Team

CDRUSSOCOM—Commander United States Special Operations Command

CDS—Container Delivery System

CEOI—Command Electronic Order of Information

CF—Customs Form

CFL—Critical Field Length

CFP—Computer Flight Plan

CFPS—Computer Flight Planning Software

CFR—Crash Fire Rescue

CHK—Check

CHOP—Change in Operational Control

CHUM—Chart Updating Manual

CI/FP—Counter Intelligence/Force Protection

CLO—Combat Logistics Operations

CMDS—Countermeasures Dispensing System

CMS—Combat Mission Sortie

CNBP—Communication/Navigation/Breaker Panel

CNDC—Canadian National Defense Contract

CNI—Communication/Navigation/Identification

CNI-MS—Communications/Navigation/Identification-Management System

CNI-MU—Communication/Navigation/Identification Management Unit

CNI-SP—Communication/ Navigation/ Identification System Processor

COD—Completion of Drop

COE—Certificate of Equivalency

COMAFFOR—Commander Air Force Forces

COMAFSOC—Commander Air Force Special Operations Command

COMAFSOF—Commander Air Force Special Operations Forces

COMSEC—Communications Security

CONUS—Continental United States

COP—Common Operating Picture

CP—Command Post or Copilot

CRL—Container Ramp Load

CRM—Crew Resource Management

CRO—COMSEC Responsible Officer

CRRC—Combat Rubber Raiding Craft

CRS—Container Recovery System

CS—Commando Solo or Concurrent Servicing

CSO—Combat Systems Operator

CSS—Concurrent Servicing Supervisor

CUI—Combined Unit Inspection

CW—Carrier Wave

CVR—Cockpit Voice Recorder

DA—Digital Autopilot

DACO—Departure Airfield Controlling Officer

DA/FD—Digital Autopilot/Flight Director

DAFIF—Digital Aeronautical Flight Information File

DC—Direct Current

DCS—Defense Courier Service

DD—Department of Defense Form

DESC—Defense Energy Support Center

DFDR—Digital Flight Data Recorder

DFSC—Defense Fuel Supply Center

DH—Decision Height

DIGMAP—Digital Map

DIP—Diplomatic

DLA—Defense Logistics Agency

DMC—Deputy Mission Commander

DME—Distance Measuring Equipment

DNIF—Duties Not Including Flying

DoD—Department of Defense

DOMOP—Domestic Operation(s)

DoT—Department of Transportation

DSC—Digital Selective Calling

DSCA—Defense Support of Civil Authorities

DSN—Defense Switched Network

DSO—Direct Support Operator

DSR—Deployed Status Reports

DST—Degraded Systems Training

DTR—Defense Transportation Regulation

DV—Distinguished Visitor

DVT—Divert

DZ—Drop Zone

DZC—Drop Zone Controller

DZSO—Drop Zone Safety Officer

EAR—End Air Refueling

ECB—Electronic Circuit Breakers

ECHUM—Electronic Chart Updating Manual

ECM—Electronic Countermeasures

ECS—Electronic Communications Systems

ECSF—Electronic Combat Support Flight

EGI—Embedded Global Positioning/Inertial Navigation System

EL—Electroluminescent

EMI—Electro-magnetic Interference

EO—Electro Optical

EOD—Explosives Ordinance Disposal

EP—Emergency Procedures

EPJS—Emergency Parachute Jettison System

ER—Exceptional Release

ERO—Engines Running Offload or Onload

ESA—Emergency Safe Altitude

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

EWO—Electronic Warfare Officer

F—Fahrenheit

FA—Crew Flight Authorization

FAA—Federal Aviation Administration

FADEC—Full Authority Digital Electronic Controls

FAF—Final Approach Fix

FAR—Federal Aviation Regulation

FARP—Forward Area Refueling Point

FAS—Fuels Automated System

FAST—Fly Away Security Team

FBO—Fixed Base Operator

FCC—Federal Communications Commission

FCF—Functional Check Flight

FCG—Foreign Clearance Guide

FCIF—Flight Crew Information File

FD—Flight Director

FDP—Flight Duty Period

FIH—Flight Information Handbook

FIR—Flight Information Regions

FL—Flight Level

FLCV—Fuel Level Control Valve

FLIP—Flight Information Publications

FM—Frequency Modulation

FMC—Fully Mission Capable

FMP—Flight Manuals Program

FOD—Foreign Object Damage

FODS—Fire and Overheat Detector System

FOL—Forward Operating Location

FOM—Figure(s) of Merit

FOUO—For Official Use Only

FP—First Pilot

FPA—Flight Path Angle

FPM—Feet Per Minute

FS—Flight Station

FSAF—First Suitable Airfield

G—Gravity

G/A—Go-Around

GC—Gyro Compass

GCAS—Ground Collision Avoidance System

GDSS—Global Decision Support System

GMRS—General Mobile Radio Service

GNC—Global Navigation Charts

GP—General Planning

GPS—Global Positioning System

GRADS—Ground Radar Aerial Delivery System

GS—Glide Slope or Groundspeed

GW—Gross Weight

HAAR—Helicopter Air-to-Air Refueling

HAHO—High-Altitude High-Opening

HALO—High-Altitude Low-Opening

HARP—High-Altitude Release Point

HAT—Height Above Touchdown

HATR—Hazardous Air Traffic Report

HDD—Heads Down Displays

HDG—Heading

HE—Heavy Equipment

HERP—Hostile Environment Repair Procedures

HF—High Frequency

HP—Horsepower

HPW—High Performance Waveform

HQ—Headquarters

HSLLADS—High-Speed Low-Level Delivery System

HSGI—High-Speed Ground Idle

HUD—Heads Up Display

IAF—Initial Approach Fix

IAS—Indicated Air Speed

IAW—In Accordance With

ICAO—International Civil Aviation Organization

ICDS—Improved Container Delivery System

ICS—Digital Intercommunication System

ID—Identification Number

IDS—Independent Disconnect System

IFA—In-Flight Alignment

IFF—Identification Friend or Foe

IFR—Instrument Flight Rules

ILS—Instrument Landing System

IMC—Instrument Meteorological Conditions

INAV—Integrated Navigation

INU—Inertial Navigation Unit

IP—Initial Point or Instructor Pilot

IPRA—Independent Precision Radar Approach

IR—Infrared

ITU—International Telecommunications Union

JAAAC—Joint Air Apportionment Allocation Conference

JA/ATT—Joint Airborne/Air Transportability Training

JAI—Joint Airdrop Inspection

JCET—Joint Combined Exchange Training

JMD—Jump Master Directed

JNCA—Jet Navigation Chart-High Altitude

JOG—Joint Operations Graphic

JPADS—Joint Precision Airdrop System

JPADS-MP—JPADS Mission Planner System

JSIR—Joint Spectrum Interference Resolution

JSOAC—Joint Special Operations Air Component

JSOTF—Joint Special Operations Task Force

JTWS—Joint Threat Warning System

KCAS—Knots Calibrated Air Speed

kHz—Kilohertz

KIAS—Knots Indicated Air Speed

KTAS—Knots True Air Speed

KTS—Knots

LAIRCM—Large Aircraft Infrared Countermeasures

LANTCOM—United States Atlantic Command (USN)

LAT—Lateral Axis

lb(s)—Pound(s)

LCC—Lambert Conformal Conic

LCADS-LV—Low Cost Aerial Delivery System-Low Velocity

LCLA—Low Cost Aerial Delivery System-Low-Altitude

LL—Low-Level

LM—Loadmaster

LOX—Liquid Oxygen

LPU—Life Preserver Unit

LRC—Logistics Readiness Center or Long Range Cruise

LRNS—Long Range Navigation Systems

LSAF—Last Suitable Airfield

LSK—Line Select Key

LUT—Local User Terminals

LZ—Landing Zone

MAF—Mobility Air Forces

MAJCOM—Major Command

MAP—Missed Approach Point

MB—Marker Beacon

MC—Mission Computer or Mission Commander

MCC—Mission Crew Commander

MCD—Medical Crew Director

MDA—Minimum Descent Altitude

MDS—Mission Design Series

ME—Mission Essential

MEA—Minimum Enroute Altitude

MEL—Minimum Equipment List

MEP—Mission Essential Personnel

MF—Medium Frequency

MFCD—Multifunction Control Display

MFF—Military Free Fall

MFP—Master Flight Plan

MFLMETO—Minimum Field Length Maximum Effort Takeoff

MGM—Mono-Pulse Ground Mode

MGT—Measured Gas Temperature

MHE—Materials Handling Equipment

MHz—Megahertz

MICAP—Mission Impaired Capability/Awaiting Parts

MIL—Military

MISREPs—Mission Reports

MNPS—Minimum Navigation Performance Specifications

MOA—Memorandum of Agreements

MP—Mission Pilot

MPC—Master Plotting Chart

MPP—Most Probable Position

MSA—Minimum Safe Altitude

MSC—Multiservice Corporation

MSL—Mean Sea Level

MTR—Military Training Route

MX—Maintenance

MXG—Maintenance Group

MXG/CC—Maintenance Group Commander

NA—North American

NAT—North Atlantic Region

NATO—North Atlantic Treaty Organization

NAV—Navigation

NAVAID—Navigation Aid

NC—Noncurrent

NDB—Non-directional Beacon

NEW—Net Explosive Weight

NG—Gas Generator Speed

NGB—National Guard Bureau

NIU—Nacelle Interface Unit

nm—Nautical Miles

NMC—Not Missions Capable

NOPAC—North Pacific

NOTAM—Notice to Airmen

NORTHCOM—United States Northern Command

NP—Power Turbine Speed

NSN—National Stock Number

NVG—Night Vision Goggles

OAP—Offset Aiming Point

OAT—Outside Air Temperature

OCONUS—Outside Continental United States

OG—Operations Group

OG/CC—Operations Group Commander

OGV—Standardization and Evaluation

OI—Operating Instructions

ONC—Operational Navigational Charts

OP—Senior Staff Pilots

OPARS—Optimum Path Aircraft Routing System

OPCON—Operational Control

OPORD—Operational Order

OPR—Office of Primary Responsibility

OPREP—Operations Report

ORE—Operational Readiness Exercise

ORF—OGV Read File

ORI—Operational Readiness Inspection

ORM—Operational Risk Management

ORM-D—Other Regulated Materials for Domestic Transport Only

OT&E—Operational Test and Evaluation

P—Pilot

PA—Pennsylvania or Public or Pressure Altitude

PAR—Precision Radar Approach

PERF—Performance

PEX—Patriot Excalibur

PF—Pilot Flying

PFD—Primary Flight Display

PFPS—Portable Flight Planning System

PGU—Portable GPS Unit

PI—Point of Impact

PIC—Pilot In Command

PITCH—Pitch Axis

PJ—Pararescue Jumper

PLCU—Pallet Lock Control Unit

PM—Pilot Monitoring

PMC—Partially Mission Capable

PMCJ—Pennsylvania Code of Military Justice

POK—Passenger Oxygen Kit

POL—Petroleum, Oil, and Lubricants

PRM—Precision Runway Monitor

PSN—Proper Shipping Name

PSP—Pierced Steel Plank

PTs—Physiological Technicians

QTY—Quantity

RA—Resolution Advisories or Radar Altimeter

RADALT—Radar Altimeter

RAMZ—Rigging Alternate Method Zodiac

RCC—Rescue Coordination Center

RCR—Runway Condition Reading

RDS—Records Disposition Schedule

REF—Reference

REF/SET—Reference Set/Mode Select

RFA—Regulatory Flexibility Act

RNP—Required Navigation Performance

RP—Release Point

RPS—Regulated Power Supply

RSC—Runway Surface Condition

RSDN—Regional Switched Digital Network

RVR—Runway Visual Range

RVSM—Reduced Vertical Separation Minimums

RWR—Radar Warning Receiver

SAR—Search and Rescue

SARSAT—Search and Rescue Satellite-Aided Tracking

SAT—Static Air Temperature

SATB—Standard Airdrop Training Bundles

SATCOM—Satellite Communications

SCA—Self-Contained Approach

SEL—Select

SF—Standard Form

SIF—Selective Identification Feature

SITREP—Situational Reports

SITCO—Shell International Trading Company

SJ—Super J

SLTA—Small Laser Transmitter Assemblies

sm—Statute Miles

SMB—Special Mission Branch

SME—Special Mission Equipment

SOAR—Special Operations Air Refueling

SOC—Special Operations Command

SOF—Special Operation Forces

SORN—System of Records Notice

SOW—Special Operations Wing

SPINS—Special Instructions

Sq—Squadron

Sq/CC—Squadron/Commander

STAR—Standard Terminal Arrival Route(s)

Stan/Eval—Standardization/Evaluation

STD—Standard

STS—Special Tactics Squadron

SUA—Special Use Airspace

SYN—Pitch Synchronization

TA—Traffic Advisory

TAAR—Tiltrotor Air-to-Air Refueling

TAC—Tactical

TACAN—Tactical Air Navigation

TACON—Tactical Control

TAG—Adjutant General

TAS—True Airspeed

TAWS—Terrain Awareness and Warning System

TBMCS—Theater Battle Management Core Systems

TCAS—Traffic Alert Collision Avoidance System

TDZE—Touchdown Zone Elevation

TFF—Terminal Fuel Flow

TOA—Time of Arrival

TO—Technical Order

TOLD—Takeoff and Landing Data

TOT—Time Over Target

TPC—Tactical Pilotage Chart

TR—Transformer Rectifiers

TRIADS—Tri-Wall Aerial Delivery System

TSA—Transportation Security Agency

TSOC—Theater Special Operations Commands

TWG—Threat Working Group

UARRSI—Universal Aerial Refueling Receptacle Slipway Installation

UHF—Ultra-high Frequency

UN—United Nations

UNQ—Unqualified

USAF—United States Air Force

USAFWS—United States Air Force Weapons School

USDAO—United States Defense Attaché Office

USN—United States Navy

USSOCOM—United States Special Operations Command

USTRANSCOM—United States Transportation Command

UTA—Unit Training Assembly

UTC—Coordinated Universal Time

VFR—Visual Flight Rules

VHF—Very High Frequency

VMC—Visual Meteorological Conditions

$\mathbf{V_{MCA}}$—Minimum Controllable Airspeed

$\mathbf{V_{MCG}}$—Ground Minimum Control Speed

VOR—VHF Omni-directional range

VOX—Voice Operated Transmitter

$\mathbf{VR_{MAX}}$—Maximum Effort Rotation Speed

VIRS—Verbally Initiated Release System

VVOD—Vertical Vector Obstruction Data

WF—Wind Factor

Wg—Wing

Wg/CC—Wing/Commander

WPS—Weapons Squadron

WSO—Weapon Systems Officer

WX—Weather

Terms

AFKAI—Contains the worldwide USAF voice call sign list and the specific assignment of each to USAF, JCS, Army, Navy, unified and specified commands, and certain Executive, State Department, and DoD activities.

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 AFRC or Air National Guard (ANG).

Airborne Mission Commander(AMC)—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.

Auto Computed Air Release Point (CARP)—An airdrop in which the CARP is automatically calculated in-flight by the navigation system. Automatic steering or manual steering indications are provided to guide the aircraft to the CARP.

Basic Proficiency—Crews or crew members qualified and current to fly the unit aircraft only on non-mission sorties.

Basic Mission Capable—Crews or crew members 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.

Chalk Number—A number on an aircraft to identify and designate its position for loading and unloading.

Combat Control Team (CCT)—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 Entry Point—A geographical point inbound to the objective area where the hostile environment is penetrated.

Combat Off-Load—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 instruction, CCCs include the AFSOC Command Center, Air Mobility Command Command Center, Command Post (CP), Air Mobility Elements (AME), Airlift Coordination Centers (ACC), Combat Control Teams, AFRC Headquarters Command Post (HQ AFRC CP), 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 theater SOC/CCs 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 SOC/CC 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.

Computed Air Release Point—A computed air position at which the release of personnel, equipment, containers, and bundles is initiated to land on a specific point of impact (PI).

Conference SKYHOOK—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.

Contingency Mission—A mission operated in direct support of an operation plan, operation order, disaster, or emergency.

Deadhead Time—Duty time accrued by crew members in a passenger or ACM status.

Drop Zone Controller (DZC)—An individual on a drop zone required to monitor all airdrop operations except airdrop of Special Forces.

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**).

Forward Operating Base—An airfield without full support facilities used during mission operations for an undetermined and sometimes extended period of time.

Hazardous Cargo or Materials—Explosive, toxic, caustic, nuclear, combustible, flammable, biologically infectious, or poisonous materials that may directly endanger human life or property, particularly if misused, mishandled, or involved in accidents (AFJI 11-204, AFMAN 24-204, TO 11N-20-11).

Helicopter Air-to-Air Refueling (HAAR)—Airborne fuel offload by MC-130 aircraft to a helicopter.

High-Altitude High-Opening (HAHO)—A high-altitude airdrop in which personnel deploy their parachutes immediately on exiting the aircraft (no programmed free fall).

High-Altitude Low-Opening (HALO)—Airdrop of personnel or containers using a programmed free fall (parachutist) or a staged parachute delivery.

High-Altitude Release Point (HARP)—A computed air position at which parachutists, equipment, containers, or bundles are released to land on a specific point of impact. A HARP is computed for all HAHO and HALO drops.

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.

Integrated Tasking Order—The Republic of South Korea's version of the US Air Tasking Order.

Interfly—Intermixing of crew members from different units in the same aircrew or unit aircrews flying aircraft assigned to another unit.

Joint Special Operations Task Force (JSOTF)—A joint task force composed of special operations units from more than one Service, formed to carry out a specific special operation or prosecute special operations in support of a theater campaign or other operations. The joint special operations task force may have conventional non-special operations units assigned or attached to support the conduct of specific missions.

Live Ordnance—Combat type ordnance incorporating explosive or incendiary material to include flares.

Load Message—An operational immediate message electronically transmitted from departure station listing pertinent traffic and operational data.

Low-Level—Operations conducted below 3,000 feet AGL.

Maintenance Codes—Fully Mission Capable (FMC), Partially Mission Capable (PMC), Not Mission Capable (NMC), + M (Maintenance), + S (Supply), + B (Both).

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.

Military Free Fall (MFF)—HALO or HAHO airdrop operations.

Minimum Safe Altitude (MSA)—MSA is an intermediate altitude that will provide terrain clearance in VMC or IMC.

Mission Capable—Crews or crew members 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 crew members fully qualified and current to perform the unit mission.

Night Vision Goggles—Self-contained, battery-operated devices that amplify light to enhance night vision.

Offset Aiming Point (OAP)—A reference, other than the actual target, used for aircraft positioning.

Operating Weight—Basic aircraft weight plus weight of crew members, crew baggage, steward's equipment, emergency, and extra equipment.

Operational Control—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.

Payload—1. The sum of the weight of passengers and cargo that an aircraft can carry. 2. The load (expressed in tons of cargo or equipment, gallons of liquid, or number of passengers), which the vehicle is designed to transport under specified conditions of operation, in addition to its unladen weight.

Point of Impact (PI)—The point on the drop zone where the first airdropped parachutist or cargo item lands or is expected to land.

Quick Turn—A set of procedures designed to expedite the movement of selected missions by reducing ground times at enroute or turn around stations.

Self-Contained Approach (SCA)—An approach conducted using self-contained, onboard navigation systems.

Serial—Any number of aircraft under one commander, usually conveying one air-transportable unit or subunit to the same objective.

Special Tactics Squadron (STS)—Air Force special operations combat control and pararescue forces.

Standby Force, Aircraft, or Crews—Designated aircraft and crews capable of being launched in less than the normal alert-to-takeoff time period.

Station Time (Air Force)—A specified time at which aircrew, passengers, and material are to be in the aircraft and prepared for flight. Passengers will be seated and loads tied down. Aircrews will have completed briefing and aircraft preflight inspection prior to station time. Normally, station time will be 30 minutes prior to takeoff time.

Station Time (Airborne)—A specified time when parachutists will be seated in the aircraft with seat belts fastened. This time normally will be 5 minutes prior to Air Force station time.

Supported Forces—Space-required passengers consisting of US and foreign military members who are on board 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.

Tactical Control (TACON)—Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed and, usually, local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned. Tactical is inherent in operational control. Tactical control may be delegated to, and exercised at any level at or below the level of combatant command.

Time Over Target (TOT)—The actual time an aircraft is at a geographic point or area carrying out an assigned mission.

Zero Fuel Weight (Actual)—The actual zero fuel weight of an aircraft plus the weight of the cabin load (cargo, passengers, troops, and munitions).

Zero Fuel Weight (Maximum)—That weight expressed in pounds where an addition to the aircraft gross weight can be made only by adding fuel in wing tanks. This value is referred to as "Limiting Wing Fuel".

Attachment 2

INFILTRATION/EXFILTRATION PROCEDURES

A2.1. General Procedures.

A2.1.1. Infil/Exfil Procedures. Use this guidance when conducting infil/exfil operations. These procedures are only authorized when conducting infil/exfil operations with dedicated unconventional forces and foreign counterparts. All personnel in the cargo compartment will be seated and secured except those crew members having valid duties to perform. (T3)

A2.1.1.1. Rapid Infiltration ("Rapids"). Rapids are a tactical method of onloading or offloading dedicated unconventional and SOF Forces. Spring-loaded, latch-activated, folding ramps (canary slides), or ground loading ramps are used to offload and onload vehicles, personnel, and H-6 series helicopters in minimal time. Selection of the onload/offload point and aircraft orientation impacts total ground times. Extensive premission planning/static load training may be required for large or complex loads. **Exception:** Group commander/COMAFSOF (for contingency operations) may authorize Rapid Infil/Exfil procedures and floor loading with non-SOF personnel to meet unit training requirements. (T-3)

A2.1.2. Preparation. Prepare aircraft for Infil/Exfil IAW 1C-130J-9.

A2.1.3. Loadmaster Preflight:

A2.1.3.1. Blackout covers should be in place for all missions flown in a hostile environment at night.

A2.1.3.2. Chemical lights will be attached to each emergency exit handle. (T3) Apply tape to allow a small amount of light to shine through. (T3)

A2.1.3.3. Emergency exit lights will be armed/off (as required). (T3)

A2.1.3.4. Cargo compartment lights will be set (as required) - set. (T3)

A2.1.3.5. Door warning lights will be taped (as required). (T3)

A2.1.3.6. Turn off cargo floor, crew entrance door, and nose gear inspection lights. (T3)

A2.1.3.7. Jump lights will be taped (as required). (T3)

A2.1.4. Approved Deviations. Personnel inside vehicles will be properly secured either with vehicle seat belts or personnel restraining devices (e.g., Swiss seats) for takeoffs and landings. (T3) Do not exceed maximum vehicle gross weights. (T3) All other personnel in the cargo compartment will be seated and secured using personnel restraint device or Passenger combat loading procedures. (T3) Crew members with valid duties (such as scanning) to perform are not required to be seated. **Note:** Users will provide their own personal restraint device. (T3) If users do not provide their own restraining devices, secure personnel using passenger combat loading procedures. (T3)

A2.1.4.1. Loadmasters. Loadmasters are normally positioned in the paratroop door and secured in a troop door seat or with a modified restraint belt or swiss seat for takeoff and landings when using infil/exfil procedures.

A2.1.4.2. Drivers. All vehicle drivers will wear NVGs when driving vehicles on or off the aircraft under blacked out conditions or when cargo compartment EL/NVG lighting is in use. (T3) If a vehicle driver does not have NVGs, the vehicle will be pushed or winched on/off the aircraft. (T3)

A2.1.4.3. Aerial Delivery System (ADS). ADS arms will be disconnected/disengaged at the 10-minute warning. (T3) Reconnect/reengage ADS arms after takeoff as soon as mission requirements permit. (T3) **Note:** If airdrop operations are to be conducted over the ramp after the ADS arms have been disconnected/disengaged, loadmasters will check the ramp/door in the ADS position (to facilitate checking the ADS/no-go light) prior to taking off/departure, if mission requirements allow.

A2.1.4.4. Ramps. Canary slide ramps or auxiliary ground loading ramps may be installed in flight and remain installed during all phases of flight. **Note:** It may be impossible to remove the auxiliary ground loading ramps from the outboard fittings with the ramp rails installed and the ramp on the ground. If this occurs, raise the ramp to horizontal to remove the loading ramps. (T3)

A2.1.5. Prohibited Actions. (T3)

A2.1.5.1. Open carriage vehicles such as: quads, mules (6-wheeler), motorcycles, and mini-bikes will not allow drivers on vehicles for takeoffs and landings. (T3)

A2.1.5.2. Personnel will not be inside helicopters for takeoff or landings. (T3)

A2.1.5.3. For loads that have an item restrained to both the cargo floor and cargo ramp, open only the cargo door until the aircraft comes to a complete stop. (T3) The cargo ramp will not be lowered until the aircraft arrives at the offload point and all restraints are removed. (T3)

A2.1.5.4. Vehicles will not be started in-flight. (T3) ***CAUTION:*** To prevent the possibility of carburetor vapor-lock, vehicles will not be started in-flight. (T3)

A2.1.5.5. The cargo ramp will not be lowered below horizontal until the aircraft comes to a complete stop at the offload point. (T3)

A2.1.5.6. Vehicles will not be onloaded/offloaded while the center anchor cable supports are in the installed position. (T3)

A2.1.5.7. Vehicle IR lights will not be used in or around aircraft. (T3)

A2.1.5.8. Personnel will not loiter between vehicles while on the aircraft. (T3)

A2.1.5.9. Personnel will not sit or extend arms or legs under vehicles. (T3)

A2.1.5.10. Chemical lights attached to side escape hatch/crew entrance door handle will not be removed in-flight at any time. (T3)

A2.1.6. Ordnance Procedures.

A2.1.6.1. 2.75-inch rockets and other missile-type arms may be taken out of shipping containers and shipping tubes. Safety rings must remain attached. (T3) They may be secured in the vehicle for storage or maintained by the user.

A2.1.6.2. Machine gun/Gatling gun ammunition may be kept readily available but will not be breached (chambered) until exiting the aircraft.

A2.1.6.3. Troops may maintain their own small arms ammunition, but weapons will not be breached (chambered) until exiting the aircraft.

A2.1.6.4. All weapons will be cleared and on SAFE with muzzles pointing down prior to boarding the aircraft. (T3)

A2.1.7. Fuel Limitations.

A2.1.7.1. Vehicle fuel tanks will not exceed 75% full when positioned on the cargo floor. (T3) Fuel tanks for vehicles transported on the cargo ramp will not exceed 50% full. (T3)

A2.1.7.2. The H-6 series helicopters' main and auxiliary tanks will not exceed 75% full. (T3)

A2.1.7.3. Spare gas cans (DoT 5L, jerry type) must have serviceable rubber gaskets in place and be secured inside the vehicle. **Exception:** Some types of vehicles provide for the storage of spare fuel cans outside of the vehicle. They will be secured to prevent puncture in the event of contact with the aircraft or another vehicle). In all cases, do not place fuel cans on the front or rear bumpers. Spare gas cans may be filled to their capacity. If placed on the aircraft floor, metal-to-metal contact is not allowed. **Note:** Total combined fuel quantity for a vehicle and DoT 5L jerry cans cannot exceed twice the vehicle fuel tank capacity. (T3)

A2.1.8. Aircraft Configuration. See AFI 11-2EC-130J, Vol 3, and AFI 11-2EC/MC-130, Vol 3, Addenda A as required. **Note:** Due to the unique requirements needed to perform infiltration/exfiltration procedures sound judgment and coordination with user personnel will dictate specific aircraft configuration beyond the basic aircraft configurations.

A2.1.8.1. Cargo ramp and minimum necessary canary slides/ground loading ramps should be left extended until the latest possible time to facilitate bump plans at the intermediate staging base (ISB).

A2.1.9. General Considerations. (T3)

A2.1.9.1. Tape chemical lights to emergency exit handles to allow a small amount of light to shine through. (T3) WARNING: Chemical lights attached to exit doors and emergency escape hatch handles will remain in place until mission completion. (T3)

A2.1.9.2. Tape may be used on the cargo compartment floor and tie-down rings to mark vehicle locations and tie-down points for exfil operations. **Note:** Tape is usually installed at the ISB during static loading for exfil operations.

A2.1.9.3. Tying pairs of auxiliary ground loading ramps together with 1/2 inch tubular nylon or 550 cord can expedite closing operations.

A2.1.9.4. The following are considerations for H-6 series helicopters.

A2.1.9.5. Remove paratroop door jump platforms to prevent the tail/tail rotor from contacting them on rapid on-load/offload operations. (T3)

A2.1.9.6. If dual rails are unable to be removed from the aircraft due to short notice tasking/mission requirements, up to three H-6 series helicopters may be loaded safely (if not equipped with modified tail boom). (T3) Extreme caution is needed during loading

to ensure the tail/tail rotor of the last aircraft will not contact the cargo door and ramp/canary slides or ground loading ramps when in the closed position.

A2.1.10. Restraint Requirements. All vehicles/helicopters will be restrained IAW **Table 3.2**, Restraint Requirements.

Table A2.1. Restraint Requirements.

Weight of Vehicle (pounds)	**Restraint Required**
Less than 5,000	4 x 5,000-/10,000-pound straps (2 forward/2 aft)
5,001 to 7,500	6 x 5,000-pound straps (4 forward/2 aft) or 4 x 10,000-pound straps/chains and devices (2 forward/2 aft)
7,501 to 11,500	6 x 10,000-pound straps/chains and devices (4 forward/2 aft)
11,501 to 12,100	10 x 10,000-pound straps/chains and devices (6 forward/4 aft)
Note: The rapid all-terrain vehicle (RATV) will be restrained using a minimum of six 5,000/10,000 pound tie-down straps (four forward and two aft). (T-3) The tie-down attachment points on the RATV are only rated at 5,000 pounds.	

A2.1.10.1. Restrain motorcycles and mini-bikes with one 5,000 pound tie-down strap each. Restrain quads with three 5,000 pound tie-down straps (The vertical strap centered over the seat will be left on during taxi, fwd and aft straps may be removed after 80 knot call). (T3)

A2.1.10.2. Motorcycle, quad and mini-bike restraint may be attached to a prepositioned chain connected to aircraft sidewall tie-down rings.

A2.1.10.3. Restrain H-6 series helicopters with five 5,000 pound tie-down straps (two forward, two aft, and one tail boom, or as identified by the user). **Note:** 10,000 pound straps may be used in-lieu of the 5,000 pounds straps for H-6 series helicopters. (T3) Users will provide straps when the 10,000 pound strap is used. (T3) ***WARNING:*** Chains positioned across side emergency exits will be connected to the side wall tie-down ring with a tie-down device to expedite removal in case of emergency egress. (T3)

A2.1.10.4. Leave approximately 24 inches of slack in the excess portion of the tie-down strap if possible. After the vehicle is restrained, the excess strap will be rolled and taped. Do not tape the excess portion to the taut side of the strap. (T3) **Exception:** The 5,000 pound straps used to tie-down H-6 series helicopters will have slack folded and taped to the taut side of the strap with enough slack to allow removal/installation. (T3)

A2.1.11. Static Load Training. Conduct static load training prior to all infil/exfil operations. (T3) Conduct static load training during daylight (or white lights), blacked-out, and high noise environments (e.g., APU, cheek rack blowers). (T3) For training, conduct static load training to your situation (e.g., day rapids only require day static load training). (T3) **Note:** Ensure vehicle and passenger configuration/load sequence is thoroughly validated by user and loadmaster. (T3)

A2.1.11.1. Generation IV ground loading ramps/bi-fold ramps (canary slides) will be used. Canary slide ramps are primary for helicopter onload/offload but facilitate on/offloading for all types of cargo. During helicopter onload use a full set of canary slides or five ground loading ramps if canary slides are not available. Five auxiliary ground loading ramps or three canary slide ramps will be used unless mission requirements allow fewer numbers to be used. (See TO 13C10-8-1 for limitations and preflight inspection requirements.) (T-3)

A2.1.11.2. Install/stow ramps using a minimum of two people. (T3)

A2.1.11.3. Ramp intermediate roller conveyors should not be installed when canary slides are being used. (T3)

A2.1.11.4. Ensure canary slides do not contact the cargo door during opening or closing. (T3)

A2.1.11.5. Secure installed ramps with 1,000 pound tubular nylon (or suitable substitute), route through cable guides (canary slide ramps) or through structural member (auxiliary ground loading ramps) to ramp tie-down rings. (T3)

A2.1.11.6. The loadmaster will notify personnel at 60, 30, 20, 10, 6, 1 minute(s), and immediately prior to landing. (T3) The 1 minute will be initiated when the CSO calls "2 MILES" or "EXPECT DESCENT IN 1 MILE". Give a "PREPARE TO LAND" call when the CSO calls "MINIMUMS" or "100 FEET ABOVE TOUCHDOWN". (See TO 1C-130(E)J-1 for expanded infil/exfil checklist).

A2.1.12. Aircraft Egress, Familiarization, and Destruction Training.

A2.1.12.1. Aircraft egress, familiarization, and destruction training will be conducted with the user participating in infil/exfil operations. (T3) This training is mandatory for all personnel prior to the mission and will be conducted during static load training. (T3) The aircraft loadmasters are responsible for conducting this training on their aircraft. (T3) **Note:** In cases where the crew which performed static load/egress training does not fly the mission, another crew from the same MDS may execute the mission, provided a detailed face-to- face briefing is conducted prior to execution with the original crew and the user.

A2.1.12.2. Egress drills will be conducted during static load training. (T3) They will be conducted during daylight (or white light) and blacked-out/minimum EL/NVG lighting conditions. (T3)

A2.1.12.3. All user personnel will practice the use of emergency exits and equipment. (T3) ***CAUTION:*** When demonstrating the use of overhead emergency exits, ensure user personnel are fully briefed on equipment that may be damaged during egress. (T3)

A2.2. Offload Operations.

A2.2.1. Vehicles will be backed onto the aircraft. (T3) Park vehicles in lowest gear (neutral for diesel powered). (T3) Put automatic vehicles in park. (T3)

A2.2.2. Loadmasters will pass time warnings/advisories to the troop commander/Departure Airfield Controlling Officer (DACO). (T3)

A2.2.3. All personnel will prepare for landing at the 6-minute advisory. (T3)

A2.2.4. A loadmaster will remain on headset at all times (normally the left side loadmaster). (T3)

A2.2.5. Loadmasters will use NVGs for all nighttime infil/exfil operations, except as required for training. (T3)

A2.2.6. Cargo compartment (NVIS)/NVG lighting will be adjusted at the 6-minute advisory. (T3) Do not turn off/readjust lights until the troop commander/DACO confirms checks are complete. (T3) **Note:** (NVIS)/NVG lighting may be adjusted to minimum setting prior to the 6-minute advisory, provided the user is notified, or as pre-coordinated.

A2.2.7. User personnel will initiate their "80-knot" procedures upon hearing the "80-KNOT" call or when the aircraft ramp and door start to open. (T3)

A2.2.8. All restraint devices except one forward and one aft (opposite corners) may be removed during taxi to the offload point (one strap over seat for motorcycles, quads and mini-bikes will remain installed). Self-propelled vehicles must have drivers in place with brakes set prior to removing restraints. (T3) **Exception:** All restraints will remain on helicopters except for the tail boom until the aircraft has come to a complete stop. (T3)

A2.2.9. Do not position the cargo ramp below horizontal until the aircraft comes to a complete stop at the offload point. (T3) For areas where ground threats or mission requirements dictate minimum time on the ground, the loadmaster and the PIC will brief a countdown for movement of the ramp below horizontal. (T3) Caution must be exercised to ensure the ramp does not contact the ground before the aircraft stops. (T3)

A2.2.10. Do not deploy canary slides/ground loading ramps until the ramp is positioned below horizontal and the aircraft has stopped.

A2.2.11. Clearance to offload: A loadmaster will be positioned on the vehicle driver's side of the cargo ramp and raise both arms to signal clearance to offload. (T3) The loadmaster will drop both arms to signal vehicle drivers to halt offload operations. (T3)

A2.2.12. Offload vehicles and personnel as trained during statics. (T3)

A2.2.13. Clear a stalled vehicle immediately to the aircraft right (engines 3 and 4) or as static trained to allow the offload to continue. (T3) **Note:** If a time delay occurs before onloading/departure, turn off all (NVIS)/NVG lighting and raise the ramp approximately 12 inches to allow the aircraft to be taxied in the event of an emergency. (T3)

A2.3. Onload Operations.

A2.3.1. A loadmaster will remain on headset at all times (normally the left side loadmaster). (T3)

A2.3.2. Loadmasters will use NVGs for all nighttime infil/exfil operations or as required for training. (T3)

A2.3.3. **(NVIS)** /NVG lighting will be adjusted as required for the onload. (T3)

A2.3.4. A loadmaster will be positioned on the vehicle driver's side of the loading ramp (outside aircraft). (T3) The loadmaster will advise the troop commander/DACO when ready for loading. (T3) The troop commander/DACO will not clear personnel or vehicles to load until cleared by the loadmaster. (T3)

A2.3.5. A loadmaster will be in the cargo compartment to marshal vehicles into position with IR chemlights. (T3)

A2.3.6. Load vehicles and personnel as trained during statics. (T3)

A2.3.7. The loadmaster will coordinate with the troop commander/DACO to confirm all personnel and equipment are onboard and the on load is complete. (T3)

A2.3.8. When the loadmaster has determined sufficient restraint has been applied to the load, (minimum of one forward and one aft) and it is safe to do so, the loadmaster will advise the crew “CLEAR TO TAXI”. (T3) Once the ramp and door are closed and locked, the cargo compartment (NVIS)/NVG lights may be turned to the maximum setting (if required). After all cargo and personnel restraint is checked, the loadmaster will advise the crew “SECURE”. (T3)

A2.3.9. Rapid Infiltration/Exfiltration**.** Rapids are a tactical method of onloading or offloading dedicated unconventional and SOF Forces. Spring-loaded, latch-activated, folding ramps (canary slides), or ground loading ramps are used to offload and onload vehicles, personnel, and H-6 series helicopters in minimal time. Selection of the onload/offload point and aircraft orientation impacts total ground times. Extensive pre-mission planning/static load training may be required for large or complex loads. **Exception:** Group commander/COMAFSOF (for contingency operations) may authorize Rapid Infil/Exfil procedures and floor loading with non- SOF personnel to meet unit training requirements. (T-3)

A2.3.10. The loadmaster will notify the onboard user of the one-minute warning. (T3)

A2.3.11. When the CSO calls 100 ft, the loadmaster will notify the onboard user, "Prepare To Land". (T3)

A2.3.12. After Touchdown.

A2.3.13. During the initial Infil/Exfil brief, the pilot may prebrief the opening of the ramp and door upon reversing of the engines. When there is a delay in the offload/onload or an extended ground time is anticipated, raise the ramp approximately 12 inches above the ground so the aircraft can taxi in the event of an emergency. (T3) Refer to Rapid Infiltration Procedures.

Attachment 3

COMBAT OFFLOAD PROCEDURES

A3.1. The method of combat offload will be determined by the aircrew based on the conditions at the offload site. (T3)

A3.2. Cargo pallets, airdrop platforms, and CDS containers can be offloaded without damage to the aircraft with the cargo ramp in the horizontal position. Use the following methods for combat offload operations. (T3)

A3.2.1. Method A. Use this method to offload single, multiple, ramp or married pallets, airdrop platforms, and CDS containers. (T3) Pallets, platforms, or CDS may be offloaded in a train like fashion or one-by-one as the situation dictates. **Note:** When quickly offloading fragile items (such as computers), loadmasters may lower the ramp to a position approximately 18 inches above the ground to lessen the chances of damage. As a technique, loadmasters can restrain the load with a drift strap while the pilot slowly taxis from underneath the load. ***WARNING:*** Many explosive items have specific "drop" criteria that, if exceeded, render the item useless or dangerous to the user. With the exception of small arms ammunition (hazard class and division 1.4), explosives and munitions shall not be combat offloaded without approval of MAJCOM/A3. (T2) **Exception:** Explosives and munitions rigged for airdrop may be combat offloaded without MAJCOM/A3 approval. (T3) ***CAUTION:*** A taxiway or ramp at least 500 feet long is required; however, 1,000 feet is desired to provide a margin of safety. (T3) When pallets, platforms, or containers are offloaded one at a time, use a longer taxiway based on the number to be offloaded. (T-2).

A3.2.1.1. Single or double/triple married pallets may be offloaded, without ballast, using this method provided their weight does not exceed 12,000 pounds, and the height of the pallets fall within cargo height jettison limit in section III of the flight manual or **Chapter 5** of the cargo loading manual.

A3.2.1.2. Airdrop rigged platforms up to 24 feet in length may be offloaded, without ballast, using this method provided their weight does not exceed 12,000 pounds. **Note:** Single or married pallets and airdrop rigged platforms over 12,000 pounds may be offloaded using this method, provided ballast or cargo equal to the difference between 12,000 pounds and the weight of the pallets or platforms (to be offloaded) remains in C through F compartments during offload. **Example:** A 17,000 pound married pallet or airdrop platform requires 5,000 pounds of ballast or cargo to remain in C through F compartments during the offload. (T3)

A3.2.1.3. CDS bundles may be combat offloaded using this method. The static line retriever or manual gate cut can be used as required. With the Centerline Vertical Restraint (CVR), offload must be accomplished one side at a time if the total bundle weight exceeds 12,000 pounds. Non-CVR single stick may be offloaded if the total weight is less than 12,000 pounds. Without the CVR, if the total weight of the bundles exceeds 12,000 pounds, bundles should be restrained in groups of four or less and offloaded one group at a time. For the unplanned combat offload of non-CVR bundles, restrain the bundles as described above. (T3) Perform an initial offload via the static line retriever, and on sequential offload remove aft restraint before clearing the pilot to taxi. (T3) Consider the slope of the offload site, which may cause bundles to roll aft upon

removal of restraint. ***CAUTION:*** When using method "A" on excessively rough, sharply undulating, or battle- damaged surfaces, damage to the aircraft ramp may occur. Reducing forward taxi speed on these surfaces will reduce aircraft oscillation. The PIC must determine if the offload area will permit the offload operation to be conducted without damage to the aircraft or equipment. (T3)

A3.2.2. Method B. Use this method to offload married pallets that do not fit the category for method A or for which no ballast is available for married pallets weighing between 12,000 to 15,000 pounds. (T3) Use four serviceable steel 55-gallon drums under each pallet to be offloaded. (T3) The correct number of steel drums needed to complete this type of offload must be available at the offload site or must accompany the load when conditions at the offload site are unknown. (T3) WARNING: The maximum weight for pallets to be offloaded across the ramp at any one time when using method B is 15,000 lbs. (T3) WARNING: Do not use method B for airdrop-rigged platforms to prevent binding the platform under the vertical restraint rails. (T3)

A3.2.3. Aircrew Procedures:

A3.2.3.1. Prior to commencing combat offload operations, the pilot will brief each crew member on the method to be used. Specific procedures are in the expanded checklist. (T3)

A3.2.3.2. All crew members participating in the offload will refer to the checklist. Report any problem to the pilot immediately. (T3)

A3.2.3.3. If other individuals must be aboard to assist the crew in an unusual circumstance, give them a thorough safety and procedures briefing for the entire offload sequence. (T3)

A3.2.3.4. The loadmaster will maintain constant interphone contact with the PIC and is the only crew member authorized to operate the dual rail locks during combat offload operations. (T3) ***WARNING:*** During the entire offload operation, no one is permitted behind or beside the load unless the loadmaster checks that all rail locks are locked and engaged in the pallet detents or secures' each pallet to aircraft tie-down rings to ensure positive aft restraint. (T3)

Attachment 4

ELECTRONIC COMMUNICATIONS SYSTEMS OPERATOR DUTIES

A4.1. General. In addition to other duties established in applicable directives, the ECS operators will comply with the procedures and duties specified in this instruction. (T3) The Aircraft Commander and Mission Crew Commander (MCC) may assign other duties as necessary. The Program Technician (PT) operator will serve as the Mission Crew NCOIC. **Note:** A second PT operator may be required to perform the coordination duties of the MCC, when the MCC is required to perform CSO duties in the cockpit.

A4.2. Situational Awareness and Orientation. Situational Awareness is critical to mission success. The key to maintaining good situational awareness is to thoroughly plan and pre-brief the mission before flight. During mission planning, the ECS operators will cover all elements and details of the mission to be flown. (T3)

A4.3. Control of Classified Information and Materials. Every ECS operator is responsible for their classified material from mission planning to debrief they use. (T3)

A4.3.1. Clear/zeroize secure devices and classified frequencies prior to leaving the aircraft. (T3)

A4.3.2. Secure classified Media/Product. (T3)

A4.3.3. Secure classified Logs, Notes, and Supplements. (T3)

A4.4. Mission Planning. The following are tasks ECS operators will normally perform during pre-deployment and pre-mission planning.

A4.4.1. Review with MCC Mission Tasking to ensure the CS Weapons Platform is safely capable of providing requested Mission Tasking.

A4.4.2. Assist MCC with any Planning tasks as directed. (MSDP/IMOM Plots, AFIWC Modeling, Target Audience Analysis, Adversarial Electronic Order of Battle (EOB), et al).

A4.4.3. Review procedures to ensure checklists provide guidance to safely implement all mission tasking. If procedures are inadequate, develop, test, and receive approval for any supplementary procedures needed to fulfill Mission Tasking.

A4.4.4. Ensure SME is satisfactorily configured for Mission Tasking. If deficiencies exist, recommend changes and acquire approval for SME deviations.

A4.4.5. ECS NCOIC will assist MCC with properly assigning and supervising duties of ECS crew members to prevent task saturation by any one position.

A4.4.6. ECS NCOIC will assist MCC with properly assigning ECS to Scanner/Spotter duties.

A4.4.7. ECS NCOIC will review and brief previous flight‘s Daily Flight Notes with Msn Crew.

A4.4.8. ECS Crew will review prevalent sections of SPINS, EW SPINS, ATO, and other instructions as required.

A4.4.9. Ensure ECS operators are provided with sequential playlists for events and that provided modulation is properly marked.

A4.4.10. Ensure that Mission Crew has guidance on degraded modes of operation and Mission Event priority.

A4.4.11. Ensure that Modulation materials are compatibly formatted for SME and that sufficient copies are available.

A4.4.12. Ensure any required Equipment/Procedures/Supplies/Media are available.

A4.4.13. Attend the mission crew briefing to obtain mission profile, requirements, and objectives.

A4.5. ECS Preflight Duties.

A4.5.1. The ECS operators will preflight the Special Mission Equipment (SME) needed to complete the mission is on board. (T3)

A4.5.2. Ensure aircraft maintenance status is compatible with mission tasking. (T3)

A4.5.3. When directed by MCC, authorized ECS will sign out and maintain control of all crypto/authentication tables for missions requiring these items. (T3)

A4.5.4. Narrow-band operator is responsible for inventorying and transporting mission kit to and from the aircraft. (T3)

A4.6. In-Flight Mission Duties.

A4.6.1. ECS operators are responsible for the execution of mission event tasking. (T3)

A4.6.2. When directed by the MCC, the PT Position is responsible for assisting in directing, monitoring, and controlling Mission Event Tasking. The PT operator will also assist with the monitoring and operating of the Command and Control radios. **Note:** A second PT operator may be required to perform the coordination duties of the MCC, when the MCC is required to perform CSO duties in the cockpit. **Note:** A second PT operator may be required to perform the coordination duties of the MCC, when the MCC is required to perform CSO duties in the cockpit.

A4.6.3. ECS operators will ensure satisfactory operation of mission equipment and provide needed information as it impacts the mission log. (T3)

A4.6.4. ECS Operators will scan SME periodically as required. (T3)

A4.6.5. Troubleshoot malfunctioning mission equipment to minimize impact on mission operations. Enter malfunction information on the AFTO Form 781A. (T3)

A4.6.6. Monitor requested frequencies when directed by the MSO/Pilot or as pre-planned in mission tasking. (T3)

A4.6.7. Load required modulation. (T3)

A4.6.8. Pre-program required equipment. (T3)

A4.6.9. Monitor provided modulation to provide feedback to production agency. (T3)

A4.6.10. Log/Record transmission up/down times, frequency, output power, and modulation for Debrief/Mission Report (MISREP)s. (T3)

A4.6.11. Individual ECS Crew positions will record transmission parameters for event operation as required. (T3)

A4.6.12. Assist with emergency situations as directed. (T3)

A4.7. In-Flight ECS Tactical Duties.

A4.7.1. Assist with Scanner/Spotter duties as required. (T3)

A4.7.2. Identify threats directed toward the aircraft and coordinate evasive maneuvers with the flight crew and spotters. (T3)

A4.7.3. Operate CMDS Remote dispenser switch and direct evasive maneuvers from visual threat engagements. (T3)

A4.7.4. Assist LM with configuring defensive systems equipment, located in the cargo compartment, as required. (T3)

A4.7.5. Identify the type of anti-aircraft threats and locations for real time intelligence gathering relative to the mission and follow-on missions. (T3)

A4.7.6. Inform the crew of malfunctions and systems affected by battle damage. (T3)

A4.7.7. Assist during in-flight emergencies and accomplish recommended corrective actions to isolate malfunctions. (T3)

A4.7.8. Will coordinate with crew should the TWA need to be guillotined. (T3)

A4.7.9. ECS Crew members will cover both paratroop door Spotter duties during AR operations. (T3)

A4.7.10. At least one qualified ECS Operator will be assigned as the assistant Fire Fighter. (T3)

A4.8. Monitoring Interphone. The ECS operators will monitor required interphones on all flights. (T3)

A4.8.1. The ECS operator will notify the MCC/Pilot prior to leaving and after returning to a duty station. (T3)

A4.8.2. The ECS Program Technician will assume the MCC‘s interphone duties temporarily when the MCC cannot maintain flight crew interphone coordination. (T3)

A4.8.3. While TWAs are deployed, the HF or MF operator will monitor Interphone for the guillotine call. (T3)

A4.9. Post Mission Duties. The post mission phase of the mission begins at the combat exit point. Once the aircraft has departed the working area the ECS operators will complete all appropriate checklists as directed IAW the flight manual. (T3)

A4.10. Post Flight Duties.

A4.10.1. Clear/zeroize secure devices and classified frequencies prior to leaving the aircraft. (T3)

A4.10.2. Secure classified Media/Product. (T3)

A4.10.3. Secure classified Logs, Notes, and Supplement. (T3)

Attachment 5

COMMANDO SOLO OPERATIONS

A5.1. See **Paragraph 3.1.2**. Basic mission capable (M coded) crew members (i.e., MP, MN, and ML) may perform primary crew duties on any unilateral training mission. For other missions, the unit commander must determine the readiness of each basic mission capable crew member to perform primary crew duties for specific mission tasking. (T3)

A5.2. See **Paragraph 3.1.4**. Other non-current or U-coded crew members (i.e., UN, UL, UE, and UK) may perform duties in their primary crew position on any sortie when under direct supervision of a qualified instructor or flight examiner in their respective crew position. In this case, the student crew member and the instructor or flight examiner fulfills the requirement for one primary position as specified in **Table A5.1**.

A5.3. See **Paragraph 3.1.6**. For EC-130J Commando Solo operations, a qualified Weapon Systems Officer (WSO) or Mission Crew Commander (MCC) is required in the MCC crew position if transmitters are operated. (T3) The OG/CC may authorize the basic crew to be reduced, in a non-threat environment, to one MCC qualified WSO who would perform duties in both the CSO and MCC position. (T3) When authorized, these WSOs will occupy the CSO seat as required for flight operations. (T-3)

Table A5.1. EC-130J (Commando Solo) Crew Compliment.

Crew Position	Non-Operational Sorties		Operational Missions	
	Basic Crew	Augmented Crew	Basic Crew	Augmented Crew
Aircraft Commander	1	2 [1]	1	2 [1]
Pilot	1	1	1	1
CSO [2]	0-1 [2]	0-2 [2]	1	2
Loadmaster	1	2	2 [3]	3 [3]
MCC [2]			1	2
ECS			5 [4]	7 [4]

Notes

1. **ACs:** Both ACs must be qualified in all phases of the mission to be accomplished. Transfer of PIC duties between qualified ACs will be briefed to the crew.

2. **CSO:** For augmented aircrew, the OG/CC (or designated representative) will determine the number required depending on the operational mission environment.

3. **Loadmaster:** Two LMs normally are required for all Commando Solo Operational missions. For Scanner Duties, an ECS crew member can be a substituted for a LM. For Operational Missions (Basic Crew or Augmented Crew), the OG/CC (or designated representative) will determine the number of LM(s) required depending on the operational mission environment.

4. **ECS:** Unit commander may adjust the crew complement for these crew positions based on specific mission requirements and/or aircraft systems availability. Normally, for an Augmented crew, or when the MCC is performing CSO duties, there will be 2 Program Technicians assigned to the crew.

A5.4. Reference **Table A5.2** Special Mission Equipment (SME) Failures**.** The MCC will advise the AC about the impact that SME failures have upon the specific mission accomplishment. (T3) The AC will decide whether to repair the inoperative SME or perform the mission without the inoperative equipment. (T3)

Table A5.2. Special Mission Equipment (SME) Failures.

System Item	Installed	Required	Remarks or Exceptions
Auxiliary Vent Valve, Cargo Compartment	1	1	Commando Solo
Cargo Under floor Heat System	1	0	Commando Solo: Required for Vertical Trailing Wire Antenna (VTWA) operations.
Pressurization System			
a. Automatic Pressure Control System	1	0	**Note:** Must keep cabin altitude below 10,000 feet to prevent arcing during Commando Solo missions.
d. Manual Pressurization Control System	1	0	**Note:** Must keep cabin altitude below 10,000 feet to prevent arcing during Commando Solo missions.
e. Outflow Valve	1	0	**Note:** Must keep cabin altitude below 10,000 feet to prevent arcing during Commando Solo missions.
f. Safety Valve	1	0	**Note:** Must keep cabin altitude below 10,000 feet to prevent arcing during Commando Solo missions.

System Item	Installed	Required	Remarks or Exceptions
Commando Solo Special Systems Air Conditioner	1	0	Consider mission impact.
Digital Intercommunication System (ICS)			
a. Headset Interface Unit	8	As required	One required for each crew member and spotter. Commando Solo: Consider mission impacts.
b. ICS Control Panels	8	As required	One required for each crew member and spotter. Commando Solo: Forward Loadmaster ICS panel must be functional with a mission crew onboard.
AN/AIC-18 Analog ICS Control Panels	9	0	Consider mission impact.
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. The generator will be removed and the generator mount padded before flight. **Note:** All 4 generators are required to execute Commando Solo mission.
Special Systems Power Distribution Panel	1	0	Consider mission impact.
Horizontal Trailing Wire Antenna (HTWA) Ice Protection System (Commando Solo Only)	1	0	May be inoperative provided the HTWA is not required for mission accomplishment.
VTWA Ice Protection System (Commando Solo Only)	1	0	May be inoperative provided the VTWA is not required for mission accomplishment.

System Item	Installed	Required	Remarks or Exceptions
Embedded Global Positioning/Inertial Navigation System (EGI)	2	1	**Note:** (Commando Solo) EGI data input to Special Mission Equipment may be inoperative for mission execution. Antenna switching may be done manually.
Liquid Oxygen System	2	1	Oxygen on board for takeoff must be sufficient to accomplish the flight plan route from the equal time point (ETP), or most distant point to the first suitable airfield. Minimum for takeoff of no less than 5 Liters in each oxygen bottle.
Oxygen Regulators	17	3	Commando Solo – All crew member occupying positions must have an operable regulator.

A5.5. See **Paragraph 5.2.10.2.2**. Trailing wire operations should not be accomplished in areas of moderate or greater icing conditions during training.

A5.6. See **Paragraph 5.3.7.2**. Oxygen. Oxygen on board for takeoff must be sufficient to accomplish the flight plan route from the equal time point (ETP), or most distant orbit point to the first suitable airfield. Minimum for takeoff of no less than 5 Liters in each oxygen bottle. (T2)

A5.7. See **Paragraph 5.3.7.2**. A continuous supply of oxygen will be used by all personnel during unpressurized operations above 10,000 feet MSL on Commando Solo Aircraft. (T2)

A5.8. See **Paragraph 5.3.7.6.1**. The standard parachutes load for the EC-130J (Commando Solo) aircraft is 15. (T3)

A5.9. See **Paragraph 5.7.1**. When SME will be operated, do not allow items to block any SME air intakes nor allow items to be placed unsecured where movement, loading, or unloading of those items will possibly damage the equipment. (T3)

A5.10. See **Paragraph 6.23.2.3**. An engine-out takeoff in the EC-130J (Commando Solo) is prohibited. (T1)

A5.11. See **Paragraph 6.23.2.5**. Touch-and-Go Landings. Minimum runway length for touch and go landings in the EC-130J (Commando Solo) is 6,000 feet. (T2)

A5.12. See **Paragraph 6.23.3.3**. Max Effort Operations in the EC-130J (Commando Solo) is prohibited. (T3)

A5.13. See **Paragraph 7.1**. EC-130J aircraft are Protection Level "C" resources. (T2)

A5.14. See **Paragraph 9.5.2.2**. Maximum Gross Weight for Normal Landings. Except for actual emergencies and no-flap landings, the maximum gross weight for normal landings in the EC130J (Commando Solo) should not exceed 140,000 pounds during training sorties. (T2)

A5.15. See **Paragraph 9.5.4**. No-Flap Landing. The maximum gross weight for no-flap landings is 128,000 pounds for EC-130J (CS). (T2)

A5.16. See **Paragraph 9.5.11.2**. Aircrew participating in a formal tactics school (example: AATTC, St Joe), with a qualified course instructor onboard, are authorized 500 ft AGL for Commando Solo or as limited by course or airspace requirements, whichever is more restrictive. (T3)

A5.17. See **Paragraph 9.7**. Stop-and-Go Landings. Stop-and-go landings will not be accomplished in the EC-130J (CS). (T3)

A5.18. See **Paragraph 12.2.3.1**. Commando Solo VTWA operations and high generator loads.

A5.19. See **Paragraph 12.7.4.5**. PLANNED EAR #2 FUEL (item 26). Do not exceed the aircraft maximum gross weight limit established in the applicable flight manual. End A/R aircraft gross weights greater than 164,000 pounds (CS) will require waiver authority IAW AFI 11-2EC-130J, Vol 3, or MAJCOM waiver guidance. (T-2)

A5.20. See **Paragraph 13.18**. For the EC-130J CS Limiting Wing Fuel ACL will require manual entry after extracting data from the weight limitations chart from the TO 1C-130(E)J-1.