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Flying Operations

EC-130H OPERATIONS PROCEDURES

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(Mr. Gerald F. Pease, Jr., SES)

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This instruction implements AFPD 11-2, *Aircraft Rules and Procedure*s and AFPD 11-4, *Aviation Servic*e. It establishes operational guidance for all EC-130H COMPASS CALL aircraft and aircrew. It applies to all EC-130H COMPASS CALL units and their assigned Back-up Aircraft Inventory (BAI) aircraft. It is used in conjunction with AFI 11-202, Volume 3, *General Flight Rule*s, and MAJCOM supplements. This document does not apply to the Air Force Reserve, the Air National Guard, or the Civil Air Patrol. 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. See paragraph **1.6** of this volume for guidance on submitting comments and suggesting improvements to this publication. Maintain official records created as a result of prescribed processes IAW AFMAN 33-363, *Management of Records*, and and disposed of in accordance with AF Records Disposition Schedule (RDS) located on the AF Portal at the Air Force Records Information Management System (AFRIMS) link located at **https://www.my.af.mil/gcss-af61a/afrims/afrims**/. Contact supporting records managers as required.

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed.

The following is synopsis of major changes set forth in this instruction: moved alpha status to definitions (paragraph 2.5); defined pilot, copilot seat and aircraft commander (paragraph 3.1); incorporated guest flyer definitions from local supplement (paragraph 3.3); deletes Mission Essential Ground Personnel (MEGP) guidance and adds Mission Essential Personnel (MEP) guidance per AFI 11-401, *Aviation Management*; deleted scheduling restrictions already

included in AFI 11-202V3 (paragraph 3.4); standardized scheduling restrictions with AFI 48-123, *Medical Examinations and Standards* (paragraph 3.4); added counter-fatigue management program (paragraph 3.9); updated definitions for maintenance (paragraph 4.6) and moved maintenance status to definitions in Attachment 1; standardized Tables 4.1 – 4.15 with C-130 baseline; provided greater definition for ADI in Table 4.12; changed requirement for propeller anti-ice, must be operational in manual (Table 4.6); standardized mandatory aircrew calls with C-130 (chapter 5); incorporated ACC FCIF H4 dated 27 May 03; minimum RCR on any portion of the runway is 05 (paragraph 5.10); incorporated TCAS, BASH, radar altimeter and FCF/OCF guidance into chapter 5; changed OCONUS alternate requirements to provide second exception for mission orbits (paragraph 6.20.2); deleted details for rendezvous with hijacked aircraft to be consistent with baseline C-130 V3 (paragraph 7.5.9); deleted information that is contained in AFPAM 10-100 *Airmans Manual* duplication (paragraph 7.12); updated Chemical, Biological, Radiological, Nuclear and High-Yield Explosive (CBRNE) Weapon threat information (chapter 10); Range Control Chart construction, ARA, GRID sections deleted (chapter 11); significantly edited passenger handling (paragraph 13.4); deleted Table 13.1, drinking water requirements (required to be defined in supplement); Table 14.1 edited to align with AFI 11-202V3; made overhead and downwind recovery descriptions more complete with altitude and airspeed data (paragraphs 17.2.1.1 and 17.2.1.2); deleted low-altitude arrivals (curvilinear and straight-in approaches) with reference to classified volumes; deleted Engine-Running Offload and Engine-Running Crew Change procedures (chapter 17); deleted weight-and-balance data from old chapter 24 and incorporated items not moved to TO 1EC-130H-5-2, *Loading Data* into chapter 12; incorporated applicable search and rescue procedures into chapter 22.

Chapter 1

GENERAL INFORMATION

1.1. General. This directive is for EC-130H COMPASS CALL aircrews. Use it in conjunction with aircraft flight manuals, FLIP and applicable USAF directives. This volume prescribes procedures for most circumstances, but is not to be used as a substitute for sound judgment or common sense. It is written for normal and contingency operations to reduce procedural changes at the onset of contingencies.

1.1.1. HQ ACC/A3T has overall responsibility for administration of this volume.

1.2. Terms Explained. The terms "Shall, Will, Should, May, Warning, Caution and Note" are defined in the appropriate EC-130H-flight manual. Additional terms are defined in Attachment 1.

1.3. Deviations and Waivers. Deviations from these procedures require specific approval of HQ ACC/A3 (or other authority specified in this volume), unless an urgent requirement, safety or aircraft emergency dictates otherwise. The aircraft commander (AC) will take the appropriate action to safely recover the aircraft and is responsible for the action taken.

1.3.1. Unless otherwise stipulated, waiver authority for the contents of this AFI is HQ ACC/A3. Forward waiver requests to through NAF channels to HQ ACC/A3T for staffing, with informational copies to HQ ACC/A3I as necessary. When chopped to another MAJCOM, forward waiver requests through the chain of command to MAJCOM standardization/evaluation, JFACC, or COMAFFOR, as appropriate, with informational copies to HQ ACC/A3, HQ ACC/A3T, and HQ ACC/A3I. Waivers issued by HQ ACC/A3 are effective until the next rewrite of this AFI unless stated otherwise in the waiver approval. For waivers issued under other authority specified in this AFI, duration of the waiver will be included in the approval. HQ ACC/A3 must approve long-term (permanent) waivers.

1.4. Supplements. This AFI is a basic directive. Each user MAJCOM or operational theater may supplement this AFI according to AFPD 11-2 and AFI 33-360, *Publications and Forms Management*. Stipulate unique MAJCOM procedures (shall not be less restrictive than this basic document) and publish MAJCOM/A3/DO-approved permanent waivers in the MAJCOM supplement.

1.4.1. Coordination Process. Units will send one copy of their supplement to this AFI (local procedures) to 8 AF/OV for coordination and approval. 8 AF/OV will then forward a copy to HQ ACC/A3TV.

1.5. Combined Operations. Use only the basic AFI for planning or operations involving forces from other commands. Commanders may use approved MAJCOM supplement procedures with assigned and/or chopped forces provided these forces receive appropriate training on the procedures and the duration of their use is specified. Commanders should not assume or expect aircrews from another command to perform MAJCOM-specific procedures in their supplements unless these provisions are met. Questions by aircrews, planners and staff should be submitted to OPR via ACC Command Post or ACC Operations Center (see **Chapter 4**).

1.6. Revisions. Personnel at all echelons are encouraged to submit changes in accordance with AFI 11-215, *USAF Flight Manuals Program (FMP).* Use an AF Form 847, *Recommendation for Change of Publication*. ACC Standardization/Evaluation offices (HQ ACC/A3TV, 205 Dodd Blvd., Suite 101, Langley AFB, VA 23665-2789) will forward approved recommendations to HQ USAF/A3O-AT for final approval prior to publication.

Chapter 2

COMMAND AND CONTROL

2.1. General. The ACC command and control (C2) system is based on the principles of centralized monitoring and decentralized control and execution. The result is a C2 mechanism which keeps the ACC commander informed of the current status of ACC forces while enabling the wing or group commander to exercise control over day-to-day operations. The C2 network consists of theater Air and Space Operations Centers, Contingency Response Groups (CRG), Special Tactics Teams (STT), unit command posts and the ACC command center.

2.2. Operational Control (OPCON). ACC is designated as the controlling agency for assigned Air Force aircraft, while theater commands have OPCON of theater-based assets. In practice, responsibility for planning and executing ACC missions is routinely delegated to the wing or group commander. The wing or group commander, in turn, exercises control of routine missions through the wing command post or squadron operations center (SOC). When assigned forces undergo a change in operational control (CHOP), responsibility for mission monitoring passes from the wing or group C2 facility to the gaining command/theater. Changeover will be accomplished IAW the pertinent OPLAN, OPORD or deployment/execution order. For the purpose of this directive when the term ECG/CC (Electronic Group Commander) or WG/CC (Wing Commander) is used, but the assigned forces have been CHOPed, it can be assumed that the terms EOG/CC (Expeditionary Operations Group Commander) and EW/CC (Expeditionary Wing Commander) apply unless otherwise stated. **Note:** For certain close-hold activities, security considerations may compel the wing or group commander to shift mission monitoring responsibilities from the command post to another wing or squadron agency. The wing or group commander will ensure procedures are established for the responsible agency to monitor mission progress and advise the MAJCOM/A3 and COMACC as appropriate.

2.3. Detachment Commander (DETCO). When one or more aircraft are deployed to perform missions away from home station, the tasked unit will designate a DETCO to assume responsibility for mission execution, personnel supervision and higher headquarters coordination.

2.3.1. The DETCO is the final authority responsible for ensuring aircrews have properly coordinated mission details. DETCO duties include, but are not limited to:

2.3.1.1. Ensuring all collocated aircrews complete required mission briefings, including local procedures, Rules of Engagement and Special Instructions (see paragraph **6.10**).

2.3.1.2. Coordinating with Air Traffic Control (ATC), Combat Control Teams (CCT), STT range control, users and others that may have an impact on the mission.

2.3.1.3. Ensuring both maintenance and operations personnel have ample and adequate billeting, dining and transportation arrangements.

2.3.1.4. Coordinating aircraft and fuel requirements with maintenance supervision.

2.3.1.5. Submitting timely reports on aircraft movements (see paragraph **2.5**).

2.3.1.6. Other duties as outlined by the squadron commander or operations officer.

2.4. Aircraft Commander (AC) Responsibility and Authority. Flight authorization designates a Pilot in Command (PIC) on all flights, in accordance with AFI 11-401, *Aviation Management*. For purposes of this instruction, aircraft commander refers to an eligible pilot designated as the PIC. PIC and AC are interchangeable unless otherwise noted.

2.4.1. PICs are:

2.4.1.1. In command of all persons aboard the aircraft.

2.4.1.2. Responsible for the welfare of the crew.

2.4.1.3. Vested with the authority necessary to manage crew resources in order to safely accomplish the mission. The PIC shall only fly events authorized in the mission tasking unless in the PIC's judgment an emergency condition demands otherwise.

2.4.1.4. The final authority as to the operation of the aircraft and will make decisions not specifically assigned to higher authority.

2.4.1.5. The final authority for requesting or accepting any waivers affecting the crew, aircraft or mission.

2.4.1.6. Charged with keeping the applicable C2 or executing agencies informed concerning mission progress.

2.4.1.7. Responsible for the timely reporting of aircraft movements in the absence of a DETCO (see paragraph **2.5**).

2.4.2. IAW AFI 11-401, eligible pilots may alternate command responsibility. Ensure all crewmembers are aware of which pilot has AC responsibility at all times. When an instructor or evaluator pilot is performing IP/EP duties on the mission, but not designated as the pilot in command on the flight authorization, the IP/EP will assume command when safety requirements dictate, or when deviation from this volume is necessary IAW paragraph **1.3**

2.5. Mission Monitoring. Except for selected close-hold missions, the ACC Command Center monitors all ACC aircraft that move to, from or between OCONUS locations. Key components of the ACC C2 system are the Global Command and Control System (GCCS) and the 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 from situation reports (SITREP) and Deployed Status Reports (DSR). For missions that are not close-hold in nature and have not been chopped to another command, the respective squadron operations center or wing command post tracks CONUS movements of their aircraft based on aircrew reports. Information on OCONUS movements of ACC aircraft is relayed to the ACC Command Center (DSN: 574-1555; commercial: 757-764-1555) via telephone notification from host wing command posts. The host wing command post receives data directly from aircrew or via the enroute facility's local command post. **Note:**: These procedures may be modified to meet local/contingency requirements.

2.5.1. Missions at Bases with a C2 Facility. DETCOs or ACs will ensure that at least 30 minutes prior to landing, the following information is relayed to the applicable C2 facility: call signs, mission numbers, ETAs, maintenance status and additional service requirements. After landing, the DETCO or AC will contact the C2 facility with ground handling requirements and departure information. In addition, CONUS-based crews operating

OCONUS must keep their home station Squadron Operations Center (SOC)/command post apprised of all actual takeoff and landing times, projected takeoff times and other related information. Home station agencies relay information to the ACC Command Post. These actions keep the ACC commander apprised of the locations and status of OCONUS forces. When forces chop to another theater commander, reporting will be through theater C2 centers upon arrival in the assigned area of responsibility.

2.5.2. Missions at Bases without a C2 Facility. DETCOs or ACs will report, as soon as possible, actual takeoff and landing times, maintenance status, projected takeoff times, and other pertinent data to the host wing command post or command/operations center. Possible methods of communicating this information include HF phone patch, SATCOM radio, DSN, and commercial telephone. Accomplish movement reporting as soon as possible after the event, when crew duties and safety permit. If unable to contact 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 the FLIP, Flight Information Handbook, USAF HF/SSB Airways and Command and Control Station section for guidance on mission reporting. Restrict HF transmission to operational traffic, such as movement reporting, itinerary revisions, maintenance status, flight plan information, aircraft emergencies, or other important flight information.

2.5.3. Enroute Reporting. Enroute reports are required only when specified in an OPORD/OPLAN or other mission directive.

2.5.3.1. Contact the destination IAW the Flight Information Handbook/Enroute Supplement. 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. When within UHF/VHF range, contact the appropriate destination agency (command post, SOC, etc.) with the following information, unless previously transmitted:

2.5.3.1.1. ETA.

2.5.3.1.2. VIP code and requirements (if applicable).

2.5.3.1.3. Hazardous cargo and remote parking requirements (if applicable).

2.5.3.1.4. Maintenance status.

2.5.3.1.5. Any additional servicing requirements.

2.5.4. Close-Hold or Sensitive Missions. Command and control procedures for these missions will be outlined in the tasking directive.

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

2.6.1. Diverting or rerouting a mission must be authorized by the commander with OPCON, except in an emergency or when required by enroute or terminal weather conditions or

facilities. In the event of an emergency, weather-related divert or change in routing, the DETCO or AC must notify the controlling authority as soon as possible.

2.6.1.1. The controlling agency directing the change in routing or diversion is responsible for ensuring destination requirements or facilities are adequate for the aircraft.

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

2.6.2. When directing an aircraft to an alternate airfield, the C2 agency will ensure the AC is provided existing and forecast weather for the alternate, notices to airmen (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 AC will coordinate with the C2 agency for other suitable alternates. The C2 agency will coordinate with customs and ground service agencies to prepare for arrival. The AC is final authority on selecting a suitable alternate.

Chapter 3

CREW COMPLEMENT

3.1. Aircrew Qualification. Primary aircrew members, or those occupying a primary position during flight, must be qualified or in training for qualification in 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).

3.1.1. Pilots:

3.1.1.1. Qualification Requirements.

3.1.1.1.1. A pilot is trained and qualified to perform left-seat maneuvers, to include engine-out and no-flap practice under direct IP supervision. The term "pilot" applies to the mobility pilot development (MPD) graduate, previously qualified pilot (PQP), or any other left-seat qualified pilot who may or may not be certified as an aircraft commander.

3.1.1.1.2. Any qualified pilot may occupy the copilot seat.

3.1.1.1.3. An aircraft commander is any pilot trained and qualified to command the aircraft. The aircraft commander upgrade program is outlined in AFI 11-2EC-130H, Volume 1, *EC-130H Aircrew Training*.

3.1.1.2. 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 (ACM) or Mission Essential Personnel (MEP) on board. 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 AFI 11-2EC-130HV1, will occupy a pilot's seat with passengers on board the aircraft. **EXCEPTION:** A qualified pilot regaining currency under direct IP supervision (in the seat at the controls) may also fly with passengers on board. Guidance for space-available, orientation, incentive and familiarization flights will be outlined in the supplement to this volume.

3.1.2. Navigators, Flight Engineers and AMTs. Non-current or unqualified navigators, flight engineers or AMTs may perform in their primary crew position on any mission when supervised by a qualified instructor or flight examiner of like specialty (direct supervision for critical phases of flight).

3.1.3. Senior leaders.

3.1.3.1. 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.

3.1.3.2. Crew members who complete the Senior Staff Qualification Course will log "FP/FN" for Flight Authorization Duty code on the AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document.*

3.1.3.3. Crew members who complete a Senior Staff Familiarization flight will log "OP/ON" for Flight Authorization Duty Code on the AFTO Form 781.

3.2. Crew Complement.

3.2.1. Minimum basic crew is defined as one aircraft commander, one pilot, one navigator, one flight engineer and one AMT. Squadron commanders, operations officers, or DETCOs may authorize flights without a navigator when not required for mission accomplishment. **Note:** A navigator will be required on missions if reported or forecast thunderstorms or other inclement weather exists. Units will post procedures regarding the use of navigators on proficiency trainers in the supplement to this volume. A navigator is required for training missions when the sortie involves a mission orbit or air refueling or for proficiency training missions outside the local area as defined in the supplement to this AFI.

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

3.2.3. Mission crew is defined as basic crew plus two EWOs, one MCS, one to four ANOs and one AO. Minimum mission crew is one EWO, one MCS, one ANO and one AO/ANO. The ECG/CC may make adjustments to the minimum mission crew on a case-by-case basis. **Note:** The AC maintains ultimate responsibility of overall conduct of the mission. However, qualified aircrew in the seats when the AC is not at the controls maintain responsibility for the actions they take. Transfer of duties between qualified ACs will be briefed to the crew.

3.3. Mission Essential Personnel (MEP). Mission Essential Personnel are personnel who are required for the execution of the aircraft or unit mission, to include follow-on missions. This includes additional aircrew members required for follow-on missions and personnel not authorized AOs who are tasked to perform ground support duties at enroute locations or destination points that are directly related and essential to accomplishment of the aircraft or unit mission, e.g. a specialist or technician required to provide aircraft support or a security team required to guard the aircraft. MEP may include military staff personnel and U.S. Government employees when those individuals are required for the mission. MEPs travel in passenger status, but report to the command and control agency through the AC. MEP authority must be on the individual's orders or other written authorization. MEPs will be manifested and anti-hijack processed by the aircrew at the aircraft. They are authorized flight deck seating with AC approval. Eligibility and authority for granting MEP status is specified in AFI 11-401.

3.3.1. MEP travel status will be strictly controlled and approved only for personnel with a bona fide mission-essential purpose for a specific flight or period of flights.

3.3.2. Maintenance discrepancies that restrict ECG aircraft from carrying passengers also prohibit the carrying of MEPs.

3.3.3. MEP status will not be approved to allow non-aircrew members to perform in-flight duties as MEPs are a category of passenger while the aircraft is airborne, and performe duties on the ground enroute or at point of destination. Members required to perform duties while the aircraft is airborne will not be classified as MEP. Maintenance personnel required to observe aircraft systems or perform maintenance inflight will be put on non-interferance AOs IAW AFI 11-401.

3.3.4. Simulated emergency procedures may not be performed with MEP on board.

3.3.5. Touch and go procedures may be performed with MEP on board.

3.3.6. The ECG/CC is the approval authority for MEP status.

3.4. Scheduling Restrictions. Refer to AFI 11-202V3, 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 AFI 11-202V3, aircrew members will not be scheduled to fly, nor will they perform crew duties:

3.4.1. When the maximum flying time limitations of AFI 11-202V3 will be exceeded.

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

3.4.3. When taking oral or injected medication unless individual medical waiver has been granted by the Flight Surgeon. Aircrew members may not self-medicate except as noted in AFI 48-123. The following is a partial list of medications which may be used without medical consultation:

3.4.3.1. Skin antiseptics, topical antifungals, 1 percent Hydrocortisone cream (more potent topical steroids require waivers), or benzoyl peroxide for minor wounds and skin diseases which do not interfere with the performance of flying duties or wear of personal equipment.

3.4.3.2. Single doses of over-the-counter aspirin, acetaminophen or ibuprofen to provide analgesia for minor self-limiting conditions.

3.4.3.3. Antacids for mild isolated episodes of epigastric distress.

3.4.3.4. Hemorrhoidal suppositories.

3.4.3.5. Bismuth subsalicylate for mild afebrile cases of diarrhea.

3.4.3.6. Oxymetazoline or phenylephrine nasal sprays may be used by aircrew as "get me downs" should unexpected ear or sinus block occur during flight. These should not be used to treat symptoms of head congestion existing prior to flight.

3.4.3.7. Multivitamins.

3.4.3.8. Dietary, herbal and nutritional supplements can only be used with the approval of a flight surgeon. The flight surgeon should consider aeromedical implications of the supplement as well as the probability the supplement will actually enhance performance.

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

3.5. Inter-fly: Squadron operations officers may authorize inter-fly of ACC aircrews and ACC aircraft in specific operations, exercises or under special circumstances. In all cases, the crew will be qualified in the aircraft MDS as well as any systems required to fly the mission. HQ ACC/A3 is the approval authority for command-to-command inter-fly.

3.6. Flight Duty Period (FDP). The terms Crew Duty Day (CDD), Crew Duty Time (CDT), and FDP are interchangeable for the purposes of this volume. CDT/CDD/FDP begins at scheduled or established show time. For aircrew members performing other duties prior to flight-related duties, CDT/CDD/FDP begins when reporting for other duties. For Alpha Standby, CDT/CDD/FDP begins when the crew is told to launch. For Bravo Standby,

CDT/CDD/FDP begins when the crew shows for duty. CDT/CDD/FDP ends when all aircrew members have completed their duties at the aircraft. Waiver authority is IAW AFI 11-202V3 and this paragraph. **Note:** The following paragraphs supplement AFI 11-202V3, Table 9.1, for EC-130E/H aircraft.

3.6.1. Basic CDD is 16 hours, provided no pilot proficiency training (multiple approaches/landings at practice airfields), air-to-air refueling training, or Functional Check Flights (FCF) are accomplished after 12 hours. If the autopilot is not operational or its use is denied for more than 4 hours, CDD is 12 hours (unless the pilot position is augmented). Waiver authority for contingencies is JFACC or MAJCOM/A3 of the agency with OPCON. Preflight crew duty day is the same as a flight crew and is outlined in AFI 11-202V3.

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

3.6.2.1. 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 will allow the new crew member time to get acclimated. **Note:** If the autopilot fails after departure, consider mission requirements and determine best course of action to preclude further mission impact due to reduced CDD. Contact C2 agencies, coordinate intentions, and comply with preceding limitations.

3.6.3. CDD for flight examiners administering flight evaluations will not exceed augmented CDD.

3.6.4. CDD may be extended IAW AFI 11-202, Vol 3, para 9.10.1. MAJCOM/A3 or equivalent for the agency with OPCON of the aircraft is waiver authority for maximum CDD. Coordinate with C2 agencies so that downstream activities are not adversely affected. Under no circumstances will missions be scheduled to exceed the maximum CDD above without appropriate waiver.

3.7. Crew Rest. Crew rest policy is IAW AFI 11-202V3 and this paragraph. The minimum crew rest period is 12 hours unless waived by HQ ACC/A3.

3.7.1. Home-Station Pre-Departure Crew Rest. All primary and deadhead 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. Deadhead aircrew members will not be manifested as passengers to reduce or eliminate crew rest requirements.

3.7.2. 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 time period provides crews with time to complete normal post-flight duties. These

duties include, but are not limited to, refueling, securing classified, performing maintenance or completing mission debriefings. **Note:** Crew rest does not begin until all crewmembers have completed post-flight duties, to include any duty requiring an aircrew member to stay at the aircraft past the 45-minute period.

3.7.2.1. Minimum crew rest period is 12 hours. This period provides the crew a minimum of 8 hours of uninterrupted rest plus time for transportation, free time and meals. The crew will not be disturbed during this period, except during emergencies. Should the 12-hour crew rest period be infringed upon by official duties, the crew will enter crew rest for an additional 12 hours on completion of the official duties.

3.7.2.2. Crews will re-enter crew rest if their aircraft or mission is not capable of departure within 4 hours of scheduled takeoff time. Exceptions require the concurrence of the AC. Refer to AFI 11-2EC-130HV1 for additional restrictions on training missions.

3.7.3. Crew Chief Work and Rest Plan. The crew chief is responsible to the AC. The AC, in conjunction with the enroute station chief of maintenance, will determine how long the crew chief can safely perform aircraft recovery actions. The crew chief must have the opportunity to sleep 8 hours of each 24-hour period. See AFI 21-101, *Aircraft and Equipment Maintenance Management*, for detailed guidance.

3.8. Standby Force Procedures: Note: Contingency operations may require modification of the following Standby Force Procedures. The squadron commander or operations officer will approve any modification of these procedures.

3.8.1. 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. Standby crews will not preflight any aircraft other than their standby aircraft.

3.8.2. ALPHA Standby Force. An aircraft and aircrew capable of launching 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. 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. After 48 hours, the crew must be launched, released or entered into pre-departure crew rest. CDT/CDD begins when the crew is told to launch.

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

3.8.3. BRAVO Standby Force. An aircraft or aircrew capable of launching in 3 hours (from the time the crew is told to launch, 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 be launched, released, or entered into pre-departure crew rest. CDT begins when the crew shows for duty. If a BRAVO standby crew is alerted for any duty (launch, preflight, mission planning), and the unit is subsequently tasked to launch the mission, CDT will be calculated from when the crew first reported for that duty.

3.8.4. CHARLIE Standby Force. An identified aircrew capable of entering crew rest within 2 hours (after their controlling unit is notified). This aircrew will become legal for alert 12 hours after entering crew rest. CHARLIE Standby will not exceed 72 hours. After 72 hours, the crew will be released. 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.

3.9. Counter-Fatigue Management Program.

3.9.1. 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 shall not use no-go pills in flight.

3.9.2. It is USAF policy that aircrew shall never use no-go pills as a first choice counter-fatigue management tool.

3.9.3. Responsibility for counter-fatigue management of aircrew medicinal products rests with the home station Flight Surgeon (FS), ECG/CC (may delegate to but no lower than squadron commander), and with each individual aircrew member. During extended deployments, aircrew members will only obtain no-go pills from a deployed USAF flight surgeon. The deployed flight surgeon shall consult with the home-unit medical team prior to dispensing no-go pills to deployed fliers.

3.9.4. Unit Operational Risk Management (ORM) programs shall include use of no-go medication with ECG/CC and FS oversight.

3.9.5. Home station or deployed flight surgeon is the point of contact for no-go prescription. Upon request, the FS will advise/assist 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.

3.9.6. The ECG/CC shall 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):

3.9.6.1. Home station night launch missions greater than four hours duration.

3.9.6.2. Crew rest facilities lacking an optimal sleeping environment (quiet, climate controlled and darkened).

3.9.6.3. Off-station missions that are four or more time zones from home station.

3.9.6.4. Rotating schedules (stair-stepped flying schedules) with greater then 6-hour flight time duration.

3.9.6.5. Missions that run consistently near a 14-hour (or greater) duty day.

3.9.7. SQ/CC will not schedule crewmembers to fly or perform crew duties within 12 hours of consuming no-go pills. *EXCEPTION:* Commanders may reduce the 12-hour timeline after consultation with a flight surgeon to confirm prescribed no-go pills have short duration effect. In no case will crew members consume a no-go pill on a timeline where they would be under the effect of the medication while they perform aircrew duties (use mission report or legal for alert time to determine latest time to take no-go medication).

3.9.8. Aircrew member's responsibilities:

3.9.8.1. Aircrew members will complete ground testing for no-go pills and receive flight surgeon clearance prior to using no-go pills in the operational environment.

3.9.8.2. Aircrew members shall not operate equipment within the DNIF periods for each of the no-go pills as specified in paragraph **3.9.7** of this instruction.

3.9.8.3. Aircrew members shall not take no-go-pills within 12 hours of consuming alcohol.

3.9.8.4. Aircrew will 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.

3.9.8.5. Limit use of restoril and ambien to a maximum of seven consecutive days and no more than 20 days in a 60-day period.

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

Chapter 4

AIRCRAFT OPERATING RESTRICTIONS

4.1. Objective. This chapter applies to accepting an aircraft from maintenance prior to launch. The ultimate objective of the aircraft maintenance team is to provide an aircraft for launch 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 AC is the final authority in determining an overall status of an aircraft. Use the following maintenance identifiers and Tables 4.1 – 4.15 to effectively communicate the status of an aircraft and to determine whether an aircraft is airworthy and able to perform the scheduled mission.

4.1.1. Mission Essential (ME). An item, system or subsystem component essential for safe aircraft operation or mission completion will be designated Mission Essential (ME) by the AC in AFTO Form 781A, *Maintenance Discrepancy and Work Document*. Include a brief explanation of the reason for ME status in the AFTO Form 781A discrepancy block. Any AC accepting an aircraft (for one mission or mission segment) without an item or system does not commit that AC (or a different AC) to subsequent operations with the same item or system inoperative.

4.1.2. Mission Contributing (MC). Any discrepancies that are not currently ME, but may become ME (if circumstances change), are designated as MC in the AFTO Form 781A discrepancy block. Every effort will be made to clear the MC discrepancies at the earliest opportunity to the extent that maintenance skills, ground time, and spare part availability permit. If subsequently, in the AC's judgment, mission safety would be compromised by the lack of any component, he may designate the component as ME. However, do not delay a mission to correct an MC discrepancy.

4.1.3. Open Item. Discrepancies not expected to adversely impact the current mission or any subsequent mission are not designated MC or ME. These items receive low priority and are normally worked at home station. Do not accept an aircraft from factories, modification centers, or depots unless all instruments are installed and operative.

4.1.4. Control and Performance Instruments. Engine performance, aircraft attitude, vertical velocity indications, altitude, speed, and heading instruments should be operative in both pilot positions IAW AFI 11-202V3. For instruments with both analog and digital displays, as a minimum the analog must be operational. EXCEPTION: The radar altimeter may have either analog or digital operation.

4.2. 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 for launch.

4.2.1. The AC 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 shall also be considered. This chapter is not intended to allow for continued operation of the aircraft for an indefinite period with systems/subsystems inoperative. The Minimum Equipment List (MEL) shall not direct deviation from the aircraft flight manual limitations, emergency procedures, or USAF/ACC directives. ACs should be aware that the MEL is an operational tool, and serves a different purpose than the maintenance Minimum Essential Subsystem List (MESL). If an item is required to be operational according to the maintenance MESL, the AC may still opt to accept the aircraft without waiver. Safety of flight is paramount.

4.2.2. If, after exploring all options, an AC determines a safe launch is possible with an item inoperable (beyond a particular restriction) the AC shall request a waiver. Waivers will be requested IAW Chapter 1 of this regulation. Plan a minimum 12-hour response to the waiver request.

4.3. Waiver Protocol. Waivers to operate with degraded equipment may be granted on a case-by-case basis and only in exceptional circumstances. Waiver authority is based on who has operational control (OPCON) and execution of the aircraft performing a specific mission. The AC determines the need for a waiver and initiates the request.

4.3.1. Local Missions (Executed by ECG/CC). Waiver authority for local missions is the ECG/CC or designated representative.

4.3.2. ACC-Directed Missions (Including HQ ACC Operational Readiness Inspections). Waiver authority is HQ ACC/A3.

4.3.3. Other Missions (Contingencies). Waiver authority is listed in the OPORD, DEPORD, execution order, tasking order, etc. Aircrew members may request additional assistance or confirmation from their home units or ACC.

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

4.4.1. ACs 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.

4.4.2. If beyond C2 communication capability, the AC may deviate from this chapter or the MEL according to paragraph **1.3** Report deviations (without waiver) through channels to HQ ACC/A3 within 48 hours. Units must be prepared to collect background information and submit a follow-up written report upon request.

4.5. Supplements. See **Chapter 1**.

4.6. Definitions (Specific to this Chapter):

4.6.1. 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 will apply to all aircraft departures.

4.6.2. Enroute. Enroute locations where C-130 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.

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

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

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

4.6.5.1.1. One-time Flight Clarification: Normally a Red X discrepancy is downgraded for a one-time flight. This condition does not preclude carrying cargo and passengers. The priority is to move the airplane to a repair-capable facility. ACs must coordinate with appropriate agencies to ensure repair capability exists at the destination. 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 IAP and requires an enroute fuel stop (Cairo) before landing at the nearest repair capable facility, Sigonella NAS.

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

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

4.6.5.1.2. Other Mission and Repair Clarifications:

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

4.6.5.1.2.2. Mission dictates requirement: AC shall consider 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 AC elects to have the item repaired prior to departing.

4.7. Navigation Systems:

4.7.1. For flights in Minimum Navigation Performance Specification (MNPS) airspace in the North Atlantic Region or the Composite Hawaii/Mainland US Route System, the following fully operable navigation systems are considered the minimum necessary to permit compliance.

4.7.1.1. Compass Systems. When two systems are installed, both should be operational. If one system fails, refer to the flight manual to determine what other equipment is affected.

4.7.2. For flights on all other Category I routes, the AC 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.

4.7.3. Equipment listed in FLIP AP/2 for permitting compliance with MNPS is mandatory. Loss of any component before track entry requires return to a station with maintenance capability or re-filing via specified routes.

4.8. 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 tool boxes, or safety/emergency equipment. However, items other than those listed above may be carried on board the aircraft to support operations. All cargo/baggage must be properly restrained IAW T.O. 1EC-130H-5-1, *Sample Basic Weight Checklists* and T.O. 1EC-130H-5-2 . The following restrictions apply to all EC-130H flights unless a waiver is obtained IAW para **4.3**: **Note:** Cargo and baggage will not be loaded until the flight engineer and AMT have preflighted the cargo compartment. The flight engineer and AMT will supervise all loading. The flight engineer will calculate weight and balance and center of gravity.

4.8.1. No palletized cargo will be carried.

4.8.2. No hazardous cargo (as defined by AFMAN 24-204, *Preparing Hazardous Materials for Military Air Shipments*). This does not apply to items that are required to be carried per TO 1EC-130H-1, *Flight Manual* or TO 1EC-130H 5-2.

4.8.3. Total weight will not exceed 1,500 pounds.

4.8.4. No single item over 400 pounds.

4.8.5. Loading restrictions: Do not load/secure baggage or equipment between the aft side of flight station 245 and the first equipment rack; 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 as long as tie down devices are available, mission equipment is shielded, weight and balance is maintained, and safety is not compromised.

4.8.5.1. Single side-wall seats shall not be used unless connected to a double side-wall seat (except for specific configurations).

4.8.5.2. 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.

4.8.5.3. 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 TO 1EC-130H-5-2 for further restrictions.

Table 4.1. Engines/Gas turbine Compressor (GTC).

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Engines	4	4	Do not take off with nonstandard aircraft configuration or power unless a hostile threat to the aircraft and/or crew makes it imperative. Do not take off unless all four engines achieve charted torque at takeoff power settings.
Torquemeter	4	4	
Tachometer	4	4	
Turbine Inlet Temperature 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 must 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	

Table 4.2. 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. Synchrophaser will be removed.

Table 4.3. 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, flight to a destination with repair capability, including enroute stops, may be made. If the AC generator is not equipped with a disconnect, it will be removed and the generator mount padded before flight, provided no other electrical malfunction exists.
Transformer Rectifiers (TR)	4	4	One Essential TR unit may be inoperative for flight to a repair facility provided no other electrical malfunction exists.
ATM and ATM generator	1	1	If the ATM, 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 will be operational for each operative engine-driven generator (generator control panel, GCU, voltage regulator, generator out/caution light, AC loadmeter, etc.).			

Table 4.4. 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 should be operational for any tank containing fuel.

External Tank Fuel Pumps (per tank, if tank contains fuel)	2	1	**Note:** Fuel in the tank with the inoperative boost pump will be trapped should the second boost pump fail. Fuel balancing with the opposite tank will then be necessary, resulting in a reduction of usable 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 quantity are verified by use of a fuel tank dipstick. The fuel tank dipstick is calibrated for JP-4. Use with other fuels is inaccurate for reading pounds of fuel quantity. 2. At enroute stops when engines are shut down, the tank with the inoperative indicator and the symmetrically opposite tank will be dip checked. 3. Crossfeed operation will begin when total calculated fuel quantity has decreased to 8,000 lbs.. 4. Engine-out training using the engine corresponding to the inoperative indicator or its symmetrical opposite will not be conducted during tank to engine operation. 5. Flights consisting of multiple stops/landings when the mission profile does not allow dipping of tanks (i.e., EROs, local training sorties) will terminate with a minimum of 8,000 lbs calculated main tank fuel.
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 crossfeed from auxiliary or external tanks with operative indicators. 4. Symmetrical engine fuel flow is maintained. 5. Mission will terminate with a minimum of 8,000 lbs calculated main tank fuel.
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 crossfeed until no pressure is obtained. This will be completed prior to takeoff.
Auxiliary Tank Fuel Quantity Indicators	2	0	If fuel quantity indicator is inoperative, fuel quantity will be verified with the magnetic sight gauge.
Aux Fuel Crossfeed valves	2	0	The aux crossfeed valve may be inoperative provided the bypass valve and external crossfeed on the same side is operational
External Fuel Crossfeed valves	2	0	The external crossfeed valve may be inoperative provided the bypass valve and aux crossfeed 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 4.5. Hydraulics.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
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 4.6. Anti Ice/De Ice Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Ice Detection System	1	1	(See note)
Pitot-Heat System	2	2	
TAS Probe Heat	1	1	
Wing/Empennage Anti-Icing System	2	2	(See note)
Engine Inlet Air Duct Anti-Icing Systems	4	4	(See note)
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	Automatic deicing function may be inoperative when release is authorized by maintenance supervision, provided manual deicing operation is satisfactory.
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 4.7. Brake/Anti-Skid Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Wheel Brakes	4	4	
Anti-Skid (Home Station/Enroute)	1	1	The antiskid may be inoperative for flight to a destination with repair capability, including enroute stops.
Anti-Skid (Local Training)	1	1	A local training flight may continue if the antiskid fails provided the system is turned off. Multiple landings should not be accomplished.
Parking Brake	1	1	

Table 4.8. Flight Recorder/Locator Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Flight Data Recorder	1	1	See Note. If FDR is inoperative but the CVR is operational, flight is authorized to next repair capable base.
Cockpit Voice Recorder (CVR)	1	1	See Note . If CVR is inoperative but the FDR is operational, flight is authorized to next repair-capable base.
Emergency Locator Transmitter	1	1	If enroute, shall be repaired at next repair capable facility.
Underwater Acoustical Locator Beacon (UAB)	1	1	
Note: Training missions may be flown with an inoperative Flight Data Recorder or CVR, provided no passengers are carried. FDR and CVR must be operational prior to departing home station for deployment and for all combat/combat support sorties.			

Table 4.9. Fire Protection/Warning Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Fire Extinguisher System	2	2	Both bottles will be serviceable.
Engine Fire and Turbine Overheat Warning Systems	4	4	
Nacelle Overheat System	4	4	
GTC Fire Warning System	1	1	

Table 4.10. Air Conditioning, Pressurization, and Bleed Air.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Flight Deck and Cargo Compartment Air Conditioning Units and Temperature Control System	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. Crew and passengers will be briefed on the possibility that discomfort may be encountered. Air conditioning and pressurization are not required for missions which will not exceed 10,000 ft MSL if a reasonable temperature can be maintained.
Flight Deck Auxiliary Vent Valve	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 System	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 controller 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 4.11. Landing Gear.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Landing Gear System	1	1	If a landing gear malfunction is encountered, make a full stop landing and troubleshoot the malfunction before continuing the mission. 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.
Landing Gear Position Indicators	3	3	On training or enroute missions, all indicators may be inoperative provided gear is not moved from the down and locked position. Shall be repaired at next repair capable facility.
Landing Gear Warning Light	1	1	On training or enroute missions, landing gear warning light may be inoperative provided gear will not be moved from the down and locked position. Shall be repaired at next repair capable facility.

Table 4.12. Flight Instruments.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Airspeed Indicator	2	2	
Vertical Velocity Indicator	2	2	Only one is required for local training sorties or enroute stops. Flights in RVSM airspace require 2.

Flight Director Systems	2	2	
Attitude Director Indicator Attitude Sphere/ Warning Flag Bank Pointer Turn Needle Slip Indicator	 2 2 2 2	 2 2 1 1	The turn needle and slip indicator must be operable on the same side. All remaining ADI subsystems and warning flags (glideslope and course) are at the discretion of the pilot in command.
Standby ADI (if installed)	1	1	
Horizontal Situation Indicators	2	2	
EFI Displays (if installed)	4	3	
BDHI	3	0	
Barometric Altimeters	3	2	Both pilots' altimeters must be operational.
CARA (If Equipped)	1	0	Mission dictates requirements.
Ground Proximity Warning System (GPWS) (if equipped)	1	0	Shall be repaired at next repair-capable facility.
Ground Collision Avoidance System (GCAS) (if equipped)	1	0	Shall be repaired at next repair capable facility.
Enhanced Traffic Alert and Collision Avoidance System (E-TCAS) (if equipped)	1	0	Shall be repaired at next repair capable facility.
Central Air Data Computer (CADC) (if installed)	1	1	
HF Radio	2	1	Required for overwater flight only. Mission dictates further requirements.
Airborne Integrated Terminal Group (AITG)	2	1	One of the two AITG operating stations required for combat/combat support sorties. Not required for training sorties.

Table 4.13. Navigation Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Standby Magnetic Compass	1	1	
Heading Systems (INS)	2	1	One INS may be inop provided GPS is operational
NAV SELECTOR Panel	2	2	
VOR	2	1	See note 1

ILS	2	1	See note 1
NDB	2	1	See note 1
TACAN	2	1	See note 1
Radar	1	0	Required if thunderstorms or hazardous conditions that can be detected by airborne radar are forecast or exist along route of flight.
IFF/SIF	1	1	Aircraft will not take off with an IFF known to be inoperative. See note 2.
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 IFF 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, you may take off if the IFF was operational on the previous mission. The IFF/SIF must be operational when TCAS is required (if equipped).			

Table 4.14. Aircraft Exterior/Interior Lighting.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Landing Lights	2	1	One may be inoperative provided the taxi light on same side is operational.
Taxi Lights	2	1	One may be inoperative providing the landing light on the same side is operational.
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; shall be repaired 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) will be operational for night operations for the following instruments; airspeed, altimeters, VVI/VSI, ADI, and HSI.			

Table 4.15. 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 will 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	

Chapter 5

OPERATIONAL PROCEDURES

5.1. 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.

5.1.1. The pilot flying the aircraft will initiate all checklists unless another procedure is established by the flight manual or this volume.

5.1.2. The only pages (or inserts) authorized in checklist are C-130 series T.O. aircrew checklists, AFI MDS Volume 3 or MAJCOM checklists and briefing guides, and NAF or ECG/EGV-approved information guides. Unapproved items may not be inserted within authorized checklists (ie, items not approved can not be placed inside the "blue" checklist page covers). Pencil entries are authorized but must be current. Local in-flight guides and inserts not affecting T.O guidance and procedures may be locally developed with ECG-level Stan/Eval approval.

5.1.3. 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.

5.2. 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 paragraph 3.1.3 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.

5.2.1. 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. Other crew members may occupy other stations, with MCC and AC concurrence, only if doing so will not interfere with normal crew duties.

5.2.2. During other phases of flight, flight crew members will notify the pilot before leaving and after returning to their duty station. For mission crew only the AMT and the MCC need to notify the pilot. The AMT and the MCC will be responsible for controlling mission aircrew members in the mission crew compartment.

5.3. Flight Station Entry. ACs may authorize passengers, observers, MEP, and any crewmember access to the flight station 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. In all cases, ensure sufficient oxygen sources are available and used to meet the requirements of AFI 11-202V3. Passengers and observers will not occupy the pilot, copilot, navigator or flight engineer positions at any time.

5.4. Takeoff and Landing Policy:

5.4.1. An aircraft commander will occupy either the left or right seat during all takeoffs and landings. **EXCEPTION:** Instructor or flight examiner pilots may occupy either seat at their discretion regardless of who is designated as pilot in command on the flight authorization (see paragraph **2.4.2**). The designated PIC (A-code) is not required to occupy a primary position, but still retains overall authority for conduct of the mission.

5.4.2. Aircraft commanders who possess less than 100 hours in command in the C-130 since initial upgrade will make all takeoffs and landings from the left seat when a copilot occupies the right seat. They may allow ACs or higher to perform takeoffs and landings when required for currency.

5.4.3. MPD Graduates may takeoff or land from either seat if an AC with over 100 hours since certification in the C-130 occupies the other seat.

5.4.4. An instructor, flight examiner or AC-qualified pilot will make all takeoffs and landings during:

5.4.4.1. Aircraft emergencies, unless conditions prevent compliance.

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

5.4.4.3. Arrival/departure at airfields that require higher headquarters approval as indicated in the AMC Airfield Suitability and Restrictions Report (ASRR).

5.4.4.4. Situations when, in the opinion of the AC, marginal conditions exist.

5.5. Landing Gear and Flap Operating Policy. The copilot will operate the landing gear. The pilot monitoring (PM) the aircraft will operate the flaps. Actuate the landing gear or flaps only after command of the pilot flying (PF) the aircraft. Prior to actuation of the landing gear or flaps, the other pilot will acknowledge the command by repeating it. During ground operations when the aircraft is stopped, the copilot may actuate the flaps without notifying the pilot.

5.6. Use of Outside Observers. Use crew members to assist in outside watch 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 **5.7** during taxi.

5.7. Seat Belts:

5.7.1. Crew members occupying their primary positions will have seat belts fastened at all times in flight, except when crew duties require otherwise.

5.7.2. All occupants will be seated with seat belts and shoulder harnesses (if available) fastened during taxi, takeoff, air-to-air refueling and landing. **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; however, a seat with an operable restraint will be available and readily accessible.

5.7.3. All occupants will have a designated seat with a seat belt.

5.8. Aircraft Lighting. Operate aircraft lighting IAW **Chapter 4** of this volume, AFI 11202V3, AFI 11-218, *Aircraft Operations and Movement on the Ground*, and applicable T.O.s.

5.8.1. Use anticollision lights or strobe lights from takeoff to landing on all flights, unless reflections cause pilot distractions in instrument conditions. Unless otherwise directed, aircraft strobe lights will be operated as follows:

5.8.1.1. "Before Starting Engines" Checklist, "red" position.

5.8.1.2. "Lineup" Checklist, "White" position.

5.8.1.3. "After Landing" Checklist, "Red" position.

5.8.2. 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.

5.8.3. Use leading edge lights in addition to other required aircraft lighting during operations below 10,000 feet, unless their use causes a distraction during IMC flight.

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

5.9. Advisory Calls. The pilot flying will periodically announce intentions during departures, arrivals, approaches, and when circumstances require deviating from normal procedures. The pilot not flying the aircraft will make mandatory advisory calls except those designated for any crew member.

5.9.1. Takeoff. State "GO" at refusal speed or takeoff speed, whichever is lower. Any aircrew member noting a safety of flight malfunction before hearing "GO" will state "REJECT" and a brief description of the malfunction (e.g., "Reject, number two engine flameout").

5.9.2. Altitudes.

Table 5.1. Climb Out.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Transition Altitude	"Transition Altitude" (See note 4)	(See note 4)
1,000 feet below assigned altitude	"1,000 Below"	

Table 5.2. Descent.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Transition Level	"Transition Level" (See note 4)	(See note 4)
1,000 feet above assigned altitude	"1,000 Above"	

5.9.3. Approaches:

Table 5.3. Nonprecision Approaches.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
100 feet above Final Approach Fix (FAF) altitude	"100 Above"	
100 feet above stepdown altitude	"100 Above"	
100 feet above Minimum Descent Altitude (MDA)	"100 Above	
At MDA	"Minimums"	
Runway Environment in Sight	"Runway in Sight"	
Missed Approach Point	"Missed Approach Point"	(See note 1)

Table 5.4. Precision Approaches.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
100 feet above glide slope intercept altitude	"100 above"	
100 feet above decision height (DH)	"100 above"	
At Decision Height:		
- Runway environment in Sight	"Land"	(See note 3)
- Approach Lights in Sight (CAT 1 ILS)	"Continue" (See note 2)	"Continue" (See note 3)
- Approach Lights or Runway Environment Not in Sight	"Go Around"	"Go Around"

Notes:
1. The PF will announce his/her intentions to either land or go-around. If the runway environment is not in sight and/or the aircraft is not in position for a normal landing, a go around will be made.
2. With weather at CAT 1 minimums on a CAT 1 ILS, the pilot may not see the runway environment at DH; however, the initial portion of the approach lights will be visible. The pilot may continue to 100 HAT with reference to the approach lights. The pilot may not descend below 100 feet above touchdown zone elevation using the approach lights as reference unless the red terminating bars or the red side row bars are distinctly visible and identifiable.
3. The PF will announce his/her intentions to either land, continue, or go-around. Respond 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.
4. Both pilots and navigator will state the altimeter setting.

5.9.4. " Touch and Gos." If a malfunction is encountered, crew members will only state the observed malfunction. The pilot in command will announce his/her intention to stop or continue the takeoff.

5.10. Deviations.

5.10.1. The pilot monitoring the aircraft will tell the pilot flying the aircraft when heading or airspeed deviations are observed or altitude is more than 100 feet from desired, and no attempt is being made to correct the deviation.

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

5.11. Communications Policy:

5.11.1. Aircraft Interphone:

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

5.11.1.2. Flight crew members (including AMT) will monitor interphone/flight crew hot mic at all times. All crew members will monitor interphone/flight crew hot mic during ground operations and all takeoffs, departures, approaches, aerial refuelings and landings. Advise the AC when off interphone. During other phases of flight, mission crew members will monitor interphone/flight crew hot microphone as directed by the AC or MCC.

5.11.1.3. The AC may clear the mission crew off interphone and direct them to monitor Flight Crew hot microphone ("hot mic") upon completion of the After Takeoff checklist.

5.11.1.4. After engine shutdown, crew members will remain on headset until the AC clears the crew off headset. The AMT will remain outside the aircraft on headset while the GTC is running.

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

5.11.2. Command Radios:

5.11.2.1. In terminal areas, all aircrew members will monitor the primary command radio, if able.

5.11.2.2. The pilot or copilot operating command radios will tell the crew which radio is primary, and update the crew when the primary radio changes.

5.11.2.3. A primary flight deck crew member will monitor UHF emergency frequency 243.0 MHz regardless of primary radio.

5.11.2.4. One of the pilots will record and read back all air route traffic control (ARTC) clearances. The navigator will record the clearance and monitor the read back. Disregard this procedure when ATC instructions require immediate execution, or when such action interferes with timely completion of more important duties.

5.12. Crew Resource Management (CRM). The goal of CRM is enhancing mission effectiveness. The responsibility and authority of the aircraft commander 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.

5.12.1. ACs 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.

5.12.2. Crew member responsibility includes respecting the authority of the aircraft commander. Participate in the mission and decision-making process, and support the AC. Crew members must assert their best judgment and, when in doubt, speak out. The AC is the final decision authority.

5.12.3. "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 pilot flying the aircraft. 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. Based on crew inputs, the PIC will decide whether to continue the current course of action or pursue another. The PIC is final decision authority.

5.12.4. “Knock it off” is used to terminate the 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.

5.12.5. The “Two Challenge” rule is used if the pilot not flying the aircraft is unable to gain a response from the pilot flying the aircraft. After two challenges, the pilot not flying will take control of the aircraft.

5.13. Runway Condition Reading (RCR) and Runway Surface Condition (RSC) Limitations:

5.13.1. 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.

5.13.2. The performance charts used to determine braking action are based on concrete runways. The RCR values for the following runway surfaces depicted in **Table 5.5** are estimates based on operational experience and should be used only as a guide.

Table 5.5. RCR Values.

TYPE SURFACE	RCR (DRY)	RCR (WET)
Asphalt/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

5.13.3. 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.

5.14. Runway and Taxiway Requirements:

5.14.1. Minimum runway width is 80 feet/25 meters. Minimum taxiway width is 30 feet/9 meters.

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

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

5.14.3.1. The ECG/CC may authorize use of tactical takeoff criteria when necessary for mission accomplishment. Comply with performance manual calculation procedures using the non-assault crew criteria. This procedure disregards VMCG in takeoff distance calculations. Refer to T.O. 1C-130H-1-1, *Flight Manual Performance Data* for definition of tactical takeoff. EC-130H crews fall under the guidance of non-assault crews.

5.14.3.1.1. Calculate minimum field length for tactical takeoff (MFLTTO) by correcting MFLMETO using normal takeoff speed. Do not use runways less than 3,000 feet long unless approved by MAJCOM/A3.

5.14.4. Intersection takeoffs are authorized and the decision to make intersection takeoffs rests solely with the aircraft commander. Takeoff and Landing Data (TOLD) computations are based on the runway remaining from the point at which the takeoff is initiated.

5.14.5. Rolling Takeoffs. A rolling takeoff is preferred if performance calculations permit. If the AC deems takeoff performance to be critical, (ie, any time charted performance is desired), takeoff power should be applied before the brakes are released (static takeoff). Do not perform static takeoffs if crosswinds exceed 10 knots when 30 degrees or more off the nose.

5.15. Aircraft Taxi and Taxi Obstruction Clearance Criteria:

5.15.1. 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.

5.15.2. Without wing walkers, avoid taxi obstructions by at least 25 feet; with wing walkers, by at least 10 feet. **EXCEPTION:** According to AFI 11-218, aircraft may taxi without marshallers/wing walkers at home station along locally established taxi lines which have been measured to ensure a minimum of 10 feet clearance from any obstruction.

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

5.15.4. Reverse Taxi:

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

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

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

5.15.4.2.2. 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.

5.15.4.3. During night reverse taxi operation, the pilot in command and AMT will ensure that the taxi area is sufficiently lighted.

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

5.16. Operating With Runway Barriers. 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.

5.17. Fuel Jettison Procedures.

5.17.1. 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, the AC will use designated jettison areas, except when safety of flight would be compromised.

5.17.2. The ECG/CCs will establish jettison areas and procedures to minimize the impact of fuel jettisoning. Ideally, establish jettison areas at altitudes above 20,000 feet 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.

5.17.3. All jettisons will be followed up with a detailed report filed by the pilot in command immediately after landing. Submit report to ECG/SE. ECG/SE will retain report for six months. Document all pertinent information, including the following items:

5.17.3.1. Scheduled Duration.

5.17.3.2. Actual Duration.

5.17.3.3. Landing Gross Weight.

5.17.3.4. Computed Stopping Distance.

5.17.3.5. Recovery Field.

5.17.3.6. Runway Available.

5.17.3.7. Jettison Altitude/Location.

5.17.3.8. Jettison Amount.

5.17.3.9. Reason for Jettison.

5.17.3.10. Approval Authority.

5.18. 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:

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

5.18.1.1. Bird Watch Condition Low - No operating restrictions.

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

5.18.1.3. Bird Watch Condition Severe - All takeoffs and landings are prohibited. Waiver authority is local ECG/CC or equivalent. Parent MAJCOM/A3 waiver is required to operate at airfields not controlled by the MAF.

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

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

5.18.4. 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 HQ AFSC/SEF website contains BASH information including regionalized CONUS bird migration patterns, Portable Flight Planning System (PFPS) software overlay, and the latest news. The Avian Hazard Advisory System (AHAS) website is another source for real time bird hazard information. See AFPAM 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques*, for additional information.

5.18.5. Following a known bird strike, aircrews should land as soon as conditions permit, or as practical, to have the aircraft inspected by qualified maintenance personnel. Bird strike damage cannot be accurately assessed in-flight, and undetected damage may result in a complex airborne emergency; only qualified maintenance personnel, on the ground, can make reliable damage assessments. PIC should complete AF Form 853, *Air Force Wildlife Strike Report* and fax to nearest Air Force Flight Safety Office.

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

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

5.19.1.1. The ECG/CC, or deployed equivalent, may authorize temporary waivers to FCF procedures for aircrew qualification when operationally necessary. Permanent waivers require MAJCOM/A3 approval IAW **Chapter 1**.

5.19.1.2. 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.

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

5.19.1.4. Perform high speed taxi checks IAW the flight manual, maintenance technical orders, and policy letter on file in QA. Prepare the aircraft with minimum fuel necessary to accomplish the check to limit brake/tire wear, (ensure fuel on board will permit a safe return to base should the aircraft unexpectedly become airborne) and turn on the anti-skid system. The 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.

5.19.2. IAW AFI 21-101 para 10.19.3.1, QA will ensure the FCF, ACF or OCF aircrew is briefed on the purpose and extent of the flight, previous maintenance problems, and discrepancies recorded on the aircraft or engines related to the FCF.

5.19.3. 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. OCF crews will conduct only normal flight procedures to verify proper systems operation. In special circumstances, TO 1EC-130H-1 section 3 procedures (i.e., 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 -6CL checklists be utilized.

5.19.4. 55 ECG/EGV is the focal point for FCFs, ACFs and OCFs for the flying squadrons. 55 ECG/EGV will perform the FCF OIC duties outlined in AFI 21-101 paragraph 10.19.2.29.1 Change 1.

5.19.5. Crew Complement. An FCF crew consists of: an FCF certified aircraft commander, an FCF certified flight engineer, an experienced pilot, an AMT and a navigator. The AMT and navigator should be the most experienced available. *An OCF crew consists of an Instructor Pilot, an experienced Pilot, an experienced Flight Engineer, an AMT and a Navigator. If conditions warrant, OCFs may be flown without a Navigator IAW paragraph 3.2.3. of this volume.*

5.19.6. FCF crew certification (AC and flight engineer). Squadron commanders certify FCF crew members by memorandum indicating the dates of completion for each item in **paragraph 5.19.6.1** to be kept on file in the crew members' permanent training folder. Squadron DOVs will update the Letter of Certifications IAW AFI 11-202, Volume 2, 55 ECG Sup, *AircrewStandardizations/Evaluation Program.*

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

5.19.6.1.1. TheAC will be instructor qualified IAW 11-2EC-130HV1. The flight engineer will be experienced IAW AFI 11-2EC-130HV1, Table 1.1.

5.19.6.1.2. Nominated for certification by the squadron DO.

5.19.6.1.3. Once nominated, complete a thorough review of FCF reference material. This review must be conducted with another FCF certified crewmember.

5.19.6.1.3.1. ACs complete an FCF with an FCF certified AC.

5.19.6.1.3.2. Flight engineers complete an FCF with an FCF certified flight engineer.

5.20. Terrain Alert and Collision Avoidance System (TCAS). It is imperative to follow resolution advisories (RAs) to obtain aircraft separation computed by TCAS. Failure to follow the computed RA may increase the probability of a midair collision. Pilots who deviate from an ATC clearance in response to an RA shall notify ATC of the deviation as soon as practical and promptly return to the ATC clearance when the traffic conflict is resolved or obtain a new clearance.

5.21. Radar Altimeter.

5.21.1. Any crew member detecting the illumination of the radar altimeter Low Altitude Warning Light will immediately notify the pilot flying the aircraft. Terrain clearance and aircraft position must be verified.

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

5.21.3. The navigator and pilot will use the same radar altimeter setting unless briefed otherwise.

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

5.22. Reduced Power Operations. Pilots will normally use reduced power for takeoffs provided refusal speed (VR) is equal to or greater than takeoff speed. Use normal takeoff power if VR is less than takeoff speed.

5.23. Instrument Flight Rules. Conduct flight operations under IFR to the maximum extent possible without unacceptable mission degradation.

Chapter 6

AIRCREW PROCEDURES

Section 6A—Pre-Mission

6.1. Aircrew Uniforms.

6.1.1. Aircrew will wear the aircrew uniform, as outlined in AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel,* and the appropriate MAJCOM supplement on all missions unless otherwise authorized. When the Foreign Clearance Guide (FCG) requires civilian attire, dress conservatively.

6.1.2. Squadron commanders will determine clothing and equipment to be worn or carried aboard all flights commensurate with mission, climate and terrain involved.

6.1.2.1. See AFI 11-301, Volume 1, *Aircrew Flight Equipment (AFE) Program*, Attachment 1 for minimum aircrew clothing requirements. All crew members will have Nomex gloves in their possession.

6.1.2.2. Primary crew members will wear Nomex gloves during engine start, takeoff, air-to-air refueling, landing, emergencies, and as directed by the AC.

6.1.2.3. Crew members will remove rings and scarves before performing aircrew duties.

6.2. Personal Requirements. Aircrew members will carry or wear personal and professional equipment as follows on all flights:

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

6.2.2. Passport. Crew members will carry a valid passport on all sorties outside the CONUS. This does not apply to combat missions. ***EXCEPTION:*** Unit commanders may authorize newly assigned personnel who have applied for, but not yet received, a passport to act as crew members on sorties not scheduled to transit locations where passports are required.

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

6.2.4. Driver's License. A valid state driver's license is required on each TDY where use of US government general purpose vehicles may be required. Crew members will contact the local airfield manager before driving on the flight line.

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

6.2.6. FOD 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. They will be accounted for before and after flight.

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

6.2.8. Tool Kits. At least one AMT tool kit will be on board for all sorties.

6.3. Pre-Mission Actions.

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

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

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

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

6.3.1.4. Obtain required customs forms.

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

6.3.1.6. Ensure physiological training, annual physical, immunizations, and flight evaluations will remain current for all crew members throughout the TDY period.

6.3.1.7. Ensure visas have been received, if required.

6.3.1.8. Obtain terrain charts for unfamiliar destinations if available.

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

6.3.1.10. Consider any foreseeable safety risks and risk mitigation factors IAW Operational Risk Management (ORM).

6.4. Aircrew Publications Requirements. Primary crew members will carry the publications specified in **Table 6.1** on all missions. When the crew includes two additional crew members in the same specialty (i.e. two flight engineers on proficiency sorties) each will carry a checklist but otherwise only one set of publications is required.

Table 6.1. 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
Abbreviated Checklists (-1)	ALL
TO 1C-130-101	E
ATP-56(B) [2]	P[3]
AFI 11-202 Volume 3	P[3]
AFI 11-2EC-130H, Volume 3, *EC-130H Flying operations*	P[3]
Appropriate Fuel Planning Documents	N

Notes:
1. Required on all combat or combat support missions.
2. Part 1 General, Part 2 Fixed Wing, and Part 5 Annex ZA, ZB, ZE only.
3. This is the pilot not identified as pilot in command on the flight authorization

6.5. Airfield Review. Aircrews will consult an airfield database and comply with the Airfield Suitability and Restrictions Report for updates to airfield operability and weight bearing capability.

6.6. Aircrew Intelligence Briefing. Before leaving home stations on OCONUS missions, aircrews will receive an intelligence briefing that will emphasize terrorist, enemy, and friendly political and military development in the area in which they will be flying. Obtain timely intelligence updates prior to entering a specific area of operations (AOR). In theater, aircrews should receive intelligence updates on initial arrival at a forward operating location (FOL), or 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).

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

Section 6B—Predeparture

6.8. Flight Crew Information File (FCIF).

6.8.1. Crew members will review FCIF, Volume 1, before all missions or ground aircrew duties, and update the FCIF currency record. Go/No-Go status will be IAW AFI 11-202, Volume 2 as supplemented. During exercises and contingencies, deployed squadrons will develop procedures to comply with this paragraph and local requirements.

6.8.2. 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.

6.8.3. Crew members not assigned or attached to the unit operating a mission will certify 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. Instructor pilots flying with general officers or senior staff members are responsible for briefing appropriate FCIF items.

6.9. Operations & Mission Kits. Carry operations kits on all sorties. Contents of the kits will be 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:

6.9.1. Required on all Sorties:

6.9.1.1. DD Form 2131, *Cargo/Passenger Manifest* (if applicable)

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

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

6.9.1.4. UDI Worksheet, *C-130E/H Series Fligt Data Worksheet*

6.9.1.5. Local Mission Summary Sheet

6.9.1.6. AF Form 4064, *C-130 Takeoff and Landing Data Card*

6.9.1.7. AF Form 4063, *Pilot Information Card*

6.9.1.8. Flight Authorization (IAW AFI 11-401)

6.9.1.9. AFTO Form781

6.9.1.10. DD Form 2131 (if carrying passengers)

6.9.1.11. COMPASS CALL Risk Analysis Worksheet

6.9.1.12. AF Form 711B, *USAF Mishap Report*

6.9.1.13. DD Form 175, *Military Flight Plan*

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

6.9.2. Required on all Sorties Away from Home Station, if applicable:

6.9.2.1. Airfield Suitability and Restrictions Report (ASRR)

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

6.9.2.3. CBP 7507, *General Declaration (Outward/Inward)*

6.9.2.4. AF Form 15, *United States Air Force Invoice*

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

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

6.9.2.7. AF Form 4116, *C-130 Flight Plan and Log* (on overwater flights)

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

6.9.3. Additional Items:

6.9.3.1. AFI 11-401

6.9.3.2. AFI 11-2EC-130HV1

6.9.3.3. AF Form 457, *USAF Hazard Report*

6.9.3.4. AF Form 1297, *Temporary Issue Receipt*

6.10. Route Navigation Kits.

6.10.1. 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.

6.10.2. Minimum contents of route navigation kits are in **Table 6.2**

6.10.3. On local unit training sorties, local area navigation kits may be used in lieu of route navigation kits in **Table 6.2** The unit will determine contents of these kits.

Table 6.2. 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 2)
FLIP IFR Supplement	2	2
FLIP Flight Information Handbook	2	2
FLIP Enroute Charts (High and Low)	2	2
FLIP Area Charts (Terminal)	2	2
FLIP Instrument Approach Procedures (Terminal) (High and Low)	3 (2 if no Nav)	3 (2 if no Nav)
Jeppesen Approaches	3 (2 if no Nav)	3 (2 if no Nav)
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
Special Departure Procedures (if available)	As Required	As Required
Notes: 1. FLIP Planning Books (GP, AP/1/1B/2/3) are required only when missions are planned to operate overseas. 2. Unit will provide username and password for Jeppesen publications.		

6.11. Briefing Requirements. Units may amplify these briefing requirements in the supplement to this AFI.

6.11.1. Pre-Departure Briefing Items. The AC will contact the local C2 agency to onfirm mission requirements. The AC and controlling agency jointly share responsibility to identify special briefing requirements. Briefings may include buffer zone, electronic warfare activities, SAFE PASSAGE, Electromagnetic Interference (EMI), diplomatic clearance, hazardous cargo, anti-hijacking procedures, operations and safety supplements to flight manuals, and OPORD procedures.

6.11.2. Pilot in Command Briefing. The AC designated as PIC will ensure that an aircrew briefing is conducted prior to the first sortie of the day. 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.COMPASS CALL, *Tactical Employment--EC-130H* (U) (Secret).

6.11.3. 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 AC will back brief all appropriate items.

6.11.4. Weather Briefings. The AC will obtain a briefing on current weather, trends, and forecast for the proposed route, destination, and alternates. The AC will brief primary crew members on appropriate weather conditions before departure.

6.11.4.1. On sorties not planned by a flight manager, crews should obtain weather information from their local weather flight or the OWS responsible for weather support at their location.

6.11.4.2. If adequate services are not available, and the crew cannot contact their home weather flight or OWS, obtain weather through any means available prior to mission accomplishment.

6.11.4.3. Weather information is permitted from US Military weather services, any FAA-approved weather source, or any host nation civil or military weather source.

6.11.4.4. Verbal weather briefings are authorized for local flights. Face-to-face briefings are not required.

6.11.5. Mission Briefing. Conduct mission briefings prior to all mission sorties. Briefing content will vary depending on numerous factors including mission requirements, ROE/SPINS, threat assessment, etc. Crews will be 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 Special Interest Items, training and evaluation requirements (if applicable), flying safety, and intelligence.

6.11.6. Peacetime and Wartime SAFE PASSAGE Procedures. Pilots must be familiar with peacetime and wartime safe passage of friendly military aircraft.

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

6.12. Call Signs.

6.12.1. Training Missions. Aircraft will use the unit static call sign prefix followed by a 2-digit suffix assigned by the parent unit.

6.12.2. Operational Missions. Use call signs assigned by OPORD, 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.

6.13. Flight Plan/Data Verification.

6.13.1. 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.

6.13.1.1. 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.

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

6.13.2. All waypoint data retrieved from a database should be verified by one or more of the following methods:

6.13.2.1. Latitude/longitude from current FLIP.

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

6.13.2.3. Ground Based NAVAIDs.

6.13.3. The flight engineer will complete AF Form 4064, and AF Form 4063, as specified in **Chapter 11**. Pilots will use AF Form 4063. A pilot crew member, or additional flight engineer, will cross-check the AF Form 4063 for accuracy by using the performance manual or approved tabulated data. As a minimum, the person checking the data will:

6.13.3.1. Verify gross weight independently from the AF Form 4063.

6.13.3.2. Cross-check air minimum control speed (Vmca) (one engine inoperative in ground effect), takeoff, and landing speeds.

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

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

6.14. Departure Planning. Use AFI 11-202V3, AFMAN 11-217 Volume 1 *Instrument Flight Procedures* and Volume 3 *Supplemental Fligh Information*, 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, GDSS Giant Report, and suitable terrain charts. The AC will provide the obstacle height, distance, and gradient information necessary for performance computations to the flight engineer.

6.14.1. VFR Departures. **Note:** VFR departures will not be flown in lieu of obstacle clearance planning.

6.14.1.1. VFR departures are authorized when there is no authorized IFR departure method for the airport, when the aircraft cannot depart using one of the IFR departure methods contained in AFI 11-202V3 and AFMAN 11-217V1, when operational requirements dictate (i.e. tactical necessity), or when most of the mission is planned as a VFR flight for training. VFR departures require detailed planning to ensure obstacles and high terrain are avoided. **Note:** 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.

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

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

6.14.1.2.2. One Engine Inoperative (OEI) climb capability shall ensure departure and emergency return route provides obstacle avoidance.

6.14.1.2.3. In all cases, the aircraft must be capable of maintaining a climb rate of at least 100 ft/nm to VFR traffic pattern altitude. **Note:** If unable to comply with all of the above conditions, download fuel or delay until conditions that are more favorable exist.

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

6.14.1.4. When departing VFR, maintain VFR cloud clearances until obtaining an IFR clearance.

6.14.1.5. Conduct night VFR departures, other than VFR pattern operations, only when required for mission accomplishment. WARNING: Without the opportunity to see and avoid terrain, pilots must exercise extreme caution when aircraft performance is marginal and VFR departure is required at night.

6.14.2. IFR Departures: Aircrews must use an approved IFR departure method as outlined in AFI 11-202 V3 and AFMAN 11-217 V1.

6.14.2.1. If the airport does not have an authorized IFR departure method, depart VFR IAW **6.14.1** An IFR departure is not authorized at airfields without an instrument approach.

6.14.2.2. IFR departures require detailed planning to ensure obstacles and high terrain are avoided. Adhere to screen height/departure end of runway (DER) requirements for IFR departure planning (AFMAN 11-217 V1). **Note:** Screen height requirements for departures depend on the agency that wrote the departure and/or the airfield where the departure is being flown. There is no standard or easy way for crews to determine screen height requirements. Therefore, when using departures other than those listed below, or when any doubt exists about which screen height to use, plan to cross the DER at 35 feet (minimum) unless you can ascertain a different screen height requirement from an appropriate authority.

6.14.2.2.1. Special Departure Procedure: Published on SDP.

6.14.2.2.2. USAF/USN produced SID or USAF/USN/USMC airfield: Zero feet.

6.14.2.2.3. US Army, FAA SID, and Joint Use Airfield within the US: 35 feet unless published.

6.14.2.2.4. NATO Countries (except US and Canada) Military Airports: 35 feet.

6.14.2.2.5. NATO Countries (except US and Canada) Civil Airports: 16 feet or as published.

6.14.2.2.6. Other ICAO nations: 16 feet or as published.

6.14.2.2.7. All others: 35 feet unless published.

6.14.2.3. Aircraft must be able to meet the published climb gradient, to an applicable IFR altitude, for the departure runway with all engines operating. If no minimum climb gradient is published, 200 ft/nm will be used. For purposes of calculating climb gradient, aircrews are authorized to use local MVA, MOCA, MSA and/or OROCA as the minimum applicable IFR altitude. Aircrew may also use MVA if two operational radios are available to receive radar vectors. In the event the aircraft is unable to meet the published ALL ENGINE climb gradient:

6.14.2.3.1. Calculate TOLD using 100 percent engine efficiency, or using drag index for LBT antennae removed. These options are automatically approved for day VMC but require squadron CC (or designated representative) approval for night VMC or day/night IMC conditions. Prior to takeoff, crews must verify engine efficiency and thoroughly brief responsibilities for and timing of LBT antenna jettison.

6.14.2.3.2. Download fuel.

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

6.14.2.3.4. Depart VFR. Comply with para 6.14.1. above.

6.14.2.4. Use one of the following methods to ensure the aircraft can vertically clear all obstacles along the planned departure route if unable to meet the published climb gradient with OEI:

6.14.2.4.1. Special Departure Procedures (SDPs). SDPs are MDS-specific OEI escape procedures intended only for emergency use. They are applicable after the loss of an engine and, where available, should be used for engine-out departure planning. ‘Ad hoc’ requests for fields not currently listed may be requested through 55 ECG/EGV NLT 48 hours prior to scheduled departure. HQ ACC/A3T authorizes the use of Ad Hoc SDPs for a maximum of 30 days after the analysis date. The SDP analysis date is located in the upper left-hand corner of the takeoff performance sheet.

6.14.2.4.2. Minimum climb gradient. The TERPS standard minimum climb gradient is 200 ft/nm, which is based on the standard obstacle clearance surface (OCS) of 152 ft/nm plus the required obstacle clearance (ROC) of 48 ft/nm. If an SDP is not available, the crew must ensure compliance with any obstacle-based minimum climb gradients for the selected departure, with one-engine inoperative. Minimum climb gradients may be published as a ‘Trouble T’ restriction in the IFR Take-off Minimums section of FLIP or on a SID. When required for mission accomplishment, crews may subtract 48’/nm from published climb gradients before computing engine-out takeoff data. Minimum climb gradients do not take into account low, close-in obstacles (obstacles or terrain 200’ AGL and below) which should normally be published as a NOTE on the SID or IFR departure procedure (Trouble T). Crews must also ensure the aircraft can clear these obstacles by computing the MTOGW for the obstacles and comparing it to that calculated for the climb restriction. **Note:** If the requirements of **6.16.2.4.2** cannot be met, download fuel or delay until more favorable conditions exist.

6.14.2.5. Practice Instrument Approaches under VFR. For the purpose of determining climb requirements, a practice instrument approach under VFR will be considered a departure if a touch and go is performed. ECG/CC approval is required if unable to meet IFR departure climb restrictions after performing touch and go landings. Practice instrument approaches under VFR to low approaches are not considered departures.

6.14.2.6. Missed Approach Climb Gradients. As per AFI 11-202 V3, missed approach climb gradients must meet the published missed approach requirements on 3 engines (minimum 200 ft/nm). This includes flying alternate climb out procedures in lieu of a published missed approach. AFI 11-202 V3 eliminates this requirement for initial takeoffs only, provided the aircraft can vertically clear all obstacles OEI along the missed approach routing/emergency return.

6.14.3. Critical Field Length (CFL). Takeoff gross weight (GW) must never exceed that which would require CFL in excess of the runway available for a normal takeoff. In some cases, a minimum altitude is required at the published screen height. For screen height of 50 feet or less, use DER correction on the balanced critical field length chart to determine if runway available and aircraft performance meet departure restrictions. For higher screen height (greater than 50 feet), add 50 feet to balanced CFL for every foot of required altitude at DER (Example: 55 feet screen height drives a 250 feet increase to balanced CFL).

6.14.4. Gross Weight (GW). Unless waived by MAJCOM/A3, ensure that the aircraft does not exceed the maximum GW, zero fuel weight, or center of gravity 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.

6.15. Weather Minimums for Takeoff. Minimum RVR for takeoff is 1600.

6.15.1. For RVR less than 1600 but equal to or greater than 1000, takeoffs are permitted for operational missions provided the runway has dual RVR readouts and displays (minimum RVR 1000 on both), runway centerline lighting is operational, and both pilots are fully qualified in their respective crew position. If any of the above criteria is not met, minimum RVR is 1600 on all RVR readouts.

6.15.1.1. When weather is below landing minimums, a departure alternate is required (see paragraph **6.19**).

6.15.1.2. If no RVR readout is available for the departure runway, visibility must be reported to be 1/2 mile (800 meters) or better.

6.16. Alternate Planning. Select alternate airports meeting the requirements of AFI 11-202 V3. Choose alternates that best meet mission requirements and conserve fuel; they should not be within the same terminal area, if terminal forecasts are marginal. Select alternates that are not restricted by FLIP, FCG or diplomatic clearances, and are compatible with the mission load and performance characteristics of the aircraft. The PIC retains final authority in the choice of alternates; however, selection by support agencies normally should be used if they meet the above criteria and the aircraft has already been serviced.

6.17. Departure Alternates.

6.17.1. A departure alternate is required if weather is below landing minimums for an available approach (at departure aerodrome). If planning an ILS approach, Category I minimums will be used.

6.17.2. Suitability of Departure Alternates. When a departure alternate is required, the aircraft must be capable of maintaining the MEA or minimum obstruction clearance altitude (MOCA), whichever is higher, to the alternate using OEI performance criteria. To qualify as a departure alternate, the airfield must meet one of the following conditions:

6.17.2.1. For an alternate within 30 minutes flying time, the existing weather must be equal to or better than the published approach minimums and forecast to remain so until one hour after takeoff, but in no case forecast to be lower than 200-1/2 (RVR 2400), or:

6.17.2.2. For an alternate within two hours flying time, the existing weather must be at least 500-1 above the lowest compatible published approach minimums, but not less than 600-2 for a precision approach or 800-2 for a non-precision approach, and forecast to remain so for one hour after ETA at the alternate.

6.18. Destination Requirements (for filing purposes). The forecast destination weather will be according to AFI 11-202 V3 and the following:

6.18.1. File two alternates when:

6.18.1.1. The forecast visibility (TEMPO or prevailing) is less than published for the available DOD or National Aeronautical Charting Office (NACO) precision approach.

6.18.1.2. The forecast ceiling or visibility (TEMPO or prevailing) is less than published for all other approaches. For approaches with no published ceiling requirement (for example Jeppesen approaches), the minimum required ceiling shall be computed by taking the published HAA or HAT 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 feet would require a forecasted ceiling of 700 feet.

6.18.1.3. The forecast surface winds (TEMPO or prevailing) exceed limits corrected for RCR.

6.18.2. File an alternate, regardless of forecast weather, when the departure or destination aerodrome is outside the CONUS. ***EXCEPTIONS***: comply with basic AFI 11-202V3 when:

6.18.2.1. OCONUS intra-theater flight does not exceed a 3-hour duration; or

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

6.18.3. A remote or island destination is defined as any aerodrome, which due to its unique geographic location, offers no suitable alternate (civil or military) within 2 hours flying time. The forecast weather at the remote or island destination must meet the following criteria:

6.18.3.1. The prevailing surface winds, corrected for RCR, must be within limits at ETA and forecast to remain so for 2 hours thereafter, and

6.18.3.2. The prevailing ceiling and visibility must be equal to or greater than published minimums for an available non-precision approach, for ETA plus 2 hours. However, if a precision approach is available, the ceiling or visibility may be intermittently below non-

precision approach minimums (excluding ASR), but not below precision approach minimums (for ETA plus 2 hours). **Note:** See **Chapter 14** for fuel planning considerations to a remote or island destination.

6.18.4. When filing to a destination where the alternate is located in Alaska or at latitudes greater than 59°N, see **Chapter 14** for fuel planning considerations.

6.19. Adverse Weather.

6.19.1. Flight into areas of forecast or reported severe turbulence is prohibited.

6.19.1.1. Crews should confirm the type of aircraft to which the forecast turbulence applies to, or what type of aircraft reported the encounter, to gain a more accurate picture for their route of flight. The EC-130H is a category III aircraft for turbulence.

6.19.1.2. 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.

6.19.2. Flight into areas of forecast or reported severe icing is prohibited. Prolonged operation, such as cruise flight or holding, in areas of moderate icing should be avoided. **Note:** Air Force Weather Agency technical note AFWA/TN 98/002, *Meteorological Techniques*, states that freezing drizzle is equivalent to moderate icing and freezing rain is equivalent to severe icing.

6.19.2.1. Do not takeoff under conditions of freezing rain. Do not takeoff under conditions of freezing drizzle except when aircraft has been properly de-iced/anti-iced IAW flight manual procedures.

6.19.2.2. 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/anti-icing prior to takeoff, refer to the following:

6.19.2.2.1. Aircrews will only use de-ice and anti-ice fluids listed in their respective flight manual. Aircrews will be familiar with, and follow all restrictions in their associated flight manual with respect to anti-ice/de-ice procedures.

6.19.2.2.2. MIL-A-8243 (Type I and Type II) and AMS 1424 (Type I) de-icing fluids are approved for use on the EC-130. These deicing fluids do not provide any anti-icing benefit, and therefore do not have holdover times.

6.19.2.2.3. In all cases, ACs will ensure a visual inspection of the aircraft is completed within 5 minutes of departure.

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

6.19.3.1. 20 NMs at or above FL 230.

6.19.3.2. 10 NMs below FL230. ***WARNING:*** Aircraft damage may occur 20NMs or more from any thunderstorms. Aircrews must familiarize themselves with information

on thunderstorm development and hazards. Refer to AFH 11-203 Volume 1, *Weather for Aircrews*.

6.19.4. 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:

6.19.4.1. Changing routing.

6.19.4.2. Diverting to alternate.

6.19.4.3. Declaring an emergency and requesting priority assistance.

6.19.5. Aircrews should avoid flying in areas of recently dissipated thunderstorms and clouds advected (horizontal movement of clouds caused by wind) downwind of thunderstorms.

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

6.19.6.1. Attempt to maintain VMC.

6.19.6.2. Maintain at least 5NMs separation from heavy rain showers.

6.19.6.3. Avoid areas of high lightning potential (defined in 6.21.11). **Note:** Approaches or departures may be accomplished when thunderstorms are within 10NMs providing they are not producing any hazardous conditions (such as hail, lightning, strong winds, gusts fronts, heavy rain, wind shear, or microburst) at the airport, and are not forecast or observed to be moving in the direction of the route of flight (to include the planned missed approach corridor, if applicable).

6.19.7. When performing approaches and landings at locations where temperatures are 0°C or below, refer to the FIH Section D, Temperature Correction Chart, to correct MDA, DH, and other altitudes inside the FAF. Additional procedures for temperature corrections beyond the requirements listed in the FIH are contained in AFI 11-202 V3.

6.19.8. Do not fly into an area of known or forecast moderate or greater mountain wave turbulence.

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

6.19.10. 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 20 NMs.

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

6.19.11.1. Within 8°C of freezing level.

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

6.19.11.3. In clouds within plus or minus 5,000 feet of the freezing level.

6.20. Operational Risk Management (ORM). ORM is a logic based, common sense approach to making calculated decisions on human, material, and environmental factors before, during, and after all operations. USAF policy on ORM is contained in Air Force Policy Directive 90-9, *Operational Risk Management.* ACs will accomplish ORM worksheets IAW MAJCOM and local guidance as part of preflight activities.

Section 6C—Preflight

6.21. AFTO Form 781.

6.21.1. Review AFTO Forms 781 series before applying power to the aircraft or operating aircraft systems. An exceptional release must be signed before flight. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the exceptional release. If one of these individuals is not available, the AC may sign the exceptional release. Ensure that the DD1896, **Jet Fuel Identaplate** and AIR card are aboard the aircraft.

6.21.2. 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 another station. 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 AC's concurrence is required before the aircraft can be flown.

6.21.3. For Red X clearing procedures at stations without maintenance support refer to Chapter 12.

6.22. Aircraft Servicing and Ground Operations.

6.22.1. Aircraft Refueling. Aircrew members qualified in ground refueling may perform refueling duties. Flight engineers acting as refueling supervisors and panel operators will comply with T.O. 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding* and refueling job guide. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed. Crew members may augment maintenance refueling teams at enroute stops.

6.22.2. Aircraft Dash One Preflight Inspection Requirements.

6.22.2.1. The aircraft dash one preflight inspection will remain valid until either:

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

6.22.2.1.2. Another maintenance dash six preflight is performed.

6.22.2.2. When an aircrew assumes a preflighted spare or quick turn, a thorough visual inspection will be performed. A thorough visual inspection will include, 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.

6.22.2.2.1. An aircraft should be sealed if the aircrew preflight has been completed and the aircraft will be unattended by aircrew. The time an aircraft remains sealed will not exceed the maintenance dash six inspection time limit.

6.22.2.2.2. Once the aircraft is sealed, the following notes will be entered in the aircraft AFTO Form 781A, Maintenance Discrepancy and Work Document, discrepancy block, and the maintenance operations desk and Squadron Operations Center (SOC) will be notified of the seal number:

Note: E preflight inspection C.W., Time:_____, Fuel:_____, LOX:_____, Seal #:_____

Note: AMT preflight inspection C.W., Time:_____, Seal #:_____.

The E/AMT will state what sections of the preflight were not accomplished.

6.22.2.2.3. An aircraft seal may be broken only by a maintenance officer, maintenance superintendent, production superintendent, flight engineer or AMT. The corrective actions block in 781A will be annotated anytime the seal is broken. The date corrected block will be completed, noting the reason for breaking the seal, and the corrected/transferred by block will be signed. In addition, a new discrepancy block will be completed as follows:

Note: Aircraft Resealed, Seal #_____, See Page:_____ block:_____ (this will refer to the discrepancy block where the aircraft was originally sealed).

6.22.3. Fire Protection and Crash Rescue.

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

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

6.22.4. Aircrew and Maintenance Engine Runs.

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

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

6.22.4.1.2. 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.

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

6.22.4.1.4. 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. ERCC procedures apply (see TO 1EC-130H-1 procedures).

6.22.5. Towing. Aircrew members normally will not participate in towing operations. If required to occupy cockpit positions during towing operations conducted by personnel not familiar with C-130 towing procedures, the AC will coordinate with the senior maintenance officer or superintendent to ensure the towing supervisor and crew are qualified. At non-USAF installations, the AC must have approval from the airfield operations officer or manager prior to towing. The AC will ensure the tow team supervisor briefs all personnel on their duties and the associated hazards. Proper checklists will be used. If any doubt exists as to the qualification of tow team personnel or the safety of the operation, make no attempt to tow the aircraft until qualified Air Force personnel can be located. Under no circumstances will any crewmember act as the towing supervisor.

6.22.6. During servicing and ground operations, personnel will not walk through a prop arc unless performing engine/propeller maintenance, inspecting intakes, or performing required pilot, flight engineer or AMT preflight duties. Personnel will not enter a 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. The AMT will relay the number of maintenance personnel enplaning/deplaning to the PIC.

6.23. 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 tasking.

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

6.23.1.1. Parking and receiving.

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

6.23.1.3. Supervision of minor maintenance within local capability.

6.23.1.4. Minor configuration changes to meet mission tasking.

6.23.1.5. Securing the aircraft before entering crew rest.

6.23.1.6. Coordinating aircraft security requirements.

6.23.1.7. Documenting AFTO 781-series forms.

6.23.2. In all cases where aircrews must service the aircraft without qualified maintenance specialist assistance, comply with the appropriate maintenance T.O.

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

6.24. Aircrew Flight Equipment Requirements.

6.24.1. Oxygen. Oxygen on board for takeoff must be sufficient to accomplish the planned flight from the equal time point (ETP) should oxygen be required (minimum 5 liters in the system with walk-around bottles filled).

6.24.1.1. Since the EC-130H flight deck can accommodate more crew members than there are oxygen regulators, EC-130H aircrew may pre-position emergency escape breathing devices (EEBD), emergency passenger oxygen systems (EPOS), or passenger oxygen kits (POK) on the aircraft.

6.24.1.2. When carrying passengers or MEPs, distribute EPOS (if available) to each passenger regardless of planned flight altitude. If the POKs are used, the kits need only be positioned on the aircraft and distributed to each passenger for scheduled flights above FL250. Mixing EPOS and POKs on the same aircraft is not authorized. EPOS/POKs will be distributed and their use demonstrated before departure.

6.24.1.3. Aircrew members will comply with the oxygen requirements in AFI 11-202V3. Additional crew members above those required to accomplish the mission shall be considered passengers for the purpose of determining oxygen requirements.

6.24.1.4. Crew members occupying a crew station will have an oxygen mask with communication connected and readily available for use from before engine start until engine shutdown.

6.24.1.5. Crew members who do not have access to the aircraft oxygen system will have a POK or EEBD within reach for flights above 10,000 feet.

6.24.2. Life preserver units (LPUs) or Personal Floatation Device. The AMT will place an LPU within easy reach of each passenger and aircrew member before takeoff on overwater flights (outside gliding distance to land). Crew members will fit and adjust LPUs (if applicable) for overwater flights and will wear them on overwater missions below 2,000 feet. (***EXCEPTION***: LPUs need not be worn for takeoffs, landings or approaches).

6.24.3. Parachutes:

6.24.3.1. Parachutes will be carried on aircraft IAW AFI 11-301V2, *Maintenance and Configuration Requirements for Mobility Air Forces (MAF) Aircrew and Aircraft-installed Aircrew Life Support Equipment (ALSE)* and T.O. 1EC-130H-5-2.

6.24.3.2. Personnel performing duties near an open (or suspected open) door/hatch/ramp in-flight will be restrained by a safety harness. As a secondary option only, if a safety harness is unavailable, personnel will wear a parachute at a minimum.

6.24.4. Aircrew Flight Equipment Documentation. ACs will ensure all prepositioned AFE and survival equipment items are serviceable, inventoried, and certified on the AFTO Form 46, *Prepositioned Life Support Equipment* (or equivalent), prior to flight. Notify the AFE section ofany onboard equipment shortages or unserviceable conditions. Note discrepancies in the AFTO Form 781F, *Aerospace Vehicle Flight Report and Maintenance Document.* Standard preflight requirements will suffice for inventories at enroute stops when the crew does not change. Do not open sealed bags for the sole reason to count equipment. Check attached tag on sealed bags for type and quantity of equipment and inspection currency.

Section 6D—Departure

6.25. On-Time Takeoffs. Mission departures are on time if the aircraft is airborne within +/- 30 minutes of scheduled takeoff time or as specified in a MAJCOM supplement.

6.25.1. Scheduled takeoff time may be adjusted to meet mission requirements. PICs shall notify C2 agency before takeoff to adjust the scheduled takeoff time.

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

Section 6E—Enroute

6.26. Flight Progress. In-flight, use all available navigational aids to monitor GPS/INS performance. Immediately report malfunctions or any loss of navigation capability that degrades centerline accuracy to the controlling air route traffic control center (ARTCC). Use the following procedures for flight progress:

6.26.1. Before an oceanic flight, plot the oceanic portion on an appropriate chart. Annotate the chart with the mission number and date. If practical, chart may be reused.

6.26.2. The navigator will verify waypoint data inserted into the CANS/INS by checking both the coordinate information and the distances between waypoints against the flight plan.

6.26.2.1. Use all available navigational aids to monitor CANS/INS performance. Immediately report malfunctions or any loss of navigation capability that degrades centerline accuracy to the controlling air route traffic control center (ARTCC). Use the following procedures for flight progress:

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

6.26.2.1.2. If a revised clearance is received, record and plot the new route of flight on the chart.

6.26.2.2. Navigators will use the procedures in **Chapter 11** for flight following.

6.26.3. Operations in International/Territorial Airspace. (See FLIP, FCG, and AP, for further guidance). US military aircraft and DOD personnel entering another nation to conduct US government business must have the approval of the foreign government concerned to enter their airspace. Foreign clearances for US international air operations are obtained through US officials known as Defense Attaché Officers (DAOs).

6.26.3.1. There are essentially two types of airspace: international airspace and territorial airspace. International airspace includes all airspace seaward of coastal states' territorial seas. Military aircraft operate in such areas free of interference or control by the coastal state. Territorial airspace includes airspace above territorial seas, archipelagic waters, inland waters, and land territory, and is sovereign airspace. Overflight may be conducted in such areas only with the consent of the sovereign country.

6.26.3.2. Consistent with international law, the US recognizes sea claims up to 12 NMs. Diplomatic constraints and/or a lack of diplomatic clearances usually result in missions operating in international airspace. Therefore, it is imperative sufficient information be

provided far enough in advance to allow compliance with FCG requirements established by the countries concerned. The US does not normally recognize territorial claims beyond 12 NMs; however, specific guidance from certain US authorities may establish limits, which differ from the standard.

6.26.3.3. Flight Information Region. An FIR is an area of airspace within which flight information and related services are provided. An FIR does not reflect international borders or sovereign airspace. Aircraft may operate within an established FIR without approval of the adjacent country, provided the AC avoids flight in territorial airspace.

6.26.3.4. Aircrews on a flight plan route, which takes them from international airspace into territorial airspace, for which approved aircraft clearances were obtained, should not amend entry point(s).

6.26.3.5. Violations of foreign sovereignty result from unauthorized or improper entry or departure of aircraft. Aircrews should not enter into territorial airspace for which a clearance has not been duly requested and granted through diplomatic channels.

6.26.3.6. ATC agencies are not vested with authority to grant diplomatic clearances for penetration of sovereign airspace where prior clearance is required from the respective country. Aircraft clearances are obtained through diplomatic channels only.

6.26.3.7. In the event ATC agency challenges the validity of a flight routing or attempts to negate existing clearances, ACs must evaluate the circumstances. The normal response will be to attempt to advise the ATC agency that the aircraft will continue to planned destination, as cleared in international airspace. The key phrase is "in international airspace." Safety of flight is paramount in determining mission continuation. Under no circumstances should aircrews construe a clearance, which routes their mission over sovereign airspace, which was not approved through diplomatic channels before mission departure, as being valid authorization.

6.26.3.8. Aircrews operating missions requiring unique or specially developed routing will normally be briefed at home station, on-load station, and/or by the last C2 facility transited before performing the critical portion of the mission.

6.26.3.9. Aircrews normally are not tasked to and should not fly "due regard" routings unless coordinated with the appropriate MAJCOM C2 and specifically directed in the mission FRAG. The "due regard" or "operational" option obligates the military AC to be their own ATC agency to separate their aircraft from all other air traffic. If operational requirements dictate, ACs may exercise the "due regard" option to protect their aircraft. Aircraft will return to normal air traffic services as soon as practical. Additional information on “due regard” is contained in FLIP General Planning, Chapter 7.

6.27. Navigational Aid Capability. Note:: EC-130H GPS systems (either hand-held or integrated) are mission-enhancement systems only, and are not certified for IFR navigation. EC-130H crews will not use GPS, either in PPS or SPS mode, as the primary source of navigation information.

6.27.1. MNPS standards are established in FLIP. **Note:** Airspace and associated navigational aid equipment capability are rapidly evolving. Pilots must maintain an in depth knowledge of current FLIP requirements/policies.

6.27.1.1. Aircraft that lose required equipment prior to oceanic airspace will return to the nearest maintenance repair facility.

6.27.2. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. The EC-130H is not RVSM compliant at this time, pending future upgrades. Once integrated, pilots will refer to FLIP AP/2 and the following for RVSM requirements:

6.27.2.1. Pilot and copilot altimeters, at least one autopilot, the altitude advisory system, and the transponder must be fully operational. The AC will request a new clearance to avoid this airspace should any of this equipment fail.

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

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

6.27.2.4. Continuously crosscheck the primary altimeters to ensure they agree ± 200 feet.

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

6.27.2.6. Immediately notify ATC if any of the required equipment fails after entry into RVSM airspace and coordinate a plan of action.

6.27.2.7. Document in the aircraft forms malfunctions or failures of RVSM required equipment.

6.27.3. Required Navigation Performance (RNP) Airspace. EC-130H aircraft are approved for RNP-5 operations only with a qualified navigator at the navigator's station. Airspace where RNP is applied is considered special qualification airspace. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between routes. Pilots will immediately notify ATC if any of the required equipment fails after entry into RNP airspace and coordinate a plan of action. Document in the aircraft forms malfunctions or failures of RNP required equipment. Minimum equipment to operate in RNP-5 airspace is one INS capable of updates. Flights entering RNP-5 airspace after long over water flight must be especially aware of RNP-5 tolerances and update accordingly. Aircrew should refer to FLIP General Planning for specific tolerance information.

6.28. CIRVIS and Other Reports. Report all vital intelligence sightings from aircraft as indicated in FLIP planning or FLIP Enroute Supplement.

6.28.1. In-flight harassment or hostile action against aircraft. Aircraft subjected to harassment or hostile action by foreign aircraft will immediately contact the nearest USAF air and ground voice facility and report the encounter. Include aircraft nationality, type, insignia, or any other identifying features. The crew should note position, heading, time, speed when harassed, and the type of harassment. Request relay of the report to the nearest C2 agency. Also, attempt to contact the nearest command post when in UHF and VHF range.

6.28.2. Other incidents will be reported as indicated in JCS Pub 6V5 and AFI 10-206, *Operational Reporting.*

6.29. In-flight Meals. Pilots should not eat meals at the same time and their meals should consist of different menu items. Flameless Ration Heaters, included in MREs, will not be activated or handled inside the aircraft.

6.30. Communications.

6.30.1. Crews should conduct an HF radio ground check before takeoff if use of the HF radio may be required for ATC or C2 communications. Attempt to establish HF contact before going out of UHF/VHF range. If unable to establish HF contact with the controlling HF station, and an alternate means of relay of ATC information is not available, the aircraft should return to the nearest suitable support base.

6.30.2. Pilots shall provide ARTCC position and weather observations when required. If unable to contact an ATC agency, attempt to relay through the global HF stations.

6.31. In-flight Emergency Procedures. The AC shall report deviations from directives that may occur as a result of an emergency according to AFI 11-202 V3. Time and conditions permitting, inform the passengers of the situation and intentions.

6.31.1. Notification of C2 Agencies. When practical, after completing the aircraft emergency action checklists and associated actions, the AC shall furnish ATC and appropriate C2 agencies with a description of the difficulty, assistance required, intentions and any other pertinent information.

6.31.2. The AC may initiate a CONFERENCE HOTEL when additional expertise is necessary. Communications procedures are as follow:

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

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

6.31.2.3. Provide the following information when time permits:

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

6.31.2.3.2. What assistance is being requested.

6.31.2.3.3. Fuel on board and hours of endurance.

6.31.2.3.4. Position.

6.31.2.3.5. Altitude and flight conditions.

6.31.2.3.6. Number of personnel and DVs on board.

6.31.2.3.7. Qualification of all primary crewmembers.

6.31.2.3.8. Planned landing destination and ETA.

6.32. 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 will include the patient's sex, approximate age, and the major complaint.

Section 6F—Arrival

6.33. Descent. Before descent into unfamiliar areas, pilots and navigators will review appropriate terrain charts to increase aircrew situational awareness of obstructions. Primary crew members will not be involved in duties other than aircraft operations, descent and approach monitoring, and required checklist items from the initial descent point to landing.

6.33.1. Weather Forecasts. It is the pilot's responsibility to obtain destination weather prior to descent.

6.33.1.1. Obtain weather from any USAF base weather station via pilot-to-meteorologist service (PMSV), Flight Service Station (FSS), ATIS, or a USAF aeronautical station. Check on the latest weather prior to descent or landing.

6.33.1.2. For aircraft flying in EUCOM AOR (ENAME operations) contact USAFE/OWS at Sembach AB GE (DSN 314-496-6145). In the SOUTHCOM AOR, contact 25 OWS at Davis-Monthan AFB, AZ (DSN 228-1977).

6.33.1.3. The ATC system can provide weather information to enroute aircraft, based on controller workload. All CONUS ARTCCs have weather forecasters assigned, but will only provide weather information when their workload allows. Do not use ARTCC controllers as a primary source of weather information.

6.33.1.4. SIGMET (significant meteorological information) advisories will be transmitted from the servicing ATC unit. Crews will consider all SIGMETs valid for their aircraft until verified as not applicable with a military METRO service.

6.33.2. Night and Marginal Weather Operations. Fly a precision approach, if available, at night or during marginal weather. If a precision approach is not available, fly any available approved instrument approach. A visual approach may be flown during night VFR conditions, if an approved instrument approach is not available or operational mission requires a non-standard approach.

6.33.2.1. On training/evaluation flights at familiar fields, pilots may fly non-precision approaches or VFR traffic patterns to accomplish required training and evaluations. The PM will monitor a precision approach when practical to enhance safety.

6.33.2.2. For recovery at home station, pilots may elect to fly a visual or non-precision approach, if weather minimums permit.

6.34. Instrument Approach Procedures.

6.34.1. Aircraft category. The C-130 is a category "C" aircraft. If approach speeds exceed 140 knots, the minimums for category "D" will be used.

6.34.2. Prior to starting an instrument approach, pilots will confirm their aircraft can comply with the missed approach climb gradient requirements established in AFI 11202 V3.

6.34.3. Weather minimums. Before starting an instrument approach, or beginning an enroute descent, pilots will confirm the existing weather is reported to be:

6.34.3.1. At or above required visibility for straight-in or sidestep approaches.

6.34.3.1.1. For precision approaches, visibility will be no lower than RVR 2400 (730 meters) or 1/ 2 mile visibility (800 meters) with no RVR readout available. DH will be based on a HAT of no less than 200 feet.

6.34.3.2. At or above required ceiling and visibility for circling approaches.

6.34.3.2.1. For circling approaches with no published ceiling requirement, the required ceiling shall be computed by taking the published HAA plus 100 feet rounded up to the next one hundred foot value. (For example, if the HAA is 747 feet, add 100 feet to get 847 feet and then round up to the next one hundred foot value which would be 900 feet. Your ceiling for the approach must be at or above 900 feet). When circling minimums are published, but not by category, circling approach minimums will be as published, but in no case lower than 500 feet and 1.5 miles visibility (Category C) or 600 feet and 2 miles visibility (Category D) above published airport elevation.

6.34.3.3. Increase the published visibility minimums of an instrument approach by ½ statute miles (SM) or as noted in NOTAMs, on ATIS, or on the approach plate, when the runway approach lighting system (ALS) is inoperative. This applies only to the ALS itself, not to VASIs, PAPIs, and other lights that are not a component of the ALS.

6.34.3.4. If the ceiling is below the value depicted for published DOD or NACO precision approach, but visibility is at or above authorized minimums, comply with fuel requirements before initiating enroute descent, penetration or approach.

6.34.4. Flight Instrumentation Requirements.

6.34.4.1. If full flight instrumentation is not available and operational, aircraft are limited to a DH/MDA based on a HAT of 300 feet and RVR 40, or ¾ mile visibility (1220 meters) with no RVR.

6.34.4.1.1. Category I ILS. Full flight instrumentation consists of: dual flight displays (one flight director plus ADI repeat), complete differential pressure instruments, heading/compass systems, and attitude indicators in the pilot and copilot positions.

6.34.4.1.2. Full flight instrumentation for a precision approach radar (PAR) consists of: complete differential pressure instruments, heading/compass systems, and attitude indicators in the pilot and copilot positions.

6.34.5. Category I ILS Procedures.

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

6.34.5.1.1. Two operational VHF communication radios are required.

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

6.34.5.1.3. If unable to accept an ILS PRM approach clearance, contact the FAA ATCSCC at 1-800-333-4286 prior to departure time to obtain a pre-coordinated arrival time. Pilots who arrive at a PRM airport unable to accept PRM approach

clearance, which did not contact ATC prior to departure, should expect an ATC directed divert to a non-PRM airport.

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

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

6.34.6. NDB Procedures. NDB approaches may be flown during day, night, or IMC conditions after compliance with any airfield restrictions in GDSS and the ASRR. Back up each approach with available navaids/GPS to include loading the NDB coordinates in the FMS or CANS.

6.34.7. Established on a Segment of the Approach. When cleared for or established on a segment of the approach and the weather is reported or observed to be below approach minimums, the PF has the option of continuing the approach to the missed approach point (MAP)/DH. If the approach is abandoned, level off (or descend if a lower altitude is required for the missed approach procedure). Comply with the last assigned clearance until a new or amended clearance is received.

6.34.7.1. Do not continue the approach below minimums unless the runway environment is in sight and the aircraft is in a position to make a safe landing.

6.34.7.2. If the approach is continued, the AC must have sufficient fuel available to complete the approach and missed approach, and proceed to a suitable alternate with normal fuel reserve.

6.34.7.3. The AC has final responsibility for determining when the destination is below designated minimums, and for initiating proper clearance request.

6.34.8. Holding. An aircraft may hold at a destination that is below landing minimums, but forecast to improve to or above minimums provided:

6.34.8.1. The aircraft has more fuel remaining than that required to fly to the alternate and hold for the appropriate holding time, and the weather at the alternate is forecast to remain at or above alternate filing minimums for the period, including the holding time.

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

Section 6G— Post-Flight

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

6.35.1. An entry will be placed in AFTO 781A, "Aircraft Subjected to Salt Spray" (state lowest altitude and duration) anytime the aircraft is flown under 1000 feet above sea except for takeoffs and landings.

6.36. Border Clearance.

6.36.1. Normal Operations.

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

6.36.1.2. When support is not available, border clearance is the responsibility of the AC. Duties may be assigned to ground personnel or to the AMT, but the AC retains ultimate responsibility. When an EC-130H aircraft is on-loaded at a base without an air traffic function, the AC is responsible for ensuring the following:

6.36.1.2.1. Crew membersand passengers possess current passports and valid visas, when required.

6.36.1.2.2. Crew membersand passengers have current certificates of immunization (shot record).

6.36.1.2.3. Departing or entering the United States through a location where border clearance can be obtained.

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

6.36.1.2.5. Spraying the aircraft (see the FCG and paragraph **6.47**).

6.36.2. Procedures for US Entry.

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

6.36.2.2. 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.

6.36.2.3. Obtain a permit to proceed when military necessities require that an aircraft, which has landed in the United States for customs clearance, to proceed to another base in the US to obtain border clearance. The 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. The permit to proceed is valid only to the airport of next landing where the border clearance must be completed or a new permit to proceed issued by a customs official. Do not make intermediate stops between the issue point of the permit to proceed and destination of manifested cargo unless required by an emergency or directed by the controlling C2 center.

6.36.2.4. When an aircraft lands for a US border clearance, a US Customs representative normally will 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 (AMT excepted). Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the US and all landings required when operating on a permit to proceed or until all crew, passengers, and cargo complete final border clearance.

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

6.36.3.1. Follow USAF policy on status of military aircraft as stated in AFI 24-405 *Depart of Defense Foreign Clearance Guide (FCG), General Information* (Chapter 3). In substance, this policy holds that US military aircraft are immune from searches, seizures, and inspections (including customs and safety inspections) by foreign officials. In addition, ACs must be aware of, and adhere to, any specific FCG provisions for individual countries.

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

6.36.3.2.1. In most cases, search attempts may be halted simply by a statement of the PIC to the foreign official that the aircraft is a sovereign instrumentality not subject to search without consent of USAF headquarters or the US 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.

6.36.3.2.2. If foreign authorities insist on conducting a search, the AC 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 AC should then notify these agencies of foreign request by the most expeditious means available and follow their instructions.

6.36.3.2.3. 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 or she would prefer to fly the aircraft elsewhere (provided fuel, flying time, and mechanical considerations permit a safe flight) and request permission to do so.

6.36.3.2.4. If permission is refused and the foreign authorities insist on forcing their way on board an aircraft, the AC should state that he protests the course of action being pursued and that he intends to notify both USAF headquarters and the appropriate American embassy of the foreign action. The AC should not attempt physical resistance, and should thereafter report the incident to USAF headquarters and appropriate embassy as soon as possible. The AC should escort foreign authorities if the inspection cannot be avoided.

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

6.36.4. Exercises and Contingency Operations.

6.36.4.1. General. Certain missions, which do not transit normal ports of entry or exit, 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.

6.36.4.2. 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 US on-load or off-load base, or at the foreign on-load or off-load base.

6.36.4.3. Customs Procedures.

6.36.4.3.1. Outbound: No requirement. Filing of Customs Form 7507 is not required unless directed.

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

6.36.4.3.2.1. Customs Form 7507 (Passenger list not required).

6.36.4.4. Public Health Procedures.

6.36.4.4.1. When operating from a base without a traffic officer, the AC will ensure all crewmembers and passengers are properly immunized.

6.36.4.4.2. Spray the aircraft if required.

6.36.4.5. Immigration Procedures.

6.36.4.5.1. Outbound: No requirements.

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

6.36.4.5.2.1. One copy of Customs Form 7507.

6.36.4.6. Agriculture Procedures:

6.36.4.6.1. Outbound: No requirement.

6.36.4.6.2. Inbound: Consult Border Clearance Guide.

6.36.5. Military Customs Pre-clearance Inspection Program. All crew members will ensure compliance with Military Customs Pre-clearance requirements. Expect a Customs representative will meet the aircraft and collect all declarations.

6.37. Insect and Pest Control.

6.37.1. Responsibility. ACs will ensure required spraying is accomplished according to AFJI 48-104,*Quarantine Regulations of the Armed Forces*, Department of Defense FCG, or as directed by higher headquarters. Certify the spraying on Customs Form 7507, or on forms provided by the country transited. Aircraft should never be sprayed with passengers on board. The only exception is when mandated by the FCG.

6.37.1.1. 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.

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

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

6.37.1.1.3. Spray the cabin, cockpit, 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.

6.37.1.2. 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.

6.37.2. Responsibility of AC 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.

6.37.3. 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.

6.38. Aircrew Debriefing. Review and evaluate overall training and/or mission performance. Each student or aircrew member should understand thoroughly what training has been accomplished, or lessons learned from mission employment. Ensure all training is documented. Debrief maintenance write-ups with applicable personnel.

Section 6H—Miscellaneous

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

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

6.39.2. Notify maintenance at the first military station transited.

6.40. Cockpit Voice Recorder. If involved in a mishap or incident, after landing and terminating the emergency, pull the CVR power circuit breaker.

6.41. Aircrew Flight and Dash 21 Equipment Documentation. The AC or designated representative will:

6.41.1. Before departing home station or enroute stations, ensure appropriate serviceable protective clothing, aircrew flight equipment, survival, and dash 21 equipment for the entire or remainder of the mission are aboard the aircraft.

6.41.2. Before departing home station and following enroute crew changes, review AF Form 4076, *Aircraft Dash 21 Equipment Inventory*, to ensure all required dash 21 equipment has been certified as installed by maintenance, the initial check has been signed by maintenance, and configuration documents match mission requirements.

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

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

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

6.41.4.2. Annotate AF Form 4076 and AFTO Form 46 in the next vacant column indicating the quantity remaining for the item. Ensure the ICAO location designator is entered above the check number of that column. Leave AF Form 4076 and AFTO Form 46 on board the aircraft in the event of an enroute crew change.

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

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

6.41.4.5. When possible, advise HQ ACC/A3TV and HQ ACC/A3TO (or MAJCOM aircrew flight equipment office) and appropriate C2 agency (or airport management) before mission continuation.

6.41.5. Additional Equipment. If more equipment is discovered during the preflight than is annotated on the AF Form 4076 or AFTO Form 46, annotate the total quantity in the next vacant column for the item. Ensure the ICAO location designator is entered above the check number of that column.

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

6.43. Loose Objects in the Cockpit.

6.43.1. No items (checklists, charts, etc.) will be placed behind the condition levers or on the throttle quadrant during critical phases of flight.

6.43.2. Place only soft items on the top bunk.

6.44. Wake Turbulence Avoidance. Comply with wake turbulence avoidance criteria. Acceptance of traffic information, instructions to follow an aircraft, or a visual approach clearance is acknowledgment that the AC will ensure takeoff and landing intervals and accepts responsibility of providing wake turbulence separation. Refer to FLIP General Planning (GP) section 5-37 for more information concerning wake turbulence separation.

6.45. Ordnance Procedures. Conduct the following procedures after the live firing of flares or the crew suspects aircraft battle damage:

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

6.45.2. The flight engineer or AMT will deplane the aircraft and check all flare dispensers for hung ordnance or damage, and will maintain contact with either a safety observer or the AC at all times, either visually or over interphone. **Note:** ALE-47 flare squibs that fail to fire are not considered hung ordnance.

6.45.3. If hung ordnance is found, identified by a protruding or partially ejected flare cartridge, the aircraft will remain in or proceed to a de-arm area until Explosive Ordnance

Disposal (EOD) personnel meet the aircraft. The aircraft must remain in the designated safe area until EOD personnel can clear all hung ordnance.

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

6.46. Classified Equipment and Material. Comply with the following or as directed in MAJCOM supplement.

6.46.1. Equipment. When classified equipment is onboard, ensure the C2 Center or airfield management operations office is aware of the requirement for aircraft security according to **Chapter 7** of this AFI. At bases not under jurisdiction of the Air Force, ensure the aircraft and equipment are protected. AFI 31-401, *Information Security Program Management*, provides specific guidance concerning the security of various levels of classified equipment aboard aircraft. For classified aircraft components which cannot be removed and stored, lock and seal the aircraft. If available, use Ravens to guard the aircraft; otherwise, use guards employed by the host country for flight line/airport area control. Do not leave unguarded classified information stored in navigation or radio equipment.

6.46.1.1. COMPASS CALL aircraft security requirements are defined in AFI 31-101,The Air Force Installation Security Program(FOUO) when operating at US Air Force installations and in AFJI 31-102 (OPNAVINST 5530.15A, AFR 207–4, MCO 5500.13A, DLAR 5710.4) when operating on another service's installation. Chapter 7 of this volume provides additional guidance. Security requirements should be specified in the deployment order for deployed operations.

6.46.1.2. The security requirements for an aircraft processing SCI material are the same as a ground SCIF.

6.46.2. 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 will provide temporary storage for COMSEC and other classified materials during enroute, turnaround, and crew rest stops. If a storage facility is not available, the aircraft gun storage box may be used for material classified 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.

6.46.3. Aircrews will ensure that they have an operable Mode IV when required for mission accomplishment. Aircrews will conduct an operational ground test of the Mode IV (ground test assets permitting) before deployment overseas, or as specified in the OPORD or contingency/ exercise tasking.

6.46.4. Attempt to fix an inoperable Mode IV before takeoff. Do not delay takeoff nor cancel a mission for an inoperable Mode IV, except when the aircraft will transit an area where safe passage procedures are implemented.

6.46.5. Conduct an in-flight check of the Mode IV on all missions departing the CONUS for overseas locations. Aircrews can request the Mode IV interrogation check through NORAD on UHF frequency 364.2.

6.46.6. Aircraft with inoperable Mode IV will continue to their intended destinations. 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 4 as directed in the applicable airspace control order or Air Tasking Order (ATO).

6.46.7. Ground and in-flight checks of the Mode IV, when conducted, are a mandatory maintenance debrief items. Crews will annotate successful and unsuccessful interrogation of the Mode IV on all aircraft forms (AFTO Form 781A).

6.46.8. Aircrews will carry COMSEC equipment and documents required to operate the Mode IV on missions when required for mission accomplishment. Before departing for any destination without COMSEC storage facilities, crews will contact their local COMSEC managers for guidance.

6.46.9. Emergency Destruction. Destroy/damage classified material/equipment prior to a crash landing or bailout if possible. If the situation does not permit securing of classified material during ground egress, aircrew will obtain the names and telephone numbers of all un-cleared emergency responders and/or maintenance personnel who boarded the aircraft and were exposed to classified material. If SCI material was inadvertently disclosed, the SSO will be contacted to conduct an inadvertent disclosure briefing to those members exposed to SCI.

6.47. Confidence Activities:

6.47.1. Confidence activities (in-flight opening of paratroop doors or ramp and cargo door) are required for AMT and flight engineer training to prepare for emergency procedures. Conduct confidence activities IAW the Inflight Guide. Only AMTs and flight engineers are permitted to accomplish the confidence activities. All other aircrew members not taking part in the confidence activities will be seated with seat belt securely fastened.

6.47.2. Confidence activities will only be conducted during syllabus training, continuation training, or during evaluations.

6.47.3. A safety observer (flight engineer or AMT) will be present during all confidence activities and will have a second restraint harness on and fitted. **Note:** Do not use the flight deck restraint harness for confidence activities.

6.47.4. Adjust the lifeline of the restraint harness to allow mobility only to the troop door for opening and closing. ***WARNING:*** Aircraft ramp and door and paratroop doors will not be open at the same time. ***WARNING:*** Except for an actual contingency or emergency that threatens the survivability of the aircraft and crew, the restraint harness will not be disconnected or lengthened to a point that would allow the AMT/flight engineer to fall outside the aircraft.

6.47.5. A parachute will not be worn in place of a restraint harness during any confidence activity training or evaluation.

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance for aircraft security and unlawful seizure of aircraft. EC-130H aircraft are normally priority C assets, but become priority B assets when transient or deployed IAW AFJI 31-102 (AR 90-160 . AFI 13207, *Preventing and Resisting Aircraft Piracy (Hijacking),* AFI 31-101, and specific MAJCOM security publications contain additional guidance.

7.2. Security. See AFI 13-207; AFI 10-701, *Operations Security*; and AFI 31-101, for requirements for protection of aircraft in transient status at US and foreign bases.

7.3. Security Procedures:

7.3.1. Forward Operating Location Security. Security arrangements at forward operating locations will be made by DETCOs or ADVON personnel, and must comply with the minimum requirements referenced in AFI 31-101, which provides protection level status and procedures for COMPASS CALL and other aircraft.

7.3.2. Enroute Security. ACs will receive a threat assessment and security capability evaluation briefing at home station and receive updates at enroute C2s. Assess the situation and take the following actions, if necessary:

7.3.2.1. Request area patrol coverage from local security forces. If local authorities request payment for this service, use AF Form 15.

7.3.2.2. 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.

7.3.2.3. If the AC determines airfield security is inadequate and the safety of the aircraft is in question, (i.e. local security forces are unacceptable or unavailable and the crew is not augmented with security police), the AC 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, US embassy, local military or law enforcement, as appropriate.

7.3.2.4. If, in the AC's judgment, the aircraft needs to be locked and sealed to detect unauthorized entry, use the aircraft lock and secure the hatches, windows, and doors in a manner that will indicate unauthorized entry. Wipe the immediate area around lock and latches clean to aid in investigation of a forced entry. Coordinate with local base operations on procedures for servicing the aircraft while the crew is away. Report any unauthorized entry or tampering to the Office of Special Investigation (OSI), security forces or local authorities, and the C2 agency. Have aircraft thoroughly inspected prior to flight.

7.4. Arming of Aircrew Members. Due to the nature of the EC-130H mission, crews will not normally be armed enroute to a forward operating location. However, weapons may be carried

on the aircraft for use in theater. When the ECG/CC determines the nature of the deployment warrants the aircrews carry weapons enroute, follow the procedures in paragraph **7.4.1** below.

7.4.1. Weapons Issue (Enroute). When required by Rules of Engagement (ROE), Air Tasking Order (ATO), or Special Instructions (SPINS), obtain weapons and ammunition from the weapons storage area. Crew members will be armed according to AFI 31-207, *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 will be reissued until the mission terminates. If an armed aircrew member must leave the crew enroute, transfer the weapon to another authorized aircrew member using AF Form 1297.

7.4.1.1. 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.

7.4.1.2. 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). Weapons will remain under the positive control of the crewmember at all times.

7.4.1.3. Aircrew members will be armed prior to preflight duties. When no passengers are aboard and after a satisfactory stowaway check, weapons may be stored in the gun box in flight. Aircrew members will rearm before landing. Weapons will not be unloaded before placement in the gun box.

7.4.1.4. During crew rest, store weapons in the most secure facility available, normally a 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 boxcar seal and maintain the seal number. Lock and seal the aircraft doors.

7.4.2. Contingency Missions:

7.4.2.1. Normally, all crewmembers will be issued weapons prior to combat/combat support sorties, as part of their survival equipment, in accordance with theater directives. Procedures for weapons issue will be determined by squadron commander/DETCO in conjunction with AFE personnel. Additionally, in-garrison weapons issue / arming procedures will be developed by deployed leadership commensurate with current force protection procedures.

7.5. Preventing and Resisting Hijacking. Refer to AFI 13-207 for detailed guidance. Security operations surrounding EC-130H aircraft at deployed locations are normally sufficient to deter piracy without any action by aircrew. Aircrew should always remain vigilant to any unusual circumstances, and report them to security forces.

7.5.1. The Air Transportation Act of 1974 and the Federal Aviation Act of 1958, as amended, vest the FAA Administrator with exclusive responsibility for the direction of law enforcement activity in aircraft hijacking situations involving all aircraft (civil and military) in-flight in the United States.

7.5.2. In taking action during an aircraft hijacking situation, military forces will act under military command within the scope of their duties.

7.5.3. In the event an aircraft involved in an aircraft hijacking situation is carrying documents, equipment, or material that DoD has determined to be highly sensitive, or weapons of mass destruction, DoD will provide the FAA, and where appropriate, the FBI, with all pertinent information. Where possible, the FAA will consult and cooperate with DoD before directing any law enforcement activity.

7.5.4. An aircraft is most vulnerable to hijacking when the aircrew is aboard and the aircraft is operationally ready for flight.

7.5.5. A concerted effort must be made to prevent the hijacking of military or military contract aircraft by detecting potential hijackers before they board the aircraft.

7.5.6. Should preventive efforts fail, any actual attempt to hijack a military aircraft must be resisted in a manner appropriate to the situation.

7.5.7. Since air piracy may be committed by political terrorists or by individuals to whom the threat of death is a stimulus rather than a deterrent, ordinary law enforcement procedures may be ineffective. Thus, successful conclusion of a hijacking situation and apprehension of the hijackers may require use of specialized law enforcement techniques and procedures.

7.5.8. Delaying actions have been most successful in overcoming hijackings without loss of life or property.

7.5.9. Assistance to hijacked civil or military contract aircraft will be rendered as requested by the pilot in command of the aircraft and the authority exercising operational control of the anti-hijacking effort.

7.6. Armed Passengers. EC-130H aircraft normally do not carry passengers; therefore the risk of hijacking is further reduced. When carried, passengers will normally not carry weapons or ammunition on their person or in hand carried baggage. Exceptions include special agents and guards of the Secret Service or State Department and other individuals specifically authorized to carry weapons. Take every precaution to prevent accidental discharge of weapons.

7.6.1. Passengers or deadhead crewmembers will not retain custody of ammunition on an aircraft. They will turn it in to the troop commander or AC. Excepted passengers (above) may carry unloaded weapons and ammunition aboard the aircraft during combat operations.

7.6.2. If guards or couriers must clear their weapons, the AC will ensure the individual:

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

7.6.2.2. Clears weapons in accordance with standard safety procedures.

7.7. Preventive Measures. Commanders at all levels must ensure preventive measures are taken to minimize access to the aircraft by potential hijackers. When an EC-130H is operating away from home station, the AC or DETCO, as appropriate, will ensure compliance with this chapter and AFI 13-207, as supplemented.

7.8. Initial Response. When an act of air piracy involves an Air Force installation or aircraft within the United States, response will be according to the following guidelines until such time

as FAA assumes active direction of anti-hijacking efforts. Resist all attempts to hijack a military aircraft. Resistance may vary from simple dissuasion, through deception and subterfuge, to direct physical confrontation, including the prudent use of weapons.

7.8.1. The following guidelines should be used to counter a hijacking, actual or threatened, while the aircraft is on the ground:

7.8.1.1. Delay movement of the aircraft to provide time for ground personnel and the aircrew to establish communication and execute coordinated resistance actions.

7.8.1.2. The authority for determining when ground resistance will be discontinued is vested in the highest available level of command. When adequate communication cannot be established, or when time does not permit, this authority is delegated in the following order:

7.8.1.2.1. MAJCOM commander exercising operational control of the aircraft.

7.8.1.2.2. MAJCOM commanders in whose area of responsibility (AOR) the airfield lies.

7.8.1.2.3. Senior operational commander on scene.

7.8.1.2.4. AC in compliance with MAJCOM directives.

7.9. In-flight Resistance. After airborne, success in thwarting a hijacking depends on the resourcefulness of the aircrew. Many variables of a hijacking preclude use of any specific counter-hijacking procedure. Some key factors should be evaluated before deciding a course of action to be taken, including the nature of the threat, danger to life or crippling damage to the aircraft in-flight, destination indicated by the hijacker, and the presence of sensitive material onboard. Some counter-hijacking actions the aircrew may consider are:

7.9.1. Engage the hijackers in conversation to calm him or her and to evaluate what course of action might be effective.

7.9.2. Dissuade the hijacker.

7.9.3. Use facts or subterfuge to convince the hijacker intermediate stops are necessary.

7.9.4. Propose more favorable alternatives, such as landing in a neutral, rather than a hostile, country.

7.9.5. Exploit any reasonable opportunity to incapacitate or overcome the hijacker physically, including the prudent use of firearms.

7.10. Communications Between Aircrew and Ground Agencies. Crews will be familiar with guidance found in AFI 13-207 and the HQ AFFSA website.

7.11. Forced Penetration of Unfriendly Airspace. These procedures are designed to deter possible hostile action against the hijacked aircraft that has been forced to penetrate airspace of a nation unfriendly to the United States.

7.11.1. If instructions from the unfriendly nation are received, either by radio contact or by air intercept before boundary crossing, comply with instructions received.

7.11.2. If no contact with unfriendly nation is made before approaching a boundary:

7.11.2.1. Maintain TAS not more than 400 knots.

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

7.11.2.3. Fly a direct course toward destination announced by the hijacker, if no course is specified.

7.11.2.4. Follow communications procedures set forth in FLIP.

7.11.3. Consider the presence of classified documents and equipment aboard the aircraft. When a landing in an unfriendly nation is imminent, attempt to dispose of or destroy the equipment or material.

7.12. Force Protection. Crews must be alert to possibility of terrorist activities at all times. Reference AFPAM 10-100, *Airman's Manual,* Joint Service Guide 5260, *Service Member's Personal Protection Guide: Combat Terrorism While Overseas,* and AFI 10-245, *Antiterrorism (AT),* for force protection measures.

Chapter 8

OPERATIONAL REPORTS AND FORMS

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

8.2. AF Form 457, *USAF Hazard Report* (AFI 91-202, *The US 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.

8.3. 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.

8.3.1. AFI 91-202, Attch 3, *Hazardous Air Traffic Report (HATR) Program* and AFMAN 91-223, *Aviation Safety Investigations and Reports* list HATR reportable incidents.

8.3.2. Procedures:

8.3.2.1. Anyone aware of a reportable incident files a HATR, RCS: HAF-SE (AR) 7602.

8.3.2.2. Deadline to file a HATR is 24 hours after event via any communication mode available. Submit the completed AF Form 651 to the base safety office. If landing airport is not a US Air Force Base, notify the safety office of the Air Force base nearest to location where the condition occurred, the AC's home base safety office, the safety office at the next landing base, or as prescribed by overseas MAJCOM. In that case, provide contact sufficient information to prepare AF Form 651. Unit Commanders will ensure AF Form 651 is available to aircrew at base operations facilities, flying squadron operations offices, in trip kits, and in US Air Force air traffic control facilities.

8.3.2.2.1. When flying in Europe reference STANAG 3750 NATO Standardization Agreement, *Reporting and Investigation of Air Traffic Incidents* procedures and guidelines for filing a HATR.

8.3.2.3. If you have a NMAC, make an airborne report of the hazardous condition to the nearest ATC agency (e.g., center, FSS, control tower, or aeronautical radio station), and give the following information as appropriate:

8.3.2.3.1. Identification or call sign.

8.3.2.3.2. Time and place (radial/DME of NAVAID, position relative to the airfield, incident, etc.

8.3.2.3.3. Altitude or flight level.

8.3.2.3.4. Description of the other aircraft or vehicle.

8.3.2.3.5. Advise controlling ATC agency that the PIC will file a NMAC upon landing and request that th controllers save all available data. **Note:** ATC agencies (e.g., FAA) must know if an official report is being filed.

8.3.3. Immunity From Disciplinary Action. Individuals submitting a HATR are granted immunity from disciplinary action provided:

8.3.3.1. Their violation was not deliberate.

8.3.3.2. They committed no criminal offense.

8.3.3.3. No mishap occurred.

8.3.3.4. They properly reported the incident using procedures above. **Note:** HATR reports are not privileged information and may be released outside the USAF.

8.4. AF Form 711, USAF Aircraft Mishap Report Worksheet (AFI 91-204):

8.4.1. Responsibilities. Notify the appropriate authorities of any mishap involving aircraft or crew. When notified, appropriate authorities will initiate investigative and reporting actions in accordance with AFI 91-204. **Note:** Do not attempt to classify a mishap.

8.4.2. Reportable Mishaps:

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

8.4.2.2. Report the following occurrences:

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

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

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

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

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

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

8.4.2.2.1.6. Aircrew G-induced loss of consciousness.

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

8.4.2.2.1.8. 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.

8.4.2.2.1.9. Suspected Laser Exposure. If exposed to a laser, the aircraft commander will ensure appropriate command and control, intelligence; safety and medical agencies are notified as soon as possible. Aircrew who suspect exposure

to laser radiation from either friendly or hostile sources should report to the Flight Surgeons Office or nearest emergency room where individual can be examined by an ophthalmologist immediately upon landing. Reference AFI 11-301 Vol 4 for further guidance.

8.4.2.2.1.10. Hyperventilation.

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

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

8.4.2.2.1.13. Alcohol and hangover (crew only).

8.4.2.2.1.14. 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 aircrew members and passengers involved will report to a flight surgeon as soon as practical and request that an AF Form 711B be accomplished.

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

8.4.2.2.3. Unselected propeller reversal.

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

8.4.2.2.5. All uncommanded inputs to the flight controls 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.

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

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

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

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

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

8.4.2.2.11. Any incident which does not meet the established criteria for a reportable mishap but, in the judgment of the AC, needs to be emphasized in the interest of flight safety.

8.5. 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 AFI 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 aircraft, state, and local law enforcement aircraft, and some foreign government aircraft. All PICs should plan to use the "platinum" MSC card. In most cases, there will be no changes when refueling at non-Defense Energy Support Center (DESC) contract locations. The MSC card is accepted at approximately 4,800 locations worldwide. It replaces the Standard Form (SF) 44, *Purchase Order-Invoice-Voucher*, at locations that accept the MSC card.

8.5.1. Responsibilities. Aircrew and maintenance personnel will be familiar with AVPOL procedures and documentation requirements of this chapter. Improper use of AIR card could create financial liability for the purchaser.

8.5.2. Refuel/de-fuel USAF aircraft at DOD locations when ever possible. If DOD service is not available, purchase fuel from other source(s) in the following priority:

8.5.2.1. Defense Fuel Supply Center (DFSC) or Canadian into-plane contracts.

8.5.2.2. Foreign government air forces. **Note:** DOD FLIP enroute supplements identify locations with into-plane contracts.

8.5.2.3. Open market AIR card purchase to include Shell International Trading Company (SITCO) agreement.

8.5.3. Refueling at USAF Locations. AF Form 1994, *Fuels Issue/Defuel Document*, is used to record the aviation fuels transaction (issue or defuel) at USAF locations using a valid DD1896, *DOD Fuel Identaplate*. The AC or designated representative shall complete the form then log and place a copy inside the AF Form 664, *Aircraft Fuels Documenting Log*.

8.5.3.1. DD1896, Jet Fuel Identaplate, is the aircraft fuel and oil charge card.

8.5.4. Refueling at Locations Other Than USAF Bases:

8.5.4.1. DD Form 1898, *Fuel 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 AC or designated representative shall 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."

8.5.4.2. 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 shall complete this form when appropriate.

8.5.4.3. 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 DD1896, Jet Fuel Identaplate, 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.

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

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

8.5.4.5.1. SF 44 fuel purchases where FBO agrees to invoice DESC for payment.

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

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

8.5.4.5.1.3. Copy 3 of the SF 44 and one copy of the FBO commercial invoice, if applicable, shall be provided to the aircrew. Log and place a copy inside the AF Form 664. Aircrews shall present all fuel purchase receipts to the designated aviation squadron Certifying Official and/or Accountable Official upon return to home station to enable timely validation and financial obligation processing into the Fuels Automated System(FAS). **Note:** Aviation Into-Plane Reimbursement (AIR) Card. The AIRcard 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 SF44; and AF Form 15, United States Air Force Invoice at locations that accept the AIRcard. All Air Force aircraft will be issued an AIRcard.

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

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

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

8.5.4.5.2.1.2. Aircrews shall complete the SF44 and obtain the FBO fuel vendor annotation in block 11 of the form to confirm total cash amount and

also sign and date blocks 20 and 21. Log and place a copy inside the AF Form 664. Aircrew shall return unused cash to their local DoD Finance source upon return to home station. Present the completed AF Form 315 *United States Air Force AVFuels Invoice* (for non-fuel charges only) to the appropriate home station administrative personnel for processing (e.g., Wing Refueling Document Control Officer, Finance Office, etc.).

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

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

8.5.4.5.4. 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.

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

8.5.4.5.6. Present the aircraft identaplate 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 Air Force member who accepted product. If vendor also requires completed SF 44 write statement, "AF FORMS EXECUTED" on vendor's invoice. Log and place a copy inside the AF Form 664.

8.6. AF Form 15, United States Air Force Invoice. Used to purchase ground fuels, oils, or services at non-DoD activities. When completed, log and place inside AF Form 664. Use of AF Form 15 requires a fund cite.

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

8.6.2. If the vendors require a signature on their form and an AF Form 15 has been used, write the statement "AF Form 15 Executed" on the vendor's form.

8.6.3. Return two copies of the AF Form 15 to the operations officer at home station.

8.6.4. Purchases at SITCO Agreement locations require presenting the aircraft identaplate. The invoice must include the date of transaction, grade of the product, quantity issued or defueled, unit of measure, and signature of the Air Force representative. If the vendor also requires completion of an AF Form 15 or 315 in addition to their invoice, annotate on the vendor's invoice "AF Forms Executed." Log and place the documentation inside the AF Form 664.

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

8.6.6. Purchases at foreign military airfields, including replacement-in-kind (RIK) locations, the host country forms are used to record the purchase. Information from aircraft identaplate should be hand scribed on the local form. Log and place a copy inside AF Form 664.

8.7. AFTO Form 781H. Use AFTO Form 781H to record POL actions for specific airframe IAW applicable directives. The AC or designated representative shall complete the form and turn it in to maintenance debrief.

Chapter 9

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

9.1. 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 the global operations of air mobility forces. This chapter describes the CBRNE threat, passive defense measures to mitigate that threat, and guidance for ground and flight operations in a contaminated environment.

9.2. Understanding the CBRNE Threat.

9.2.1. Chemical Weapons. Militarily significant chemical weapons include nerve, blister, choking, and blood agents. A key point for aircrew members to remember is that time is on your side. The ultra-violet (UV) rays of the sun, high temperatures, and high absorption rates of chemicals all decrease their lethality. Most chemical agents will either evaporate or absorb into surfaces. For decontamination, cleaning with hot soap and water and/or a 5 percent bleach solution currently appears to be the best and most practical method of removing chemical agents that may remain as a contact hazard on glass, and unpainted metal. Currently, the only decontaminate authorized for use on aircraft is soap and water. **Note:** Recent tests indicate that as a decontaminated aircraft dries, the absorbed chemical warfare agent (CWA) may resurface from painted surfaces causing contact and vapor hazards.

9.2.2. Biological Weapons. Biological warfare agents (BWA) are normally divided into three areas: bacteria (i.e., Anthrax) that live outside the cell, reproduce, and are normally susceptible to antibiotics; toxins (i.e., Ricin), that are poisons produced by living organisms or plants; and viruses (i.e., Smallpox) that normally require the host of a living cell to survive and reproduce. Viruses and toxins do not respond to antibiotics. It is probable that the medical community would be the first to recognize that an upsurge in "flu-like symptoms" is actually a bio attack. Although BWA are degraded by UV rays, humidity and high/low temperatures, some BWA (i.e., Anthrax spores) may have a long life, lasting decades under the right conditions. Current immunizations and good personal hygiene help prevent infection.

9.2.3. Radiological Weapons. The radiation dispersal device (RDD), or so-called "dirty bomb," is the typical radiological weapon. RDD is any device that disseminates radioactive material without using a nuclear detonation. Key points to remember are that shielding and distance are the best defenses against radiation exposure.

9.2.4. Nuclear Weapons. The threat from a nuclear device is from the initial blast, heat, radiation and residual fallout. In addition, the Electromagnetic Pulse (EMP) from a nuclear detonation can damage electronic equipment. The best protection is a combination of shielding, distance from the blast, and limited time of exposure.

9.2.5. High-Yield Explosives. High-yield explosives are conventional weapons or devices that are capable of a high order of destruction or disruption. Passive defense measures include hardening of facilities and establishing stand-off distances for personnel and key assets.

9.3. 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.

9.3.1. Contamination Avoidance. Contamination avoidance is the most important passive defense measure. Techniques for contamination avoidance include: in-flight diversion, survival launch, and minimizing exposure to contaminated cargo, aerospace ground equipment (AGE), and material handling equipment (MHE).

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

9.3.1.2. Survival Launch. If caught on the ground during attack warning, every reasonable effort will be made to launch to avoid the attack. Upon proper clearances, aircrew may launch to survive if they have 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 Individual Protective Equipment (IPE), and seek personal protective cover on the base. If time does not permit using base facilities, and the attack is a missile attack, remain in the sealed aircraft for a minimum of one-hour after the attack and/or follow host-base guidance.

9.3.1.3. Avoiding Cross Contamination from AGE, MHE, and Cargo. All formerly contaminated equipment and cargo must be marked to facilitate contamination avoidance and the use of protective measures. Additionally, the air shipment of formerly contaminated cargo requires special precautions and must be specifically authorized by the senior transportation commander.

9.3.2. Protection. When exposure to chemical and/or biological agents cannot be avoided, protection provides the force with the ability to survive and operate in a CBRNE environment. Protection is afforded by individual protective equipment, collective protection, and hardening of facilities.

9.3.2.1. Individual Protective Equipment. The current in-flight protective gear for aircrew members is the Aircrew Chemical Defense Ensemble (ACDE). The ACDE includes the newer Aircrew Eye-Respiratory Protection System (AERPS) above the shoulders and the CWU-66/P or CWU-77/P Integrated Aircrew Chemical Coverall (IACC). The Ground Crew Ensemble (GCE) consists of the protective mask, C2 series canister (or filter element for MCU-2A/P protective mask), and over garment, boots, and gloves. The ACDE and GCE provide protection against chemical and biological agents. They do not provide blast or radiation protection from an RDD or nuclear detonation. The ACDE requires care during donning using "buddy dressing" procedures and Aircrew Flight Equipment (AFE) expertise during processing through the Aircrew Contamination Control Area (ACCA). **Note:** AECMs will utilize the MCU-2A series mask.

9.3.2.1.1. ACDE/GCE Issue and Medical Pretreatment. Aircrews will be issued sized ACDE and GCE at home station. Aircrews will ensure their ACDE and GCE are available at all times while in a CBRNE threat area. During deployments, the unit commander or applicable C2 agency will issue at least one ACDE and one GCDE to each aircrew member as directed. AFE technicians will prepare and issue mobility ACDE "D" bags for aircrew members. Mobility processing personnel will issue GCDE "C" bags. Aircrew members will confirm the mobility bag contents and correct sizes. The local ACC C2 (or applicable C2 agency) will direct aircrews to undergo medical pretreatment for chemical exposure.

9.3.2.1.2. ACDE Wear During Ground Operations. Because aircraft contamination is unlikely to occur during flight, ground operations represent the highest threat to aircrew safety. Protection from enemy attacks and exposure to liquid chemical agents is paramount. Aircrew should limit activities to essential duties only, and separate ground duties from air duties.

9.3.2.1.3. Equipment Limitations.

9.3.2.1.3.1. Body Temperature and Fluids Control. Heat stress and dehydration are serious hazards while wearing the ACDE. Aircrew members need to control perspiration rates and limit activities to essential duties only. The need to consciously slow the work pace while performing physical labor, share workloads and monitor each other's physiological condition is essential.

9.3.2.1.3.2. Breathing Restrictions. One of the inherent design characteristics of the filter assembly is moderate breathing resistance. Normally, this is not noticeable except during high flow rates. For example during physical exertion, users should be aware of the possibility of hyperventilation. During flying operations using the EMERGENCY position on the oxygen regulator can reduce resistance. The valsalva maneuver cannot be performed while wearing the MBU-13/P mask. Alternate means such as yawning or chewing can be used. If these are unsuccessful, attempt to clear ears by holding the oxygen regulator in the TEST MASK position and forcefully exhale or yell against the regulator pressure. The new AERP mask and hood assembly, which incorporates a blower system, presents less-than-moderate breathing resistance. However, in the event of a blower system failure, aircrews will experience an increase in breathing resistance.

9.3.2.1.3.3. Limited Dexterity. Wearing three pairs of gloves restrict dexterity; therefore, visual confirmation of switch selection and positioning become very important.

9.3.2.1.3.4. Restricted Communications. Normal communications are limited while wearing the chemical defense mask. Using the mini-amplifier and speaker with the ACDE can enhance communications. Some of the newer ground masks may be issued with a built-in amplifier. Otherwise, visual signals, the aircraft's public address system, and the aircraft's interphone system can be used to compensate.

9.3.2.1.3.5. Peripheral Visions Limits. The aircrew chemical defense mask may

reduce peripheral vision as much as 15 percent.

9.3.2.1.3.6. Emergency Procedures. Wearing any of the chemical defense masks and filter assemblies impose several limitations:

9.3.2.1.3.6.1. The aircrew member will not be able to detect fumes from fuel, hydraulic fluid and oil.

9.3.2.1.3.6.2. Filter assembly will not protect the user against ammonia fumes and carbon monoxide gas.

9.3.2.1.3.6.3. Filter assembly will not be used without an oxygen source in an oxygen deficient atmosphere.

9.3.2.2. Collective Protection. Collective protection provides a temperature-controlled, contamination-free environment to allow personnel relief from continuous wear of IPE such as the ACDE. The basic concept for most facility collective protective solutions is to employ overpressure, filtration, and controlled entry/exit. Crewmembers should avail themselves of facilities, if provided, on the airfield.

9.3.2.3. Hardening. Permanent and expedient hardening measures are used to strengthen buildings and utility systems or provide barriers to resist blast effects. To reduce the potential of vapor exposure in facilities without collective protection, seal windows and doors, turn off HVAC systems and use rooms above the first floor whenever possible.

9.3.2.4. Limitations. Aircrews need to be mentally prepared to face the dangers of chemical weapons. Plans should be developed to limit aircrew exposure during enemy attacks and liquid agent contamination while engaged in non-flying activities. Flight planning must be thorough and ACs should emphasized chemical defensive operations during mission planning, hazards and countermeasures, plans for pre-mission operations in the event of a ground attack, and plans for the return leg in the event of a contaminated aircraft. Alternate scenario plans should also be considered in the event conditions change.

9.3.3. Contamination Control. In the post-attack environment, contamination control measures limit the spread of chemical, biological, and radiological contamination through disease prevention measures, decontamination, and use of Exchange Zone (EZ) operations. Effective contamination control helps sustain air mobility operations by minimizing performance degradation, casualties, or loss of material.

9.3.3.1. Disease Prevention. Up-to-date immunizations, standard personal hygiene practices, and the use of chemoprophylaxis are effective biological warfare defensive measures.

9.3.3.2. Decontamination.

9.3.3.2.1. In-flight Decontamination. 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 (i.e., wheel wells, flap wells, rivet and screw heads, joints, etc.). 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. Be advised that exterior contamination may seep into the aircraft interior creating a vapor hazard for aircrews. Use of ACDE is recommended. Follow smoke and fume elimination procedures to help purge interior contamination.

9.3.3.2.2. Limits of Decontamination. Complete decontamination of aircraft and equipment may be difficult, if not impossible, to achieve. Formerly contaminated assets will be restricted to DOD-controlled airfields and not released from US government control.

9.3.3.3. Exchange Zone (EZ) Operations. The AMC Concept for Air Mobility Operations in a Chemical and Biological Environment (CB CONOPS) describes a method for continuing the vital flow of personnel into a contaminated airfield while limiting the number of air mobility aircraft and personnel exposed to the contaminated environment. The purpose of the EZ is to minimize the spread of contamination within the air mobility fleet, preserving as many aircraft as possible for unrestricted international flight. The EZ is an area (located at uncontaminated airfield) set aside to facilitate the exchange of uncontaminated (clean) cargo/passengers to a contaminated (dirty) airframe, or vice versa, without cross-contamination. Additional information on the EZ is available through HQ AMC/A35.

9.4. Flight Operations.

9.4.1. Mission Planning. Aircrews must be mentally prepared to face the dangers of CBRNE weapons. Flight/mission planning must be thorough. Aircraft commanders should emphasize ACDE wear, crew coordination, CBRNE hazards and countermeasures, in-flight diversion, 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.

9.4.2. Establishing the Threat Level. Aircrews should monitor command and control 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 TACC or theater C2 agency (normally through the controlling OPORD) will direct aircrew pre-exposure activities such as medical pre-treatment for chemical/biological exposure or issue dosimetry for potential radiological hazards.

9.4.3. Fuel Requirements. Extra fuel may be needed to compensate for altitude restrictions as the result of CB agent exposure. During purge periods, the aircraft will be unpressurized. Although the aircrew can use the aircraft oxygen systems, passengers wearing GCE cannot, thus restricting the aircraft cruise altitude and increasing fuel requirements accordingly.

9.4.4. Oxygen Requirements. Operating a contaminated aircraft will increase oxygen requirements. Aircrew wear of ACDE will require use of the aircraft oxygen system to counter actual/suspected contamination. Using the 100 percent oxygen setting offers the greatest protection in a contaminated environment. Appropriate oxygen reservoir levels must be planned to meet higher consumption rates. Use the aircraft Dash 1 charts to calculate the required reservoir levels.

9.4.5. Donning Equipment. Aircrew will don ACDE based on the alarm condition (See Airman’s Manual (AFPAM 10-100). Use the "buddy dressing" procedures, and refer to

AMCVA 11-303 *AERP Donning Checklist Use Buddy System*, AMCVA 11-304, *ACDE Donning Checklist Use Buddy System*, and the C-130 T.O., 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 will enable personnel to locate the medication should an individual be overcome by CWA poisoning. M-9 paper on the flight suit will facilitate detection of liquid chemical agents and ACCA processing. M-9 paper should be placed on the flight suit prior to entering the CBRNE threat area or when an alarm "yellow" or higher has been declared. When inbound to a CBRNE threat area, prior to descent, the aircraft commander will ensure crew and passengers don appropriate protective equipment IAW arrival destination's MOPP level and brief aircrew operations in the CBRNE threat area. As a minimum, this briefing will include: flight deck isolation, oxygen requirements, air conditioning system requirements, IPE requirements, ground operations and MOPP levels. Aircrew members must determine if the wear of the integrated survival vest/body armor and LPUs will 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.

9.4.6. Communicating Down-line Support. Pass aircraft and cargo contamination information through command and control channels when inbound. This information will be 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.

9.5. Ground Operations.

9.5.1. 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. Then, they will report to the ACCA for processing and ACDE donning with assistance from ALS personnel. If possible, aircrew transport should be provided in a covered vehicle. Aircrews should avoid pre-flighting the aircraft prior to departure to prevent contamination spread to them and/or the aircraft. 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.

9.5.2. On-load and Off-load Considerations. Extreme care must be exercised to prevent contamination spread to the aircraft interior during ground operations, particularly to the flight deck area. Reduce the number of personnel entering the aircraft. Contaminated engine covers, safety pins and chocks will not be placed 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.

9.5.3. Communications. Conducting on/offloading 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.

9.5.4. Airlift of Retrograde Cargo. Only CRITICAL retrograde cargo will be moved from a contaminated to an uncontaminated airbase. Critical requirements are pre-designated in theater war plans. On-load cargo will be protected prior to and while being transported to the aircraft. If contaminated, protective covers will be removed or replaced just prior to placing the cargo on the aircraft. It is the user's responsibility to decontaminate cargo for air shipment. The airlift of contaminated or formerly contaminated cargo requires the approval of the senior transportation commander.

9.5.5. Passenger/Patients. A path should be decontaminated between the aircraft and the ground transportation vehicle to reduce interior contamination when loading/unloading passengers/patients. Normally, externally contaminated patients and those infected with contagious biological agents will not be transported onboard AMC or AMC-procured aircraft. The AMC/CC is the waiver authority to this policy. **Note:** An altitude below 10,000 feet is recommended due to AECM use of the ground chemical mask.

9.5.6. Physiological Factors. Aircraft commanders must be very sensitive to the problems resulting from physical exertion while wearing ACDE. The aircraft commander should consider factors such as ground time, temperature and remaining mission requirements when determining on/offload capabilities. Individuals involved should be closely monitored for adverse physiological effects.

9.5.7. Work Degradation Factors. Work timetables need to be adjusted to minimize thermal stress caused by wearing the ACDE. Aircrews must weigh all factors when performing in-flight and ground duties. The following are degradation factors for wearing full GCE, and may also be used to represent the Task Time Multipliers for the ACDE. A more extensive discussion of this subject is found in AFMAN 10-2602 *Nuclear, Biological, Chemical, and Convential (NBCC) Defense Operations and Standards.*

Table 9.1. Work Degradation Matrix.

WORK RATE	**TEMPERATURE**		
	20-49F	**50-84F**	**85-100F**
Light	1.2	1.4	1.5
Moderate	1.3	1.4	3.0
Heavy	1.7	2.1	5.0

9.5.8. Outbound with Actual/Suspected Chemical Contamination. Once airborne with actual/suspected vapor contamination, the aircraft must be purged for 2 hours using Smoke and Fume Elimination procedures. To ensure no liquid contamination exists, a close inspection of aircrew, passenger ensembles, and cargo will be conducted using M-8 and M-9 detection paper. Detection paper only detects certain liquid agents and will 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/ GCE until processed through their respective contamination control area (CCA). Upon arrival, the contaminated aircraft will be parked in an isolated area and cordoned to protect unsuspecting ground personnel.

9.5.9. 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 will be entered and an annotation will be made in historical records for the lifecycle of the equipment. Before clearance of a Red X for contamination, Bioenvironmental Engineer or higher DOD authority will be consulted.

9.5.10. 10-Foot Rule. The 10-foot rule was developed in order 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 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.

9.5.10.1. Initial Phase. During the initial phase, personnel will remain in MOPP 4 whenever they stay within 10 feet 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.

9.5.10.2. Follow-on Phase. In the follow-on phase, personnel will use gloves (i.e. leather, rubber, cloth, etc.) 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 will ensure that unnecessary bare skin contact with agent residue is avoided.

9.5.10.3. **Table 9. 2** 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, i.e., 24 hours for the initial phase and all periods of time greater than 24 hours for the follow-on phase.

Table 9.2. "10-Foot Rule" Time Standards".

"10 Foot Rule" Time Standards*		
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
* Rule is based on expected contamination on an airbase following a chemical attack. Adjust times if agent concentration is higher than expected.		

9.6. Factors Influencing the Chemical Warfare (CW) Agent Hazard:

9.6.1. General. A crew may be exposed to chemicals through inhalation, absorption through the skin, eyes or ingestion. Contaminated drink and food are considered harmful, but immediate concerns must be contamination avoidance to the maximum extent, limit exposure of the skin and eyes, as well as avoid breathing the contaminates. Factors affecting persistence are weather, agent physical characteristics, method of dissemination, droplet size and terrain.

9.6.2. Weather. Factors include temperature, wind, humidity, precipitation and atmospheric stability. For example, high winds and heavy rains reduce the contamination hazard. Conversely, lack of wind, overcast skies and moderate temperatures favor persistence.

9.6.3. Agent Dissemination. Disseminated as vapors, aerosols or liquids. Solids seem unlikely, but agents may become solids at lower temperature.

9.6.4. Agent Droplet Size. Persistence factor is determined by droplet size. Agents may be mixed with other chemicals (thickeners), and form large drops making removal more difficult.

9.6.5. Surface and Terrain. CW agent clouds tend to follow the terrain, flowing over countryside and down valleys. Chemicals persist in hollows, depressions, and other low areas. Rough terrain retards cloud movement. Flat countryside allows a uniform, unbroken cloud movement. Vegetated areas are more contaminated than barren terrain. Liquid agents soak into porous surfaces, making evaporation much slower than for non-porous surfaces.

9.7. Categories of CW Agents. CW agents having military significance may be categorized as nerve, blister, choking, and blood. Because they are produced biologically, toxins are technically not chemical agents. However, they are considered a potential CW threat.

9.7.1. Nerve Agents:

9.7.1.1. Military Significance. Nerve agents are the most lethal and fastest acting of the standard CW agents. These agents affect the nervous system and are highly toxic whether inhaled, ingested, or absorbed through the skin. Persistency ranges from hours to many days.

9.7.1.2. Symptoms of Exposure. Nerve agent exposure is difficult to distinguish. Symptoms include runny nose, tightness of the chest, difficulty breathing, excessive sweating, drooling, nausea, vomiting, diarrhea and convulsions. Nerve agents can also cause muscular twitching, dimness of vision and pinpointing of the pupils.

9.7.1.3. Onset of Symptoms. Inhalation produces symptoms within 1-2 minutes. The victim may be incapacitated within 5-10 minutes. Death may occur after several hours or days. Ingestion may cause the same symptoms, however, incapacitation may take longer. The body retains nerve agents for an extended period; thus intermittent, cumulative exposure to low amounts can lead to the same ultimate effect as a single exposure to a higher amount.

9.7.1.4. Protection. The full protective ACDE is effective against nerve agents. When properly worn, the various chemical protective masks prevent inhalation of nerve agents and all layers of the outer garment must be protected against saturation of liquids, chemical agents, water or petroleum.

9.7.1.5. Antidotes and Prophylaxis. Antidotes are effective in combating effects of nerve agent exposure. These antidotes may be effective if given to a victim having advanced symptoms, and as long as the victim is made to continue breathing. People who use the antidotes must be seen by medical personnel and may not be combat-ready for several days.

9.7.2. Blister Agents:

9.7.2.1. Military Significance. Blister agents are dispensed as vapors or liquids and may be encountered as solids. These agents primarily affect the eyes, respiratory tract, and the skin.

9.7.2.2. Symptoms of Exposure. Placed on the skin, a drop the size of a pin head can produce a blister one inch in diameter. This action is accentuated by moisture; hence, a more severe danger is present during periods of sweating. The groin and armpits, which tend to be sweaty, are especially susceptible to blister agents. Blister agents that come in contact with the eyes lead to redness, watering of the eyes, blurring of vision, sensitivity to light, and frequently blindness. Inhalation causes serious damage due to burns and blisters to the mouth, nose, throat and lungs. Incapacitation may last for days or weeks; aircrews will probably be unable to fly for indefinite periods. After hospitalization, complications from blister agent exposure can arise and may be fatal.

9.7.2.3. Onset of Symptoms. Blister agents are quickly absorbed through the skin. However, it usually takes several minutes (up to 5 minutes and as long as several hours) for the symptoms to appear. They act most rapidly in liquid form, but are also effective in vapor form.

9.7.2.4. Protection. The full ACDE is effective against blister agents. Exposed areas must be cleaned thoroughly immediately after exposure. Blister agents are easily transferred from contaminated surfaces; thus, great care must be taken to avoid contact with any contamination.

9.7.3. Choking Agents:

9.7.3.1. Military Significance. These agents are disseminated as vapors and when inhaled affect the respiratory system by damaging the lungs. Persistence is very brief, and they dissipate rapidly (within minutes) under most field conditions.

9.7.3.2. Symptoms of Exposure. Choking agents cause coughing, choking, tightness of the chest, nausea, headache and watering of the eyes. Choking agents can be lethal, with death normally from the lungs filling with fluids, making breathing difficult or impossible.

9.7.3.3. Onset of Symptoms. Exposure to choking agents has an immediate effect. Victims experience slightly delayed effects, such as painful cough, breathing discomfort, and fatigue.

9.7.3.4. Protection. Both the aircrew and ground crew protective mask is extremely essential to protect against exposure; the entire protective ACDE should be used as directed.

9.7.4. Blood Agents:

9.7.4.1. Military Significance. Blood agents are usually dispensed as vapor or aerosol and inhaled. Under most field conditions they may briefly persist on target (up to 10 minutes).

9.7.4.2. Symptoms of Exposure. Exposure to a single breath of blood agent causes giddiness, headaches, confusion and nausea. As dose increases, breathing becomes more difficult. The victim will have deep, uncontrollable breathing and cramps, then loss of consciousness. Death is certain if the victim receives no medical aid.

9.7.4.3. Protection. Blood agents are breathing hazards. The full ACDE is most effective because the mask provides the breathing protection needed.

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

Chapter 10

NAVIGATOR PROCEDURES

10.1. General.

10.1.1. This chapter contains EC-130H navigation procedures and forms. Publish local procedures, in the unit supplement to this AFI.

10.1.2. General instructions for completion of AF Form 4116, are provided in this chapter. MAJCOM-approved computer flight plans may be used as a substitute for AF Form 4116.

10.1.2.1. The AF Form 4116 was developed to provide a tool for all possible missions of the C-130. Most missions will not require all sections of the Form. In the interest of conservation, navigators are encouraged to print and use only those sections of the AF Form 4116 required for their respective mission.

10.2. Mission Planning Procedures.

10.2.1. The AC and navigator will jointly verify routing, altitude and fuel load prior to departure. 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 Jeppesen approved approach plate. FalconView generated charts with updated ECHUM overlays fulfill this requirement. A copy of the navigator's flight plan will be provided to the copilot to verify routing and aid in position reporting.

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

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

10.2.4. A fuel plan is required for all flights.

10.2.5. The navigator will sign in the indicated block on page 2 of the AF Form 4116 to certify accuracy of all entries. Any entries not required for a particular mission on the AF Form 4116 may be left blank.

10.3. Flight Planning.

10.3.1. Most entries on the AF Form 4116 are self-explanatory or explained below.

10.3.1.1. 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.

10.3.2. 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.

10.3.3. Aircrews may use PFPS or any other MAJCOM approved flight planning program.

10.3.4. Fuel Planning. Accomplish fuel planning IAW T.O. 1C-130H-1-1 and Chapter 14 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 computer flight plan printed format.

10.4. Equal Time Point Computations.

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

10.4.2. Recompute ETP in-flight when the actual time of arrival at a reporting point is 15 minutes or more ahead or behind the planned time if the change was caused by erroneous wind information.

10.4.3. ETP Computations (see **Figure 10.1**). 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 5-hours or more.

10.5. Flight Charts.

10.5.1. Show the following items on the chart:

10.5.1.1. Navigator's name and coordinated universal date. Chart number and edition will be annotated on a stripped chart.

10.5.1.2. Flight plan course line and waypoints (if not pre-labeled) will be annotated with waypoint number, identifier, radial and DME, or latitude and longitude.

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

10.5.1.4. Portions of Air Defense Identification Zones (ADIZ)/FIR boundaries (if not depicted accurately) pertinent to the route will be annotated.

10.5.1.5. Annotate the approximate location of the ETP.

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

10.5.3. In the interest of conservation, flight charts for high level missions may be reused whenever such reuse would not affect plotting accuracy of fixes or position determination.

10.5.4. FalconView produced Lambert-Conformal charts may be used.

10.6. In-flight Procedures.

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

10.6.2. On approach or departure, the navigator will monitor the aircraft position using an appropriately scaled chart (ONC, TPC, JOG, etc). In IMC or at night the navigator will use all available navigational aids (including aircraft radar) to keep the aircraft clear of all obstructions.

10.6.3. The navigator will flight follow on all missions using a suitable plotting chart (JNC, JNCA, or GNC).

10.6.4. Compute a TAS check on all Category I routes of 3 hours or longer. Use the procedures in paragraph **10.11**

10.6.5. Maintain a flight log on Category I routes or route segments of 3 hours or longer. Time between fix plots will not exceed 1 hour. **Note:** Malfunctions or loss of navigational capability, which degrade course centerline accuracy, will be reported immediately to ATC.

10.6.6. On Category I routes, when the time between the LSAF and FSAF is 5 hours or more, the following procedures are required: wind factors, equal time point (ETP) calculations, and in-flight fuel management.

10.6.7. Heading deviation checks are not required on Category II routes. On Category I routes or route segments of 3 hours or longer, compute heading deviation for each compass system within one hour of reaching initial cruise altitude. Record deviation for all compass systems (see paragraph **10.10**).

10.7. Laptop/Integrated Computers. Computers running Falcon View moving map software and connected to a GPS provide invaluable situational awareness. Laptop computers and handheld GPS must be approved for unrestricted use in flight IAW AFI 11-202 V3.

10.7.1. Navigators should use a USAF approved computer on all combat and combat support missions.

10.7.1.1. When computers are used, GPS units should be connected and the Falcon View Moving Map Display should be operating.

10.7.2. Computers with GPS Falcon View moving map displays will not be used as the primary source of navigation.

10.8. Flight Records. Flight progress will be recorded for Category I routes of 3-hours or longer. Record enough detail to reconstruct the mission. Units may publish local standards for log procedures in the unit supplement. See **Figure 10.2** for an example of a completed AF Form 4116.

10.8.1. This form will consist of planning and in-flight progress data. It will be completed in sufficient detail to fully evaluate or reconstruct the flight. Page 1 of the form should be completed when a CFP is not available on Category I routes. Page 4, the in-flight section, will be used to record present positions and spot readings.

10.8.1.1. As soon as practical after level-off or coast-out, whichever occurs latest, navigators will verify aircraft position by either navigation aid fix or radar fix.

10.8.1.1.1. Record the fix in AF Form 4116 Section VII.

10.8.1.1.2. At the time of the fix record the primary navigation solution in AF Form 4116 Section V.

10.8.1.1.3. At the time of the fix record, as a minimum, GMT, present position, true heading, spot wind, TAS, altitude and ETA to the next waypoint in AF Form 4116 Section VIII.

10.8.1.2. After coast out, record current position every 30 minutes on AF Form 4116, Page 3 in Section V, Fix/Computer Position.

10.8.1.2.1. Record the present position for the navigation solution.

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

10.8.1.3.1. Record the GMT, current position of the primary navigation system, true heading, spot w/v, true air speed, altitude, and ETA to the next point.

10.8.1.4. Between recorded positions, record spot readings at regular intervals to allow for calculating a DR in the event of a navigation system failure.

10.8.1.4.1. Spot readings will include, as a minimum, time, heading, drift angle, ground speed, wind vector, and true airspeed.

10.8.1.5. As soon as practical prior to coast-in, navigators will verify aircraft position by either navigation aid fix or radar fix.

10.8.1.5.1. Record the fix in AF Form 4116 Section VII.

10.8.1.5.2. At the time of the fix record the primary navigation solution for all other navigation solutions in AF Form 4116 Section V.

10.8.1.5.3. At the time of the fix record, as a minimum, GMT, present position, true heading, spot wind, TAS, altitude and ETA to the next waypoint in AF Form 4116 Section VIII.

10.8.2. In the event of a navigation system failure (INU or GPS) full log procedures will be implemented. Beginning at the last plotted position, compute a DR up to the present position. Plot a fix at a minimum of once per hour. A DR associated with the fix will be plotted 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 **10.8.1**

10.8.2.1. At the time of the fix record the GMT, current position, true heading, spot w/v, true air speed, altitude and ETA to the next point.

10.8.2.2. As soon as practical prior to coast-in, navigators will verify aircraft position by either navigation aid fix or radar fix.

10.9. Deviation Check Procedures.

10.9.1. Accomplish within one hour of initial cruise altitude. Heading checks should be computed in Section IV of AF Form 4116, page 3. Record and compare the CANS true heading with all compass systems. The AF Form 4116 deviation checks format solves for "deviation" (DEV) for all heading reference systems. **Note:** Compass deviation is not necessarily constant over time or after significant course changes. Navigators should reconfirm deviation on CAT I legs every 3 hours or after planned course changes of greater than 30 degrees. ***EXCEPTION:*** A deviation check is not required on flights transiting Category I routes of less than three hours if:

10.9.1.1. The aircraft is equipped with two or more operable heading systems (the standby compass is not considered a system for this requirement).

10.9.1.2. The difference between systems does not exceed 2-degrees.

10.10. True Airspeed (TAS) Check Procedures.

10.10.1. Accomplish within one hour of initial cruise altitude. Record time of the check and altitude from the pressure altimeter. If using free air temperature gauge, record indicated outside air temperature (IOAT). Use the heat of compression table on AF Form 4116 to convert IOAT to true outside air temperature (TOAT). If using CANS temperature, record TOAT.

10.10.2. Normally, navigators on EC-130H models can use +1 knots for indicated airspeed (IAS) to calibrated airspeed (CAS) correction and -2 knots for CAS to equivalent airspeed (EAS) correction for TAS below 270.

10.10.3. ITAS - Indicated TAS. Record the TAS reading from the TAS meter and the CANS. Record the difference between computed TAS and this reading in the CORR block.

10.11. In-flight Fuel Management Procedures.

10.11.1. Fuel computations are required for Category I route segments of 3 hours or longer, all oceanic crossings, and upon reaching initial cruise altitude. Record the fuel readings listed below within one hour of level off time and at regular time intervals, not to exceed 1 hour and 30 minutes. Use the worksheet on page 3 of the AF Form 4116 to complete in-flight fuel management computations. For flights not requiring fuel computations, annotate fuel status on the flight plan or CFP used for flight following.

10.11.1.1. ETA DEST. Best known arrival time at destination.

10.11.1.2. TIME. Time of the fuel reading.

10.11.1.3. TERMINAL FUEL FLOW.

10.11.1.4. CURRENT FUEL FLOW.

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

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

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

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

10.11.1.9. FUEL ETE. Calculate using formula in **11.12.2.3**

10.11.1.10. ETE DEST. Subtract TIME from ETA DEST.

10.11.1.11. EXT TIME. Subtract ETE DEST from FUEL ETE. Report this value to the pilot. If this is a negative value, check the computation and values for errors. If they are correct, evaluate your destination options.

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

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

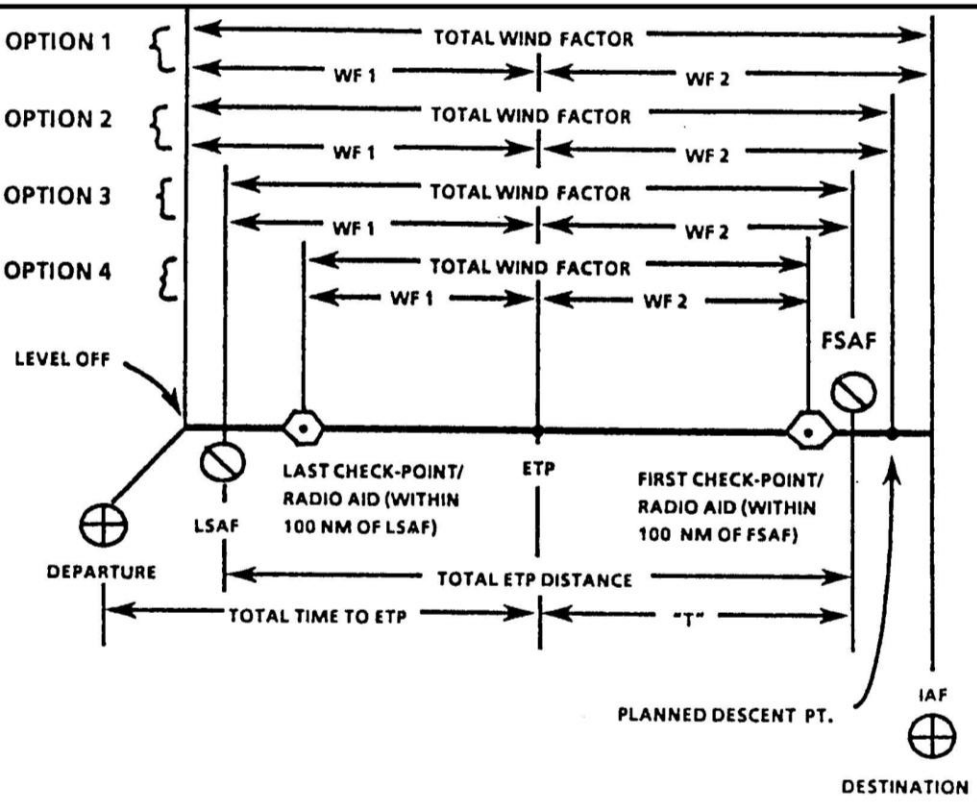
10.11.2.2. Present fuel - Overhead fuel = Usable Fuel

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

10.11.2.4. Fuel ETE - ETE to destination = Extra Time

10.11.3. The navigator may terminate these procedures one hour from destination, when the Category I route segment is completed, or at the discretion of the AC.

Figure 10.1. 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 10.2. Example AF Form 4116 (1 of 4).

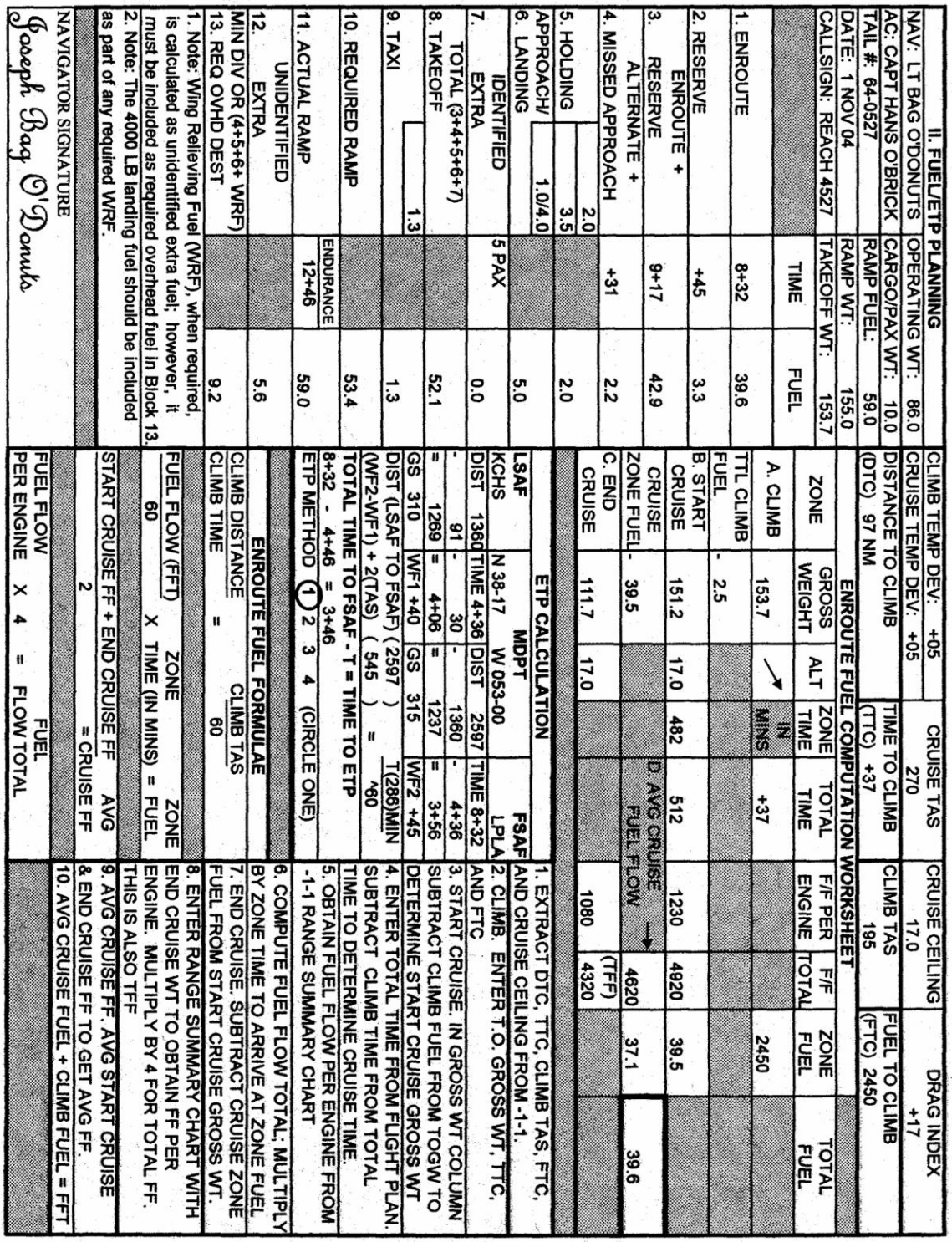
C-130 NAVIGATOR FLIGHT PLAN AND LOG

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

Figure 10.3. AF Form 4116 Example (2 of 4).



II. FUEL/ETP PLANNING

NAV: LT BAG O'DONUTS | OPERATING WT: 86.0
AC: CAPT HANS O'BRICK | CARGO/PAX WT: 10.0
TAIL #: 64-0527 | RAMP FUEL: 59.0
DATE: 1 NOV 04 | RAMP WT: 155.0
CALLSIGN: REACH 4527 | TAKEOFF WT: 153.7

	TIME	FUEL
1. ENROUTE	8+32	39.6
2. RESERVE ENROUTE +	+45	3.3
3. RESERVE ALTERNATE +	9+17	42.9
4. MISSED APPROACH	+31	2.2
5. HOLDING	2.0	3.5
APPROACH/ 6. LANDING	1.0/4.0	
IDENTIFIED	5 PAX	5.0
7. EXTRA		0.0
TOTAL (3+4+5+6+7)		52.1
8. TAKEOFF	1.3	1.3
9. TAXI		
10. REQUIRED RAMP	ENDURANCE	53.4
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

CLIMB TEMP DEV: +05
CRUISE TEMP DEV: +05
DISTANCE TO CLIMB (DTC) 97 NM

CRUISE TAS 270
TIME TO CLIMB (TTC) +37

CRUISE CEILING 17.0
CLIMB TAS 195
FUEL TO CLIMB (FTC) 2450

DRAG INDEX +17

ENROUTE FUEL COMPUTATION WORKSHEET

ZONE	GROSS WEIGHT	ALT	ZONE TIME IN MINS	TOTAL TIME	F/F PER ENGINE	F/F TOTAL	ZONE FUEL	TOTAL FUEL
A. CLIMB	153.7	→		+37			2450	
TTL CLIMB FUEL	- 2.5							
B. START CRUISE	151.2	17.0	482	512	1230	4920	39.5	
CRUISE ZONE FUEL	- 39.5			D. AVG CRUISE FUEL FLOW →		4620	37.1	39.6
C. END CRUISE	111.7	17.0			1080	(TFF) 4320		

ETP CALCULATION

LSAF	MDPT	FSAF
KCHS	N 38-17 W 053-00	LPLA
DIST 1360	TIME 4+36 DIST 2597	TIME 8+32
- 91	- 30 - 1380	- 4+36
= 1269	= 4+06 = 1237	= 3+56
GS 310	WF1 +40 GS 315	WF2 +45

DIST (LSAF TO FSAF) (2597) = T(286)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

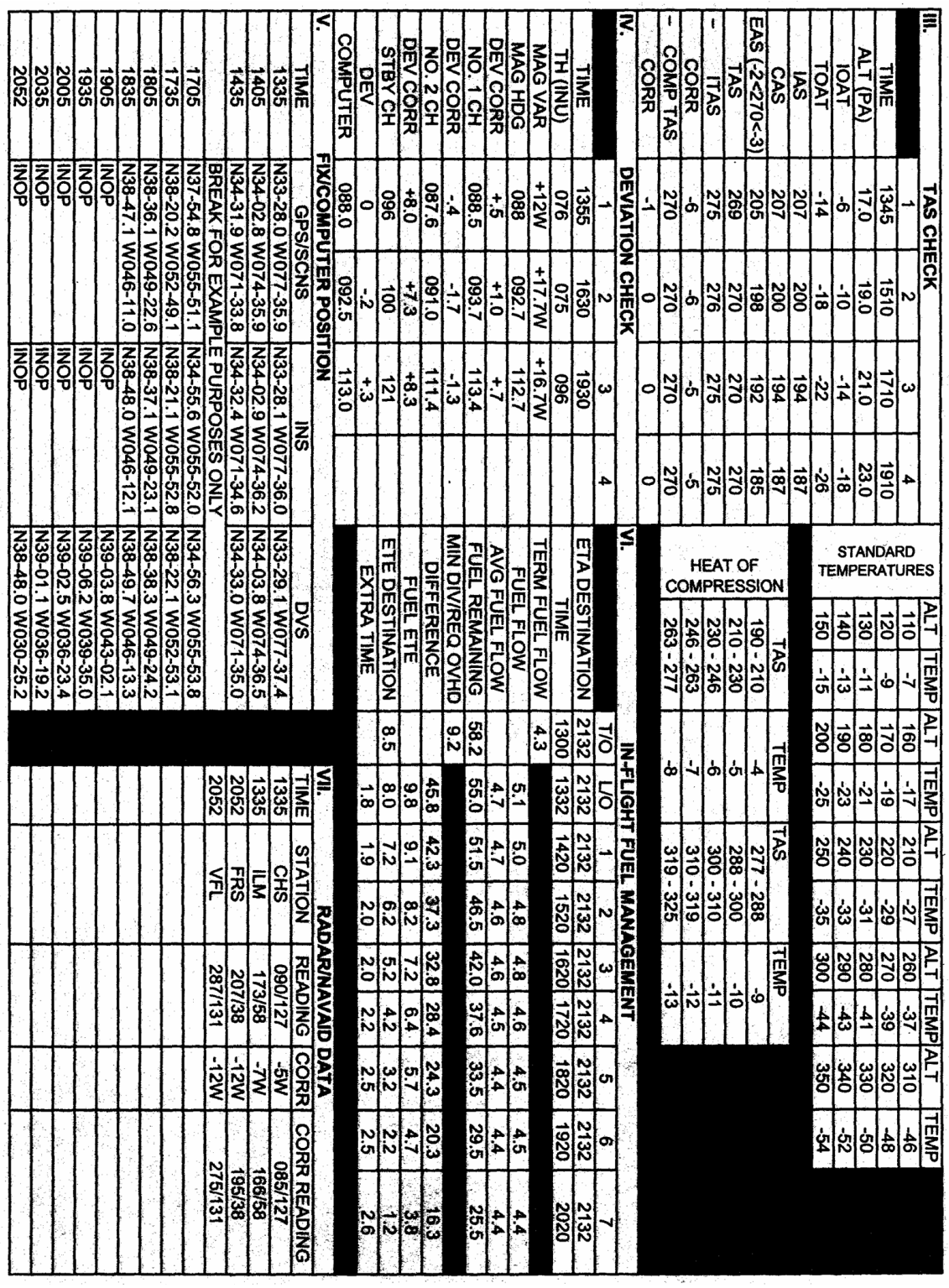
CLIMB DISTANCE = CLIMB TAS / 60
CLIMB TIME = CLIMB DISTANCE

FUEL FLOW (FFT) = ZONE FUEL / 60 X ZONE TIME (IN MINS) = FUEL

START CRUISE FF + END CRUISE FF = AVG / 2 = CRUISE FF

FUEL FLOW PER ENGINE X 4 = FUEL FLOW TOTAL

Figure 10.4. 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	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	

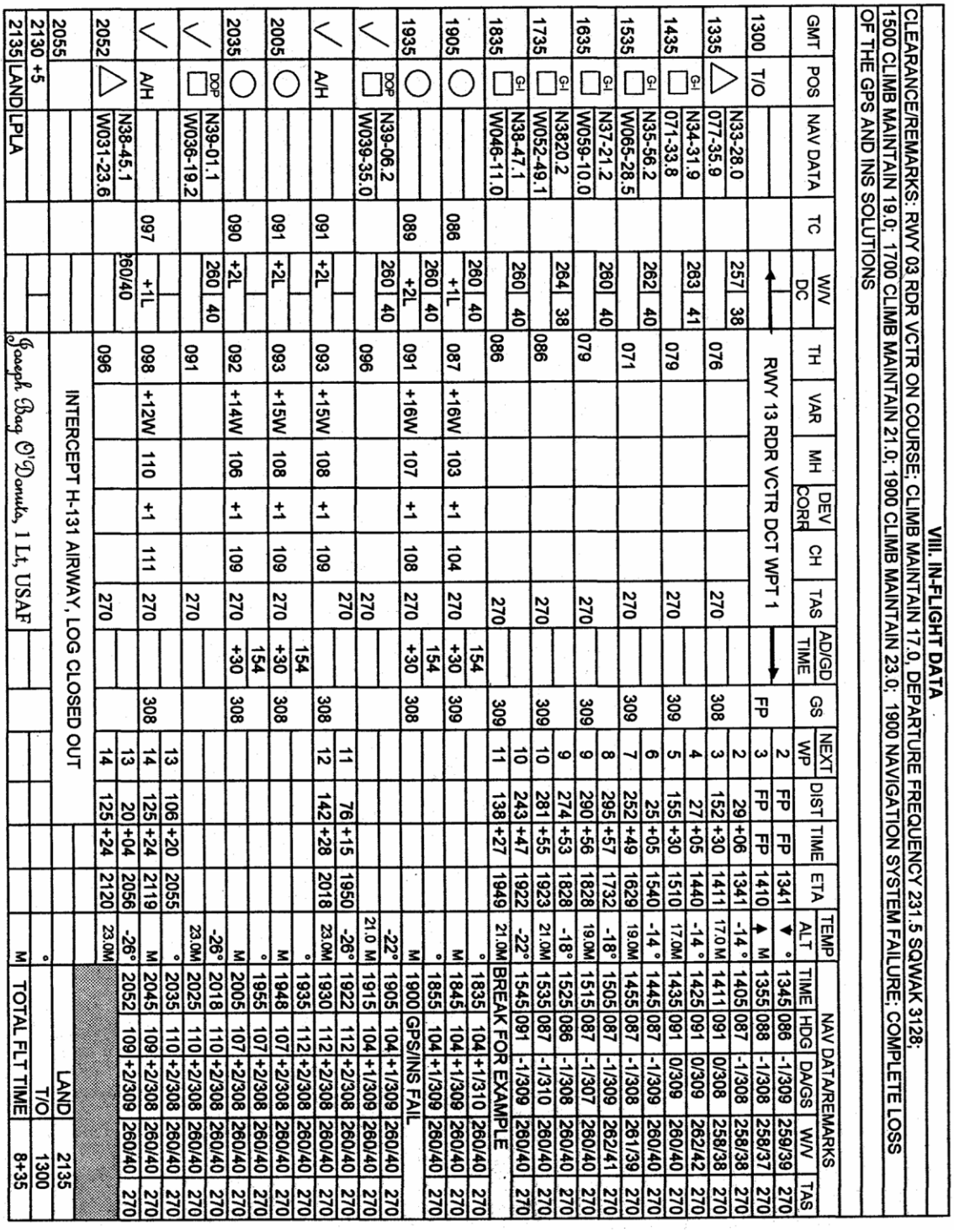
V.

FIX/COMPUTER POSITION			
	GPS/SCNS	INS	DVS
TIME			
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 10.5. 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
		N33-28.0		257 38									3	FP	FP	1410	▲ M	1355	088	-1/308	258/37	270
1335	△	077-35.9			076				270			308	2	29	+06	1341	-14 °	1405	087	-1/308	258/38	270
	G-I	N34-31.9		263 41									3	152	+30	1411	17.0 M	1411	091	0/308	258/38	270
1435	□	071-33.8			079				270			309	4	27	+05	1440	-14 °	1425	091	0/309	262/42	270
	G-I	N35-56.2		262 40									5	155	+30	1510	17.0M	1435	091	0/309	260/40	270
1535	□	W065-28.5			071				270			309	6	25	+05	1540	-14 °	1445	087	-1/309	260/40	270
	G-I	N37-21.2		260 40									7	252	+49	1629	19.0M	1455	087	-1/308	261/39	270
1635	□	W059-10.0			079				270			309	8	295	+57	1732	-18°	1505	087	-1/309	262/41	270
	G-I	N3820.2		264 38									9	290	+56	1828	19.0M	1515	087	-1/307	260/40	270
1735	□	W052-49.1			086				270			309	9	274	+53	1828	-18°	1525	086	-1/308	260/40	270
	G-I	N38-47.1		260 40									10	281	+55	1923	21.0M	1535	087	-1/310	260/40	270
1835	□	W046-11.0			086				270			309	10	243	+47	1922	-22°	1545	091	-1/309	260/40	270
				260 40						154			11	138	+27	1949	21.0M	BREAK FOR EXAMPLE				
1905	○		086	+1L	087	+16W	103	+1	104	270	+30	309					°	1835	104	+1/310	260/40	270
				260 40						154							M	1845	104	+1/309	260/40	270
1935	○		089	+2L	091	+16W	107	+1	108	270	+30	308					°	1855	104	+1/309	260/40	270
	DOP	N39-06.2		260 40						270							M	1900	GPS/INS FAIL			
√	□	W039-35.0			096				270								-22°	1905	104	+1/309	260/40	270
													11	76	+15	1950	21.0 M	1915	104	+1/309	260/40	270
√	A/H		091	+2L	093	+15W	108	+1	109	308	154	308	12	142	+28	2018	-26°	1922	112	+2/308	260/40	270
																	23.0M	1930	112	+2/308	260/40	270
2005	○		091	+2L	093	+15W	108	+1	109	270	+30	308					°	1935	112	+2/308	260/40	270
											154						M	1948	107	+2/308	260/40	270
2035	○		090	+2L	092	+14W	106	+1	109	270	+30	308					°	1955	107	+2/308	260/40	270
											154						M	2005	107	+2/308	260/40	270
√	DOP □	N39-01.1		260 40						270							-26°	2018	110	+2/308	260/40	270
		W036-19.2			091												23.0M	2025	110	+2/308	260/40	270
√	A/H												13	106	+20	2055	°	2035	110	+2/308	260/40	270
			097	+1L	098	+12W	110	+1	111	270		308	14	125	+24	2119	M	2045	109	+2/308	260/40	270
2052	△	N38-45.1		260/40									13	20	+04	2056	-26°	2052	109	+2/309	260/40	270
		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 11

FLIGHT ENGINEER (E) PROCEDURES AND FORMS

Section 11A—Normal Procedures

11.1. General. In addition to duties in the flight manual and other applicable technical orders, Flight Engineers will comply with the procedures and duties in this AFI. With the exception of hostile environment repair, these items need not be briefed and will be performed as normal procedures. The AC may assign other duties to the flight engineer as necessary.

11.2. Responsibilities. The flight engineer is responsible to the AC for all inspections and procedures required by all applicable technical orders and DoD and Air Force instructions.

11.3. Authority to Clear Red X Symbols. Flight engineers are normally not authorized to clear a Red X. When the aircraft is on a Red X and qualified maintenance personnel are not available to clear it, the flight engineer may obtain authorization to clear the Red X in accordance with TO 00-20-1. At enroute stations, flight engineers are authorized to clear Red X symbols for: intake and exhaust inspections, dust covers and plugs installed, and aircraft panels removed and installed to facilitate other maintenance. Other aircrew members are not authorized to clear a Red X.

11.4. Aircraft Servicing. Flight engineers are normally not required to refuel or de-fuel 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. If no crew chief is 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 TO 1EC-130H-1 for primary fuel management procedures.

11.4.1. In order to comply with the intent of primary and spear pod fuel management and to provide the greatest flexibility for maintenance and operations, standard ramp fuel loads in excess of 28,000 pounds should be loaded as follows:

11.4.1.1. Without SPEAR pods installed:

11.4.1.1.1. Outboard main tanks. 8,000 pounds each is the minimum to be considered full.

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

11.4.1.2. With SPEAR pods installed:

11.4.1.2.1. Outboard main tanks. 6,600 pounds each is the minimum to be considered full.

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

11.4.1.3. Any additional fuel required will be put in the auxiliary tanks and then the external tanks (if installed).

11.4.2. Operational commitments, availability of fuel services or planned landing criteria will in some cases dictate that these procedures be adjusted. However, every effort should be made to comply with these guidelines and the flight manual to maximize airframe life.

11.5. Aircraft Structural Integrity Program (ASIP). Complete an UDI Worksheet IAW TO 1C- 130-101 *Implementation of C-130 series Aircraft Usage Report* on all flights.

11.6. Aircraft Systems/Forms Management:

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

11.6.2. In addition to the procedures in TO 00-20-1 and AFI 11-401, the flight engineer will assist the pilot in maintaining the AFTO Form 781.

11.7. TOLD Cards:

11.7.1. All performance calculations will normally be based on 95 percent engines and with nosewheel steering (unless otherwise specified in this volume or the performance manual). Initial TOLD cards will be computed using flight manual performance data. Subsquent TOLD card computations will be accomplished using flight manual performance data or approved tabulated data. All tabulated TOLD data will be approved by the respective NAF/OV prior to use. NAF/OV will maintain a copy of all approved tabulated data.

11.7.2. The engineer will post the torque value corresponding to the required takeoff power setting, in addition to both the 3-engine and 4-engine climb performance on the TOLD card.

11.7.3. Mini TOLD card blocks 1 thru 5 will contain: outside ambient temperature, pressure altitude, 3-engine service ceiling, 2-engine service ceiling, and Critical Field Length.

11.7.4. Following initial takeoff and landing data computation, only affected speeds need be re-computed if favorable conditions afford an additional margin of safety in all other areas. On local proficiency flights, only the Mini C-130 TOLD Card must be updated.

11.7.5. When stop-and-go operations are planned, the flight engineer will compute two stop-and-go distances, one based on 970 degrees TIT and one based on maximum power. When conducting flaps up landing data for training, compute and post VMCA speeds for both configurations; flaps 50% and flaps up (normal boost). Example, VMCA, in ground effect, one engine inoperative – 110/136.

11.7.6. Compute cruise data and post a mini C-130 TOLD Card for cruise segments of 1 hour or more duration and update hourly. Advise and assist the pilot in maintaining required climb and cruise power. Blocks 1 thru 3 will contain: Maximum Endurance 20% flaps (as charted); Stall Speed (Vs1), 0% flaps, 45 degrees bank ;Stall Speed (Vs1), 0% flaps, 60 degrees bank; and Remarks: Outside Ambient Temperature (OAT) and temperature deviation. **Note:** ACC directs that Dash 1 stall speeds will be used in lieu of the conflicting performance manual stall speeds.

11.7.7. The minimum TOLD airspeeds required for a termination landing are: air minimum control speeds, obstacle clearance speed, and 50% and 100 % landing speeds.

Section 11B—DD Form 365-4 Instructions and Miscellaneous Information

11.8. Introduction. This section provides instructions for computation and completion of DD Form 365-4, *Weight and Balance Clearance Form F*. The Form F will be computed by using simplified moments. All entries and signatures must be legible.

11.9. Load Planning. Plan so that the center of gravity of the loaded aircraft will be within the specified forward and aft limits for any given operating condition. Consideration must also be given to aircraft limitations and emergency jettisoning. Math, charts contained in TO 1EC-130H-5-2, and aircraft load adjuster (slipstick) are tools which may be used for planning. When the fuel load is unknown, load plan for a 20-22 percent of MAC zero fuel.

11.10. General Instructions. These instructions apply to Forms F using simplified moments. Entries on the form (Figure 11.1) may be either typed, handwritten, or computer entered.

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

11.10.2. Limitations Column. Enter the appropriate weight and CG limits for the planned mission using the following criteria--the maximum gross weight and center of gravity limits specified in TO 1EC-130H-1 will not be exceeded. 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.

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

11.10.2.2. Landing. Unless other landing restrictions are imposed, use 155,000 pounds for EC-130H and subtract operating weight plus estimated landing fuel (references 9 and 23).

11.10.3. Permissible CG Takeoff and Landing. Compute the forward and aft center of gravity limitations using the center of gravity table in the appropriate TO 1EC-130H-5-2. Leave blank the block entitled Permissible CG Zero Fuel Wt.

11.10.4. Signature Blocks:

11.10.4.1. Computed By --Signature, rank, and organization.

11.10.4.2. Weight and Balance Authority --Leave blank

11.10.4.3. Pilot --Signature on original and duplicate.

11.11. Instructions for Moment Form F. Use applicable TO 1EC-130H-5-2, Chart E.

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

11.11.2. Reference 2. Leave blank.

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

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

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

11.11.6. Reference 8. Leave blank.

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

11.11.8. Reference 10. Enter total takeoff fuel and determine moments from fuel moment charts. **Note:** In the remarks section enter takeoff fuel weight, broken down by tank, to the nearest 100 pounds along with the associated moments using the fuel moment charts contained in TO 1EC-130H-5-2. An alternate method of computing fuel moments is accomplished with the following formula: Fuel weight X .552 = Fuel moment. If this method is used only total fuel needs to be entered (not individual tanks).

11.11.9. Reference 11. Leave blank.

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

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

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

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

11.11.11.3. The total load weight and moment of reference 13 will be entered in reference 15 as a subtotal. **Note:** The total weight of reference 13 shall not exceed the smallest allowable load determined by the limitation block.

11.11.12. 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.

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

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

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

11.11.16. 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.

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

11.11.18. Reference 20. Enter corrected CG in percent of MAC, as required. **Note:** References 18, 19, and 20 will be left blank if corrections are not required.

11.11.19. Reference 21. Enter figures from reference 14.

11.11.20. Reference 23. Enter landing fuel weight and moment, obtained by determining estimated amount of fuel remaining in tanks for landing. **Note:** In the remarks section enter estimated landing fuel weight, broken down by tank, to the nearest 100 pounds along with the associated moments using the fuel moment charts contained in TO 1EC-130H-5-2. An alternate method of computing fuel moments is accomplished with the following formula:

Fuel weight X .552 = Fuel moment. If this method is used only total fuel needs to be entered (not individual tanks). When flight plan fuel weights are not available, use the following criteria to compute fuel burn off: **Note:** PPH = pounds per hour.

11.11.20.1. 4,500 PPH - normal flight at altitude

11.11.20.2. 5,000 PPH - low level

11.11.20.3. 6,000 PPH - first hour of flight (climb-out)

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

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

11.11.23. Remarks Block. A/R.

11.11.24. Load Adjuster Number Block. Leave blank.

Figure 11.1. 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 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)* 20090525	AIRCRAFT TYPE EC-130H	FROM KDMA	HOME STATION KDMA
MISSION DMAR	SERIAL NO. 73-1590	TO KDMA	PILOT Pane, Maj

REMARKS

Takeoff		Land	
O 16.0	8725	O 4.0	2191
I 14.4	7993	I 2.0	1117
A 5.6	3123		
T 36.0	19841	T 6.0	3308

REF	ITEM	WEIGHT	INDEX OR MOM/ x 1000
1	BASIC AIRCRAFT *(From Chart C)*	103771	541.51
2			
3	CREW *(No.)* 13	2600	81.4
4	CREW'S BAGGAGE		
5	STEWARD'S EQUIPMENT		
6	EMERGENCY EQUIPMENT	1046	76.6
7	EXTRA EQUIPMENT		
8			
9	OPERATING WEIGHT	107391	557.31
10	TAKEOFF FUEL *(Gal.)*	36000	1984.8
11	WATER INJ.		
12	TOTAL AIRCRAFT WEIGHT	143391	2542.11

LOAD ADJUSTER NUMBER Math + Chart E

CORRECTION/MOST FWD/MOST AFT

13 DISTRIBUTION OF ALLOWABLE LOAD *(PAYLOAD)*

14 ZERO FUEL WT 107391

ZERO FUEL WT INDEX OR MOM 55731

ZERO FUEL % M.A.C

COMPT OR ARM	ITEM	CHANGES *(+ or -)* WEIGHT	CHANGES *(+ or -)* INDEX OR MOM/	PASSENGERS NO.	PASSENGERS WEIGHT	COMPT OR ARM	CARGO	CARGO	COMPT OR ARM
							NO LOAD		
TOTAL WEIGHT REMOVED									
TOTAL WEIGHT ADDED									
NET DIFFERENCE									

LIMITATIONS				
CONDITION	TAKEOFF	LANDING	1 FUEL	
ALLOWABLE GROSS WEIGHT	155000	155000		16
TOTAL AIRCRAFT WT. (Ref. 12)	143391			17
(Ref. 9) + (Ref. 23)		113391		18
OPERATING WT. *(Ref. 9)*				19
ALLOWABLE LOAD *(Ref. 13) (use smallest figure)*	11609	41609		20
1 Zero Fuel or Limiting Wing Fuel				21
PERMISSIBLE C.G. TAKEOFF FORWARD	21.9	AFT	30.0	22
PERMISSIBLE C.G. LANDING FORWARD	17.6	AFT	29.9	
PERMISSIBLE C.G. ZERO FUEL WT. FORWARD		AFT		

TAKEOFF CONDITION *(Uncorrected)*	143391	527.0 / 24.0	
TAKEOFF C.G. IN % M.A.C. OR IN			
CORRECTIONS *(If required)*			
TAKEOFF CONDITION *(Corrected)*			
TAKEOFF C.G. IN % M.A.C. OR IN			
ZERO FUEL WT *(Ref. 14)*	107391	557.31	
LESS AIR DROP LOAD			
ESTIMATED LANDING FUEL	6000	331.08	23
ESTIMATED LANDING CONDITON	113391	520.6 / 20.1	24
ESTIMATED LANDING C.G. IN % M.A.C. OR IN			25

COMPUTED BY SIGNATURE

WEIGHT AND BALANCE AUTHORITY SIGNATURE

PILOT SIGNATURE

DD FORM 365-4, AUG 96 PREVIOUS EDITION MAY BE USED. Adobe Professional 7.0

Table 11.1. 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

11.12. Flight Engineer (E) Abbreviations and Formulas:

11.12.1. General Abbreviations. Contained in **Attachment 1** of this AFI.

11.12.2. Standard Formulas:

11.12.2.1. Time, Speed and Distance formulas.

11.12.2.1.1. DISTANCE = (SPEED X TIME in min) ³ 60.

11.12.2.1.2. SPEED = (DISTANCE X 60) ³ TIME in min.

11.12.2.1.3. TIME in min = (DISTANCE X 60) ³ SPEED.

11.12.2.1.4. SM = NM X 1.152.

11.12.2.1.5. NM = SM ³ 1.152.

11.12.2.1.6. TASK = EASK X SMOE

11.12.2.1.7. EASK = TASK ³ SMOE.

11.12.2.2. General Fuel Formulas.

11.12.2.2.1. Pounds = Gallons X Fuel density.

11.12.2.2.2. Gallons = Pounds ³ Fuel density.

11.12.2.2.3. F/Pd =(FF X TIME in min) ³ 60.

11.12.2.2.4. FF = (F/Pd X 60) ³ TIME in min.

11.12.2.2.5. DISTANCE = NMPP X F/Pd.

11.12.2.2.6. NMPP = DISTANCE ³ F/Pd.

11.12.2.2.7. F/Pd = DISTANCE ³ NMPP.

11.12.2.2.8. FF = TASK ³ NMPP.

11.12.2.2.9. TASK = NMPP X FF.

11.12.2.2.10. F/Pd = (FF X DISTANCE) ³ TASK.

11.12.2.2.11. Charted TASK = Logged TASK ³ SMOE for cruise altitude.

11.12.2.2.12. Charted FF = FF ³ SMOE for cruise altitude.

11.12.2.2.13. ×F = 1.8 C + 32, ×C = (×F -32) ³ 1.8.

11.12.2.3. Weight and Balance Formulas.

11.12.2.3.1. Arm = Moments ³ Weight.

11.12.2.3.2. Moments = Arm X Weight.

11.12.2.3.3. Weight = Moments ³ Arm.

11.12.2.3.4. Average Arm = Total Moment ³ Total Weight.

11.12.2.3.5. CG (% of MAC) = (Average Arm - LEMAC) ³ MAC.

Section 11C—Hostile Environment Repair Procedures

11.13. General. Authority to use the Hostile Environment Kit and Repair Procedures is granted by Operations Group Commanders/Deputy Commanders for Operations when the aircraft is directed into a hostile or potentially hostile environment or in extreme cases where recovery of the aircraft or completion of the mission dictate their use. This authority is documented on the FRAG or Air Tasking Order. 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. All normal avenues of repair/recovery should be exhausted (when practical) prior to use of the Hostile Environment Repair Procedures. Procedures identified with an asterisk (*) are not considered Hostile Environment Repair and may be accomplished with the AC's concurrence. When Hostile Environment Repair Procedures are actually employed, inform Numbered Air Force Stan/Eval by letter. Include a brief description of the circumstances and conditions leading to the decision to approve Hostile Environment Procedures.

11.13.1. Hostile Environment Repair Kit (HERK). Safe and efficient accomplishment of the hostile environment repair procedures is facilitated by the use of a repair kit. **Table 11.2**

includes the items normally contained in such kits. Units may identify repair kit inventory and issue procedures in the local supplement to this volume. **CAUTION:** When installing or removing recommended jumper wires electrical arcing is possible.

Table 11.2. Hostile Environment Repair Kit 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 1/2" (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
Note: STOCK NUMBERS MAY CHANGE WITHOUT NOTICE. NUMBERS SHOULD BE	

VERIFIED WITH SUPPLY ORGANIZATIONS WHEN ORDERING.	
23. #16 GAUGE JUMPER WIRE WITH TERMINALS (10 INCHES LONG) A. WIRE (ORDER BY FOOT) B. TERMINALS #10 (PACK OF 50 EACH)	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
**27. APU DUMMY ACTUATOR ROD A. BEARING END APU ACTUATOR ROD B. NUT, APU ACTUATOR ROD END	3120001071678 5310008810944
* The cannon plug must be ordered and the pins removed from the plug for use. Each cannon plug contains six pins. ** The APU dummy actuator rod must be locally manufactured IAW TO 1C-130H-2-4, Figure 11-5.	

11.14. 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 DC Power Switch remains in the "BATTERY" position. **Note:** If another aircraft is available, temporarily place its operable battery (or INS battery when available) in the disabled aircraft until at least one engine is operating. On INS equipped aircraft, the INS battery may be swapped with the aircraft battery and used for engine start. An alternative is to bypass the INS Reverse Current Relay. (See paragraph **11.15**)

11.14.1. Jumping Battery--Aircraft to Aircraft:

11.14.1.1. Position aircraft nose to nose to allow the DC power cable (or cables) to reach.

11.14.1.2. Join both aircraft DC power cables by use of extender plug or brass bars listed in **Table 11.2**

11.14.1.3. Place cable from operating aircraft DC winch receptacle to external DC power receptacle of disabled aircraft.

11.14.1.4. 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.

11.14.1.5. Start GTC on disabled aircraft.

11.14.1.6. ATM and Generator Switch -ON.

11.14.1.7. Jump battery relay using failed battery relay procedure. (See paragraph **11.16**)

11.14.1.8. When battery relay is closed, remove jumper cables and continue with checklist.

11.14.2. 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.)

11.14.2.1. 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 11.2**).

11.14.2.2. Insert stock into battery connector for option one.

11.14.2.3. Connect jumper cables to aircraft and batteries.

11.14.2.4. 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.

11.14.2.5. Start GTC.

11.14.2.5.1. Control Switch - Start, Run.

11.14.2.5.2. Bus Tie Switch - Tied.

11.14.2.6. ATM and generator - ON, checked.

11.14.2.7. If option two was utilized, jump battery relay using failed battery relay procedure. (See paragraph **11.16**)

11.14.2.8. Start an engine and place the generator switch to ON.

11.14.2.9. Disconnect jumper cables.

11.15. Bypassing the INS Reverse Current Relay (RCR): Note: This method should only be used if the INS battery cannot be swapped into the aircraft battery position.

11.15.1. If the aircraft battery is damaged, disconnect and remove it from the aircraft. Use caution to avoid acid burns if the battery is leaking.

11.15.2. Open the Pilot's upper circuit breaker panel.

11.15.3. Jump the INS RCR by installing a #10 jumper wire from the APP terminal to the BATT terminal of the reverse current relay (see **Figure 11.9**).

11.15.4. Check the DC voltmeter in the ESS DC BUS position to verify the bus is powered.

11.15.4.1. If the ESS DC BUS is not powered, bypass the relay as follows:

11.15.4.1.1. Remove all power from the aircraft.

11.15.4.1.2. Disconnect the INS battery.

11.15.4.1.3. Bypass the INS RCR by installing a #4 jumper wire from the GEN terminal to the BAT terminal of the reverse current relay (see **Figure 11.9**).

11.15.4.1.4. Connect the INS battery.

11.15.5. Start GTC. ***WARNING:*** Fire protection is not available for the GTC, until the Battery Relay is jumped.

11.15.5.1. Place Bleed Air Valve switch to OPEN.

11.15.6. Place ATM and generator switch to ON. Check Voltage and Frequency.

11.15.7. Remove #10 jumper wire from the INS Reverse Current Relay (RCR).

11.15.8. Jump the battery relay using Failed Battery Relay procedure. (See paragraph **11.16**). ***WARNING:*** If the INS 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.

11.16. Failed Battery Relay:

11.16.1. DC power switch--BATTERY.

11.16.2. Jump battery relay by momentarily touching terminals "A-1" to "A-2" using the #10 jumper wire (see **Figure 11.3**).

11.16.3. Check the battery voltage on voltmeter to verify closing of relay. (The voltmeter should read bus voltage.)

11.16.4. If battery relay fails to close, bypass the relay as follows:

11.16.4.1. Remove all power from the aircraft.

11.16.4.2. Disconnect the aircraft battery and INS battery.

11.16.4.3. Install a #4 jumper wire between terminals "A-1" and "A-2."

11.16.4.4. Connect the aircraft battery and INS 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.

11.17. Failed RCR between Isolated and Essential DC Bus:

11.17.1. Open pilot's side circuit breaker panel.

11.17.2. Install a #10 jumper wire between the SW post and the APP post (see **Figure 11.3**).

11.17.3. If the RCR fails to energize, bypass the relay as follows:

11.17.3.1. Remove all power from the aircraft.

11.17.3.2. Disconnect the aircraft battery.

11.17.3.3. Install a #4 jumper wire between the BATT and GEN terminals (see **Figure 11.3**).

11.17.3.4. 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 Iso DC on Batt/Batt Disc light will remain ON, even though the Essential DC bus is powering the Isolated Bus.

11.18. *GTC Stalls and Fails to Accelerate to "On Speed: "

11.18.1. Hold fingers over the acceleration limiter holes (see Figure 11.4) 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.

11.19. GTC Fails to Rotate (No Start Light):

11.19.1. 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.

11.19.2. 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.

11.19.2.1. 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.

11.19.3. For failed door actuator (doors not open or not opened enough to allow disconnecting of actuator), remove four (4) screws in upper door. This will release 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.

11.19.3.1. When finished with GTC, close and secure the doors using two of the four bypass switch mounting bracket screws.

11.19.4. 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 will bypass the limit switches.

11.19.4.1. Start GTC.

11.20. GTC Fails to Rotate (Start Light On):

11.20.1. Remove all electrical power.

11.20.2. Open pilot’s side circuit breaker panel.

11.20.3. Check GTC starter current limiter; (see **Figure 11.3**) if bad or suspect; replace as follows:

11.20.3.1. Disconnect battery.

11.20.3.2. Remove and replace current limiter with spare.

11.20.3.3. If no spares are available, open copilot’s upper circuit breaker panel cover, remove cargo winch current limiter and use as a replacement.

11.20.4. If current limiter is good, check GTC starter for broken wires and repair as necessary (see **Figure 11.4**).

11.20.5. Connect battery and attempt to start. If no rotation, rap starter relay and attempt another start.

11.20.6. If GTC still will 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 11.3**) until the start light goes out, then remove the jumper wire.

11.21. *GTC Fuel Vapor Lock:

11.21.1. Use petcock drain on bottom of aircraft below GTC to drain fuel while motoring GTC, then attempt start (see **Figure 11.5**).

11.21.2. If no fuel is present at petcock drain, check GTC fuel shutoff valve opening by momentarily positioning GTC control switch to "START" then "OFF".

11.21.3. If fuel shutoff valve fails to operate, remove cannon plug and open the valve manually.

11.21.4. 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.

11.21.5. Reconnect the line and attempt another start.

11.22. *GTC Rotates - Negative Ignition:

11.22.1. Check oil quantity.

11.22.2. Attempt a start while depressing and holding the oil primer button. Release the button when the GTC lights off.

11.23. Starting GTC with Failed Oil Pressure Switch:

11.23.1. A 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 11.4**)

11.23.2. Remove oil line to the oil pressure switch and momentarily rotate GTC. (Oil should spurt from the line opening.)

11.23.3. 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.

11.23.4. Attempt to start the GTC. If the oil pressure switch was faulty the start should be successful.

11.24. Leaking Brakes:

11.24.1. Disconnect brake lines from both sides of the brake shuttle valve.

11.24.2. Use plugs and caps from the HERK kit to seal the brake lines and shuttle valve.

11.24.3. Secure disconnected hose ends to prevent interference with landing gear movement during retraction and extension. **Note:** Both landing and takeoff performance calculations will be affected by a disconnected brake. Recommend using RCR of 5 for all performance calculations.

11.25. 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.

11.25.1. Install main gear towing/jacking fitting on the strut with the flat tire.

11.25.2. Install a 10,000-pound chain around the top of the strut above the upper track shoes.

11.25.3. Connect a tie down device to the towing fitting. Connect the chain to the device and tighten.

11.25.4. Open the Schrader valve at the top end of the MLG strut and bleed all air pressure from the strut. ***WARNING:*** Do not open Schrader valve more than 3/4 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 becomes loose it may allow the Schrader valve to blow out of the strut body.

11.25.5. 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.

11.25.6. When the strut has been compressed to the maximum extent possible, tighten the tie down device.

11.25.7. Remove the flat tire if time and situation permits.

11.25.8. 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.

11.26. Failed Engine Driven Hydraulic Pump:

11.26.1. Disconnect the failed engine driven hydraulic pump from the gearbox and secure to any available structure with safety wire. Do not disconnect hydraulic lines.

11.26.2. Install a starter pad in place of the failed hydraulic pump.

11.26.3. If time and resources permit, the pump may be removed from the nacelle as follows:

11.26.3.1. With the ESS DC bus powered, place the corresponding hydraulic pump switch to the OFF position. This will close the hydraulic shutoff valve.

11.26.3.2. Disconnect and plug all hydraulic lines to the pump.

11.26.3.3. Remove the failed pump and install a starter pad in its place. **CAUTION:** The hydraulic pump switch must remain in the OFF position as long as the hydraulic pump is removed.

11.27. Failed Fuel Valve(s):

11.27.1. Locate the failed valve(s) and remove the cannon plug(s).

11.27.2. Manually open or close the valve(s) by actuating the manual arm. **Note:** On some aircraft, the dump mast shutoff valves must be manually closed to refuel. Insure these valves are reopened prior to flight.

11.28. Failed Speed Sensitive Switch:

11.28.1. Pull Ignition Control Circuit Breaker on Copilots Lower Circuit Breaker Panel.

11.28.2. Open lower left side engine cowling on the affected engine.

11.28.3. Remove the speed sensitive control cannon plug (see **Figure 11.6**).

11.28.4. Install the pre-wired cannon plug from the Hostile Environment Repair Kit and secure it in place (see Figure 11.6. and Figure 11.8.). **CAUTION:** Pre-wired cannon plugs used as jumpers must be wired as shown in Figure 11.8.

11.28.5. Secure all engine cowling.

11.28.6. Begin the start sequence (in normal ground idle) while watching tachometer.

11.28.7. At 16% engine RPM, reset the Ignition Control Circuit Breaker.

11.28.8. At 94% RPM, pull the Ignition Control Circuit Breaker. **Note:** The secondary fuel pump pressure light will be illuminated and the pumps will be in parallel operation until the Ignition Control Circuit Breaker is pulled.

11.28.9. After landing, use normal ground idle only and shutdown the affected engine as follows:

11.28.10. Ignition Control Circuit Breaker - RESET.

11.28.11. 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.

11.28.12. When the fuel flow indicator drops to zero and RPM is decreasing, pull the Ignition Control Circuit Breaker.

11.29. Failed Ignition Control Relay:

11.29.1. Pull the Ignition Control circuit breaker.

11.29.2. Open the lower left engine cowling and locate the ignition control relay (see **Figure 11.6**).

11.29.3. Disconnect the cannon plug from the relay and install the prewired cannon plug from the repair kit. **CAUTION:** Pre-wired cannon plugs used as jumpers must be wired as shown in Figure 11.8.

11.29.4. Close and secure cowling.

11.29.5. During engine start proceed as follows:

11.29.5.1. At 16 percent RPM, reset the Ignition Control circuit breaker.

11.29.5.2. At 65 percent RPM, pull the Ignition Control circuit breaker.

11.29.6. For engine shutdown following landing, proceed as follows:

11.29.6.1. Reset the Ignition Control circuit breaker.

11.29.6.2. Place the condition lever to GROUND STOP.

11.29.6.3. When fuel flow drops to zero and RPM decreases, pull the Ignition Control circuit breaker.

11.30. Failed Speed Sensitive Valve: CAUTION: This procedure will render the torquemeter shroud anti-icing system inoperative. Icing conditions should be avoided.

11.30.1. Open the lower left side engine cowling on the affected engine.

11.30.2. Disconnect the air supply line to the speed sensitive valve (see **Figure 11.6**) at the bottom of the filter element installed in the line and install a #6 plug in the open line.

11.30.3. Disconnect the torquemeter shroud anti-icing line at the left side of the balance line fitting and secure it.

11.30.4. Disconnect the line from the top side of the speed sensitive valve and connect it to the balance line fitting where the torquemeter shroud anti-icing line was connected.

11.30.5. 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.

11.30.6. Place the Engine Inlet Duct Anti-icing switch for the affected engine to ON.

11.30.7. Start the affected engine while watching RPM and standing by to activate the Prop and Engine Anti-icing Master switch.

11.30.8. At 94% 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 will be actuated 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 will activate the systems and rob the engines of torque. Overheating of the blade/spinner anti-ice/de-ice systems will occur if the aircraft remains on the ground for longer than the two cycle operating limit. **Note:** In this configuration the affected engine will have continuous anti-icing and an associated reduction in torque will be noted.

11.30.9. After landing, shutdown the engine in normal ground idle. **CAUTION:** Do not use "Low Speed Ground Idle" during ground operations. To do so may cause the engine to stall/over temp.

11.31. Failed Fuel Shutoff Valve on Fuel Control:

11.31.1. Open lower left side cowling on affected engine.

11.31.2. Remove the defective fuel control shutoff actuator (Geneva lock) from the fuel control (see **Figure 11.6**).

11.31.3. 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 will be no fuel leakage from where the actuator was removed.

11.31.4. 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.

11.31.5. For engine shutdown, place the condition lever to FEATHER rather than GROUND STOP for the affected engine.

11.32. Failed Engine Fuel Drip Valve:

11.32.1. Use enrichment on next engine start. The sudden surge of pressure should close the drip valve.

11.32.2. If enrichment fails to close the drip valve, shutdown the engine and plug or crimp the drip valve drain valve closed.

11.33. Prop Fails To Rotate (No Light In Button). CAUTION: Insure the oil shutoff valve circuit breaker is set (in).

11.33.1. If it is determined or suspected that no power is available to the starter button, proceed as follows:

11.33.1.1. Select another engine which is not operating and close its bleed air valve. (This bleed valve must remain closed throughout the start cycle.)

11.33.1.2. Start the defective engine normally while simultaneously holding in the starter button for the selected non-operating engine. Both buttons must be held in until 60 percent RPM.

11.34. Alternate Fuel Management with Inboard Main Tanks Empty (External Tanks Containing Fuel):

11.34.1. The external tanks may be filled to maximum capacity provided the outboard main tanks and both auxiliary tanks are full.

11.34.2. Takeoff configuration will be engines 1 and 4 on tank to engine from their respective tanks. Engines 2 and 3 will be on cross-feed from the auxiliary tanks with the cross-feed separation valve open. ***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.

11.34.3. As soon as practical after takeoff, close the cross-feed separation valve and place all engines on cross-feed from the auxiliary tanks.

11.34.4. When auxiliary tank fuel is reduced to 4,000 - 4,500 pounds 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 pounds if external tank fuel exceeds 4,700 pounds per side.

11.34.5. 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.

11.34.6. When the auxiliary tank fuel is 1,000 pounds per side, open the outboard cross-feed valves to place all engines on cross-feed.

11.34.7. When the auxiliary tanks are empty, close the auxiliary tank cross-feed valves and place the auxiliary tank fuel boost pump switches to OFF.

11.34.8. Observe flight manual touch down rate of sink and outboard tank fuel quantity landing limitations.

11.34.9. 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.

11.35. Failed Bleed Air Valve (Engine Fails To Rotate):

11.35.1. Place the bleed air valve switch to "OPEN." Open horse collar and "tap" the motor mechanism on the bleed air valve.

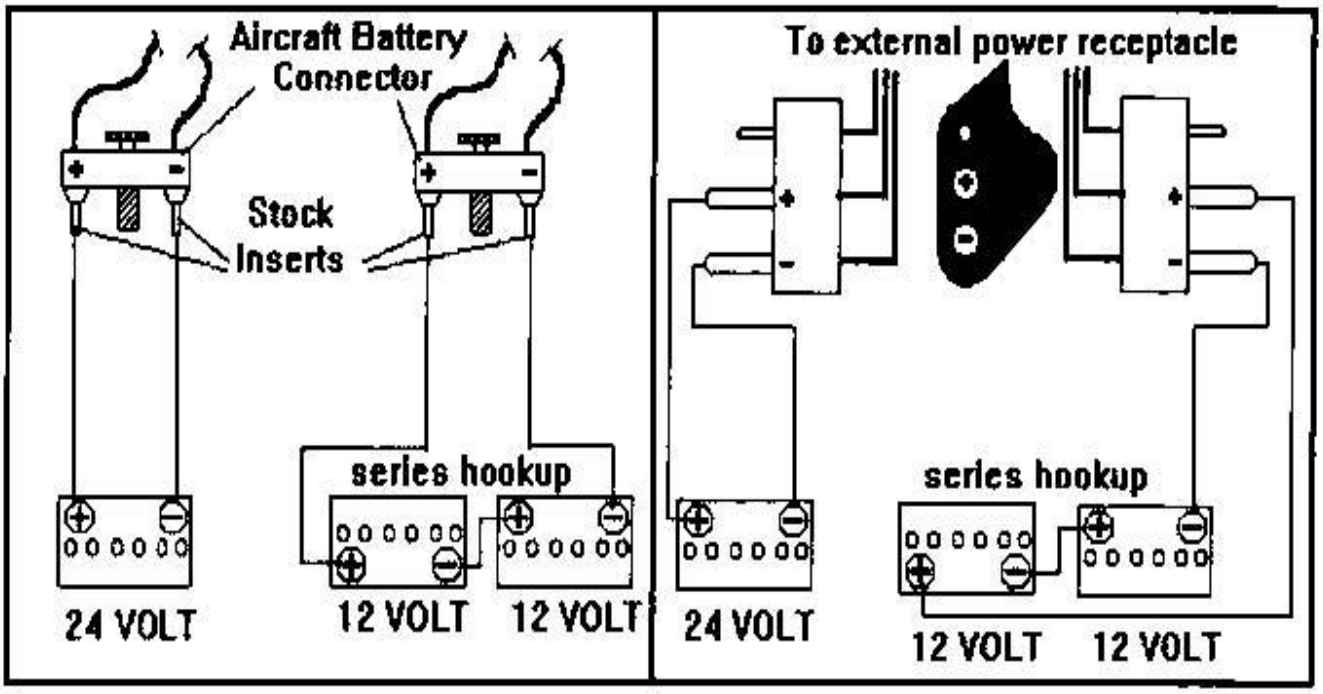
11.35.2. If the valve still fails to open, remove the motor from the valve. Manually open the valve and secure the lever to one of the mount holes with safety wire. ***WARNING:*** Once bleed air valve has been secured in the open position, it will not be possible to close the valve for wing isolation procedure. Engine shut down will be required to isolate wing.

11.35.3. Close the horse collar and attempt engine start.

11.36. Severe Fuel Leaks:

11.36.1. 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 11.2. Alternate DC Power Connections.



OPTION ONE **OPTION TWO**

Figure 11.3. Reverse Current Relay.

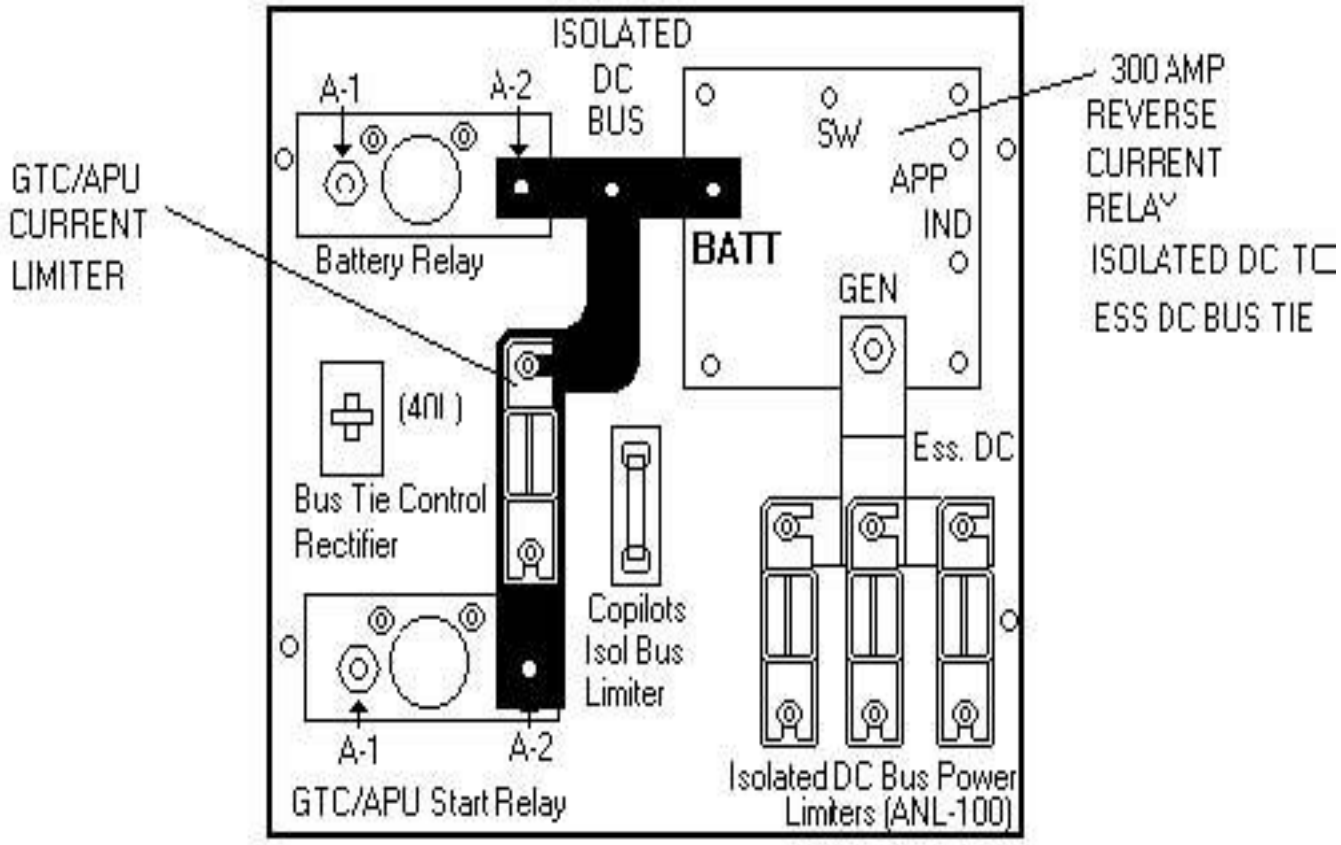


Figure 11.4. Gas Turbine Compressor.

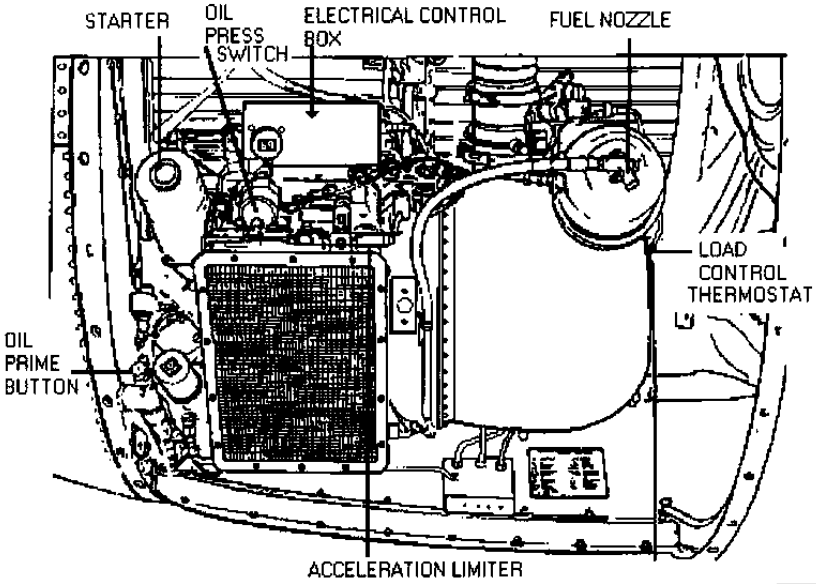


Figure 11.5. GTC Fuel Supply.

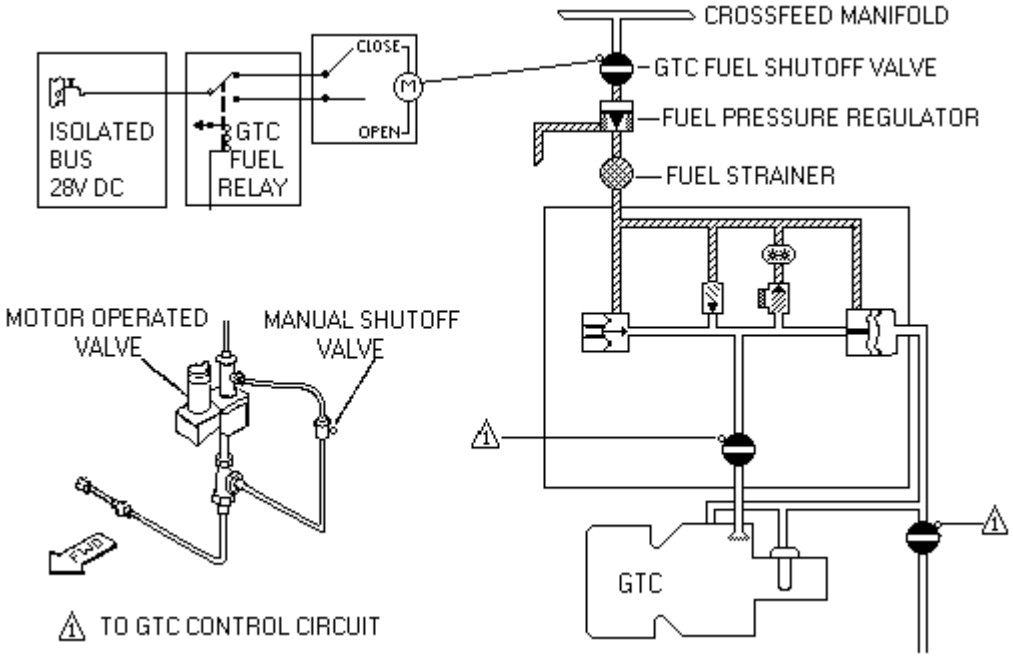


Figure 11.6. Engine Accessory Locations.

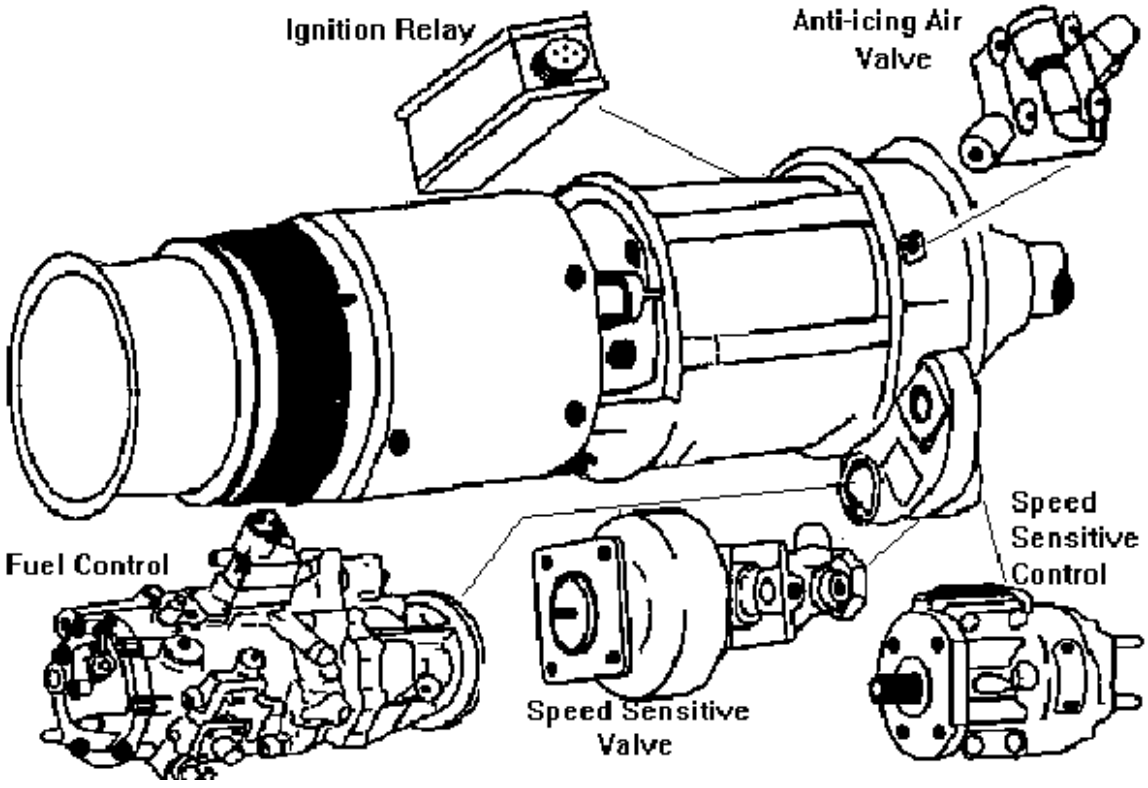


Figure 11.7. Gear Box Accessory Locations.

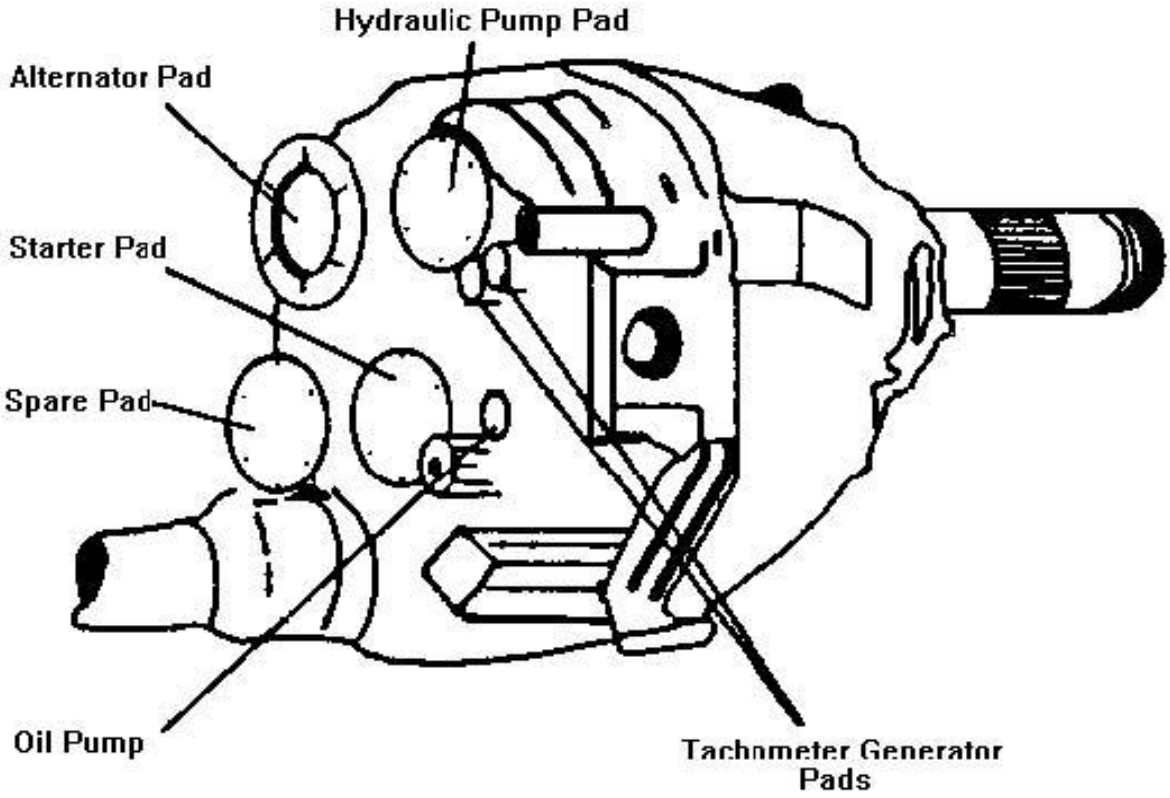
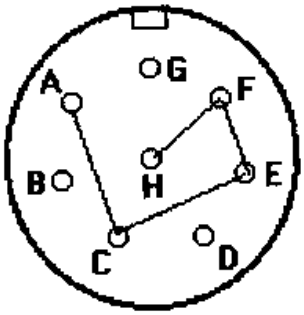


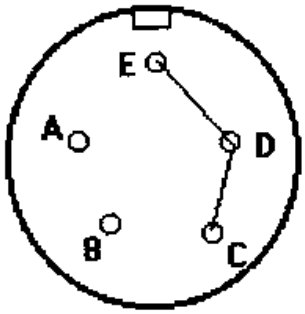
Figure 11.8. Prewired Cannon Plugs (Speed Sensitive Control and Ignition Relay).

Speed Sense Control
Pin A to C to E to F to H
16 Ga. Wire



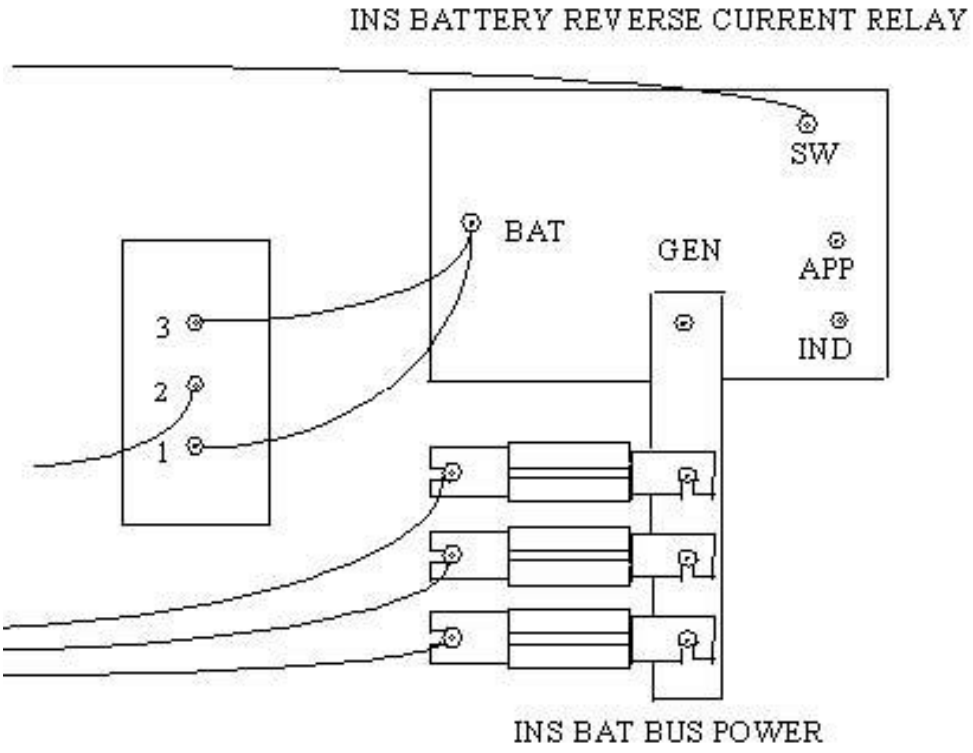
MS 3101A18-8p
A- Power
C- Fuel Shutoff (Open)
E- Ignition Relay
F- TD Sys (Start Limit)
H- Enrichment

Ignition Relay
Pin C to D to E
16 Ga. Wire



C - Power
D- Ignition Exciter and Drip Valve
E- Misc

Figure 11.9. Bypassing the INS Reverse Current Relay.



Chapter 12

AIRBORNE MAINTENANCE TECHNICIAN (AMT) PROCEDURES

12.1. 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 will:

12.1.1. Perform and supervise scanner duties.

12.1.2. Coordinate mission equipment requirements and any special procedures necessary to ensure optimum mission accomplishment.

12.1.3. Initialize, maintain, and troubleshoot mission systems during flight as required.

12.1.4. Document all write-ups in aircraft forms and thoroughly debrief appropriate ground personnel.

12.1.5. Ensure MEPs and passengers have appropriate AFE equipment, are briefed on emergency procedures, and seated prior to stations time.

12.1.6. At the AC's direction, complete anti-hijacking procedures for all passengers.

12.1.7. Ensure the GTC is shutdown prior to en-planning or de-planning passengers unless proper hearing protection is used.

12.2. Weight and Balance. The flight engineer will calculate all weight and balance data.

12.3. Emergency Exits and Safety Aisles: At least one unobstructed emergency exit is available for each 20 passengers (This does not restrict over water flights if the overhead escape hatches are available for egress). Seats erected across an emergency exit are not considered as an obstruction.

12.4. Passenger Handling:

12.4.1. The AMT is the key figure for good passenger relations. There are certain rules that should be observed:

12.4.1.1. Address passengers by proper titles.

12.4.1.2. Avoid arguments and controversial subjects, national or international politics, criticism of other personnel or organizations.

12.4.2. In-flight Procedures:

12.4.2.1. Passengers may move about the cabin after reaching cruise altitude; however, judgment must be exercised 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.

12.4.2.2. Make frequent checks on the cabin temperature.

12.4.2.3. Do not allow passengers to tamper with emergency equipment. Passengers will not be permitted access to checked baggage.

12.4.2.4. On long flights, particularly during hours of darkness, use all possible means to make passengers comfortable. Dim and extinguish unnecessary compartment lights.

12.4.2.5. Passengers may visit the flight deck only when approved by the AC. Use good judgment when requesting this authority.

12.4.2.6. When passengers are carried, an AMT will be in the cargo compartment for all takeoffs and landings.

12.4.2.7. The AMT will insure sufficient fresh water is available for the crew and passengers. Establish crew drinking water requirements in the unit supplement to this volume.

Chapter 13

FUEL PLANNING

13.1. General. This chapter provides general fuel planning considerations and procedures. Publish local procedures in the supplement to this volume.

13.2. Fuel Conservation:

13.2.1. 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 pounds.

13.2.2. Extra fuel (identified extra) may be added to RRFL:

13.2.2.1. When fuel availability is limited or not available at enroute stops.

13.2.2.2. For known holding delays in excess of standard.

13.2.2.3. For anticipated off course weather avoidance.

13.2.3. To maximize fuel, consider the following:

13.2.3.1. Use optimized CFPs when possible.

13.2.3.2. Long-range cruise (LRC) and/or optimum altitude should be flown (when possible).

13.2.3.3. Limit the use of the GTC when possible.

13.2.3.4. Delay engine start.

13.2.3.5. Cruise CG should be aft if practical.

13.2.3.6. Fly enroute descents when possible.

13.2.4. Fuel Loads:

13.2.4.1. Use appropriate flight planning software or TO 1C-130H-1-1 for fuel planning. Use 100 percent engine and constant altitude performance. Apply an appropriate drag index to software or TO 1C-130H-1-1 computations. Items for fuel analysis are explained in **Table 13.1**

13.3. Fuel Planning:

13.3.1. Entering Arguments:

13.3.1.1. Weight. Add OPERATING WT, CARGO/ PAX WT, and RAMP FUEL to obtain RAMP WT. Subtract TAXI fuel to obtain TAKEOFF WT.

13.3.1.2. TEMP DEV - Temperature Deviation. Compare the forecast temperature at cruise altitude to the standard temperature for that altitude. The algebraic difference is TEMP DEV.

13.3.2. Fuel Computations. Refer to Fuel Planning guidance in **Table 13.1** and the local supplement for fuel computations.

Table 13.1. 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 meet the following requirement: IAW AFI 11-202V3 2.2.3 aircraft must carry enough usable fuel on each flight to increase the total flight time between refueling points by 10% or 20 minutes whichever is greater (maximum 45 min.). Computed at maximum endurance and 10,000 MSL (may be calculated using more conservative 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 alternate must be filed. **Missed Approach:** 2,200 lbs. Required if destination is below ceiling minimums but above visibility minimums for planned destination approach.
	Reserve	Entry required. Minimum 2,000 lbs. (Applicable for Enroute Reserve Requisite)
	Holding	For remote/island destinations, alternate located in Alaska, alternate not available, or located at latitudes greater than 59 degrees N/S, use 1,500 lbs. See AFI 11-202V3 8.4.3 for remote/island destination without a suitable alternate for additional 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	Pressurization Loss	Additional fuel for pressure loss at ETP - used when pressurized, carrying passengers, and aircraft oxygen is not available to the passengers. Compute at 1,000 lbs/hr for time from ETP to FSAF or LSAF or "T" time. If computed fuel required for pressurization loss is less than total of items 2, 4, 5, and 12, no additional entry required in "Identified Extra". If computed fuel exceeds the total of item 2, 4, 5, and 12, add the difference in "Identified Extra."
	Stored Fuel	Ramp fuel for succeeding legs without refueling.
	Off-Course Maneuvers	Fuel for anticipated off-course maneuvering for terrain clearance, thunderstorm avoidance, and ATC requirement. 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 in excess of 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 14

AIR-TO-AIR REFUELING (AAR)

14.1. General. Air to air refueling (AAR) operations will be performed according to ATP-56B, *Air-To-Air Refueling* and TO 1EC-130H-1. Mission planning should include consideration of 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 in addition to the normal procedures in the refueling manuals and applicable directives.

14.2. Crew Policy:

14.2.1. Non-aircraft commander-certified pilots will only perform contacts with an IP in the seat from pre-contact to contact. If training an unqualified or noncurrent pilot, the IP will occupy a pilot seat before initiation of the AAR checklists.

14.2.2. Instructor pilots and pilots in instructor upgrade (under direct IP supervision) may perform boom limit demonstrations.

14.3. 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.

14.3.1. Airspace. AAR may be conducted on established tracks published in FLIP, tracks published in an ATO, or random tracks coordinated between tanker and receiver.

14.3.1.1. Using an established AAR track simplifies mission planning. Scheduling published tracks is normally the tanker crew's responsibility, but receivers will coordinate the use of the track/ anchor with the tanker, and ensure both receiver and tanker are coordinated for the proper rendezvous.

14.3.1.2. When using tracks/anchors defined by an ATO, OPT/DPT planners will coordinate with tanker planners and thoroughly brief aircrews on all aspects of the refueling.

14.3.1.3. Not using a previously identified track will usually require coordination of an Altitude Reservation (ALTRV). Plan and coordinate the ALTRV IAW FAA 7610.4J *Special Military Operations* Chapter 3 and FLIP requirements. Tanker planners and TACC can provide assistance with ALTRV coordination.

14.3.1.4. In all cases, the route to and from the AAR track/anchor should allow divert to a suitable abort airfield that meets the requirements of **Chapter 6** of this volume and AFI 11-202 V3.

14.3.1.5. Fuel planning may be completed using either an approved computer planning program or manually using procedures in **Chapter 10**. A standard fuel flow of 6,000 PPH may be used from the ARIP to EAR.

14.3.2. Military Assumes Responsibility for Separation of Aircraft (MARSA):

14.3.2.1. Acceptance of MARSA normally is the tanker's responsibility. Normally MARSA begins prior to the receiver reaching the AAR/RVIP. When a rendezvous is

conducted in an area that does not use normal track or anchor procedures, MARSA begins when participating aircraft enter the refueling airspace.

14.3.2.2. MARSA ends when normal separation standards are established and ATC accepts control at the end of refueling.

14.4. Procedures/Restrictions:

14.4.1. Performing AAR Maneuvers. AAR-qualified aircrews may perform normal maneuvers at any time, and are encouraged to do so to enhance continuation training opportunities. Toboggan, contact, and practice emergency separation maneuvers do not require instructor supervision, except as mentioned in para **14.2** However, when any member of either the tanker or receiver crew is in training, close coordination with the tanker is required to ensure compliance with training restrictions.

14.4.2. In-flight Fuel Management. Track in-flight fuel management from departure to AAR abort base until EAR. When the EAR point is reached, track in-flight fuel management to either DEST or the next AAR abort base. Compute wind factors and ETPs IAW **Chapter 10** procedures.

14.4.3. Inoperative Fuel Quantity Indicators. Refer to **Table 4.4** for allowable combinations of inoperative fuel quantity indicators. After refueling any tank(s) with inoperative fuel quantity indicators, the flight engineer and navigator will closely monitor fuel burn rates. Immediately bring any discrepancies between actual and expected fuel burn to the AC's attention.

14.4.3.1. If the inoperative indicator is on a main tank, the first indication of a discrepancy between actual and expected fuel quantity may be a need for excessive aileron trim. If this condition arises, pilots should assume they have less than expected fuel, and adjust the mission accordingly. Consider any fuel left in that tank(s) to be reserve fuel.

14.4.3.2. During normal operations, all fuel quantity indicators will be operational for those tanks to be refueled. During contingency or emergency operations, tanks with inoperative quantity indicators may be refueled with a known quantity of fuel from tanks with operative indicators. Both primary and secondary shutoff mechanisms must be working properly for the tanks with the inoperative indicators. Transfer the fuel in 1,000 lb increments and closely monitor fuel distribution and aircraft trim. Comply with flight manual fuel balance limits.

14.4.4. Gross Weight Limitations. When mission requirements dictate air to air refueling to gross weights above 155,000 pounds, a MAJCOM waiver is required IAW the aircraft flight manual. Gross weights above 155,000 pounds are restricted to that amount needed to arrive at destination or next refueling point with required fuel reserves. Refer to aircraft Weight Limitations Chart for load factor limits and max recommended airspeeds. Consider refueling performance, and 3- and 4-engine cruise ceiling when operating at heavy gross weights.

14.4.5. Manual Boom Latching. Manual boom latching procedures will be used only during fuel emergencies, actual contingency operations, or when refueling with a KC-10 with an operable IDS system (with tanker concurrence).

14.5. Communication:

14.5.1. The AC will ensure the receiver and the tanker are on the same frequency. Secondary refueling frequencies need not be monitored unless instructed by the tanker. Pilots will monitor only the primary AAR frequency, interphone, and flight crew hot mic. However, at least one flight deck crewmember will monitor UHF guard throughout the refueling.

14.5.2. During all AARs, the AC will designate one aircrew member as primary monitor for the controlling agency radio frequency. This aircrew member will write down any clearance issued by ATC to the tanker for the receiver aircraft, and compare it to the end AAR clearance issued by the tanker. If there is a discrepancy, query the ATC controller prior to accepting post-AAR clearance.

Chapter 15

COMBAT MISSION PLANNING

15.1. General. Refer to the following AFTTP 3-1 for details pertaining to combat mission planning:

15.1.1. **(U)** AFTTP 3-1.General Planning, *General Planning and Employment Considerations* (Secret)

15.1.2. **(U)** AFTTP 3-1.Threat Guide, *Threat Reference Guide and Counter tactics* (Secret)

15.1.3. **(U)** AFTTP 3-1.COMPASS CALL

15.1.4. **(U)** AFTTP 3-1.HC/MC-130, *Tactical Employment, C/HC-130* (Secret)

15.2. Responsibilities.

15.2.1. The AC and MCC jointly share responsibility for mission planning.

15.2.2. Deployment Planning Team (DPT). When a deployment order is received, the 755 OSS will stand up a DPT to support squadron deployments. The DPT will plan the movement of aircraft to the deployed location and subsequent employment until a Mission Planning Cell (MPC) is established. ACC Air Operations Squadron assistance may be utilized if applicable.

15.2.3. Mission Planning Cell (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 activates the MPC and assigns a team chief. The deployed operations officer determines MPC augmentation requirements. The team chief will assign responsibilities to individual team members IAW operational needs.

15.2.4. Intelligence Support. Intelligence briefings will be presented IAW AFI 14-105, *Unit Intelligence Mission and Responsibilities*, as supplemented, and intelligence Operating Instructions.

15.2.4.1. Intelligence personnel will support DPT with an initial situation/threat briefing upon activation and any update briefings, as necessary. They shall also provide an intelligence pre-deployment briefing to aircrews.

15.2.4.2. Intelligence personnel will support MPC with an initial situation/threat briefing, extract pertinent ATO information, analyze threats to mission aircraft, build/maintain target database and establish targeting priorities IAW mission directives. They will provide continuous, in-depth analysis of the situation and update MPC. Intelligence personnel will conduct the intelligence portions of mission brief and debrief.

15.2.4.3. Intelligence personnel will serve as liaison between COMPASS CALL, the Intelligence, Surveillance and Reconnaissance (ISR) community and mission package planners.

15.2.4.4. Intelligence personnel will provide CCMCS support for scenario development, scenario briefing and scenario debriefing.

Chapter 16

TACTICAL/THREAT AVOIDANCE PROCEDURES

16.1. General. Use these procedures and the flight manual when operating into airfields where an identified or suspected ground threat exists. In a threat situation, aircrew members must understand their limitations and those of their equipment. The procedures contained herein are not all encompassing. Therefore, aircrews should use good judgment and sound airmanship to successfully accomplish the mission.

16.1.1. This chapter deals primarily with the takeoff/departure and approach/landing phase of flight. AFTTP 3-1.COMPASS CALL contains a more detailed discussion of threat avoidance in takeoff/departure, approach/landing, enroute operations and in the orbit area.

16.1.2. 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 have visible to both pilots, stall speeds for 0, 30 and 60 degrees of bank and 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.

16.1.3. Threats and emission control requirements permitting, use all available aids (e.g., map reading, CANS, and tactical air navigation) to remain position oriented. Aircrew members share 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 distract attention from outside the aircraft to mission essential items only.

16.2. Tactical Arrivals:

16.2.1. High Altitude Approaches (Figure 16.2.). See AFTTP 3-1.COMPASS CALL for discussion of advantages/disadvantages and flight parameters for each 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 AGL.17.2.1.1. Overhead. Initiate overhead recoveries at 200 knots indicated airspeed (KIAS) and 1,500 feet AGL or traffic pattern altitude, whichever is higher, unless local procedures or tactical situation dictate otherwise. Break as the tactical situation permits with approximately a 45 degree angle of bank and retard the power to flight idle after the bank is established. Make a level turn to downwind with power reapplied as necessary to maintain 150 KIAS. Maintain 140 KIAS (or approach speed if higher) until wings level on final.

16.2.1.1. Downwind. Enter a downwind leg for the active landing runway, normally maintaining 200 KIAS and 1,000 feet 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.

16.2.2. Selection of Maneuver. The desired outcome of the random approach is to place the aircraft on final (never less that 300 feet and 0.25 miles from the runway) wings level, above threshold speed so that a safe landing may be executed.

16.3. Tactical Departures. See AFTTP 3-1.COMPASS CALL for discussion of advantages/disadvantages and flight parameters for each arrival.

16.4. Ground Operations. This section outlines procedures to follow when conducting specific ground operations. Preparation and a thorough briefing enhance the ability to operate quickly and safely. Brief appropriate ground personnel and subsequent aircrews on unexpected hazards encountered during takeoff or landing (e.g., dust, winds and hostile activity). If possible, park in a spot that allows exit via two or more taxi routes.

16.5. Compass Call Hand-Off Guide. This checklist is intended to streamline coordination between two Compass Call crews when one aircraft is replacing the other aircraft on a designated orbit. Refer to the local supplement for specific procedures and checklist.

Chapter 17

SEARCH AND RESCUE

17.1. General. In most cases EC-130H aircraft will continue to perform their mission, while other assets conduct CSAR. However, the crew must be prepared to act as on-scene commander until CSAR forces arrive. Crews will then assist CSAR forces in any way necessary.

17.1.1. The following general instructions apply to all search missions:

17.1.1.1. Brief crew members who did not attend the operations briefing on the purpose of the mission.

17.1.1.2. Scanners who are not aircrew members will receive a briefing on the search objective.

17.1.1.3. The AC will supervise and coordinate activities of crew members during preparation for search, as follows:

17.1.1.3.1. Plan the search with the navigator.

17.1.1.3.2. Discuss scanning procedures with all crew members.

17.1.1.3.3. Discuss procedures for making search pattern turns with the navigator and copilot.

17.1.1.3.4. Discuss the radio communication procedures with the crew.

17.1.1.3.5. Discuss preparation of flares, sea dyes and smoke signals for deployment with the AMT.

17.1.1.4. The AC will coordinate crew member activities during prosecution of the search by:

17.1.1.4.1. Ensuring completion of the Search and Rescue Checklist (in local In-Flight Guide) prior to commencing any search.

17.1.1.4.2. Alerting the scanners to begin scanning when approaching the search area.

17.1.1.4.3. Directing crew member to put on their LPUs prior to descending below 2,000 feet over water.

17.1.1.4.4. Checking with crew members to ensure all equipment and personnel are ready for action in the event of a sighting.

17.1.1.4.5. Making periodic checks of fuel remaining to ensure sufficient fuel remains for return to home station.

17.1.2. Report all deviations from assigned search procedures to the on-scene commander or mission commander.

17.1.3. Thoroughly investigate sightings and report findings immediately. Initiate recovery action or assistance when the survivors are located and inform appropriate agencies of the progress.

17.1.4. The navigator will:

17.1.4.1. Maintain an accurate record of area searched.

17.1.4.2. Direct the aircraft to ensure proper coverage of the search area.

17.1.4.3. Continually cross check headings, drift, time, airspeed and altitude to maintain the best possible search coverage.

17.1.4.4. Use a large scale chart when searching over land to ensure terrain and obstacle clearance. Use a search pattern graph as a suitable reference while searching over water.

17.1.4.5. Record sighting information on log and plot position on navigation chart.

17.1.4.6. Monitor equipment during radar and electronic searches.

17.1.4.7. Debrief controlling agency with an accurate depiction of any areas searched.

17.1.4.8. When other aircraft are involved, with the assistance of the ACS, track and assign search areas for other aircraft.

17.1.5. The copilot will maintain radio communications with other search aircraft and the controlling agency as directed by the PIC.

17.1.6. The AMT will assume supervision of the scanners and will schedule rotation and rest periods.

17.1.7. All crew members will assist with the scanning duties when possible.

17.2. Search. When a search is completed with negative results, consider searching the area again. Normally, position subsequent search legs between or 45 degrees to the previous search legs. This procedure results in smaller track spacing.

17.2.1. In the search area:

17.2.1.1. Descend to search altitude (**Table 17.1**) if possible.

Table 17.1. Recommended Search Altitudes.

RECOMMENDED ALTITUDES OVER WATER	EXPECTED TARGET
500 feet and below	Survivor without raft or dye marker.
500 feet to 1000 feet	Survivor in raft without dye marker or signaling device.
1000 feet to 2500 feet	Survivor has dye marker.
1000 feet to 3000 feet	Survivor has signaling device or radar reflector.
2000 feet to 3000 feet	Expecting to find wreckage during initial phase of the mission.
2000 feet	During night over water.
RECOMMENDED ALTITUDES OVER LAND	**EXPECTED TARGET**
1000 feet	Survivors of an aircraft incident over level terrain with little foliage.
500 feet	Survivors of an aircraft incident

	over level terrain with heavy foliage
500 feet to 1000 feet	Survivors of an incident in mountainous terrain.
2000 feet	Expecting to find wreckage.
2000 feet	Over land at night.
RECOMMENDED ALTITUDES FOR ELECTRONIC BEACONS	
8000 feet or higher	

17.2.1.2. Have navigator obtain the wind at search altitude. To visually cover the area thoroughly, slow the airspeed during search patterns (refer to the Aircraft Performance Manual).

17.2.1.3. Notify ATC of arrival on scene and estimated endurance.

17.2.1.4. Vector other aircraft to the scene.

17.2.1.5. Use radar (some life rafts carry reflectors).

17.2.1.6. Assume on-scene command until relieved by another duly appointed SAR aircraft. As other aircraft arrive, do the following:

17.2.1.6.1. Establish contact on channels other than Guard.

17.2.1.6.2. Obtain aircraft type identification, endurance and rescue capability.

17.2.1.6.3. Assign altimeter setting, frequencies, search areas, patterns and altitude separation.

17.2.1.7. If leaving the search area because of lack of fuel, assign another aircraft as on-scene commander.

17.2.2. Determine an accurate wind prior to and throughout the search by CANS, INS, Doppler, or plotting winds. To determine wind direction and velocity by plotting winds, the following apply:

17.2.2.1. Crest lines of waves on the surface of the water are perpendicular to the direction of the wind. Ripples and bow waves break away from the wind (downwind). The foam of whitecaps formed by breaking waves always appears to slide into the wind (upwind).

17.2.2.2. There may be streaks in the water parallel to the wind direction. These streaks are called wind lanes.

17.2.2.3. Turn aircraft so its longitudinal axis is aligned with the direction of movement of ripples, whitecaps, waves, or wind streaks.

17.2.2.4. Read compass to determine magnetic direction of wind or its reciprocal (convert to true values, if necessary).

17.2.2.5. Determine the direction in which ripples, waves, or whitecaps are moving to obtain actual direction of wind.

17.2.2.6. Determine wind velocity by observing the appearance of the surface (**Table 17.2**).

Table 17.2. Wind and Sea Prediction Chart.

WIND VELOCITY IN KNOTS	HEIGHT OF WAVES IN FEET	BEAUFORT NUMBER	SEA INDICATIONS
Calm	0	0	Like a mirror.
1-3	1/2	1	Ripples with the appearance of scales
4-6	1	2	Small wavelets, crests have glassy appearance.
7-10	2	3	Large wavelets, crests begin to break: scattered whitecaps.
11-16	5	4	Small waves, becoming longer. Fairly frequent white caps.
17-21	10	5	Moderate waves, taking pronounced long form; many whitecaps.
22-27	15	6	Large waves begin to form; white foam crests more extensive; some spray.
28-33	20	7	Sea heaps, white foam from breaking waves blown in streaks along direction of waves.
34-40	25	8	Moderately high waves of greater length; crests break into spindrift; foam blown in well marked streaks in direction of wind.
41-47	30	9	High waves, dense streaks of foam; sea begins to roll; spray affects visibility.
48-55	35	10	Very high waves with overhanging crests; foam in great patches blown in dense white streaks. Whole surface of sea takes on a white appearance. Visibility affected.

17.2.3. When flying search patterns, turns must be accurate and uniform as possible. The following procedures are provided to assist the aircrew in making precise turns:

17.2.3.1. Fly the aircraft on autopilot when possible.

17.2.3.2. Prior to starting the pattern, the navigator will brief the crew on the direction and rate of turn and the turn command procedure used.

17.2.3.3. Normally, all turns are standard rate (3 degrees per second) unless track spacing is less in distance than the diameter of a standard turn at a given speed. In this situation, continue turn to 180 degrees and adjust turn rate as required to remain within the pattern.

17.2.3.4. On any search pattern employing a succession of 90-degree standard rate turns separated by cross legs, use the following procedure for computing time to begin each turn:

17.2.3.4.1. Compute time required to fly entire first leg using ground speed for that leg.

17.2.3.4.2. Subtract 19 seconds from the time computed in paragraph 17.2.4.4.1.

17.2.3.4.3. Add the difference obtained in paragraph 17.2.4.4.2. to start search time. Resultant will be the time to begin the first 90-degree turn.

17.2.3.4.4. Compute time required to fly the entire second leg using ground speed for that leg.

17.2.3.4.5. Subtract 8 seconds from time computed in paragraph 17.4.4.4.4.

17.2.3.4.6. Add the difference obtained in paragraph 17.2.4.4.5. to start search time. Resultant will be the time to begin the first 90-degree turn.

17.2.3.4.7. To compute ensuing turn times, continue to subtract 8 seconds from successive full leg time and add the resultant to previous turn time.

17.3. Sighting Procedures:

17.3.1. When a sighting is made, the appropriate crewmember will notify the rest of the crew over interphone and indicate the position of the sighting by using the clock system; e.g., "Pilot, right scanner, target sighted at 4 o'clock, 500 yards."

17.3.2. Immediately upon making a sighting, drop a smoke signal or sea dye marker to mark the approximate location of the sighting. During search missions, have marking devices readily available to jettison. The crewmember who launches the smoke will announce "SMOKE AWAY" over the interphone. **Note:** During the pre-search briefing, the AC should designate who will launch smokes to mark a sighting. This will ensure a smoke is launched and preclude inadvertent multiple launches.

17.3.3. Following the launching of a smoke signal and other marker, make a procedure turn to bring the aircraft back over the target, or if the observer can keep the target in sight, the pilot flying should immediately turn in the direction of the target. The observer will continue to call out the target position and distance to orient the pilot. As the turn progresses, the pilot or copilot should be able to acquire the target.

17.3.4. The following procedures are for confirmed sightings:

17.3.4.1. Keep the target in sight at all times. Mark with dye marker or smoke floats.

17.3.4.2. Turn on IFF.

17.3.4.3. Report the sighting to the rescue center, OSC, air or ground station, or operating agency, as appropriate. This report should include:

17.3.4.3.1. Position.

17.3.4.3.2. Number of survivors.

17.3.4.3.3. Condition of survivors.

17.3.4.3.4. Type of emergency equipment used or needed by survivors.

17.3.4.3.5. Action already taken or assistance needed.

17.3.4.3.6. Condition of weather and sea.

17.3.4.3.7. Fuel remaining in hours.

17.3.4.4. Orbit the scene. When two planes are available, one should climb to an altitude that ensures radar detection by other craft or land bases, and the other should remain low, keeping the target in sight. Both aircraft should remain on station until relieved by other aircraft, rescue or recovery has been affected, or forced to return to base because of low fuel. In the latter event, mark the position with the best means available before departing the search area.

17.3.4.5. Drop available emergency equipment and/or personnel, if required. If survivors are in life jackets, make attempts as soon as possible to furnish them with life rafts or other survival equipment and signaling devices.

17.3.4.6. Direct potential rescue or recovery vessels and other aircraft to the scene by radio or visual signals. Radio and visual signals you may use to direct a vessel to the scene to include:

17.3.4.6.1. Radio message to the vessel (If unsure of frequency guarded by the vessel, use 2182 KHz voice or 156.8 MHz VHF or FM).

17.3.4.6.2. ADF to take bearings on a vessel's LF or MF transmissions.

17.3.4.6.3. VHF or UHF direction finder to take bearings of VHF or UHF transmissions.

17.3.4.6.4. Radar and IFF.

17.3.4.6.5. Signal light.

17.3.4.6.6. Dropping message containers.

17.3.4.6.7. Pyrotechnic flares.

17.3.4.6.8. When radio communications are not possible, establish self-identification, and then indicate location of the target by:

17.3.4.6.8.1. Circling the vessel at least once at low altitude.

17.3.4.6.8.2. Flying across the bow of the vessel at least once, and rocking wings at the same time.

17.3.4.6.8.3. Sending a message by signal light or dropping a message, if possible.

17.3.4.6.8.4. Heading in the direction of the target. Repeat this procedure until the vessel acknowledges by following the aircraft, or indicates that it is unable to comply by hoisting the International Flag, November (the International Flag, November, is a blue and white checkerboard). Crossing the wake of the vessel close astern at a low altitude means that the service of the vessel to which the signal is directed is no longer required.

17.3.4.7. In daytime, use any of the following means to inform survivors they have been sighted:

17.3.4.7.1. Fly low over survivors with landing lights on.

17.3.4.7.2. Blink a signal light in the direction of survivors.

17.3.4.7.3. Drop two smoke signals a few seconds apart.

17.3.4.8. Aircrews sighting survivors at night should:

17.3.4.8.1. Mark the position by dropping smoke floats or float lights.

17.3.4.8.2. Request assistance from other search aircraft or ships.

17.3.4.8.2.1. If a rescue vessel arrives in the area, direct it to the scene by giving the target position in relation to the float light. Drop parachute flares to assist the rescue or recovery vessel in sighting the target.

17.3.4.8.2.2. If the objective has not been located, but its position is fairly well established, drop two float lights to outline the limits of the search area, the most probable position of target being halfway between the lights. Start the search from one light to the other, dropping parachute flares for illumination.

17.3.4.8.2.3. If no surface vessel is available, but two aircraft are on-scene, have one aircraft fly over the area at 3,000 feet dropping flares at 2- or 3-mile intervals. Station the other aircraft 3 miles behind the illuminating aircraft, slightly upwind at 500 feet to search.

17.4. Scanning Techniques. Precise scanning is one of the most important aspects of a search. During a search, all crewmembers will make a cursory examination of the area. For maximum effectiveness, assign personnel primary duties as scanners. If available, assign personnel other than the basic crew to these duties. Thoroughly brief scanners on techniques prior to beginning a search.

17.5. Communications with a Distressed Aircraft:

17.5.1. Establish direct communications with the distressed aircraft as soon as possible. Accomplish this on the distressed aircraft's HF enroute frequency, emergency VHF or UHF frequency, or any other frequency used by the distressed aircraft to alert air or ground facilities. The primary method of communications will be VHF or UHF when positive contact is made, see **Table 17.3**

Table 17.3. Communications Frequencies.

EMERGENCY	RESCUE COORDINATION
ADF 500 KHz	UHF 282.8 MHz
HF 8364 KHz	VHF 123.1 MHz
UHF 243.0 MHz (Guard)	HF 3023.5 KHz
VHF 121.5 MHz (Guard)	HF 2182 KHz (Maritime Distress)
ENROUTE SETUP	**ON-THE SCENE**
Both ADFs–500 KHz (for objects with 500 KHz	ATC Frequency

beacons)	
Liaison – Primary HF	HF – 2023.5 KHz (SAR on-scene
HF – 8364 or 2182 KHz	VOR – 121.5
Ship to Plane – 2182 KHz	VHF – 121.5
VOR – 121.5 MHz	UHF- 282.8 MHz and Guard for interplane
VHF 121.5 MHz	VHF-FM 156.8 MHz (153.8 for mountain areas)
UHF – GCI and Guard	
VHF-FM – 156.8 MHz (153.8 for mountain areas)	
Note: These are suggested radio setups. Actual frequencies used will be determined by the search objective, crew and availability of radio equipment.	

17.5.2. Communications procedures should instill confidence in the distressed crew so they will know professional assistance is at hand. The crew will achieve this goal by employing the following:

17.5.2.1. Coordinate immediate action items first and supplemental items as the mission progresses. Communications may be lost or the distressed crew may be forced to bail out, crash land or ditch.

17.5.2.2. Avoid long transmissions and provide pertinent data at periodic intervals to assure the distressed crew that contact is being maintained.

17.5.2.3. Make all messages clear and concise. Know what to say and use a tone of confidence.

17.5.2.4. If direct communications are delayed or fail completely, relay pertinent data and instructions through any air or ground station in contact with both aircraft.

17.5.2.5. If all efforts to contact the distressed aircraft fail, transmit pertinent information and instructions in the blind, assuming the distressed aircraft is receiving but unable to acknowledge.

17.5.3. Use the following frequencies and procedures during an intercept:

17.5.3.1. Primary Frequency. The HF, VHF or UHF enroute frequency used by the distressed aircraft to alert air or ground stations and to request intercept.

17.5.3.2. Secondary Frequency. Designate a secondary HF frequency shortly after initial contact. Instruct the distressed aircraft to change to this frequency if contact on the primary frequency is lost for a 10-minute period. When VHF or UHF contact is established, designate a secondary frequency. Prior to changing VHF or UHF frequencies, instruct the distressed aircraft to return to primary if contact cannot be established within 30 seconds.

17.5.4. Initial Communications Procedures:

17.5.4.1. Attempt initial contact with distressed aircraft before takeoff or as soon as practical on HF, VHF or UHF. If initial contact is on HF, designate a VHF or UHF

frequency to monitor. If initial contact is on VHF or UHF, instruct distressed aircraft to monitor enroute HF frequency.

17.5.4.2. Identify yourself and advise that you are enroute to intercept.

17.5.4.3. Instruct the distressed crew to use the present frequency as primary and not to break contact. Designate a secondary frequency.

17.5.4.4. Instruct the distressed crew to transmit "emergency" on the IFF.

17.5.4.5. Obtain and evaluate the latest position, time, magnetic heading, indicated airspeed (IAS), ground speed (GS), altitude, fuel remaining, personnel on board and flight conditions of the distressed aircraft.

17.5.4.6. Verify the nature of emergency and intentions of the distressed aircraft.

17.5.4.7. If required, instruct the distressed aircraft to home on the signal transmitted by the rescue aircraft.

17.5.4.8. Transmit supplemental data as appropriate to the situation such as altimeter setting, weather, estimated time to intercept (ETI), minimum safe altitude, etc.

17.6. Lost Aircraft Procedures. Fixing, intercepting and escorting a lost aircraft is an extremely difficult problem. Establish communications with the lost aircraft in order to initiate orientation procedures. Use all possible aids to locate the approximate position of the lost aircraft. In many cases, radar or direction finding stations will establish a bearing from the station to the lost aircraft and indicate the general direction to fly to accomplish an intercept.

17.6.1. Attempt contact with the lost aircraft as soon as possible. Climb to the highest practical altitude to increase communications range.

17.6.2. If the lost aircraft is in contact with an air or ground station within reasonable range from the base, the rescue aircraft should orbit at altitude over the appropriate station until some clue is received which indicates the general direction or position of the lost aircraft.

17.6.3. If all communication attempts prove unsuccessful, it is advisable to proceed in the most logical direction toward the lost aircraft.

17.6.4. Instruct the distressed aircraft to maintain radio contact at all costs and orbit at its present position to keep within communications range, maintaining the highest practical altitude to improve communications.

17.6.5. Ascertain amount of fuel remaining and the number of personnel aboard.

17.6.6. Maintain communications with air or ground stations capable of providing bearings, fixes or other assistance.

17.6.7. Use every possible intercept method and electronic aid to ensure a successful mission.

17.6.7.1. Employ the electronic aid that can provide the quickest and most reliable bearing or fix on the lost aircraft.

17.6.7.2. Obtain a reliable bearing or fix and instruct the lost aircraft to leave orbit and head toward the rescue aircraft or the nearest suitable landing area.

17.6.7.3. If in voice contact with the lost aircraft and unable to establish a bearing or fix, determine its approximate position from any surface objects, landmarks or peculiar cloud formation. Landing lights and pyrotechnic flares improve detection capabilities at night.

17.7. Departing Search Area:

17.7.1. Notify ATC and the appropriate SAR agency on-scene SAR aircraft, Rescue Coordination Center, etc.

17.7.2. If other search aircraft have not arrived, reconfirm position, and advise survivors when further assistance will arrive, if known.

17.8. Forms Adopted. AF Form 8, *Certificate of Aircrew Qualification***;** AF Form 15, *United States Air Force Invoice***;** AF Form 70, *Pilot's Flight Plan and Log*; AF Form 72**,** *Air Report (AIREP);* AF Form 457, *USAF Hazard Report***;** AF Form 523, *USAF Authorization to Bear Firearms*; AF Form 651, *Hazardous Air Traffic Report (HATR);* AF Form 664, *Aircraft Fuels Documentation Log*; AF Form 711, *USAF Mishap Report*; AF Form 847, *Recommendation for Change of Publication*; AF Form 1297, *Temporary Issue Receipt*; AF Form 1631, *NATO Travel Orders*; AF Form 1994, *Fuels Issue/Defuel Document*; AF Form 4091, *Mission Data*; AF Form 4064, *C-130 Takeoff and Landing Data Card*; AF Form 4116, *C-130 Flight Plan and Log*; AFTO Form 46, *Prepositioned Life Support Equipment*; AFTO Form 781, *Aerospace Vehicle Flight Data Record;* DD Form 175, *Military Flight Plan*; DD Form 175-1, *Flight Weather Brief;* DD Form 365-4, *Weight and Balance Clearance Form F*; DD Form 1351-2, *Travel Voucher or Sub-voucher;* DD Form 1610, *Request and Authorization for TDY Travel of DoD Personnel*; DD Form 1801, *DoD International flight Plan*;*;* DD Form 1854, *US Customs Accompanied Baggage Declaration*; DD Form 1898, *AVFuels Into-Plane Sales Slip*; DD Form 2131, *Cargo/Passenger Manifest;* CBP 7507, *General Declaration (Outward/Inward).*

PHILIP M. BREEDLOVE, Lt Gen, USAF
DCS, Operations, Plans and Requirements

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

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Abbreviations and Acronyms

AAR— Air to Air Refueling

AC— Aircraft Commander

ACC— Air Combat Command

ACCA—Aircrew Contamination Control Area

ACDE— Aircrew Chemical Defense Ensemble

ACF— Acceptance Check Flight

ACM— Additional Crew Member

ADI— Attitude Direction Indicator

ADIZ— Air Defense Identification Zone

ADVON— Advanced Echelon

AERPS— Aircrew Eye-Respiratory Protection System

AFE— Aircrew Flight Equipment

AFI— Air Force Instruction

AFRIMS— Air Force Records Information Management System

AFTO— Air Force Technical Order

AGE— Aircraft Ground Equipment

AGL—Above Ground Level

AHAS—Aviation Hazard Advisory System

AIR— Aviation Into-Plane Reimbursement

AITG— Airborne Integrated Terminal Group

ALTRV— Altitude Reservations

AMT— Airborne Maintenance Technician

ANO— Analysis Operator

AO— Acquisition Operator/Aeronautical Order

AOC— Air Operations Center

AOR— Area of Operations

APOD— Aerial Port of Debarkation

ARIP— Air Refueling Initiation Point

ARMS— Aviation Resource Management

ARTC— Air Route Traffic Control

ARTCC— Air Route Traffic Control Center

ASIP— Aircraft Structural Integrity Program

ASR— Air Surveillance Radar

ASRR— Airfield Suitability and Restriction Report

ATA— Actual Time of Arrival

ATC— Air Traffic Control

ATC/SCC— Air Traffic Control System Command Center

ATIS— Area Terminal Information System

ATM— Air Turbine Motor

ATO— Air Tasking Order

AVPOL— Aviation Petroleum Lubricants

BAI— Back Up Aircraft Inventory

BAM— Bird Avoidance Model

BASH— Bird/Wildlife Aircraft Strike Hazard

BDHI— Bearing, Distance, Heading Indicator

BWA— Biological Warfare Agent

C2— Command and Control

CADC— Central Air Data Computer

CANS— Computer Aided Navigation System

CARA— Combined Altitude Radar Altimeter

CAS— Calibrated Air Speed

CB CONOPS— Chemical-Biological Concept of Operations

CBRNE— Chemical, Biological, Radiological, Nuclear and High Yield Explosives

CCMCS— Compass Call Mission Crew Simulator

CCT— Combat Control Team

CDD— Crew Duty Day

CDT— Crew Duty Time

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

COMACC— Commander Air Combat Command

COMAFFOR— Commander Air Force Forces

COMSEC— Communications Security

CONUS— Continental United States

CRA— Country Risk Assessment

CRG— Contingency Response Group

CRM— Crew Resource Management

CSAR— Combat Search and Rescue

CVR— Cockpit Voice Recorder

CWA— Chemical Warfare Agent

DAO— Defense Attaché Officer

DEPORD— Deployment Order

DER— Departure End of Runway

DESC— Defense Energy Support Center

DETCO— Detachment Commander

DEV— Deviation

DFSC— Defense Fuel Supply Center

DH— Decision Height

DME— Distance Measuring Equipment

DNIF— Duty Not Involving Flying

DO— Director of Operations

DOD— Department of Defense

DOV— Standardization / Evaluation

DPT— Deployment Planning Team

DR— Dead Reckoning

DSN— Defense Switched Network

DSR— Deployed Status Reports

DV— Distinguished Visitor

EAS— Equivalent Air Speed

ECG/CC— Electronic Combat Group Commander

ECG/EGV— Electronic Combat Group Standardization / Evaluation

ECG/SE— Electronic Combat Group Safety

EEBD— Emergency Escape Breathing Device

EFI— Electronic Flight Instrument

EMI— Electromagnetic Interference

EMP— Electromagnetic Pulse

ENAME— Europe, North Africa and Middle East

EP— Evaluator Pilot

EPOS— Emergency Passenger Oxygen System

EOD— Explosive Ordinance Disposal

ERCC— Engine Running Crew Change

ERO— Engine Running On/Off Load

ETA— Estimated Time of Arrival

ETCAS— Enhanced Traffic Collision Avoidance System

ETI— Estimated Time to Intercept

ETP— Equal Time Point

EUCOM—United States European Command

EW/CC— Expeditionary Wing Commander

EWO— Electronic Warfare Officer

EZ— Exchange Zone

FAA— Federal Aviation Administration

FAF— Final Approach Fix

FAS— Fuel Automated System

FBI— Federal Bureau of Investigation

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

FIR— Flight Information Region

FL— Flight Level

FLIP— Flight Information Publication

FMC— Fully Mission Capable

FMP— Flight Manual Program

FMS— Flight Management System

FOL— Forward Operating Location

FP/FN— Basic Qualified Pilot/Basic Qualified Navigator

FRAG— Fragmentation

FSS— FLIGHT Service Station

GCAS— Ground Collision Avoidance System

GCCS— Global Command and Control System

GCE— Ground Crew Ensemble

GCU— Generator Control Unit

GDSS— Global Defense Support System

GMT— Greenwich Mean Time

GNC— Global Navigational Chart

GPS— Global Positioning System

GPWS— Ground Proximity Warning System

GW— Gross Weight

HAA— Height Above Airport

HAT— Height Above Touchdown

HATR— Hazardous Air Traffic Report

HERK— Hostile Environment Repair Kit

HF— High Frequency

HQ ACC/A3— Headquarters Air Combat Command/Director of Operations

HQ ACC/A3I— Headquarters Air Combat Command/Information Operations Division

HQ ACC/A3T— Headquarters Air Combat Command/Flight Operations Division

HQ ACC/A3TV— Headquarters Air Combat Command/Standardization Branch

HQ AFFSA— Headquarters Air Force Flight Safety Agency

HQ AFSC/SEF— Headquarters Air Force Safety Center Aviation Center

HQ USAF/A3OT— Headquarters United States Air Force/Operations Training Division

HSI— Horizontal Situation Indicator

HVAC— Heating Ventilation and Air Conditioning

IACC— Integrated Aircrew Chemical Coverall

IAP— Initial Approach Point

IAW— In Accordance With

ICAO— International Civil Aviation Organization

IDS— Independent Disconnect System

IFF/SIF— Identification Friend or Foe/Selective Identification Feature

IFR— Instrument Flight Rules

ILS— Instrument Landing System

IMC— Instrument Meteorological Conditions

INS— Inertial Navigation System

IOAT— Indicated Outside Air Temperature

IP— Instructor Pilot

IPE— Individual Protective Equipment

ISR— Intelligence, Surveillance and Reconnaissance

ITAS— Indicated True Airspeed

JCS— Joint Chiefs of Staff

JFACC— Joint Force Air Component Commander

JNC— Jet Navigational Chart

JNCA— Jet Navigational Chart–High Altitude

KIAS— Knots Indicated Airspeed

LBT— Low Band Transmit

LPU— Life Preserver Unit

LRU— Long Range Cruise

LSAF— Last Suitable Airfield

MAC— Mean Aerodynamic Chord

MAF— Mobility Air Force

MAJCOM— Major Command

MAJCOM A3— Major Command Director of Operations

MAJCOM A3/DO— Major Command Director of Operations/Director of Operations

MARSA— Military Assumes Responsibility for Separation of Aircraft

MC— Mission Contributing

MCS— Mission Crew Supervisor

MDA— Minimum Descent Altitude

MDS— Mission Design Series

ME— Mission Essential

MEA— Minimum Enroute Altitude

MEL— Minimum Equipment List

MEP— Mission Essential Personnel

MESL— Minimum Essential Subsystem List

MFLMETO— Minimum Field Length for Maximum Effort Take Off

MFLTTO— Minimum Field Length for Tactical Take Off

MHE— Material Handling Equipment

MLG— Main Landing Gear

MNPS— Minimum Navigation Performance Specifications

MOCA— Minimum Obstruction Clearance Altitude

MOPP— Mission-Oriented Protective Posture

MPC— Mission Planning Cell

MPD— Mobility Pilot Development

MRE— Meal Ready to Eat

MSA— Minimum Safe Altitude

MSC— Multi Service Corporation

MSL— Mean Sea Level

MTOGW— Maximum Take Off Gross Weight

MVA— Minimum Vectoring Altitude

MXG/CC— Maintenance Group Commander

NACO— National Aeronautical Charting Office

NAF/OV— Numbered Air Force Standardization and Evaluation

NAS— Naval Air Station

NATO— North Atlantic Treaty Organization

NAVAIDS— Navigational Aids

NDB— Non Directional Beacon

NM— Nautical Miles

NMAC— Near Mid-Air Collision

NSN— National Stock Number

NORAD— North American Aerospace Defense Command

NOTAM— Notice to Airmen

OAT— Outside Air Temperature

OCF— Operational Check Flight

OCONUS— Outside the Continental United States

OCS— Obstacle Clearance Surface

OEI— One Engine Inoperative

OIC— Officer in Charge

ONC— Operational Navigational Chart

OP/ON— Observer Pilot/Observer Navigator

OPCON— Operational Control

OPORD— Operation Control

OPR— Office of Primary Responsibility

OROCA— Off Route Obstruction Clearance Altitude

OSC— On Scene Commander

OSD— Office of Secretary of Defense

OSI— Office of Special Investigation

OWS— Operational Weather Squadron

PAPI— Precision Approach Path Indicator

PF— Pilot Flying

PFPS— Portable Flight Planning Software

PIC— Pilot in Command

PPH— Pounds Per Hour

PM— Pilot Monitoring

PMSV— Pilot to Meteorologist Service

POK— Passenger Oxygen Kit

POL— Petroleum, Oil and Lubricants

PPS— Precision Positioning Service

PQP— Previously Qualified Pilot

PRM— Precision Runway Monitor

QA— Quality Assurance

RA— Resolution Advisory

RCR— Reverse Current Relay/Runway Condition Reading

RDD— Radiation Dispersal Device

RDS— Records Disposition Schedule

RIK— Replacement In Kind

RNP— Required Navigation Performance

ROC— Required Obstacle Clearance

ROE— Rules of Engagement

RRFL— Required Ramp Fuel Load

RSC— Runway Surface Covering

RVR— Runway Visual Range

RVSM— Reduced Vertical Separation Minimum

RVIP— Rendezvous Initial Point

SAR— Search and Rescue

SATCOM— Satellite Communication

SCI— Sensitive Compartmented Information

SCIF— Sensitive Compartmented Information Facility

SDP— Special Departure Procedure

SF— Standard Form

SID— Standard Instrument Departure

SIGMENT— Significant Meteorological Information

SII— Special Interest Items

SITCO— Shell International Trading Company

SITREPS— Situation Reports

SM— Statute Miles

SOC— Squadron Operations Center

SOUTHCOM— Southern Command

SPINS— Special Instructions

SPR— Single Point Refueling

SPS— Standard Positioning Service

SSO— Senior Staff Officer

STAN/EVAL— Standardization and Evaluation

STT— Special Tactics Teams

TACAN— Tactical Air Navigation

TACC— Tanker Airlift Control Center

TAS— True Airspeed

TCAS— Traffic Alert and Collision Avoidance System

TDY— Temporary Duty

TEMPO— Temporary Group

TERPS— Terminal Instrument Procedures

TIT— Turbine Inlet Temperature

TO— Technical Order

TOAT— True Outside Air Temperature

TPC— Tactical Pilotage Chart

TR— Transformer Rectifier

UAB— Underwater Acoustical Locator Beacon

UHF— Ultra High Frequency

USAF— United States Air Force

USAFE— United States Air Forces in Europe

USMC— United States Marine Corp

USN— United States Navy

UV— Ultra Violet

VASI— Visual Approach Slope Indicator

VCSL— Voice Call Sign Listing

VFR— Visual Flight Rules

VHF— Very High Frequency

VIP— Very Important Person

VMCA— Air Minimum Control Speed

VMCG— Ground Minimum Control Speed

VOR— Very High Frequency Omni-Directional Radio-Range

VR— Refusal Speed

VS1— Stall Speed

VSI— Vertical Speed Indicator

VVI— Vertical Velocity Indicator

WG/CC— Wing Commander

Terms

Additional Crew Member—Mobility aircrew members and authorized flight examiners possessing valid aeronautical orders who are authorized to accompany the normal crew complement required for that mission according to **Chapter 3**.

Air Route Traffic Control Center (ARTCC)—The principal facility exercising enroute control of aircraft operating under instrument flight rules within its area of jurisdiction. Approximately 26 such centers cover the United States 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.

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.

Command and Control Center (CC) (C2)—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission (Ref: Joint Publication 1-02).

Conference SKYHOOK—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.

Critical Phase of Flight—Takeoff, air refueling, approach and landing.

Deadhead Time—Duty time for crewmembers positioning or returning from a mission or mission support function and not performing crew duties.

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).

Due Regard—Operational situations that do not lend themselves to International Civil Aviation Organization (ICAO) flight procedures, such as military contingencies, classified missions, SAR missions, politically sensitive missions, or training activities. Flight under "Due Regard" obligates the military PIC to be his or her own ATC agency and to separate his or her aircraft from all other air traffic (see FLIP General Planning, section 7.)

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.

Familiar Field—An airport in the local flying area at which unit assigned aircraft routinely perform transition training. Each operations group commander will designate familiar fields within their local flying area.

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.

Hazardous Cargo or Materials (HAZMAT)—Articles or substances that are capable of posing significant risk to health, safety, or property when transported by air.

Instructor Supervision—Supervision by an instructor of like specialty (see also Direct InstructorSupervision).

Joint Force Air Component Commander— 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 **JFACC.** See also **joint force commander.** (JP 3-0).

Knock—it-Off—A term any aircrew member may use to terminate a training maneuver. Upon hearing "Knock-it-Off" the crew should establish a safe attitude, altitude, and airspeed and return the aircraft power and controls to a normal configuration.

Last Suitable Airfield (LSAF)—The last suitable airfield available before beginning the category I route segment.

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

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, i.e., hydraulic, ultra high frequency (UHF) radio, radar, engine, fuel control, generator, etc. Attempt to describe the nature of the system malfunction to the extent that appropriate maintenance personnel will be available to meet the aircraft. Use system codes in appropriate AFTO Forms 781 whenever possible to enhance OPSEC. When possible, identify system as mission essential (ME) or mission contributing (MC).

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 (MC)—Any degraded component, system, or subsystem which is desired, but not essential to mission accomplishment.

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. Operational control is inherent in combatant command (command authority). Operational control may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish

assigned missions. Operational control does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called OPCON (Ref: Joint Publication 1-02).

Operational Missions—Missions such as deployment, re-deployment, and operational readiness inspections (ORI) are considered operational missions.

Orbit—The airspace where EC-130H aircraft conduct the mission.

Overwater Flight—Any flight that exceeds power off gliding distance from land.

Permit to Proceed—Aircraft not cleared at the first US port of entry may move to another US 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). ACs 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 AC for not complying with permit to proceed procedures.)

Pilot in Command—Aircraft commander-qualified pilot who is in command of the aircraft and the overall mission, regardless of whether he or she is in the seat.

Prior Qualified Pilot—Pilot converted from another MDS. PQPs have no prior C-130 pilot qualification.

Show Time—The time a crew member is required to 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 sand storms. SIGMETs frequently cover a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

Special Tactics Team (STT)—A task-organized element of special tactics that may include combat control, pararescue, and combat weather personnel. Functions include austere airfield and assault zone reconnaissance, surveillance, establishment, and terminal control; terminal attack control; combat search and rescue; combat casualty care and evacuation staging; and tactical weather observations and forecasting.

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. The crew will have completed aircraft preflight inspections prior to stations time.

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 TO 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.

Time Out—Common assertive statement used to voice aircrew member concern when safety may be jeopardized.

Zero Fuel Weight—Weight, expressed in pounds, of a loaded aircraft not including wing and body tank fuel. All weight in excess of the maximum zero fuel weight will consist of usable fuel.