BY ORDER OF THE COMMANDER
AIR COMBAT COMMAND

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Flying Operations

EC-130H OPERATIONS PROCEDURES

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This manual implements AFPD 11-2, *Aircrew Operations*. It establishes operational guidance for all EC-130H COMPASS CALL aircraft and aircrew. This manual applies to all Regular Air Force COMPASS CALL units. This publication does not apply to the Air National Guard, Air Force Reserve, or the United States Space Force. It is used in conjunction with AFMAN 11-202V3, *Flight Operations*, and Major Command (MAJCOM) supplements thereto. This is a specialized publication intended for use by Airmen who have graduated from technical training related to this publication. Ensure all records generated as a result of processes prescribed in this publication adhere to AFI 33-322, *Records Management and Information Governance Program*, and are disposed IAW the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Personnel at all echelons are encouraged to submit changes IAW AFI 11-215, *Flight Manuals Program*. Use a DAF Form 847, *Recommendation for Change of Publication*. Air Combat Command Airborne Reconnaissance office (ACC/A3CR), 205 Dodd Blvd., Suite 101, Langley AFB, VA 23665-2789)) will forward approved recommendations to Air Force Aircrew Task Force (AF/ACTF) for final approval prior to publication. This publication may be supplemented at any level, but all supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing or unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See DAFMAN 90-161, *Publishing Processes and Procedures*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the publication's OPR for non-tiered compliance items. See **paragraph 1.3** of this publication for further information on waiver authority. The use of the name or mark of any

specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. This manual provides guidance for operating the EC-130H. It is an original source document for many areas, but for efficiency reaffirms information found in aircraft flight manuals, flight information publications (FLIP), and other AF directives. When guidance in this manual conflicts with another basic/source document, the basic/source document takes precedence. When this manual is the source document, waiver authority is IAW **paragraph 1.3** For matters where this manual duplicates information from another document, follow waiver authority outlined in the basic/source document.

1.1.2. Unit commanders and agency directors involved with or supporting EC-130H operations shall make current copies (electronic or hardcopy) of this manual available to appropriate personnel. **(T-3)**

1.2. Key Words Explained.

1.2.1. "Will", or “Must” indicate a mandatory requirement.

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

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

1.2.4. "**Note**" indicates operating procedures, techniques, etc., considered essential to emphasize.

1.2.5. **“*Caution*”** indicates operating procedures, techniques, etc., which could result in damage to equipment if not carefully followed.

1.2.6. **“Warning”** indicates operating procedures, techniques, etc., which could result in personal injury or loss of life if not carefully followed.

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

1.3.1. Deviations. The PIC shall report deviations or exceptions taken without a waiver through command channels to the Air Combat Command, Command and Control, Intelligence, Surveillance, and Reconnaissance Operations Division (ACC/A3C) within 48 hours for follow-on action. **(T-2)**

1.3.2. Waivers. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statements. See DAFMAN 90-161, *Publications Processes and Procedures,* for a description of the authorities associated with the Tier numbers. Submit waiver requests through the chain of command to the appropriate tier waiver approval authority or to the requestor’s commander for non-tiered items.

1.3.3. Waivers affecting theater unique circumstances without an expiration date must be approved by, or coordinated through, the Air Combat Command Director of Operations (ACC/A3). **(T-2)**

1.3.4. ACC/A3 is the waiver approving authority for non-tiered requirements in this manual. Forward waiver requests through Numbered Air Force (NAF) channels to ACC/A3C for staffing, with informational copies to ACC/A3CR. When Changed Operational Command (CHOPed) to another MAJCOM, forward waiver requests through the chain of command to MAJCOM standardization/evaluation, Combined/Joint Force Air Component Commander (C/JFACC), or Commander Air Force Forces (COMAFFOR), as appropriate, with informational copies to ACC/A3, Air Combat Command Flight Operations Division (ACC/A3T), and ACC/A3C. Waivers will be issued by ACC/A3 IAW DAFMAN 90-161, paragraph 9.6. For waivers issued by other authorities specified in this manual, duration of the waiver should be included with the approval. ACC/A3 approves long-term (permanent) waivers. **(T-3)**

1.4. Local Supplement Coordination Process. Operations Group commanders (OG/CCs) may define operating procedures to this manual in a unit supplement or locally generated guidance. OG/CCs must obtain approval from Air Combat Command (ACC) prior to releasing their supplement or Operating guidance. **(T-2)** Send an electronic copy of the approved version to 16th Air Force Standardization and Evaluations (16 AF/A3V). 16AF/A3V will send approved copies to ACC/A3TV.

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

1.6. Roles and Responsibilities.

1.6.1. Major Command Directorate of Operations (MAJCOM/A3). MAJCOMs will provide guidance and approve waivers (as required), where specified throughout this manual. **(T-2)**

1.6.2. Detachment Commander (DETCO). Operational units should designate a DETCO when one or more aircraft are performing missions away from home station. The DETCO will assume responsibility for mission execution, personnel supervision (aircrew and maintenance members), lodging and transportation requirements, and coordination with higher headquarters. The DETCO is the final authority responsible for ensuring aircrews have properly coordinated mission details and will ensure all personnel complete required pre-mission briefings (e.g., local area procedures, Rules of Engagement (ROE), Special Instructions (SPINS)). They will coordinate with all respective agencies that affect mission execution and will perform any additional duties directed by the squadron commander (Sq/CC) or operations officer (Sq/DO). **(T-3)**

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

1.6.3.1. HAF, MAJCOM, and Mission Design Series (MDS)-specific guidance. **(T-2)**

1.6.3.2. Flight Information Publications (FLIP) and Foreign Clearance Guide (FCG). **(T-2)**

1.6.3.3. Air Traffic Control (ATC) clearances. **(T-2)**

1.6.3.4. Notices to Air Missions (NOTAMs). **(T-2)**

1.6.3.5. Aircraft Technical Orders (T.O.). **(T-2)**

1.6.3.6. Combatant Commander's instructions and other associated directives. **(T-2)**

1.6.4. Mission Commander (MC). MCs are required during operations involving multiple EC-130H aircraft. They are responsible for the overall mission plan process when acting as the Mission Planning Cell (MPC) Chief. The MC will function as the mission execution authority and coordinate electronic attack activity on missions involving multiple EC-130H aircraft. The PIC is the final authority for operation of the aircraft. MCs are not intended to serve as logistic coordinators for aircraft movement or duplicate the administrative roles normally accomplished by a commander, operations officer, or PIC. However, an MC will ensure that executing agencies are updated following mission completion.

1.6.4.1. MCs will be designated through a separate process and may fulfill this role in conjunction with their primary aircrew duties.

1.6.5. Aircrew. Individuals designated on the flight authorization (FA) and responsible to fulfill specific aeronautical tasks regarding operating United States Air Force (USAF) aircraft as specified in this manual or by other competent, supplemental authority.

1.7. Aircrew Operational Reports. The reporting requirements in this manual are exempt from licensing IAW AFI 33-324, *The Air Force Information Collections and Reports Management Program.*

1.7.1. Mission Monitoring. Enroute reports are required only when specified in an Operations Order (OPORD)/Operations Plan (OPLAN). Squadron operations centers (SOCs) and the wing command post use aircrew reports to track Continental United States (CONUS) movements for non-sensitive missions and missions not CHOPed, The ACC Command Post monitors all assigned aircraft that move to, from, or between Outside the Continental United States (OCONUS) locations. Key components of the ACC Command and Control (C2) system are the Global Command and Control System (GCCS) and various C2 facilities at theater and wing locations. When aircraft are deployed in support of operations and exercises, the command center may obtain additional information with Situation Reports (SITREPs) and Deployed Status Reports (DSRs). Host wing command posts relay OCONUS movement information for ACC-assigned aircraft to the ACC Command Post via telephone notification (Defense Switched Network (DSN): 574-1555; Commercial: 757-764-1555). The DETCO, or PIC when a DETCO is not assigned, is responsible for the timely reporting of aircraft movement and mission progress to applicable C2 or executing agencies either through direct communication or via the enroute facility’s local command post. These procedures may be modified to meet local/contingency requirements. **Note:** C2 procedures for missions deemed sensitive in nature are outlined in the tasking directive.

1.7.2. When directing an aircraft to an alternate airfield, the C2 agency will normally ensure the PIC is provided existing and forecast weather for the alternate, NOTAMs, bird hazard (BASH), and appropriate airfield information from the Airfield Suitability and Restrictions Report (ASRR). If the planned alternate becomes unsuitable while enroute, the PIC should coordinate with the C2 agency for other suitable alternates. The C2 agency should coordinate

with customs and ground service agencies to prepare for arrival. The PIC is final authority on selecting a suitable alternate.

1.7.3. Missions at Bases with a C2 Facility. The DETCO/PIC will contact the destination IAW the Flight Information Handbook (FIH)/Enroute Supplement approximately 30 minutes prior to landing and include aircraft call sign, estimated time of arrival (ETA), very important person (VIP) code and requirements, maintenance status, and any additional servicing requirements. After landing, the DETCO/PIC will update the applicable C2 facility with ground handling requirements and departure information. In addition, when operating OCONUS, CONUS-based crews will inform their respective SOC/command post of actual takeoff/landing times, next projected takeoff times, and any other pertinent information. Home station C2 agencies will relay aircraft information to the ACC Command Post. These actions inform the ACC commander of the location and status of OCONUS forces. When forces CHOP to a different theater commander, report aircraft information through theater C2 agencies upon arrival in the assigned area of responsibility.

1.7.4. Missions at Bases without a C2 Facility. DETCOs or PICs will report actual takeoff/landing times, maintenance status, projected takeoff times, and other pertinent information to the host wing command post or command/operations center as soon as possible after the event when crew duties and safety permit. Methods of communicating this information include High Frequency (HF) phone patch, satellite communication (SATCOM) radio, DSN, or commercial telephone. If unable to contact the host wing command post or command/operations center, retain information for submission when contact is re-established. Report communication difficulties through the chain of command. Refer to FLIP, FIH, and USAF HF/Single Side Band Airways and C2 Station section for guidance on mission reporting. Upon initial contact, confirm your arrival message has been received and update your ETA. If your arrival message has not been received, transmit information to the destination as necessary. Restrict HF transmission to operational traffic, such as movement reporting, itinerary revisions, maintenance status, flight plan information, aircraft emergencies, or other important flight information.

1.8. Mission Clearance Decision. The agency with Operational Control (OPCON) and the PIC are the final decision authorities to refuse/delay a mission when, in the opinion of either, conditions are not safe to start or continue a mission. However, the PIC has final responsibility for the safe execution of the mission. If the decision is made to refuse/delay a mission, the aircraft will not depart until the conditions affecting this decision have been corrected or improved to allow safe mission execution. Another PIC and aircrew will not be alerted to take the same mission under the same conditions.

1.9. Aircraft Divert or Rerouting. Mission changes must be authorized by the commander with OPCON. The PIC may direct a divert or reroute due to an emergency, when required due to an unexpected change in enroute/terminal weather conditions, or due to facility availability. The controlling agency directing the changes is responsible for ensuring destination requirements and facilities are adequate for the aircraft and aircrew. However, it is the PIC's responsibility to ensure all changes allow for safe operation and beddown of the aircraft. The PIC will notify the controlling agency of any limitations that may impede the directed changes. **(T-3)**

Chapter 2

CREW COMPLEMENT

2.1. Aircrew Qualification. Primary aircrew members, or those occupying a primary position during flight, will be qualified or in qualification training for that crew position, mission, and aircraft. If non-current or in training for a particular event, the aircrew member must be under the supervision of an instructor while accomplishing that event (direct supervision for critical phases of flight, as defined in **Attachment 1**). **(T-3)**

2.1.1. Pilots:

2.1.1.1. Qualification Requirements.

2.1.1.1.1. The term pilot applies to any C-130 qualified pilot.

2.1.1.1.2. Any qualified pilot may occupy the copilot seat.

2.1.1.1.3. An Aircraft Commander (AC) certified pilot is any pilot trained and certified to command the aircraft. The AC upgrade program is outlined in ACCMAN 11-2EC-130HV1, *EC-130H Aircrew Training*.

2.1.1.2. Passenger Restrictions. Do not perform touch and go landings or simulated emergency procedures with passengers on board. **Note:** Touch and go landings may be performed with Additional Crew Members or Mission Essential Personnel (MEP) onboard. Only a pilot that is qualified (current and valid AF Form 8, *Certificate of Aircrew Qualification*, for the C-130 and occupied position), and current IAW ACCMAN 11-2EC-130HV1, will occupy a pilot's seat with passengers on board the aircraft. **(T-3) Exception:** A qualified pilot regaining currency under direct instructor pilot (IP) supervision may also fly with passengers on board. Guidance for orientation, incentive and familiarization flights can be found in DAFMAN 11-401, *Aviation Management*.

2.1.2. Senior leaders.

2.1.2.1. Senior leaders who complete a Senior Staff Qualification course (restricted AF Form 8) or orientation for a Senior Staff Familiarization flight may occupy a primary crew position when under direct instructor supervision.

2.1.2.2. Crew members who complete the Senior Staff Qualification Course will log basic qualified pilot (FP)/basic qualified navigator (FN) for Flight Authorization Duty code on the AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document.*

2.1.2.3. Crew members who complete a Senior Staff Familiarization flight will log Observer Pilot (OP)/Observer Navigator (ON)/Observer Electronic Warfare Officer (OE) for Flight Authorization Duty Code on the AFTO Form 781.

2.2. Crew Complement.

2.2.1. Minimum basic crew is defined as one AC, one pilot, one navigator, one flight engineer and one airborne maintenance technician (AMT). SQ/CCs may authorize training/functional check flights (FCFs)/operational check flight (OCF) without a navigator when not required for mission accomplishment. Units will post procedures regarding the use of navigators on

proficiency trainers in the supplement to this volume. Formal Training Units (FTUs) will establish procedures regarding the use of navigators on all training missions. **(T-3)**

2.2.1.1. A navigator is required when the sortie involves a mission orbit, air refueling, or for proficiency training sorties outside the local area as defined via Flight Crew Information File (FCIF), local supplement to this manual, local instructions, or other official Standardization/Evaluations (Stan/Eval) guidance.

2.2.2. Augmented Crew is defined as basic crew plus an additional AC-certified pilot, navigator, flight engineer and AMT.

2.2.3. Mission crew is defined as basic crew plus minimum mission crew, which is at least one Mission Crew Commander (MCC), one Weapon System Operator, one Mission Crew Supervisor, two Analysis Operators and one Acquisition Operator. The Electronic Group Commander (ECG/CC), or equivalent, or designated representative may authorize adjustments to the minimum mission crew based on mission requirements.

2.2.4. The PIC maintains ultimate responsibility of overall conduct of the mission. However, qualified aircrew in their respective seats, when the PIC is not at the controls, maintain responsibility for the actions they take. Transfer of duties between certified ACs will be briefed to the crew. **(T-3)**

2.2.5. A qualified MC is required when conducting an operation with multiple EC-130H aircraft. An additional crew member is not required when the MC occupies their primary crew duty position (AC, Navigator, MCC). The ECG/CC, or equivalent, or designated representative may authorize adjustments for multi-EC-130H operations to be conducted without an MC.

2.3. Mission Essential Personnel (MEP). Eligibility and authority for granting MEP status is specified in DAFMAN 11-401.

2.4. Scheduling Restrictions. Refer to AFMAN 11-202V3, *Flight Operations*, for further guidance. **Note:** Do not takeoff early (before scheduled departure time) if the early takeoff time would violate the following restrictions. In addition to restrictions outlined in AFMAN 11-202V3, aircrew members are not scheduled to fly, nor will they perform crew duties:

2.4.1. When the maximum flying time limitations of AFMAN 11-202V3 are exceeded.

2.4.2. Within the 12-hour period prior to assuming standby force duty.

2.4.3. When taking oral or injected medication, unless individual medical waiver has been granted by the Flight Surgeon (FS), aircrew members may not self-medicate except as noted in DAFMAN 48-123, *Medical Examinations and Standards*, and AFMAN 11-202V3_ACCSUP, *Flight Operations*.

2.4.4. Within 30 minutes of accomplishing ground pressurization checks of less than 10 minutes (restricted from flying).

2.5. Orientation, Incentive and Familiarization flights. Orientation, Incentive and Familiarization flights will be flown IAW DAFMAN 11-401 and the MAJCOM supplement. The AC will brief the applicable sections of the passenger briefing guide attachment.

2.6. Flight Duty Period (FDP). FDP begins at scheduled or established show time. For aircrew members performing other duties prior to flight-related duties, FDP begins when reporting for other duties. For Alpha Standby, FDP begins when the crew is told to takeoff. For Bravo Standby,

FDP begins when the crew shows for duty. FDP ends at final engine shutdown. Waiver authority is IAW AFMAN 11-202V3 and this paragraph. **Note:** The following paragraphs supplement AFMAN 11-202V3, for EC-130H aircraft.

2.6.1. Basic FDP is 16 hours, provided no flight crew members perform proficiency training (multiple approaches/landings at practice airfields), air-to-air refueling training, FCFs, or OCFs after 12 hours. Mission crew members past 12-hour FDP do not restrict performance of flight crew training. If the autopilot is not operational or its use is denied for more than 4 hours, FDP is 12 hours (unless the pilot position is augmented). Waiver authority for contingencies is C/JFACC or MAJCOM/A3 of the agency with OPCON. Preflight FDP is the same as a flight crew and is outlined in AFMAN 11-202V3. **Note:** If the autopilot fails after 12 hours, the PIC should exercise judgment in coordination with the crew to determine the best course of action, considering mission requirements, crew fatigue, remaining transit time to landing point, weather and other applicable factors.

2.6.2. Augmented FDP is 20 hours with adequate in-flight crew rest facilities available (determined by the PIC), provided no pilot proficiency training, air refueling training, FCFs, or OCFs are accomplished after 16 hours. If the autopilot is not operational or its use is denied for more than 8 hours, FDP is 16 hours. Basic crews are not augmented after crew duty has started. Waiver authority for contingencies is C/JFACC or MAJCOM/A3 of the agency with OPCON.

2.6.2.1. Crew changes should not be made immediately prior to performing critical phases of flight. Normally 30 minutes prior to initiating the checklist for an event allows the new crew member time to get acclimated. See the note in **paragraph 2.6.1** if applicable.

2.6.3. FDP for flight examiners administering flight evaluations will not exceed augmented FDP.

2.6.4. FDP may be extended IAW AFMAN 11-202V3. MAJCOM/A3 or equivalent for the agency with OPCON of the aircraft is waiver authority for maximum FDP. Coordinate with C2 agencies so that downstream activities are not adversely affected. Under no circumstances should missions be scheduled to exceed the maximum FDP above without appropriate waiver.

2.7. Crew Rest. Crew rest policy is IAW AFMAN 11-202V3 and this paragraph.

2.7.1. Home-Station Pre-Departure Crew Rest. All primary aircrew members should enter crew rest 24 hours prior to show time for missions scheduled away from home station for more than 16 hours. The first 12 hours are not considered crew rest, but are designed to allow crew members time to resolve personal affairs. During these first 12 hours, crew members may perform limited non-flying duties, including mission planning. The ECG/CC is the waiver authority for the first 12 hours of pre-departure crew rest if flight related duties are required during this period. Aircrew members will not be manifested as passengers to reduce or eliminate crew rest requirements.

2.7.2. Enroute Ground Time and Crew Rest. Minimum planned ground time is 16 hours between engine shutdown and mission takeoff, unless extended post-flight duties are anticipated. Crew rest normally begins 45 minutes after final engine shutdown. The 45-minute period is intended to provide crews with time to complete normal post-flight duties. These duties include, but are not limited to, refueling, securing classified material, performing maintenance, or completing mission debriefings. **Note:** Crew rest does not begin until all

crewmembers have completed post-flight duties including any duty requiring an aircrew member to stay at the aircraft past the 45-minute period.

2.7.2.1. Minimum crew rest period is 12 hours unless exceptions per AFMAN 11-202V3 are met.

2.7.2.2. Crews re-enter crew rest if their aircraft or mission is not capable of departure within 4 hours of scheduled takeoff time. Exceptions may be made by the Sq/DO or above but require the concurrence of the PIC. Refer to ACCMAN 11-2EC-130HV1 for additional restrictions on training missions.

2.7.2.3. FDP may be further limited for crews in Individual Protective Equipment (IPE) such as the Aircrew Chemical Defense Ensemble (ACDE) due to heightened Operational Risk Management (ORM) concerns. Aircrew members in IPE may experience a degradation in flight duty performance due to increased fatigue and restrictions in situational awareness. PICs should work closely with C2 personnel to ensure appropriate FDP are established when mission segments require IPE. See **Chapter 8** for additional guidance.

2.7.2.4. Mission planners should construct mission itineraries with enroute ground times longer than 16 hours to afford aircrew members opportunities to recover from the cumulative effects of fatigue caused by flying on several consecutive days or due to transiting several time zones. If practical, schedule up to 36 hours enroute ground time after three consecutive near-maximum FDPs.

2.7.3. Crew Chief/MEP Maintenance Technician Work and Rest Plan. These personnel are responsible to the PIC. The PIC, in conjunction with the enroute station chief of maintenance, determines how long they can safely perform aircraft recovery actions. They must have the opportunity to sleep 8 hours of each 24-hour period. See DAFI 21-101, *Aircraft and Equipment Maintenance Management*, for detailed guidance.

2.7.4. Post-Mission Crew Rest (PMCR). SQ/CCs will grant aircrew members returning to home base sufficient time to recover from cumulative effects of the mission and tend to personal needs. **(T-3)** PMCR begins upon mission termination.

2.7.4.1. ECG/CC (or equivalent) is the PMCR waiver authority.

2.7.4.2. For missions that keep an aircrew off station 16 or more hours, the SQ/CC will provide 1 hour (up to 24 hours) PMCR for each 3 hours off-station. **(T-3)** SQ/CCs may extend PMCR at their discretion. Do not enter aircrew members in pre-departure crew rest until the PMCR period expires.

2.7.4.3. PMCR is not applicable to continuing missions.

2.8. Standby Force Procedures. Note: Contingency operations may require modification of the following Standby Force Procedures. The Sq/CC or Sq/DO will approve any modification of these procedures. **(T-3)**

2.8.1. Crew Management. Except as noted below, commanders will not use a standby crew to perform any non-mission duties or duties not related to their standby status. **(T-3)** Standby crews will not preflight any aircraft other than their standby aircraft. **(T-3)**

2.8.2. ALPHA Standby Force. An aircraft and aircrew capable of taking off in 1 hour. Aircrew members are given 12 hours of pre-standby crew rest before or after aircraft preflight. Aircrews must complete all preflight duties within 6 hours of crew show time. **(T-3)** An additional 12-hour pre-standby crew rest is required when preflight time exceeds 6 hours and crew rest was given before the preflight. Once an ALPHA force is formed, additional pre- flights may be necessary to maintain the ALPHA aircraft. Additional pre-flights done during normal waking hours do not interrupt crew rest. A crew will not stay on ALPHA standby duty for more than 48 hours. **(T-3)** After 48 hours, the crew must takeoff, be released, or be entered into pre-departure crew rest. **(T-3)** FDP begins when the crew is told to takeoff.

2.8.2.1. Aircraft Security. Each unit will complete a maintenance and aircrew preflight inspection when they put an aircraft on ALPHA standby status. **(T-3)** The ALPHA Standby PIC will ensure the aircraft is sealed after preflight. **(T-3)** Secure all hatches and doors to prevent unauthorized entry. Close and lock the crew entrance door with a controllable device, which prevents entry without damage to the door or lock. The command post, Sq/CC, or DETCO must grant permission prior to persons, other than the ALPHA Standby crew, entering an aircraft once the plane is sealed. **(T-3)** Ensure standby aircraft is resealed any time the aircraft has been opened. The ALPHA Standby PIC or designated representative must be present if access to the assigned aircraft is required. **(T-3)**

2.8.3. BRAVO Standby Force. An aircraft or aircrew capable of taking off in 3 hours (from the time the crew is told to takeoff or alerted). Aircrew members are given 12 hours of pre-standby crew rest. Crews are legal for alert after pre-standby crew rest. Preflight duties, if required, interrupt crew rest. A crew will not stay on BRAVO standby duty for more than 48 hours. After 48 hours, the crew must takeoff, be released, or be entered into pre-departure crew rest. FDP begins when the crew shows for duty. If a BRAVO standby crew is alerted for any duty (takeoff, preflight, mission planning), and the unit is subsequently tasked to launch the mission, FDP is calculated from when the crew first reported for that duty.

2.8.3.1. MODIFIED BRAVO Standby Force. While in garrison, all BRAVO Standby Force criteria will remain unchanged with exception to a revised alert timeline. A recall will be initiated to alert aircrews for contingency operations or HHQ taskings. Upon alert notification, crews will have 1 hour to report to the specified location and will be prepared to takeoff within 4 hours from the initial alert notification. ECG/CC, or designated representative, may adjust this timeline as necessary to align with mission requirements. FDP is calculated from when the crew first reports to the specified duty location.

2.8.4. CHARLIE Standby Force. An identified aircrew capable of entering crew rest within 2 hours (after their controlling unit is notified). This aircrew becomes legal for alert 12 hours after entering crew rest. CHARLIE Standby will not exceed 72 hours. After 72 hours, the crew will be released. **(T-3)** Afford a minimum of 12 hours before resuming CHARLIE Standby duty, entering crew rest for a mission, or entering pre-standby crew rest for ALPHA or BRAVO Standby.

2.9. Counter-Fatigue Management Program.

2.9.1. Aircrew may use medications with prior approval (on a voluntary basis following ground testing) that enhance natural rest during off-cycle crew rest periods. This section provides guidance for the use of no-go pills (prescription medications) that help aircrew initiate

and maintain restful sleep during off-cycle (desynchronosis) crew rest periods. Fliers on augmented aircrews will not use no-go pills in flight. **(T-2)**

2.9.2. It is USAF policy that aircrew will never use no-go pills as a first-choice counter-fatigue management tool. **(T-2)**

2.9.3. Responsibility for counter-fatigue management of aircrew medicinal products rests with the home station FS, ECG/CC (may delegate to but no lower than Sq/CC), and with each individual aircrew member. During deployments, aircrew members only obtain no-go pills from a FS after review with a USAF FS.

2.9.4. Unit ORM programs include use of no-go medication with ECG/CC and FS oversight.

2.9.5. Home station or deployed FS is the point of contact for no-go prescription. Upon request, the FS advises/assists the local ECG/CC to identify missions that may impair crew rest caused by duty day length, departure and arrival times and other mission timelines.

2.9.6. The ECG/CC will establish a system to inform the FS when missions fall into any of the following categories (may cause sleep disruptions and are therefore candidates for no-go medications):

2.9.6.1. Home station night launch missions greater than four hours duration. **(T-3)**

2.9.6.2. Crew rest facilities lacking an optimal sleeping environment (quiet, climate controlled and darkened). **(T-3)**

2.9.6.3. Off-station missions that are four or more time zones from home station. **(T-3)**

2.9.6.4. Rotating schedules (stair-stepped flying schedules) with greater than 6-hour flight time duration. **(T-3)**

2.9.6.5. Missions that run consistently near a 14-hour (or greater) duty day. **(T-3)**

2.9.7. Crew members will not consume a no-go pill on a timeline where they would be under the effect of the medication while they perform aircrew duties or are on ALPHA/BRAVO status (use mission report or legal for alert time to determine latest time to take no-go medication). Adhere to guidance below, unless superseded by updated MAJCOM or HAF direction.

2.9.7.1. Temazepam (Restoril). A dose of 15-30 mg is to be taken with a minimum duty not involving flying (DNIF) period of 12 hours before resuming duties.

2.9.7.2. Zolpidem (Ambien). A dose of 5-10 mg is to be taken with a minimum DNIF period of 6 hours before resuming duties.

2.9.7.3. Zaleplon (Sonata). A dose of 10 mg is to be taken with a minimum DNIF period of 4 hours before resuming duties.

2.9.8. Aircrew member’s responsibilities:

2.9.8.1. Complete ground testing for no-go pills and receive flight surgeon clearance prior to using no-go pills in the operational environment.

2.9.8.2. Do not operate equipment within the DNIF periods for each of the no-go pills as specified in **paragraph 2.9.7** of this manual.

2.9.8.3. Do not take no-go-pills within 12 hours of consuming alcohol.

2.9.8.4. Inform the FS of any other medications (including nutritional supplements and over the counter medications) they are taking so the FS can evaluate potential interactions.

2.9.8.5. Limit use of Restoril and Ambien to a maximum of seven consecutive days and no more than 20 days in a 60-day period.

2.9.8.6. Limit use of Sonata to a maximum of 10 consecutive days and no more than 28 days in a 60-day period.

Chapter 3

AIRCRAFT OPERATING RESTRICTIONS

3.1. Objective. This chapter applies to accepting an aircraft from maintenance prior to takeoff. The ultimate objective of the aircraft maintenance team is to provide an aircraft ready for flight with all equipment operational (Fully Mission Capable (FMC)). Manpower limitations, skills, and spare part availability have a negative and direct impact on mission accomplishment. However, under specific circumstances, some missions can be safely operated without all equipment being operational. Using the following policies, the PIC is the final authority in determining an overall suitability of an aircraft. Use the following maintenance identifiers and **Table 3.1** through **Table 3.16** to effectively communicate the status of an aircraft and to determine whether an aircraft is airworthy and able to perform the scheduled mission.

3.2. Minimum Equipment List (MEL) Policy. It would be impractical to prepare a list that would anticipate all possible combinations of equipment malfunction and contingent circumstances. This chapter lists the minimum equipment and systems considered essential for routine as well as contingency operations. The list does not necessarily include all equipment or systems essential to airworthiness (e.g., rudder, ailerons, elevators, flaps, tires). Those items which state a minimum requirement and have no listed exceptions ground the aircraft.

3.2.1. The PIC is responsible for exercising the necessary judgment to ensure no aircraft is flown with multiple items inoperative that may result in an unsafe degradation and/or an undue increase in crew workload. The possibility of additional failures during continued operation with inoperative systems or components are also to be considered. This chapter is not intended to allow for continued operation of the aircraft for an indefinite period with systems/subsystems inoperative. The MEL does not direct deviation from the aircraft flight manual limitations, emergency procedures, or USAF/ACC directives. PICs should be aware that the MEL is an operational tool and serves a different purpose than the maintenance Minimum Essential Subsystem List (MESL).

3.2.2. If, after exploring all options, a PIC determines a safe takeoff is possible with a required MEL item inoperable (beyond a particular restriction) the PIC will request a waiver. **(T-3)** Plan a minimum 12-hour response to the waiver request. If an item is needed to be operational IAW the maintenance MESL, the PIC may still opt to accept the aircraft without waiver. Safety of flight is paramount.

3.2.3. All emergency equipment will be installed and fully operational unless not required in support of mission requirements. **(T-3)**

3.3. Waiver Protocol. Waivers to operate with degraded or inoperative equipment beyond the guidance in **Table 3.1** through **Table 3.15** of this chapter may be granted on a case-by-case basis and only in exceptional circumstances. Waiver authority is the ECG/CC for local missions, or equivalent, based on who has OPCON and execution of the aircraft performing a specific mission. The PIC determines the need for a waiver and initiates the request.

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

3.4.1. PICs electing to operate with degraded equipment or aircraft systems (with appropriate waiver, if necessary) must coordinate mission requirements (revised departure times, fuel requirements, maintenance requirements, etc.) with the C2 agency before flight. **(T-3)**

3.4.2. If beyond C2 communication capability, the PIC may deviate from this chapter or the MEL IAW **paragraph 1.3** Report deviations (without waiver) through channels to ACC/A3C within 48 hours. Units must be prepared to collect background information and submit a follow-up written report upon request. **(T-3)**

3.5. Definitions (Specific to this Chapter).

3.5.1. Home Station. Home bases of assignment for EC-130H aircraft. Aircraft will not depart their home stations unless MEL home station requirements are met. **Exception:** During wartime, enroute criteria applies to all aircraft departures.

3.5.2. Enroute. Enroute locations where maintenance repair capability exists. An enroute station has the necessary skilled USAF or USAF-contract maintenance personnel, support equipment, and technical data available to accomplish most repairs.

3.5.3. Local Training. A mission scheduled to originate and terminate at home station, generated for training or evaluation and executed at the local level.

3.5.4. Off-Station Training. A mission that departs home station to perform training, as directed by the wing or ECG/CC, without returning the same day. These missions are supported by home station logistics. **Note:** Off-station trainers are considered local training for the purposes of this chapter.

3.5.5. Remarks/Limitations/Exceptions. Some technical information and procedures are contained in this column. This is not all inclusive. Crew members refer to the flight manual and other directives for procedures, techniques, limitations, etc.

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

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

3.5.5.2. Other Mission and Repair Clarifications:

3.5.5.2.1. Repaired at next repair-capable facility: Mission may continue as scheduled; item is repaired upon reaching a repair-capable facility. Once maintenance action is initiated, and it is determined repairs are not possible, the PIC discusses possible courses of action with C2 agency to return aircraft to service. Flights should only be conducted with intent to take the aircraft to a repair facility, not to conduct training.

3.5.5.2.2. Mission dictates requirement: PIC considers the entire mission profile, not just the next leg. **Example:** An airplane is departing an enroute station with repair

capability, after engine start the flight engineer discovers the #1 engine anti-ice is inoperative. Icing conditions are not forecasted for the next leg. However, because the mission spans several days and repair capability does not exist at the scheduled enroute stops, the PIC elects to have the item repaired prior to departing.

3.6. Navigation Systems.

3.6.1. For flights in Minimum Navigation Performance Specification, refer to T.O. 1EC-130H(AV)-1-4, *Partial Flight Manual—Flight Management System (FMS), USAF Series EC-130H Aircraft Equipped with Avionics Upgrade*, FLIP General Planning (GP) and Area Planning (AP) volume appropriate for route of flight for equipment requirements.

3.6.2. For flights on all other Category I routes, the PIC determines the minimum navigational capability required to safely accomplish the mission. Consider the following: duration, route of flight, weather, experience, and proficiency of the crew.

3.7. Equipment/Cargo Loading. EC-130H aircraft/crews are not equipped or trained to carry cargo. Cargo is defined as any item loaded aboard the aircraft except crew baggage, professional gear, spare mission equipment, crew chief toolboxes, or safety/emergency equipment. However, items other than those listed above may be carried on board the aircraft to support operations. All cargo/baggage is properly restrained IAW T.O. 1EC-130H-5-1, *Sample Basic Weight Checklists* and T.O. 1EC-130H-5-2, *Loading Data*. The following restrictions apply to all EC-130H flights unless a waiver is obtained IAW **paragraph 3.3**. **Note:** Cargo and baggage will not be loaded until the flight engineer and AMT have preflighted the cargo compartment. **(T-3)** The flight engineer and AMT will supervise all loading. **(T-3)** The flight engineer will calculate weight and balance and center of gravity (CG). **(T-3)**

3.7.1. No palletized cargo can be carried.

3.7.2. No hazardous cargo as defined by AFMAN 24-604, *Preparing Hazardous Materials for Military Air Shipments*. This does not apply to items that will be carried IAW T.O. 1EC-130H-1, *Flight Manual* or T.O. 1EC-130H-5-2.

3.7.3. Total weight will not exceed 1,500 pounds (lbs).

3.7.4. No single item over 400 lbs.

3.7.5. Loading restrictions: Do not load/secure baggage or equipment between the aft side of flight station 245 and the first equipment rack/operator console; in the aisle, escape routes, or access areas to aircraft mission systems; or in front of the wheel well inspection windows. Personal and professional equipment, and cargo that meets the requirements of this chapter may be loaded in all other areas if tie down devices are available, mission equipment is shielded, weight and balance is maintained, and safety is not compromised.

3.7.5.1. Personnel may not be seated closer than 30 inches in front of netted cargo or cargo that is secured with straps. This does not apply to cargo restrained by chains/chain bridle assemblies.

3.7.5.2. For flight, the weight limit on the aircraft ramp is limited to 4824 lbs. floor loaded cargo (ramp intermediate conveyors removed and stowed forward of ramp). See T.O. 1EC-130H-5-2 for further restrictions.

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

3.8.1. Standard climb-out flight path charts are in T.O. 1C-130H-1-1, *Flight Manual Performance Data*. For gear down operations, drag index must be applied using the Effect of Variant Configurations On Climb Out Flight Path charts. PICs will not takeoff without reasonable assurance the aircraft can achieve/maintain adequate obstacle clearance to include enroute stops and alternates.

3.8.1.1. Time and communications capability permitting, validate takeoff data with 55th Electronic Group Standardization and Evaluation (55 ECG/EGV).

Table 3.1. Engines/Gas Turbine Compressor (GTC).

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Engines	4	4	Do not takeoff with nonstandard aircraft configuration or power unless a hostile threat to the aircraft and/or crew makes it imperative. Do not takeoff unless all four engines achieve charted torque at takeoff power settings.
Engine Instrument Display System	2	2	
Torquemeter	4	4	
Tachometer	4	4	
Turbine Inlet Temperature (TIT) Indicators	4	4	
Fuel Flow Gauges	4	4	
Oil Temperature Gauges	4	4	
Oil Pressure Gauges	4	4	Indicators for both the engine power section and reduction gear section must be operational.
Oil Quantity Gauges	4	3	One oil quantity gauge may be inoperative provided the oil quantity is verified prior to flight and the Low Oil Quantity light is operational.
Low Oil Quantity Light	1	0	If inoperative, all four oil quantity gauges are to be operational.
Oil Cooler Flap	4	0	Oil Cooler Flap may be inoperative if the flap can be manually positioned to open and fixed and oil temperature can be maintained within normal limits.

Oil Cooler Flap Position Indicator	4	0	
GTC	1	0	Mission dictates requirement.

Table 3.2. Propellers.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Propeller	4	4	Propeller may be operated with a feather override failure where the override button fails to pop out at full feather (faulty pressure switch), provided maintenance instructions in the applicable fault isolation manual are followed and no other system is affected.
Synchrophaser	1	1	If the synchrophaser fails, mission may continue to a repair facility provided no other portion of the propeller system is affected. Remove synchrophaser.

Table 3.3. Electrical System.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Generators, Engine-Driven	4	4	If a generator fails at an enroute stop or off-station training, a flight to a destination with repair capability, including enroute stops, may be made. If the generator is not equipped with a disconnect, remove it and pad the generator mount before flight, provided no other electrical malfunction exists.
Regulated Transformer-Rectifier Unit (RTRU)	4	2	Mission dictates requirement. Transformer Rectifier Unit fans are considered part of the RTRU for the purposes of determining operational status. One RTRU must be operational on each source AC bus.

Air Turbine Motor (ATM) and ATM Generator	1	1	If the ATM or ATM generator fails, one-time flight to a repair facility, in visual meteorological conditions (VMC), is authorized provided no other electrical malfunctions exist.
Generator Out Lights	4	4	See Note.
AC Loadmeter	4	4	See Note.
Note: If a generator has been disconnected or removed and padded, its associated indicators do not have to be operational. All associated equipment and indicators are to be operational for each operative engine-driven generator (generator control panel, generator control unit, voltage regulator, generator out/caution light, AC loadmeter, etc.).			

Table 3.4. Fuel System.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Main Tank Fuel Pumps	4	4	One main tank fuel boost pump may be inoperative for one-time flight to a repair facility, provided the respective fuel dump pump is operational.
Main Tank Dump Pumps	4	4	
Auxiliary Tank Fuel Pumps (per tank)	1	0	Mission dictates requirement. Auxiliary tank fuel pumps will be operational for any tank containing fuel.
External Tank Fuel Pumps	2	0	Minimum one pump operative for tanks containing fuel.

Main Fuel Quantity Indicators (see note)	4	3	One main fuel tank indicator may be inoperative provided: 1. Both the tank with the inoperative indicator and its symmetrically opposite tank are dipped by the flight engineer to verify quantitative symmetry. Reference T.O. 1-C-130H-2-12JG-10-1, *Job Guide Maintenance Manual—Ground Handling Fuel System Servicing and Concurrent Servicing* for fuel conversion as needed. 2. At enroute stops when engines are shut down, dip check the tank with the inoperative indicator and the symmetrically opposite. 3. Cross-feed operation begins when total calculated fuel quantity has decreased to 10,000 lbs. 4. Engine-out training using the engine corresponding to the inoperative indicator or its symmetrical opposite is not conducted during tank to engine operation. 5. Plan flights to arrive overhead destination with a minimum 8,000 lbs calculated fuel. Consider maintaining cross-feed operation until engines are shut down. For air refueling restrictions, reference **paragraph 13.4.2.**
Main Fuel Quantity Indicators	4	2	Two main fuel tank indicators may be inoperative provided: 1. All conditions required with 3 operational main fuel quantity indicators (above) are met. 2. Inoperative indicators are asymmetrical. (Main tank indicators in combinations of either #1 and #3 or #2 and #4.) 3. Engine out training is not performed unless all engines are on cross-feed from auxiliary or external tanks with operative indicators.

			4. Symmetrical engine fuel flow is maintained.
External Fuel Quantity Indicator (see note)	2	0	One external fuel tank indicator may be inoperative provided both external fuel tanks are checked full or empty. Both external fuel tank indicators may be inoperative provided both external tanks are verified empty. 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: 1. Check pressure with each pump in the external tank. If no pressure is obtained, the tank is verified empty. 2. If pressure is obtained, ground transfer the fuel from the external tank. Defuel the external tank if unable to ground transfer. 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 is completed prior to takeoff.
Auxiliary Tank Fuel Quantity Indicators	2	0	If fuel quantity indicator is inoperative, fuel quantity is verified by the flight engineer with the magnetic sight gauge.
Aux Fuel Cross-feed Valves	2	0	The aux cross-feed valve may be inoperative provided the bypass valve and external cross-feed on the same side is operational.
External Fuel Cross-feed Valves	2	0	The external cross-feed valve may be inoperative provided the bypass valve and aux cross-feed on the same side is operational.
Note: Both a main and external fuel tank indicator may be inoperative on the same wing provided the limitations listed for a single inoperative main fuel tank indicator and a single external fuel tank indicator are followed.			

Table 3.5. Hydraulics.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Hydraulic Control Panel	1	1	
Engine-driven Hydraulic Pumps	4	4	
Utility/Booster System Engine Pump Pressure Warning Lights	4	4	
Utility System Hydraulic Pressure Indicator	1	1	
Booster System Hydraulic Pressure Indicator	1	1	
Hydraulic Suction Boost Pumps	2	2	
Auxiliary Hydraulic Pump	1	1	
Auxiliary Hydraulic Pressure Indicator	1	1	Direct reading gauge in cargo compartment may be inoperative.
Rudder Boost Pressure Indicators	2	1	

Table 3.6. Anti-Ice/De-Ice Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Ice Detection System	1	1	See Note.
Pitot-Heat System	2	2	
True Airspeed (TAS) Probe Heat	1	1	See Note.
Wing/Empennage Anti-Icing System	2	2	See Note.
Engine Inlet Air Duct Anti-Icing Systems	4	4	
Leading Edge Temperature Indicators	6	6	
Wing Leading Edge and Wheel Well Overtemp Warning Lights	7	7	
Propeller Anti-Icing and Deicing Systems	4	4	See Note below. If flown in an inoperative condition, this system must be turned off and all applicable circuit breakers pulled at all times.

Windshield Anti-Icing Systems	2	2	See Note.
Note: System may be inoperative provided aircraft is not operated in known or forecast icing conditions.			

Table 3.7. Brake/Anti-Skid Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Wheel Brakes	4	4	
Anti-Skid	1	1	1. The antiskid may be inoperative for flight to a destination with repair capability, including enroute stops. Repair at next capable facility. 2. Local training flights may continue if the antiskid fails provided the system is turned off. Do not accomplish multiple landings.
Parking Brake	1	1	

Table 3.8. Flight Recorder/Locator Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Flight Data Recorder (FDR)	1	1	See Note. If FDR is inoperative but the CVR is operational, flight is authorized to next repair capable facility.
Cockpit Voice Recorder (CVR)	1	1	See Note. If CVR is inoperative but the FDR is operational, flight is authorized to next repair-capable facility.
Emergency Locator Transmitter	1	1	If enroute, repair at next repair-capable facility.
Underwater Acoustical Locator Beacon	1	1	
Note: Training missions may be flown with an inoperative FDR or CVR, provided no passengers are carried. When initiating a tail swap or cross country sortie, FDR and CVR must be operational prior to departing home station.			

Table 3.9. Fire Protection/Warning Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Fire Extinguisher System	2	2	
Engine Fire and Turbine Overheat Warning Systems	4	4	
Nacelle Overheat System	4	4	
GTC Fire Warning System	1	1	

Table 3.10. Air Conditioning, Pressurization, and Bleed Air.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Flight Deck and Cargo Compartment Air Conditioning Units	2	2	Pressurization and both air conditioning systems should be operational. If a system fails, flight to a destination with repair capability (including enroute stops) may be accomplished. Brief crew and passengers on the possibility that discomfort may be encountered. Air conditioning and pressurization are not required for missions which do not exceed 10,000ft Mean Sea Level (MSL) if a reasonable temperature can be maintained.
Flight Deck Auxiliary Vent	1	1	
Cargo Compartment Auxiliary Vent Valve	1	1	Not required for training sorties or when enroute to a base with repair capability.
Flight Deck/Cargo Compartment Temperature Control Systems	2	2	Automatic system may be inoperative provided manual temperature control is operable. Manual system may be inoperative provided automatic temperature control is operable.
Under Floor Heat System	1	0	May be inoperative provided the regulation of cargo compartment temperature is not a mission requirement.
Cabin Pressure Controller	1	1	Automatic controller may be inoperative for pressurized flight provided the manual control is operative. May be inoperative for unpressurized flight.

Cabin Altimeter	1	1	May be inoperative for unpressurized flight.
Cabin Differential Pressure Indicator	1	1	May be inoperative for unpressurized flight.
Cabin Rate of Climb Indicator	1	1	May be inoperative for unpressurized flight.
Emergency De-Pressurization Switch	1	1	

Table 3.11. Landing Gear.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Landing Gear System	1	1	If repair capability does not exist and further flight can be made with the gear down and locked, the aircraft may be flown to a destination with repair capability (including enroute stops), provided the gear is not moved from the down and locked position. Flight (including enroute stops) with landing gear doors removed may be accomplished to a destination with repair capability. See **paragraph 3.8.** for additional guidance.
Landing Gear Position Indicators	3	3	All indicators may be inoperative provided gear is not moved from the down and locked position. Repair at next repair capable facility.
Landing Gear Warning Light	1	1	Landing gear warning light may be inoperative provided gear is not moved from the down and locked position. Repair at next repair capable facility.

Table 3.12. Flight Instruments.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Air Data Computer (ADC)	2	1	
Electronic Standby Indicator (ESIS)	1	1	
Display Control Panel (DCP)	3	2	Required at both pilot stations.
Mode Select Panel (MSP)	2	0	
Airspeed Indicator	2	2	
Vertical Speed Indicator	2	2	Only one is required for local training sorties or enroute stops.
Flight Director	2	0	
Attitude Director Indicator (ADI) - Attitude Sphere/ Warning Flag - Bank Pointer - Turn Needle - Slip Indicator	 2 2 2 2	 2 2 1 1	The turn needle and slip indicator is to be operable on the same side. All remaining ADI subsystems and warning flags (glideslope and course) are at the discretion of the PIC.
Horizontal Situation Indicators (HSI)	2	2	For the purposes of this section, an operational HSI does not require a valid heading source. Refer to **Table 3.13.**
Barometric Altimeters	3	2	Both pilots' altimeters must be operational.
APN-232 CARA	1	1	Repair at next repair capable facility.
Ground Collision Avoidance System (GCAS) (if equipped)	1	1	Repair at next repair capable facility.
Enhanced Traffic Alert and Collision Avoidance System (ETCAS)	1	1	Repair at next repair capable facility.
HF Radio	2	0	Mission dictates requirements.

Airborne Integrated Terminal Group (AITG)	2	0	One of the two AITG radios required for combat/combat support sorties. One radio capable of 8.33 kHz spacing (AITG 2 or ARC-210) must be operative for flight in European airspace.
RAD1	1	1	

Table 3.13. Navigation Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Standby Magnetic Compass	1	1	
ARN-151 Mil Global Positioning System (GPS)	1	0	Mission dictates requirements (i.e., Mil GPS feeds ownership position data to Link 16, and timing data to ARC-210 anti-jam functions).
Civ GPS	2	1	See Note 1.
Inertial Navigation Unit (INU)/Attitude and Heading Reference System(AHRS)	4	2	INU 1 or AHRS 1 must be operational/INU 2 or AHRS 2 must be operational. One INU must be operational.
Interactive Hand Control Unit (IHCU)	3	0	For flight into thunderstorm activity, one IHCU must be operational at the pilot or navigator station.
Flight Management System (FMS) Control Panel	3	2	Required at both pilot stations.
FMS Control Display Unit (CDU)	4	2	Required at navigator station and at least one pilot station. If navigator not on board, required at both pilot stations.
Multi-Functional Display (MFD)	5	3	Pilot and copilot stations each require at least one functioning MFD. If flying into thunderstorm activity and either a navigator is not on board or the navigator’s MFD is not operational, the pilot must have two functioning MFDs.
Pilot Mode Selector Switch	2	2	

Very High Frequency (VHF) Omni-Directional Radio-Range (VOR)	2	1	See Note 1.
Instrument Landing System (ILS)	2	1	See Note 1.
Tactical Air Navigation (TACAN)	2	1	See Note 1.
APS-150 Radar	1	0	Required if thunderstorms or hazardous weather conditions that can be detected by airborne radar are forecast or exist along route of flight.
Transponder	1	1	See Note 2. Mode 4 (or 5, with future upgrade) is not required for home station training sorties.

Notes:
1. Navigation equipment compatible with the facilities required for the entire route of flight must be operational.
2. Perform a ground check of the transponder before takeoff, using either the self-test or ground radar interrogation. If self-test is unacceptable and radar facilities do not permit a ground check, crews may takeoff if the transponder was operational on the previous mission. The transponder must be operational when Traffic Alert and Collision Avoidance System (TCAS) is required. Refer to AFI11-202V3, as supplemented, for additional restrictions.

Table 3.14. Aircraft Exterior/Interior Lighting.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Landing Lights	2	1	One may be inoperative provided the wheel well taxi light on same side is operational.
Wheel Well Taxi Lights	2	1	One may be inoperative provided the landing light on the same side is operational.
Wingtip Taxi Lights	2	2	
Formation Lights	9	0	

Navigation Lights	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.
Anti-Collision/Strobe Lights	2	2	If enroute, one may be operational; repair at next repair capable facility.
Wing Leading Edge Lights	2	0	
Primary Instrument Cockpit Lighting	1	0	See Note.
Note: Sufficient edge "peanut" lighting or backlit lighting (depending on aircraft model) is to be operational for night operations for the following instruments: airspeed, altimeters, vertical speed indicator, ADI, and HSI.			

Table 3.15. Doors and Ramp Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Ramp and Ramp Locking System	1	1	Warning light, latching mechanisms, and locking system are to be operative for pressurized flight. Aircraft will not be released for flight with a malfunctioning ramp lock system, with cargo on the ramp. Aircraft may continue to destination if ramp locks malfunction in-flight. Cargo ramp will not be operated in flight, with cargo on the ramp, with malfunctioning locks. 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. If enroute, unpressurized flight, with no cargo on the ramp, may be performed with a cargo ramp lock malfunction when mission requirements dictate.
Aft Cargo Door and Locking System	1	1	If enroute, mission may continue. Pressurized flight may be performed with an aft cargo door lock malfunction when mission requirements dictate.

Crew Entrance Door Warning Light	1	1	

Table 3.16. Aircraft Lavatory Equipment.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Urinal	1	0	Not required for flight if aircraft chemical toilet is installed and operational.
Chemical Toilet and Privacy Curtain	1	1	PIC may waive this requirement based on crew compliment or mission requirements.

Chapter 4

OPERATIONAL PROCEDURES

4.1. Checklists. Accomplish all checklists with strict discipline. A checklist is not complete until all items have been accomplished and all applicable crewmembers have called it complete. Momentary hesitations for coordination items, ATC interruptions, and deviations specified in the flight manual, etc., are authorized. Notes amplifying checklist procedures or limitations may be added to the checklists in pencil.

4.1.1. The pilot flying (PF) the aircraft initiates all checklists unless another procedure is established by the flight manual or this volume.

4.1.2. The only pages (or inserts) authorized in checklists are C-130 series T.O. aircrew checklists, AFI/ACCMAN MDS Volume 3 or MAJCOM checklists and briefing guides, and NAF or ECG/EGV-approved information guides. No unapproved items will be inserted between the page covers of authorized checklists. Authorized entries will be current and written in pencil. **(T-3)** Local in-flight guides and inserts not affecting T.O. guidance and procedures may be locally developed with 55th Electronic Combat Group Standardization and Evaluations 55 ECG/EGV approval.

4.1.3. Abbreviated checklist items that do not apply to the unit's aircraft or mission may be lined out. Do not challenge these items during checklist accomplishment.

4.2. Duty Station. A qualified pilot will be in control of the aircraft at all times during the flight. (**Exception:** Unqualified pilots undergoing qualification training and senior leaders who have completed required training IAW **Chapter 2** of this volume). Only one pilot may be absent from their duty station at a time and only if the flight engineer is at his/her duty station. Both pilots will be in their seats when the flight engineer is not in his/hers. With both pilots in their seats, ACs may authorize rest periods for one pilot occupying a primary duty station during non-critical phases of flight (the other pilot will be awake and alert). Notify the AC prior to departing assigned primary duty station.

4.2.1. Both pilots, the navigator, and the flight engineer will be at their duty stations during all takeoffs, departures, approaches, aerial refuelings, and landings except when required for the performance of normal crew duties. **(T-3)** Other crew members may occupy other stations, with MCC and AC concurrence, only if doing so does not interfere with normal crew duties.

4.2.2. During other phases of flight, flight crew members will notify the pilot before leaving and after returning to their duty station. **(T-3)** For mission crew, only the AMT and the MCC need to notify the pilot before leaving and after returning to their duty station. The MCC is responsible for controlling mission aircrew members in the mission crew compartment during all phases of flight.

4.3. Flight Station Entry. ACs may authorize passengers, observers, MEP, and any crewmember access to the flight deck during any phase of flight. The total number of persons permitted is limited to the number of seats with operable seatbelts and a sufficient oxygen source. Passengers and observers will not occupy the pilot, copilot, navigator, or flight engineer positions at any time.

4.4. Takeoff and Landing Policy.

4.4.1. An AC-certified pilot will occupy either the left or right seat during all takeoffs and landings. Instructor or flight examiner pilots may occupy either seat at their discretion regardless of who is designated as PIC on the flight authorization. The designated PIC (A-code) is not required to occupy a primary position, but still retains overall authority for conduct of the mission.

4.4.2. AC-certified pilots will make all takeoffs and landings from the left seat when a copilot occupies the right seat until reaching 100 PIC hours in any C-130 aircraft or until becoming certified to perform touch and go landings, whichever occurs first. **(T-3)**

4.4.3. Non AC-certified pilots may perform takeoffs and landings from either seat when an AC-certified pilot, who is certified to perform touch and go landings, occupies the other seat. Pilots in Mission Pilot Development (MPD) and copilots will perform all takeoffs and landings from right seat unless under direct IP supervision.

4.4.4. An AC-certified pilot makes all takeoffs and landings during:

4.4.4.1. Aircraft emergencies unless conditions prevent compliance.

4.4.4.2. Missions operating in areas of hostile activity unless conditions prevent compliance.

4.4.4.3. Situations when, in the opinion of the PIC, marginal conditions exist.

4.5. Landing Gear and Flap Operating Guidance. The PF will command configuration changes. **(T-2)** The pilot monitoring (PM) the aircraft will verify appropriate limitations and acknowledge the command by repeating it. **(T-2)** The landing gear will be operated by the copilot. **(T-2)** The flaps will normally be operated by the PM, but the PIC may assign flap operation to the flight engineer as necessary. **(T-2)**. During ground operations when the aircraft is stopped, the copilot may actuate the flaps without notifying the pilot.

4.6. Use of Outside Observers. Use additional crew members to assist in visually clearing for obstacles and obstructions during all taxi operations and in-flight during arrivals and departures. Crew members designated to perform these duties are exempt from the requirements of **paragraph 4.7** during taxi.

4.7. Seat Belts.

4.7.1. All occupants will have a designated seat with a seat belt. **(T-3)**

4.7.2. Crew members occupying their primary positions will have seat belts fastened at all times in flight, except when crew duties require otherwise. **(T-3)**

4.7.3. All occupants will be seated with seat belts and shoulder harnesses (if available) fastened during taxi, takeoff, air-to-air refueling, and landing. **(T-3) Exceptions:** The flight engineer is exempt from wearing the shoulder harness for ground operations and air-to-air refueling, and mission crew are exempt from wearing shoulder harness during air-to-air refueling. Crew members performing flight examiner and instructor duties and not occupying a primary position are exempt from seat belt requirements if they are in compliance with **paragraph 4.7.1**.

4.8. Aircraft Lighting. Operate aircraft lighting IAW **Chapter 3** of this volume, AFMAN 11-202V3, AFMAN 11-218, *Aircraft Operations and Movement on the Ground*, and applicable T.O.s.

4.8.1. Use anti-collision lights or strobe lights from takeoff to landing on all flights unless reflections cause pilot distractions in instrument conditions.

4.8.2. Use taxi lights during all taxi operations. Use wingtip taxi lights during night taxi operations. Use landing lights at night in unlighted areas. Use landing and taxi lights during night takeoffs. Use taxi lights in flight any time the landing gear is extended unless reflections cause pilot distractions in instrument conditions. Landing lights may be used continuously during local traffic pattern training and during low-altitude maneuvering in high-density traffic areas.

4.8.3. Use leading edge lights in addition to other required aircraft lighting during operations below 10,000 feet (ft), unless use causes a distraction during Instrument Meteorological Conditions (IMC) flight.

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

4.9. Advisory Calls. The PF will periodically announce intentions during departures, arrivals, approaches, and when circumstances require deviating from normal procedures. **(T-3)** The PM will make mandatory advisory calls except those designated for any crew member. **(T-3)**

4.9.1. Takeoff. Stating "GO" is only a required call when refusal speed (Vr) is less than rotate speed. If applicable, state "GO" at Vr. For all takeoffs, state "ROTATE" at rotate speed. If takeoff speed is adjusted for wind gusts or Air Minimum Control Speed (Vmca), state "ROTATE" five knots below the adjusted takeoff speed. Any crewmember noting a safety of flight malfunction before hearing "GO" (when Vr is less than rotate speed) or "ROTATE" (when Vr is greater than or equal to rotate speed) will state "REJECT" and a brief description of the malfunction (e.g., "REJECT, number two engine flameout."). **(T-3)**

4.9.2. Altitudes.

Table 4.1. Climb (Use Notes in Table 4.4).

CLIMB OUT	PM CALL	PF RESPONSE
Transition Altitude (Note 4, Note 5)	"Transition Altitude, Set 29.92"	"Transition Altitude, Set 29.92"
1,000 ft below assigned altitude	"(Altitude Passing) for (Altitude Assigned)"	"(Altitude Passing) for (Altitude Assigned)"

Table 4.2. Descent (Use Notes in Table 4.4).

DESCENT	PM CALL	PF RESPONSE
Transition Level (Note 4, Note 5)	"Transition Level, Set (local altimeter)"	"Transition Level, Set (local altimeter)"
1,000 ft above assigned altitude	"(Altitude Passing) for (Altitude Assigned)"	"(Altitude Passing) for (Altitude Assigned)"

4.9.3. Approaches.

Table 4.3. Non-precision Approaches (Use Notes in Table 4.4).

NON-PRECISION APPROACHES	PM CALL	PF RESPONSE
100 ft above Final Approach Fix (FAF) altitude	"100 Above"	
100 ft above stepdown altitude	"100 Above"	
100 ft above Minimum Descent Altitude (MDA)	"Approaching Minimums"	"Acknowledged"
At MDA	"Minimums"	(Note 3)
Runway Environment in Sight	"Runway in Sight"	"Landing" or "Going Around"
Missed Approach Point	"Missed Approach Point" (Note 3)	"Going Around" (Note 1)

Table 4.4. Precision Approaches.

PRECISION APPROACHES	PM CALL	PF RESPONSE
100 ft above glide slope intercept altitude	"100 Above"	
100 ft above Decision Height (DH)/Decision Altitude (DA)	"Approaching Minimums"	"Acknowledged"
At Decision Height/Decision Altitude	"Minimums"	"Landing," "Continuing," or "Going Around" (Note 2)
Approach Lights in Sight (CAT 1 ILS)	"Approach lights in sight"	"Continuing" (Note 1)
Runway Environment in Sight	"Runway in Sight"	(Note 3)
Approach Lights and/or Runway Environment Not in Sight	"Go Around"	"Going Around"

At 100 ft above Touchdown Zone Elevation (TDZE) (CAT I ILS)	"100 ft" (Note 3)	"Landing" or "Going Around"

Notes:
1. With weather at CAT I minimums on a CAT I ILS, the pilot may not see the runway environment at DA; however, the initial portion of the approach lights may be visible. The pilot may continue to 100 ft Height Above Touchdown (HAT)/Height Above Threshold (HATh) with reference to the approach lights only. The pilot may not descend below 100 ft above TDZE using the approach lights as reference unless the red termination bars or the red side row bars are distinctly visible and identifiable.
2. Respond with the intention to land if runway environment is in sight, will remain in sight throughout touchdown and the aircraft is in a position for a safe landing.
3. Not required if the PF has stated, "landing."
4. When on board, the navigator responds with altimeter setting after the PF.
5. The left seat pilot says "set twice" after accounting for both the Primary Flight Display (PFD) altimeter and the ESIS altimeter regardless of whether PF or PM.

4.9.4. Touch and Go. If a malfunction is encountered, crew members should only state the observed malfunction. The AC at the controls announces intention to stop or continue the takeoff.

4.10. Deviations.

4.10.1. The PM will tell the PF when heading or airspeed deviations are observed or altitude is more than 100 ft from desired and no attempt is being made to correct the deviation.

4.10.2. Any aircrew member seeing a variation of 200 ft altitude, a deviation of +/-10 knots in airspeed, or potential terrain or obstruction problem will immediately notify the pilot.

4.11. Communications Policy.

4.11.1. Aircraft Interphone.

4.11.1.1. Do not discuss classified information over interphone when radio transmissions are being made unless absolutely necessary for mission accomplishment.

4.11.1.2. Flight crew members (including AMT) will monitor interphone and flight crew hot microphone (mic) at all times. **(T-3)** All crew members will monitor interphone and flight crew hot mic during ground operations in the terminal environment and during aerial refueling. **(T-3)** Advise the AC when off interphone. During other phases of flight, mission crew members will monitor interphone and flight crew hot mic as directed by the AC or MCC. **(T-3)**

4.11.1.3. After engine shutdown, crew members will remain on headset until the AC clears the crew off headset. **(T-3)** The AMT will remain outside the aircraft on headset while the GTC is running. **(T-3)**

4.11.1.4. Sterile Cockpit. Limit conversation to that essential for crew coordination and mission accomplishment during taxi, takeoff, approach, landing and any flight below 10,000 ft MSL.

4.11.2. Command Radios.

4.11.2.1. In terminal areas, all aircrew members will monitor the primary command radio, if able. **(T-3)**

4.11.2.2. The pilot or copilot operating command radios will tell the crew which radio is primary, and update the crew when the primary radio changes. **(T-3)**

4.11.2.3. A primary flight deck crew member will monitor ultra-high frequency (UHF) emergency frequency 243.0 megahertz (MHz) regardless of primary radio.

4.11.2.4. One of the pilots will record and read back all ATC clearances. **(T-2)** The navigator will record the clearance and monitor the read back. **(T-3)** Disregard this procedure when ATC instructions require immediate execution, or when such action interferes with timely completion of more important duties.

4.12. Cockpit/Crew Resource Management (CRM). The goal of CRM is enhancing mission effectiveness. The responsibility and authority of the PIC is clearly established in regulations and mission directives. However, CRM is the responsibility of all crew members. It encompasses all aspects of the mission, from planning through debriefing.

4.12.1. PICs are responsible for fostering an atmosphere of open communication and crew participation in the decision-making process. They should delegate and acknowledge team participation. Communication should be frequent, direct, open and concise.

4.12.2. Crew member responsibility includes respecting the authority of the PIC, participating in the mission and decision-making process, and supporting the PIC. Crew members are expected to assert their best judgment and, when in doubt, speak out. The PIC is the final decision authority.

4.12.3. “Time Out” is the common assertive statement for use by all crew members when safety might be jeopardized. It provides a clear warning sign of a deviation or loss of situational awareness and is used to gain the attention of the PF. As soon as possible after a “Time Out” call, the pilot will stabilize the aircraft, safety permitting. The AC at the controls will then allow the crew to voice concerns. Relying on crew inputs, the PIC decides whether to continue the current course of action or pursue another.

4.12.4. “Knock it off” is used to terminate a maneuver for safety of flight situations. Upon hearing “knock-it-off” the crew should establish a safe attitude, altitude and airspeed and return the aircraft power and flight controls to a normal configuration.

4.12.5. The Two Challenge Rule is used if the PM is unable to gain a response from the PF. After two challenges, the PM takes control of the aircraft.

4.13. Use of Automation.

4.13.1. General Automation Procedures. There should be a clear understanding of the PF, the PM, and navigator duties at all times. Aircrews should use aircraft automation consistent with changing flight environments and aircraft capabilities. If the use of automation creates a loss of situational awareness or results in task saturation, shift to a less demanding level or disconnect the automation entirely and re-establish desired aircraft path and control. Both pilots are responsible for ensuring the aircraft is following the desired flight path.

4.13.2. Verbalize, Verify, and Monitor (VVM) is a closed-loop system of communication designed to significantly reduce typical automation selection errors between the PF, PM and the navigator. VVM consists of the following three step process:

4.13.2.1. When making any changes in the FMS, the pilot/navigator making the entries will VERBALIZE the intended change. **(T-3)** The PF will verbalize all changes to the level of automation, flight director and autopilot mode selections, and mode transitions (e.g., "Autopilot engaged", "Altitude Hold", "Nav-Capture"). The PM will verbally confirm the automation that has been enabled. **(T-3)**

4.13.2.2. The other pilot and navigator, if applicable, will VERIFY changes made to the FMS. **(T-3)**

4.13.2.3. Both pilots and the navigator will MONITOR the aircraft to ensure the expected performance is achieved. **(T-3)**

4.14. Runway Condition Reading (RCR) and Runway Surface Condition (RSC) Limitations.

4.14.1. When no reported RCR is available, consider the runway surface wet when water on the runway causes a reflective glare. The minimum RCR on any portion of the runway for takeoff or landing is 05.

4.14.2. The performance charts used to determine braking action are based on concrete runways. The RCR values for the following runway surfaces depicted in **Table 4.5** are estimates based on operational experience and should be used only as a guide.

Table 4.5. RCR Values.

TYPE SURFACE	RCR (DRY)	RCR (WET)
Asphalt/Concrete	23	12
Aluminum Matting	20	10
M8A1/With Anti-Skid (PSP)	20	8
M8A1/Without Anti-Skid (PSP)	13	3
Clay/Crushed Rock	16	5
Coral	16	4

4.14.3. Limit EC-130H aircraft operations into and out of slush- or water-covered runways to a covering of 1 inch. This number is based on performance charts where an RSC of 10 is equal to 1 inch of slush or water. Performance data where more than 1 inch of slush or water is present may not be accurate.

4.15. Runway and Taxiway Requirements.

4.15.1. Minimum runway width is 80 ft/25 meters. Minimum taxiway width is 30 ft/9 meters.

4.15.2. Runway Length for Landing. Minimum runway for landing is landing distance from 50 ft over the threshold (unless higher obstacles exist).

4.15.3. Runway Length for Takeoff. Minimum runway for a normal takeoff is balanced or unbalanced critical field length (CFL), whichever is greater.

4.15.4. The decision to make intersection takeoffs belongs to the AC at the controls. Takeoff and Landing Data (TOLD) computations are based on the runway remaining from the point at which the takeoff is initiated.

4.15.5. Rolling Takeoffs. A rolling takeoff is preferred if performance calculations permit. If the AC deems takeoff performance to be critical takeoff power should be applied before the brakes are released (static takeoff).

4.16. Aircraft Taxi and Taxi Obstruction Clearance Criteria.

4.16.1. After landing and clearing the runway, and with approval of the pilot, the AMT may open the aft cargo door and lower the ramp to approximately 12 inches above horizontal in preparation for back taxi if needed.

4.16.2. Without wing walkers, avoid taxi obstructions by at least 25 ft; with wing walkers, by at least 10 ft.

4.16.3. When taxi clearance is doubtful, use wing walker(s). If wing walker(s) are not available, deplane aircrew member(s) to maintain obstruction clearance.

4.16.4. Reverse Taxi.

4.16.4.1. The pilot in the left seat will coordinate reverse taxi directions and signals to be used with the AMT and marshaller (when available). **(T-3)**

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

4.16.4.2.1. Open the aft cargo door and lower the ramp to approximately 12 inches above horizontal.

4.16.4.2.2. The AMT will be on the aircraft ramp in the best position to direct reverse taxi, report any hazards, and provide the pilot in the left seat with timely interphone instructions on turns, distance remaining, conditions of the maneuvering area, and stopping point. **(T-3)**

4.16.4.3. During night reverse taxi operation, the PIC and AMT will ensure that the taxi area is sufficiently lighted. **(T-3)**

4.16.4.4. Stop no less than 25 ft from an obstruction even if using a wing walker.

4.16.5. Arresting Cables.

4.16.5.1. EC-130H aircraft operations are authorized on runways where BAK-12 systems are installed with an eight-point cable tie-down system. 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, plan to takeoff and/or touchdown beyond the barrier. Do not touch down on approach end arresting cables, unless recessed. If the aircraft lands before the cable, contact the tower to have the cable inspected.

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

4.16.5.3. Operation over raised barrier cables with disc-type support (except donut supported BAK-12 cables restrained with eight-point tie downs) at high speeds may result in damage to the airplane.

4.17. Fuel Jettison Procedures.

4.17.1. Aircrews should consider burning down fuel versus jettison, unless safety of flight requires an immediate jettison, as determined by the AC. Except in the case of an emergency, before jettisoning fuel, notify the appropriate ATC or flight service facility of intentions, altitude, and location. If available, use designated jettison areas, except when safety of flight would be compromised.

4.17.2. The ECG/CC will coordinate with local agencies to establish jettison areas. **(T-3)** Ideally, jettison areas are at altitudes above 20,000 ft above ground level, 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.

4.17.3. Follow up all jettisons with a detailed report filed by the pilot in command immediately after landing. Submit report to ECG/SE who will retain the report for six months. **(T-3)** Document all pertinent information, including the following items:

4.17.3.1. Scheduled Duration.

4.17.3.2. Actual Duration.

4.17.3.3. Landing Gross Weight.

4.17.3.4. Computed Stopping Distance.

4.17.3.5. Recovery Field.

4.17.3.6. Runway Available.

4.17.3.7. Jettison Altitude/Location.

4.17.3.8. Outside Air Temperature (OAT).

4.17.3.9. Wind Direction and Velocity.

4.17.3.10. Jettison Amount.

4.17.3.11. Reason for Jettison.

4.17.3.12. Approval Authority.

4.18. 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:

4.18.1. Ensure compliance with the following Bird Watch condition restrictions.

4.18.1.1. Bird Watch Condition Low – No operating restrictions.

4.18.1.2. Bird Watch Condition Moderate – Initial takeoffs and final landings allowed only when departure and arrival routes avoid bird activity. Local Instrument Flight Rules (IFR) /Visual Flight Rules (VFR) traffic pattern activity is prohibited.

4.18.1.3. Bird Watch Condition Severe – All takeoffs and landings are prohibited. The ECG/CC, or equivalent, may waive this restriction on a case-by-case basis.

4.18.2. 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.

4.18.3. Consider bird migratory patterns during the enroute portion of the mission to help minimize the potential of an in-flight bird strike. The Bird Avoidance Model (BAM) on Air Force Flight Safety Center Flight Safety Division (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 AFI 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program*, for additional information.

4.18.4. Following a known bird strike, aircrew should land as soon as practical to have the aircraft inspected. Bird strike damage cannot be accurately assessed in-flight, and undetected damage may result in a complex airborne emergency. PIC should complete AF Form 853, *Air Force Wildlife Strike Report*, and fax to nearest Air Force Flight Safety Office.

4.19. Functional Check Flights (FCFs), Acceptance Check Flights (ACFs), & Operational Check Flights (OCFs). FCFs, ACFs and OCFs are accomplished IAW T.O. 1-1-300, *Acceptance/Functional Check Flights and Maintenance Operational Checks,* T.O. 1C-130E(H)-6CF-1, *Acceptance and Functional Check Flight Manual,* and DAFI 21-101. Crews should only perform tasks or functions contained in specific T.O. guidance. If requested to perform a non-standard function, PICs should contact ECG/CC to see if an FCF applies.

4.19.1. FCF Restrictions. See T.O. 1-1-300.

4.19.1.1. If a fully certified FCF aircrew is not available, the ECG/CC or deployed equivalent may appoint a temporary FCF crew, in writing, when operationally necessary and on a case-by-case basis. The Sq/CC executing the FCF will ensure the temporary FCF crew is fully briefed by 55 ECG/EGV FCF program managers, given adequate time to study appropriate materials, and participates in a full mission briefing including Quality Assurance (QA) the day prior to the FCF sortie. **(T-3)**

4.19.1.2. Ideally, conduct FCFs in daylight, VMC. ECG/CCs may authorize a flight under a combination of VMC and IMC. Begin the flight in VMC. If the aircraft and all systems are operating properly, the crew may proceed IFR through cloud cover to VFR on top for the altitude phase of the flight.

4.19.1.3. If a malfunction occurs during an FCF, the ECG/CC (or deployed Expeditionary Maintenance Group Commander (EMXG/CC)) may subsequently release the aircraft for flight providing the malfunction is not related to the condition generating the FCF, and the original condition operationally checked good.

4.19.1.4. Perform high speed taxi checks IAW the flight manual, maintenance T.O.s, and policy letter on file in QA. To accomplish the check, prepare the aircraft with minimum fuel necessary to limit brake/tire wear (ensure fuel on board permits a safe return to base should the aircraft unexpectedly become airborne) and activate the anti-skid system. The

flight engineer 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-3)**

4.19.2. IAW DAFI 21-101 QA will ensure the FCF, ACF or OCF aircrew is briefed on the purpose and extent of the flight, previous maintenance problems, and aircraft or engine discrepancies related to the FCF.

4.19.3. OCFs are conducted to validate the correct operation of an aircraft system or systems. OCF crews will be briefed by maintenance QA on the nature of the previous malfunction(s) and subsequent corrective actions. **(T-3)** OCF crews will conduct only normal flight procedures to verify proper systems operation. **(T-3)** In special circumstances, T.O. 1EC-130H-1 section 3 procedures (e.g., manual gear extension, cruise engine shutdown, etc.) may be utilized to provide a more thorough check of aircraft systems, but prior coordination with 55 ECG/EGV is specifically required in such cases. An FCF is normally required should any portion of the T.O. 1C-130H-6CF-1 checklists be utilized.

4.19.4. 55 ECG/EGV is the focal point for FCFs, ACFs and OCFs for the flying squadrons. The 55 ECG/EGV Pilot and Flight Engineer are designated as the group FCF officer in charge (OIC) & non-comissioned officer in charge (NCOIC), respectively, and manage the group FCF program in coordination with QA IAW DAFI 21-101. 55 ECG/CC may assign these duties to different crew positions on a temporary basis as needed.

4.19.5. Crew Complement. An FCF crew consists of an FCF-certified AC, an FCF-certified flight engineer, and the most experienced pilot, AMT and navigator available. An OCF crew consists of an IP, an experienced flight engineer, the most experienced pilot available, and an AMT and navigator. If conditions warrant, OCFs may be flown without a navigator IAW **Chapter 2** of this volume.

4.19.6. FCF crew certification (AC and flight engineer). Sq/CCs certify FCF crew members by memorandum indicating the dates of completion for each item in **paragraph 4.19.6.1** to be kept on file in the crew members' permanent training folder. FCF certifications will be maintained in each squadron's Letter of Certifications.

4.19.6.1. FCF crew members may be certified once they meet the requirements listed below:

4.19.6.1.1. The PIC will be instructor qualified IAW ACCMAN 11-2EC-130HV1. The flight engineer will be experienced IAW ACCMAN 11-2EC-130HV1, Table 1.1.

4.19.6.1.2. Nominated for certification by the Sq/DO.

4.19.6.1.3. Once nominated, complete a thorough review of FCF reference material. This review must be conducted with another FCF certified crewmember. **(T-3)**

4.19.6.1.3.1. Pilots will complete FCF certification training with an FCF-certified pilot.

4.19.6.1.3.2. Flight engineers will complete FCF certification training with an FCF-certified flight engineer.

4.20. Traffic Alert and Collision Avoidance System (TCAS). For any resolution advisory (RA) requiring deviation from a clearance, consider filing a Hazardous Air Traffic Report (HATR) upon landing.

4.21. Radar Altimeter.

4.21.1. Any crew member detecting a yellow "DH" indication on the PFDs at or below the altitude set in the radar altimeter will immediately notify the PF. **(T-3)** Verify terrain clearance and aircraft position.

4.21.2. Before departure set the radar altimeter for emergency return.

4.21.3. The pilot, copilot, and navigator will use the same radar altimeter setting unless briefed otherwise. **(T-3)**

4.21.4. Set the radar altimeter to the HAT/HATh/Height Above Airport (HAA) during instrument approaches.

4.22. Reduced Power Operations. Crews are authorized to use reduced power for takeoff, any time maximum takeoff and climb capability are not required. Reduced power is any setting less than Normal Takeoff power, which is defined in the flight manual as 1077°C TIT or 19,600 inch-lbs of torque, whichever occurs first. Crews should consider using reduced power to extend the life of the engine turbines. In all cases, crews will ensure that the computed/posted TOLD data matches actual power settings. **(T-3)**

Chapter 5

AIRCREW PROCEDURES

5.1. Aircrew Uniforms.

5.1.1. Aircrew will wear the aircrew uniform, as outlined in DAFI 36-2903, *Dress and Personal Appearance of United States Air Force and United States Space Force Personnel,* and the appropriate MAJCOM supplement on all missions unless otherwise authorized. When the FCG requires civilian attire, dress conservatively.

5.1.2. Sq/CCs will determine clothing and equipment to be worn or carried aboard all flights commensurate with mission, climate and terrain involved. **(T-3)**

5.1.2.1. See AFI 11-301V1, *Aircrew Flight Equipment (AFE) Program*, for minimum aircrew clothing requirements.

5.1.2.2. Wear of flight gloves for EC-130H aircrew will be at the discretion of the ECG/CC (or equivalent). **(T-3)**

5.2. Personal Requirements. In addition to AFMAN 11-202V3 requirements, aircrew members will carry or wear personal and professional equipment on all flights as follows:

5.2.1. Flight equipment, including as a minimum: headset, personal helmet, oxygen mask, and operable flashlight.

5.2.2. Passport. Crew members will carry a valid passport on all sorties to countries requiring a passport in the FCG. This does not apply to combat missions. **Exception:** Unit commanders may authorize personnel who have applied for, but not yet received, a passport to act as crew members on sorties not scheduled to transit locations where passports are required.

5.2.3. Shot Record. Crew members will maintain worldwide shot requirements and carry their shot records on all sorties outside the CONUS. This does not apply to combat missions.

5.2.4. Driver's License. A valid state driver’s license is required on each Temporary Duty (TDY) where use of United States (U.S.) government general purpose vehicles may be required. Contact the local airfield manager before driving on the flight line.

5.2.5. Identification Tags. Crew members will carry two identification tags on all flights.

5.2.6. Foreign Object Debris Hazards. 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. Crew members will account for them before and after flight.

5.2.7. A reflective belt or suitable substitute will be worn on flight lines during hours of darkness or periods of reduced visibility.

5.2.8. Tool Kits. Have at least one AMT tool kit on board for all sorties.

5.3. Pre-Mission Actions.

5.3.1. Aircrews will review theater-specific information necessary to successfully operate in the applicable theaters. The review should include (but is not limited to):

5.3.1.1. Review tasking, itinerary and altitude reservation (ALTRV) requirements.

5.3.1.2. Review applicable OPORD, SPINS, Virtual Risk Assessment (VRA), Country Risk Assessment (CRA) and FLIP.

5.3.1.3. Review the FCG for areas of operation (to include classified portion). Obtain necessary diplomatic clearances where required.

5.3.1.4. Obtain required customs forms.

5.3.1.5. Obtain worldwide FLIP and sufficient communications security (COMSEC) materials for the duration of the mission.

5.3.1.6. Ensure physiological training, annual physical, immunizations, flight evaluations, as well as all grounding Go/No-Go items are reviewed to ensure they are current and valid throughout any TDY. CMR items need to be complete IAW ACCMAN 11-2EC-130HV1 requirements and Combatant Command (CCMD)/theater guidance such as reporting instructions, SPINS, etc.

5.3.1.7. Ensure visas have been received, if required.

5.3.1.8. Obtain terrain charts for unfamiliar destinations if available.

5.3.1.9. Compile sufficient spare forms, flight orders, etc. to cover the TDY period.

5.3.1.10. Consider any foreseeable safety risks and risk mitigation factors IAW ORM.

5.4. Aircrew Publications Requirements. Primary crew members will ensure the publications specified in **Table 5.1** are carried on all missions. **(T-3)** When the crew includes additional crew members in the same specialty (e.g., two flight engineers on proficiency sorties) each will possess a checklist but otherwise only one set of publications is required. **(T-3)** Units may compile standardized publication kits and issue specific guidance for use to satisfy the requirements of **Table 5.1**.

Table 5.1. Aircrew Publications.

PUBLICATION	EC-130H
Aircraft Flight Manual (-1)	E
Aircraft Performance Manual (-1-1)	E
Aircraft Flight Manual (-1-4)	N
Aircraft Flight Manual (-1-5)[1]	N
Aircraft Flight Manual (-1-6)[3] (Secret)	AMT
Abbreviated Checklists (-1)	ALL
T.O. 1C-130-101	E
Allied Tactical Publication (ATP) 3.3.4.2 (D), *Standards Related Document (SRD)*	P[2]
ATP 3.3.4.2-EDD-V1, *Air-To-Air Refueling*	P[2]
AFMAN 11-202V3	P[2]

ACCMAN 11-2EC-130HV3, *EC-130H Operations Procedures*	P[2]
Appropriate Fuel Planning Documents	N
Notes: 1. Required on all combat or combat support missions. 2. This is the pilot not identified as pilot in command on the flight authorization. 3. Required on mission sorties only.	

5.5. Airfield Review. Aircrews will consult the web-based airfield database maintained by Air Mobility Command Airfield Sustainability Branch (AMC/A3AS) and comply with the Global Decision Support System 2 (GDSS2)/ASRR for updates to airfield operability, weight bearing capacity, and Terminal Instrument Procedures (TERPS) reviews. **(T-2)** Refer to AFMAN 11-202V3 and MAJCOM guidance for non-DoD published approach criteria. See MAJCOM/CCMD guidance for foreign instrument procedures not maintained by the U.S. Military, even if they are published in DoD FLIP.

5.6. Aircrew Intelligence Briefing. Before leaving home stations on OCONUS missions, aircrews receive an intelligence briefing that emphasizes terrorist, enemy, and friendly political and military development in the area in which they are planned to fly. 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 enroute stop, and thereafter when significant developments occur. Report information of possible intelligence value to the local intelligence office as soon as practical to ensure timely dissemination of mission reports (MISREPs).

5.7. Interconnectivity. Pilots will obtain an easily accessible email account to ensure interconnectivity with all required planning facilities for the mission. **(T-3)** If possible, PICs will acquire a worldwide cell phone to facilitate communication with command and control, maintenance, and planning personnel in case of changes in itinerary. **(T-3)**

5.8. Flight Crew Information File (FCIF).

5.8.1. Crew members will review FCIF, Volume 1, before all missions or ground aircrew duties, and update the FCIF currency record. **(T-3)** Go/No-Go status is IAW AFMAN 11-202V2, *Aircrew Standardization and Evaluation Program* supplemented. During exercises and contingencies, deployed squadrons will develop procedures to comply with this paragraph and local requirements.

5.8.2. Crew members delinquent in FCIF review or joining a mission enroute will receive an FCIF update from a primary aircrew member counterpart on the mission. **(T-3)**

5.8.3. Crew members not assigned or attached to the unit operating a mission will certify their FCIF review by entering the last FCIF number and their initials behind their name on the file copy of the flight authorization or file copy of their crew orders. This applies to all crew members if the normal sign-in system is not working at show time. IPs flying with general officers or senior staff members are responsible for briefing appropriate FCIF items.

5.9. Operations & Mission Kits. Carry operations kits on all sorties. Contents of the kits are determined by mission requirements. Mission kits required for operating the mission system should be defined in the supplement to this volume. Required and suggested items for operations kits include:

5.9.1. Required on all sorties:

5.9.1.1. DD Form 2131, *Passenger Manifest* (if applicable)

5.9.1.2. AF Form 70, *Pilot's Flight Plan and Flight Log* (or computerized flight plan)

5.9.1.3. ECG Form 33, *C-130 Mission Log*

5.9.1.4. UDI Worksheet, *C-130E/H Series Flight Data Worksheet*

5.9.1.5. Local Mission Summary Sheet (as necessary per PIC/MCC discretion)

5.9.1.6. Flight Authorization (IAW DAFMAN 11-401)

5.9.1.7. AFTO Form 781

5.9.1.8. COMPASS CALL Risk Analysis Worksheet

5.9.1.9. AF Form 711B, *USAF Mishap Report (or locally developed Incident Report)*

5.9.1.10. DD Form 1801, *DoD International Flight Plan*

5.9.1.11. DD Form 175-1, *Flight Weather Brief*, or equivalent

5.9.2. Required on all sorties away from home station, if applicable:

5.9.2.1. Airfield Suitability and Restrictions Report (ASRR)

5.9.2.2. DD Form 1252, *US Customs and Border Protection (CBP) Declaration for Personal Property Shipments*

5.9.2.3. U.S. Customs and Border Protection (CBP) Form 7507, *General Declaration (Outward/Inward) Agriculture, Customs, Immigration, and Public Health*

5.9.2.4. AF Form 651, *Hazardous Air Traffic Report* (HATR)

5.9.2.5. DD Form 1610, *Request and Authorization for TDY Travel of DoD Personnel*

5.9.2.6. AF Form 4116, *C-130 Navigator Flight Plan and Log* (on overwater flights) (or locally approved equivalent)

5.10. Route Navigation Kits.

5.10.1. A route navigation kit is issued at home station and remains with the aircraft until return. Kits contain sufficient quantities of material to cover the planned mission and global operations as required.

5.10.2. Minimum contents of route navigation kits are in **Table 5.2**.

5.10.3. On local unit training sorties, local area navigation kits may be used in lieu of route navigation kits in **Table 5.2** Kits' contents are determined by the crew.

Table 5.2. Route Navigation Kit Contents.

Publication (applicable to area of operation)	Number Required	
	Local	Off Station
FLIP Planning (GP, AP/1/1B/2/3)	N/A	1 (Note 1)
FLIP IFR Supplement	1	1
FLIP FIH	1	1
FLIP Enroute Charts (High and Low)	2	2
FLIP Area Charts (Terminal)	2	2
FLIP Instrument Approach Procedures (Terminal) Low [High as required]	3 (2 if no Nav)	3 (2 if no Nav)
Jeppesen Approaches (Note 2)	As Required	As Required
FLIP Civ DP/STAR	3 (2 if no Nav)	3 (2 if no Nav)
Topographical and Sectional Charts	As Required	As Required
FLIP VFR Supplement	1	1

Notes:
1. FLIP Planning Books (GP, AP/1/1B/2/3) are only required on overseas missions.
2. A username and password are required for Jeppesen publications.

5.11. Briefing Requirements. Units may amplify these briefing requirements in the supplement to this manual.

5.11.1. Pre-Departure Briefing Items. The PIC will contact the local C2 agency to confirm mission requirements. **(T-3)** The PIC and controlling agency share joint responsibility to identify special briefing requirements. Briefings may include buffer zone, electronic warfare activities, SAFE PASSAGE, Electromagnetic Interference (EMI), diplomatic clearance, anti-hijacking procedures, operations and safety supplements to flight manuals, and OPORD procedures.

5.11.2. Pilot in Command (PIC) Briefing. The PIC will ensure that an aircrew briefing is conducted prior to the first sortie of the day. **(T-3)** As a minimum, brief crew members on specific mission details for that day's sortie(s) and the ORM factors for the mission. Complete this briefing prior to engine start. Cover all applicable items of the operations briefing, including MAJCOM, NAF, unit special interest items (SIIs), and ORM. Use briefing guides contained in AFTTP 3-1.EC-130H, (U) *Tactical Employment EC-130H* (S) or 55 ECG IFG (Herk Hints).

5.11.3. Specialized Briefing. Use specialized briefings to detail operating procedures or SIIs peculiar to various crew positions, and to answer questions relating to those specialties. Specialized briefings review tactics and procedures, and technical instructions for specialized equipment operations. All crew members should attend each briefing. Crew members may only be excused from specialized briefings for pre-flight duties; however, the PIC will back brief all appropriate items. **(T-3)**

5.11.4. Weather Briefings. The PIC will obtain a briefing on current weather, trends, and forecast for the proposed route, destination, and alternates. **(T-3)** The PIC will brief primary crew members on appropriate weather conditions before departure. **(T-3)** Verbal briefings are authorized for local flights. Face-to-face briefings are not required.

5.11.5. Mission Briefing. Conduct mission briefings prior to all mission sorties. Briefing content varies depending on numerous factors including mission requirements, ROE/SPINS, threat assessment, etc. Crews are provided all applicable information to ensure safe and effective mission accomplishment. Mission briefings should include, but are not limited, to mission description and purpose, itinerary, aircraft configuration and special equipment, fuel load, clothing requirements, MAJCOM/NAF/unit SIIs, training and evaluation requirements (if applicable), flying safety, and intelligence.

5.11.6. Intelligence Briefings. Before operating in a combat environment, the crew will obtain a current intelligence briefing.

5.11.7. Multi-ship Briefings. In the case of multi-ship operations, MCs will lead mass briefings to all crews (as applicable) and ensure that all other required briefings are conducted by their respective crew members.

5.12. Call Signs.

5.12.1. Training Missions. Use the unit's static call sign prefix followed by a 2-digit suffix assigned by the parent unit.

5.12.2. Operational Missions. Use call signs assigned by OPORD, fragmentation (FRAG), or diplomatic clearance. If call sign is not assigned obtain and use ACC-assigned off-station call-sign. If an ACC-assigned off-station call sign is unavailable, use the Voice Call Sign Listing (VCSL) option. As a last resort, use unit static call signs.

5.13. Flight Plan/Data Verification.

5.13.1. Computer Flight Plan (CFP) Use. CFPs are the official sources of performance, navigation, and climatic data, including enroute wind information. If stand-alone computer based plans are used, each mission segment should utilize best wind data available. Use only MAJCOM validated CFPs.

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

5.13.1.2. Verify CFPs for route of flight and fuel computation accuracy before departure. Pass any flight plan discrepancies.

5.13.2. All waypoint data retrieved from an expired database should be verified by one or more of the following methods:

5.13.2.1. Latitude/longitude from current FLIP.

5.13.2.2. Bearing/distance from a flight plan after latitude/longitude is verified for each waypoint.

5.13.2.3. Ground Based Navigational Aids (NAVAIDs).

5.13.3. Takeoff and Landing Data (TOLD). The flight engineer will complete a *TOLD Card* and *Pilot Information Card* IAW Part 10 of T.O. 1C-130H-1-1 or locally developed versions, as specified in **Chapter 10**. A pilot crew member, or additional flight engineer, will cross-check the TOLD for accuracy by using the performance manual or approved tabulated data. As a minimum, the person checking the data will:

5.13.3.1. Verify gross weight independently from the TOLD.

5.13.3.2. Cross-check Vmca (one engine inoperative (OEI) in ground effect), takeoff, and landing speeds.

5.13.3.3. Review and compare the computed distances, ground roll, and climb gradient (if applicable) with the actual conditions, runway available, and departure procedures.

5.13.3.4. When conducting flaps-up landing data for training, compute and post Vmca speeds for both configurations; flaps 50% and flaps up (normal boost).

5.14. Departure Planning. Use Federal Aviation Administration (FAA) *Aeronautical Information Manual (AIM)*, AFMAN 11-202V3, this chapter, and the appropriate MAJCOM supplements. Regardless of the type of departure flown (IFR/VFR), review the following (as appropriate): IFR Departure Procedure, instrument approach plate, NOTAMs, ASRR, and suitable terrain charts. The AC will provide the obstacle height, distance, and gradient information necessary for performance computations to the flight engineer.

5.14.1. VFR Departures. **Note:** Do not fly VFR departures in lieu of obstacle clearance planning.

5.14.1.1. ECG/CC or designated representative approval is required if departing VFR due to inability to meet IFR climb gradient requirements. Conduct an ORM analysis for the VFR departure and provide this analysis to the approving official.

5.14.1.2. The minimum climb performance for VFR departures is determined by ensuring all the following conditions are met:

5.14.1.2.1. All-engine climb capability ensures obstacle avoidance along the departure route.

5.14.1.2.2. OEI climb capability will ensure departure and emergency return route provides obstacle avoidance.

5.14.1.2.3. In all cases, the aircraft performance must meet or exceed a climb rate of 100 ft/nautical miles (NM) OEI to VFR traffic pattern altitude **(T-3) Note:** If unable to comply with all of the above conditions, download fuel or delay until more favorable conditions exist.

5.14.1.3. Refer to FLIP for host nation VFR requirements before flying VFR outside of CONUS.

5.14.2. IFR Departures.

5.14.2.1. If the airport does not have an authorized IFR departure method, depart VFR IAW **paragraph 5.14.1** An IFR departure is not authorized at airfields without an instrument approach.

5.14.2.2. Departure End of Runway (DER) Screen Height. When any doubt exists about which screen height to use, plan to cross the DER at 35 ft (minimum) unless you can ascertain a different screen height requirement from an appropriate authority.

5.14.2.3. IFR Climb-To Altitude. Prior to takeoff, the PIC will calculate climb-out to a minimum enroute IFR altitude with all engines operating. Furthermore, the PIC will ensure that the aircraft can meet all published altitude restrictions for the associated procedure unless ATC has issued a new altitude restriction. The PIC will also calculate OEI climb-out performance to an applicable obstacle clearance altitude.

5.14.2.4. Minimum Climb Gradient. In the event the aircraft is unable to meet the published IFR climb gradient with OEI, use the following methods for contingency procedure planning to ensure the aircraft can clear all obstacles along the planned departure route.

5.14.2.4.1. Calculate TOLD using a combination of maximum takeoff power and all engine bleed air valves closed.

5.14.2.4.2. Calculate TOLD using 100 percent engine efficiency or using drag index for Low Band Transmit (LBT) antennae removed. When LBT antennae are not installed, the PIC may utilize 100 percent engine efficiency in TOLD calculations. These options are automatically approved for day VMC, but require SQ/CC or designated representative approval for night and/or IMC conditions. Prior to takeoff, crews must verify engine efficiency and thoroughly brief crew responsibilities including the applicable timing for LBT antenna jettison. **(T-3)**

5.14.2.4.3. Ensure current weather meets or exceeds non-standard takeoff minimums to visually clear all obstacles vertically or laterally.

5.14.2.4.4. Download fuel.

5.14.2.4.5. Delay the mission until atmospheric conditions allow for sufficient performance to meet the requirements.

5.14.2.4.6. After exhausting all other contingency procedure planning and the mission is deemed operationally necessary to justify the increased risk, ECG/CC or designated representative may approve the reduction of up to 48 ft/NM from the required IFR climb gradient provided the PIC has conducted extensive preflight obstacle planning.

5.14.2.4.7. Depart VFR IAW **paragraph 5.14.1**.

5.14.2.5. Practice Instrument Approaches under VFR. While conducting instrument approach procedures under VFR, crews will comply with the minimum IFR climb gradient for the procedure being flown (e.g., ATC climbout instructions/radar vectors, Standard Instrument Departure (SID), published missed approach procedure). ECG/CC approval is required if unable to meet the minimum IFR climb gradient for practice instrument approaches under VFR.

5.14.2.6. Missed Approach Climb Gradients. Missed Approach Climb Gradients. PICs must ensure the aircraft can meet the published missed approach climb gradient IAW AFMAN 11-202V3. **(T-2)** If unable to meet the published minimum climb gradient, crews will comply with **paragraph 5.14.2.4** and subordinate paragraphs.

5.14.3. Critical Field Length (CFL). Takeoff gross weight (GW) considerations must ensure that the runway available is greater than CFL for a normal takeoff. In some cases, a minimum altitude is required at the published screen height. For screen heights greater than 50 ft, increase balanced CFL by 50 ft for every additional foot of required altitude at DER (**Example*:*** 55 ft screen height drives a 250 ft increase to balanced CFL).

5.14.4. Gross Weight (GW). Unless waived by MAJCOM/A3, ensure that the aircraft does not exceed the maximum GW, zero fuel weight, or CG limitations specified in the aircraft flight manual. GW may be further restricted by operating conditions such as, icing, temperature, pressure altitude, runway length and slope, aerodrome weight bearing capacity, departure maneuvering, required climb gradients, and obstacles.

5.15. Weather Minimums for Takeoff. Minimum Runway Visual Range (RVR) for takeoff is 1600 ft.

5.15.1. Takeoffs are permitted on operational missions with weather greater than or equal to 1000 RVR provided the runway has operating centerline lights, visible runway centerline markings, two operative RVR reporting systems, and both pilots are fully qualified in their respective crew position.

5.15.1.1. Select a departure alternate when departure weather is below landing minimums IAW **paragraph 5.17**.

5.15.1.2. If no RVR readout is available for the departure runway, a report of ½ mile (800 meters) or better visibility is required.

5.16. Alternate Planning. Select alternate airports IAW AFMAN 11-202V3. The PIC retains final authority in the choice of alternates; however, selection by supporting agencies normally should be used if they meet the above criteria and the aircraft has already been serviced.

5.17. Departure Alternates. PICs will select a departure alternate IAW AFMAN11-202V3 and MAJCOM guidance.

5.18. Destination Requirements (for filing purposes). The forecasted destination weather meets AFMAN 11-202V3 requirements and the following:

5.18.1. File two alternates when:

5.18.1.1. The forecast visibility (Temporary Group (TEMPO) or prevailing) is less than published for the approved straight-in or sidestep approach.

5.18.1.2. The forecast ceiling or visibility (TEMPO or prevailing) is less than published for all other approaches. For approaches with no published ceiling requirement (e.g., Jeppesen approaches), the minimum required ceiling is computed by taking the published HAA or HAT/HATh and rounding it up to the nearest one hundred feet (or as determined by MAJCOM TERPs review). For example, a Jeppesen VOR approach with a published HAA of 642 ft would require a forecasted ceiling of 700 ft.

5.18.1.3. The forecast surface winds (TEMPO or prevailing) exceed RCR-corrected limits.

5.18.2. File an alternate for an OCONUS departure or destination aerodromes regardless of forecasted weather. **Exception:** Comply with basic AFMAN 11-202V3 when:

5.18.2.1. OCONUS intra-theater flight does not exceed a 3-hour duration or:

5.18.2.2. OCONUS mission orbit is less than 3 hours flight time from arrival or departure base.

5.18.3. In addition to AFMAN 11-202V3 filing requirements for remote or island destinations, the prevailing RCR-corrected surface winds at the destination must remain within limits from one hour before to one hour after the ETA.

5.18.4. Refer to **Chapter 12** and AFMAN 11-202V3 for fuel planning considerations when filing to a remote or island destination or when the destination is located in Alaska or at latitudes greater than 59°N

5.19. Adverse Weather.

5.19.1. Flight into areas of forecast or reported severe turbulence is prohibited. **(T-3)** Do not fly into an area of known or forecast moderate or greater mountain wave turbulence. **(T-3)**

5.19.1.1. The EC-130H is a Category III aircraft for turbulence. To gain a more accurate picture for their route of flight, crews will confirm the Category type of aircraft to which the forecast turbulence applies to or what Category type of aircraft reported the encounter and convert the turbulence intensity IAW AFH 11-203V2, *Weather for Aircrews—Products and Services.*

5.19.1.2. The AC is responsible for ensuring all passengers are seated, with seat belts fastened, when areas of moderate or greater turbulence are encountered or anticipated. ***Warning:*** Serious injury may occur if passengers do not have their seat belts fastened and the aircraft encounters moderate or severe turbulence.

5.19.2. Flight into areas of forecast or reported severe icing is prohibited. **(T-3)** Prolonged operation, such as cruise flight or holding, in areas of moderate icing should be avoided. **Note:** Air Force Weather Agency technical note AFH 15-101, *Meteorological Techniques*, states that freezing drizzle is equivalent to moderate icing and freezing rain is equivalent to severe icing.

5.19.2.1. Do not takeoff under conditions of freezing rain. **(T-3)** Do not takeoff under conditions of freezing drizzle except when aircraft has been properly de-iced/anti-iced IAW flight manual procedures. **(T-3)** When freezing fog is forecast or reported, aircrews will confirm with weather agencies what type (if any) icing is associated with the freezing fog.

5.19.2.2. Freezing precipitation, snow, freezing fog, or temperatures near 0°C, may cause ice or frost to accumulate on aircraft surfaces. When an aircraft requires de-icing prior to takeoff, refer to the following:

5.19.2.2.1. Only use de-ice and anti-ice fluids listed in an aircrew's 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. In extreme climatic conditions, anti-ice fluids listed in T.O. 1EC-130H-1 are approved for use. Most current FAA holdover times for expected duration of anti-ice benefits can be found by initiating a search at the Air Force Flight Standards Agency (AFFSA) website: **https://usaf.dps.mil/sites/affsa**. As a guide for approved anti-icing fluids, crews may use published anti-icing holdover times IAW T.O. 42C-1-2, *Aircraft Anti-Icing Procedures*.

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

5.19.3. Do not fly directly above or in close proximity to thunderstorms or cumulonimbus clouds. Additionally, do not fly in, under, or downwind of the anvil top of a thunderstorm. Avoid any thunderstorm identified as severe by at least 20NM. **Warning:** Regardless of altitude, aircraft damage from thunderstorms is possible at distances in excess of 20 NM. To ensure safety of flight and prevent aircraft damage, aircrews must familiarize themselves with information on thunderstorm development, convective activity, and associated hazards to ensure appropriate avoidance. **(T-2)** Refer to AFH 11-203V1, *Weather for Aircrews* and FAA AIM, paragraph 7-1-27 for more information.

5.19.4. 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:

5.19.4.1. Changing routing.

5.19.4.2. Diverting to alternate.

5.19.4.3. Declaring an emergency and requesting priority assistance.

5.19.5. Aircrews should avoid flying in areas of recently dissipated thunderstorms and clouds due to advection (horizontal movement of clouds caused by wind) downwind of thunderstorms.

5.19.6. To minimize exposure to thunderstorm hazards when approaching or departing an airport in an area where thunderstorms are occurring or are forecast:

5.19.6.1. Attempt to maintain VMC.

5.19.6.2. Maintain at least 5 NM separation from heavy rain showers.

5.19.7. Significant Meteorological Information (SIGMET). National Weather Service in-flight weather advisories are not limiting to AF aircraft. Contact the nearest military weather facility or flight service station (FSS) for details, if applicable.

5.19.8. Volcanic Dust Precautions. Aircraft flight operations in areas of forecast or known volcanic activity or dust is prohibited. Plan all missions to avoid flying downwind of volcanic activity, and in all cases by at least 50 NM.

5.19.9. Lightning Avoidance. The following conditions are most conducive to lightning strikes and prolonged flight in them should be avoided:

5.19.9.1. Within 8°C of freezing level.

5.19.9.2. In clouds or in any intensity of precipitation or turbulence associated with thunderstorm activity.

5.19.9.3. In clouds within 5,000 ft of the freezing level.

5.20. Risk Management (RM). RM is a logic based, common sense approach to making calculated decisions on human, material, and environmental factors before, during, and after all operations. PICs will accomplish RM worksheets IAW MAJCOM and local guidance as part of

preflight activities. Deployed crews will comply with local instructions and use locally derived RM worksheets. In the absence of deployed guidance, the 55 ECG RM worksheet may be used.

5.21. AFTO Form 781.

5.21.1. Review AFTO Forms 781 series before applying power to the aircraft or operating aircraft systems. Sign an exceptional release before flight. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the exceptional release. If one of these individuals is not available, the PIC may sign the exceptional release. Ensure that the DD Form 1896, *DoD Fuel Identaplate*, is aboard the aircraft and Aviation Into-Plane Reimbursement Card (AIR Card) information available for servicing. **Note:** The aircraft must have a physical AIR Card on board for OCONUS trips unless waived by the ECG/CC or equivalent.

5.21.2. 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 facility. Refer to T.O. 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*, for downgrade authority and procedures. After the maintenance release is obtained, coordinate mission requirements with the controlling agency. The PIC's concurrence is required before the aircraft can be flown.

5.21.3. Refer to **Chapter 10** for Red X clearing procedures at stations without maintenance support refer to.

5.22. Aircraft Servicing and Ground Operations.

5.22.1. Aircraft Refueling. Aircrew members qualified in ground refueling or specialized refueling operations may perform refueling duties. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed or when squadron operations officers have approved specialized refueling operations. **(T-3)** Qualified crew members may augment maintenance refueling teams at enroute stops.

5.22.2. Aircraft Dash One Preflight Inspection Requirements.

5.22.2.1. The aircraft dash one preflight inspection remains valid until either:

5.22.2.1.1. Aircraft ground time exceeds 12 hours (72 hours provided the aircraft is sealed, not flown and documented entry control is maintained).

5.22.2.1.2. Another maintenance dash six preflight is performed.

5.22.2.2. When an aircrew assumes a pre-flighted spare or quick turn, a thorough visual inspection will be performed. **(T-3)** A thorough visual inspection includes, but is not limited to, ensuring all panels are secure, tires and struts are inflated, all hydraulic reservoirs are serviced, and there are no visible fluid leaks on the aircraft.

5.22.2.2.1. An aircraft should be sealed if the aircrew preflight has been completed and the aircraft is left unattended by aircrew.

5.22.2.2.2. Once the aircraft is sealed, the following notes are entered in the aircraft AFTO Form 781A, *Maintenance Discrepancy and Work Document*, discrepancy block (Flight Engineer and AMT notes may be combined into one block). Notify the maintenance operations desk what time the aircraft is sealed and seal number.

5.22.2.2.2.1. **Note:** Flight Engineer preflight inspection C.W., Time:____, Fuel:____, LOX:___, Seal #: _____

5.22.2.2.2.2. **Note:** AMT preflight inspection C.W., Time:_____, Seal #:_____. Write seal numbers in ink. The Flight Engineer/AMT will state what sections of the preflight were not accomplished.

5.22.2.2.3. Only a maintenance officer, maintenance superintendent, production superintendent, flight engineer or AMT may break an aircraft seal. When the seal is broken, annotate the reason for breaking the seal in the AFTO Form 781A corrective action block. Complete the date corrected block and sign the corrected/transferred by block. Additionally, a new discrepancy block is completed as follows:

5.22.2.2.3.1. **Note:** Aircraft Resealed, Seal # _____, See Page:_____, Block:_____ (this refers to the discrepancy block where the aircraft was originally sealed).

5.22.3. Fire Protection and Crash Rescue.

5.22.3.1. The aircraft engine fire extinguisher system fulfills the minimum requirements for fire protection during engine start.

5.22.3.2. A fireguard is required for all engine starts including the GTC. A crew member or ground controller may act as fireguard.

5.22.4. Aircrew and Maintenance Engine Runs.

5.22.4.1. Normally, engine runs are not accomplished by a mix of aircrew and maintenance personnel. When an aircrew member will start or run-up engines for maintenance purposes, the following procedures apply:

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

5.22.4.1.2. Use the pilot, flight engineer and AMT flight manual checklists. Begin with the "Cockpit Checklist" and complete all appropriate checklists through the "Before Leaving the Airplane" checklist.

5.22.4.1.3. Only deviate from the flight crew checklist when maintenance requires less than four engines to be started.

5.22.4.1.4. Operate symmetrical engines when power settings above ground idle are required. **Note:** The above procedures do not preclude an aircrew from allowing maintenance personnel onboard to troubleshoot an engine malfunction after engines have been started at the beginning of a mission or prior to engine shutdown at the end of a mission.

5.22.5. Towing. Aircrew members normally do not participate in towing operations. If required to occupy cockpit position during towing operations conducted by personnel unfamiliar with C-130 towing procedures, the PIC will coordinate with the senior maintenance officer or superintendent to ensure the towing supervisor and crew are qualified. **(T-3)** At non-USAF installations, the PIC must have approval from the airfield operations officer or airfield

manager prior to towing. **(T-3)** The PIC will ensure the tow team supervisor briefs all personnel on their duties and the associated hazards. **(T-3)** Proper checklists will be used. If any doubt exists as to the qualification of tow team personnel or the safety of the operation, make no attempt to tow the aircraft until qualified USAF personnel can be located. Under no circumstances will any crewmember act as the towing supervisor. **(T-3)**

5.22.6. During servicing and ground operations, personnel will not walk through the prop arc unless performing engine/propeller maintenance, inspecting intakes, or performing required pilot, flight engineer or AMT preflight duties. Personnel will not enter the prop arc while an engine/GTC is running, or external air is connected to the aircraft. After stations time maintenance personnel will report to the AMT prior to boarding. **(T-3)** The AMT will relay the number of maintenance personnel enplaning/deplaning to the PIC. **(T-3)**

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

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

5.23.1.1. Parking and receiving.

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

5.23.1.3. Supervision of minor maintenance within local capability.

5.23.1.4. Minor configuration changes to meet mission tasking.

5.23.1.5. Securing the aircraft before entering crew rest.

5.23.1.6. Coordinating aircraft security requirements.

5.23.1.7. Documenting AFTO 781-series forms.

5.23.2. In all cases when aircrews will service the aircraft without qualified maintenance specialist assistance, comply with the appropriate maintenance T.O.

5.23.3. Aircrews are not qualified to accomplish the required ground inspections. When maintenance personnel are unavailable, the aircrew will document the overdue maintenance inspection (e.g., preflight, basic post-flight, calendar inspection) in the AFTO Form 781A, *Maintenance Discrepancy and Work Document*. If the current aircraft status is not a red dash symbol, enter a red dash symbol in the AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance Document*.

5.24. Aircrew Flight Equipment (AFE) Requirements.

5.24.1. Oxygen. Prior to takeoff, sufficient on-board oxygen will accomplish the planned flight from the equal time point (ETP) with a minimum of 5 liters in the system and all walk-around bottles filled.

5.24.2. Since the EC-130H flight deck can accommodate more crew members than available oxygen regulators, EC-130H aircrew may pre-position emergency escape breathing devices (EEBD), emergency passenger oxygen systems (EPOS), or MA-1 Walk-Around bottles on the flight deck.

5.24.3. When carrying passengers or MEPs, distribute EPOS (if available) to each passenger. EPOS are required on flights above Flight Level (FL) 250. AMTs will demonstrate their use prior to departure.

5.24.4. Aircrew members will comply with AFMAN 11-202V3 oxygen requirements. Additional crew members not required for mission accomplishment may be considered passengers when determining oxygen requirements.

5.24.5. Crew members occupying a crew station will have an oxygen mask with communication connected and readily available prior to engine start until engine shutdown. **(T-3)**

5.24.5.1. Crew members without access to aircraft oxygen will have an EPOS, EEBD, or spare MA-1 walk-around bottle readily available for flights above 10,000 ft. **(T-3)**

5.24.6. Life preserver units (LPUs) or Personal Floatation Devices. The AMT will place an LPU within easy reach of each passenger and aircrew member before takeoff on overwater flights. **(T-3)** Crew members will fit and adjust LPUs (if applicable) for overwater flights and will wear them on overwater missions below 2,000 ft. **(T-3)** (**Exception:** LPUs need not be worn for takeoffs, landings or approaches).

5.24.7. Parachutes.

5.24.7.1. Parachutes will be carried on the aircraft IAW T.O. 1EC-130H-5-2 or other applicable MAJCOM or tech order guidance.

5.24.7.2. Personnel performing in-flight duties near an open (or suspected open) door, hatch, or ramp require restraint by a safety harness. At a minimum, if a safety harness is unavailable, personnel may wear a parachute. **(T-3)**

5.24.8. AFE Documentation. Prior to flight, PICs will ensure all prepositioned AFE and survival equipment items are serviceable, inventoried, and certified on the AFTO Form 46, *Prepositioned Aircrew Flight Equipment*. Notify AFE of any onboard equipment shortages or unserviceable conditions. Annotate discrepancies in the AFTO Form 781A, *Maintenance Discrepancy and Work Document*. PICs will ensure AFE equipment inspections will remain current at enroute stops when a crew change is not anticipated. Do not open sealed bags to inventory equipment. Inspect each sealed bag's serviceability tag for equipment list and inspection currency.

5.25. On-Time Takeoffs.

5.25.1. An on-time takeoff requires the aircraft to be airborne +/- 30 minutes of scheduled takeoff time or as specified by applicable MAJCOM or CCMD guidance.

5.25.2. Scheduled takeoff time may be adjusted to meet mission requirements. PICs will notify the C2 agency to request scheduled takeoff time adjustments. **(T-3)**

5.25.3. Early Departures. Early departures are authorized to meet an air refueling control time, on-station time, ATC restriction, airfield or aircraft operational limitation, to accommodate mission flow during a large-scale operation, or to prevent weather delays. PICs will consider the impact on local facilities and FDP prior to coordination with C2 agencies.

5.26. Flight Progress. Use all available NAVAIDS to monitor performance of in-flight navigation systems. Immediately notify ATC of any navigation system malfunctions or degradation that effects centerline accuracy.

5.26.1. The navigator/PM will verify waypoint names, sequence, courses, altitudes, and distances in the FMS against published FLIP for all flight routings and instrument approach procedures. The navigator/PM will notify the crew when the FMS has been properly loaded and verified.

5.26.1.1. Navigators will use **Chapter 9** procedures for flight following. **(T-3)**

5.26.2. Operations in International/Territorial Airspace. (See FLIP, FCG, and AP, for further guidance).

5.27. Communications Instructions for Reporting Vital Intelligence Sightings (CIRVIS) and Other Reports. Vital intelligence sightings in flight will be reported IAW FLIP planning or FLIP Enroute Supplement. Report other incidents as indicated in AFMAN 10-206, *Operational Reporting (OPREP).*

5.28. In-flight Meals. Pilots should not eat meals at the same time and their meals should consist of different menu items. Do not activate or handle Meal Ready to Eat (MRE) Flameless Ration Heaters inside the aircraft.

5.29. Communications.

5.29.1. Crews will perform an HF radio ground check before takeoff if HF radio use is required for ATC or C2 communications in flight. **(T-3)** Establish HF contact before leaving UHF/VHF radio range. The aircraft should return to the nearest suitable support base if unable to establish HF contact with the controlling HF station and an alternate means of relaying ATC information is unavailable.

5.29.2. When required, pilots will provide ATC position reports and weather observations. If unable to contact an ATC agency, attempt to relay through the global HF stations.

5.30. In-flight Emergency (IFE) Procedures. Inform passengers and MEPs of an IFE and crew intentions when time and conditions permit.

5.30.1. Notification of C2 Agencies. When practical, after completion of the aircraft emergency action checklists and associated actions, the PIC will furnish ATC and appropriate C2 agencies with an IFE description, assistance required, intentions and any other pertinent information.

5.30.2. The PIC may initiate a CONFERENCE HOTEL when additional expertise is necessary. See local guidance for current contact information. Communications procedures are as follow:

5.30.2.1. Local Area. Use appropriate UHF or VHF frequencies.

5.30.2.2. Enroute. Attempt to establish a phone patch with the nearest C2 Center using the global HF network, UHF/VHF stations, SATCOM, etc.

5.30.2.3. Provide the following information when time permits:

5.30.2.3.1. Description of the situation to include actions taken and intentions.

5.30.2.3.2. Requested assistance.

5.30.2.3.3. Fuel on board and hours of endurance.

5.30.2.3.4. Position.

5.30.2.3.5. Altitude and flight conditions.

5.30.2.3.6. Number of personnel and Distinguished Visitors on board.

5.30.2.3.7. Qualification of all primary crewmembers.

5.30.2.3.8. Planned landing destination and ETA.

5.31. Need for Medical Assistance. When a person aboard the aircraft requires medical care, the AC will notify the station of intended landing in sufficient time so the aircraft may be met by medical personnel. Notification includes the patient's sex, approximate age, and the major complaint.

5.32. Descent. Before descent into unfamiliar areas, pilots and navigators will review appropriate terrain charts to increase aircrew situational awareness of obstructions. Crew members will only perform their primary duties for aircraft operations, monitor descent and approach, and complete required checklist items from the initial descent point until landing.

5.32.1. Weather Forecasts. The PIC is responsible for obtaining destination weather prior to initial descent.

5.32.1.1. Obtain current weather information from Automatic Terminal Information Service **(**ATIS) /Automated Surface Observing System (ASOS)/Automated Weather Observation System (AWOS), any USAF base weather station via Pilot-To-Metro Service (PMSV), Flight Watch, or FSS.

5.32.1.2. When OCONUS, contact servicing Operational Weather Squadron (OWS) IAW the FIH.

5.32.1.3. Weather forecasters are assigned to all national air space (NAS) Air Route Traffic Control Center (ARTCC) facilities and can provide weather information to enroute aircraft based on controller workload. Do not use ARTCC controllers as a primary source for weather information.

5.33. Instrument Approach Procedures.

5.33.1. Aircraft category. For FAA/NAS operations, the EC-130H is a category "C" aircraft, unless requiring higher approach airspeeds. For International Civil Aviation Organization (ICAO) or other foreign operations, category is determined by comparing computed airspeed to applicable guidance.

5.33.2. Weather minimums.

5.33.2.1. Precision approaches require a minimum of 2400 RVR, or ½ mile (800 meters) visibility with no RVR. DH is based on a minimum of 200 ft HAT/HATh.

5.33.2.2. Use the following procedures to calculate the required ceiling for published circling approaches without a minimum ceiling requirement. Add 100 ft to the published HAA and round up to the next one hundred foot value. (**Example:** for a HAA of 747 ft, the required ceiling for the approach must be at or above 900 ft.) When published circling

minimums do not include aircraft categories, use a ceiling of 500 ft above the published airport elevation and 1.5 statute mile visibility or published circling approach minimums, whichever is greater for Category C minimums. For Category D minimums, use a ceiling of 600 ft above the published airport elevation and 2 statute miles visibility or published circling approach minimums, whichever is greater.

5.33.3. Flight Instrumentation Requirements.

5.33.3.1. If full flight instrumentation is unavailable or non-operational, the aircraft is limited to a DH/MDA based on a 300 ft HAT/HATh and 4000 RVR or ¾ mile visibility (1220 meters) with no RVR.

5.33.3.1.1. ILS. Full flight instrumentation consists of dual flight displays (one flight director plus ADI repeat), complete differential pressure instruments, compass systems and heading indicators, and both pilot and copilot attitude indicators. **Note:** The EC-130H is only certified for the Category I ILS. Monitor official Stan/Eval channels for future upgrades.

5.33.3.1.2. Precision Approach Radar (PAR). Full flight instrumentation consists of complete differential pressure instruments, compass systems and heading indicators, and both pilot and copilot attitude indicators.

5.34. Maintenance. Complete the AFTO Form 781 after each flight. After landing, crew members will debrief maintenance personnel, if available, on aircraft condition, engines, avionics equipment, and all installed special equipment as required.

5.34.1. Document anytime the aircraft is flown under 1000 ft AGL over saltwater except for takeoffs and landings. Place an entry in the AFTO 781A stating, “Aircraft Subjected to Salt Spray” (state lowest altitude and duration).

5.35. Border Clearance.

5.35.1. Normal Operations.

5.35.1.1. The unit dispatching the mission is normally responsible for the border clearance of its aircraft.

5.35.1.2. When support is not available, the PIC is responsible for border clearance. When an EC-130H aircraft is on-loaded at a base without an air traffic function, the PIC is responsible for ensuring the following:

5.35.1.2.1. Crew members and passengers possess current passports and valid visas, as required.

5.35.1.2.2. Crew members and passengers have current immunization certificates (shot records).

5.35.1.2.3. Departing or entering the U.S. through a Port of Entry where border clearance can be obtained.

5.35.1.2.4. Obtaining border clearance for passengers, crew, and baggage, as required, before takeoff to a foreign area or after arrival from a foreign area.

5.35.1.2.5. Spraying the aircraft (see the FCG and **paragraph 5.36**).

5.35.2. Procedures for U.S. Entry.

5.35.2.1. Enroute, the AMT will distribute personal customs declarations (when not accomplished by passenger services) to all passengers and crew members. **(T-3)** The AMT will also brief passengers and crew members on customs regulations and prepare and compile necessary border clearance forms for the PIC's signature. **(T-3)**

5.35.2.2. Enroute, notify the C2 agency at the base of intended landing of any change in ETA to ensure that border clearance is accomplished as soon as possible after landing.

5.35.2.3. Obtain a permit to proceed, when military necessity requires the aircraft which has landed in the U.S. for customs clearance, to proceed to another U.S. base to obtain border clearance. A permit to proceed delays customs inspection of cargo, passengers, and crew until arrival at the offload station, and saves intermediate offloading and reloading normally required for customs inspection. A permit to proceed is valid only to the airport of next landing where the border clearance will be completed unless a new permit to proceed is issued by a customs official. Do not make intermediate stops between a permit to proceed issuing point and the manifested cargo destination unless required due to an emergency or when directed by the C2 controlling agency.

5.35.2.4. When an aircraft lands for a U.S. border clearance, a U.S. Customs representative will normally meet the aircraft to obtain the required documents. Do not deplane passengers, troops, or crew members unless necessary for safety or the preservation of life and property. **Exception:** AMT may deplane to perform necessary duties for ground operations. Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the U.S. and all landings required when operating on a permit to proceed or until all crew, passengers, and cargo complete final border clearance.

5.35.3. Inspections of U.S. Aircraft by Foreign Officials.

5.35.3.1. Follow USAF policy on status of military aircraft as stated in DoD FCG. In summary, this policy holds that U.S. military aircraft are immune from searches, seizures, and inspections (including customs and safety inspections) by foreign officials. Additionally, ACs should be aware of, and adhere to, any specific FCG provisions for individual countries.

5.35.3.2. If confronted with a search request by foreign authorities, aircrews should use the following procedures.

5.35.3.2.1. In most cases, search attempts may be halted simply by the PIC stating to the foreign official that the aircraft is a sovereign instrumentality not subject to search without consent of USAF headquarters or the U.S. Department of State officials 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.

5.35.3.2.2. If foreign authorities insist on conducting a search, the PIC should make every effort to delay the search until he or she can contact USAF headquarters (through MAJCOM C2) or the appropriate embassy officials. The PIC should then notify these

agencies of foreign request by the most expeditious means available and follow their instructions.

5.35.3.2.3. If foreign officials refuse to desist in their search request, pending notification to USAF headquarters or the appropriate embassy, the PIC should indicate that he/she would prefer to fly the aircraft elsewhere and request permission to do so (provided fuel, flying time, and mechanical considerations permit a safe flight).

5.35.3.2.4. If the request is denied and the foreign authorities insist on forcing their way aboard the aircraft, the PIC should state that he/she protests the course of action being pursued and that he/she intends to notify both USAF headquarters and the appropriate American embassy of the foreign action. The PIC should not attempt physical resistance, and should thereafter report the incident to USAF headquarters and appropriate embassy as soon as possible. The PIC should escort foreign authorities if the inspection cannot be avoided.

5.35.3.3. Other procedures may apply when carrying sensitive cargo or equipment. Follow these procedures and applicable portions of classified FCG supplements.

5.35.4. Exercises and Contingency Operations.

5.35.4.1. General. Certain missions, which do not transit normal Ports of Entry, require special procedures to expedite compliance with customs, public health, immunization, and agricultural requirements. A joint memorandum of understanding between these agencies and MAJCOM establishes certain procedures and waivers.

5.35.4.2. Implementation. Implementation of the agreement is not automatic. 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 U.S. on-load or off-load base, or at the foreign on-load or off-load base.

5.35.4.3. Customs Procedures.

5.35.4.3.1. Outbound: No requirement. Filing of CBP Form 7507 is not required unless directed.

5.35.4.3.1.1. Inbound: Prepare one copy of the following documents before arrival:

5.35.4.3.1.2. U.S. Customs and Border Protection (CBP) Form 7507 (Passenger list not required).

5.35.4.4. Public Health Procedures.

5.35.4.4.1. When operating from a base without a traffic officer, the PIC ensures all crewmembers and passengers are properly immunized.

5.35.4.4.2. Spray the aircraft if required.

5.35.4.4.3. Immigration Procedures.

5.35.4.4.4. Outbound: No requirements.

5.35.4.4.5. Inbound: Submit the following to the immigration inspector if carrying civilian passengers.

5.35.4.4.5.1. One copy of CBP Form 7507.

5.35.4.5. Agriculture Procedures:

5.35.4.5.1. Outbound: No requirement.

5.35.4.5.2. Inbound: Consult Border Clearance Guide.

5.35.5. Military Customs Pre-clearance Inspection Program. All crew members will follow Military Customs Pre-clearance requirements. Expect a Customs representative will meet the aircraft and collect all declarations.

5.36. Insect and Pest Control.

5.36.1. Responsibility. PICs will ensure required spraying is accomplished IAW Department of Defense FCG, or as directed by higher headquarters. Certify the spraying on CBP Form 7507, or on forms provided by the country transited. Aircraft will not be sprayed with passengers on board. The only exception is when mandated by the FCG.

5.36.1.1. 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.

5.36.1.1.1. Direct the nozzle toward the ceiling of the compartment or space being sprayed.

5.36.1.1.2. Spray spaces inaccessible from within the aircraft after completely loading fuel, baggage, cargo, and passengers, including baggage compartments, wheel wells, and other similar spaces.

5.36.1.1.3. Spray the cabin, flight deck, and other spaces accessible from within the aircraft after the crew is aboard and after closing all doors, windows, hatches, and ventilation openings. ***Caution:*** If the insecticide label directs disembarkation after use, spray before boarding crew or passengers. Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone on board.

5.36.1.2. Spray for 105 seconds unless longer periods are specified for the country being transited. **Note:** Keep used aerosol cans separate from other trash so they may be disposed of safely.

5.36.2. PIC Responsibility In-flight. When seeing any insect or rodent infestation of the aircraft in-flight, notify the destination C2 center, airfield management operations, or airport manager of the situation before landing so the proper authorities can meet the aircraft.

5.36.3. Procedure at Aerial Port of Debarkation (APOD). On arrival at an APOD, do not open cargo doors or hatches except to enplane officials required to inspect the aircraft for insect or rodent infestation.

5.37. Aircrew Debriefing. Review and evaluate overall training and/or mission performance. Each student or aircrew member should thoroughly understand the accomplished training and lessons learned from mission employment. Ensure all training is appropriately documented.

5.38. Dropped Objects. If an externally dropped object is discovered, the flight crew will:

5.38.1. Notify ATC or the controlling agency as soon as practical and include details of routing, altitude, weather, etc.

5.38.2. Notify maintenance at the first transited military station.

5.39. Cockpit Voice Recorder (CVR). If involved in a mishap or incident, after landing and terminating the emergency, pull the CVR and FDR power circuit breakers.

5.40. Aircrew Flight and Dash 21 Equipment Documentation. The PIC, or designated representative, is responsible for:

5.40.1. Before departing home station and enroute stations, ensure appropriate serviceable protective clothing, AFE, survival, and Dash 21 equipment are aboard the aircraft for the entire or remainder of the mission.

5.40.2. Before departing home station and following enroute crew changes, review AF Form 4076, *Aircraft Dash 21 Equipment Inventory*, to ensure maintenance has certified the installation of all required Dash 21 equipment, maintenance has signed the initial inspection, and configuration documents match mission requirements.

5.40.3. Before departing home station and following enroute crew changes, review, sign, and date the AFTO Form 46 to ensure AFE has certified the installation of all required protective clothing, AFE and survival equipment, and that configuration documents match mission requirements. Ensure appropriate number and type of life preservers are aboard for over-water missions.

5.40.4. Missing Equipment. Aircrew members discovering missing equipment will accomplish the following:

5.40.4.1. Make an AFTO Form 781A entry for the missing equipment. Additionally, ensure equipment removed from the aircraft at an enroute station is documented in the AFTO Form 781A.

5.40.4.2. Annotate AF Form 4076 and AFTO Form 46 in the next vacant column to indicate the quantity remaining for the item. Enter the ICAO location designator above the column's check number. Leave AF Form 4076 and AFTO Form 46 aboard the aircraft in the event of an enroute crew change.

5.40.4.3. Advise the PIC and determine whether the missing equipment should be recovered or replaced before mission continuation.

5.40.4.4. Assist in preparing reports of survey for missing equipment, as required.

5.40.4.5. When possible, advise ACC/A3TV, Air Combat Command Weapons and Tactics Branch (ACC/A3TO) (or MAJCOM AFE office), and appropriate C2 agency (or airport management) before mission continuation.

5.40.5. Additional Equipment. If undocumented additional equipment is discovered during the preflight, annotate the total quantity on the AF Form 4076 or AFTO Form 46 in the next vacant column for the item. Ensure the ICAO location designator is entered above the column's check number.

5.41. Impoundment of Aircraft. If an aircraft is involved in a serious in-flight incident, the PIC will immediately impound the aircraft after landing and contact the controlling C2 agency for further instructions.

5.42. Loose Objects in the Flight Deck.

5.42.1. Do not place items (checklists, charts, etc.) behind the condition levers or on the throttle quadrant during flight.

5.42.2. Only place soft items on the top bunk.

5.43. Wake Turbulence Avoidance. PICs will comply with takeoff and landing intervals and wake turbulence separation criteria IAW AFMAN 11-202V3 and FLIP GP when receiving instructions to follow an aircraft or when receiving a visual approach clearance.

5.44. Ordnance Procedures. Conduct the following procedures after dispensing flares or when aircraft battle damage is suspected:

5.44.1. After landing, taxi to the de-arm area or another suitable safe location.

5.44.2. Deplane the flight engineer or AMT to check all flare dispensers for hung ordnance or damage. Remain in contact with either a safety observer or the PIC at all times, either visually or over interphone. **Note:** ALE-47 flare squibs that fail to fire are not considered hung ordnance.

5.44.3. If hung ordnance is found (identified by a protruding or partially ejected flare cartridge) the aircraft will remain in the de-arm area until Explosive Ordinance Disposal (EOD) personnel meet the aircraft and clear all hung ordnances. Aircrew should remain onboard aircraft unless another emergency requires egress for crew safety.

5.44.4. The aircraft can proceed to parking if hung ordnance is not found.

5.45. Classified Equipment and Material.

5.45.1. Equipment. When classified equipment is onboard, ensure the C2 center or airfield management operations office is aware of the requirement for aircraft security IAW **Chapter 6**. At bases without USAF jurisdiction, ensure the aircraft and equipment are protected. DoDM 5200.01V1_DAFMAN16-1404V1, *Information Security Program: Overview, Classification, and Declassification*, provides specific guidance concerning the security of classified equipment aboard aircraft. For classified aircraft components which cannot be removed and stored, lock and seal the aircraft. If available, use security forces to guard the aircraft; otherwise, use guards employed by the host country for flight line/airport area control. Zeroize navigation and radio equipment if left unattended.

5.45.1.1. DAFI 31-101, *Integrated Defense (ID)*, and **Chapter 6** define COMPASS CALL aircraft security requirements. Security requirements should also be specified in the deployment order (DEPORD) for deployed operations.

5.45.1.2. The security requirements for an aircraft possessing Sensitive Compartmented Information (SCI) material are the same as a ground Sensitive Compartmented Information Facility (SCIF).

5.45.2. Material. Ensure COMSEC and other classified materials are turned in at destination and receipts are obtained for COMSEC and classified material. The on-site C2 center may provide temporary storage for COMSEC and other classified materials during enroute, turnaround, and crew rest stops. Prior to depositing classified material for over-night storage, the PIC must ensure the facility is authorized for classified storage equal to the material's classification level and on-site personnel are qualified to handle the classified material being

deposited. If a storage facility is not available, the aircraft safe and gun storage box may be used for classified material up to and including SECRET. Encrypted COMSEC will only be transferred to authorized DoD personnel. The PIC and MCC will ensure that all material, discussions, and display screens are limited to the clearance level of escorted personnel.

5.45.3. **Mode 5 Procedures.**

5.45.3.1. Aircrews will ensure Mode 5 is operable when required for mission accomplishment. Aircrews will conduct a Mode 5 operational ground test (ground test assets permitting) before overseas deployment or as specified in the OPORD and/or contingency/exercise tasking.

5.45.3.2. Attempt to fix an inoperable Mode 5 before takeoff. Do not delay takeoff or cancel a mission for an inoperable Mode 5 except when planning to transit an area where safe passage procedures are implemented.

5.45.3.3. Conduct a Mode 5 operational check in-flight on all missions departing the CONUS. Aircrews can request a Mode 5 interrogation check with North American Aerospace Defense Command (NORAD) on UHF frequency 364.2.

5.45.3.4. Aircraft with inoperable Mode 5 may continue to their intended destination. Repairs will be accomplished at the first destination where equipment, parts, and maintenance technicians are available. In theaters where safe passage is implemented, aircraft will follow procedures for inoperable Mode 5 IAW the applicable airspace control order or Air Tasking Order (ATO) and/or SPINS.

5.45.3.5. Mode 5 operational checks on the ground or in-flight are a mandatory maintenance debrief item. The PIC will annotate successful and unsuccessful interrogations of the Mode 5 in the AFTO Form 781A.

5.45.4. When required for mission accomplishment, aircrews will carry COMSEC equipment and documents for Mode 5 operation IAW SPINS. Crews will contact their local COMSEC manager for guidance before departure for destinations without COMSEC storage facilities. **(T-3)**

5.45.5. Emergency Destruction. If possible, destroy/damage classified material and/or equipment prior to a crash landing or bailout.

5.45.6. If ground egress is required and classified material cannot be secured, the PIC or designated representative will obtain the names and telephone numbers of all un-cleared personnel who boarded the aircraft. If SCI material was inadvertently disclosed, contact the Special Securities Officer (SSO) to conduct an inadvertent disclosure briefing to all members exposed to SCI.

5.46. AMT and Flight Engineer Confidence Activities.

5.46.1. Confidence activities is defined as the opening of paratroop doors or cargo ramp and door in flight. They are required for AMT and flight engineer training for emergency procedure preparation. Conduct confidence activities IAW Inflight Door Opening Checklist of TO 1EC-130H-1. Only AMTs and flight engineers are permitted to accomplish the confidence activities. All other aircrew members will remain seated with their seatbelt securely fastened.

5.46.2. Confidence activities will only be conducted for syllabus training, continuation training, flight evaluations and/or emergencies.

5.46.3. A safety observer is required for all confidence activities. Safety observers will also don and appropriately fit a restraint harness. **Note:** Do not use the flight deck restraint harness for confidence activities.

5.46.4. For preflight fitment of the restraint harness, adjust the lifeline of the restraint harness to allow mobility only to the paratroop door. After completion of the confidence activity, readjust lifeline of the restraint harness to allow mobility only to the paratroop door. **Warning:** Do not open aircraft ramp and door and paratroop doors at the same time. **Warning:** Except for an emergency or contingency situation that threatens the survivability of the aircraft and/or crew, do not disconnect or lengthen the restraint harness to a point that would allow the crew member to fall outside the aircraft.

5.46.5. Do not wear a parachute in lieu of a restraint harness during any confidence activity training or evaluation.

Chapter 6

AIRCRAFT SECURITY

6.1. General. This chapter provides guidance for aircraft security and unlawful seizure of aircraft. EC-130H aircraft are normally Protection Level 3 assets, but may become Protection Level 2 under certain conditions. See DAFI 31-101 for definitions and designations of Protection Levels.

6.2. Security. See AFI 13-207-O, *Preventing and Resisting Aircraft Piracy (Hijacking)(FOUO)*, AFI 10-701, *Operations Security*, and DAFI 31-101, for requirements for protection of aircraft in transient status at U.S. and foreign bases.

6.3. Security Procedures.

6.3.1. Forward Operating Location (FOL) Security. DETCOs or Advanced Echelon (ADVON) personnel will make security arrangements at FOLs and will comply with the minimum requirements IAW DAFI 31-101.

6.3.2. Enroute Security. Aircrews will receive a threat assessment and security capability evaluation briefing at home station and receive updates at enroute C2s. If necessary, assess the situation and perform the following actions:

6.3.2.1. Request area patrol coverage from local security forces. If local authorities request payment for this service, consult appropriate C2 channels.

6.3.2.2. Direct armed aircrew members to remain with the aircraft and maintain surveillance over aircraft entrances and activities in the vicinity of the aircraft. Acquire a means to report suspicious or hostile activity to security forces, if available.

6.3.2.3. If the PIC determines airfield security is inadequate and the safety of the aircraft is in question, (e.g., local security forces is not sufficient or unavailable and the crew is not augmented with security forces) the PIC may waive crew duty time limitations and depart as soon as possible for a base where adequate security is available. If departure is not possible, the aircrew must secure the aircraft to the best of their ability. Crew rest requirements are subordinate to aircraft security when the airframe/equipment may be at risk. Request security assistance from the nearest DoD installation, U.S. embassy, local military, or law enforcement, as appropriate.

6.3.2.4. If the PIC determines the aircraft must be locked and sealed to detect unauthorized entry, use the aircraft lock, and secure the hatches, windows, and doors in a manner that will identify unauthorized entry. Prior to departing the aircraft, wipe off the immediate area surrounding the lock and latches to aid an investigation if a forced entry is discovered upon return. Coordinate procedures with local base operations aircraft servicing while the crew is away. Report any unauthorized entry or tampering to the Office of Special Investigation, security forces and/or local authorities, and the C2 agency. Thoroughly inspect the aircraft prior to flight.

6.4. Arming of Aircrew Members. Due to the nature of the EC-130H mission, crews are not normally armed enroute to a FOL. However, weapons may be carried on the aircraft for use in theater. If the ECG/CC determines the nature of the deployment warrants the aircrew to carry weapons enroute, the follow the procedures will be utilized.

6.4.1. Weapons Issue (Enroute). When required by ROE, ATO, or SPINS, obtain weapons and ammunition from the weapons storage area. Crew members will be armed IAW AFI 31-117, *Arming and Use of Force by Air Force Personnel*, and MAJCOM directives. Present a current AF Form 522, *USAF Ground Weapons Training Data*, for weapon issue. The same weapon is reissued until the mission terminates. If an armed aircrew member leaves the crew enroute, transfer the weapon to another authorized aircrew member using AF Form 1297, *Temporary Issue Receipt*.

6.4.1.1. Load and unload weapons at approved clearing barrels if available. To transfer loaded weapons to another aircrew member, place the weapon on a flat surface. Do not use hand-to-hand transfer.

6.4.1.2. Do not wear weapons off the flight line except to and from the armory and other facilities associated with aircrew activities (e.g., base operations, fleet service, cargo and passenger terminals, flight line cafeteria or snack bar). Crew members will maintain positive control of the weapon at all times.

6.4.1.3. Arm aircrew members prior to preflight duties. When no passengers are aboard and after a satisfactory stowaway check has been conducted, weapons may be stored in the gun box in flight. Aircrew members will rearm before landing. Weapons will remain loaded when stored in the gun box.

6.4.1.4. Store weapons in the most secure facility available prior to crew rest (e.g., base or civil law enforcement armory). If a weapons storage facility is unavailable, secure firearms and ammunition in the aircraft. If the aircraft is not equipped with a gun box, leave the weapons in the most secure and least visible location on the aircraft. Attempt to seal the weapons with a tamper-evident seal (e.g., boxcar seal) and maintain the seal number. Lock and seal the aircraft doors when leaving the aircraft.

6.4.2. Contingency Missions.

6.4.2.1. Crewmembers will be issued weapons with their survival equipment IAW theater directives prior to combat/combat support sorties. The Sq/CC or DETCO, in conjunction with AFE personnel, will establish procedures for weapons issue. Additionally, deployed leadership will develop in-garrison weapons issue/arming procedures commensurate with current force protection procedures. **(T-3)**

6.5. Preventing and Resisting Hijacking. Refer to AFI 13-207-O for detailed guidance. Security operations at deployed locations are normally sufficient to deter aircraft piracy. Aircrew should always remain vigilant and report any unusual activity to security forces.

6.6. Armed Passengers. EC-130H aircraft do not normally carry passengers. Therefore, the risk of hijacking is further reduced. While onboard, passengers do not normally possess weapons or ammunition. Exceptions include special agents and guards of the Secret Service or State Department or other individuals specifically authorized to carry weapons. Take every precaution necessary to prevent an accidental weapons discharge.

6.6.1. Passengers or deadhead crewmembers will not retain custody of ammunition on an aircraft and will turn it in to the troop commander or PIC. **(T-3)** Passengers authorized to carry weapons may carry unloaded weapons and ammunition aboard the aircraft during combat operations.

6.6.2. If guards or couriers need to clear their weapons, the PIC will ensure the individual:

6.6.2.1. Moves to a safe, clear area at least 50 ft from any aircraft, equipment, or personnel before un-holstering or unslinging their weapons.

6.6.2.2. Clears weapons IAW standard safety procedures.

6.7. Force Protection. Crews will always remain alert for possible terrorist activities. Reference AFTTP 3-4, *Airman's Manual*, Chairman Joint Chiefs of Staff Guide 5260, *A Self-Help Guide to ANTITERRORISM*, and DoDI O-2000.16V1_DAFI 31-145-O, *Antiterrorism (AT) Program Implementation*, for force protection measures.

Chapter 7

OPERATIONAL REPORTS AND FORMS

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

7.2. AF Form 457, *USAF Hazard Report* (AFI 91-202, *The U.S. Air Force Mishap Prevention Program*). AF 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.

7.3. AF Form 651, Hazardous Air Traffic Report (HATR). The Air Force HATR program provides a means for personnel to report all near midair collisions (NMAC), TCAS resolution advisories requiring the aircraft to deviate from assigned course/altitude, alleged hazardous air traffic conditions, or NAVAIDS, FLIP or published directions/instructions that contributed to a hazardous situation. Use information in HATR reports only for mishap prevention.

7.3.1. AFI 91-202 and DAFMAN 91-223, *Aviation Safety Investigations and Reports*, list HATR reportable incidents and procedures.

7.4. AF Form 711B, USAF Mishap Report Worksheet (DAFI 91-204).

7.4.1. Responsibilities. Notify the appropriate authorities of any mishap involving aircraft or crew. When notified, appropriate authorities initiate investigative and reporting actions IAW DAFI 91-204, *Safety Investigations and Reports*. **Note:** Do not attempt to classify a mishap.

7.4.2. Reportable Mishaps.

7.4.2.1. Report damage to the aircraft, or injury to the crew or passengers; also report any damage or injury to another organization’s equipment or personnel resulting from the movements or actions of an aircraft or crew.

7.4.2.2. Report the following occurrences:

7.4.2.2.1. A physiological episode is a physiological reaction, near accident, or hazard in-flight due to medical or physiological reasons. This includes:

7.4.2.2.1.1. Aircrew or passenger decompression sickness from evolved gas (the bends, chokes, skin, neurological, or neurocirculatory manifestations).

7.4.2.2.1.2. Aircrew loss of consciousness or incapacitation in-flight.

7.4.2.2.1.3. Aircrew hypoxic (altitude) hypoxia (suspected, probable, or definite).

7.4.2.2.1.4. Aircrew trapped gas disorders (ear, sinus, teeth, or abdominal).

7.4.2.2.1.5. Aircrew or passenger symptoms or health effects caused by toxic, noxious, or irritating materials such as smoke, fumes (including carbon monoxide) or liquids.

7.4.2.2.1.6. All events during which a crewmember executed any portion of an emergency checklist in response to toxic smoke/fumes/liquid exposure.

7.4.2.2.1.7. When the aircraft unintentionally strikes another object regardless of damage cost or need for repairs.

7.4.2.2.1.8. Loss of cabin pressurization that requires executing an emergency checklist.

7.4.2.2.1.9. Aircrew G-induced loss of consciousness.

7.4.2.2.1.10. Aircrew spatial disorientation of any type (including visual illusion) resulting in an unusual aircraft attitude.

7.4.2.2.1.11. Any medical condition, event or physical injury directly resulting from performance of flight activities that an aeromedical professional determines is significant to the health of the aircrew.

7.4.2.2.1.12. Suspected Laser Exposure. If exposed to a laser, the AC notifies appropriate C2, intelligence, safety and medical agencies as soon as possible. Aircrew who suspect exposure to laser radiation from either friendly or hostile sources should report to the FS's office or nearest emergency room where individual can be examined by an ophthalmologist immediately upon landing. Reference AFI 48-139, *Laser and Optical Radiation Protection Program.*

7.4.2.2.1.13. Hyperventilation.

7.4.2.2.1.14. Death by natural causes of any aircrew member during flight.

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

7.4.2.2.1.16. Alcohol and hangover (crew only).

7.4.2.2.1.17. Illness (both acute and pre-existing), including food poisoning, dehydration, myocardial infarction, seizure, and so forth. **Note:** In the event of a physiological episode, all involved aircrew members will report to a FS as soon as practical and request that an AF Form 711B be accomplished.

7.4.2.2.2. Emergency, precautionary, or inadvertent engine shutdown at any time after taxi until normal engine shutdown. Report any loss of thrust sufficient to prevent maintaining level flight at a safe altitude. **Note:** Intentional shutdowns for training and FCFs are excluded; however, report failure to restart, using the criteria above.

7.4.2.2.3. Unselected propeller reversal.

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

7.4.2.2.5. All un-commanded flight control inputs whether it results in a dangerous situation or not. Report autopilot faults if, in the opinion of the investigator, the autopilot would have put the aircraft in a dangerous situation.

7.4.2.2.6. Structural failure of critical landing gear components. Malfunction of landing gear when difficulty is experienced using emergency system or procedures.

7.4.2.2.7. In-flight loss of all pitot-static instrument indications or both primary and standby attitude indicators.

7.4.2.2.8. In-flight fires, massive fuel leakage in an engine bay, all gear-up landings.

7.4.2.2.9. Spillage or leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores that creates a hazardous condition or an airborne emergency divert.

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

7.4.2.2.11. 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.

7.5. Petroleum, Oil and Lubricants (POL)—Aviation Fuels Documentation. This section prescribes aviation POL (AVPOL) procedures that ensure correct documentation, form and invoice processing, and program supervision. Reference AFMAN 11-202V3. 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 U.S. government, state, local law enforcement, and some foreign government aircraft. All PICs should plan to use the AIR Card. In most cases, there should not be fees when refueling at non-Defense Logistics Agency Energy (DLA Energy) contract locations. The MSC card is accepted at approximately 4,800 locations worldwide. It replaces the Standard Form (SF) 44, *Purchase Order-Invoice Voucher (Storage Safeguard Form)*, at locations that accept the MSC card.

7.5.1. Responsibilities. Aircrew and maintenance personnel must be familiar with AVPOL procedures and documentation requirements of this chapter. Purchasers may be financially liable for improper use of the AIR Card.

7.5.2. Refuel/de-fuel USAF aircraft at DoD locations to the max extent possible. If DoD service is not available, purchase fuel from other source(s) in the following priority:

7.5.2.1. Defense Logistics Agency Energy or Canadian into-plane contracts.

7.5.2.2. Foreign government air forces. **Note:** Historically, the most reliable source of contract servicers has been **https://aircardsys.com** or alternatively **https://www.airseacard.com**.

7.5.2.3. Open market AIR Card purchases to include SHELL™ International Trading Company (SITCO) agreement.

7.5.3. DD Form1896, *DoD Fuel Identaplate*. The DD Form1896 will be utilized at military installations to purchase fuel unless automated data capture (ADC) equipment is installed. The PIC or designated representative will complete the form, log the purchase and place a copy inside the AF Form 664, *Aircraft Fuels/Ground Servicing Documentation Log*.

7.5.4. Refueling at Locations other than USAF Bases.

7.5.4.1. DD Form 1898, *Energy Sales Slip*. This form is used to record the aviation fuels transaction (issue or defuel) at other DoD locations, including into-plane contract locations. Log and place the DD1898 inside the AF Form 644. The PIC or designated representative will complete this form. **Note:** If the contractor insists on a unique invoice along with the DD 1898, annotate the vendor's invoice with "DUPLICATE DD1898 ACCOMPLISHED".

7.5.4.2. AF Form 664 is a tool to log and store all AVPOL transaction forms. Record all off station transactions on the front of the form and insert the original form inside the envelope. Turn in the AF Form 664, with supporting forms, to maintenance debriefing or as directed by local procedures. The PIC or designate representative will complete this form when appropriate.

7.5.4.3. 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 when refueling at Canadian airfields with a Canadian National Defense Contract (CNDC). Use the AIR Card for fuel purchases at Canadian airports without a CNDC, and for ground handling services at all Canadian airports.

7.5.4.4. Use host country forms to effect purchases at foreign military airfields, including replacement-in-kind locations. Hand scribe information from DD Form 1896 on the local form. Log and place a copy inside the AF Form 664.

7.5.4.5. SF 44, *U.S. Government Purchase Order-Invoice-Voucher*. This may be used to purchase fuel, ground services and/or other authorized products when no MSC card contract is in place.

7.5.4.5.1. SF 44 fuel purchases where Fixed Base Operations (FBO) agrees to invoice DLA Energy for payment.

7.5.4.5.1.1. The aircrew presents the SF 44 as the purchase invoice when an FBO refuses to accept the MSC card. The aircrew completes the SF 44 and attaches 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 are documented on a separate SF 44 from ground services and other authorized products since the FBO invoices DLA Energy for the fuel and the customer for non-fuel product and services.

7.5.4.5.1.2. Copies 1 and 2 of the SF 44 are provided to the FBO. Copy 1 of the SF 44 and one copy of the FBO commercial invoice, if applicable, is forwarded to the following address by the FBO to bill/invoice DLA Energy: DLA Finance Energy F8-FR, 1525 Wurtsmith Street, Building 5730, JBSA-Lackland, TX 78236 or email: **DESCSALocalPurchase@dla.mil**.

7.5.4.5.1.3. Copy 3 of the SF 44 and one copy of the FBO commercial invoice, if applicable, is provided to the aircrew. Log and place a copy inside the AF Form 664. Aircrews 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). **Note**: AIR Card. The AIR Card is a commercial credit card which allows aircrews to purchase aviation fuel, fuel related supplies, and/or ground services at commercial airports where no DoD/Canadian into-plane contracts exist. Accepted at over 4200 locations, it is intended to replace the SF 44 at locations that accept the AIR Card. All AF aircraft are issued an AIR Card.

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

7.5.4.5.2.1. Cash fuel purchases are only authorized when either the Electronic Foreign Clearance Guide requires cash payment or when FBO locations outside the

U.S. and U. S. Territories refuse the MSC card and/or SF 44 invoicing process. Aircrews will employ the following procedures when required to pay cash for aviation fuel purchases. **Note:** These procedures do not apply to non-fuel products or services.

7.5.4.5.2.1.1. The aircrew will obtain cash from a local DoD Finance source that is charged to an approved Treasury suspense account prior to home station departure.

7.5.4.5.2.1.2. Aircrews complete the SF 44 and obtain the FBO fuel vendor annotation in block 11 of the form to confirm total cash amount. Sign and date blocks 20 and 21. Log and place a copy inside the AF Form 664. Aircrew will return unused cash to their local DoD Finance source upon return to home station.

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

7.5.4.5.3.1. Complete a separate SF 44 for non-fuel purchases. Provide the FBO copies 1 and 2 of the SF 44. The FBO uses 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 reflects the organization name and address of the finance office responsible for payment to the FBO. The purchasing organization makes payment to the FBO upon receipt of the invoice from the FBO. Log and place a copy inside the AF Form 664.

7.5.4.5.4. 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.

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

7.5.4.5.6. Present the DD Form 1896 for purchases at SITCO agreement locations. Make certain the invoice includes date of transaction, grade of product, quantity issued/defueled, unit of measure, and signature of AF member who accepted product. If vendor also requires completed SF 44 write statement, "AF FORMS EXECUTED on vendor's invoice". Log and place a copy inside the AF Form 664.

7.6. AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance*. Use AFTO Form 781H to record POL actions for specific airframe IAW applicable directives. The PIC or designated representative completes the form and turns it in to maintenance debrief.

Chapter 8

AIRCREW OPERATIONS IN CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND HIGH-YIELD EXPLOSIVE THREAT ENVIRONMENT

8.1. Overview. The proliferation of Chemical, Biological, Radiological, Nuclear and High-Yield Explosive (CBRNE) weapons and the means to deliver them present serious security threats to all airborne operations. See AFMAN 11-301V2, *Management and Configuration Requirements for Aircrew Flight Equipment (AFE)*, for general aircrew operational guidance and AFMAN 10-2503, *Operations in a Chemical, Biological, Radiological, and Nuclear (CBRNE) Environment* for general CBRNE discussion.

8.2. CBRNE Passive Defense Measures. Passive defense measures are those activities conducted to negate, contain, and manage the effects of CBRNE attack. Passive defense measures include pre-, trans-, and post-attack actions designed to mitigate the CBRNE threat through contamination avoidance, protection, and contamination control.

8.2.1. In-flight Divert. When advised that a destination airfield is under CBRNE attack or has been contaminated, the aircrew will divert to an uncontaminated airfield, if possible. Authority to land at a contaminated airfield is specified in the controlling OPORD.

8.2.2. Survival Launch. If on the ground during an attack warning, make every reasonable effort to survive provided the aircraft has sufficient fuel and unrestricted/safe access to the runway. In practice, this option may only be practical for aircraft that have just landed or aircraft at or near the end of the runway. If launch is not possible, shut down engines and avoid running environmental control systems. Close aircraft doors/hatches/ramps, don IPE) and seek personal protective cover on the base. For missile attacks when time does not permit using base facilities, remain in the sealed aircraft for a minimum of one-hour after the attack and/or follow host base guidance.

8.2.3. Individual Protective Equipment (IPE). The current in-flight protective gear issue for aircrew members is listed in AFMAN 11-301V2 and AFMAN 11-301V3, *Aircrew Flight Equipment (AFE) Contingency Operations and Planning*.

8.3. Ground Operations.

8.3.1. Establishing the Threat Level. Aircrews should monitor C2 channels to ensure they receive the latest information concerning the destination's alert condition. Diversion of aircraft to alternate "clean" locations may be required, unless operational necessity otherwise dictates. The theater C2 agency (normally through the controlling OPORD) directs aircrew pre-exposure activities.

8.3.2. Crew Rest Procedures. Operational necessity may require the aircrew to rest/fly in a contaminated environment. If the mission is not being staged by another aircrew or pre-flight crews are not available, the aircrew may pre-flight, load, and secure the aircraft prior to entering crew rest. The departing aircrew will perform necessary crew preparations and pre-flight briefings. If possible, aircrew transport should be provided in a covered vehicle. To prevent spreading contamination to personnel and/or the aircraft, aircrews should avoid pre-flighting the aircraft prior to departure. As aircrews proceed to fly, they will require assistance from ground support personnel in removing their aircrew protective over cape and over boots prior to entering the aircraft.

8.3.3. Mission Planning. Mental preparation is key for aircrews facing the dangers of CBRN weapons. Thorough flight/mission planning is required. PICs should emphasize ACDE wear, crew coordination, CBRNE hazards and countermeasures, in-flight divert, plans for on-load/off-load in the event of a ground attack, and plans for the return leg in the event of aircraft contamination. Alternative scenario plans should also be considered in the event mission-oriented protective posture (MOPP) conditions change.

8.3.4. Oxygen Requirements. Operating a contaminated aircraft may increase oxygen requirements. T.O. 1EC-130H-1 contains charts of oxygen consumption if operating at cabin altitudes above 10,000 ft MSL.

8.3.5. Donning Equipment.

8.3.5.1. Aircrew Chemical Defense Ensemble (ACDE). Aircrew don ACDE based on the alarm condition (See AFTTP 3-4). Use the "buddy dressing" procedures and refer to AFE-provided donning checklist and T.O. 1EC-130H-1 to ensure proper wear. When wearing the ACDE, Atropine and 2 PAM Chloride auto injectors will be kept in the upper left ACDE pocket. If the integrated survival vest/body armor is worn, the Atropine and 2 PAM Chloride auto injectors may be kept in the lower right flight suit pocket. This standardized location enables personnel to locate the medication should an individual be overcome by chemical warfare agent poisoning.

8.3.5.2. M-9 Paper. M-9 paper on the flight suit facilitates detection of liquid chemical agents and Aircrew Contamination Control Area processing. M-9 paper should be placed on the flight suit prior to entering the CBRN threat area or when an Alarm Yellow or higher has been declared.

8.3.5.3. PIC responsibilities and Brief when Inbound to a CBRN. When inbound to a CBRN threat area, prior to descent, the PIC will ensure crew and passengers don appropriate protective equipment IAW arrival destination's MOPP level and brief aircrew operations in the CBRN threat area. As a minimum, include the following in this briefing: flight deck isolation, oxygen requirements, air conditioning system requirements, IPE requirements, ground operations and MOPP levels. Aircrew members determine if the wear of the integrated survival vest/body armor and LPUs restrict dexterity and mobility to the point that it becomes a safety issue. If the aircrew deems the equipment to create a safety of flight concern, then the items may be pre-positioned (instead of worn) on the aircraft to be readily available to the aircrew.

8.3.6. On-load and Off-load Considerations. Exercise extreme care to prevent spreading contamination to the aircraft interior during ground operations, particularly to the flight deck area. Reduce the number of personnel entering the aircraft. Do not place contaminated engine covers, safety pins and chocks in the aircraft unless sealed in clean plastic bags and properly marked IAW T.O. requirements. Aircrew members entering the aircraft will remove plastic over boots and over cape portions of the aircrew ensemble and ensure flight/mobility bags are free of contaminants and placed in clean plastic bags. Prior to entering the aircraft all personnel should implement boot wash/decontamination procedures. Aircrew exiting aircraft into a contaminated environment will don plastic over boots and over cape prior to leaving the aircraft.

8.3.7. Communications. Conducting on-/off-loading operations, while wearing the complete ACDE, complicates communications capability. Use the mini-amplifier/speaker or the aircraft public address system and augment with flashlight and hand signals, as required.

8.3.8. 10-Foot Rule. The 10-foot rule was developed to provide guidance for protecting personnel using or handling contaminated resources (such as pallets) or working in locations with materials that might retain a residual chemical. The 10-foot rule embodies a safety factor that goes beyond current Office of the Secretary of Defense (OSD) guidance (which allows removal of IPE whenever detectors no longer detect a chemical agent vapor hazard). There are two phases associated with the 10-foot rule.

8.3.8.1. Initial Phase. During the initial phase, personnel remain in MOPP 4 whenever they stay within 10ft of the contaminated equipment for more than a few seconds. This MOPP level provides personnel the maximum protection from the chemical agent as it transitions from a contact and vapor hazard to a vapor hazard only.

8.3.8.2. Follow-on Phase. In the follow-on phase, personnel use gloves (e.g., leather, rubber, cloth) when operating on or handling the contaminated equipment. Although a contact hazard is unlikely, relatively small amounts of the agent may still be present. The use of gloves ensures that unnecessary bare skin contact with agent residue is avoided.

8.3.8.3. **Table 8.1** shows "estimated" times associated with initial and follow-on phases of the 10-foot rule. To simplify response processes, commanders may choose to use the worst case scenario as the foundation for all 10-foot rule actions, e.g., 24 hours for the initial phase and all periods of time greater than 24 hours for the follow-on phase.

Table 8.1. "10-Foot Rule" Time Standards.

"10 Foot Rule" Time Standards (See Note)		
Agent	**Initial Phase**	**Follow-on Phase**
HD	0-12 hrs	Greater than 12 hrs
GB	0-12 hrs	Greater than 12 hrs
GD, GF, GA	0-18 hrs	Greater than 12 hrs
VX, R33	0-24 hrs	Greater than 24 hrs
Note: Rule is based on expected contamination on an airbase following a chemical attack. Adjust times if agent concentration is higher than expected.		

8.3.8.4. Additional Threats. Blood agents damage mask filters. All personnel will change mask filters at the earliest possible opportunity after a blood agent attack. **Exception:** Filters installed in aircrew CWU-80/P filter packs can only be removed and replaced by AFE personnel.

8.4. Flight Operations.

8.4.1. Outbound with Actual/Suspected Chemical Contamination. Air washing is a useful in-flight decontamination technique for removing most of the liquid agent from aircraft metal surfaces. However, vapor hazards may remain in areas where the airflow characteristics

prevent complete off-gassing (e.g., wheel wells, flap wells, rivet and screw heads, joints). Flights of at least 2 hours are recommended, and lower altitudes are more effective than higher altitudes. Fly with the aircraft configured (gear and flaps extended) as long as possible to maximize the airflow in and around as many places as possible. Once airborne with actual/suspected vapor contamination, purge the aircraft for 2 hours using Smoke and Fume Elimination procedures. To ensure no liquid contamination exists, conduct a close inspection of aircrew, passenger ensembles, and cargo using M-8 and M-9 detection paper. Detection paper only detects certain liquid agents and does not detect vapor hazards. Above the shoulder ACDE should only be removed if there is absolutely no vapor hazard. Be advised that residual contamination (below the detectable levels of currently fielded detection equipment) may be harmful in an enclosed space. The aircrew must take every precaution to prevent spreading of liquid contaminants, especially on the flight deck area. The best course is to identify actual/suspected contamination, avoid those areas for the remainder of the flight, and keep the cargo compartments cool. If an aircrew member or passenger has been in contact with liquid contaminants, all personnel aboard the aircraft will stay in full ACDE/ground crew ensemble (GCE) until processed through their respective contamination control area. Upon arrival, park the contaminated aircraft in an isolated area and cordoned to protect unsuspecting ground personnel.

8.4.2. Documenting Aircraft Contamination. When it is suspected or known that an aerospace vehicle or piece of equipment has been contaminated with a radiological, biological or chemical contaminant, a Red X is entered and an annotation is made in historical records for the lifecycle of the equipment. Before clearance of a Red X for contamination, consult Bioenvironmental Engineer or higher DoD authority.

8.4.2.1. Limits of Decontamination. Complete decontamination of aircraft and equipment may be difficult, if not impossible, to achieve. Crews must restrict formerly contaminated assets to DoD-controlled airfields and not released from US government control. **(T-3)**

8.4.3. Communicating Down-line Support. Pass aircraft contamination information through command and control channels when inbound. This information is used to determine if a diversion flight is required or decontamination teams are needed. Report the physical condition of any crew/passengers who are showing agent symptoms and whether they are wearing chemical defense ensembles.

Chapter 9

NAVIGATION PROCEDURES

9.1. General. This chapter contains EC-130H navigation procedures and forms. It is used in conjunction with procedures and requirements set forth in AFMAN 11-202V3, and FLIP. Since airspace and associated navigational equipment capabilities are rapidly evolving, aircrew need to maintain an in depth knowledge of current requirements/policies.

9.1.1. General instructions for completion of AF Form 4116 are provided in this chapter. MAJCOM-approved CFPs may be used as a substitute for AF Form 4116.

9.1.1.1. The AF Form 4116 was developed to provide a tool for all possible missions of the C-130. Most missions do not require all sections of the form. For conservation purposes, navigators are encouraged to print and use only the AF Form 4116 sections required for their mission.

9.1.1.2. The 55 ECG Form 33, *EC-130H Mission Log*, may be used along with a Navigator CFP in lieu of an AF Form 4116. In-flight procedures and calculations on the 55 ECG Form 33 correspond to the same sections on the AF Form 4116, and all procedures and regulations in this instruction apply to completing the 55 ECG Form 33.

9.2. Mission Planning Procedures.

9.2.1. Prior to departure, both the AC and navigator will verify routing, altitude and fuel load. Use the chart updating manual or host nation chart updating product to update charts within 10 NM of the approach, departure, emergency, and divert bases for airfields without a DoD or MAJCOM-approved approach. FalconView® or Joint Mission Planning System (JMPS) generated charts with updated Electronic Chart Update Manual (ECHUM) overlays fulfill this requirement. Navigators will provide the copilot with a copy of the flight plan to verify routing and aid in position reporting.

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

9.2.3. A MAJCOM-approved CFP, AF Form 70, or AF Form 4116 is required for all flights.

9.2.4. A fuel plan is required for all flights.

9.3. Flight Planning.

9.3.1. Most entries on the AF Form 4116 and 55 ECG Form 33 are self-explanatory or explained below.

9.3.1.1. A/B - Ahead or Behind. Compare ETA based on the original flight plan to actual time of arrival (ATA) at each waypoint. Record the difference in this column. If the flight plan changes in-flight, non-applicable ATA spaces may be left blank.

9.3.2. When an alternate destination is required**,** use a flight planning line to indicate, at a minimum, the name of the alternate and the time, course, and distance to the alternate.

9.3.3. Aircrews may use JMPS or any other MAJCOM-approved flight planning program.

9.3.4. Fuel Planning. Accomplish fuel planning IAW T.O. 1C-130H-1-1 and **Chapter 13** of this volume. CFP enroute fuel may be used for fuel analysis in lieu of enroute fuel derived

from T.O. 1C-130H-1-1. AF Form 4116 fuel analysis blocks may be reproduced on the CFP printed format.

9.4. Flight Charts.

9.4.1. The navigator flight follows all missions using a suitable plotting chart (Joint Navigational Chart (JNC), Joint Navigational Chart High Altitude (JNCA), Global Navigational Chart (GNC), or Operational Navigational Chart (ONC)). Navigators use the FalconView® moving map on Digital Mapping Interface System (DMIS) or laptop computer for situational awareness only; these tools do not replace printed charts.

9.4.2. Show the following items on the chart:

9.4.2.1. Navigator's name and coordinated universal date. Annotate chart number and edition on a stripped chart.

9.4.2.2. Annotate flight plan course line and waypoints (if not pre-labeled) with waypoint number, identifier, radial and Distance Measuring Equipment (DME), or latitude and longitude.

9.4.2.3. Annotate suitable emergency airfields. Optimum emergency airfields are located within 50 NM of the intended route. Refer to GDSS2 (when available)/ASRR for suitability.

9.4.2.4. Annotate portions of Air Defense Identification Zones/Flight Information Region boundaries (if not depicted accurately) pertinent to the route.

9.4.2.5. Annotate the approximate location of the ETP.

9.4.2.6. Planned air refueling track and exit point.

9.4.3. Plot each fix or position along with the time at that position. Use standard symbols from AFPAM 11-216, *Air Navigation*.

9.4.4. For conservation purposes, flight charts for high level missions may be reused whenever such reuse would not affect plotting accuracy of fixes or position determination.

9.4.5. FalconView® or JMPS produced Lambert-Conformal charts may be used.

9.5. In-Flight Procedures.

9.5.1. The navigator will monitor the primary command radio unless otherwise directed. The navigator will record ATC clearances and monitor the read back. This normally includes all ATC instructions involving departure, enroute, and approach procedures. This procedure is not necessary when ATC instructions require immediate execution by the pilot, or when such action interferes with the performance of other time-sensitive navigator duties.

9.5.2. The navigator will monitor the aircraft's position during all departures and approaches using an appropriately scaled chart (ONC, Tactical Pilotage Chart (TPC), Joint Operations Graphic (JOG), etc.). While IMC and/or at night the navigator will use all available NAVAIDS (including aircraft radar) to ensure the aircraft remains clear of all obstructions.

9.6. Laptop/Integrated Computers. Computers running FalconView® or JMPS moving map software and connected to a GPS receiver provide additional situational awareness. Refer to AFMAN 11-202V3 for carry-on equipment usage.

9.6.1. Navigators will use a USAF approved computer on all combat and combat support missions. **(T-3)** Annotate non-USAF approved computers in unit supplements, as applicable.

9.6.1.1. When computers are used, GPS units should be connected with an operational Moving Map Display.

9.7. Flight Records. Units may publish local standards for log procedures in the unit supplement. See **Figure 9.2** through **Figure 9.5** for examples of a completed AF Form 4116.

9.7.1. Record flight progress and maintain a flight log for Category I routes or route segments of 3 hours or longer. Time between fix plots will not exceed 1 hour. **(T-3) Note:** Malfunctions or loss of navigational capability which degrade course centerline accuracy, will be reported immediately to ATC.

9.7.2. The AF Form 4116 may be used to document planning and in-flight progress data. Record enough detail to reconstruct the mission. Page 1 of the form should be completed when a CFP is not available on Category I routes. Use page 4, the in-flight section, to record present positions and spot readings.

9.7.2.1. As soon as practical after level-off or coast-out, whichever occurs first, navigators will use either a NAVIAD fix or radar fix to verify aircraft position.

9.7.2.1.1. Record the active navigation solution in AF Form 4116, Section V.

9.7.2.1.2. Record the fix in AF Form 4116, Section VII.

9.7.2.1.3. Record Greenwich Mean Time (GMT), present position, true heading, spot wind, TAS, altitude and ETA to the next waypoint in AF Form 4116 Section VIII.

9.7.2.2. Every 30 min after coast out, record current position on page 3, Section V.

9.7.2.2.1. Record the present position for the active navigation solution.

9.7.2.3. Plot the current position within 10 minutes of crossing an oceanic reporting point or every hour, whichever occurs first.

9.7.2.3.1. Record GMT, current position of the active navigation solution, true heading, spot w/v, TAS, altitude, and ETA to the next point.

9.7.2.4. Record spot readings at regular intervals between recorded positions for calculating Dead Reckoning (DR) should a navigation system failure occur.

9.7.2.4.1. Spot readings will include, as a minimum, time, heading, drift angle, ground speed, wind vector, and TAS.

9.7.2.5. As soon as practical and prior to coast-in, the navigator will use either a NAVAID fix or radar fix to verify aircraft position.

9.7.2.5.1. Refer to **paragraphs 9.7.2.1.1** thru **9.7.2.1.3** for fix recording procedures.

9.7.2.6. In the event of a navigation system failure (INU or GPS), implement full log procedures. Beginning at the last plotted position, compute a DR up to the present position. Plot a fix at least once per hour. Plot a DR associated with the fix on the chart prior to plotting the position. If the navigation system failure is resolved, the navigator may resume log procedures as outlined in **paragraph 9.7.1**.

9.8. Equal Time Point (ETP) Computations. ETP Computations are required on Category I routes or Category I portions of routes when the total time between the last suitable airfield (LSAF) and the first suitable airfield (FSAF) is 3 hours or more (see **Figure 9.1**).

9.8.1. Use the worksheet on the AF Form 4116, page 2 to calculate the time to ETP.

9.8.2. Re-compute ETP in-flight when the ATA at a reporting point is 15 minutes or more ahead or behind the planned time if the change is due to erroneous wind information.

9.9. In-flight Fuel Management Procedures.

9.9.1. Fuel computations are required for Category I route segments of 3 hours or longer. Record the fuel readings listed below within one hour of level off time and at regular time intervals, not to exceed 90 minutes. Use the worksheet on AF Form 4116, page 3 for in-flight fuel management computations. For flights not requiring fuel computations, annotate fuel status on the flight plan or CFP used for flight following.

9.9.1.1. ETA DEST. Best known arrival time at Initial Approach Fix.

9.9.1.2. TIME. Time of the fuel reading.

9.9.1.3. TERMINAL FUEL FLOW.

9.9.1.4. CURRENT FUEL FLOW.

9.9.1.5. AVG FUEL FLOW. Calculate by adding terminal fuel flow to current fuel flow and dividing the sum by 2.

9.9.1.6. FUEL REM. Fuel quantity at time of calculation. In the interest of safety, use the lower of the calculated or gauge fuels.

9.9.1.7. O/H FUEL. Required overhead fuel (item 13 of the fuel plan).

9.9.1.8. DIFF. Subtract O/H Fuel from FUEL REM.

9.9.1.9. FUEL ETE. Calculate using DIFF divided by AVG FUEL FLOW.

9.9.1.10. ETE DEST. Subtract TIME from ETA DEST.

9.9.1.11. EXT TIME. Subtract ETE DEST from FUEL ETE. Report this value to the pilot. If the value is negative, check for computation and value errors. If negative value is correct, reevaluate available destination options.

9.9.2. Use the following formulas to accomplish in-flight fuel management:

9.9.2.1. [(Terminal fuel flow + Present fuel flow)] / 2 = Average Fuel Flow

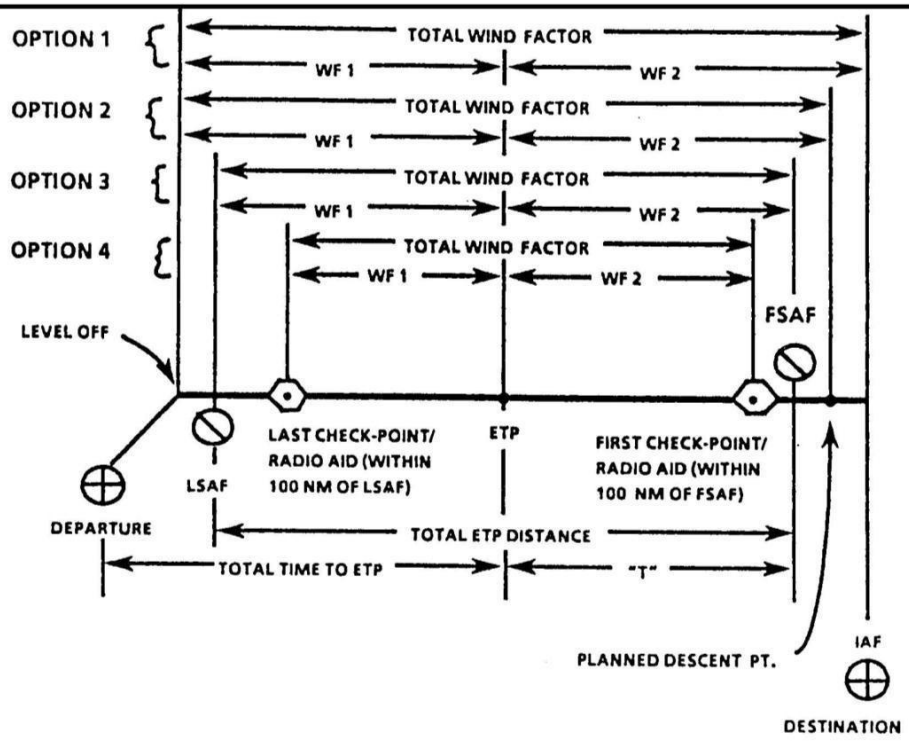
9.9.2.2. Present fuel - Overhead fuel = Usable Fuel

9.9.2.3. Usable fuel / Average fuel burn rate = Fuel ETE

9.9.2.4. Fuel ETE - ETE to destination = Extra Time

9.9.3. The navigator may terminate these procedures one hour from destination, when the Category I route segment is completed, or with AC approval.

Figure 9.1. ETP Computations.



1. WIND FACTOR COMPUTATION (USE OPTION 1, 2, 3, OR 4):

   A. TOTAL WIND FACTOR:

   $$\frac{\text{TOTAL WIND FACTOR DISTANCE}}{\text{TOTAL WIND FACTOR TIME}} = \text{AVERAGE GS}$$

   AVERAGE GS - PLANNED AVERAGE TAS = TOTAL WIND FACTOR

   B. FIRST HALF WIND FACTOR (WF 1):

   $$\frac{\text{DISTANCE FROM BEGIN PT. TO APPROX. MID-POINT}}{\text{TIME FROM BEGIN PT. TO APPROX. MID-POINT}} = \text{AVERAGE GS}$$

   AVERAGE GS - PLANNED AVERAGE TAS = WF 1

   C. SECOND HALF WIND FACTOR (WF 2):

   $$\frac{\text{DISTANCE FROM APPROX. MID-POINT TO END PT.}}{\text{TIME FROM APPROX. MID-POINT TO END PT.}} = \text{AVERAGE GS}$$

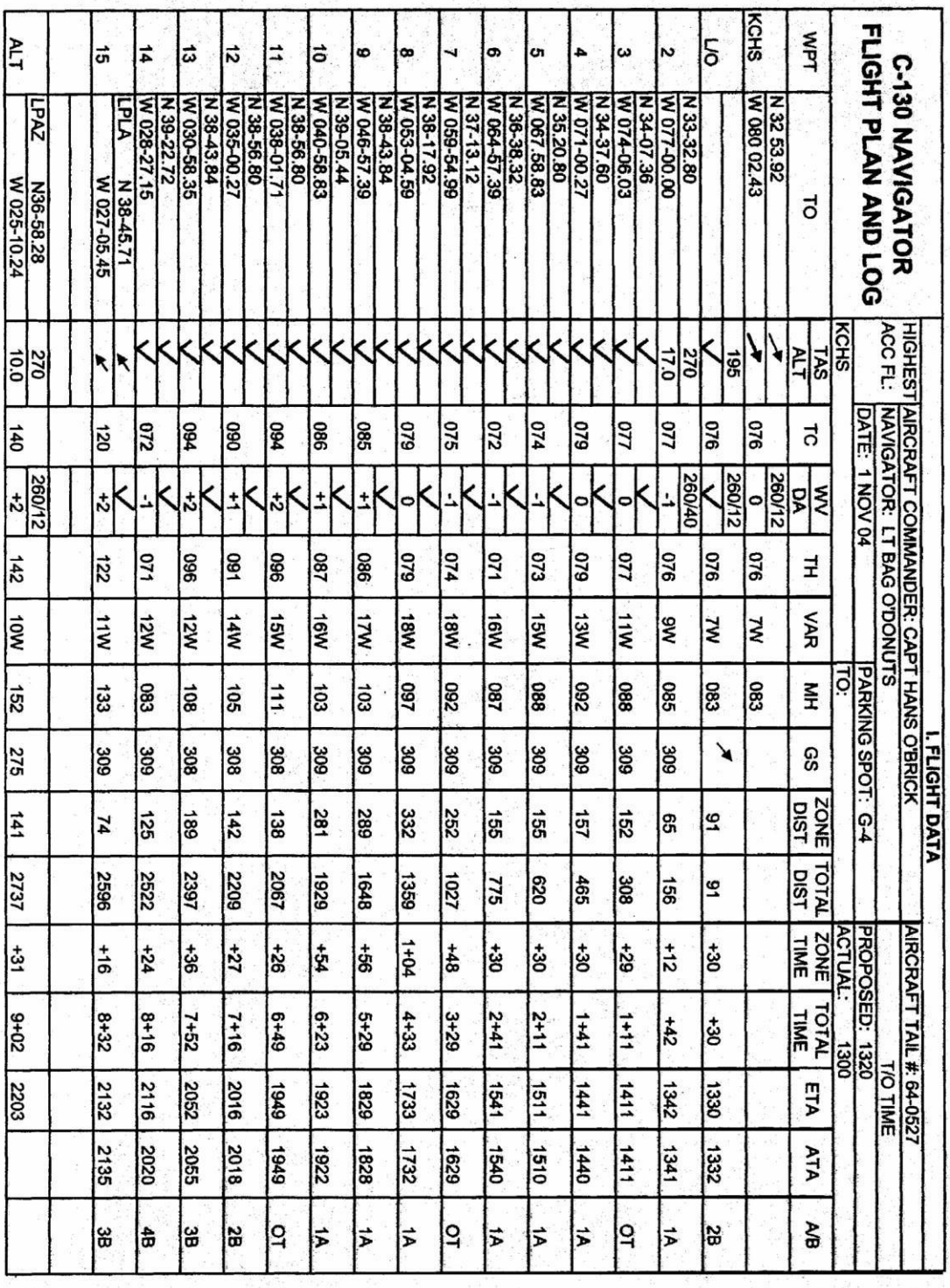
   AVERAGE GS - PLANNED AVERAGE TAS = WF 2

2. ETP COMPUTATION:

   A. $$\frac{\text{TOTAL ETP DISTANCE (LSAF TO FSAF)}}{\text{(WF 2 - WF 1) + 2(PLANNED AVG TAS)}} = \frac{\text{"T" (TIME IN MIN FROM ETP TO FSAF)}}{60}$$

   B. TIME (FROM DEPARTURE) TO ETP = TOTAL TIME TO FSAF - "T"

Figure 9.2. AF Form 4116 Example (1 of 4).



C-130 NAVIGATOR FLIGHT PLAN AND LOG

I. FLIGHT DATA

HIGHEST ACC FL: | AIRCRAFT COMMANDER: CAPT HANS O'BRICK | AIRCRAFT TAIL #: 64-0527

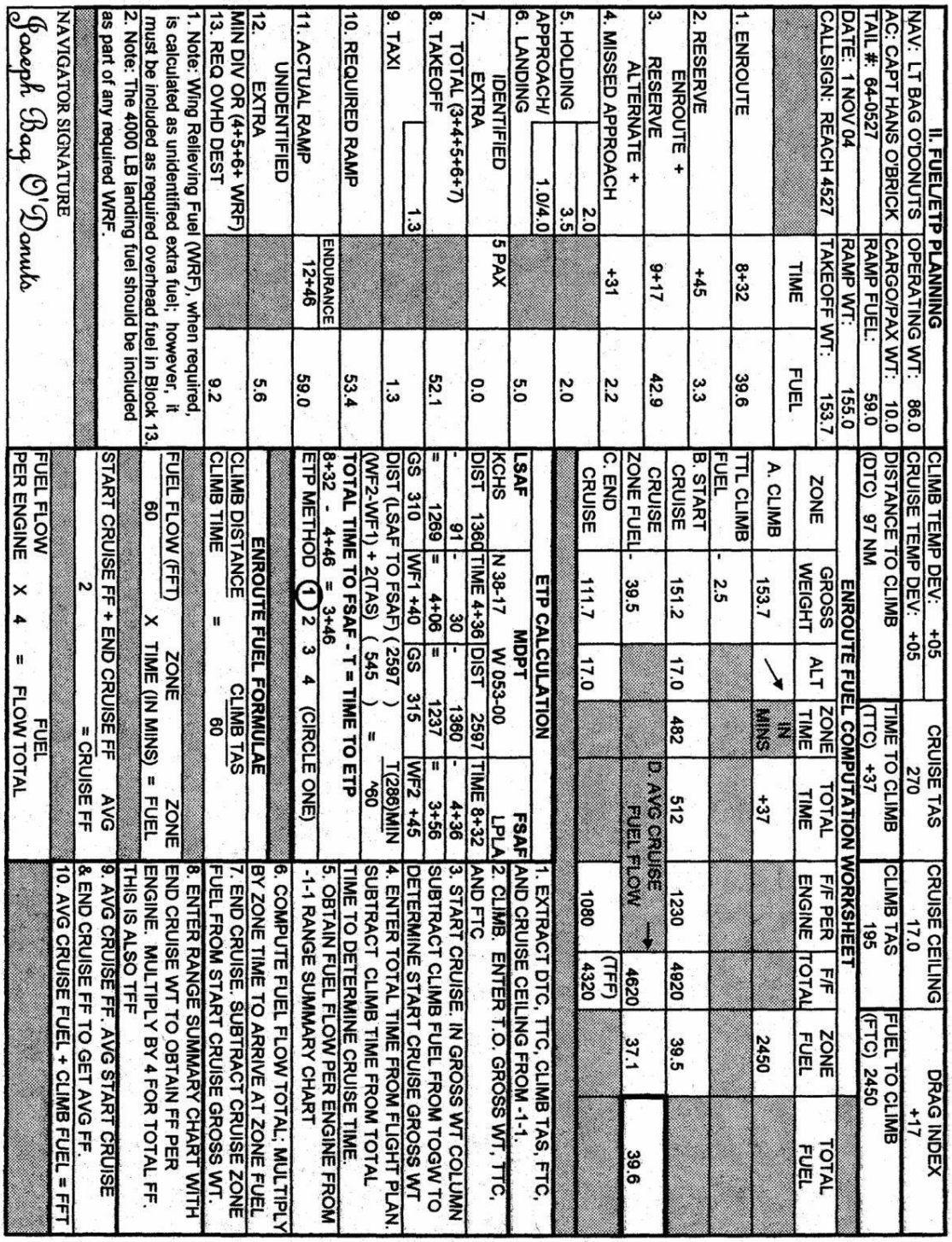
NAVIGATOR: LT BAG O'DONUTS | T/O TIME

DATE: 1 NOV 04 | PARKING SPOT: G-4 | PROPOSED: 1320

KCHS | TO: | ACTUAL: 1300

WPT	TO	TAS / ALT	TC	WV / DA	TH	VAR	MH	GS	ZONE DIST	TOTAL DIST	ZONE TIME	TOTAL TIME	ETA	ATA	A/B
	N 32 53.92	↘		260/12											
KCHS	W 080 02.43	↘	076	0	076	7W	083								
		195		260/12											
L/O		✓	076	✓	076	7W	083	↗	91	91	+30	+30	1330	1332	2B
	N 33-32.80	270		260/40											
2	W 077-00.00	17.0	077	-1	076	9W	085	309	65	156	+12	+42	1342	1341	1A
	N 34-07.36	✓		✓											
3	W 074-06.03	✓	077	0	077	11W	088	309	152	308	+29	1+11	1411	1411	OT
	N 34-37.60	✓		✓											
4	W 071-00.27	✓	079	0	079	13W	092	309	157	465	+30	1+41	1441	1440	1A
	N 35.20.80	✓		✓											
5	W 067.58.83	✓	074	-1	073	15W	088	309	155	620	+30	2+11	1511	1510	1A
	N 36-38.32	✓		✓											
6	W 064-57.39	✓	072	-1	071	16W	087	309	155	775	+30	2+41	1541	1540	1A
	N 37-13.12	✓		✓											
7	W 059-54.99	✓	075	-1	074	18W	092	309	252	1027	+48	3+29	1629	1629	OT
	N 38-17.92	✓		✓											
8	W 053-04.59	✓	079	0	079	18W	097	309	332	1359	1+04	4+33	1733	1732	1A
	N 38-43.84	✓		✓											
9	W 046-57.39	✓	085	+1	086	17W	103	309	289	1648	+56	5+29	1829	1828	1A
	N 39-05.44	✓		✓											
10	W 040-58.83	✓	086	+1	087	16W	103	309	281	1929	+54	6+23	1923	1922	1A
	N 38-56.80	✓		✓											
11	W 038-01.71	✓	094	+2	096	15W	111	308	138	2067	+26	6+49	1949	1949	OT
	N 38-56.80	✓		✓											
12	W 035-00.27	✓	090	+1	091	14W	105	308	142	2209	+27	7+16	2016	2018	2B
	N 38-43.84	✓		✓											
13	W 030-58.35	✓	094	+2	096	12W	108	308	189	2397	+36	7+52	2052	2055	3B
	N 39-22.72	✓		✓											
14	W 028-27.15	✓	072	-1	071	12W	083	309	125	2522	+24	8+16	2116	2020	4B
	LPLA N 38-45.71	↙		✓											
15	W 027-05.45	↙	120	+2	122	11W	133	309	74	2596	+16	8+32	2132	2135	3B
	LPAZ N36-58.28	270		260/12											
ALT	W 025-10.24	10.0	140	+2	142	10W	152	275	141	2737	+31	9+02	2203		

Figure 9.3. AF Form 4116 Example (2 of 4).



II. FUEL/ETP PLANNING			CLIMB TEMP DEV: +05	CRUISE TAS 270	CRUISE CEILING 17.0	DRAG INDEX +17
NAV: LT BAG O'DONUTS	OPERATING WT: 86.0		CRUISE TEMP DEV: +05	TIME TO CLIMB (TTC) +37	CLIMB TAS 195	FUEL TO CLIMB (FTC) 2450
AC: CAPT HANS O'BRICK	CARGO/PAX WT: 10.0		DISTANCE TO CLIMB (DTC) 97 NM			
TAIL #: 64-0527	RAMP FUEL: 59.0					
DATE: 1 NOV 04	RAMP WT: 155.0		ENROUTE FUEL COMPUTATION WORKSHEET			
CALLSIGN: REACH 4527	TAKEOFF WT: 153.7					

	TIME	FUEL	ZONE	GROSS WEIGHT	ALT	ZONE TIME IN MINS	TOTAL TIME	F/F PER ENGINE	F/F TOTAL (TFF)	ZONE FUEL	TOTAL FUEL
			A. CLIMB	153.7	↗						
1. ENROUTE	8+32	39.6	TTL CLIMB FUEL	- 2.5			+37			2450	
2. RESERVE	+45	3.3	B. START CRUISE	151.2	17.0	482	512	1230	4920	39.5	
3. ENROUTE + RESERVE	9+17	42.9	CRUISE ZONE FUEL	- 39.5			D. AVG CRUISE FUEL FLOW →		4620	37.1	39.6
ALTERNATE + 4. MISSED APPROACH	+31	2.2	C. END CRUISE	111.7	17.0			1080	(TFF) 4320		
5. HOLDING	2.0										
	3.5										
APPROACH/	1.0/4.0										
6. LANDING		5.0									
IDENTIFIED	5 PAX										
7. EXTRA		0.0									
TOTAL (3+4+5+6+7)											
8. TAKEOFF	1.3										
9. TAXI		1.3									
10. REQUIRED RAMP		53.4									
	ENDURANCE										
11. ACTUAL RAMP	12+46	59.0									
UNIDENTIFIED											
12. EXTRA		5.6									
MIN DIV OR (4+5+6+ WRF)											
13. REQ OVHD DEST		9.2									

1. Note: Wing Relieving Fuel (WRF), when required, is calculated as unidentified extra fuel; however, it must be included as required overhead fuel in Block 13.
2. Note: The 4000 LB landing fuel should be included as part of any required WRF.

NAVIGATOR SIGNATURE

Joseph Bag O'Donuts

ETP CALCULATION MDPT

LSAF	N 38-17 W 053-00	FSAF
KCHS		LPLA
DIST 1360	TIME 4+36 DIST 2597	TIME 8+32
- 91	- 30 - 1360	- 4+36
= 1269	= 4+06 = 1237	= 3+56
GS 310	WF1 +40 GS 315	WF2 +45
DIST (LSAF TO FSAF) (2597)		T(288)MIN
(WF2-WF1) + 2(TAS) (545)		= ^60

TOTAL TIME TO FSAF - T = TIME TO ETP

8+32 - 4+46 = 3+46

ETP METHOD (1) 2 3 4 (CIRCLE ONE)

1. EXTRACT DTC, TTC, CLIMB TAS, FTC, AND CRUISE CEILING FROM -1-1.
2. CLIMB. ENTER T.O. GROSS WT, TTC, AND FTC
3. START CRUISE. IN GROSS WT COLUMN SUBTRACT CLIMB FUEL FROM TOGW TO DETERMINE START CRUISE GROSS WT
4. ENTER TOTAL TIME FROM FLIGHT PLAN. SUBTRACT CLIMB TIME FROM TOTAL TIME TO DETERMINE CRUISE TIME.
5. OBTAIN FUEL FLOW PER ENGINE FROM -1-1 RANGE SUMMARY CHART
6. COMPUTE FUEL FLOW TOTAL; MULTIPLY BY ZONE TIME TO ARRIVE AT ZONE FUEL
7. END CRUISE. SUBTRACT CRUISE ZONE FUEL FROM START CRUISE GROSS WT.
8. ENTER RANGE SUMMARY CHART WITH END CRUISE WT TO OBTAIN FF PER ENGINE. MULTIPLY BY 4 FOR TOTAL FF. THIS IS ALSO TFF
9. AVG CRUISE FF. AVG START CRUISE & END CRUISE FF TO GET AVG FF.
10. AVG CRUISE FUEL + CLIMB FUEL = FFT

ENROUTE FUEL FORMULAE

CLIMB DISTANCE = CLIMB TAS	ZONE TIME = 60
CLIMB TIME = 60	
FUEL FLOW (FFT) = 60	ZONE TIME (IN MINS) = FUEL
START CRUISE FF + END CRUISE FF = 2	AVG = CRUISE FF
FUEL FLOW PER ENGINE X 4 =	FUEL FLOW TOTAL

Figure 9.4. AF Form 4116 Example (3 of 4).

III. TAS CHECK	1	2	3	4
TIME	1345	1510	1710	1910
ALT (PA)	17.0	19.0	21.0	23.0
IOAT	-6	-10	-14	-18
TOAT	-14	-18	-22	-26
IAS	207	200	194	187
CAS	207	200	194	187
EAS (-2<270<-3)	205	198	192	185
TAS	269	270	270	270
– ITAS	275	276	275	275
CORR	-6	-6	-5	-5
– COMP TAS	270	270	270	270
CORR	-1	0	0	0

STANDARD TEMPERATURES									
ALT	TEMP	ALT	TEMP	ALT	TEMP	ALT	TEMP	ALT	TEMP
110	-7	160	-17	210	-27	260	-37	310	-46
120	-9	170	-19	220	-29	270	-39	320	-48
130	-11	180	-21	230	-31	280	-41	330	-50
140	-13	190	-23	240	-33	290	-43	340	-52
150	-15	200	-25	250	-35	300	-44	350	-54

HEAT OF COMPRESSION			
TAS	TEMP	TAS	TEMP
190 - 210	-4	277 - 288	-9
210 - 230	-5	288 - 300	-10
230 - 246	-6	300 - 310	-11
246 - 263	-7	310 - 319	-12
263 - 277	-8	319 - 325	-13

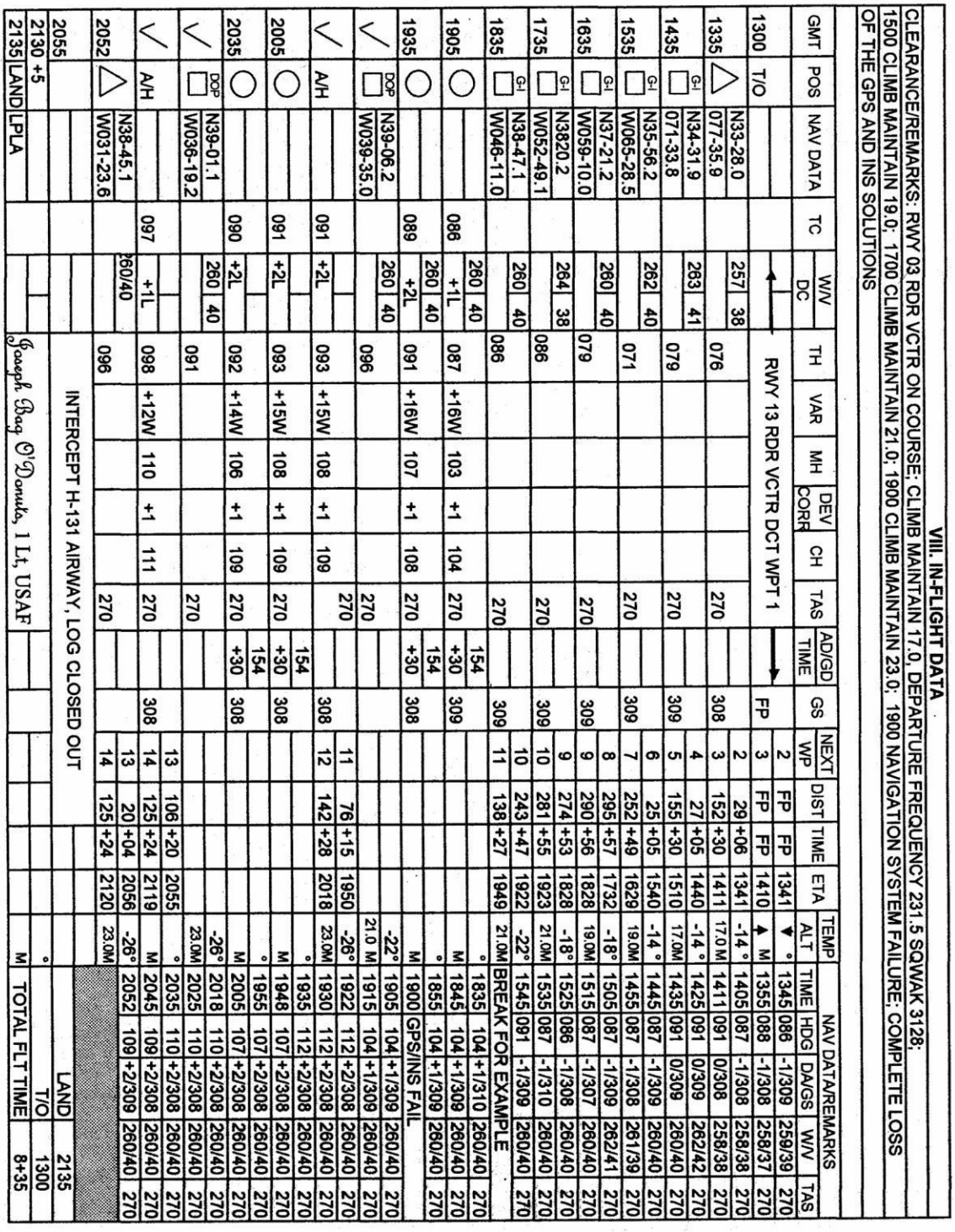
IV. DEVIATION CHECK	1	2	3	4
TIME	1355	1630	1930	
TH (INU)	076	075	096	
MAG VAR	+12W	+17.7W	+16.7W	
MAG HDG	088	092.7	112.7	
DEV CORR	+.5	+1.0	+.7	
NO. 1 CH	088.5	093.7	113.4	
DEV CORR	-.4	-1.7	-1.3	
NO. 2 CH	087.6	091.0	111.4	
DEV CORR	+8.0	+7.3	+8.3	
STBY CH	096	100	121	
DEV	0	-.2	+.3	
COMPUTER	088.0	092.5	113.0	

VI. IN-FLIGHT FUEL MANAGEMENT	T/O	L/O	1	2	3	4	5	6	7
ETA DESTINATION	2132	2132	2132	2132	2132	2132	2132	2132	2132
TIME	1300	1332	1420	1520	1620	1720	1820	1920	2020
TERM FUEL FLOW	4.3								
FUEL FLOW		5.1	5.0	4.8	4.8	4.6	4.5	4.5	4.4
AVG FUEL FLOW		4.7	4.7	4.6	4.6	4.5	4.4	4.4	4.4
FUEL REMAINING	58.2	55.0	51.5	46.5	42.0	37.6	33.5	29.5	25.5
MIN DIV/REQ OVHD	9.2								
DIFFERENCE		45.8	42.3	37.3	32.8	28.4	24.3	20.3	16.3
FUEL ETE		9.8	9.1	8.2	7.2	6.4	5.7	4.7	3.8
ETE DESTINATION	8.5	8.0	7.2	6.2	5.2	4.2	3.2	2.2	1.2
EXTRA TIME		1.8	1.9	2.0	2.0	2.2	2.5	2.5	2.6

V. FIX/COMPUTER POSITION			
TIME	GPS/SCNS	INS	DVS
1335	N33-28.0 W077-35.9	N33-28.1 W077-36.0	N33-29.1 W077-37.4
1405	N34-02.8 W074-35.9	N34-02.9 W074-36.2	N34-03.8 W074-36.5
1435	N34-31.9 W071-33.8	N34-32.4 W071-34.6	N34-33.0 W071-35.0
	BREAK FOR EXAMPLE PURPOSES ONLY		
1705	N37-54.8 W055-51.1	N34-55.6 W055-52.0	N34-56.3 W055-53.8
1735	N38-20.2 W052-49.1	N38-21.1 W055-52.8	N38-22.1 W052-53.1
1805	N38-36.1 W049-22.6	N38-37.1 W049-23.1	N38-38.3 W049-24.2
1835	N38-47.1 W046-11.0	N38-48.0 W046-12.1	N38-49.7 W046-13.3
1905	INOP	INOP	N39-03.8 W043-02.1
1935	INOP	INOP	N39-06.2 W039-35.0
2005	INOP	INOP	N39-02.5 W036-23.4
2035	INOP	INOP	N39-01.1 W036-19.2
2052	INOP	INOP	N38-48.0 W030-25.2

VII. RADAR/NAVAID DATA				
TIME	STATION	READING	CORR	CORR READING
1335	CHS	090/127	-5W	085/127
1335	ILM	173/58	-7W	166/58
2052	FRS	207/38	-12W	195/38
2052	VFL	287/131	-12W	275/131

Figure 9.5. AF Form 4116 Example (4 of 4).



VIII. IN-FLIGHT DATA

CLEARANCE/REMARKS: RWY 03 RDR VCTR ON COURSE; CLIMB MAINTAIN 17.0, DEPARTURE FREQUENCY 231.5 SQWAK 3128;
1500 CLIMB MAINTAIN 19.0; 1700 CLIMB MAINTAIN 21.0; 1900 CLIMB MAINTAIN 23.0; 1900 NAVIGATION SYSTEM FAILURE; COMPLETE LOSS OF THE GPS AND INS SOLUTIONS

GMT	POS	NAV DATA	TC	W/V DC	TH	VAR	MH	DEV CORR	CH	TAS	AD/GD TIME	GS	NEXT WP	DIST	TIME	ETA	TEMP ALT	NAV DATA/REMARKS TIME	HDG	DA/GS	W/V	TAS
1300	T/O				RWY 13 RDR VCTR DCT WPT 1							FP	2	FP	FP	1341	▼ °	1345	086	-1/309	259/39	270
													3	FP	FP	1410	▲ M	1355	088	-1/308	258/37	270
1335	△	N33-28.0	257	38	076				270			308	2	29	+06	1341	-14 °	1405	087	-1/308	258/38	270
		077-35.9											3	152	+30	1411	17.0M	1411	091	0/308	258/38	270
	G-I □	N34-31.9	263	41									4	27	+05	1440	-14 °	1425	091	0/309	262/42	270
1435		071-33.8			079				270			309	5	155	+30	1510	17.0M	1435	091	0/309	260/40	270
	G-I □	N35-56.2	262	40									6	25	+05	1540	-14 °	1445	087	-1/309	260/40	270
1535		W065-28.5			071				270			309	7	252	+49	1629	19.0M	1455	087	-1/308	261/39	270
	G-I □	N37-21.2	260	40									8	295	+57	1732	-18°	1505	087	-1/309	262/41	270
1635		W059-10.0			079				270			309	9	290	+56	1828	19.0M	1515	087	-1/307	260/40	270
	G-I □	N3820.2	264	38									9	274	+53	1828	-18°	1525	086	-1/308	260/40	270
1735		W052-49.1			086				270			309	10	281	+55	1923	21.0M	1535	087	-1/310	260/40	270
	G-I □	N38-47.1	260	40									10	243	+47	1922	-22°	1545	091	-1/309	260/40	270
1835		W046-11.0			086				270			309	11	138	+27	1949	21.0M	BREAK FOR EXAMPLE				
			260	40							154						°	1835	104	+1/310	260/40	270
1905	○		086	+1L	087	+16W	103	+1	104	270	+30	309					M	1845	104	+1/309	260/40	270
			260	40							154						°	1855	104	+1/309	260/40	270
1935	○		089	+2L	091	+16W	107	+1	108	270	+30	308					M	1900	GPS/INS FAIL			
		N39-06.2	260	40						270							-22°	1905	104	+1/309	260/40	270
√	DOP □	W039-35.0			096				270								21.0 M	1915	104	+1/309	260/40	270
													11	76	+15	1950	-26°	1922	112	+2/308	260/40	270
√	A/H		091	+2L	093	+15W	108	+1	109		154	308	12	142	+28	2018	23.0M	1930	112	+2/308	260/40	270
																	°	1935	112	+2/308	260/40	270
2005	○		091	+2L	093	+15W	108	+1	109	270	+30	308					M	1948	107	+2/308	260/40	270
											154						°	1955	107	+2/308	260/40	270
2035	○		090	+2L	092	+14W	106	+1	109	270	+30	308					M	2005	107	+2/308	260/40	270
			260	40													-26°	2018	110	+2/308	260/40	270
√	DOP □	N39-01.1			091				270								23.0M	2025	110	+2/308	260/40	270
		W036-19.2											13	106	+20	2055	°	2035	110	+2/308	260/40	270
√	A/H		097	+1L	098	+12W	110	+1	111	270		308	14	125	+24	2119	M	2045	109	+2/308	260/40	270
		N38-45.1		260/40									13	20	+04	2056	-26°	2052	109	+2/309	260/40	270
2052	△	W031-23.6			096				270				14	125	+24	2120	23.0M					
2055					INTERCEPT H-131 AIRWAY, LOG CLOSED OUT															LAND	2135			
2130	+5																°			T/O	1300	
2135	LAND	LPLA			Joseph Bag O'Donuts, 1 Lt, USAF												M	TOTAL FLT TIME			8+35	

Chapter 10

FLIGHT ENGINEER PROCEDURES AND FORMS

Section 10A—Normal Procedures

10.1. General. In addition to duties in the flight manual and other applicable T.O.s, Flight Engineers will comply with the procedures and duties in this manual. Except for hostile environment repair, these items are performed as normal procedures and may not be briefed. The AC may assign other flight engineer duties as necessary.

10.2. Responsibilities. The flight engineer is responsible to the AC for all inspections and procedures required by all applicable T.O.s and DoD and AF instructions.

10.3. Authority to Clear Red X Symbols. Flight engineers are not normally authorized to clear a Red X. **Exception:** Flight engineers are authorized to clear Red X symbols at enroute stops for engine intake and exhaust inspections, removing installed dust covers and plugs, and removing and installing aircraft panels to facilitate other maintenance. Additionally, when the aircraft is on a Red X for any other reason, and qualified maintenance personnel are not available to clear it, the flight engineer may obtain authorization to clear the Red X IAW T.O. 00-20-1. Other aircrew members are not authorized to clear a Red X.

10.4. Aircraft Servicing. Flight engineers are not normally required to refuel or defuel aircraft. However, the flight engineer is qualified and authorized to accomplish these duties when maintenance personnel are not available. This policy is designed for support of the aircraft and its mission while away from home station. The applicable refueling and defueling checklists will be used during all refueling and defueling operations. **(T-3)** If a crew chief is not available, the flight engineer will perform the Refueling Supervisor duties and operate the Single Point Refueling (SPR) panel. The AC may designate other aircrew members as safety observers/fire guards as required. Follow procedures in T.O. 1EC-130H-1 for primary fuel management procedures.

10.4.1. To comply with primary fuel management and Special Emitter Array (SPEAR) pod fuel management as well as providing the greatest flexibility for maintenance and operations, standard ramp fuel loads greater than 28,000 lbs should be completed as described below. Every effort should be made to comply with the flight manual and these guidelines to maximize airframe life. However, some cases may dictate that these procedures be adjusted (e.g., operational constraints, availability of fuel services, planned landing criteria, etc.).

10.4.1.1. Without SPEAR pods installed.

10.4.1.1.1. Outboard main tanks. 8,000 lbs each is the minimum to be considered full.

10.4.1.1.2. Inboard main tanks. 7,200 lbs in each tank is the minimum to be considered full.

10.4.1.2. With SPEAR pods installed.

10.4.1.2.1. Outboard main tanks. 6,600 lbs each is the minimum to be considered full.

10.4.1.2.2. Inboard main tanks. 7,200 lbs in each tank is the minimum to be considered full.

10.4.1.3. Use the auxiliary tanks and, if installed, external tanks for all additional required fuel.

10.5. Aircraft Structural Integrity Program. Complete an UDI Worksheet IAW T.O. 1C-130-101, *Implementation of C-130 series Aircraft Usage Report* on all flights. Flight Engineers will input flight data reflecting aircraft usage within five duty days of the flight. **(T-3)**

10.6. Aircraft Systems/Forms Management.

10.6.1. The flight engineer will monitor the aircraft systems during all flight and ground operations. Notify the pilot of all abnormal indications and take the appropriate action.

10.6.2. In addition to the procedures in T.O. 00-20-1 and DAFMAN 11-401, the flight engineer will assist the pilot in maintaining the AFTO Form 781.

10.6.2.1. Multiple sorties will be logged on the AFTO Form 781 IAW DAFMAN 11-401 if the engines are stopped, the aircraft is on the ground more than five minutes, or any crewmember enplane or deplane. Annotate separate lines with the original mission number. Actual takeoff and landing times (+5 minutes) will be used when completing the 781. An AF Form 2407, *Weekly/Daily Flying Schedule Coordination* is not required since it is a continuation of the original sortie.

10.7. Take Off and Landing Data (TOLD) Cards.

10.7.1. Performance calculations are normally based on 95 percent engines and without nose wheel steering unless otherwise specified. If takeoff data using the "with nose wheel steering" option is used, crews will thoroughly review and brief the "with nose wheel steering" takeoff procedures in the performance manual. Initial TOLD cards are computed using flight manual performance data. Subsequent TOLD card computations are accomplished using flight manual performance data or approved tabulated data. All tabulated TOLD data will be approved by the respective NAF/A3V prior to use. A copy of all approved tabulated data is maintained by NAF/A3V.

10.7.1.1. Flight Engineers will only use the forms prescribed in T.O. 1C-130H-1-1 or locally produced equivalent forms. 55 ECG/EGV may approve minor modifications of TOLD cards. Locally produced forms will be submitted to ACC/A3CR for information purposes.

10.7.2. The flight engineer will post the torque value corresponding to the required takeoff power setting as well as the 3-engine and 4-engine climb performance on the TOLD card.

10.7.3. Mini TOLD card blocks 1 thru 5 contain: outside ambient temperature, pressure altitude, 3-engine service ceiling, 2-engine service ceiling, and CFL.

10.7.4. Following initial takeoff and landing data computation, only recompute the affected speeds if favorable conditions provide an additional margin of safety in all other areas. On local proficiency flights, only update the mini C-130 TOLD Card.

10.7.5. When conducting flaps up training, compute and post Vmca speeds for both 50% flap and no-flap (normal boost) configurations separated by a "/". Example: OEI Vmca, in ground effect – 94/110.

10.7.6. Compute cruise data and post a mini C-130 TOLD card for cruise segments of 1 hour or longer and update every hour. Advise and assist the pilot in maintaining the required climb

and cruise power. Blocks 1 thru 3 contain: Maximum Endurance 20% flaps (as charted), Stall Speed (Vs1), 0% flaps, 45 degrees bank, Vs1, 0% flaps, 60 degrees bank, Remarks, OAT and temperature deviation. **Note:** Dash 1 stall speeds will be used when there is a conflict with performance manual stall speeds.

10.7.7. The minimum TOLD requirements for a termination landing are: Vmca speeds, obstacle clearance speed, 3-engine climb-out factor, 3-engine climb speed, 0% flap landing approach speed, and 50% and 100 % landing speeds and distances.

Section 10B—DD Form 365-4, Weight and Balance Clearance Form F Transport/Tactical, Instructions and Miscellaneous Information

10.8. Introduction. This section provides instructions for completing a DD Form 365-4. Compute the Form F by using simplified moments. All entries and signatures must be legible.

10.9. Load Planning. The CG of the loaded aircraft must be within the specified forward and aft CG limits for any given operating condition. Also consider aircraft limitations and emergency jettison. The math and charts contained in T.O. 1EC-130H-5-2 are tools which may be used for planning. When the fuel load is unknown, load plan for a 20-22 percent of Mean Aerodynamic Chord (MAC) zero fuel.

10.10. General Instructions. These instructions apply to Form F using simplified moments. Entries on the form (**Figure 10.1**) may be either handwritten, computer generated/printed or maintained digitally.

10.10.1. DD Form 365-4 Heading. Enter date, mission number (from flight orders), aircraft type, serial number, departure and destination station (name or ICAO identifier), home station of aircraft, and pilot's rank and last name.

10.10.2. Limitations Column. Enter the appropriate weight and CG limits for the planned mission using the following criteria: do not exceed the maximum gross weight and CG limits specified in T.O. 1EC-130H-1. Gross weights may also be limited by operating conditions (e.g., obstacle clearance, rate of climb, weather conditions, altitude, runway/taxiway bearing capacity), or any other published restrictions.

10.10.2.1. Takeoff. Unless other restrictions are imposed, use 155,000 lbs for EC-130H aircraft.

10.10.2.2. Landing. Unless other landing restrictions are imposed, use 155,000 lbs for EC-130H and subtract operating weight plus estimated landing fuel (References 9 and 23 in paragraphs **10.11.7** and **10.11.20**).

10.10.3. Permissible CG Takeoff and Landing. Compute the forward and aft CG limitations using the CG table in the appropriate T.O. 1EC-130H-5-2. Permissible CG Zero Fuel Wt. block is not required to be filled in.

10.10.4. Signature Blocks.

10.10.4.1. Computed By—Signature, rank, and organization.

10.10.4.2. Weight and Balance Authority—Leave blank.

10.10.4.3. Pilot—Signature on original and duplicate.

10.11. Instructions for Moment Form F. Use applicable T.O. 1EC-130H-5-2, Chart E.

10.11.1. Reference 1. Enter basic weight and moment from the last entry of the certified copy of DD Form 365-3, Chart C - *Basic Weight and Balance Record* in the aircraft weight and balance handbook.

10.11.2. Reference 2. Leave blank.

10.11.3. Reference 3. Enter the number of aircrew members, locations, weight, and moment from crew/cargo compartment tables.

10.11.4. Reference 4. Enter crew baggage by location. Determine weight and moment.

10.11.5. References 5, 6, and 7. Determine amount of equipment on board and enter by location. Determine weight and moment.

10.11.6. Reference 8. Leave blank.

10.11.7. Reference 9. Total of references 1 through 8.

10.11.8. Reference 10. Enter total takeoff fuel and determine moments from fuel moment charts. **Note:** In the remarks section enter takeoff fuel weight for each fuel tank, rounded to the nearest 100 lbs. Annotate the associated moments using the fuel moment charts in T.O. 1EC-130H-5-2. If individual tank moments cannot be calculated, accomplish alternate fuel moment calculations by using the following formula: Fuel weight X 0.552 = Fuel Moment. **Note:** Only enter total fuel if using alternate fuel moment calculations.

10.11.9. Reference 11. Leave blank.

10.11.10. Reference 12. Total of references 9 and 10.

10.11.11. Reference 13. Distribution of Allowable Load (Payload/Cargo).

10.11.11.1. Enter weight of cargo by determining the fuselage station of the cargo center of balance. General cargo may be compartment loaded. Determine moment.

10.11.11.2. Enter number and weight of passengers using either a compartment centroid or each individual's weight by location centroid. Determine moment.

10.11.11.3. Enter the total load weight and moment of reference 13 in reference 15 as a subtotal. **Note:** The total weight of reference 13 cannot exceed the smallest allowable load determined by the limitation block.

10.11.12. Reference 14. Compute and enter zero fuel weight and zero fuel moment by adding references 9 and 15. Zero fuel percent of MAC is not required but may be helpful when targeting a 20-22 zero fuel percent of MAC.

10.11.13. Reference 15. Subtotals; enter totals from reference 13.

10.11.14. Reference 16. Total of references 12 and 15.

10.11.15. Reference 17. Enter the takeoff CG in percent of MAC.

10.11.16. Reference 18. When applicable, enter correction from computations in corrections column. **Note:** Computations in the corrections column may require correction of the zero fuel figures but is not mandatory.

10.11.17. Reference 19. Adjustments after weight or moment from reference 18 are either added or subtracted to/from reference 16.

10.11.18. Reference 20. Enter corrected CG in percent of MAC, as required. **Note:** Leave references 18, 19, and 20 blank if corrections are not required.

10.11.19. Reference 21. Enter figures from reference 14.

10.11.20. Reference 23. Enter landing fuel weight and moment. This is obtained by determining estimated amount of fuel remaining in tanks for landing. **Note:** In the remarks section enter estimated landing fuel weight for each fuel tank, rounded to the nearest 100 lbs. Annotate the associated moments IAW **paragraph 10.11.8** Compute fuel burn off when flight plan fuel weights are not available using the criteria below. **Note:** Pounds per hour (PPH).

10.11.20.1. 4,500 PPH – normal flight at altitude.

10.11.20.2. 5,000 PPH – low level.

10.11.20.3. 6,000 PPH – first hour of flight (climb-out).

10.11.21. Reference 24. Total of references 21 and 23.

10.11.22. Reference 25. Enter the landing CG in percent of MAC.

10.11.23. Remarks Block. Enter weight and simplified moment for all tanks containing fuel for planned takeoff fuel load as well as estimated landing fuel. Include total weight and moment of fuels. See **Figure 10.1**.

10.11.24. Load Adjuster Number Block. Enter Load Adjuster number, if used. If Load Adjuster is not used and fuel calculations are computed using Chart E tables in T.O. 1EC-130H-5-2, enter “Chart E and Math”.

Figure 10.1. Example DD Form 365-4 Form F.

WEIGHT AND BALANCE CLEARANCE FORM F - TRANSPORT
(Use reverse for tactical missions)

FOR USE WITH T.O. 1-1B-40, NAVAIR 01-1B-40, AND TM-55-1500-342-23 | Form Approved OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services and Communications Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.
PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.

DATE (YYYYMMDD) 20150301	AIRCRAFT TYPE EC-130H	FROM KDMA	HOME STATION KDMA
MISSION KDMA043I15365A	SERIAL NO. 73-1585	TO KDMA	PILOT Capt Awesome

REMARKS

Takeoff	Land
O 13.8 / 7529	O 3.4 / 1863
I 15.2 / 8437	I 4.6 / 2559
A 9.0 / 5012	
T 38.0 / 20978	T 8.0 / 4422

REF	ITEM	WEIGHT	INDEX OR MOM/1000
1	BASIC AIRCRAFT (From Chart C)	103458	539.7
2			
3	CREW (No.) 18	3600	137.8
4	CREW'S BAGGAGE		
5	STEWARD'S EQUIPMENT		
6	EMERGENCY EQUIPMENT	843	64.5
7	EXTRA EQUIPMENT		
8			
9	OPERATING WEIGHT	107901	541.3
10	TAKEOFF FUEL / Gal.)	38000	2097.8
11	WATER INJ.		
12	TOTAL AIRCRAFT WEIGHT	145901	2639.1

LOAD ADJUSTER NUMBER: Chart "E" + Math

CORRECTION/MOST FWD/MOST AFT

13 DISTRIBUTION OF ALLOWABLE LOAD (PAYLOAD)

14 ZERO FUEL WT 107901
ZERO FUEL WT INDEX OR MOM 55993
ZERO FUEL % M.A.C.

COMPT OR ARM	ITEM	CHANGES (+ or -) WEIGHT	CHANGES (+ or -) INDEX OR MOM/1000	PASSENGERS NO.	PASSENGERS WEIGHT	COMPT OR ARM	CARGO	CARGO	COMPT OR ARM
	CREW	-1600	-866					NO LOAD	
	B W/M	+3574	+1801						
	TOTAL WEIGHT REMOVED	-1600	-866						
	TOTAL WEIGHT ADDED	+3574	+1801						
	NET DIFFERENCE	+1974	+935						

LIMITATIONS

CONDITION	TAKEOFF	LANDING	/ FUEL
ALLOWABLE GROSS WEIGHT	155000	155000	
TOTAL AIRCRAFT WT. (Ref. 12)	145901		
(Ref. 9) + (Ref. 23)		115901	
OPERATING WT. (Ref. 9)			
ALLOWABLE LOAD (Ref. 13) (use smallest figure)	9099	39099	
/ Zero Fuel or Limiting Wing Fuel			

PERMISSIBLE C.G. TAKEOFF	FORWARD	22.3	AFT	30.0
PERMISSIBLE C.G. LANDING	FORWARD	18.1	AFT	30.0
PERMISSIBLE C.G. ZERO FUEL WT.	FORWARD	16.5	AFT	29.5

COMPUTED BY SIGNATURE //SIGNATURE// TSgt/41 ECS

WEIGHT AND BALANCE AUTHORITY SIGNATURE

PILOT SIGNATURE

REF	ITEM	WEIGHT	INDEX OR MOM/1000
15			
16	TAKEOFF CONDITION (Uncorrected)	145901	527.5
17	TAKEOFF C.G. IN % M.A.C. OR IN		24.3
18	CORRECTIONS (If required)	+19745	+935
19	TAKEOFF CONDITION (Corrected)	147501	7909.6
20	TAKEOFF C.G. IN % M.A.C. OR IN		526.8 / 23.9
21	ZERO FUEL WT (Ref. 14)	107901	5593.9
22	LESS AIR DROP LOAD		
23	ESTIMATED LANDING FUEL	8000	442.2
24	ESTIMATED LANDING CONDITION	115901	6036.1
25	ESTIMATED LANDING C.G. IN % M.A.C. OR IN		521.2 / 20.5

DD FORM 365-4, AUG 96 PREVIOUS EDITION MAY BE USED.

Table 10.1. Crew Weight and Moment Table.

NUMBER OF CREW	LOCATION	WEIGHT	MOMENT/1000
4	3B-1E	800	175
5	4B-1E	1000	209
6	5B-1E	1200	243
7	5B-1D-1E	1400	306
8	5B-2D-1E	1600	369
9	5B-2D-2E	1800	441
10	5B-2D-3E	2000	512
11	5B-2D-3E-1G	2200	610
12	5B-2D-3E-2G	2400	709
13	5B-2D-3E-2G-1H	2600	814
14	5B-2D-3E-2G-2H	2800	920
15	5B-2D-3E-2G-2H-1J	3000	1052
16	5B-2D-3E-2G-2H-2J	3200	1184
17	6B-2D-3E-2G-2H-2J	3400	1218
18	6B-2D-3E-2G-2H-2J-1L	3600	1378
19	6B-2D-3E-2G-2H-2J-2L	3800	1538
20	6B-2D-3E-2G-2H-2J-2L-1M	4000	1704
21	7B-2D-3E-2G-2H-2J-2L-1M	4200	1738

10.12. Flight Engineer (FE) Abbreviations and Formulas.

10.12.1. General Abbreviations. Contained in **Attachment 1** of this manual.

10.12.2. Standard Formulas. **Note:** Statute miles (SM). True Airspeed Knots (TASK). Equivalent Airspeed Knots (EASK).

10.12.2.1. Time, Speed and Distance formulas.

10.12.2.1.1. DISTANCE = (SPEED X TIME in min) / 60.

10.12.2.1.2. SPEED = (DISTANCE X 60) / TIME in min.

10.12.2.1.3. TIME in min = (DISTANCE X 60) / SPEED.

10.12.2.1.4. SM = NM X 1.152.

10.12.2.1.5. NM = SM / 1.152.

10.12.2.1.6. TASK = EASK X SMOE.

10.12.2.1.7. EASK = TASK / SMOE.

10.12.2.2. General Fuel Formulas.

10.12.2.2.1. POUNDS = GALLONS X FUEL DENSITY.

10.12.2.2.2. GALLONS = POUNDS / FUEL DENSITY.

10.12.2.2.3. F/Pd = (FF X TIME in min) / 60.

10.12.2.2.4. FF = (F/Pd X 60) / TIME in min.

10.12.2.2.5. DISTANCE = NMPP X F/Pd.

10.12.2.2.6. NMPP = DISTANCE / F/Pd.

10.12.2.2.7. F/Pd = DISTANCE / NMPP.

10.12.2.2.8. FF = TASK / NMPP.

10.12.2.2.9. TASK = NMPP X FF.

10.12.2.2.10. F/Pd = (FF X DISTANCE) / TASK.

10.12.2.2.11. Charted TASK = Logged TASK / SMOE for cruise altitude.

10.12.2.2.12. Charted FF = FF / SMOE for cruise altitude.

10.12.2.2.13. Fahrenheit = 1.8 X Celsius + 32; Celsius = (Fahrenheit - 32) / 1.8.

10.12.2.3. Weight and Balance Formulas.

10.12.2.3.1. Arm = Moments / Weight.

10.12.2.3.2. Moments = Arm X Weight.

10.12.2.3.3. Weight = Moments / Arm.

10.12.2.3.4. Average Arm = Total Moment / Total Weight.

10.12.2.3.5. CG (% of MAC) = (Average Arm - LEMAC) / MAC.

Section 10C—Hostile Environment Repair Procedures

10.13. General. Operations Group Commanders/Deputy Commanders for Operations authorize the use of Hostile Environment Kit and Repair Procedures when the aircraft is directed into a hostile or potentially hostile environment. Additionally, they may authorize usage under extreme cases when recovery of the aircraft or completion of the mission dictates. The authority is documented on the FRAG or ATO. The operations group commander/deputy commander for operations may delegate this authority as necessary in cases where: (1) The unit is geographically separated from the parent unit, or (2) the unit is deployed or otherwise not co-located with the operations group commander/deputy commander for operations. When practical, all normal avenues of repair/recovery should be exhausted prior to using the Hostile Environment Repair Procedures. Procedures identified with an asterisk (*) are not considered Hostile Environment Repair and may be approved by the PIC. Inform NAF/A3V when utilizing Hostile Environment Repair procedures. Include a brief description of the circumstances and conditions that lead to the use of these procedures.

10.13.1. Hostile Environment Repair Kit (HERK). The repair kit facilitates the safe and efficient accomplishment of the hostile environment repair procedures. **Table 10.2** includes the items normally contained in the kits. Additional repair kit inventory items and procedures

for their use may be identified in unit supplements. **Caution:** Electrical arcing is possible when installing or removing recommended jumper wires.

Table 10.2. Hostile Environment Repair Kit (HERK) Inventory.

ITEM	STOCK NUMBER
Note: Stock numbers may change without notice. Numbers should be verified with supply organizations when ordering.	
1. ELECTRICAL TAPE	5970004194291
2. VISE GRIP PLIERS, 8 ½" (2 EA.)	5120004941911
3. ALLEN WRENCH, 5/32, 6 point (long)	5120001985413
4. CHANNEL LOCK PLIERS, 10"	5120002780352
5. GENEVA LOCK WRENCH	5120007158467
6. STARTER WRENCH	5120006843605
7. SMALL BLADE COMMON SCREWDRIVER	5120002363127
8. IGNITION RELAY CANNON PLUG	5935000139655
9. SPEED SWITCH CANNON PLUG	5935012309542
10. BRAKE SHUTTLE VALVE PLUG, #6 MS (2 EA.)	4730002033709
11. BRAKE PLUG, #8 MS (2 EA.)	4730002028341
12. BRAKE LINE CAP, #8 (2 EA)	4730002898634
13. PIG REPAIR PUTTY (REPLACES OYLTYTE)	8030012652895
14. WIRE BUNDLE TIES (20)	5975010132742
15. WOOD PLUG (LARGE)	5510002559492
16. WOOD PLUG (SMALL)	5510002559493
17. BRASS BAR 7/16 (STOCK BY FOOT) (Cut two 4 inch lengths per kit)	9530002289235
18. BRASS BAR 3/8 (STOCK BY FOOT) (Cut two 4 inch lengths per kit) (Use with Maintenance Free Battery)	9530002289234
19. BRASS BAR 5/16 (STOCK BY FOOT) (Cut one 2 inch length per kit)	9525002289233
20. #10 GAUGE WIRE WITH ALLIGATOR CLAMPS A. 16 INCH WIRE (ORDER BY FOOT) & B. ALLIGATOR CLAMPS (PACK OF 6 EA.)	6145006006051 5999002045206
21. #16 GAUGE JUMPER WIRE WITH TERMINALS (2 EA.) A. 7 INCH WIRE (ORDER BY FOOT) & *B. PINS FROM SPEED SWITCH CANNON PLUG	6145000138651 5935012309542
22. #4 GAUGE JUMPER WIRE WITH TERMINALS (18 INCHES LONG) A. WIRE (ORDER BY FOOT) & B. 3/8 INCH TERMINALS	6154007563030 5940005574338

23. #16 GAUGE JUMPER WIRE WITH TERMINALS (10 INCHES LONG) A. WIRE (ORDER BY FOOT) & B. TERMINALS	6145000138651 59400014347780
24. OVERSPEED SOLENOID VALVE CAP, #4 (1 EA)	4730002785006
25. OVERSPEED SOLENOID VALVE PLUG, #4 (1 EA)	4730005424994
26. #10 WIRE AND CANNON PLUGS WIRED TO BYPASS BSU (12 INCHES LONG) A. #10 WIRE, B. CONNECTOR, & C. CONNECTOR	6145006006051 5935011865487 5935011686755
Notes: * The cannon plug will be ordered and the pins removed from the plug for use. Each cannon plug contains six pins.	

10.14. Battery Dead or Damaged. ***CAUTION:*** If the aircraft battery is damaged, disconnect and remove it from the aircraft. Use caution to avoid acid burns if the battery is leaking. When swapping batteries, the battery connector should be installed as rapidly as possible to preclude excess arcing. ***Caution:*** When flying with a dead or otherwise disabled battery, ensure the Direct Current (DC) Power Switch remains in the "BATTERY" position. **Note:** If another aircraft is available, temporarily place its operable battery (or INU battery when available) in the disabled aircraft until at least one engine is operating. On INU equipped aircraft, the INU battery may be swapped with the aircraft battery and used for engine start. An alternative is to bypass the INU Reverse Current Relay. (See **paragraph 10.15**).

10.14.1. Jumping Battery—Aircraft to Aircraft.

10.14.1.1. Position aircraft nose to nose to allow the DC power cable (or cables) to reach.

10.14.1.2. Join both aircraft DC power cables by use of extender plug or brass bars listed in **Table 10.2**.

10.14.1.3. Place cable from operating aircraft DC winch receptacle to external DC power receptacle of disabled aircraft.

10.14.1.4. DC power switch on disabled aircraft to "External DC" position. ***Caution:*** Reduce DC load on disabled aircraft as much as possible to preclude the possibility of overloading the DC cargo winch current limiter.

10.14.1.5. Start GTC on disabled aircraft.

10.14.1.6. ATM and Generator Switch – ON.

10.14.1.7. Jump battery relay using failed battery relay procedure. (See **paragraph 10.16**).

10.14.1.8. When battery relay is closed, remove jumper cables and continue with checklist.

10.14.2. If a usable replacement aircraft battery or another aircraft is not available, obtain two 12-volt or one 24-volt battery and jumper cables, or suitable heavy-duty cable, modified as required. (DC cargo winch cable may be used.).

10.14.2.1. Use option one to connect the external batteries to the battery connector, or option two to connect the external batteries to the external DC power receptacle (see **Figure 10.2**).

10.14.2.2. Insert stock into battery connector for option one.

10.14.2.3. Connect jumper cables to aircraft and batteries.

10.14.2.4. DC Power Switch – "Battery" for option one; "EXT DC" for option two. **Note:** With DC power switch placed in the EXT DC position (option two), check the EXT DC PWR light ON. If the light is not illuminated, check all connections and battery polarity.

10.14.2.5. Start GTC.

10.14.2.5.1. Control Switch – Start, Run.

10.14.2.5.2. Bus Tie Switch – Tied.

10.14.2.6. ATM and generator – ON, checked.

10.14.2.7. If option two was utilized, jump battery relay using failed battery relay procedure. (See **paragraph 10.16**).

10.14.2.8. Start an engine and place the generator switch to ON.

10.14.2.9. Disconnect jumper cables.

10.15. Bypassing the INU Reverse Current Relay (RCR). Note: This method should only be used if the INU battery cannot be swapped into the aircraft battery position.

10.15.1. If the aircraft battery is damaged, disconnect and remove it from the aircraft. Use caution to avoid acid burns if the battery is leaking.

10.15.2. Open the Pilot's upper circuit breaker panel.

10.15.3. Jump the INU RCR by installing a #10 jumper wire from the APP terminal to the BATT terminal of the reverse current relay (see **Figure 10.9**).

10.15.4. Check the DC voltmeter in the ESS DC BUS position to verify the bus is powered.

10.15.4.1. If the ESS DC BUS is not powered, bypass the relay as follows:

10.15.4.1.1. Remove all power from the aircraft.

10.15.4.1.2. Disconnect the INU battery.

10.15.4.1.3. Bypass the INU RCR by installing a #4 jumper wire from the GEN terminal to the BAT terminal of the reverse current relay (see **Figure 10.9**).

10.15.4.1.4. Connect the INU battery.

10.15.5. Start GTC. **Warning:** Fire protection is not available for the GTC, until the Battery Relay is jumped.

10.15.5.1. Place Bleed Air Valve switch to OPEN.

10.15.6. Place ATM and generator switch to ON. Check Voltage and Frequency.

10.15.7. Remove #10 jumper wire from the INU Reverse Current Relay (RCR).

10.15.8. Jump the battery relay using Failed Battery Relay procedure. (See **paragraph 10.16**). **Warning:** If the INU RCR has been bypassed by installing the #4 jumper wire the ISOLATED DC bus nor the ESSENTIAL DC bus can be isolated using bus isolation procedures in the flight manual.

10.16. Failed Battery Relay.

10.16.1. DC power switch – BATTERY.

10.16.2. Jump battery relay by momentarily touching terminals "A-1" to "A-2" using the #10 jumper wire (see **Figure 10.3**).

10.16.3. Check the battery voltage on voltmeter to verify closing of relay. (The voltmeter should read bus voltage.)

10.16.4. If battery relay fails to close, bypass the relay as follows:

10.16.4.1. Remove all power from the aircraft.

10.16.4.2. Disconnect the aircraft battery and INU battery.

10.16.4.3. Install a #4 jumper wire between terminals "A-1" and "A-2".

10.16.4.4. Connect the aircraft battery and INU battery. **Warning:** Fire protection is not available for the GTC until the aircraft battery bus is powered. If an engine fire or nacelle overheat is indicated and battery relay has opened, install a #4 jumper wire from terminals "A-1" and "A-2" to power the battery bus. **Caution:** When flying with a dead or otherwise disabled battery, ensure the DC Power Switch remains in the "BATTERY" position.

10.17. Failed RCR between Isolated and Essential DC Bus.

10.17.1. Open pilot's side circuit breaker panel.

10.17.2. Install a #10 jumper wire between the SW post and the APP post (see **Figure 10.3**).

10.17.3. If the RCR fails to energize, bypass the relay as follows:

10.17.3.1. Remove all power from the aircraft.

10.17.3.2. Disconnect the aircraft battery.

10.17.3.3. Install a #4 jumper wire between the BATT and GEN terminals (see **Figure 10.3**).

10.17.3.4. Connect the aircraft battery. **Warning:** The potential for electrical shock, and electrical arcing exists when performing this procedure. This procedure should only be performed in-flight as an absolute last resort effort to restore Essential DC bus power. **Warning:** The Essential DC bus cannot be isolated using bus isolation procedures contained in the flight manual. **Note:** When the #4 jumper wire is used on the RCR, the ISOL DC ON BAT light remains ON, even though the Essential DC bus is powering the Isolated Bus.

10.18. *GTC Stalls and Fails to Accelerate to "On Speed".

10.18.1. Hold fingers over the acceleration limiter holes (see **Figure 10.4**) while an assistant starts the GTC. Place and remove fingers over the holes several times during the start cycle until the start cycle sustains itself.

10.19. GTC Fails to Rotate (No Start Light).

10.19.1. Check the following prior to proceeding with the hostile environment repair procedure: GTC control circuit breaker, GTC fire handle, Isolated DC bus powered, and check GTC doors to ensure they are fully open.

10.19.2. For a failed door actuator, (doors open and close but do not fully open) disconnect the GTC door actuator at attachment point on inside of upper door. Prop doors open (use broom handle, fuel dipstick, etc.). Disconnect door actuator cannon plug and install jumper wire from pin “D” to pin “E” and attempt restart.

10.19.2.1. When finished with the GTC, attach door actuator to upper door, remove jumper wire, and install cannon plug back on actuator. Use door switch to close door.

10.19.3. For failed door actuator (doors not open or not opened enough to allow disconnecting of actuator), remove four (4) screws in upper door. This releases the door actuator attaching bracket on which the door bypass switch is located. Prop doors open and attempt start. **Note:** Ensure bypass switch is fully extended.

10.19.3.1. When finished with GTC, close and secure the doors using two of the four bypass switch mounting bracket screws.

10.19.4. If the limit switch is suspected faulty, at upper forward area of the intake, disconnect the two wires to the door bypass switch and connect the two input leads together. This bypasses the limit switches.

10.19.4.1. Start GTC.

10.20. GTC Fails to Rotate (Start Light On).

10.20.1. Remove all electrical power.

10.20.2. Open pilot’s side circuit breaker panel.

10.20.3. Check GTC starter current limiter; (see **Figure 10.3**) if bad or suspect; replace as follows:

10.20.3.1. Disconnect battery.

10.20.3.2. Remove and replace current limiter with spare.

10.20.3.3. If spares are not available, open the copilot’s upper circuit breaker panel cover, remove cargo winch current limiter and use as a replacement.

10.20.4. If current limiter is good, check GTC starter for broken wires and repair as necessary (see **Figure 10.4**).

10.20.5. Connect battery and attempt to start. If no rotation, rap starter relay and attempt another start.

10.20.6. If GTC still does not rotate, place the GTC control switch to START momentarily to energize the relay, then release the switch to RUN. Place a #4 jumper wire between post A1 and A2 of the GTC relay (see **Figure 10.3**) until the start light goes out, then remove the jumper wire.

10.21. *GTC Fuel Vapor Lock.

10.21.1. Use petcock drain on bottom of aircraft below GTC to drain fuel while motoring GTC, then attempt start (see **Figure 10.5**).

10.21.2. If no fuel is present at petcock drain, check GTC fuel shutoff valve opening by momentarily positioning GTC control switch to “START” then “OFF”.

10.21.3. If fuel shutoff valve fails to operate, remove cannon plug and open the valve manually.

10.21.4. Remove fuel line at GTC burner can and motor GTC until a steady stream of fuel is noted. This procedure may require several attempts to attain desired results.

10.21.5. Reconnect the line and attempt another start.

10.22. *GTC Rotates - Negative Ignition.

10.22.1. Check oil quantity.

10.22.2. Attempt a start while depressing and holding the oil primer button. Release the button when the GTC lights off.

10.23. Starting GTC with Failed Oil Pressure Switch.

10.23.1. Failed oil pressure switch can be detected during the start cycle by observing no ignition firing noise during start attempt and that fuel is present at the fuel pressure regulator drain and no detectable fuel pressure present in the fuel nozzle hose. (See **Figure 10.4**).

10.23.2. Remove oil line to the oil pressure switch and momentarily rotate GTC. (Oil should spurt from the line opening.).

10.23.3. Remove oil pressure switch cannon plug and place jumper wires from pin “A” to pin “B” for ignition and from pin “C” to pin “D” for fuel. Secure the jumper wires with tape.

10.23.4. Attempt to start the GTC. If the oil pressure switch was faulty the start should be successful.

10.24. Leaking Brakes.

10.24.1. Disconnect brake lines from both sides of the brake shuttle valve.

10.24.2. Use plugs and caps from the HERK kit to seal the brake lines and shuttle valve.

10.24.3. Secure disconnected hose ends to prevent interference with landing gear movement during retraction and extension. **Note:** Both landing and takeoff performance calculations are affected by a disconnected brake. Recommend using RCR of 5 for all performance calculations.

10.25. Moving an Aircraft with Flat Main Landing Gear Tire. Warning: Use this procedure only as a last resort to move an aircraft out of a hostile environment. Reduce aircraft weight as much as possible by unloading cargo, defueling, or burning off fuel. Some fuel may be transferred out of the wing corresponding to the flat tire and into the opposite wing. Be aware of wing tip and propeller ground clearance.

10.25.1. Install main gear towing/jacking fitting on the strut with the flat tire.

10.25.2. Install a 10,000 lbs chain around the top of the strut above the upper track shoes.

10.25.3. Connect a tie down device to the towing fitting. Connect the chain to the device and tighten.

10.25.4. Open the Schrader valve at the top end of the main landing gear strut and bleed all air pressure from the strut. **Warning:** Do not open Schrader valve more than ¾ of a turn. It may be necessary to use the valve stem to bleed the pressure from the strut. Do not allow the

lower nut to loosen. If the lower nut loosens, it may allow the Schrader valve to blow out of the strut body.

10.25.5. Compress the strut by any means possible such as the use of a "J" bar, chocks, milk stool or taxiing the aircraft onto shoring in order to elevate the flat tire.

10.25.6. When the strut has been compressed to the maximum extent possible, tighten the tie down device.

10.25.7. Remove the flat tire if time and situation permit.

10.25.8. Flight should be made with the landing gear extended and the landing gear control circuit breaker pulled. When safely airborne, pull the touchdown relay circuit breaker. Refer to the flight manual for airspeed limitations with landing gear extended. After landing, reset the touchdown relay circuit breaker.

10.26. Failed Engine Driven Hydraulic Pump.

10.26.1. Disconnect the failed engine driven hydraulic pump from the gearbox and secure to any available structure with safety wire. Do not disconnect hydraulic lines.

10.26.2. Install a starter pad in place of the failed hydraulic pump.

10.26.3. If time and resources permit, the pump may be removed from the nacelle as follows:

10.26.3.1. With the ESS DC bus powered, place the corresponding hydraulic pump switch to the OFF position. This closes the hydraulic shutoff valve.

10.26.3.2. Disconnect and plug all hydraulic lines to the pump.

10.26.3.3. Remove the failed pump and install a starter pad in its place. **Caution:** The hydraulic pump switch remains in the OFF position if the hydraulic pump is removed.

10.27. Failed Fuel Valve(s).

10.27.1. Locate the failed valve(s) and remove the cannon plug(s).

10.27.2. Manually open or close the valve(s) by actuating the manual arm. **Note:** On some aircraft, the dump mast shutoff valves are manually closed to refuel. Ensure these valves are reopened prior to flight.

10.28. Failed Speed Sensitive Switch.

10.28.1. Pull Ignition Control Circuit Breaker on Copilot's Lower Circuit Breaker Panel.

10.28.2. Open lower left side engine cowling on the affected engine.

10.28.3. Remove the speed sensitive control cannon plug (see **Figure 10.6**).

10.28.4. Install the pre-wired cannon plug from the HERK and secure it in place (see **Figure 10.6** and **Figure 10.8**). **Caution:** Pre-wired cannon plugs used as jumpers will be wired as shown in **Figure 10.8**.

10.28.5. Secure all engine cowling.

10.28.6. Begin the start sequence (in normal ground idle) while watching tachometer.

10.28.7. At 16 percent engine Revolutions per Minute (RPM), reset the Ignition Control Circuit Breaker.

10.28.8. At 94 percent RPM, pull the Ignition Control Circuit Breaker. **Note:** The secondary fuel pump pressure light illuminates and the pumps are in parallel operation until the Ignition Control Circuit Breaker is pulled.

10.28.9. After landing, use normal ground idle only and shutdown the affected engine as follows:

10.28.10. Ignition Control Circuit Breaker – RESET.

10.28.11. Condition lever – GROUND STOP. **Note:** When the Ignition Control Circuit Breaker is reset prior to engine shutdown, approximately two seconds is required for the fuel control shutoff valve to close. If the engine continues to run when the condition lever is placed in GROUND STOP, place the condition lever to FEATHER.

10.28.12. When the fuel flow indicator drops to zero and RPM is decreasing, pull the Ignition Control Circuit Breaker.

10.29. Failed Ignition Control Relay.

10.29.1. Pull the Ignition Control circuit breaker.

10.29.2. Open the lower left engine cowling and locate the ignition control relay (see **Figure 10.6**).

10.29.3. Disconnect the cannon plug from the relay and install the prewired cannon plug from the repair kit. **Caution:** Wire pre-wired cannon plugs used as jumpers as shown in **Figure 10.8**.

10.29.4. Close and secure cowling.

10.29.5. During engine start proceed as follows:

10.29.5.1. At 16 percent RPM, reset the Ignition Control circuit breaker.

10.29.5.2. At 65 percent RPM, pull the Ignition Control circuit breaker.

10.29.6. For engine shutdown following landing, proceed as follows:

10.29.6.1. Reset the Ignition Control circuit breaker.

10.29.6.2. Place the condition lever to GROUND STOP.

10.29.6.3. When fuel flow drops to zero and RPM decreases, pull the Ignition Control circuit breaker.

10.30. Failed Speed Sensitive Valve. Caution. This procedure renders the torquemeter shroud anti-icing system inoperative. Icing conditions should be avoided.

10.30.1. Open the lower left side engine cowling on the affected engine.

10.30.2. Disconnect the air supply line to the speed sensitive valve (see **Figure 10.6**) at the bottom of the filter element installed in the line and install a #6 plug in the open line.

10.30.3. Disconnect the torque meter shroud anti-icing line at the left side of the balance line fitting and secure it.

10.30.4. Disconnect the line from the top side of the speed sensitive valve and connect it to the balance line fitting where the torque meter shroud anti-icing line was connected.

10.30.5. Secure any loose hardware then close and secure engine cowling. **Note:** Do not start the affected engine first. Select another engine for the first engine to be started in order to supply bleed air to the affected engine.

10.30.6. Place the Engine Inlet Duct Anti-icing switch for the affected engine to ON.

10.30.7. Start the affected engine while watching RPM and standing by to activate the Prop and Engine Anti-icing Master switch.

10.30.8. At 94 percent engine RPM, place the Prop and Engine Anti-icing Master switch to MANUAL. The acceleration bleed valves should close at this time. **Warning:** When the "Prop and Engine Anti-ice Master Switch" is selected to the MANUAL position, the engine anti-ice and prop anti-ice/de-ice systems actuate if their respective switches are turned on. These switches are normally turned on during the Before Takeoff Checklist, but should be delayed using this procedure unless absolutely necessary for safe operation. Turning these switches to the ON position with the Prop and Engine Anti-icing Master Switch selected to MANUAL activates the systems and robs the engines of torque. Overheating of the blade/spinner anti-ice/de-ice systems occurs if the aircraft remains on the ground for longer than the two cycle operating limit. **Note:** In this configuration the affected engine has continuous anti-icing and an associated reduction in torque is noted.

10.30.9. After landing, shutdown the engine in normal ground idle. **Caution:** Do not use "Low Speed Ground Idle" during ground operations. Doing so may cause the engine to stall/over temp.

10.31. Failed Fuel Shutoff Valve on Fuel Control.

10.31.1. Open lower left side cowling on affected engine.

10.31.2. Remove the defective fuel control shutoff actuator (Geneva lock) from the fuel control (see **Figure 10.6**).

10.31.3. Insert a small common (flat) screwdriver into the spline end of the fuel control and rotate in a counterclockwise direction until the fuel control opens. There should be no fuel leakage from where the actuator was removed.

10.31.4. Close the engine cowling and secure all fasteners. **Note:** During engine start, abnormal situations such as excessive fuel coming from drain mast, tailpipe torching and a higher than normal start TIT) can be expected.

10.31.5. For engine shutdown, place the condition lever to FEATHER rather than GROUND STOP for the affected engine.

10.32. Failed Engine Fuel Drip Valve.

10.32.1. Use enrichment on next engine start. The sudden surge of pressure should close the drip valve.

10.32.2. If enrichment fails to close the drip valve, shutdown the engine and plug or crimp the drip valve drain valve closed.

10.33. Prop Fails To Rotate (No Light In Button). ***Caution:*** Ensure the oil shutoff valve circuit breaker is set (in).

10.33.1. If it is determined or suspected that no power is available to the starter button, proceed as follows:

10.33.1.1. Select another engine which is not operating and close its bleed air valve. (This bleed valve will remain closed throughout the start cycle.).

10.33.1.2. Start the defective engine normally while simultaneously holding in the starter button for the selected non-operating engine. Hold both buttons in until 60 percent RPM.

10.34. Alternate Fuel Management with Inboard Main Tanks Empty (External Tanks Containing Fuel).

10.34.1. The external tanks may be filled to maximum capacity provided the outboard main tanks and both auxiliary tanks are full.

10.34.2. Takeoff configuration will be engines 1 and 4 on tank to engine from their respective tanks. **(T-3)** Engines 2 and 3 will be on cross-feed from the auxiliary tanks with the cross-feed separation valve open. **(T-3) Warning:** Do not place the auxiliary or external tank dump pump switches to the dump position while those tanks are supplying fuel to the engines.

10.34.3. As soon as practical after takeoff, close the cross-feed separation valve and place all engines on cross-feed from the auxiliary tanks.

10.34.4. When auxiliary tank fuel is reduced to 4,000 – 4,500 lbs per side, terminate cross-feed operation from the auxiliary tanks and place all engines on cross-feed from the external tanks. **Caution:** Do not reduce internal fuel (main and auxiliary) to less than 25,000 lbs if external tank fuel exceeds 4,700 lbs per side.

10.34.5. When the external tanks are empty, place engines 2 and 3 on cross-feed from the auxiliary tanks and place engines 1 and 4 on tank to engine from their respective outboard main tanks. Close the external tank cross-feed valves and place the external tank fuel boost pump switches to OFF.

10.34.6. When the auxiliary tank fuel is 1,000 lbs per side, open the outboard cross-feed valves to place all engines on cross-feed.

10.34.7. When the auxiliary tanks are empty, close the auxiliary tank cross-feed valves and place the auxiliary tank fuel boost pump switches to OFF.

10.34.8. Observe flight manual touch down rate of sink and outboard tank fuel quantity landing limitations.

10.34.9. Following completion of landing ground roll, leave the main tank cross-feed valves open and maintain at least two engines in normal ground idle until the airplane is parked.

10.35. Failed Bleed Air Valve (Engine Fails To Rotate).

10.35.1. Place the bleed air valve switch to “OPEN”. Open horse collar and “tap” the motor mechanism on the bleed air valve.

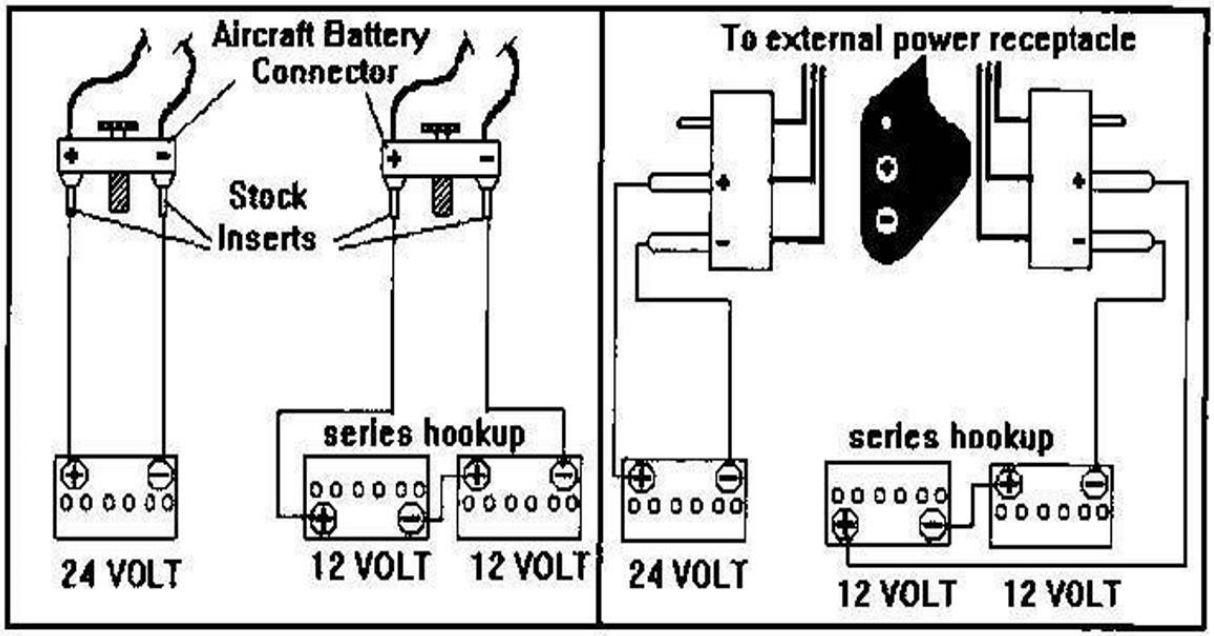
10.35.2. If the valve still fails to open, remove the motor from the valve. Manually open the valve and secure the lever to one of the mount holes with safety wire. **Warning:** Once bleed air valve has been secured in the open position, it is not possible to close the valve for wing isolation procedure. Engine shut down will isolate wing.

10.35.3. Close the horse collar and attempt engine start.

10.36. Severe Fuel Leaks.

10.36.1. Fuel leaks caused from punctures or small arms fire can be plugged by using the wooden plugs and Pig Putty from the kit. If a high number of plugs are used, it may be necessary (as time permits) to break or cut them off near the wing surface to reduce drag.

Figure 10.2. Alternate DC Power Connections.



OPTION ONE **OPTION TWO**

Figure 10.3. Reverse Current Relay.

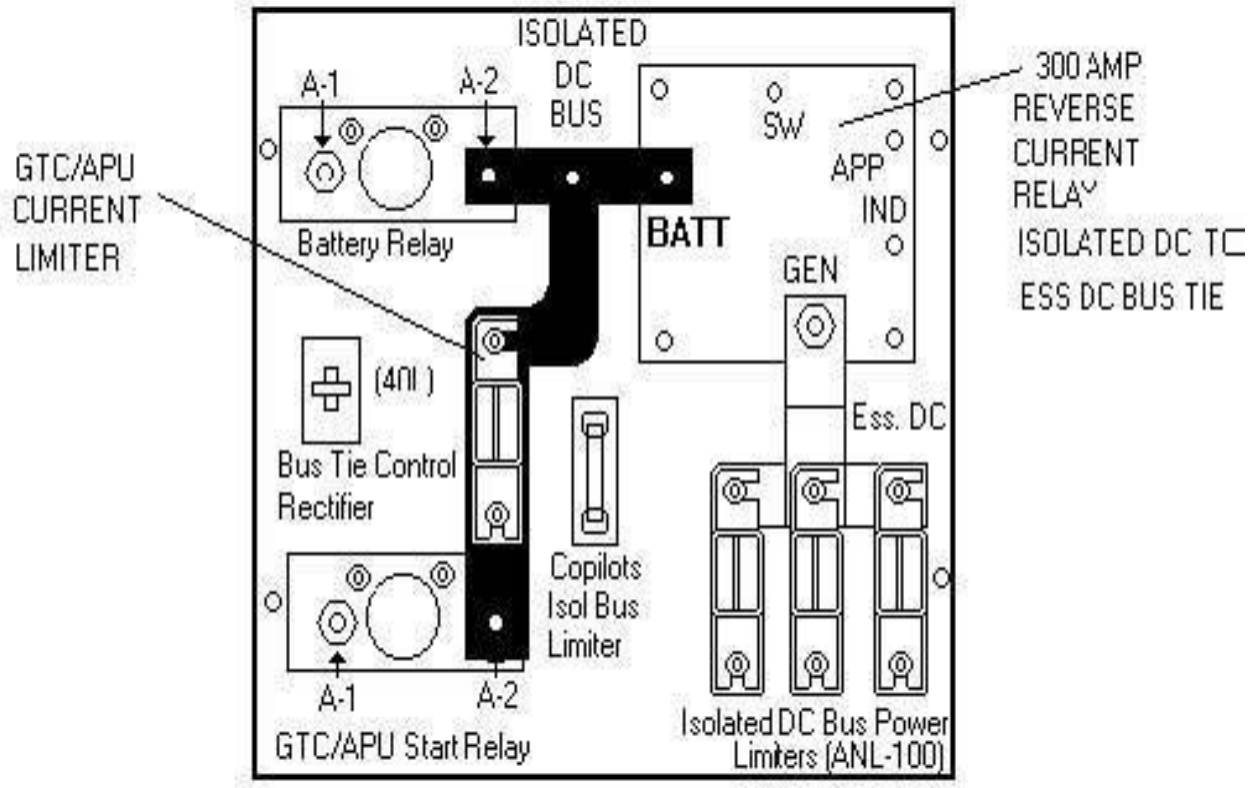


Figure 10.4. Gas Turbine Compressor (GTC).

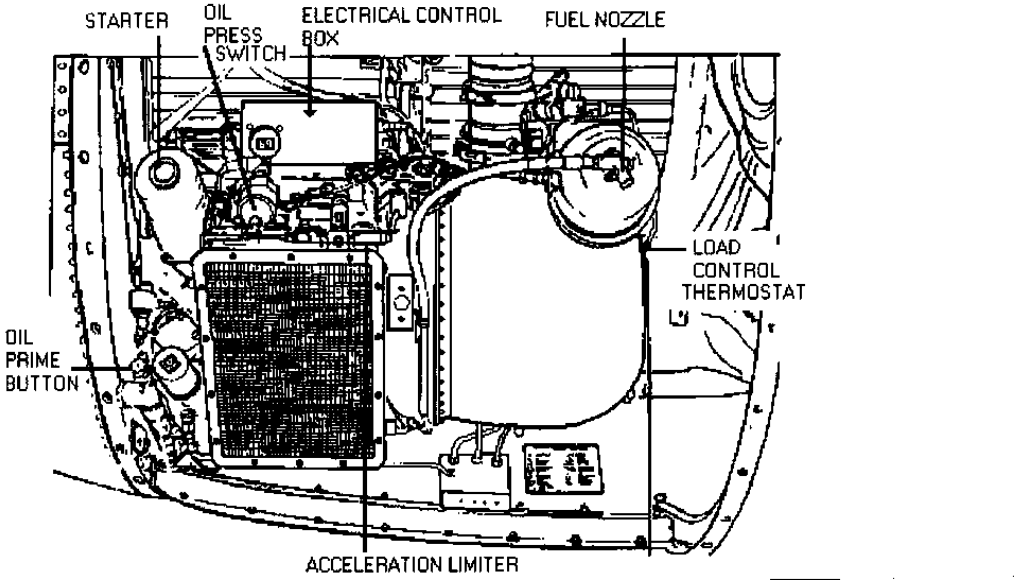


Figure 10.5. GTC Fuel Supply.

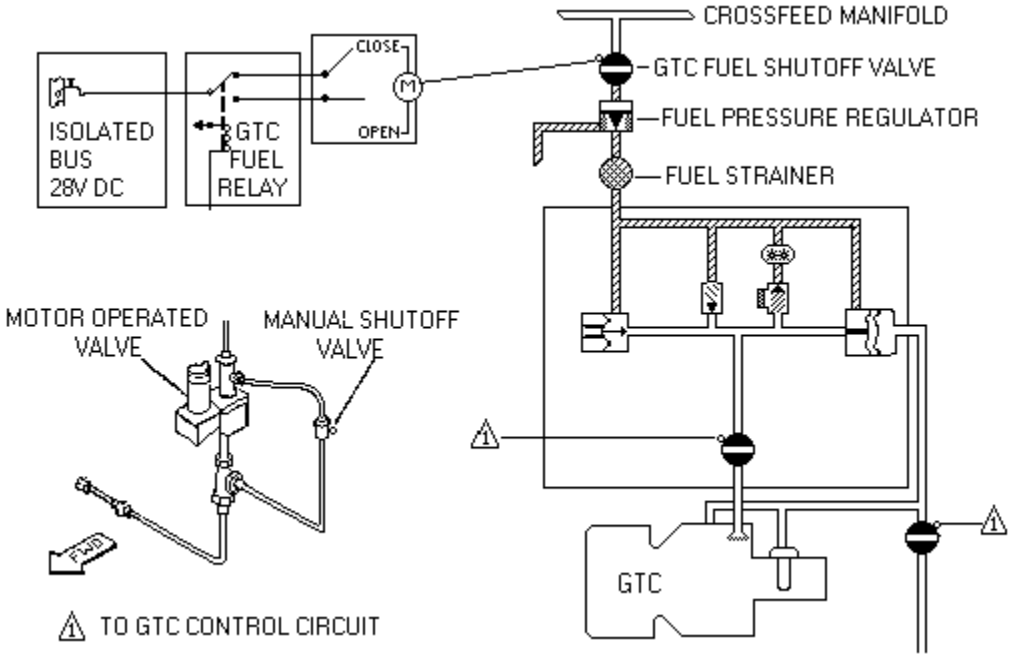


Figure 10.6. Engine Accessory Locations.

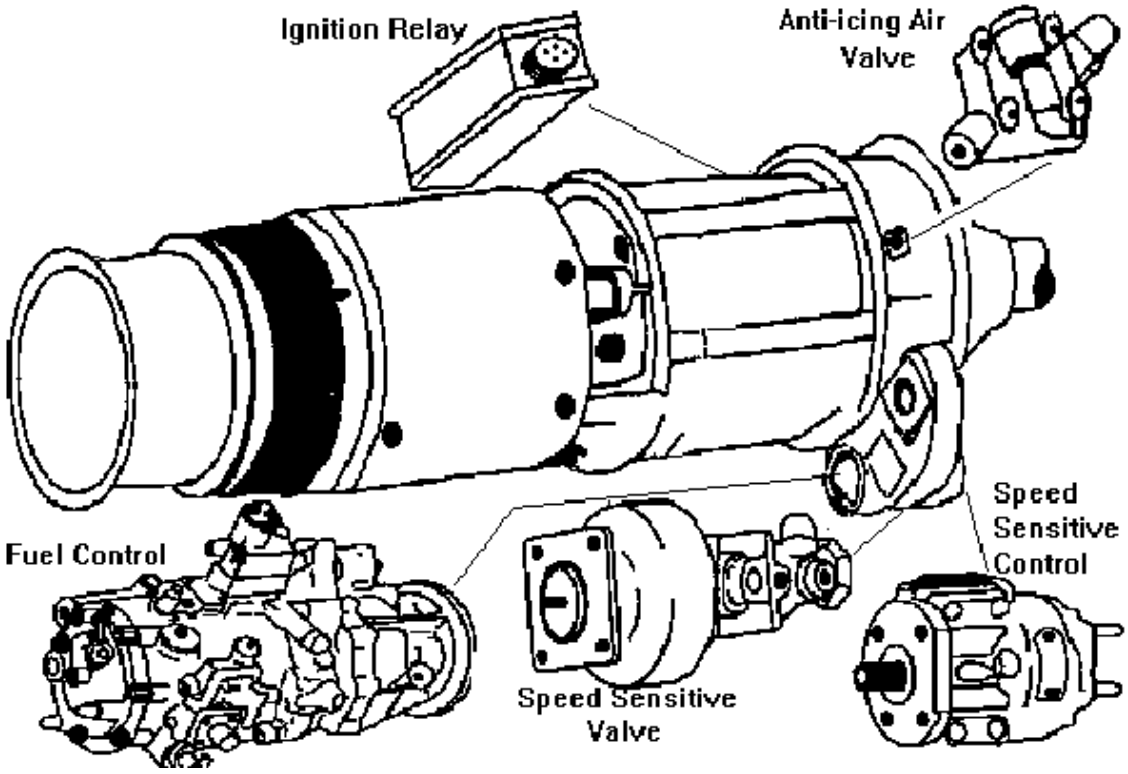


Figure 10.7. Gear Box Accessory Locations.

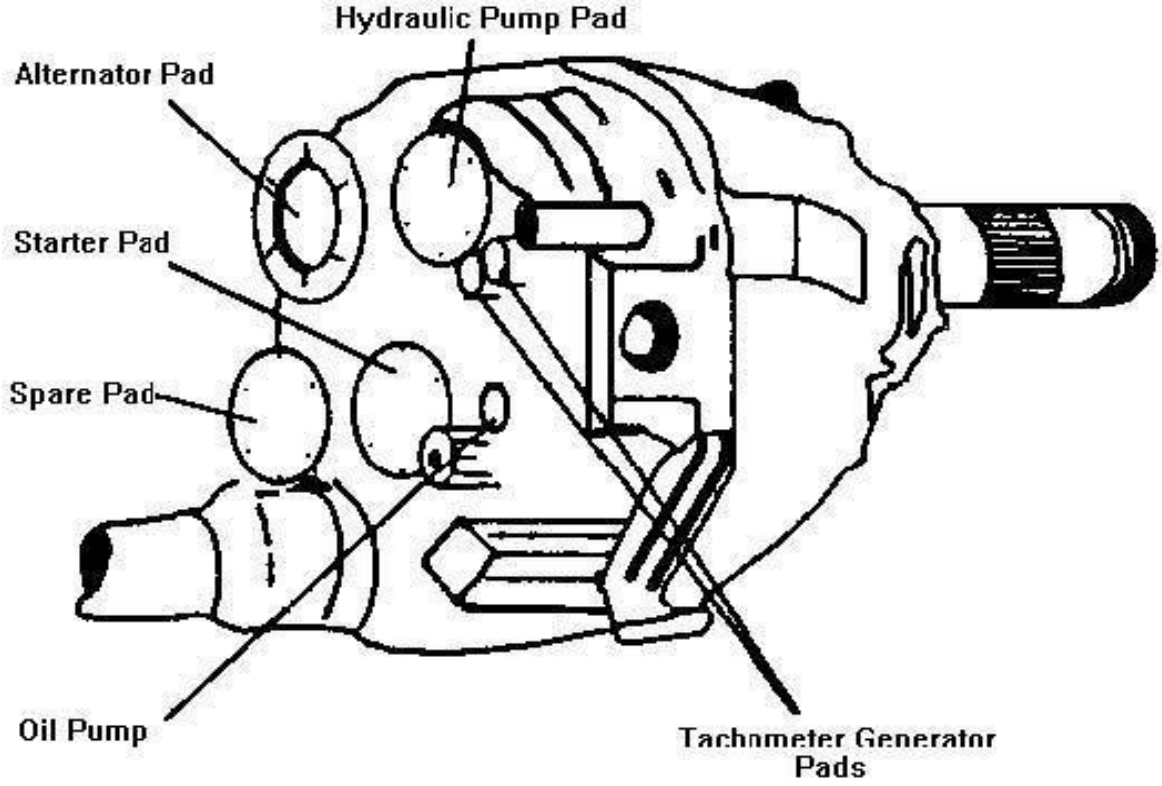
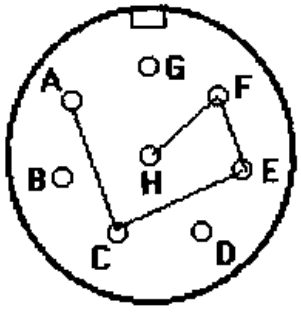


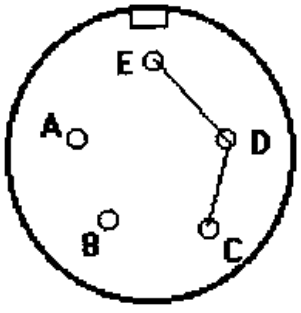
Figure 10.8. Prewired Cannon Plugs (Speed Sensitive Control and Ignition Relay).

Speed Sense Control
Pin A to C to E to F to H
16 Ga. Wire



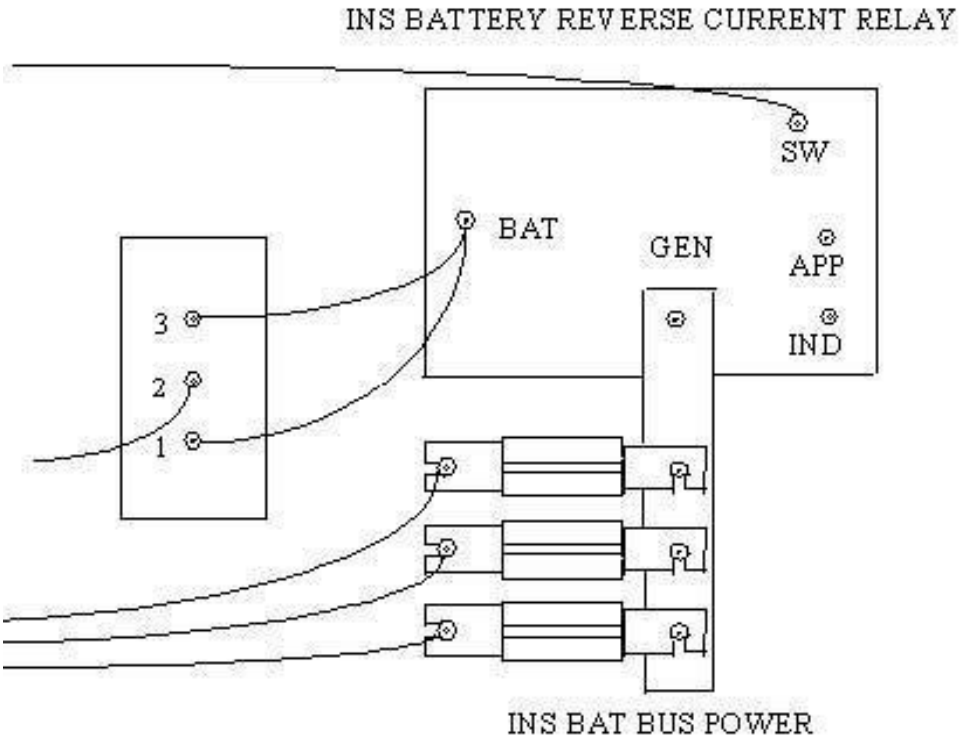
MS 3101A18-8p
A- Power
C- Fuel Shutoff (Open)
E- Ignition Relay
F- TD Sys (Start Limit)
H- Enrichment

Ignition Relay
Pin C to D to E
16 Ga. Wire



C - Power
D- Ignition Exciter and Drip Valve
E- Misc

Figure 10.9. Bypassing the INU Reverse Current Relay.



Chapter 11

AIRBORNE MAINTENACE TECHNICIAN PROCEDURES

11.1. General. The AMT is responsible to the AC for management of the mission crew/cargo compartment and COMPASS CALL mission equipment. The AMT is responsible for aircrew members stationed in the mission crew/cargo compartment, and any passengers. The AMT:

11.1.1. Will perform and supervise scanner duties.

11.1.2. Will coordinate mission equipment requirements and any special procedures necessary to ensure optimum mission accomplishment.

11.1.3. Will initialize, maintain, and troubleshoot the mission systems during flight as required.

11.1.4. Will document all discrepancies in the aircraft forms and thoroughly debrief appropriate maintenance personnel.

11.1.5. Will ensure MEPs and passengers have appropriate AFE equipment, are briefed on emergency procedures, and seated prior to stations time.

11.1.6. At the PIC's direction, will complete anti-hijacking screening for all passengers IAW AFI 13-207-O.

11.1.7. Will ensure the GTC is shutdown prior to enplaning or deplaning passengers unless proper hearing protection is used.

11.1.8. When mission requirements are not available or clearly defined, the AMT will check all PME, AME, and QRCs.

11.1.9. On all sorties, the AMT will ensure sufficient fresh water is available for the crew and passengers. **(T-3)** Establish crew drinking requirements in unit supplements to this volume.

11.2. Weight and Balance. The flight engineer will calculate all weight and balance data.

11.3. Emergency Exits and Safety Aisles. At least one unobstructed emergency exit will be available for each 20 passengers. This does not restrict over water flights if the overhead escape hatches are available for egress.

11.4. Passenger Handling.

11.4.1. The AMT is the spokesmodel for good passenger relations. There are certain rules that should be observed.

11.4.1.1. Address passengers by proper titles.

11.4.1.2. Avoid arguments and controversial subjects, national or international politics, criticism of other personnel or organizations.

11.4.2. In-flight Procedures.

11.4.2.1. Passengers may move about the cabin after reaching cruise altitude. However, exercise judgment on the number of passengers allowed out of their seats at any one time. Encourage passengers to remain seated with their seat belts fastened. Due to concern for their safety, passengers are not allowed to lounge or sleep on cargo or baggage.

11.4.2.2. Make frequent checks on the cabin temperature.

11.4.2.3. Do not allow passengers to tamper with emergency equipment. Passengers are not permitted access to checked baggage.

11.4.2.4. On long flights, particularly during hours of darkness, use all possible means to make passengers comfortable. Dim and extinguish unnecessary compartment lights.

11.4.2.5. Passengers may visit the flight deck only when approved by the AC. Use good judgment when requesting this authority.

11.4.2.6. When passengers are carried, an AMT will be in the cargo compartment for all takeoffs and landings.

Chapter 12

FUEL PLANNING

12.1. General. This chapter provides general fuel planning considerations and procedures. Publish local procedures in the supplement to this volume.

12.2. Fuel Conservation.

12.2.1. Conservation of fuel requires everyone's active participation. Do not carry extra fuel for convenience. Unidentified extra fuel should not exceed required ramp fuel load (RRFL) by more than 2,200 lbs.

12.2.2. Extra fuel (identified extra) may be added to RRFL:

12.2.2.1. When fuel availability is limited or not available at enroute stops.

12.2.2.2. For known holding delays which exceed standard delays.

12.2.2.3. For anticipated off course weather avoidance.

12.2.3. To maximize fuel, consider the following:

12.2.3.1. Use optimized CFPs when possible.

12.2.3.2. Fly long range cruise (LRC) and/or at optimum altitudes when possible.

12.2.3.3. Limit the use of the GTC when possible.

12.2.3.4. Delay engine start.

12.2.3.5. Cruise CG should be aft if practical.

12.2.3.6. Fly enroute descents when possible.

12.2.4. Fuel Loads.

12.2.4.1. Use appropriate flight planning software or T.O. 1C-130H-1-1 for fuel planning. Use 100 percent engine and constant altitude performance. Apply T.O. 1EC-130H-1 drag index to software or T.O. 1C-130H-1-1 computations. Items for fuel analysis are explained in **Table 12.1**.

12.3. Fuel Planning.

12.3.1. Assumptions.

12.3.1.1. Weight. Add OPERATING WT, CARGO/ PAX WT, and RAMP FUEL to obtain RAMP WT. Subtract TAXI fuel to obtain TAKEOFF WT.

12.3.1.2. TEMP DEVIATION. The difference between forecast temperature at cruise altitude and the standard temperature for that altitude is the TEMP DEVIATION.

12.3.2. Fuel Computations. Refer to Fuel Planning guidance in **Table 12.1** and the local supplement for fuel computations.

Table 12.1. Fuel Load Components.

Enroute		Fuel for flight time from departure to overhead destination or initial penetration fix at cruise altitude (including time for planned orbit, escort, search, recovery, appropriate climb, weather recon, etc. when applicable).
Enroute Reserve		Enroute Reserve + Overhead Reserve (2,000 lbs.) must comply with AFMAN 11-202V3 fuel reserve criteria. **(T-2)** Computed at maximum endurance and 10,000 ft MSL (may be calculated using more conservative Terminal Fuel Flow (TFF)).
Overhead	Alternate and Missed Approach	**Alternate:** Fuel for flight time from overhead destination or initial penetration fix to alternate or most distant alternate when two are required. Compute at terminal fuel flow. Required whenever an alternate is filed. **Missed Approach:** 2,200 lbs. Required if destination is below ceiling or visibility minimums for planned destination approach.
	Reserve	Entry required. Minimum 2,000 lbs. (Applicable for Enroute Reserve Requisite)
	Holding	For alternates located in Alaska or located at latitudes greater than 59 degrees N/S, use 1,500 lbs. See AFMAN 11-202V3, as supplemented, for remote/island destination requirements.
	Approach and Landing	Entry required. Approach: 1,000 lbs (2,000 lbs for high altitude approach). **Minimum Landing Fuel:** 4,000 lbs.
Identified Extra	Stored Fuel	Ramp fuel for succeeding legs without refueling.
	Off-Course Maneuvers	Fuel for anticipated off-course maneuvering for terrain clearance, weather avoidance, and ATC requirements. Compute at 100 lbs/min for departure, 50 lbs/min enroute.
	Icing	500 lbs/hour of anticipated icing.
	Known Holding Delays	Fuel for anticipated/planned excess holding time. Compute at terminal fuel flow.
Taxi and Takeoff		Normally 1,300 lbs. For known taxi delays or additional engine-running ground time exceeding 20 minutes, add 50 lbs/min.
Unidentified Extra		Difference between ramp and actual ramp fuel. Normally, should not exceed 2,200 lbs. (fuel conservation).

Chapter 13

AIR-TO-AIR REFUELING (AAR)

13.1. General. AAR operations will be performed IAW ATP-3.3.4.2-EDD-Volume 1, *Air-To-Air Refuelling* and T.O. 1EC-130H-1. **(T-2)** Mission planning should consider tanker range limitations, abort base availability, and enemy threats at refueling altitudes. Mission requirements will dictate the type of fuel management used (primary or secondary). The following procedures are supplementary to the normal procedures in the refueling manuals and applicable directives.

13.2. Crew Policy. Refer to ACCMAN 11-2EC-130HV1, *EC-130H Aircrew Training* for AAR restrictions not contained in this manual.

13.3. Flight Planning. Planners should coordinate with tanker unit planners, AMC Tanker Airlift Control Center (TACC), or Air Operations Center (AOC) tanker planners to the maximum extent possible.

13.3.1. Airspace. AAR may be conducted on established tracks published in FLIP, tracks published in an ACO, or random tracks coordinated between the tanker and receiver.

13.3.1.1. When using tracks/anchors defined by an ATO, Operational Planning Team (OPT)/Deployment Planning Team (DPT) planners will coordinate with tanker planners and thoroughly brief aircrews on all aspects of the refueling.

13.3.1.2. Coordinating an ALTRV is usually required when not using a previously identified AAR track. Plan and coordinate the ALTRV IAW FLIP requirements. Tanker planners and TACC can aid with ALTRV coordination.

13.3.1.3. In all cases, the route to and from the AAR track/anchor should allow divert to a suitable airfield IAW AFMAN 11-202V3 and **Chapter 5** of this manual.

13.3.2. Complete fuel planning using either an approved computer planning program or by using manual procedures in **Chapter 9**. A standard fuel flow of 6,000 lbs PPH may be used from the Air Refueling Initiation Point to AAR completion point.

13.4. Procedures/Restrictions.

13.4.1. Performing AAR Maneuvers. AAR-qualified aircrews are encouraged to perform all normal maneuvers at any time to enhance continuation training opportunities. Toboggans, contacts, and practice emergency separations do not require instructor supervision, except as mentioned in **paragraph 13.2** However, aircrews will ensure compliance with all training restrictions through close coordination with the tanker when a member of either AAR crew is in training.

13.4.2. Inoperative Fuel Quantity Indicators. Refer to **Table 3.4** for allowable combinations of inoperative fuel quantity indicators. After refueling any tank(s) with inoperative fuel quantity indicators, the flight engineer and navigator closely monitor fuel burn rates. Immediately inform the PIC for any discrepancies between actual and expected fuel burn.

13.4.2.1. For an inoperative main tank indicator, excessive aileron trim may be the first indication of a discrepancy between actual and expected fuel. Pilots should assume they have less than expected fuel and adjust the mission accordingly. Any remaining fuel in the tank(s) should be considered reserve fuel.

13.4.2.2. During normal operations, all tanks being refueled will have operational fuel quantity indicators. During contingency or emergency operations, fuel may be transferred from tanks with a known fuel quantity to the tank(s) with inoperative quantity indicators. Prior to transfer, the tank(s) with an inoperative fuel quantity indicator(s) will have both primary and secondary shutoff mechanisms operational. Transfer the fuel in 1,000 lb increments and closely monitor fuel distribution and aircraft trim. Comply with flight manual fuel balance limits.

13.4.3. Gross Weight Limitations. A MAJCOM waiver is required IAW the aircraft flight manual when mission requirements dictate AAR to gross weights exceeding 155,000 lbs. Gross weights exceeding 155,000 lbs are restricted to the amount necessary to arrive at the destination or next refueling point with required fuel reserves. Refer to aircraft Weight Limitations Chart for load factor limits and max recommended airspeeds. When operating at heavy gross weights, consider refueling performance as well as both the 3-engine and 4-engine cruise ceiling.

13.4.4. Manual Boom Latching. Only use manual boom latching procedures during fuel emergencies, actual contingency operations or with tanker concurrence when refueled by an aircraft with an operable Independent Disconnect System (IDS) (e.g., KC-10, KC-46).

13.5. Communication.

13.5.1. Secondary refueling frequencies do not need to be monitored unless instructed by the tanker. Pilots will monitor the primary AAR frequency, interphone, and flight crew hot mic. However, at least one flight deck crewmember will monitor UHF guard throughout the AAR.

13.5.2. During all AARs, the AC will designate one aircrew member as the primary monitor for the ATC radio frequency. **(T-3)** This aircrew member will write down the receiver aircraft clearance issued by ATC to the tanker, and compare it to the end AAR clearance issued by the tanker. **(T-3)** If there is a discrepancy, query the ATC controller prior to accepting post-AAR clearance.

Chapter 14

COMBAT MISSION PLANNING

14.1. General. Refer to the following AFTTP 3-1 for details pertaining to combat mission planning:

14.1.1. AFTTP 3-1.IPE, *Tactical Employment IPE* (S), is maintained online at 561st Joint Tactics Squadron website.

14.1.2. AFTTP 3-1.Threat Guide, Individual Chapters (S), are maintained online at 547th Intelligence Squadron website.

14.1.3. AFTTP 3-1.EC-130H, *Tactical Employment—EC-130H* (S), is maintained online at 561st Joint Tactics Squadron website.

14.2. Responsibilities.

14.2.1. Both the PIC and MCC share responsibility for mission planning. The MC is responsible for mission planning on missions involving multiple EC-130H aircraft.

14.2.2. Deployment Planning Team (DPT). When a DEPORD is received, the 755 Operational Support Squadron will establish a DPT to support squadron deployments. The DPT plans the aircraft movement to the deployed location and subsequent employment until an MPC is established. ACC Air Operations Squadron assistance may be utilized if applicable.

14.2.3. MPC. The MPC conducts mission planning for COMPASS CALL employment. Wartime MPC concepts provide an integrated team of aircrew, intelligence, and computer support personnel. The deployed commander will activate the MPC and assign a team chief. The deployed operations officer determines MPC augmentation requirements. The team chief will assign roles and responsibilities to individual team members IAW operational needs. MCs should lead the MPC to the max extent possible.

14.2.4. Intelligence Support. Intelligence briefings are presented IAW ACCMAN 14-402, *Unit-Level Intelligence Mission and Responsibilities*, as supplemented, and intelligence operating instructions.

14.2.4.1. Upon activation, intelligence personnel will support the DPT with an initial situation/threat briefing and provide update briefings as necessary. **(T-3)** They will also provide an intelligence pre-deployment briefing to aircrews. **(T-3)**

14.2.4.2. Intelligence personnel will support the MPC by providing an initial situation/threat briefing, extracting pertinent ATO information, analyzing threats to mission aircraft, building/maintaining a target database and establishing targeting priorities IAW mission directives. They will provide continuous, in-depth analysis of the situation and update the MPC. Intelligence personnel will conduct the intelligence portions of mission brief and debrief.

14.2.4.3. Intelligence personnel will serve as a liaison between COMPASS CALL, the Intelligence, Surveillance and Reconnaissance (ISR) community and mission package planners. **(T-3)**

14.2.4.4. Intelligence personnel will provide COMPASS CALL Mission Crew Simulator (CCMCS) support for scenario development, scenario briefing and scenario debriefing. **(T-3)**

Chapter 15

TACTICAL/THREAT AVOIDANCE PROCEDURES

15.1. General. Use these procedures as well as the flight manual when operating into airfields where a known or suspected ground threat exists. In a threat environment, aircrew members will understand the limitations of themselves and their equipment. The following procedures are not all encompassing. Therefore, aircrews should use good judgment and sound airmanship to successfully accomplish the mission.

15.1.1. This chapter deals primarily with the takeoff/departure and approach/landing phase of flight. AFTTP 3-1.EC-130H (S) contains a more detailed discussion of threat avoidance for all phases of flight.

15.1.2. Carefully consider performance data and energy management, particularly in mountainous terrain at heavy gross weights or with less than full engine capability. Failure to manage energy levels may cause a stall or require a go-around. Consideration should be given to planning increased airspeeds. Another accepted technique is to calculate and post the stall speeds for 0, 30 and 60 degrees of bank as well as the 3-engine service ceiling. **Warning:** Uncoordinated flight reduces stall margins and can cause an abrupt departure from controlled flight. **Caution:** Uncoordinated flight increases airframe structural loading and should be avoided unless an actual threat exists.

15.1.3. Use all available navigational aids, within threat and emission control requirements, to remain oriented to aircraft position. Aircrew members share equal responsibility for enroute navigation, terrain avoidance and threat lookout. Attention should be focused outside the aircraft, emphasizing threat detection and situational awareness. Limit duties which may cause distractions from lookout procedures to mission essential (ME) items only.

15.2. Tactical Arrivals. See AFTTP 3-1.EC-130H (S) for the advantage/disadvantage and flight parameters for each type of arrival. These maneuvers may be flown on continuation training and operational missions. In all cases plan to roll out on final at approach speed no lower than 300 ft Above Ground Level (AGL).

15.2.1. Overhead. Initiate overhead recoveries at 200 knots indicated airspeed (KIAS) and 1,500 ft AGL or traffic pattern altitude, whichever is higher, unless local procedures or tactical situation dictate otherwise. Break as the tactical situation permits with approximately 45 degrees bank and retard the power to flight idle. Make a level turn to downwind with power necessary to maintain 150 KIAS on inside downwind.

15.2.2. Downwind. Enter a downwind leg for the active landing runway, normally maintaining 200 KIAS and 1,000 ft AGL or traffic pattern altitude, whichever is higher. Displace downwind to make one continuous turn to final. Initiate turn to final ½ NM past the approach end of the runway with a 45-degree angle of bank. Retard power to flight idle after bank is established. Make a level turn until reaching 140 KIAS or approach airspeed, whichever is higher. Configure flaps and gear as speed decelerates through airspeed limits. Slow to final approach speed on final.

15.2.3. Selection of Maneuver. The desired outcome of the tactical arrival is to place the aircraft on final (never less than 300 ft and 0.25 miles from the runway) wings level, above threshold speed so that a safe landing may be executed.

15.3. Tactical Departures. See AFTTP 3-1.EC-130H (S) for the advantage/disadvantage and flight parameters for each type of departure.

15.4. COMPASS CALL Hand-Off Guide. This checklist is a locally derived aid intended to streamline coordination between two EC-130H aircrews when one aircraft is replacing the other aircraft on a designated orbit.

Chapter 16

SEARCH AND RESCUE

16.1. General. The EC-130H crew will defer to their C2 agency for prioritization between their tasked mission and the Combat Search and Rescue (CSAR) mission. **(T-2)** However, the crew will be prepared to act as on-scene commander until CSAR forces arrive. Crews then assist CSAR forces in any way necessary.

16.1.1. The following general instructions apply to all search missions:

16.1.1.1. Brief the mission purpose to crew members unable to attend the operations briefing.

16.1.1.2. Reference AFTTP 3-1.EC-130H (S) for additional guidance.

16.2. Crew Duties. EC-130H crews will allocate crew duties IAW their pre-mission planning. If re-tasked to a CSAR mission, crews should allocate crew duties as follows:

16.2.1. MCC Responsibilities:

16.2.1.1. Plan the search with the mission crew.

16.2.1.2. Discuss radio communication procedures with the crew.

16.2.1.3. Communicate mission de-confliction with C2 agencies.

16.2.2. AC Responsibilities:

16.2.2.1. Prior to commencing CSAR support, reference the Herk Hinks On-scene Commander Checklist.

16.2.2.2. Notify Tactical Air Control Command and Control (TAC C2) of on-scene arrival and estimated endurance time.

16.2.2.3. Assume on-scene commander duties as required until relieved by TAC C2 or another aircraft. As other aircraft arrive, ACs will:

16.2.2.3.1. Establish contact on channels other than Guard.

16.2.2.3.2. Obtain aircraft type identification, endurance time and rescue capability. Assign an altimeter setting, altitude separation, radio frequencies, search areas and patterns.

16.2.2.4. Maintaining radio contact with the controlling agency and other supporting assets through coordination with the MCC.

16.2.3. The navigator will optimize aircraft placement and coordination with TAC C2 agencies by:

16.2.3.1. Monitoring assigned radios through coordination with the MCC, and pass relevant information.

16.2.3.2. Maintain a log of all turn times, directions and locations.

16.2.3.3. Coordinate with the MCC and increase speed as necessary to facilitate faster direction finding.

16.2.3.4. When requested, provide remaining time on station.

16.3. Communications with a Downed Aircrew. If tasked, establish direct communications with the downed aircrew as soon as possible. Accomplish this on the prescribed CSAR frequency IAW SPINS or the Evasion Plan of Action (EPA).

16.3.1. Communications procedures should instill confidence in the downed aircrew so they know professional assistance is at hand.

16.3.1.1. Coordinate immediate action items first and supplemental items as the mission progresses. Communications may be lost or the downed crew may be forced to discontinue communications.

16.3.1.2. Avoid long transmissions, but provide pertinent data at periodic intervals to reassure the downed crew that contact is being maintained. Make all messages clear, concise and use a confident tone.

16.3.1.3. If all efforts to contact the downed aircraft fail, transmit pertinent information and instructions in the blind as though the downed aircrew is receiving but unable to acknowledge.

16.3.2. Initial Communications Procedures.

16.3.2.1. Identify yourself and advise that you are enroute to support.

16.3.2.2. Instruct the downed crew to use the present primary frequency and not to break contact. Designate a secondary frequency.

16.3.2.3. Verify the nature of the emergency and the downed aircrew’s intentions.

16.4. Departing Search Area.

16.4.1. When departing the search area at bingo fuel, appoint another aircraft as on-scene commander. If another search aircraft has not arrived, reconfirm the downed aircrew’s position, and advise them when further assistance will arrive, if known.

16.4.2. Notify the TAC C2 agency and on-scene Search and Rescue (SAR) aircraft of off-station time including any unaccomplished tasks.

DAVID B. LYONS, Maj Gen, USAF
Director of Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

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Prescribed Forms

None

Adopted Forms

AF Form 8, *Certificate of Aircrew Qualification*

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

AF Form 457, *USAF Hazard Report*

AF Form 522, *USAF Ground Weapons Training Data*

AF Form 651, *Hazardous Air Traffic Report (HATR)*

AF Form 664, *Aircraft Fuels/Ground Servicing Documentation Log*

AF Form 711B, *USAF Mishap Report*

AF Form 813, *Request for Environmental Impact Analysis*

AF Form 853, *Air Force Wildlife Strike Report*

AF Form 1297, *Temporary Issue Receipt*

AF Form 2407, *Weekly/Daily Flying Schedule Coordination*

AF Form 4076, *Aircraft Dash 21 Equipment Inventory*

AF Form 4116, *C-130 Navigator Flight Plan and Log*

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AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document*

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Abbreviations and Acronyms

AAR—Air to Air Refueling

AC—Aircraft Commander

ACC—Air Combat Command

ACDE—Aircrew Chemical Defense Ensemble

ACF—Acceptance Check Flight

ADI—Attitude Director Indicator

ADVON—Advanced Echelon

AFE—Aircrew Flight Equipment

AFTO—Air Force Technical Order

AGE—Aircraft Ground Equipment

AGL—Above Ground Level

AHAS—Aviation Hazard Advisory System

AHRS—Attitude and Heading Reference System

AIR Card—Aviation Into-Plane Reimbursement Card

AITG—Airborne Integrated Terminal Group

ALTRV—Altitude Reservation

AMT—Airborne Maintenance Technician

AOC—Air Operations Center

AOR—Area of Operations

AP—Area Planning

APOD—Aerial Port of Debarkation

ARMS—Aviation Resource Management

ARTCC—Air Route Traffic Control Center

ASOS—Automated Surface Observing System

ASR—Air Surveillance Radar

ASRR—Airfield Suitability and Restrictions Report

ATA—Actual Time of Arrival

ATC—Air Traffic Control

ATIS—Automated Terminal Information Service

ATM—Air Turbine Motor

ATO—Air Tasking Order

ATP—Allied Tactical Publication

AVPOL—Aviation Petroleum Oil and Lubricants

AWOS—Automated Weather Observation System

BAM—Bird Avoidance Model

BASH—Bird/Wildlife Aircraft Strike Hazard

BWC—Bird Watch Condition

C2—Command and Control

CARA—Combined Altitude Radar Altimeter

CBRNE—Chemical, Biological, Radiological, Nuclear and High Yield Explosives

CBP—Customs and Border Protection

CCMCS—COMPASS CALL Mission Crew Simulator

CCMD—Combatant Command

CFL—Critical Field Length

CFP—Computer Flight Plan

CG—Center of Gravity

CHOP—Change in Operational Control

CIRVIS—Communications Instructions for Reporting Vital Intelligence Sightings

CNDC—Canadian National Defense Contract

COMAFFOR—Commander Air Force Forces

COMSEC—Communications Security

CONUS—Continental United States

CRA—Country Risk Assessment

CRM—Cockpit/Crew Resource Management

CSAR—Combat Search and Rescue

CVR—Cockpit Voice Recorder

DA—Decision Altitude

DAF—Department of the Air Force

DAFMAN—Department of the Air Force Manual

DC—Direct Current

DD—Department of Defense (abbreviation for Forms only)

DEPORD—Deployment Order

DER—Departure End of Runway

DETCO—Detachment Commander

DH—Decision Height

DME—Distance Measuring Equipment

DLA Energy—Defense Logistics Agency Energy

DNIF—Duty Not Involving Flying

DO—Director of Operations (Squadron level)

DoD—Department of Defense

DoDI—Department of Defense Instruction

DoDM—Department of Defense Manual

DPT—Deployment Planning Team

DR—Dead Reckoning

DSN—Defense Switched Network

DSR—Deployed Status Report

ECG—Electronic Combat Group

ECG/CC—Electronic Combat Group Commander

ECG/EGV—Electronic Combat Group Standardization and Evaluation

ECG/SE—Electronic Combat Group Safety

ECHUM—Electronic Chart Update Manual

EEBD—Emergency Escape Breathing Device

EMI—Electromagnetic Interference

EMXG/CC—Expeditionary Maintenance Group Commander

EPA—Evasion Plan of Action

EPOS—Emergency Passenger Oxygen System

EOD—Explosive Ordinance Disposal

ETA—Estimated Time of Arrival

ETCAS—Enhanced Traffic Collision Avoidance System

ETP—Equal Time Point

EMXG/CC—Expeditionary Maintenance Group Commander

FAA—Federal Aviation Administration

FAF—Final Approach Fix

FAS—Fuels Automated System

FBO—Fixed Base Operation

FCF—Functional Check Flight

FCG—Foreign Clearance Guide

FCIF—Flight Crew Information File

FDP—Flight Duty Period

FDR—Flight Data Recorder

FIH—Flight Information Handbook

FL—Flight Level

FLIP—Flight Information Publication

FMC—Fully Mission Capable

FMS—Flight Management System

FN—Basic Qualified Navigator

FOL—Forward Operating Location

FP—Basic Qualified Pilot

FRAG—Fragmentation

FSS—Flight Service Station

ft—feet

GCAS—Ground Collision Avoidance System

GCCS—Global Command and Control System

GCE—Ground Crew Ensemble

GDSS2—Global Decision Support System 2

GMT—Greenwich Mean Time

GNC—Global Navigational Chart

GP—General Planning

GPS—Global Positioning System

GTC—Gas Turbine Compressor

GW—Gross Weight

HAA—Height Above Airport

HAT—Height Above Touchdown

HATh—Height Above Threshold

HATR—Hazardous Air Traffic Report

HERK—Hostile Environment Repair Kit

HF—High Frequency

HSI—Horizontal Situation Indicator

ICAO—International Civil Aviation Organization

IDS—Independent Disconnect System

IFE—In-flight Emergency

IFR—Instrument Flight Rules

ILS—Instrument Landing System

IMC—Instrument Meteorological Conditions

INU—Inertial Navigation Unit

IP—Instructor Pilot

IPE—Individual Protective Equipment

ISR—Intelligence, Surveillance and Reconnaissance

JCS—Joint Chiefs of Staff

C/JFACC—Combined/Joint Force Air Component Commander

JNC—Joint Navigational Chart

JNCA—Joint Navigational Chart–High Altitude

JOG—Joint Operational Graphic

JMPS—Joint Mission Planning System

KIAS—Knots Indicated Airspeed

lbs—Pounds

LBT—Low Band Transmit

LPU—Life Preserver Unit

LRC—Long Range Cruise

LSAF—Last Suitable Airfield

MAC—Mean Aerodynamic Chord

MAJCOM—Major Command

MAJCOM/A3—Major Command Directorate of Operations

MC—Mission Commander

MCC—Mission Crew Commander

MDA—Minimum Descent Altitude

MDS—Mission Design Series

ME—Mission Essential

MEL—Minimum Equipment List

MEP—Mission Essential Personnel

MESL—Minimum Essential Subsystem List

MHz—Megahertz

mic—Microphone

MOPP—Mission-Oriented Protective Posture

MPC—Mission Planning Cell

MRE—Meal Ready to Eat

MSC—Multi Service Corporation

MSL—Mean Sea Level

NAF/A3V—Numbered Air Force Standardization and Evaluations

NAS—National Air Space

NAVAIDS—Navigational Aids

NCOIC—Non-Commissioned Officer in Charge

NM—Nautical Mile(s)

NMAC—Near Midair Collision

NSN—National Stock Number

NORAD—North American Aerospace Defense Command

NOTAM—Notice to Air Missions

OAT—Outside Air Temperature

OCF—Operational Check Flight

OCONUS—Outside the Continental United States

OE—Observer Electronic Warfare Officer

OEI—One Engine Inoperative

OIC—Officer in Charge

ON—Observer Navigator

ONC—Operational Navigational Chart

OP—Observer Pilot

OPT—Operational Planning Team

OPCON—Operational Control

OPORD—Operations Order

OPLAN—Operations Plan

OPR—Office of Primary Responsibility

OSD—Office of the Secretary of Defense

OWS—Operational Weather Squadron

PF—Pilot Flying

PFD—Primary Flight Display

PFPS—Portable Flight Planning System

PIC—Pilot in Command

PPH—Pounds Per Hour

PM—Pilot Monitoring

POL—Petroleum, Oil and Lubricants

PSP—Pierced Steel Planking

QA—Quality Assurance

RA—Resolution Advisory

RCR—Runway Condition Reading

ROE—Rules of Engagement

RPM—Revolutions per Minute

RRFL—Required Ramp Fuel Load

RSC—Runway Surface Condition

RVR—Runway Visual Range

SAR—Search and Rescue

SATCOM—Satellite Communication

SCI—Sensitive Compartmented Information

SCIF—Sensitive Compartmented Information Facility

SF—Standard Form

SID—Standard Instrument Departure

SIGMET—Significant Meteorological Information

SIIs—Special Interest Items

SITCO—Shell™ International Trading Company

SITREPS—Situation Reports

SM—Statute Miles

SOC—Squadron Operations Center

SPEAR—Special Emitter Array

SPINS—Special Instructions

SPR—Single Point Refueling

SSO—Special Securities Officer

Stan/Eval—Standardization and Evaluation

TACAN—Tactical Air Navigation

TAC C2—Tactical Air Control Command and Control

TACC—Tanker Airlift Control Center

TAS—True Airspeed

TCAS—Traffic Alert and Collision Avoidance System

TDY—Temporary Duty

TDZE—Touchdown Zone Elevation

TEMPO—Temporary Group

TERPS—Terminal Instrument Procedures

TIT—Turbine Inlet Temperature

T.O.—Technical Order

TOLD—Takeoff Landing Data

TPC—Tactical Pilotage Chart

UHF—Ultra-High Frequency

USAF—United States Air Force

VCSL—Voice Call Sign Listing

VFR—Visual Flight Rules

VHF—Very High Frequency

VIP—Very Important Person

VMC—Visual Meteorological Conditions

Vmca—Air Minimum Control Speed

VOR—Very High Frequency Omni-Directional Radio-Range

Vr—Refusal Speed

Vs1—Stall Speed

Office Symbols

16 AF/A3V—16th Air Force Standardization and Evaluation

55 ECG/EGV—55th Electronic Group Standardization and Evaluation

ACC/A3—Air Combat Command Director of Operations

ACC/A3C—Air Combat Command, Command and Control, Intelligence, Surveillance, and Reconnaissance Operations Division

ACC/A3CR—Air Combat Command Airborne Reconnaissance Operations Branch

ACC/A3TO—Air Combat Command Weapons and Tactics Branch

ACC/A3TV—Air Combat Command Standardization and Evaluations Branch

AF/A3T—Air Force Training and Readiness Directorate

AF/ACTF—Air Force Aircrew Task Force

AFFSA—Headquarters Air Force Flight Safety Agency

AFSC/SEF—Air Force Safety Center Aviation Center Flight Safety Division

AMC/A3AS—Air Mobility Command Airfield Sustainability Branch

Terms

Additional Crew Member—Aircrew members and authorized flight examiners possessing valid aeronautical orders who are authorized to accompany the normal crew complement required for that mission IAW **Chapter 2.**

Aircraft Commander (AC)—A pilot that has received a mission evaluation to have authority for the operation of the aircraft and well-being of the crew, but is not necessarily designated as the Pilot in Command (PIC) in the event that multiple ACs are on board an aircraft.

Air Route Traffic Control Center (ARTCC)—The principal facility exercising enroute control of aircraft operating under IFR within its area of jurisdiction. Approximately26 such centers cover the U.S. and its possessions. Each has a communication capability to adjacent centers.

Air Traffic Control (ATC)—A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

Augmented Crew—Basic aircrew supplemented by additional qualified aircrew members to permit in-flight rest periods.

Bird/Wildlife Aircraft Strike Hazard (BASH)—An Air Force program designed to reduce the risk of bird/wildlife strikes. Refer to AFI 91-212, *Bird/Wildlife Aircraft Strike Hazards (BASH) Management Program*.

Bird Watch Condition Low—Normal bird/wildlife activity [as a guide, fewer than 5 large birds (waterfowl, raptors, gulls, etc.) or fewer than 15 small birds (terns, swallows, etc.)] on and above the airfield with a low probability of hazard. Keep in mind a single bird in a critical location may elevate the Bird Watch Condition (BWC) to moderate or severe.

Bird Watch Condition Moderate—Increased bird population (approximately 5 to 15 large birds or 15 to 30 small birds) in locations that represent an increased potential for strike. Keep in mind a single bird in a critical location may elevate the BWC to moderate or severe.

Bird Watch Condition Severe—High bird population (as a guide, more than 15 large birds or 30 small birds) in locations that represent an increased potential for strike. A single bird in a critical location may cause a severe BWC.

Border Clearance—Those clearances and inspections required to comply with federal, state, and local agricultural, customs, immigration, and immunizations requirements.

Category I Route—Any route that does not meet the requirements of a Category II route, including tactical navigation and over water routes.

Category II Route—Any route on which the position of the aircraft can be accurately determined by a radial/DME radio aid (VOR, TACAN) at least once each hour.

Command and Control (C2)—Exercise of direction and authority over assigned forces by a properly designated command echelon in the accomplishment of the mission.

CONFERENCE HOTEL—Communication conference available to help aircrews solve in-flight problems that require additional expertise.

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

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

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

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

First Suitable Airfield (FSAF)—The first suitable airfield available after completing the category I route segment.

Fix—A position determined from terrestrial, electronic or astronomical data.

Instructor Supervision—Supervision by an instructor of like specialty (see also Direct Instructor Supervision).

Combined/Joint Force Air Component Commander (C/JFACC)—The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of assigned, attached, and/or made available for tasking air forces; planning and coordinating air operations; or accomplishing such operational missions as may be assigned. The joint force air component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. Also called C/JFACC. See also combined/joint force commander. (JP 3-0, *Joint Campaigns and Operations*).

Last Suitable Airfield (LSAF)—The LSAF available before beginning the category I route segment.

Maintenance Status—**A-1**—No maintenance required.

A-2 (Plus Noun)—Minor maintenance required, but not serious enough to cause delay. Add nouns that identify the affected units or systems, (e.g., hydraulic, UHF radio, radar, engine, fuel control, generator, etc.). Attempt to describe the nature of the system malfunction to the extent that appropriate maintenance personnel meet the aircraft. Use system codes in appropriate AFTO Forms 781 whenever possible to enhance OPSEC. When possible, identify system as ME or mission contributing.

A-3 (Plus Noun)—Major maintenance. Delay is anticipated. Affected units or systems are to be identified as in A-2 status above.

A-4—Aircraft or system has suspected or known biological, chemical, or radiological contamination.

Mission Contributing—Any degraded component, system, or subsystem which is desired, but not essential to mission accomplishment.

Mission Commander (MC)—A pilot, navigator, or mission crew commander who has received a mission evaluation to have authority to lead a MPC as well as multi-ship operations.

Mission Essential (ME)—Any degraded component, system, or subsystem which is essential for safe aircraft operations or mission completion.

Off Station—The portion of the flight when the aircraft is departing from the orbit airspace and not engaged in the mission.

On Station—Ready to employ the weapon system.

Operational Control (OPCON)—Transferable command authority that may be exercised by commanders at any echelon at or below the level of combatant command. OPCON is inherent in combatant command (command authority). OPCON may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. OPCON includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. OPCON should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. OPCON normally provides full authority to organize commands and forces and to employ those forces as the commander in OPCON considers necessary to accomplish assigned missions. OPCON does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called OPCON (*Department of Defense Dictionary of Military and Associated Terms*).

Operational Missions—Missions such as deployment, re-deployment, and operational readiness inspections (ORI) are considered operational missions.

Orbit—The airspace where an EC-130H aircraft conducts the mission.

Overwater Flight—Any flight that exceeds power off gliding distance from land.

Permit to Proceed—Aircraft not cleared at the first U.S. port of entry may move to another U.S. airport, on a permit to proceed issued by customs officials at the first port of entry. This permit lists the requirements to be met at the next point of landing (e.g., number of crew and passengers, cargo not yet cleared). PICs are responsible to deliver the permit to proceed to the customs inspector at the base where final clearance is performed. (Heavy monetary fines can be imposed on the PIC for not complying with permit to proceed procedures.)

Pilot in Command (PIC)—Aircraft Commander (AC)-qualified pilot who is designated as in command of the aircraft and the overall mission, regardless of whether he or she is in the seat.

Show Time—The time a crew member will report for duty.

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

Stations Time—A specified time that aircrew, passengers, and material are to be in the aircraft and prepared for flight. Passengers will be seated and loads tied down. **(T-3)** The crew will have completed aircraft preflight inspections prior to stations time. **(T-3)**

Terminal Fuel Flow (TFF)—The fuel flow rate expected during the last hour at cruise altitude. It is the difference between the fuel required for enroute time plus one hour and fuel required for enroute time. TFF may also be computed using T.O. 1C-130H-1-1 fuel flow table and the estimated aircraft weight at destination. Estimated gross weight is determined by subtracting fuel burn off from takeoff gross weight.

Zero Fuel Weight—Weight, expressed in lbs, of a loaded aircraft not including wing and body tank fuel. All weight in excess of the maximum zero fuel weight consists of usable fuel.